City Council Meeting Agenda

Our Vision: A well-planned lakeside community of quality neighborhoods, distinctive amenities, diverse employment, and cultural charm. Rowlett: THE place to live, work and play.

Tuesday, October 21, 2025 **7:00 PM** **Municipal Building – 4000 Main**

Pursuant to Texas Government Code Section 551.127, on a regular, non-emergency basis, members may attend and participate in the meeting remotely by video conference. Should that occur, a quorum of the members, including the presiding officer, will be physically present at the location noted above on this Agenda.

As authorized by Section 551.071 of the Texas Government Code, this meeting may be convened into closed Executive Session for the purpose of seeking confidential legal advice from the City Attorney on any agenda item herein.

The City of Rowlett reserves the right to reconvene, recess or realign the Regular Session or called Executive Session or order of business at any time prior to adjournment.

Process for Public Input: If you are not able to attend in person, you may complete the Public Input Form on the City's website by 3:30 p.m. the day of the meeting. All forms will be forwarded to the City Council prior to the start of the meeting.

For in-person comments, request to speak forms/instructions are available inside the door of the City Council Chambers.

Invocation

Pledges of Allegiance

1. Call to Order

2. Presentations

2.A. Presentation of Proclamation recognizing October 19–25, 2025, as National Friends of Libraries Week.

2.B. Presentation of Proclamation recognizing November 3, 2025, as Alzheimer's Disease Awareness Day.

3. Citizens' Input

At this time, comments will be taken from the audience on any topic. No action can be taken by the Council during Citizens' Input.

4. Consent Agenda

The following may be acted upon in one motion. A City Councilmember or a citizen may request items be removed from the Consent Agenda for individual consideration.

4.A. Consider action approving the minutes.

Consider action to approve minutes from the following City Council meeting(s): October 1, 2025, City Council Special Meeting, October 13, 2025, City Council Work Session, and October 14, 2025, City Council Meeting.

4.B. Consider action approving the adoption of the Investment Policy.

Consider action to adopt a resolution adopting the City's Investment Policy for Fiscal Year 2026, including amendments to the investment policies, investment strategies, and approved brokers/dealers list.

4.C. Consider action to approve Change Order No. 1 and Change Order No. 2 to the City's contract for the Sapphire Bay DPS project with Speed Fab-Crete.

Consider action to adopt a resolution approving and ratifying Change Order No. 1 and Change Order No. 2 to the City's contract for the Sapphire Bay DPS project with Speed Fab-Crete, related to the purchase of furniture, fixtures, and equipment and the Parking Lot for Sapphire Bay Station #5, in the total amount of $608,758; and providing for an effective date.

4.D. Consider action to approve the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan for the Bayside PID North Improvement Area.

Consider action to adopt an ordinance adopting changes to the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan including the annual update to the Assessment Roll and levy of assessments on property in the PID pursuant to the Service and Assessment Plan for the Bayside PID – North Improvement Area.

4.E. Consider action to approve the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan for the Bayside PID South Improvement Area.

Consider action to approve an ordinance adopting changes to the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan including the annual update to the Assessment Roll and levy of assessments on property in the PID pursuant to the Service and Assessment Plan for the Bayside PID – South Improvement Area.

4.F. Consider action to approve the 2025-2026 Trails at Cottonwood Creek Public Improvement District (PID) Service and Assessment Plan for the Trails at Cottonwood Creek PID Major Improvement Area (MIA) and Neighborhood Improvement Area #1 (NIA#1).

Consider action to approve an ordinance adopting changes to the 2025-2026 Trails at Cottonwood Creek Public Improvement District (PID) Service and Assessment Plan including the annual update to the Assessment Roll and levy of assessments on property in the PID pursuant to the Service and Assessment Plan for the Trails at Cottonwood Creek PID – Major Improvement Area (MIA) and Neighborhood Improvement Area #1 (NIA#1).

5. Individual Consideration

5.A. Consider action to approve a resolution authorizing the award of a contract for Bid No. 2025-167-B Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid) to Felix Construction Company for a price not to exceed $1,570,547.00 ($1,427,770.00 and a 10% contingency of $142,777.00); authorizing the Mayor or his designee to execute the contract and all necessary and related documents; and providing an effective date.

Members of the City Council may request topics to be placed on an agenda for a subsequent meeting. Any deliberation or decision shall be limited to a proposal to place topic on the agenda for a subsequent meeting.

6. Executive Session

6.A. City Council will convene into closed, executive session pursuant to Texas Government Code Section 551.071 (Consultation with Attorney) to seek legal advice about initiating condemnation proceedings for the acquisition of Right-of-Way (ROW) and Easements on properties along the Chiesa Road Widening

Project in the City of Rowlett, Dallas County, Texas.

7. **Reconvene Into Open Session and Take Any Necessary or Appropriate Action on Closed/Executive Session Matters**

8. **Adjournment**

Deborah Sorensen

Deborah Sorensen, TRMC, MMC, City Secretary

I certify that the above notice of meeting was posted on the bulletin boards located inside and outside the doors of the Municipal Center, 4000 Main Street, Rowlett, Texas, as well as on the City's website on October 15, 2025, by 5:30 p.m.

City of Rowlett City Council meetings are available to all persons regardless of disability. If you require special assistance, contact the City Secretary at 972-412-6109 or write 4000 Main St., Rowlett, Texas, 75088, at least 48 hours in advance of meeting.

City of Rowlett ~ 4000 Main Street, Rowlett TX 75088 ~ www.rowlett.com

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 2.A.

Title
Presentation of Proclamation recognizing October 19–25, 2025, as National Friends of Libraries Week.

Staff Representative
Laura Tschoerner, Library Director

Executive Summary
Celebrated by libraries across the United States, National Friends of Libraries Week serves to highlight the vital contributions made by volunteers to provide advocacy and additional funding.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
ENHANCE QUALITY OF LIFE	4.5 Provide adult, youth, literacy, and ditial media services and facilities. 4.6 Support programs and resources for lifelong learning.

Background Information
Friends of the Rowlett Library began in 1950 with a small group of women in the Rowlett Home Demonstration Club who decided the community needed a public library so they banded together to form the Friends of the Rowlett Library - a 501c3 nonprofit organization run by dedicated volunteers who work to give Rowlett citizens a library where they can satisfy their literacy needs, research, or sit with a good book.

Discussion
The Friends of the Rowlett Public Library provide invaluable support for the Library through advocacy as well as providing additional funding for events like the Summer Reading Program, additional copies of reading materials for book clubs, LEGO robotics programs, along with hundreds of volunteer hours and especially the library's beloved Mark Twain statue and the Bookworms statues. As libraries expand services to include digital resources as well as wi-fi access and assistance with accessing electronic resources, the Friends of the Library groups serve as foundations to remind citizens of free access to educational and cultural enrichment to enhance the lives of citizens. The Rowlett Public Library is extremely grateful to the Friends of the Rowlett Library volunteers who tirelessly work to ensure all citizens are aware of the power of their library. At this time, we would like to recognize their efforts with a proclamation.

Financial/Budget Implications
None

Recommended Action
Provide a proclamation declaring October 19-25, 2025 as National Friends of Libraries Week.
N/A
Attachments
1. Proclamation - National Friends of Libraries Week

Rowlett
TEXAS

Proclamation

WHEREAS, Friends of the Rowlett Library raise money that enables our library to move from good to great – providing the resources for additional programming, much needed equipment, support for children's summer reading, and special events throughout the year; and

WHEREAS, the work of Friends highlights, on an on-going basis, the fact that our library is the cornerstone of the community, providing opportunities for all to engage in the joy of life-long learning and connect with the thoughts and ideas of others from ages past to present; and

WHEREAS, the Friends understand the critical importance of well-funded libraries and advocate to ensure that our library gets the resources it needs to provide a wide variety of services to all ages including access to print and electronic materials, along with expert assistance in research, readers' advisory, and children's services; and

WHEREAS, the Friends' gift of their time and commitment to the library sets an example for all in how volunteerism leads to positive civic engagement and the betterment of our community.

NOW, THEREFORE, be it resolved that I, Jeff Winget, Mayor of the City of Rowlett, Texas, and on behalf of the City Council, do hereby proclaim October 19-25, 2025, as:

National Friends of Libraries Week

In Rowlett, Texas, and urge everyone to join the Friends of the Library and thank them for all they do to make our library and community so much better.

In official recognition thereof, I hereby affix my signature this 21st day of October 2025.

Jeff Winget, Mayor, City of Rowlett

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 2.B.

Title
Presentation of Proclamation recognizing November 3, 2025, as Alzheimer's Disease Awareness Day.

Staff Representative
Jeff Winget, Mayor

Executive Summary
In partnership with the Senior Advisory Board, the City of Rowlett will join landmarks worldwide on Monday, November 3, 2025, to raise awareness for those living with Alzheimer's disease and other forms of dementia. As a symbol of support, the Rowlett Water Tower will be illuminated in teal, the official awareness color of the Alzheimer's Foundation of America. This initiative aims to honor individuals affected by these conditions, highlight the importance of early detection and treatment, and demonstrate the City's commitment to fostering understanding and advocacy for continued research.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
ENHANCE QUALITY OF LIFE	4.6 Support programs and resources for lifelong learning.

Background Information
N/A

Discussion
N/A

Financial/Budget Implications
N/A

Recommended Action
N/A

Attachments
1. Proclamation - Alzheimer's Disease Awareness Day 2025

Rowlett
TEXAS

Proclamation

WHEREAS, the US Centers for Disease Control (CDC) reports as many as 7 million Americans are affected with Alzheimer's. Alzheimer's disease is a devasting disease that affects the cells of the brain and is the most common cause of severe intellectual impairment in older individuals; and

WHEREAS, Alzheimer's is one of the top ten leading causes of death in the United States and the fifth leading cause of death among adults aged 65 or more. The disease involves parts of the brain that control thought, memory, language, and can seriously affect a person's ability to carry out daily activities. The emotional, financial, and social consequences of Alzheimer's disease takes a toll on its victim's families and friends; and

WHEREAS, the number of people living with the disease doubles every five years beyond age 65. This number is projected to nearly triple to 14 million people by 2060. Each day brings new challenges for caregivers and as the disease gets worse, people living with Alzheimer's disease often need more intensive care; and

WHEREAS, we strive to raise awareness of Alzheimer's disease and the effects on individuals, families, and communities, and the programs designed to support them. Light the World in Teal is an annual awareness program that began in 2002 and sponsored by Alzheimer's Foundation of America held in the month of November; and

WHEREAS, the Senior Advisory Board supports Alzheimer's disease awareness, and the color teal will shine on the water tower for November 3, 2025, with hopes to educate the community about Alzheimer's awareness. Teal is Alzheimer's Foundation of America's awareness color.

NOW, THEREFORE, I, Jeff Winget, Mayor of the City of Rowlett, Texas, and on behalf of the City Council, do hereby recognize November 3, 2025, as Alzheimer's Disease Awareness Day and do hereby order the water tower to be lit in teal in support of Light the World in Teal for Alzheimer's Disease Awareness Day.

In official recognition thereof, I hereby affix my signature this 21st day of October 2025.

Jeff Winget, Mayor

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 4.A.

Title
Consider action approving the minutes.

Consider action to approve minutes from the following City Council meeting(s): October 1, 2025, City Council Special Meeting, October 13, 2025, City Council Work Session, and October 14, 2025, City Council Meeting.

Staff Representative
Deborah Sorensen, City Secretary

Executive Summary
Section 551.021 of the Government Code provides as follows:

(a) A governmental body shall prepare and keep minutes or make a tape recording of each open meeting of the body.

(b) The minutes must:
(1) state the subject of each deliberation; and
(2) indicate each vote, order, decisions or other action taken.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
GOVERN TRANSPARENTLY & INCLUSIVELY	1.8 Provide accurate and timely information to policy-makers and the public.

Background Information
N/A

Discussion
In compliance with State Law and to provide access to citizens of the business conducted by the City, minutes are generated for each public meeting of the City Council. Once approved, these minutes are then published to the website, the City's electronic document storage system and kept on permanent file in the Office of the City Secretary.

Financial/Budget Implications

N/A

Recommended Action
Move to approve minutes from the following City Council meeting(s): October 1, 2025, City Council Special Meeting, October 13, 2025, City Council Work Session, and October 14, 2025, City Council Meeting.

Attachments
1. 10.01.25 City Council Special Meeting Minutes
2. 10.13.25 City Council Work Session Minutes
3. 10.14.25 City Council Meeting Minutes

CITY COUNCIL SPECIAL MEETING MINUTES

Our Vision: A well-planned lakeside community of quality neighborhoods, distinctive amenities, diverse employment, and cultural charm. Rowlett: THE place to live, work and play.

Wednesday October 1, 2025 **6:00 P.M.** **Fire Station #2 – 8602 Schrade Rd.**

Present: Mayor Jeff Winget, Mayor Pro Tem Michael Schupp, Deputy Mayor Pro Tem Mike Britton, Councilmember Jonathan Reaves, Councilmember Marvin Gibbs, and Councilmember John P. Bowers III.

Absent: Councilmember Elise Bowers (excused absence).

1. CALL TO ORDER

Mayor Winget called the meeting to order at 6:00 p.m.

2. CITIZENS' INPUT

None

5. INDIVIDUAL CONSIDERATION

5A. Discuss and take action on design options by Architects (Hoefer Welker & Westwood) and CMaR (Swinerton) for the Municipal Complex Project at Herfurth Park.

David Hall stated that we are at a stage where decisions made will impact both the budget and the design. City Council has given significant input on the alignment of the site itself. There are two design options; one that has a roundabout in it and the other is a four way stop. There will be four options contained with each of the respective choices. The design and construction team will help guide you through the options. Mr. Hall introduced James Beers, with Hoefer Welker & Westwood. Mr. Beers led City Council through the various options.

A motion was made by Deputy Mayor Pro Tem Britton, and seconded by Councilmember J. Bowers III, to approve Option 1 with the roundabout. **Motion passed 6-0.**

Mr. Beers then reviewed the elements and the various layouts of the park. It is the consensus of City Council to go with Option 1C.

Mayor Winget recessed the meeting at 6:38 pm.

Mayor Winget reconvened the meeting at 6:46 pm.

City Council discussed the elements that they preferred in the park. There will be two types of playgrounds, one wooded structure like and a larger playground. There will also be pickle ball courts, soccer fields, tennis courts, basketball courts, and a walking trail.

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Mayor Winget recessed the meeting at 7:04 pm.

Mayor Winget reconvened the meeting at 7:26 pm.

City Council discussed the various options and priorities.

6. ADJOURNMENT

Mayor Winget adjourned the meeting at 7:40 pm.

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CITY COUNCIL
WORK SESSION MINUTES

Our Vision: A well-planned lakeside community of quality neighborhoods, distinctive amenities, diverse employment, and cultural charm. Rowlett: THE place to live, work and play.

Monday, October 13, 2025 **6:00 P.M.** **Municipal Building – 4000 Main**

Present: Mayor Jeff Winget, Mayor Pro Tem Michael Schupp, Deputy Mayor Pro Tem Mike Britton, Councilmember Jonathan Reaves, Councilmember Elise Bowers, Councilmember Marvin Gibbs, and Councilmember John Bowers III

1. CALL TO ORDER

Mayor Winget called the meeting to order at 6:00 p.m.

2. EXECUTIVE SESSION - None

3. RECONVENE INTO OPEN SESSION AND TAKE ANY NECESSARY OR APPROPRIATE ACTION ON CLOSED/EXECUTIVE SESSION MATTERS – N/A

4. CITIZENS INPUT

Mark Taschet, Rowlett – Spoke regarding the current exterior lighting ordinance. The current ordinance is old and outdated. The purpose of the ordinance is not being enforced due to vague language and unclear definitions of light and glare. The ordinance seems to be open to interpretation. He would prefer to see an ordinance like the Cities of Garland, Mesquite, Sachse, and Heath. Rowlett needs a strong robust ordinance that clearly defines the proper definition and verbiage, for no light glare, no light trespass, light pollution, etc.

John Parigi, Rowlett – Spoke regarding the current exterior lighting ordinance. The purpose of the ordinance states to contribute to the pleasant nighttime environment. Then follows up to say to provide safety and security during the hours of darkness. The issue is the glare. He further stated that it controls light pollution to minimize the negative effect and misdirect the lights to recapture the views of the night sky. He read more of the ordinance and gave definitions.

Alisha Turner, Rowlett – Spoke regarding Business Development in Rowlett. Her business was established in 2017, and she is a resident of Rowlett. She has done quite a bit of work for the city. She would love to be able to continue to do embroidery and screen printing for the city. She requests that the city use local businesses first. She did not receive an email or notification of a bid being done.

5. WORK SESSION

5A. Discussion regarding Code Enforcement Division Update.

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This item was moved after 5D.

Derek Hull, Director of Community Development, introduced Andrew Espinoza, Assistant Director of Community Development. Mr. Espinoza provided a comprehensive look at current officer staffing, roles and responsibilities, Code processes and performance metrics, customer service enhancements, and recommendations for the next steps. Staff recommendations are to partner with IT and explore mobile technology equipment and additional software enhancements. Restructure and streamline process workflows and develop a Work Program. Reimagine weekend and evening Code Enforcement coverage. Implement ongoing communication and marketing initiatives. Adjust, recalibrate, and implement best practices.

Mayor Pro Tem Schupp stated it is not clear as to who do we call. It is hard to find on the website. Kristoff Bauer, Deputy City Manager, stated that this is something that they are working on. Have a technical challenge. Mayor Pro Tem Schupp asked what does proactive mean with respect to code enforcement. Mr. Espinoza stated it is to be present, be engaged, and educate the public. Councilmember Reeves asked about a clothing box that just showed up on a commercial property. What does the property owner do? Mr. Espinoza stated that the property owner would be responsible for removing the clothing box, especially if it is in the parking lot. Commercial is allotted so many parking spaces and if the box is reducing the parking spaces, then code enforcement will get involved. It is the property owner's responsibility to remove the box.

Councilmember Gibbs stated in the future have the initial inspections numbers separated from the violation inspections numbers. Mayor Pro Tem Schupp asked for the proactive numbers versus the reactive numbers. Staff will have to separate the numbers and get back with City Council. Do we want to be more reactive or proactive? Mr. Bauer stated that they have been given the task of being proactive. Councilmember Gibbs would like to have the proactive numbers versus the reactive numbers as well. Mayor Winget stated that there have been immediate responses when there is a complaint that he is aware of. Mayor Pro Tem Schupp asked how much time the code enforcement officers spend in the office. Mr. Espinoza stated about 50%. Mayor Pro Tem Schupp feels that is unacceptable. They need to spend more time in the field. Are there enough code enforcement officers? Mr. Hull stated that if we can get the software then yes. It is staff plus technology. Staff will attend HOA meetings. Mr. Bauer stated that we are not as efficient as we should be. We are working with one staff member short and working on getting new technology. Councilmember E. Bowers asked if the officers were building good relationships with community partners so that they can direct habitual offenders to them if there is a need. Mayor Winget stated that they need to engage an outside software vendor to come up with a better solution. City Council wants to see them succeed.

Mayor Winget recessed the meeting at 7:40 pm.

Mayor Winget reconvened the meeting at 7:48 pm.

5B. Discussion regarding Rowlett Community Centre Renovations.

Kristoff Bauer, Deputy City Manager, and Ryan Mullins, Director of Parks & Recreation, presented this item. Mr. Bauer discussed the current conditions of the Rowlett Community Centre and proposed potential solutions for improvement and enhancement. The Rowlett Community Centre opened in 1996, expanded in 2005, and was renovated in 2016. He reviewed the building assessment and the facility condition assessment. The City will hire a firm to professionally assess foundation, structural, mechanical, electrical, and plumbing conditions of the building. Obtain an in-

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depth analysis of things not easily seen on a surface level inspection. They will provide current market costs estimates for repairs and maintenance recommendations moving forward. The report will provide conditions ratings for findings of the building assessment. The roof needs to be replaced, along with 11 HVAC units. Mr. Mullins reviewed the other significant building conditions as well as the maintenance needs. The opportunities for enhancement were reviewed. The Rowlett Community Centre is a standby location for sheltering, warming/cooling center, when necessary. Having a permanently installed on-site generator will allow building to stay operational during power outages. It will reduce the potential for electrical damage by portable generator installation. There is a need to replace outdated lighting throughout the facility and upgrade to LED lighting in all areas. There are more than 160 light fixtures. Mr. Bauer reviewed the costs summary; $80,000 for Facility Conditions Assessment, $2,825,000 for Significant Building Conditions, $1,540,000 for Maintenance Needs, $1,922,000 for Opportunities for Enhancement, for a grand total of $6,267,000. The current CIP funding for the Rowlett Community Centre is $1,600,000.

Councilmember Reaves asked if there was a way to partner with another business to try to reduce the costs. Like a gym or something like that. Mayor Winget stated he appreciates creative thinking. Councilmember E. Bowers feels like we need to increase the membership fees. Mayor Winget feels that the community centre brings the community together and has value for its residents. It was the consensus to do the assessment and go from there. Mr. Mullins stated that a lot of high school students use the community centre in the afternoon. David Hall, City Manager, asked for a clear picture of what City Council wants. Mayor Winget stated that we will do the assessment. It is the consensus of City Council to invest in the community centre pending the outcome of the assessment.

5C. Discussion regarding the City's Procurement Process.

Wendy Badgett, Director of Finance, introduced January Calhoun, Purchasing Manager. Ms. Calhoun gave an overview of the City’s current procurement policies, procedures, and legal requirements related to purchasing goods and services. The City of Rowlett awards all bids and quotes to the lowest responsive and responsible bidder, unless the bid is clearly identified as a “Best Value Bid”. The “best value” method is utilized for the basis of award for selected bids and quotes and all proposals. In these instances, the selection criteria will be clearly identified in the solicitation document. The best value method may take into consideration, in whole or in part: 1) the purchase price; 2) the reputation of the bidder and of the bidder’s goods or services; 3) the quality of the bidders goods or services; 4) The extent to which the goods or services meet the City’s needs; 5) the bidders past relationship with the City; 6) The total long-term cost to the City; and 7) any relevant criteria specifically listed in the request for bids or proposals. For formal solicitations over $100,000, legal notice is advertised in the Dallas Morning News, once a week for two consecutive weeks. It is posted and distributed on BidNet, the City of Rowlett’s eProcurement system. For informal solicitations of up to $100,000, legal advertisement is not required. Competitive written quotes are solicited by the department. There is an option for the Purchasing Department to post and distribute on BidNet.

BidNet is the eProcurement system selected and implemented in February 2025 to improve efficiencies to better serve the City, departments, and the vendor community. It increases visibility, improves competition, streamlines vendor registration and streamlines communications. The Purchasing Office can utilize the eProcurement system to request quotes below the competitive bid threshold on behalf of the departments. The eProcurement system will provide a more robust vendor database should the departments need to source a vendor quickly.

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Ms. Calhoun stated that we do not have a local vendor advantage policy. Mayor Winget asked if we could have a policy. Ms. Calhoun stated yes and explained the pros and cons. Deputy Mayor Pro Tem Britton stated that just because they are local doesn't mean they automatically get the bid. However, he would like to keep dollars in Rowlett. He would like to see some type of way to add more to local vendors. Councilmember Reaves stated that he could see giving like five points if you are a local vendor. We want the best for what we have a need for. If we have two great vendors, maybe give the local vendor extra points for being local and points for being a chamber member. Councilmember Gibbs agrees that if it is close, then it goes to the local vendor. Mayor Winget stated that the market drives what vendor gets selected, not because that are a local vendor. David Hall, City Manager, stated that we do not select the lowest vendor. We created the best value selection. We can add a point or two to a vendor that is local. Councilmember E. Bowers agreed. Mayor Winget stated that January has added a ton of structures and processes we didn't have before.

Councilmember E. Bowers stated that she didn't even know that we had a new process. She asked if the Chamber knew as well. Mr. Hall stated that he doesn't know. Councilmember E. Bowers asked how the vendors are supposed to know to register. Ms. Calhoun stated that if they were in the old system they were added to the new system. There was a consensus of giving a nod to local businesses who are bidding if they meet all the other criteria and it is a close score.

5D. Discussion regarding a resolution rescinding the Community Services Grant Program and Policy.

This item was moved after 5E.

Mayor Winget presented this item. On March 21, 2023, the City Council discussed concepts of a formalized Community Services Grant (CSG) program. Following two budget cycles of using an informal process, a formalized process was adopted on March 18, 2025. With this process, several applications were considered during the 2026 fiscal year budget planning process. Should Council decide to approve a resolution rescinding the Community Services Grant Program and Policy, any existing grants allocated by the City Council would continue to be overseen, executed, and administered as if the policy were still in place. No future grant allocation would be made based on the program for any existing program after FY26. Going forward, funding opportunities would only be made available via contractual obligations, memorandums of use, or other similar agreements. Like the existing MOUs and other agreements, the City has with various entities, these arrangements provide structure, clarity, and expectations for both the partner entity and the City of Rowlett.

Mayor Winget feels that this has been quite burdensome and has become political. This is unhealthy for the community to be arguing over this. There are MOUs in place and that is good enough. He clarified that this does not affect the FY26 Community Services Grants. Councilmember Reaves stated that he is in full agreement. Mayor Pro Tem Schupp stated that he agrees but wants clarity. He confirmed that certain organizations already have MOUs in place and those would stay. He agrees to rescind the program. He is in favor of getting rid of discretionary action. Councilmember Reaves stated the MOU is a much better program. Future councils can continue with the MOUs or whatever they want. Deputy Mayor Pro Tem Britton stated that he agrees to rescind the program. He strongly urged to get a MOU with RCCC/CERT. Councilmember E. Bowers disagrees with rescinding the program. All councils need flexibility. This process is important. The Sensory Tent Pals is an example of a program that has a great idea to help the public at events. She suggested tightening up the process. We are in incubator for new programs.

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Mayor Winget stated that the points are valid. How do we allow flexibility in the future? He feels that MOUs are the way to go to provide structure. He sees Sensory Tent Pals doing like KRB and get a MOU. We want to keep the small town feel but have to operate as a big city. There's discretion in the amount awarded and discretion in the process. Councilmember Gibbs confirmed that the grants are from the general fund and not the CDBG fund. He assumed it was funded by the CDBG fund. He likes the MOU process. There was a lot of pressure when awarding grants. Councilmember J. Bowers III asked how well known is the MOUs. Mayor Winget stated that it started when David Hall, City Manager, came to the city. When Mayor Winget first got to the council, the grants program was more contained but it has gotten bigger as time went on. He gave examples of what a MOU can do for various programs. Councilmember Gibbs stated that he would be in favor and wants a claw back cause. Mayor Winget stated that this item will be on the consent agenda tomorrow night. Councilmember E. Bowers requested that the item be pulled for individual consideration.

5E. Discussion regarding possible amendments to Sec. 77-510 (Exterior lighting) of the Code of Ordinances.

This item was moved before 5A.

Mayor Winget presented this item. Following a request by members of City Council, staff undertook the task of providing an assessment of exterior lighting policies which are in place in surrounding communities. This assessment revealed that there could be some room for improvement within the existing code.

Mayor Winget wants to provide structure around the code. He suggested forming a subcommittee or having a couple of members of City Council to work with staff on the new ordinance. Councilmember Gibbs also wants to clean up this ordinance. He likes the pictures in Garland, Sachse, and Heath's ordinances. Deputy Mayor Pro Tem Britton stated that anytime you have ambiguity in an ordinance, it leads to confusion. Councilmember Gibbs stated that you will not get an ordinance that states "thou shalt not". Mayor Winget is not opposed to the idea of having pictures but doesn't want it to be restrictive to only using those pictured. Mayor Pro Tem Schupp agrees the ordinance needs to be changed and needs staff to assist. There are technical terms that he does not know what they mean. Mayor Winget confirmed that the current code exempts residential. The ordinance is vague and flexible for residential. He wants to find a middle ground. Councilmember Reaves stated that he is in full agreement. He likes architectural lighting and wants flexibility to allow all architectural lighting. Councilmember E. Bowers stated that they need to take into consideration wildlife in residential areas. Kristoff Bauer, Deputy City Manager, stated that staff will look at ordinance and bring something back to City Council for review.

6. DISCUSS CONSENT AGENDA ITEMS FOR OCTOBER 14, 2025, CITY COUNCIL MEETING.

Councilmember E. Bowers requested agenda item 4E regarding the Community Services Grant Program and Policy be removed from the Consent Agenda.

7. ADJOURNMENT

Mayor Winget adjourned the meeting at 9:01 pm.

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CITY COUNCIL MEETING MINUTES

Our Vision: A well-planned lakeside community of quality neighborhoods, distinctive amenities, diverse employment, and cultural charm. Rowlett: THE place to live, work and play.

Tuesday October 14, 2025 **7:00 P.M.** **Municipal Building – 4000 Main**

Present: Mayor Jeff Winget, Mayor Pro Tem Michael Schupp, Deputy Mayor Pro Tem Mike Britton, Councilmember Jonathan Reaves, Councilmember Marvin Gibbs, Councilmember Elise Bowers, and Councilmember John Bowers III

INVOCATION

Mayor Winget asked for City Council and David Hall, City Manager, to join him and Richard White's family in front of the dais. Mayor Winget recognized the passing of a member of our community who made a lasting impact on Rowlett and across North Texas, Mr. Richard White. Richard was a tireless advocate for parks, trails, and outdoor spaces. He believed deeply in the power of nature to connect people and to build community. Through his decades of involvement with the Dallas Offroad Bicycle Association, he helped shape the region's trail network and inspired countless others to be involved. In Rowlett Richard truly left his mark through his leadership on the Pecan Grove Hike and Bike Trail. He was instrumental in advocating for its approval. He was tenacious in seeking support from City leadership. He was passionate, driven, and committed to turning acres of wooded land into a space that all of us could enjoy. Today Richard's legacy lives on in every person who walks, runs, or rides along those trails. His memory is a lasting reminder of what can happen when passion and perseverance come together for the good of the community. We hold his family close in our hearts and especially his wife, Betsy and their children and we, ourselves, commit to honor his life through the same spirit of service, kindness, and dedication that he modeled for all of us. Mayor Winget asked for a moment of silence.

Betsy Chapman-White thanked DORBA, Rowlett Police Department and the community for all the love and support.

The invocation was led by Mayor Winget

PLEDGES OF ALLEGIANCE

The Pledges of Allegiance were led by the City Council.

1. CALL TO ORDER

Mayor Winget called the meeting to order at 7:12 p.m.

2. PRESENTATIONS

2A. Presentation of Blue Star Service Family Banner to Heather Cortes.

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Mayor Winget and the Rowlett Rotary Club presented the Blue Star Service Family Banner to Heather Cortes.

2B. Presentation of Blue Star Service Family Banner to Amber Smith.

Mayor Winget and the Rowlett Rotary Club presented the Blue Star Service Family Banner to Amber Smith.

2C. Presentation of Blue Star Service Family Banner to Krista Smith.

Mayor Winget and the Rowlett Rotary Club presented the Blue Star Service Family Banner to Krista Smith.

2D. Update from the City Council and Management: Financial Position, Major Projects, Operational Issues, Upcoming Dates of Interest and Items of Community Interest.

Councilmember E. Bowers provided the following announcements:

COMMUNITY ENGAGEMENT - Viva Cultura brought out a record-breaking crowd. There were 3,000 attendees downtown on Friday.

The City of Rowlett is excited to announce the return of our annual *Scarecrows on Main* competition! This family-friendly tradition invites individuals, families, businesses, and community groups to create their very own one-of-a-kind scarecrow. Winners will be named in the categories of *Best in Show, Best Fall Theme*, and *Most Texan*, with first-place winners highlighted on the City's social media pages. Scarecrows will go up from now until the 24th. Voting begins on October 25th.

We've been bragging on our bistro lights that could beat a Guinness World Record. We lit up downtown during Oktoberfest on September 19th, and they've added brightness and color to all our downtown events since! Now, we're calling all citizens to help us name them. Log onto our Facebook or Instagram for a link to pick your favorite. Votes will be accepted until 11:59 on October 22nd - don't miss the BIG name reveal during Trunk or Treat October 25th!

This Friday evening, the City of Rowlett will celebrate the completion of a record-breaking solar streetlight installation project that's bringing safer, brighter, and more sustainable lighting to our community.

In just one day, Fonroche Lighting America set a new GUINNESS WORLD RECORDS title right here in Rowlett—installing nearly 70 solar streetlights along State Highway 66 in only 10 hours and 35 minutes. Thanks to cost savings from this innovative project, Rowlett Road and Dalrock Road were also illuminated—tripling the impact for our residents.

Join us for the Illumination Celebration at Asadero House on State Highway 66 this Friday at 6:00 p.m. The lights will come on at sunset, symbolizing a brighter, smarter, and more sustainable future for Rowlett.

Haunted Hall is also making its debut this Friday evening! Head over to the lawn of City Hall beginning October 17th through Halloween to experience a maze filled with animatronics and light up inflatables! It's the perfect way to get into the Halloween Spirit.

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It's a great photo opportunity for families and a fun lead up to our huge Trunk or Treat on October 25th in Downtown Rowlett. Don't miss it! Haunted Hall is sure to become your new favorite Halloween tradition.

LIBRARY - Thursday at Drizl Coffee listen to Arts and Humanities Commission member Dr. Julia Meszaros discuss her book Economies of Gender from 6:30 to 8 pm.

Calling ALL trombone players! The Arts and Humanities Commission is looking for new trombone players, seasoned trombone players, young trombone players, old trombone players, ALL trombone players to participate in the Third Annual Trombone Thanksgiving. Trombone Thanksgiving is Wednesday, November 26 at 11 am on the Downtown Green and admission is free. To register to play trombone, please visit Rowlett.com/Trombone.

Visit the Library on Friday and Saturday from 10 to 5 for their fall book sale. Hardbacks are $1, paperbacks are 50 cents, and DVDs are $1. The Library can only accept cash or check.

POLICE - Join Dog Walker Watch!

Do you walk a dog? Love your neighborhood? Want to make a difference while getting some fresh air? Then we need you!

Dog Walker Watch is a crime prevention and awareness program that turns everyday walks into an opportunity to be extra eyes and ears for the Rowlett Police Department. Your walks can help keep our community safe. Please contact Officer Mitchell if you want to be part of program that keeps Rowlett safe.

Contact Officer Mitchell:
emitchell@rowlett.com
972-412-6242

Also.....

Join the Rowlett Police Department and Rowlett Fire Department for our National Prescription Drug Take Back Event!

Safely dispose of expired or unused medications.

Together, we can help prevent misuse and keep our homes and environment safe.

Rowlett Fire Station #1
3900 Miller Road
Saturday, October 25, 2025
10 AM – 2 PM

Accepted Items: Unused or expired medications in pill or capsule form

Not Accepted: needles, lancets, EpiPens, or liquids

This simple act makes a major difference. Let's work together for a safer Rowlett!

Councilmember Reaves introduced the Featured Pets, Margo, absolutely loves people and would love to be an addition to your family. Fredrika is sweet, affectionate, and a couch potato. She has a calm demeanor and enjoys cozy naps and a nice walk. Meet Hank, he is a volunteer and staff

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favorite – which translates to “one lucky family” that gets to adopt this good boy! To meet Margo, Fredrika, Hank, or one of their companions, please contact Animal Services at 972-412-6219 or come by the Shelter at 4402 Industrial St. from 10 am to 5 pm, Tuesday through Saturday. The animal shelter is currently at code red. This means that the kennels are full. All adoptions are $25 and include spay/neuter, microchip, and up-to-date vaccinations. Please consider fostering a pet for the weekend. Saturday, October 25, 2025, is Adopt-A-Thon from 10 am to 3 pm at the Animal Shelter.

Deputy Mayor Pro Tem Britton gave a shoutout to the Senior Advisory Board for having over 80 attendees for the educational seminar today. He gave kudos to Shelly Monroe and the Rowlett Community Centre staff.

3. CITIZENS INPUT

Cassi Marietti, Rowlett – Spoke regarding liens. She is a 25-year resident of Rowlett. She is speaking on behalf of her 86-year-old mother. At the closing of her home, she was forced to pay liens in the amount of over $10,000. The liens were issued in 1997, 1998, and 2003 for high grass and weeds. She was never notified of the liens. The original amount of the lien was over $700, and the rest was interest. She would like some of her mother’s money back.

Margie Manns, Rowlett – Spoke regarding Lake Bend Estates. The wall is still ugly. She wants a timeline for the wall. She also spoke about the Phoenix, the flowers are dying due to issues with plumbing so the sprinkler system doesn’t work.

Shannon Bandle, Rowlett – Spoke regarding Lake Bend Estates. She is going to continue to come to the City Council meetings until the wall gets repaired. Her neighbors are now like family. She is fighting for them. She is hopeful that City Council will do what is right. Actions speak louder than words. She wants to keep a masonry wall and not wrought iron or wood fence.

Patrick Bandle, Rowlett – Spoke regarding Lake Bend Estates. Rebuild the screening walls. No visible progress has been made. Please honor your commitments. He asked for a clear update.

4. CONSENT AGENDA

4A. Consider action approving the minutes.

Consider action to approve minutes from the following City Council meeting(s): September 15, 2025, City Council Work Session, September 16, 2025, and September 17, 2025, City Council Meetings and September 30, 2025, Joint City Council and Planning & Zoning Commission Work Session.

This item was approved on the Consent Agenda.

4B. Consider action to approve an Interlocal Agreement (ILA) with Dallas County to provide Mosquito Ground Control Services for FY26.

Consider an action to adopt a resolution authorizing the City Manager to enter into an Interlocal Agreement (ILA) with Dallas County on behalf of the Dallas County Health and Human Services

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Department (DCHHS) to provide Mosquito Ground Control Services for FY26; authorizing the City Manager or his designee to execute all necessary documents; and providing an effective date.

This item was approved on the Consent Agenda as RES-110-25.

4C. Consider action to authorize a change order for drainage infrastructure improvements to Kids Kingdom.

Consider action to adopt a resolution authorizing a change order to the contract with Play By Design, Inc., for drainage infrastructure improvements to the Kids Kingdom facility in the amount of $58,800.

This item was approved on the Consent Agenda as RES-111-25.

4D. Consider action to deny the rate increase application submitted by Oncor Electric Delivery Company.

Consider action to adopt a resolution finding that Oncor Electric Delivery Company LLC's application to change rates with the City should be denied; finding that the City's reasonable rate case expenses shall be reimbursed by the company; finding that the meeting at which this resolution is passed is open to the public as required by law; requiring notice of this resolution to the Company and Legal Counsel.

This item was approved on the Consent Agenda as RES-112-25.

A motion was made by Deputy Mayor Pro Tem Britton, seconded by Mayor Pro Tem Schupp, to approve all the preceding items marked as having been approved on the Consent Agenda. Motion passed 7-0.

4E. Consider action to rescind the Community Services Grant Program and Policy.

Consider action to adopt a resolution to rescind the Community Services Grant Program and Policy.

This item was removed on the Consent Agenda for individual consideration.

Councilmember J. Bowers III stated this was a way to listen to the community with their open ideas. It gives an opportunity to listen to our community and not run away from the tough conversations. Councilmember E. Bowers expressed support for the Grant Program. It was a good way to innovative programming like the Sensory Tent Pals. This is great for people in our community that have great ideas to step forward and ask for funding and support from the entire city. She will not be supporting the rescinding of this program. Councilmember J. Bowers III added that the Friends of Rescue Animals and their $20,000 grant that ended up being a benefit of value to the community of over $141,000. He thinks that if you're able to give somebody that much money and they're able to help our community in that way, he thinks it's worth a shot. Mayor Winget absolutely agrees. There are organizations, like the Rowlett Citizen Corps Council (RCCC) and others that do have tremendous impact and the return on their investment is incredibly measurable. All those organizations will have some sort of written agreement with the City. It will be a more formalized, more clearly adopted program that allows metrics to be implemented and utilized to deliver on

performance and set some real clear guidelines around what we're expecting from the organizations that we partner with more so than the grant program would allow for. That is not to say that a grant program could not be a grant program in the future. The program was formed via a resolution from the Council. It is going to take some time for some of these organizations to work through the contract-based MOU process with the City.

A motion was made by Mayor Pro Tem Schupp, and seconded by Deputy Mayor Pro Tem Britton, to approve as presented. The motion passed 5-2, with Councilmember E. Bowers and Councilmember J. Bowers III voting against.

This item was approved as RES-113-25.

5. INDIVIDUAL CONSIDERATION

5A. Conduct a public hearing regarding a request by Rhyan Weirich, on behalf of property owner John Stone, to amend the Comprehensive Zoning Ordinance and Map, as previously amended, for an approximately 94.4799 acre lot located east of President George Bush Turnpike and north of Liberty Grove Road, in the James Hamilton Survey, Abstract Number 544, in the City of Rowlett, Dallas County, Texas from Planned Development (PD-008-22) to Planned Development Amended (PD-008-22-Amended).

Derek Hull, Director of Community Development, presented this item. Mr. Hull stated this request is to amend a Planned Development (PD) for Light Manufacturing (M-1) and Limited Commercial/Retail (C-1) Uses (ORD-008-22) specifically to allow the use of college or university and commercial school – adult career education, training and vocational school by right and to request a variance from Section 77-504 (D)(3)(d) which requires landscape islands. The amendment will apply to entire development, but with special consideration to Building 3. The proposed amendment is seeking to allow the uses of college or university and commercial school - adult career education, training and vocational school by right, instead of permitted by Special Use Permit under the PD standards. This proposed amendment does not allow for a commercial (private) school for children, which would be incompatible with the surrounding uses in the PD. The applicant is requesting no landscape islands in the parking rows. The plans are restriping to fit personal vehicles. On September 26, 2025, twenty-five 200-foot notices were mailed with no responses in opposition or in favor received. Thirteen 500-foot notices were mailed with no responses in opposition or in favor received. The Planning & Zoning Commission recommended denial of the zoning amendment and require a SUP. They recommended approval of the landscaping variance.

Mayor Winget opened the public hearing at 8:01 pm.

No one spoke for or against.

Mayor Winget closed the public hearing at 8:01 pm.

Miles Terry, representing the owner, was asked why they chose to amend the PD rather than ask for the SUP. Mr. Terry stated they went on the advice of staff at the time. If they are required to go the SUP route, then that would delay the project. Councilmember Reaves stated that by right is fine with him because that's kind of designed for what they're doing specifically whether it's the current

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applicant or other vocational school. This is the perfect location for this. He doesn't see the issue with it being a SUP. He confirmed with Victoria Thomas, City Attorney, that it would require a supermajority vote to overturn the Planning & Zoning Commission's recommendation. Ms. Thomas stated that staff did run this scenario by her and she recommended just having them apply to amend their PD zoning ordinance because that way everything about their property stays in that PD zoning ordinance instead of in a PD zoning ordinance and also a SUP zoning ordinance. The criteria for both are the same.

5B. Consider action to adopt an ordinance amending the Comprehensive Zoning Ordinance and Map, as Previously Amended, for an approximately 94.4779 acre tract situated exact of President George Bush Turnpike and north of Liberty Grove Road, situated in the James Hamilton Survey, Abstract No. 544, in the City of Rowlett, Texas from Planned Development with Limited Commercial/Retail and Light Manufacturing Base Zoning Districts to 1) (PD-008-22) to Planned Development with Limited Commercial/Retail and Light Manufacturing Base Zoning to (1) allow the use of college, university and commercial school by right, and 2) to amend the development standards/regulations regarding required landscaped islands (PD-008-22-Amended).

Mayor Winget stated that he is ok with the variance. He confirmed with Ms. Thomas that they can approve the PD amendment by right for Building 3 only and all others will be SUP. Mayor Pro Tem Schupp stated that he is really excited about this project. He thinks that it's a tremendous asset to the city. It is Lincoln Tech, which is a huge national brand of trade-type schools. This has ramifications beyond just setting up a school. Mayor Pro Tem Schupp asked what the full capacity with students and faculty will be. There will be 40 to 50 faculty and roughly 1,200 students at max capacity. It will be three shifts of roughly 400 students per shift. Mayor Pro Tem Schupp added that he is completely on board with this and wants to welcome Lincoln Tech to Rowlett and thanked them for investing here. He will be supporting this. Deputy Mayor Pro Tem Britton stated that he is really excited about this. He concurs with Mayor Pro Tem Schupp and Councilmember Reaves. He does not want to delay this project. Councilmember J. Bowers III stated that he is excited to see this. It is a great option for a trade school.

Lincoln Tech will offer transportation maintenance, auto trades, welding, HVAC, electrical high and low voltage, and medical assistant. Mayor Winget stated that he is ok with amending the PD for the entire development and not just for Building 3. He thinks that all education is good.

A motion was made by Councilmember Reaves, and seconded by Councilmember J. Bowers III, to approve as presented. Ms. Thomas stated that they wanted the paragraph change with the caveat that the paragraph for the use will be changed to what was provided by staff. Councilmember Reaves amended his motion to include the paragraph as listed listing the educational and vocational type of schooling and programing for approval in this PD. Councilmember J. Bowers III seconded the motion. Motion passed 7-0.

This item was approved as ORD-031-25.

5C. Consider action to adopt a resolution to nominate a candidate to fill two seats on the Board of Directors of the Rockwall County Central Appraisal District.

Mayor Winget presented this item. On September 5, 2025, Mayor Winget received notice from the Rockwall County Central Appraisal District regarding the election/appointment of two members to

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the Board of Directors. The letter further identified the number of votes allocated to Rowlett as 46 of the 2,000 total votes. Currently, no candidates have been identified as nominees for the two openings.

Councilmember Gibbs stated that he was going to nominate someone, however, they serve on the Parks Advisory Board. He confirmed that there was no conflict. They meet the second Wednesday quarterly and that would conflict with the time that the Parks Advisory Board meets. Councilmember Gibbs stated that he doesn't have a nomination then. No one else had any nominations.

No action was taken.

5D. Consider action to adopt a resolution to nominate a candidate to fill two seats on the Board of Directors of the Dallas County Central Appraisal District.

Mayor Winget presented this item. On August 13, 2025, Mayor Winget received notice from Shane Docherty, Chief Appraiser with the Dallas County Central Appraisal District, regarding the election/appointment of two members to the Board of Directors. The letter further identified the number of votes allocated to Rowlett as 14 of the 2,000 total votes. The City Council shared prospective candidates for the two openings and two candidates responded that they would be in favor of being considered for appointment: John Cote, Chair of Planning & Zoning Commission, and Carter Holston, President of the Rowlett Housing Finance Corporation and member of the Golf Advisory Board. Both have indicated that they meet the requirements to serve as board members. Both applications were presented.

Mayor Pro Tem Schupp nominated Carter Holston and Mayor Winget nominated John Cote to serve on the Dallas County CAD Board of Directors.

A motion was made by Councilmember E. Bowers, and seconded by Councilmember Reaves, to nominate Carter Holston and John Cote to fill the two seats on the Board of Directors of the Dallas County CAD. Motion passed 7-0.

This item was approved as RES-114-25.

5E. Consider action to cast a ballot for the Texas Municipal League (TML) Region 13 Director of the TML Board of Directors.

Mayor Winget presented this item. On September 9, 2025, Mayor Winget received a copy of the ballot for TML Region 13 Director for the TML Board of Directors. The ballot was subsequently amended due to an applicant being left off the ballot. The City of Rowlett's vote must be received by October 23 to be counted for the TML election. TML has 15 regions, and each has a seat on the Board. During even-numbered years, the even-numbered regions are up for election. Terms are two years, and new terms will begin on October 31, 2025, upon adjournment of the TML Annual Conference and end on October 15, 2027, upon adjournment of the TML Annual Conference.

A motion was made by Mayor Pro Tem Schupp, and seconded by Deputy Mayor Pro Tem Britton, to cast a ballot for Stanley Jaglowski for the TML Region 13 Board of Directors. Motion passed 7-0.

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MEMBERS OF THE CITY COUNCIL MAY REQUEST TOPICS TO BE PLACED ON AN AGENDA FOR A SUBSEQUENT MEETING. ANY DELIBERATION OR DECISION SHALL BE LIMITED TO A PROPOSAL TO PLACE TOPIC ON THE AGENDA FOR A SUBSEQUENT MEETING.

There were no requests.

6. EXECUTIVE SESSION

6A. The City Council will convene into closed, executive session pursuant to Texas Government Code Section 551.071 (Consultation with Attorney) to seek legal advice about pending litigation, to wit: Essential Education, Inc. d/b/a Primrose School of Rowlett, Plaintiff & RK Healthcare, Inc., d/b/a Beehive Home of Rowlett, Intervenor vs. City of Rowlett, Liberty Grove Development 2, LLC and Circle H Contractors, L.P., Cause No. DC-25-13918 in the 116th Judicial District Court of Dallas County, Texas.

6B. The City Council will convene into closed executive session pursuant to Texas Government Code Section 551.071 - consultation with attorney, to receive legal advice regarding the Sapphire Bay Development Agreement and other matters related to the Sapphire Bay development project.

Mayor Winget adjourned the meeting into Executive Session at 8:35 pm.

7. RECONVENE INTO OPEN SESSION AND TAKE ANY NECESSARY OR APPROPRIATE ACTION ON CLOSED/EXECUTIVE SESSION MATTERS

Mayor Wingett reconvened the meeting at 9:09 pm.

A motion was made by Mayor Pro Tem Schupp, and seconded by Deputy Mayor Pro Tem Britton, to authorize the City Attorney to send Sapphire Bay Land Holdings 1 LLC a Notice of Default and Intention to Terminate the development agreements. Motion passed 7-0.

Mayor Winget made a statement on behalf of City Council. In the past 30 days, the City Council has met twice regarding the Sapphire Bay Development, and earlier this year we even met with the developer as well. After weighing all options, consulting with legal, and having serious conversations about the implications of the future of this development on Rowlett as a whole, the Council has unanimously voted to move forward with providing notice to the developer that Sapphire Bay Land Holdings I is in default of their development agreement resulting from failure to diligently pursue development in accordance with their development agreement.

Let me be clear – the Sapphire Bay Development is a private development. The City has no ability to compel development or construction. This action does not result in the change of ownership of the land. Ultimately, the developer is still the owner of the property, and just as importantly, bound by the zoning that remains in place, which places limitations on the amount of residential development

It has been almost 10 years since the initial announcement of the Bayside Development. In that 10 years, we've experienced litigation, multiple amendments, a bifurcation of the land mass into the north, Bayside, and the south, Sapphire Bay, and multiple concepts to serve as the primary

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attractions within the Sapphire Bay Special Sub-District. 10 years later we're still waiting on the successes that were sold to City of Rowlett leaders in 2015.

The time is now to make strategic, visionary decisions that compel action within the peninsula, and we are taking those steps today. We've been grateful for the efforts of those who have invested in both Bayside and Sapphire Bay, but can no longer tolerate the absence of progress.

8. ADJOURNMENT

Mayor Winget adjourned the meeting at 9:12 pm.

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City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 4.B.

Title
Consider action approving the adoption of the Investment Policy.

Consider action to adopt a resolution adopting the City's Investment Policy for Fiscal Year 2026, including amendments to the investment policies, investment strategies, and approved brokers/dealers list.

Staff Representative
Michael Kuhn, Treasurer & Debt Mgr.

Executive Summary
An annual review and adoption of the City's investment policies, investment strategies, and Broker/Dealers list is required for compliance with the Texas Public Funds Investment Act (PFIA), under Chapter 2256 of the Texas Government Code. The purpose of this item is to approve a resolution amending and adopting the City's investment policies, investment strategies, and broker/dealers list as set forth in the proposed Investment Policy for FY2026.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
GOVERN TRANSPARENTLY & INCLUSIVELY	1.8 Provide accurate and timely information to policy makers and the public.

Background Information
The City adopted and approved the last revision of the Investment Policy on October 15, 2024.

Discussion
Annual review of the City's Investment Policy, which includes the investment policies, investment strategies, and broker/dealers is conducted by the City's Investment Advisor (PFM), City Staff, and the City's Finance Committee.

In 2022, the City engaged the services of Valley View Consulting to provide a comprehensive review and update to the Policy. Undergoing significant revisions, with feedback from both Valley View and the City's Investment Advisor, the City was awarded a Certification of Distinction from the Government Treasurers' Organization of

Texas (GTOT). The City's Certification of Distinction from GTOT was renewed in 2025.

Last year's Investment Policy update included a revised broker/dealer list and adjustments to the language around permitted broker/dealers to conform with language recommended by the City's Investment Advisor.

The proposed updates for FY2026 reflect a revised broker/dealer list, language acknowledging the City's established practice of providing investment reports to the auditor at least annually, and adjustments to investment percentage limits for local government investment pools and commercial paper.

Financial/Budget Implications
N/A

Recommended Action
Move to approve a resolution amending and adopting the City's investment policies, investment strategies and broker/dealers list as set forth in the proposed Investment Policy for FY2026, as presented in Exhibit A.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS, ADOPTING THE CITY'S INVESTMENT POLICY FOR FISCAL YEAR 2026, INCLUDING AMENDMENTS TO INVESTMENT POLICIES, INVESTMENT STRATEGIES AND APPROVED BROKER/DEALERS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council is required by the Texas Public Funds Investment Act to review its investment policies, investment strategies, and broker/dealers at least annually; and

WHEREAS, the City Council has reviewed and considered the investment policies, investment strategies, and broker/dealers set forth in the Investment Policy, as well as the amendments proposed thereto, and finds and determines that the investment policies, investment strategies and broker/dealers reflected in the Investment Policy are in the best interest of the City and that this Resolution accurately records the changes made to the Policy; and

WHEREAS, it is the desire of the City Council to assure consistent management of public funds; and

WHEREAS, the City Council finds it is in the best interest of the public to amend and approve the Investment Policy for Fiscal Year 2026, including the investment policies, investment strategies and broker/dealers, as amended.

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS:

SECTION 1: The City Council of the City of Rowlett hereby adopts the City of Rowlett Investment Policy for Fiscal Year 2026, including the investment policies, investment strategies and broker/dealers, as amended, a copy of which is attached hereto and incorporated herein as Exhibit A.

SECTION 2: This resolution shall become effective immediately upon its passage.

Attachments

1. Exhibit A – Investment Policy
2. Attachment 1 – Investment Policy Red Line Version
3. Attachment 2 – Glossary of Investment and Cash Management Terms

Investment Policy

Approved on: October__2025

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ATTACHMENTS:

A. Broker/Dealers List

Investment Policy
City of Rowlett, Texas

I. PURPOSE

The purpose of this Investment Policy (hereinafter "Policy") is to set forth the investment objectives and parameters for the management of public funds of the City of Rowlett, Texas (hereinafter "City"). This Policy is designed to safeguard the City's funds, the availability of operating and capital funds when needed, and an investment return competitive with comparable funds and financial market indices. In order to execute this framework this Policy contains an Investment Strategy Statement.

II. SCOPE

This Policy is authorized by the City Council of the City in accordance with Chapter 2256, Texas Government Code, the Public Funds Investment Act. The Policy addresses the methods, procedures, and practices, which must be exercised to insure effective and judicious fiscal management of City funds. All City funds will be managed within the guidelines of this Policy. Bond funds, in addition to this Policy, shall be managed in accordance with their issuing documentation and all applicable State and Federal Law.

The Investment Strategy Statement, included in this policy, provides a separate written investment strategy for each of the City's fund types. Each investment strategy describes the investment objectives for each particular fund type. Cash and investment balances as defined in this Section are entirely known as "Available Fund".

III. INVESTMENT OBJECTIVES

Safety of Principal

The foremost objective of this investment program is the safety of the principal of City funds. Investment transactions shall seek to keep capital losses at a minimum, whether they are from issuer defaults or erosion of market value. To attain this objective, diversification is required in order to mitigate potential losses on individual investments.

Maintenance of Liquidity

The fund-type portfolios shall be managed in such a manner that funds are available to meet reasonably anticipated cash flow requirements in an orderly manner. Periodic cash flow analysis will be completed in order to ensure that the fund-type portfolios are positioned to provide sufficient liquidity.

Public Trust

All participants in the City's investment program shall seek to act responsibly as custodians of the public trust. Investment Officers shall avoid any transaction which might involve a conflict of interest or otherwise impair public confidence in the City's ability to govern effectively. All employees of the City having either a direct or indirect role in the process of investing idle funds shall act responsibly as custodians of the public trust.

Return on Investment

Investment portfolios shall be designed with the objective of attaining a market rate of return within an acceptable range of the established benchmarks taking into account the investment risk constraints and liquidity needs. Return on investment is of least importance compared to the safety and liquidity objectives described above. However, return enhancement may be attempted through active portfolio management. This strategy emphasizes low credit risk, diversification, and maturity management. The core investments have as their primary objective to assure that anticipated cash flows are matched with adequate investment liquidity. The City may sell an investment to recognize a loss or gain from time to time to achieve a perceived relative value based on its potential to enhance the overall portfolio. With an emphasis on enhancing interest income, weighted average yield to maturity will be the total portfolio performance measurement.

IV. DELEGATION OF AUTHORITY

As designated by the City Council, management responsibility for the investment program is assigned to the Director of Financial Services, Assistant Director of Financial Services, and Treasury & Debt Manager. These persons are granted investment authority and shall be considered and referred to as “Investment Officers” for the purpose of this Policy. As such, the Investment Officers are authorized to deposit, withdraw, invest, transfer, execute documentation, and otherwise manage City funds according to this Policy. The Investment Officers may grant, in writing, investment authority to other persons within the Finance Department. Any limitations placed on this authority will be specifically stated. No person may engage in an investment transaction or the management of funds except as provided under the terms of the Investment Policy, Investment Strategy Statement, and other operational procedures established by the Investment Officers. The Investment Officers shall establish written procedures for the operation of the investment portfolio and a system of internal accounting and administrative controls to regulate the activities of employees. Any new requirements from Investment Policy updates must be in compliance within one year of this adoption.

V. INVESTMENT ADVISORS AND INVESTMENT PROVIDERS

The City Council may appoint an investment advisor to assist the City’s financial staff with the management of its funds and other responsibilities including but not limited to competitive bidding, reporting requirements and security documentation. The investment advisor must be registered with the Securities and Exchange Commission (SEC) under the Investment Adviser’s Act of 1940 as well as with the Texas State Securities Board. The term of contract shall be limited under the Texas Public Funds Investment Act to a two-year period. A renewal or extension of the contract must be made by the City Council by order, ordinance, or resolution.

Investment Advisors shall adhere to the spirit, philosophy and specific term of this Policy and shall invest within the standard of "Prudent Expert ".

Investment Providers shall adhere to the spirit and philosophy of this Policy and shall avoid recommending or suggesting transactions outside the standard of "Prudent Expert."

The following criteria will be established in the selection of Investment Advisors and Investment Providers, including:

1) Adherence to the City's policies and strategies

2) Investment performance and transaction pricing within accepted risk constraints,

3) Responsiveness to the City's request for services, information and open communication,

4) Understanding of the inherent fiduciary responsibility of investing public funds,

5) Similarity in philosophy and strategy with the City's objectives.

Selected Investment Advisors and Investment Providers shall provide timely transaction confirmations and monthly activity reports.

Business organizations, as defined by the Public Funds Investment Act, eligible to transact investment business with the City shall be presented a written copy of this Policy. Additionally, the qualified representative of the business organization seeking to transact investment business shall execute a written instrument stating substantially to the effect that the business organization has:

1) Received and thoroughly reviewed this Policy

2) Acknowledged that the organization has implemented reasonable procedures and controls in an effort to preclude imprudent investment activities with the City, except to the extent that this authorization is dependent on an analysis of the makeup of the City's entire portfolio or requires an interpretation of subjective investment standard or relates to investment transactions of the City that are not made through accounts or other contractual arrangements over which the business organization has accepted discretionary investment authority.

The City will not enter into an investment transaction with a business organization prior to receiving the written instrument described above.

If brokerage services are utilized, the Investment Officer will present annually to the City Council a list of Authorized Brokers/Dealers. The City Council must review and approve the Authorized Brokers/Dealers list.

VI. STANDARDS OF CARE

The standard of care to be used by Investment Officers shall be the "Prudent Person" standard and shall be applied in the context of managing the overall investment program.

Investment officers acting in accordance with written procedures and this Policy and exercising due diligence shall be relieved of personal responsibility for an individual investment's credit risk or market price changes, provided deviations from expectation are reported to the City Council in a timely fashion and the sale or redemption of the investments are carried out in accordance with the terms of this Policy. The "Prudent Person" rule states the following:

> Investments shall be made with judgment and care, under prevailing circumstances, that a person of prudence, discretion and intelligence would exercise in the management of the person's own affairs, not for speculation, but for investment, considering the probable safety of capital and the probable income to be derived.

VII. ETHICS AND CONFLICTS OF INTEREST

Investment Officers shall act as custodians of the public trust avoiding any transaction which might involve a conflict of interest, the appearance of a conflict of interest, or any activity which might otherwise discourage public confidence. Investment Officers shall refrain from personal business activity that could conflict with proper execution of the investment program, or which could impair their ability to make impartial investment decisions. Additionally, all Investment Officers shall file with the Texas Ethics Commission and the City Council a statement disclosing any *personal business relationship* with an entity seeking to sell investments to the City or any relationship within the second degree by affinity or consanguinity to an individual seeking to sell investments to the City.

An Officer or employee involved in the investment process has a *personal business relationship* with a business organization if:

1) The Investment Officer or employee owns 10 percent or more of the voting stock or shares of the business organization or owns $5,000 or more of the fair market value of the business organization;

2) Funds received by the Investment Officer or employee from the business organization exceed 10 percent of his/her gross income for the previous year; or

3) The Investment Officer or employee has acquired from the business organization during the previous year investments with a book value of $2,500 or more for his/her personal account.

VIII. INTERNAL CONTROLS AND INVESTMENT PROCEDURES

The Investment Officers shall establish a system of internal controls and operational procedures that are in writing and made a part of the City's financial operational procedures. The internal controls should be designed to prevent losses of funds, which

might arise from fraud, employee error, and misrepresentation by third parties, or imprudent actions by employees. The written procedures should include reference to safekeeping, repurchase agreements, separation of transaction authority from accounting and recordkeeping, wire transfer agreements, banking service contracts, collateral/depository agreements, and "delivery-vs-payment" procedures. No person may engage in an investment transaction except as authorized under the terms of this Policy.

Independent auditors, as a normal part of the annual financial audit to the City, shall conduct a review of the system of internal controls to ensure compliance with policies and procedures.

IX. CONTINUING EDUCATION

In order to ensure qualified and capable investment management, within 12 months after taking office or assuming duties, each Investment Officer shall attend a training session relating to their investment responsibilities and receive not less than 10 hours of instruction. On an ongoing basis, all Investment Officers shall receive not less than 8 hours of instruction not less than once in a two-year period that begins on the first day of the City's fiscal year (October 1) and consists of the two consecutive fiscal years after that date. Training must include education in investment controls, security risks, strategy risks, market risks and compliance with the Public Funds Investment Act. Training must be provided by an independent source. Approved training sources include Government Treasurers Organization of Texas, Texas Municipal League, Government Finance Officers Association (Texas and National), American Institute of Certified Public Accountants, University of North Texas, or North Central Texas Council of Governments.

X. AUTHORIZED DEALERS

The Investment Officers or designee shall only purchase securities from Authorized Broker/Dealers.

If the City is under contract with an outside Investment Advisor, as described in Section V of this policy, it is the City's intent to utilize the Advisor's internally approved Broker/Dealer list; see Attachment A.

If an outside Investment Advisor is not under contract, the City's investment officers shall establish the City's Authorized Broker/Dealers.

The Investment Officers or designee shall maintain the list of Authorized Broker/Dealers approved by the City Council and that meet the following requirements:

1) Qualify under Securities and Exchange Commission Rule 15C3-1 (uniform net capital rule);
2) Maintain Capital of no less than $10,000,000;
3) Are registered as a dealer under the Securities Exchange Act of 1934;
4) Are member of the Financial Industry Regulatory Authority, Inc. (FINRA);
5) Are registered to sell securities in Texas;

6) Have been engaged in the business of effecting transactions in U.S. government and agency obligations for at least five (5) consecutive years (firm and assigned representative);

All Brokers/Dealers shall be provided with current copies of the City's Investment Policy.

XI. INVESTMENT STRATEGY STATEMENT

The City maintains Short-Term Portfolios for operating, debt service funds and bond construction funds and Long-Term Portfolios for core funds (operating reserve funds) and debt service reserve funds.

Short -Term Portfolios:

Operating Funds
Investment strategies for operating funds have as their primary objective to assure that anticipated cash flows are matched with adequate investment liquidity.

Suitability - Any investment eligible in the Investment Policy is suitable for Operating Funds.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, by managing the weighted average days to maturity for the Operating Fund's portfolio to less than one (1) year and restricting the maximum allowable maturity to three (3) years, the price volatility of the overall portfolio will be minimized.

Liquidity - The Short-term Operating Funds require the greatest short-term liquidity of any of the Fund types. Cash equivalent investments will provide daily liquidity and may be utilized as a competitive yield alternative to fixed maturity investments.

Marketability - Securities with active and efficient secondary markets are necessary in the event of an unanticipated cash flow requirement.

Diversification - Investment maturities should be staggered throughout the budget cycle to provide cash flow based on the anticipated operating needs of the City. Market cycle risk will be reduced by diversifying the appropriate maturity structure out through two years.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio restrictions is the desired objective. The yield of an equally weighted, rolling three-month Treasury bill portfolio will be the minimum yield objective.

Debt Service Funds

Investment strategies for debt service funds shall have as the primary objective the assurance of investment liquidity adequate to cover the debt service obligation on the required payment date.

Suitability - Any investment eligible in the Investment Policy is suitable for the Debt Service Funds.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, by managing Debt Service Funds to not exceed the debt service payment schedule the market risk of the overall portfolio will be minimized.

Liquidity - Debt Service Funds have predictable payment schedules. Therefore, investment maturities should not exceed the anticipated cash flow requirements. Cash equivalent investments may provide a competitive yield alternative for short term fixed maturity investments. A singular repurchase agreement may be utilized if disbursements are allowed in the amount necessary to satisfy any debt service payment. This investment structure is commonly referred to as a flexible repurchase agreement.

Marketability - Securities with active and efficient secondary markets are not necessary as the event of an unanticipated cash flow requirement is not probable.

Diversification - Market conditions influence the attractiveness of fully extending maturity to the next "unfunded" payment date. Generally, if investment rates are anticipated to decrease over time, the City is best served by locking in most investments. If the interest rates are potentially rising, then investing in shorter and larger amounts may provide advantage. At no time shall the debt service schedule be exceeded in an attempt to bolster yield.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio restrictions is the desired objective. The yield of an equally weighted, rolling three-month Treasury bill portfolio shall be the minimum yield objective.

Bond Construction or Special Purpose Funds

Investment strategies for bond construction or special purpose fund portfolios will have as their primary objective to ensure that anticipated cash flows are matched with adequate investment liquidity. These fund portfolios should include at least 10% in cash equivalent investments to allow for flexibility and unanticipated project outlays.

Suitability - Any investment eligible in the Investment Policy is suitable for the Bond Construction or Special Purpose Funds.

Safety of Principal - All investments will be of high quality with no perceived default risk. Market fluctuations may occur. However, by restricting the maximum maturity to the estimated project completion date and by

managing the Bond Construction or Special Purpose Funds to balance the short term and long term anticipated cash flow requirements, the market risk of the portfolio will be minimized.

Liquidity - Selecting investment maturities that provide greater cash flow than the anticipated needs and maintaining appropriate cash-equivalent balances will reduce the liquidity risk of unanticipated expenditures.

Marketability - The balancing of short-term and long-term cash flow needs requires the short-term portion of the Bond Construction or Special Purpose Funds to have securities with active and efficient secondary markets.

Diversification - Investment maturities should blend the short-term and long-term cash flow needs to provide adequate liquidity, yield enhancement, and stability.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio structures is the desired objective, however this portfolio maintains an investment strategy is comply with any applicable arbitrage or yield restriction regulations.

Long -Term Portfolios:

Core Funds

The objective is to create a portfolio structure for the City's Core Funds, as determined by the cash flow analysis report, which will experience minimal market value volatility during economic cycles. This may be accomplished by purchasing quality, short- to medium-term securities that will complement each other in a laddered or barbell maturity structure.

Suitability - Any investment eligible in the Investment Policy is suitable for Core Funds.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, by managing the weighted average days to maturity for the Core Fund's portfolio to not greater than one (1) year and restricting the maximum allowable maturity to five (5) years, the price volatility of the overall portfolio will be minimized.

Liquidity - Selecting investment maturities that provide greater cash flow than the anticipated needs and maintaining appropriate cash-equivalent balances will reduce the liquidity risk of unanticipated expenditures.

Marketability - Securities with active and efficient secondary markets are necessary in the event of an unanticipated cash flow requirement.

Diversification - Investment maturities should be staggered throughout the budget cycle to provide cash flow based on the anticipated operating needs

of the City. Market cycle risk will be reduced by diversifying the appropriate maturity structure out through two years.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio restrictions is the desired objective. The yield of an equally weighted, rolling three-month Treasury bill portfolio will be the minimum yield objective.

Debt Service Reserve Funds

Investment strategies for debt service reserve funds shall have as the primary objective the ability to generate a dependable revenue stream to the appropriate debt service fund from investments with a low degree of volatility, except as may be required by the bond ordinance specific to an individual issue. Securities should be of high quality, with short- to intermediate-term maturities.

Suitability - Any investment eligible in the Investment Policy is suitable for Debt Service Reserve Funds. Bond resolution and loan documentation constraints and insurance company restrictions may create specific considerations in addition to the Investment Policy.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, managing Debt Service Reserve Fund maturities to not exceed the call provisions of the borrowing reduces the investment's market risk if the City's debt is redeemed and the Reserve Fund liquidated. No stated final investment maturity shall exceed the shorter of the final maturity of the borrowing or three years. Annual mark-to-market requirements or specific maturity and average life limitations within the borrowing's documentation will influence the attractiveness of market risk and reduce the opportunity for maturity extension.

Liquidity - Debt Service Reserve Funds have no anticipated expenditures. The Funds are deposited to provide annual debt service payment protection to the City's debt holders. The funds are "returned" to the City at the final debt service payment. Market conditions and arbitrage regulation compliance determine the advantage of investment diversification and liquidity. Generally, if investment rates exceed the cost of borrowing, the City is best served by locking in investment maturities and reducing liquidity. If the borrowing cost cannot be exceeded, then concurrent market conditions will determine the attractiveness of locking in maturities or investing shorter and anticipating future increased yields.

Marketability - Securities with less active and efficient secondary markets are acceptable for Debt Service Reserve Funds.

Diversification - Market conditions and the arbitrage regulations influence the attractiveness of staggering the maturity of fixed rate investments for

Debt Service Reserve Funds. At no time shall the final debt service payment date of the bond issue be exceeded in an attempt to bolster yield.

Yield - Achieving a positive spread to the applicable borrowing cost is the desired objective. Debt Service Reserve Fund portfolio management shall at all times operate within the limits of the Investment Policy's risk constraints.

XII. MATURITY AND LIQUIDITY REQUIREMENTS

To the extent possible, an attempt will be made to match investment maturities with known cash needs and anticipated cash flow requirements.

A. Maturity Guidelines

Investments by or on behalf of the City shall have a final maturity of five (5) years or less from the date of settlement. The overall weighted average duration for the entire portfolio shall not be greater than one (1) year. The maturities of the underlying securities of a repurchase agreement will follow the requirements of the Repurchase Agreement.

B. Liquidity Requirements

The Investment Officers or designee shall determine the approximate amount of funds required to meet the day-to-day expenditure needs of the City. In order to have an available source of funds to meet unexpected cash requirements, a minimum of two months operating expenses will be invested in authorized cash equivalent investments. The balance of the City's funds will be available for investment according to the guidelines incorporated within this Policy.

XIII. PERFORMANCE MEASUREMENTS

In order to assist in the evaluation of the portfolios' performance, the City will use performance benchmarks for short-term and long-term portfolios. The use of benchmarks will allow the City to measure its returns against other investors in the same markets.

A. Investment performance of funds designated as short-term funds and other funds that must maintain a high degree of liquidity will be compared to the return on the S&P Rated GIP Index Government 30 Day Yield. Investments of current operating funds shall have maturities of no longer than twelve (12) months.

B. The long-term investment portfolio (Core Funds) total return shall be compared to the return of the Bank of America Merrill Lynch 1 Year U.S. Treasury Index (or a comparable benchmark). The Bank of America Merrill Lynch 1 Year Treasury Index represents U.S. Treasury securities having maturities with less than one year.

XIV. COMPETITIVE SELECTION OF INVESTMENT INSTRUMENTS

After the Investment Officers and/or the City's Investment Advisors has determined the approximate maturity date based on cash flow needs and market conditions and has analyzed and selected one or more optimal types of investments, a minimum of three (3) Broker/Dealers must be contacted and asked to provide bids/offers on securities in questions. Quotes will be held in confidence until the best option meeting the investment objectives is determined and selected.

However, if obtaining bids/offers are not feasible and appropriate, securities may be purchased/sold utilizing the comparison to current market price method on an exception basis. Acceptable current market price providers include, but are not limited to:

A. TradeWeb

B. Bloomberg Information Systems

C. Wall Street Journal or a comparable nationally recognized financial publication providing daily market pricing

D. Daily market pricing provided by the City's custodian or their correspondent institutions

The Investment Officers or designee and/or the City's Investment Advisor/s shall utilize the competitive bid process to select the securities to be purchased or sold. Selection by comparison to a current market price, as indicated above, shall only be utilized when, in judgment of the Investment Officers or the City's Investment Advisor/s, competitive bidding would inhibit the selection process.

Examples of when this method may be used include:

A. When time constraints due to unusual circumstances preclude the use of the competitive bidding process

B. When no active market exists for the issue being traded due to the age or depth of the issue

C. When a security is unique to a single dealer, for example, a private placement or

D. When the transaction involves new issues or issues in the "when issued" market

Overnight sweep investment instruments will not be bid, but may be placed with the City's Primary Depository relating to the demand account for which the investment instrument was purchased.

XV. AUTHORIZED INVESTMENTS AND PORTFOLIO COMPOSITION

Investments should be made subject to the cash flow needs and such cash flows are subject to revisions as market conditions and the City's needs change. However, when

the invested funds are needed in whole or in part for the purpose originally intended or for more optimal investments, the Investment Officers or designee and/or the City's Investment Advisors may sell or redeem the investment at the then-prevailing market price.

The following are the investment requirements and allocation limits on investment types, issuers, and maturities as established by the City. Diversification strategies within the established guidelines shall be reviewed and revised periodically as necessary by the Investment Officers. The Investment Officers, and/or City's Investment Advisor/s shall have the option to further restrict investment percentages from time to time based on market conditions, risk and diversification investment strategies. The percentage allocation requirements for investment types and issuers are calculated based on the original cost of each investment, at the time purchase. Investments not listed in this Policy are prohibited.

Investments described below are those authorized by this Policy. The following list may not contain all of the options that are authorized by state statutes, but only those that the City Council wishes to include in the City's portfolios. The City is not required to liquidate investments that were authorized investments at the time of purchase. The City funds governed by this Policy may be invested in the following investments, however funds derived from the sale of debt are not to be included in the calculation of the limits below:

Security Type	Minimum Rating Requirement	Maturity Limits	Maximum Allocation Limit	Maximum Issuer Limit
Local Government Investment Pools	AAA/AAAm	N/A	100%	N/A
United States Government Securities	N/A	5 Years	100%	N/A
United States Government Agencies (full faith and credit of the United States Government)	N/A	5 Years	100%	N/A
Federal Instrumentalities (United States Government Sponsored Enterprises ("GSE") which are non-full faith and credit).*	N/A	5 Years	70%	40%
Mortgage-Backed Securities ("MBS")*	N/A	5 Years	10%	15%
Interest Bearing Time Deposit or Saving Accounts	N/A	1 Years	20%	10%
Repurchase Agreements**	N/A	90 Days	20%	10%
Commercial Paper	P-1/A-1	365 Days	35%	5%
Bankers' Acceptances	P-1/A-1	180 Days	25%	5%
State and/or Local Government Taxable and/or Tax-Exempt Debt	Single "A" category by two NRSROs	5 Years	25%	5%
Registered Investment Companies (Money Market Mutual Funds)	AAAm	N/A	50%	25%

*The combined total of available funds invested in Federal Instrumentalities and MBS cannot be more than 80%.

** Flexible repurchase agreements for the investment of bond proceeds may have maturities greater than 90 days.

A. Local Government Investment Pools

1. Investment Authorization

Local government investment pools organized in accordance with the Interlocal Cooperation Act (Chapter 791, Texas Government Act) as amended, whose assets consist exclusively of the obligations that are allowed as a direct investment for funds subject to the Public Funds Investment Act. A public funds investment pool must be continuously rated no lower than "AAA", "AAA-m" or at an equivalent rating by at least one Nationally Recognized Statistical Rating Organization ("NRSRO").

2. Portfolio Composition

A maximum of 100% of available funds may be invested in the Local Government Pools.

3. Due Diligence Requirements

A thorough review of any local government investment pool is required prior to investing, and on a continual basis.

B. United States Government Securities

1. Purchase Authorization

Direct obligations, or obligations the principal and interest of which are unconditionally guaranteed by the United States Government. Such securities will include, but not be limited to the following:

Cash Management Bills
Treasury Bills
Treasury Notes
Treasury Bonds
Treasury STRIPs

2. Portfolio Composition

A maximum of 100% of available funds may be invested in the United States Government Securities with the exception of Treasury Strips are limited to 10% of available funds.

3. Maturity Limitations

The maximum length to maturity of any direct investment in the United States Government Securities is five (5) years from the date of settlement.

C. United States Government Agencies (full faith and credit of the United States Government)

1. Purchase Authorization

Bonds, debentures, notes, with or without a call option, issued or guaranteed by the United States Government Agencies, provided such obligations are backed by the full faith and credit of the United States Government. Examples of such issuers include, but are not limited to the following:

- Government National Mortgage Association (GNMA)
- Federal Housing Administration (FHA)
- General Services Administration (GSA)
- Small Business Administration (SBA)

2. Portfolio Composition

A maximum of 100% of available funds may be invested in United States Government agencies.

3. Maturity Limitations

The maximum length to maturity for an investment in any United States Government ~~A~~gency security is five (5) years from the date of settlement.

D. Federal Instrumentalities (United States Government Sponsored Enterprises ("GSE") which are non-full faith and credit)

1. Purchase Authorization

Bonds, debentures, notes, with or without a call option, issued or guaranteed by United States Government Sponsored Enterprises (Federal Instrumentalities), which are non-full faith and credit agencies. These are limited to the following:

- Federal Farm Credit Bank (FFCB)
- Federal Home Loan Bank (FHLB)
- Federal National Mortgage Association (FNMA)
- Federal Home Loan Mortgage Corporation (FHLMC)

2. Portfolio Composition

A maximum of 70% of available funds may be invested in Federal Instrumentalities that do not carry the full faith and credit of the United States government.

3. Limits on Individual Issuers

A maximum of 40% of available funds may be invested in any one issuer.

4. Maturity Limitations

The maximum length to maturity for an investment in any Federal Instrumentality security is five (5) years from the date of settlement.

E. Mortgage-Backed Securities (MBS)

1. Purchase Authorization

Mortgage-backed securities (MBS) which are based on mortgages that are guaranteed by a Government Agency or GSE for payment of principal and a guarantee of timely payment.

2. Portfolio Composition

A maximum of 10% of available funds may be invested in MBS.

3. Limits of Individual Issuers

A maximum of 15% of available funds may be invested with any one issuer.

4. Maturity Limitations

A maximum length to maturity for an investment in any MBS is five (5) years from the date of settlement.

The maturity of mortgage securities shall be considered the date corresponding to its average life. This date reflects the point at which an investor will have received back half of the original principal (face) amount. The average life may be different from the stated legal maturity included in a security's description.

F. Interest Bearing Time Deposit or Saving Accounts

1. Purchase Authorization

Certificates of deposit or savings accounts issued by state and national banks that has a main office or branch in Texas that are: guaranteed or insured by the Federal Deposit Insurance Corporation (FDIC), or its successor; or secured as required by the Public Funds Collateral Act and this Policy.

2. Portfolio Composition

A maximum of 20% of available funds may be invested in non-negotiable interest bearing time certificates of deposit or savings account.

3. Limits on Individual Issuers

A maximum of 10% of available funds may be deposited with any one issuer.

4. The maximum maturity on any certificate shall be no greater than one (1) year from the date of settlement.

G1. Repurchase Agreements

1. Purchase Authorization

a. Repurchase agreements composed of only cash and/or those investments authorized in the Public Funds Investment Act sections B, C, or D. The Investment Officers shall only enter into repurchase agreements with a primary government securities dealer, as defined by the Federal Reserve, or a financial institution doing business in the State of Texas. All counterparties are required to sign a Repurchase Agreement, acceptable to the City, prior to the execution of a repurchase agreement transaction.

b. A third-party custodian acceptable to the City shall hold the collateral for all repurchase agreements. A clearly marked receipt must be supplied to the Investment Officers or designee and retained.

c. Securities authorized for collateral must have maturities less than five (5) years and with market value for the principal and accrued interest of 102 percent of the value and for the term of the repurchase agreement. Immaterial short-term deviations from the 102 percent requirement are permissible only upon the approval of the Investment Officers and/or the City's Investment Advisors.

d. The overnight sweep arrangement shall adhere to the agreement between the City and the City's primary depository.

2. Portfolio Composition

A maximum of 20% of available funds may be invested in repurchase agreements excluding one (1)-business day agreements and overnight sweep agreements.

3. Limits on Individual Issuers

A maximum of 10% of available funds may be invested with any one institution excluding one (1)-business day agreements and overnight sweep agreements.

4. Limits on Maturities

The maximum length to maturity of any repurchase agreement is 90 days from the date of settlement.

G2. Repurchase agreement for the investment of bond proceeds

1. A fully secured repurchase agreement is an authorized investment under this Policy if the repurchase agreement:

   a. has a defined termination date;
   b. is secured by a combination of cash and obligations authorized in the Public Funds Investment Act described by Section B, C, or D at minimum of 104%

   c. requires the securities being purchased by the City or cash held by the City to be pledged to the City, held in an account in the City's name, and deposited at the time the investment is made with the City or with a third party selected and approved by the City; and

   d. is placed through a primary government securities dealer, as defined by the Federal Reserve, or a financial institution doing business in the State of Texas.

   e. In this section, "repurchase agreement" means a simultaneous agreement to buy, hold for a specified time, and sell back at a future date obligations described by Section B, C, D, or E of this policy, at a market value at the time the funds are disbursed of not less than the principal amount of the funds disbursed.

H. Commercial Paper

1. Purchase Authorization

   Commercial paper of any United States company that is rated, at the time of purchase, “Prime-1” by Moody’s, “A-1” by Standard & Poor’s, and/or “F-1” by Fitch (prime commercial paper), or the equivalent by two NRSROs.

2. Portfolio Composition

   A maximum of 35% of available funds may be directly invested in prime commercial paper.

3. Limits on Individual Issuers

   A maximum of 5% of available funds may be invested with any one issuer.

4. Maturity Limitations

   The maximum length to maturity for prime commercial paper shall be 365 days from the date of settlement.

I. Bankers' Acceptances

1. Purchase Authorization

Bankers' Acceptances issued by a domestic bank or a federally chartered domestic office of a foreign bank, which are eligible for purchase by the Federal Reserve System, at the time of purchase, the short-term paper is rated, at a minimum, "Prime-1" by Moody's Investors Services and "A-1" Standard & Poor's, and/or "F-1" by Fitch, or the equivalent by two NRSROs.

2. Portfolio Composition

A maximum of 25% of available funds may be directly invested in Bankers' Acceptances. The City will permit investment in Bankers' Acceptances provided they are issued in book entry format through the Depository Trust Corporation. The City will not accept any "physical" Bankers' Acceptances.

3. Limits on Individual Issuers

A maximum of 5% of available funds may be invested with any one issuer.

4. Maturity Limitations

The maximum length to maturity for Bankers' Acceptances shall be 180 days from the date of settlement.

J. State and/or Local Government Taxable and/or Tax-Exempt Debt

1. Purchase Authorization

State and/or local government taxable and/or tax-exempt debt, general obligation and/or revenue bonds, at the time of purchases, at a minimum single "A" category by any two NRSROs, or rated at least "MIG-1" by Moody's and "SP-1" by Standard & Poor's for short-term debt or the equivalent by two NRSROs.

2. Portfolio Composition

A maximum of 25% of available funds may be invested in taxable and tax-exempt debt.

3. Limits on Individual Issuers

A maximum of 5% of available funds may be invested with any one issuer.

4. Maturity Limitations

A maximum length to maturity for an investment in any state or local government debt security is five (5) years from the date of settlement.

K. Registered Investment Companies (Money Market Mutual Funds)

1. Investment Authorization

Shares in open-end and no-load money market funds provided such funds are registered under the Investment Act of 1940 and operate in accordance with Rule 2a-7.

2. Portfolio Composition

A maximum of 50% of available funds may be invested in money market funds.

3. Limits of Individual Issuers

A maximum of 25% of available funds may be invested with any one money market fund.

4. Rating Requirements

The money market funds shall be rated "AAAm" by Standard & Poor's or the equivalent by another NRSRO.

5. Due Diligence Requirements

A thorough review of any money market fund is required prior to investing, and on a continual basis.

XVI. DOWNGRADE PROVISION FOR INVESTMENT RATINGS

In the event any investment in the portfolio, subsequent to purchase, is downgraded to a level below the minimum required rating, the Investment Advisor(s) shall notify the City or its representatives as soon as practical of such ratings change along with any contemplated actions to sell or hold the security. The City, independently or in concert with the Investment Advisor(s), shall take all prudent measures that are consistent with its investment policy to liquidate an investment that does not have the minimum rating.

XVII. DERIVATIVES AND REVERSE REPURCHASE AGREEMENTS

The City may not invest in investment products that include the use of derivatives, unless specified in Section XV of this Policy. A “derivative” is defined as a financial instrument the value of which depends on, or is derived from, the value of one or more underlying assets or indices or asset values. Reverse repurchase agreements are not permitted by this Policy.

XVIII. REPORTING

The Investment performance will be monitored and evaluated by the Investment Officers. In conjunction with the Investment Officers, the City’s Investment Advisors shall provide quarterly investment reports on the City’s short-term and long-term core investments to City Council as required by the Public Funds Investment Act, and make available to the City’s auditor at least annually. Schedules in the quarterly report should include the following:

1. describe in detail the investment position of the City,

2. contain a summary statement stating the reporting period beginning market value, additions or changes to the market value during the period and ending market value for the period, and fully accrued interest for the period for each pooled fund group,

3. state the reporting period beginning book and market value and reporting period ending book and market value of each investment security by asset type and fund type,

4. state the maturity date of each investment security,

5. state the fund for which each investment security was purchased, and

6. state the compliance of the investment portfolio with the City's Investment Policy and Investment Strategy Statement and the Public Funds Investment Act, and

7. be prepared jointly and signed by each Investment Officer.

Market Values will be determined by sources independent from the investment transaction, such as the City’s custodian bank, or if a custodian relationship is not present, a safekeeping agent, if they offer the service.

XIX. DEPOSITORY AGREEMENTS

The City will select and designate a primary depository through a process consistent with State law and the City's purchasing policy.

Consistent with the requirements of State law, the City will require that all deposits be federally insured or collateralized with eligible securities, to include letters of credit issued by a Federal Home Loan Bank. If deposits are collateralized with marketable securities, the pledged securities will be held at the custodial agent acceptable to the City. The market value of the pledged securities securing the deposit of funds shall be at least equal to 102% of the amount of the deposits of funds reduced to the extent that the deposits are insured by the FDIC. Letters of Credit pledged to the City shall have a value at least equal to 100% of the principal plus anticipated accrued interest reduced to the extent that the deposits are insured by the FDIC.

The depository will be required to sign a Depository Agreement with the City. The Depository Agreement shall define the City's rights to the collateral in case of default, bankruptcy, or closing and shall establish a perfected security interest in compliance with Federal and State regulations, including:

- the Agreement must be in writing;
- the Agreement must be executed by the Depository and the City contemporaneously with the acquisition of the asset;
- the Agreement must be approved by the Board of Directors or the Loan Committee of the Depository and a copy of the meeting minutes must be delivered to the City; and
- the Agreement must be part of the Depository's "official record" continuously since its execution.

It shall further address any concerns in relation to acceptable collateral, levels of collateral, substitution and addition of collateral, and reporting and monitoring of collateral.

The City shall monitor collateral levels at least monthly.

XX. THIRD-PARTY SAFEKEEPING and CUSTODIAL AGREEMENTS

All City-owned securities shall be held with a third-party safekeeping agent and be properly designated as an asset of the City. The securities must be held in an account separate and apart from the assets of the financial institution. The safekeeping shall accept transaction instructions only from those persons who have been duly authorized by the Investment Officers and which authorization has been provided, in writing, to the agent. No purchase or withdrawal of securities, in whole or in part, shall be permitted unless by such a duly authorized person. Security transactions between a broker/dealer and the custodian involving the purchase or sale of securities by transfer of money or securities must be made on a "delivery versus payment" basis, to ensure that the safekeeping agent will have the security or money, as appropriate, in hand at the conclusion of the transaction.

A third-party custodian as defined by the Public Funds Collateral Act shall accept pledged collateral instructions only from those persons who have been duly authorized by the Investment Officers and which authorization has been provided, in writing, to the custodian. No withdrawal of pledged securities, in whole or in part, shall be permitted unless by such a duly authorized person.

Monthly, each safekeeping agent and custodian shall provide the Investment Officers or designee with detailed information on the securities held by the agent or custodian.

XXI. RESERVATION OF AUTHORITY

The Investment Policy, including the Investment Strategies and Broker/Dealers list will be reviewed and approved on an annual basis by the City Council. Revisions and or amendments will be approved and documented by the City Council.

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Mayor City of Rowlett

ATTACHMENT A
Broker/Dealers List

U.S. Bancorp Asset Management, Inc. Approved Broker-Dealer List

Academy Securities, Inc.
Alamo Capital
Ameritas Investment Company, LLC
AmeriVet Securities, Inc.
ANZ Securities, Inc.
ASL Capital Markets, Inc.
Robert W. Baird & Co. Incorporated
Bancroft Capital, LLC
Barclays Capital Inc.
BBVA Securities Inc.
B.C. Ziegler and Company
Belle Haven Investments, L.P.
BGC Financial, L.P.
Brownstone Investment Group, LLC
Blaylock Van, LLC
BMO Capital Markets Corp.
Bank of Montreal, Chicago Branch
BNP Paribas Securities Corp.
Bank of Nova Scotia, New York Agency
BNY Mellon Capital Markets, LLC
BofA Securities, Inc.
BOK Financial Securities, Inc.
Brean Capital, LLC
Cabrera Capital Markets LLC
Commonwealth Australia Securities LLC
Credit Agricole Securities (USA) Inc.
Country Club Financial Services, Inc.
Cantor Fitzgerald & Co.
CIBC World Markets Corp.
Citadel Securities LLC
Citigroup Global Markets Inc.
CastleOak Securities, LP
Commerce Brokerage Services, Inc.
Conners & Co., Inc.
Crews & Associates, Inc.
D.A. Davidson & Co.
Sanctuary Securities Inc.
Deutsche Bank Securities Inc.
Daiwa Capital Markets America Inc.
Colliers Securities LLC
Drexel Hamilton, LLC
SouthState|DuncanWilliams Securities Corp.
Edward D. Jones & Co., L.P.
First Bankers' Banc Securities, Inc
FHN Financial Securities Corp
Fifth Third Securities, Inc.
Falcon Square Capital, LLC
First Trust Portfolios L.P.
First Tryon Securities, LLC
The GMS Group, LLC
Goldman, Sachs & Co.
Guggenheim Securities, LLC
Harvestons Securities, Inc.
The Huntington Investment Company
Hilltop Securities Inc.
Herbert J Sims & Co. Inc.
HSBC Securities (USA) Inc.
Isaak Bond Investments, Inc.
TP ICAP Global Markets Americas LLC
InspereX LLC
ING Financial Markets LLC
StoneX Financial Inc.
Janney Montgomery Scott LLC
Jefferies LLC
J.M. Lummis Securities, Inc.
J.P. Morgan Securities LLC
Jane Street Execution Services, LLC
KeyBanc Capital Markets Inc.
C.L. King & Associates, Inc.
Lloyds Securities, Inc.
Loop Capital Markets LLC
Multi-Bank Securities, Inc.
Mesirow Financial, Inc.
Millennium Advisors, LLC
Mischler Financial Group
MarketAxess Corporation
Morgan Stanley
M&T Securities, Inc.
MUFG Securities Americas Inc.
Mizuho Securities USA Inc.
Nabsecurities, LLC
Natixis Securities Americas LLC
National Bank of Canada Financial Inc.
Northern Capital Securities Corporation
National Financial Services LLC
Nomura Securities International, Inc.
Northland Securities, Inc.
Oppenheimer & Co. Inc.
Piper Sandler & Co.
PNC Capital Markets LLC
Performance Trust Capital Partners, LLC
Rabo Securities USA, Inc.
Raymond James & Associates, Inc.
RBC Capital Markets, LLC
NatWest Markets Securities Inc.
Lument Securities LLC
Rice Financial Products Company
Raymond James (USA) Ltd.

Roosevelt & Cross, Incorporated
Samco Capital Markets, Inc.
Santander US Capital Markets LLC
Santander US Capital Markets LLC
Siebert, Williams, Shank & Co., LLC
Scotia Capital (USA) Inc.
Seaport Global Securities LLC
SEB Securities, Inc
R. SEELAUS & CO., LLC
Susquehanna Financial Group, LLLP
SG Americas Securities, LLC
Societe Generale, New York Branch
SAL Equity Trading, GP
SMBC Nikko Securities America, Inc
Stephens Inc.
Samuel A. Ramirez & Co., Inc.
Stern Brothers & Co.
Stifel, Nicolaus & Company, Incorporated
State Street Global Advisors Funds Distributors, LLC
Sumridge Partners, LLC
TD Securities (USA) LLC
TD Securities Automated Trading LLC
Truist Securities, Inc
Thornton Farish Inc.
Toyota Financial Services Securities USA Corporation
Tradition Securities and Derivatives Inc.
Tradeweb Direct LLC
UBS Securities LLC
UBS Financial Services, Inc.
UMB Financial Services, Inc.
Steward Partners Investment Solutions, LLC
William Blair & Company L.L.C
Wedbush Securities Inc.
Wells Fargo Bank, NA
Wells Fargo Advisors Financial Network, LLC
Wells Fargo Securities, LLC
Wiley Bros.-Aintree Capital, LLC

Attachment 1

Investment Policy

Approved on: ~~October~~October- __ ~~15, 2024~~2025

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A. Broker/Dealers List

Investment Policy
City of Rowlett, Texas

I. PURPOSE

The purpose of this Investment Policy (hereinafter "Policy") is to set forth the investment objectives and parameters for the management of public funds of the City of Rowlett, Texas (hereinafter "City"). This Policy is designed to safeguard the City's funds, the availability of operating and capital funds when needed, and an investment return competitive with comparable funds and financial market indices. In order to execute this framework this Policy contains an Investment Strategy Statement.

II. SCOPE

This Policy is authorized by the City Council of the City in accordance with Chapter 2256, Texas Government Code, the Public Funds Investment Act. The Policy addresses the methods, procedures, and practices, which must be exercised to insure effective and judicious fiscal management of City funds. All City funds will be managed within the guidelines of this Policy. Bond funds, in addition to this Policy, shall be managed in accordance with their issuing documentation and all applicable State and Federal Law.

The Investment Strategy Statement, included in this policy, provides a separate written investment strategy for each of the City's fund types. Each investment strategy describes the investment objectives for each particular fund type. Cash and investment balances as defined in this Section are entirely known as "Available Fund".

III. INVESTMENT OBJECTIVES

Safety of Principal

The foremost objective of this investment program is the safety of the principal of City funds. Investment transactions shall seek to keep capital losses at a minimum, whether they are from issuer defaults or erosion of market value. To attain this objective, diversification is required in order to mitigate potential losses on individual investments.

Maintenance of Liquidity

The fund-type portfolios shall be managed in such a manner that funds are available to meet reasonably anticipated cash flow requirements in an orderly manner. Periodic cash flow analysis will be completed in order to ensure that the fund-type portfolios are positioned to provide sufficient liquidity.

Public Trust

All participants in the City's investment program shall seek to act responsibly as custodians of the public trust. Investment Officers shall avoid any transaction which might involve a conflict of interest or otherwise impair public confidence in the City's ability to govern effectively. All employees of the City having either a direct or indirect role in the process of investing idle funds shall act responsibly as custodians of the public trust.

Return on Investment

Investment portfolios shall be designed with the objective of attaining a market rate of return within an acceptable range of the established benchmarks taking into account the investment risk constraints and liquidity needs. Return on investment is of least importance compared to the safety and liquidity objectives described above. However, return enhancement may be attempted through active portfolio management. This strategy emphasizes low credit risk, diversification, and maturity management. The core investments have as their primary objective to assure that anticipated cash flows are matched with adequate investment liquidity. The City may sell an investment to recognize a loss or gain from time to time to achieve a perceived relative value based on its potential to enhance the overall portfolio. With an emphasis on enhancing interest income, weighted average yield to maturity will be the total portfolio performance measurement.

IV. DELEGATION OF AUTHORITY

As designated by the City Council, management responsibility for the investment program is assigned to the Director of Financial Services, Assistant Director of Financial Services, and Treasury & Debt Manager. These persons are granted investment authority and shall be considered and referred to as “Investment Officers” for the purpose of this Policy. As such, the Investment Officers are authorized to deposit, withdraw, invest, transfer, execute documentation, and otherwise manage City funds according to this Policy. The Investment Officers may grant, in writing, investment authority to other persons within the Finance Department. Any limitations placed on this authority will be specifically stated. No person may engage in an investment transaction or the management of funds except as provided under the terms of the Investment Policy, Investment Strategy Statement, and other operational procedures established by the Investment Officers. The Investment Officers shall establish written procedures for the operation of the investment portfolio and a system of internal accounting and administrative controls to regulate the activities of employees. Any new requirements from Investment Policy updates must be in compliance within one year of this adoption.

V. INVESTMENT ADVISORS AND INVESTMENT PROVIDERS

The City Council may appoint an investment advisor to assist the City’s financial staff with the management of its funds and other responsibilities including but not limited to competitive bidding, reporting requirements and security documentation. The investment advisor must be registered with the Securities and Exchange Commission (SEC) under the Investment Adviser’s Act of 1940 as well as with the Texas State Securities Board. The term of contract shall be limited under the Texas Public Funds Investment Act to a two-year period. A renewal or extension of the contract must be made by the City Council by order, ordinance, or resolution.

Investment Advisors shall adhere to the spirit, philosophy and specific term of this Policy and shall invest within the standard of "Prudent Expert ".

Investment Providers shall adhere to the spirit and philosophy of this Policy and shall avoid recommending or suggesting transactions outside the standard of "Prudent Expert."

The following criteria will be established in the selection of Investment Advisors and Investment Providers, including:

1) Adherence to the City's policies and strategies

2) Investment performance and transaction pricing within accepted risk constraints,

3) Responsiveness to the City's request for services, information and open communication,

4) Understanding of the inherent fiduciary responsibility of investing public funds,

5) Similarity in philosophy and strategy with the City's objectives.

Selected Investment Advisors and Investment Providers shall provide timely transaction confirmations and monthly activity reports.

Business organizations, as defined by the Public Funds Investment Act, eligible to transact investment business with the City shall be presented a written copy of this Policy. Additionally, the qualified representative of the business organization seeking to transact investment business shall execute a written instrument stating substantially to the effect that the business organization has:

1) Received and thoroughly reviewed this Policy

2) Acknowledged that the organization has implemented reasonable procedures and controls in an effort to preclude imprudent investment activities with the City, except to the extent that this authorization is dependent on an analysis of the makeup of the City’s entire portfolio or requires an interpretation of subjective investment standard or relates to investment transactions of the City that are not made through accounts or other contractual arrangements over which the business organization has accepted discretionary investment authority.

The City will not enter into an investment transaction with a business organization prior to receiving the written instrument described above.

If brokerage services are utilized, the Investment Officer will present annually to the City Council a list of Authorized Brokers/Dealers. The City Council must review and approve the Authorized Brokers/Dealers list.

VI. STANDARDS OF CARE

The standard of care to be used by Investment Officers shall be the "Prudent Person" standard and shall be applied in the context of managing the overall investment program. Investment officers acting in accordance with written procedures and this Policy and exercising due diligence shall be relieved of personal responsibility for an individual investment's credit risk or market price changes, provided deviations from expectation are reported to the City Council in a timely fashion and the sale or redemption of the investments are carried out in accordance with the terms of this Policy. The "Prudent Person" rule states the following:

> Investments shall be made with judgment and care, under prevailing circumstances, that a person of prudence, discretion and intelligence would exercise in the management of the person's own affairs, not for speculation, but for investment, considering the probable safety of capital and the probable income to be derived.

VII. ETHICS AND CONFLICTS OF INTEREST

Investment Officers shall act as custodians of the public trust avoiding any transaction which might involve a conflict of interest, the appearance of a conflict of interest, or any activity which might otherwise discourage public confidence. Investment Officers shall refrain from personal business activity that could conflict with proper execution of the investment program, or which could impair their ability to make impartial investment decisions. Additionally, all Investment Officers shall file with the Texas Ethics Commission and the City Council a statement disclosing any *personal business relationship* with an entity seeking to sell investments to the City or any relationship within the second degree by affinity or consanguinity to an individual seeking to sell investments to the City.

An Officer or employee involved in the investment process has a *personal business relationship* with a business organization if:

1) The Investment Officer or employee owns 10 percent or more of the voting stock or shares of the business organization or owns $5,000 or more of the fair market value of the business organization;

2) Funds received by the Investment Officer or employee from the business organization exceed 10 percent of his/her gross income for the previous year; or

3) The Investment Officer or employee has acquired from the business organization during the previous year investments with a book value of $2,500 or more for his/her personal account.

VIII. INTERNAL CONTROLS AND INVESTMENT PROCEDURES

The Investment Officers shall establish a system of internal controls and operational procedures that are in writing and made a part of the City's financial operational procedures. The internal controls should be designed to prevent losses of funds, which might arise from fraud, employee error, and misrepresentation by third parties, or imprudent actions by employees. The written procedures should include reference to safekeeping, repurchase agreements, separation of transaction authority from accounting and recordkeeping, wire transfer agreements, banking service contracts, collateral/depository agreements, and "delivery-vs-payment" procedures. No person may engage in an investment transaction except as authorized under the terms of this Policy.

Independent auditors, as a normal part of the annual financial audit to the City, shall conduct a review of the system of internal controls to ensure compliance with policies and procedures.

IX. CONTINUING EDUCATION

In order to ensure qualified and capable investment management, within 12 months after taking office or assuming duties, each Investment Officer shall attend a training session relating to their investment responsibilities and receive not less than 10 hours of instruction. On an ongoing basis, all Investment Officers shall receive not less than 8 hours of instruction not less than once in a two-year period that begins on the first day of the City's fiscal year (October 1) and consists of the two consecutive fiscal years after that date. Training must include education in investment controls, security risks, strategy risks, market risks and compliance with the Public Funds Investment Act. Training must be provided by an independent source. Approved training sources include Government Treasurers Organization of Texas, Texas Municipal League, Government Finance Officers Association (Texas and National), American Institute of Certified Public Accountants, University of North Texas, or North Central Texas Council of Governments.

X. AUTHORIZED DEALERS

The Investment Officers or designee shall only purchase securities from Authorized Broker/Dealers.

If the City is under contract with an outside Investment Advisor, as described in Section V of this policy, it is the City's intent to utilize the Advisor's internally approved Broker/Dealer list; see Attachment A.

If an outside Investment Advisor is not under contract, the City's investment officers shall establish the City's Authorized Broker/Dealers.

The Investment Officers or designee shall maintain the list of Authorized Broker/Dealers approved by the City Council and that meet the following requirements:

1) Qualify under Securities and Exchange Commission Rule 15C3-1 (uniform net capital rule);
2) Maintain Capital of no less than $10,000,000;
3) Are registered as a dealer under the Securities Exchange Act of 1934;
4) Are member of the Financial Industry Regulatory Authority, Inc. (FINRA);
5) Are registered to sell securities in Texas;
6) Have been engaged in the business of effecting transactions in U.S. government and agency obligations for at least five (5) consecutive years (firm and assigned representative);

All Brokers/Dealers shall be provided with current copies of the City's Investment Policy.

XI. INVESTMENT STRATEGY STATEMENT

The City maintains Short-Term Portfolios for operating, debt service funds and bond construction funds and Long-Term Portfolios for core funds (operating reserve funds) and debt service reserve funds.

Short -Term Portfolios:

Operating Funds
Investment strategies for operating funds have as their primary objective to assure that anticipated cash flows are matched with adequate investment liquidity.

Suitability - Any investment eligible in the Investment Policy is suitable for Operating Funds.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, by managing the weighted average days to maturity for the Operating Fund's portfolio to less than one (1) year and restricting the maximum allowable maturity to three (3) years, the price volatility of the overall portfolio will be minimized.

Liquidity - The Short-term Operating Funds require the greatest short-term liquidity of any of the Fund types. Cash equivalent investments will provide daily liquidity and may be utilized as a competitive yield alternative to fixed maturity investments.

Marketability - Securities with active and efficient secondary markets are necessary in the event of an unanticipated cash flow requirement.

Diversification - Investment maturities should be staggered throughout the budget cycle to provide cash flow based on the anticipated operating needs of the City. Market cycle risk will be reduced by diversifying the appropriate maturity structure out through two years.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio restrictions is the desired objective. The yield of an equally weighted, rolling three-month Treasury bill portfolio will be the minimum yield objective.

Debt Service Funds

Investment strategies for debt service funds shall have as the primary objective the assurance of investment liquidity adequate to cover the debt service obligation on the required payment date.

Suitability - Any investment eligible in the Investment Policy is suitable for the Debt Service Funds.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, by managing Debt Service Funds to not exceed the debt service payment schedule the market risk of the overall portfolio will be minimized.

Liquidity - Debt Service Funds have predictable payment schedules. Therefore, investment maturities should not exceed the anticipated cash flow requirements. Cash equivalent investments may provide a competitive yield alternative for short term fixed maturity investments. A singular repurchase agreement may be utilized if disbursements are allowed in the amount necessary to satisfy any debt service payment. This investment structure is commonly referred to as a flexible repurchase agreement.

Marketability - Securities with active and efficient secondary markets are not necessary as the event of an unanticipated cash flow requirement is not probable.

Diversification - Market conditions influence the attractiveness of fully extending maturity to the next “unfunded” payment date. Generally, if investment rates are anticipated to decrease over time, the City is best served by locking in most investments. If the interest rates are potentially rising, then investing in shorter and larger amounts may provide advantage. At no time shall the debt service schedule be exceeded in an attempt to bolster yield.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio restrictions is the desired objective. The yield of an equally weighted, rolling three-month Treasury bill portfolio shall be the minimum yield objective.

Bond Construction or Special Purpose Funds

Investment strategies for bond construction or special purpose fund portfolios will have as their primary objective to ensure that anticipated cash flows are matched with adequate investment liquidity. These fund portfolios should include at least

10% in cash equivalent investments to allow for flexibility and unanticipated project outlays.

Suitability - Any investment eligible in the Investment Policy is suitable for the Bond Construction or Special Purpose Funds.
Safety of Principal - All investments will be of high quality with no perceived default risk. Market fluctuations may occur. However, by restricting the maximum maturity to the estimated project completion date and by managing the Bond Construction or Special Purpose Funds to balance the short term and long term anticipated cash flow requirements, the market risk of the portfolio will be minimized.

Liquidity - Selecting investment maturities that provide greater cash flow than the anticipated needs and maintaining appropriate cash-equivalent balances will reduce the liquidity risk of unanticipated expenditures.

Marketability - The balancing of short-term and long-term cash flow needs requires the short-term portion of the Bond Construction or Special Purpose Funds to have securities with active and efficient secondary markets.

Diversification - Investment maturities should blend the short-term and long-term cash flow needs to provide adequate liquidity, yield enhancement, and stability.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio structures is the desired objective, however this portfolio maintains an investment strategy is comply with any applicable arbitrage or yield restriction regulations.

Long -Term Portfolios:

Core Funds
The objective is to create a portfolio structure for the City's Core Funds, as determined by the cash flow analysis report, which will experience minimal market value volatility during economic cycles. This may be accomplished by purchasing quality, short- to medium-term securities that will complement each other in a laddered or barbell maturity structure.

Suitability - Any investment eligible in the Investment Policy is suitable for Core Funds.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, by managing the weighted average days to maturity for the Core Fund's portfolio to not greater than one (1) year and restricting the maximum allowable maturity to five (5) years, the price volatility of the overall portfolio will be minimized.

Liquidity - Selecting investment maturities that provide greater cash flow than the anticipated needs and maintaining appropriate cash-equivalent balances will reduce the liquidity risk of unanticipated expenditures.

Marketability - Securities with active and efficient secondary markets are necessary in the event of an unanticipated cash flow requirement.

Diversification - Investment maturities should be staggered throughout the budget cycle to provide cash flow based on the anticipated operating needs of the City. Market cycle risk will be reduced by diversifying the appropriate maturity structure out through two years.

Yield - Attaining a competitive market yield for comparable investment-types and portfolio restrictions is the desired objective. The yield of an equally weighted, rolling three-month Treasury bill portfolio will be the minimum yield objective.

Debt Service Reserve Funds

Investment strategies for debt service reserve funds shall have as the primary objective the ability to generate a dependable revenue stream to the appropriate debt service fund from investments with a low degree of volatility, except as may be required by the bond ordinance specific to an individual issue. Securities should be of high quality, with short- to intermediate-term maturities.

Suitability - Any investment eligible in the Investment Policy is suitable for Debt Service Reserve Funds. Bond resolution and loan documentation constraints and insurance company restrictions may create specific considerations in addition to the Investment Policy.

Safety of Principal - All investments shall be of high quality with no perceived default risk. Market price fluctuations may occur. However, managing Debt Service Reserve Fund maturities to not exceed the call provisions of the borrowing reduces the investment's market risk if the City's debt is redeemed and the Reserve Fund liquidated. No stated final investment maturity shall exceed the shorter of the final maturity of the borrowing or three years. Annual mark-to-market requirements or specific maturity and average life limitations within the borrowing's documentation will influence the attractiveness of market risk and reduce the opportunity for maturity extension.

Liquidity - Debt Service Reserve Funds have no anticipated expenditures. The Funds are deposited to provide annual debt service payment protection to the City's debt holders. The funds are "returned" to the City at the final debt service payment. Market conditions and arbitrage regulation compliance determine the advantage of investment diversification and liquidity. Generally, if investment rates exceed the cost of borrowing, the City is best served by locking in investment maturities and reducing liquidity. If the

borrowing cost cannot be exceeded, then concurrent market conditions will determine the attractiveness of locking in maturities or investing shorter and anticipating future increased yields.

Marketability - Securities with less active and efficient secondary markets are acceptable for Debt Service Reserve Funds.

Diversification - Market conditions and the arbitrage regulations influence the attractiveness of staggering the maturity of fixed rate investments for Debt Service Reserve Funds. At no time shall the final debt service payment date of the bond issue be exceeded in an attempt to bolster yield.

Yield - Achieving a positive spread to the applicable borrowing cost is the desired objective. Debt Service Reserve Fund portfolio management shall at all times operate within the limits of the Investment Policy's risk constraints.

XII. MATURITY AND LIQUIDITY REQUIREMENTS

To the extent possible, an attempt will be made to match investment maturities with known cash needs and anticipated cash flow requirements.

A. Maturity Guidelines

Investments by or on behalf of the City shall have a final maturity of five (5) years or less from the date of settlement. The overall weighted average duration for the entire portfolio shall not be greater than one (1) year. The maturities of the underlying securities of a repurchase agreement will follow the requirements of the Repurchase Agreement.

B. Liquidity Requirements

The Investment Officers or designee shall determine the approximate amount of funds required to meet the day-to-day expenditure needs of the City. In order to have an available source of funds to meet unexpected cash requirements, a minimum of two months operating expenses will be invested in authorized cash equivalent investments. The balance of the City's funds will be available for investment according to the guidelines incorporated within this Policy.

XIII. PERFORMANCE MEASUREMENTS

In order to assist in the evaluation of the portfolios' performance, the City will use performance benchmarks for short-term and long-term portfolios. The use of benchmarks will allow the City to measure its returns against other investors in the same markets.

A. Investment performance of funds designated as short-term funds and other funds that must maintain a high degree of liquidity will be compared to the return

on the S&P Rated GIP Index Government 30 Day Yield. Investments of current operating funds shall have maturities of no longer than twelve (12) months.

B. The long-term investment portfolio (Core Funds) total return shall be compared to the return of the Bank of America Merrill Lynch 1 Year U.S. Treasury Index (or a comparable benchmark). The Bank of America Merrill Lynch 1 Year Treasury Index represents U.S. Treasury securities having maturities with less than one year.

XIV. COMPETITIVE SELECTION OF INVESTMENT INSTRUMENTS

After the Investment Officers and/or the City's Investment Advisors has determined the approximate maturity date based on cash flow needs and market conditions and has analyzed and selected one or more optimal types of investments, a minimum of three (3) Broker/Dealers must be contacted and asked to provide bids/offers on securities in questions. Quotes will be held in confidence until the best option meeting the investment objectives is determined and selected.

However, if obtaining bids/offers are not feasible and appropriate, securities may be purchased/sold utilizing the comparison to current market price method on an exception basis. Acceptable current market price providers include, but are not limited to:

A. TradeWeb

B. Bloomberg Information Systems

C. Wall Street Journal or a comparable nationally recognized financial publication providing daily market pricing

D. Daily market pricing provided by the City's custodian or their correspondent institutions

The Investment Officers or designee and/or the City's Investment Advisor/s shall utilize the competitive bid process to select the securities to be purchased or sold. Selection by comparison to a current market price, as indicated above, shall only be utilized when, in judgment of the Investment Officers or the City's Investment Advisor/s, competitive bidding would inhibit the selection process.

Examples of when this method may be used include:

A. When time constraints due to unusual circumstances preclude the use of the competitive bidding process

B. When no active market exists for the issue being traded due to the age or depth of the issue

C. When a security is unique to a single dealer, for example, a private placement or

D. When the transaction involves new issues or issues in the "when issued" market

Overnight sweep investment instruments will not be bid, but may be placed with the City's Primary Depository relating to the demand account for which the investment instrument was purchased.

XV. AUTHORIZED INVESTMENTS AND PORTFOLIO COMPOSITION

Investments should be made subject to the cash flow needs and such cash flows are subject to revisions as market conditions and the City's needs change. However, when the invested funds are needed in whole or in part for the purpose originally intended or for more optimal investments, the Investment Officers or designee and/or the City's Investment Advisors may sell or redeem the investment at the then-prevailing market price.

The following are the investment requirements and allocation limits on investment types, issuers, and maturities as established by the City. Diversification strategies within the established guidelines shall be reviewed and revised periodically as necessary by the Investment Officers. The Investment Officers, and/or City's Investment Advisor/s shall have the option to further restrict investment percentages from time to time based on market conditions, risk and diversification investment strategies. The percentage allocation requirements for investment types and issuers are calculated based on the original cost of each investment, at the time purchase. Investments not listed in this Policy are prohibited.

Investments described below are those authorized by this Policy. The following list may not contain all of the options that are authorized by state statutes, but only those that the City Council wishes to include in the City's portfolios. The City is not required to liquidate investments that were authorized investments at the time of purchase. The City funds governed by this Policy may be invested in the following investments, however funds derived from the sale of debt are not to be included in the calculation of the limits below:

Security Type	Minimum Rating Requirement	Maturity Limits	Maximum Allocation Limit	Maximum Issuer Limit
Local Government Investment Pools	AAA/AAAm	N/A	~~75%~~100%	N/A
United States Government Securities	N/A	5 Years	100%	N/A
United States Government Agencies (full faith and credit of the United States Government)	N/A	5 Years	100%	N/A
Federal Instrumentalities (United States Government Sponsored Enterprises ("GSE") which are non-full faith and credit).*	N/A	5 Years	70%	40%
Mortgage-Backed Securities ("MBS")*	N/A	5 Years	10%	15%
Interest Bearing Time Deposit or Saving Accounts	N/A	1 Years	20%	10%
Repurchase Agreements**	N/A	90 Days	20%	10%
Commercial Paper	P-1/A-1	365 Days	~~25%~~35%	5%
Bankers' Acceptances	P-1/A-1	180 Days	25%	5%
State and/or Local Government Taxable and/or Tax-Exempt Debt	Single "A" category by two NRSROs	5 Years	25%	5%
Registered Investment Companies (Money Market Mutual Funds)	AAAm	N/A	50%	25%

*The combined total of available funds invested in Federal Instrumentalities and MBS cannot be more than 80%.

** Flexible repurchase agreements for the investment of bond proceeds may have maturities greater than 90 days.

A. Local Government Investment Pools

1. Investment Authorization

Local government investment pools organized in accordance with the Interlocal Cooperation Act (Chapter 791, Texas Government Act) as amended, whose assets consist exclusively of the obligations that are allowed as a direct investment for funds subject to the Public Funds Investment Act. A public funds investment pool must be continuously rated no lower than "AAA", "AAA-m" or at an equivalent rating by at least one Nationally Recognized Statistical Rating Organization ("NRSRO").

2. Portfolio Composition

A maximum of ~~75~~100% of available funds may be invested in the Local Government Pools.

3. Due Diligence Requirements

A thorough review of any local government investment pool is required prior to investing, and on a continual basis.

B. United States Government Securities

1. Purchase Authorization

Direct obligations, or obligations the principal and interest of which are unconditionally guaranteed by the United States Government. Such securities will include, but not be limited to the following:

Cash Management Bills
Treasury Bills
Treasury Notes
Treasury Bonds
Treasury STRIPs

2. Portfolio Composition

A maximum of 100% of available funds may be invested in the United States Government Securities with the exception of Treasury Strips are limited to 10% of available funds.

3. Maturity Limitations

The maximum length to maturity of any direct investment in the United States Government Securities is five (5) years from the date of settlement.

C. United States Government Agencies (full faith and credit of the United States Government)

1. Purchase Authorization

Bonds, debentures, notes, with or without a call option, issued or guaranteed by the United States Government Agencies, provided such obligations are backed by the full faith and credit of the United States Government. Examples of such issuers include, but are not limited to the following:

- Government National Mortgage Association (GNMA)
- Federal Housing Administration (FHA)
- General Services Administration (GSA)
- Small Business Administration (SBA)

2. Portfolio Composition

A maximum of 100% of available funds may be invested in United States Government agencies.

3. Maturity Limitations

The maximum length to maturity for an investment in any United States Government ~~A~~gency security is five (5) years from the date of settlement.

D. Federal Instrumentalities (United States Government Sponsored Enterprises ("GSE") which are non-full faith and credit)

1. Purchase Authorization

Bonds, debentures, notes, with or without a call option, issued or guaranteed by United States Government Sponsored Enterprises (Federal Instrumentalities), which are non-full faith and credit agencies. These are limited to the following:

- Federal Farm Credit Bank (FFCB)
- Federal Home Loan Bank (FHLB)
- Federal National Mortgage Association (FNMA)
- Federal Home Loan Mortgage Corporation (FHLMC)

2. Portfolio Composition

A maximum of 70% of available funds may be invested in Federal Instrumentalities that do not carry the full faith and credit of the United States government.

3. Limits on Individual Issuers

A maximum of 40% of available funds may be invested in any one issuer.

4. Maturity Limitations

The maximum length to maturity for an investment in any Federal Instrumentality security is five (5) years from the date of settlement.

E. Mortgage-Backed Securities (MBS)

1. Purchase Authorization

Mortgage-backed securities (MBS) which are based on mortgages that are guaranteed by a Government Agency or GSE for payment of principal and a guarantee of timely payment.

2. Portfolio Composition

A maximum of 10% of available funds may be invested in MBS.

3. Limits of Individual Issuers

A maximum of 15% of available funds may be invested with any one issuer.

4. Maturity Limitations

A maximum length to maturity for an investment in any MBS is five (5) years from the date of settlement.

The maturity of mortgage securities shall be considered the date corresponding to its average life. This date reflects the point at which an investor will have received back half of the original principal (face) amount. The average life may be different from the stated legal maturity included in a security's description.

F. Interest Bearing Time Deposit or Saving Accounts

1. Purchase Authorization

Certificates of deposit or savings accounts issued by state and national banks that has a main office or branch in Texas that are: guaranteed or insured by the Federal Deposit Insurance Corporation (FDIC), or its successor; or secured as required by the Public Funds Collateral Act and this Policy.

2. Portfolio Composition

A maximum of 20% of available funds may be invested in non-negotiable interest bearing time certificates of deposit or savings account.

3. Limits on Individual Issuers

A maximum of 10% of available funds may be deposited with any one issuer.

4. The maximum maturity on any certificate shall be no greater than one (1) year from the date of settlement.

G1. Repurchase Agreements

1. Purchase Authorization

a. Repurchase agreements composed of only cash and/or those investments authorized in the Public Funds Investment Act sections B, C, or D. The Investment Officers shall only enter into repurchase agreements with a primary government securities dealer, as defined by the Federal Reserve, or a financial institution doing business in the State of Texas. All counterparties are required to sign a Repurchase Agreement, acceptable to the City, prior to the execution of a repurchase agreement transaction.

b. A third-party custodian acceptable to the City shall hold the collateral for all repurchase agreements. A clearly marked receipt must be supplied to the Investment Officers or designee and retained.

c. Securities authorized for collateral must have maturities less than five (5) years and with market value for the principal and accrued interest of 102 percent of the value and for the term of the repurchase agreement. Immaterial short-term deviations from the 102 percent requirement are permissible only upon the approval of the Investment Officers and/or the City's Investment Advisors.

d. The overnight sweep arrangement shall adhere to the agreement between the City and the City's primary depository.

2. Portfolio Composition

A maximum of 20% of available funds may be invested in repurchase agreements excluding one (1)-business day agreements and overnight sweep agreements.

3. Limits on Individual Issuers

A maximum of 10% of available funds may be invested with any one institution excluding one (1)-business day agreements and overnight sweep agreements.

4. Limits on Maturities

The maximum length to maturity of any repurchase agreement is 90 days from the date of settlement.

G2. Repurchase agreement for the investment of bond proceeds

1. A fully secured repurchase agreement is an authorized investment under this Policy if the repurchase agreement:

   a. has a defined termination date;
   b. is secured by a combination of cash and obligations authorized in the Public Funds Investment Act described by Section B, C, or D at minimum of 104%

   c. requires the securities being purchased by the City or cash held by the City to be pledged to the City, held in an account in the City's name, and deposited at the time the investment is made with the City or with a third party selected and approved by the City; and

   d. is placed through a primary government securities dealer, as defined by the Federal Reserve, or a financial institution doing business in the State of Texas.

   e. In this section, "repurchase agreement" means a simultaneous agreement to buy, hold for a specified time, and sell back at a future date obligations described by Section B, C, D, or E of this policy, at a market value at the time the funds are disbursed of not less than the principal amount of the funds disbursed.

H. Commercial Paper

1. Purchase Authorization

   Commercial paper of any United States company that is rated, at the time of purchase, “Prime-1” by Moody’s, “A-1” by Standard & Poor’s, and/or “F-1” by Fitch (prime commercial paper), or the equivalent by two NRSROs.

2. Portfolio Composition

   A maximum of ~~25~~35% of available funds may be directly invested in prime commercial paper.

3. Limits on Individual Issuers

   A maximum of 5% of available funds may be invested with any one issuer.

4. Maturity Limitations

   The maximum length to maturity for prime commercial paper shall be 365 days from the date of settlement.

I. Bankers' Acceptances

1. Purchase Authorization

Bankers' Acceptances issued by a domestic bank or a federally chartered domestic office of a foreign bank, which are eligible for purchase by the Federal Reserve System, at the time of purchase, the short-term paper is rated, at a minimum, "Prime-1" by Moody's Investors Services and "A-1" Standard & Poor's, and/or "F-1" by Fitch, or the equivalent by two NRSROs.

2. Portfolio Composition

A maximum of 25% of available funds may be directly invested in Bankers' Acceptances. The City will permit investment in Bankers' Acceptances provided they are issued in book entry format through the Depository Trust Corporation. The City will not accept any "physical" Bankers' Acceptances.

3. Limits on Individual Issuers

A maximum of 5% of available funds may be invested with any one issuer.

4. Maturity Limitations

The maximum length to maturity for Bankers' Acceptances shall be 180 days from the date of settlement.

J. State and/or Local Government Taxable and/or Tax-Exempt Debt

1. Purchase Authorization

State and/or local government taxable and/or tax-exempt debt, general obligation and/or revenue bonds, at the time of purchases, at a minimum single "A" category by any two NRSROs, or rated at least "MIG-1" by Moody's and "SP-1" by Standard & Poor's for short-term debt or the equivalent by two NRSROs.

2. Portfolio Composition

A maximum of 25% of available funds may be invested in taxable and tax-exempt debt.

3. Limits on Individual Issuers

A maximum of 5% of available funds may be invested with any one issuer.

4. Maturity Limitations

A maximum length to maturity for an investment in any state or local government debt security is five (5) years from the date of settlement.

K. Registered Investment Companies (Money Market Mutual Funds)

1. Investment Authorization

Shares in open-end and no-load money market funds provided such funds are registered under the Investment Act of 1940 and operate in accordance with Rule 2a-7.

2. Portfolio Composition

A maximum of 50% of available funds may be invested in money market funds.

3. Limits of Individual Issuers

A maximum of 25% of available funds may be invested with any one money market fund.

4. Rating Requirements

The money market funds shall be rated "AAAm" by Standard & Poor's or the equivalent by another NRSRO.

5. Due Diligence Requirements

A thorough review of any money market fund is required prior to investing, and on a continual basis.

XVI. DOWNGRADE PROVISION FOR INVESTMENT RATINGS

In the event any investment in the portfolio, subsequent to purchase, is downgraded to a level below the minimum required rating, the Investment Advisor(s) shall notify the City or its representatives as soon as practical of such ratings change along with any contemplated actions to sell or hold the security. The City, independently or in concert with the Investment Advisor(s), shall take all prudent measures that are consistent with its investment policy to liquidate an investment that does not have the minimum rating.

XVII. DERIVATIVES AND REVERSE REPURCHASE AGREEMENTS

The City may not invest in investment products that include the use of derivatives, unless specified in Section XV of this Policy. A "derivative" is defined as a financial instrument the value of which depends on, or is derived from, the value of one or more underlying assets or indices or asset values. Reverse repurchase agreements are not permitted by this Policy.

XVIII. REPORTING

The Investment performance will be monitored and evaluated by the Investment Officers. In conjunction with the Investment Officers, the City's Investment Advisors shall provide quarterly investment reports on the City's short-term and long-term core investments to City Council as required by the Public Funds Investment Act, and make available to the City's auditor at least annually. Schedules in the quarterly report should include the following:

1. describe in detail the investment position of the City,

2. contain a summary statement stating the reporting period beginning market value, additions or changes to the market value during the period and ending market value for the period, and fully accrued interest for the period for each pooled fund group,

3. state the reporting period beginning book and market value and reporting period ending book and market value of each investment security by asset type and fund type,

4. state the maturity date of each investment security,

5. state the fund for which each investment security was purchased, and

6. state the compliance of the investment portfolio with the City's Investment Policy and Investment Strategy Statement and the Public Funds Investment Act, and

7. be prepared jointly and signed by each Investment Officer.

Market Values will be determined by sources independent from the investment transaction, such as the City's custodian bank, or if a custodian relationship is not present, a safekeeping agent, if they offer the service.

XIX. DEPOSITORY AGREEMENTS

The City will select and designate a primary depository through a process consistent with State law and the City's purchasing policy.

Consistent with the requirements of State law, the City will require that all deposits be federally insured or collateralized with eligible securities, to include letters of credit issued by a Federal Home Loan Bank. If deposits are collateralized with marketable securities, the pledged securities will be held at the custodial agent acceptable to the City. The market value of the pledged securities securing the deposit of funds shall be at least equal to 102% of the amount of the deposits of funds reduced to the extent that the deposits are insured by the FDIC. Letters of Credit pledged to the City shall have a value at least equal to 100% of the principal plus anticipated accrued interest reduced to the extent that the deposits are insured by the FDIC.

The depository will be required to sign a Depository Agreement with the City. The Depository Agreement shall define the City's rights to the collateral in case of default, bankruptcy, or closing and shall establish a perfected security interest in compliance with Federal and State regulations, including:

- the Agreement must be in writing;
- the Agreement must be executed by the Depository and the City contemporaneously with the acquisition of the asset;
- the Agreement must be approved by the Board of Directors or the Loan Committee of the Depository and a copy of the meeting minutes must be delivered to the City; and
- the Agreement must be part of the Depository's "official record" continuously since its execution.

It shall further address any concerns in relation to acceptable collateral, levels of collateral, substitution and addition of collateral, and reporting and monitoring of collateral.

The City shall monitor collateral levels at least monthly.

XX. THIRD-PARTY SAFEKEEPING and CUSTODIAL AGREEMENTS

All City-owned securities shall be held with a third-party safekeeping agent and be properly designated as an asset of the City. The securities must be held in an account separate and apart from the assets of the financial institution. The safekeeping shall accept transaction instructions only from those persons who have been duly authorized by the Investment Officers and which authorization has been provided, in writing, to the agent. No purchase or withdrawal of securities, in whole or in part, shall be permitted unless by such a duly authorized person. Security transactions between a broker/dealer and the custodian involving the purchase or sale of securities by transfer of money or securities must be made on a "delivery versus payment" basis, to ensure that the

safekeeping agent will have the security or money, as appropriate, in hand at the conclusion of the transaction.

A third-party custodian as defined by the Public Funds Collateral Act shall accept pledged collateral instructions only from those persons who have been duly authorized by the Investment Officers and which authorization has been provided, in writing, to the custodian. No withdrawal of pledged securities, in whole or in part, shall be permitted unless by such a duly authorized person.

Monthly, each safekeeping agent and custodian shall provide the Investment Officers or designee-with detailed information on the securities held by the agent or custodian.

XXI. RESERVATION OF AUTHORITY

The Investment Policy, including the Investment Strategies and Broker/Dealers list will be reviewed and approved on an annual basis by the City Council. Revisions and or amendments will be approved and documented by the City Council.

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Mayor City of Rowlett

ATTACHMENT A

Broker/Dealers List

PFM Asset Management LLC
Approved Broker/Dealer List

Second Quarter 2024

‡ Aca Securities Inc.
‡ Ameri urities, Inc.
‡ ASL Cap rkets Inc.
‡ Bancroft Ca LC
* Barclays Capi
BGC Financial, L
BMO Capital Mark p.
* BNP Paribas Securitie
BNY Mellon Capital Ma LC
* BofA Securities, Inc.
Brean Capital LLC
† Cabrera Capital Markets LLC
* Cantor Fitzgerald & Co.
† CastleOak Securities, LP
CIBC World Markets Corp.
Citadel Securities LLC
* Citigroup Global Markets Inc.
† C.L. King & Associates, Inc.
Commonwealth Australia Securities LLC
Credit Agricole Securities (USA), Inc.
D.A. Davidson & Co.
* Daiwa Capital Markets America Inc.
* Deutsche Bank Securities Inc.
‡ Drexel Hamilton LLC
Fifth Third Securities, Inc.
FHN Financial Securities Corp.
* Goldman Sachs & Co. LLC
Hilltop Securities Inc.
* HSBC Securities (USA) Inc.
ING Financial Markets, LLC
InspereX LLC
Jane Street Execution Se C
* Jefferies LLC
* J.P. Morgan Securi C
KeyBanc Capit cts
† Loop Capita s LLC
Lloyds S Inc.
MarketAxess Corporation
Mesirow Financial, Inc.
Millennium Advisors, LLC
† Mischler Financial Group, Inc.
* Mizuho Securities USA Inc.
* Morgan Stanley & Co. LLC
MUFG Securities America Inc.
* NatWest Markets Securities Inc.
* Nomura Securities International,
Oppenheimer & Co, Inc.
Performance Trust Capital , LLC
Piper Sandler & Co.
PNC Capital Markets
† R. Seelaus & Co.,
Rabo Securities nc.
Raymond Ja Associates, Inc
Raymond USA) Ltd
* RBC Ca arkets, LLC
Robert aird & Co.
† Sam Ramirez & Co Inc
S er US Capital Markets LLC
Capital (USA), Inc.
ort Global Securities LLC
nericas Securities LLC
S Williams Shank & Co LLC
SM ko Securities America Inc
Stephe
Stifel, N & Company, Incorporated
StoneX Fi Inc
TD Securities LLC
* TP ICAP Global Americas LLC
Tradeweb LLC
Tradition Securities and ives LLC
Truist Securities Inc.
UBS Securities LLC
* Wells Fargo Securities, LLC

mary Government Securities Dealer
Minority or woman owned business enterprise
‡ *Service Disabled-Veteran Owned*

Note: Direct issuers of CP and CDs are considered to be approved counterparties if approved as an issuer. Repurchase agreement counterparties are also considered to be approved.

Important Disclosures
This list is current as of the effective date only and is subject to change without notice. This list is for informational purposes only, and may not be relied upon for any other purpose. The list does not imply counterparty approval for derivatives of any type. This information is confidential and may not be distributed without prior written consent of PFM Asset Management LLC.

PFM Asset Management LLC

U.S. Bancorp Asset Management, Inc. Approved Broker-Dealer List

Academy Securities, Inc.
Alamo Capital
Ameritas Investment Company, LLC
AmeriVet Securities, Inc.
ANZ Securities, Inc.
ASL Capital Markets, Inc.
Robert W. Baird & Co. Incorporated
Bancroft Capital, LLC
Barclays Capital Inc.
BBVA Securities Inc.
B.C. Ziegler and Company
Belle Haven Investments, L.P.
BGC Financial, L.P.
Brownstone Investment Group, LLC
Blaylock Van, LLC
BMO Capital Markets Corp.
Bank of Montreal, Chicago Branch
BNP Paribas Securities Corp.
Bank of Nova Scotia, New York Agency
BNY Mellon Capital Markets, LLC
BofA Securities, Inc.
BOK Financial Securities, Inc.
Brean Capital, LLC
Cabrera Capital Markets LLC
Commonwealth Australia Securities LLC
Credit Agricole Securities (USA) Inc.
Country Club Financial Services, Inc.
Cantor Fitzgerald & Co.
CIBC World Markets Corp.
Citadel Securities LLC
Citigroup Global Markets Inc.
CastleOak Securities, LP
Commerce Brokerage Services, Inc.
Conners & Co., Inc.
Crews & Associates, Inc.
D.A. Davidson & Co.
Sanctuary Securities Inc.
Deutsche Bank Securities Inc.
Daiwa Capital Markets America Inc.
Colliers Securities LLC
Drexel Hamilton, LLC
SouthState|DuncanWilliams Securities Corp.
Edward D. Jones & Co., L.P.
First Bankers' Banc Securities, Inc
FHN Financial Securities Corp
Fifth Third Securities, Inc.
Falcon Square Capital, LLC
First Trust Portfolios L.P.
First Tryon Securities, LLC
The GMS Group, LLC
Goldman, Sachs & Co.
Guggenheim Securities, LLC
Harvestons Securities, Inc.
The Huntington Investment Company
Hilltop Securities Inc.
Herbert J Sims & Co. Inc.
HSBC Securities (USA) Inc.
Isaak Bond Investments, Inc.
TP ICAP Global Markets Americas LLC
InspereX LLC
ING Financial Markets LLC
StoneX Financial Inc.
Janney Montgomery Scott LLC
Jefferies LLC
J.M. Lummis Securities, Inc.
J.P. Morgan Securities LLC
Jane Street Execution Services, LLC
KeyBanc Capital Markets Inc.
C.L. King & Associates, Inc.
Lloyds Securities, Inc.
Loop Capital Markets LLC
Multi-Bank Securities, Inc.
Mesirow Financial, Inc.
Millennium Advisors, LLC
Mischler Financial Group
MarketAxess Corporation
Morgan Stanley
M&T Securities, Inc.
MUFG Securities Americas Inc.
Mizuho Securities USA Inc.
Nabsecurities, LLC
Natixis Securities Americas LLC
National Bank of Canada Financial Inc.
Northern Capital Securities Corporation
National Financial Services LLC
Nomura Securities International, Inc.
Northland Securities, Inc.
Oppenheimer & Co. Inc.
Piper Sandler & Co.
PNC Capital Markets LLC
Performance Trust Capital Partners, LLC
Rabo Securities USA, Inc.
Raymond James & Associates, Inc.
RBC Capital Markets, LLC
NatWest Markets Securities Inc.
Lument Securities LLC
Rice Financial Products Company
Raymond James (USA) Ltd.

Roosevelt & Cross, Incorporated
Samco Capital Markets, Inc.
Santander US Capital Markets LLC
Santander US Capital Markets LLC
Siebert, Williams, Shank & Co., LLC
Scotia Capital (USA) Inc.
Seaport Global Securities LLC
SEB Securities, Inc
R. SEELAUS & CO., LLC
Susquehanna Financial Group, LLLP
SG Americas Securities, LLC
Societe Generale, New York Branch
SAL Equity Trading, GP
SMBC Nikko Securities America, Inc
Stephens Inc.
Samuel A. Ramirez & Co., Inc.
Stern Brothers & Co.
Stifel, Nicolaus & Company, Incorporated
State Street Global Advisors Funds Distributors, LLC
Sumridge Partners, LLC
TD Securities (USA) LLC
TD Securities Automated Trading LLC
Truist Securities, Inc
Thornton Farish Inc.
Toyota Financial Services Securities USA Corporation
Tradition Securities and Derivatives Inc.
Tradeweb Direct LLC
UBS Securities LLC
UBS Financial Services, Inc.
UMB Financial Services, Inc.
Steward Partners Investment Solutions, LLC
William Blair & Company L.L.C
Wedbush Securities Inc.
Wells Fargo Bank, NA
Wells Fargo Advisors Financial Network, LLC
Wells Fargo Securities, LLC
Wiley Bros.-Aintree Capital, LLC

Glossary of Cash and Investment Management Terms

The following is a glossary of key investing terms, many of which appear in the City's investment policy. This glossary clarifies the meaning of investment terms generally used in cash and investment management. This glossary has been adapted from the GFOA Sample Investment Policy and the Association of Public Treasurers of the United States and Canada's Model Investment Policy.

Accrued Interest. Interest earned but which has not yet been paid or received.

Agency. See "Federal Agency Securities."

Ask Price. Price at which a broker/dealer offers to sell a security to an investor. Also known as "offered price."

Asset Backed Securities (ABS). A fixed-income security backed by notes or receivables against assets other than real estate. Generally issued by special purpose companies that "own" the assets and issue the ABS. Examples include securities backed by auto loans, credit card receivables, home equity loans, manufactured housing loans, farm equipment loans, and aircraft leases.

Average Life. The average length of time that an issue of serial bonds and/or term bonds with a mandatory sinking fund feature is expected to be outstanding.

Bankers' Acceptance (BA's). A draft or bill of exchange drawn upon and accepted by a bank. Frequently used to finance shipping of international goods. Used as a short-term credit instrument, bankers' acceptances are traded at a discount from face value as a money market instrument in the secondary market on the basis of the credit quality of the guaranteeing bank.

Basis Point. One hundredth of one percent, or 0.01%. Thus 1% equals 100 basis points.

Bearer Security. A security whose ownership is determined by the holder of the physical security. Typically, there is no registration on the issuer's books. Title to bearer securities is transferred by delivery of the physical security or certificate. Also known as "physical securities."

Benchmark Bills: In November 1999, FNMA introduced its Benchmark Bills program, a short-term debt securities issuance program to supplement its existing discount note program. The program includes a schedule of larger, weekly issues in three- and six-month maturities and biweekly issues in one-year for Benchmark Bills. Each issue is brought to market via a Dutch (single price) auction. FNMA conducts a weekly auction for each Benchmark Bill maturity and accepts both competitive and non-competitive bids through a web based auction system. This program is in addition to the variety of other discount note maturities, with rates posted on a daily basis, which FNMA offers. FNMA's Benchmark Bills are unsecured general obligations that are issued in book-entry form through the Federal Reserve Banks. There are no periodic payments of interest on Benchmark Bills, which are sold at a discount from the principal amount and payable at par at maturity. Issues under the Benchmark program constitute the same credit standing as other FNMA discount notes; they simply add organization and liquidity to the short-term Agency discount note market.

Benchmark Notes/Bonds: Benchmark Notes and Bonds are a series of FNMA "bullet" maturities (non-callable) issued according to a pre-announced calendar. Under its Benchmark Notes/Bonds program, 2, 3, 5, 10, and 30-year maturities are issued each quarter. Each Benchmark Notes new issue has a minimum size of $4 billion, 30-year new issues having a minimum size of $1 billion, with re-openings based on

investor demand to further enhance liquidity. The amount of non-callable issuance has allowed FNMA to build a yield curve in Benchmark Notes and Bonds in maturities ranging from 2 to 30 years. The liquidity emanating from these large size issues has facilitated favorable financing opportunities through the development of a liquid overnight and term repo market. Issues under the Benchmark program constitute the same credit standing as other FNMA issues; they simply add organization and liquidity to the intermediate- and long-term Agency market.

Benchmark. A market index used as a comparative basis for measuring the performance of an investment portfolio. A performance benchmark should represent a close correlation to investment guidelines, risk tolerance, and duration of the actual portfolio's investments.

Bid Price. Price at which a broker/dealer offers to purchase a security from an investor.

Bond. Financial obligation for which the issuer promises to pay the bondholder (the purchaser or owner of the bond) a specified stream of future cash-flows, including periodic interest payments and a principal repayment.

Book Entry Securities. Securities that are recorded in a customer’s account electronically through one of the financial markets electronic delivery and custody systems, such as the Fed Securities wire, DTC, and PTC

(as opposed to bearer or physical securities). The trend is toward a certificate-free society in order to cut down on paperwork and to diminish investors’ concerns about the certificates themselves. The vast majority of securities are now book entry securities.

Book Value. The value at which a debt security is reflected on the holder's records at any point in time. Book value is also called “amortized cost” as it represents the original cost of an investment adjusted for amortization of premium or accretion of discount. Also called “carrying value.” Book value can vary over time as an investment approaches maturity and differs from “market value” in that it is not affected by changes in market interest rates.

Broker/Dealer. A person or firm transacting securities business with customers. A “broker” acts as an agent between buyers and sellers, and receives a commission for these services. A “dealer” buys and sells financial assets from its own portfolio. A dealer takes risk by owning inventory of securities, whereas a broker merely matches up buyers and sellers. See also "Primary Dealer."

Bullet Notes/Bonds. Notes or bonds that have a single maturity date and are non-callable.

Call Date. Date at which a call option may be or is exercised.

Call Option. The right, but not the obligation, of an issuer of a security to redeem a security at a specified value and at a specified date or dates prior to its stated maturity date. Most fixed-income calls are a par, but can be at any previously established price. Securities issued with a call provision typically carry a higher yield than similar securities issued without a call feature. There are three primary types of call options (1) European - one-time calls, (2) Bermudan - periodically on a predetermined schedule (quarterly, semi-annual, annual), and (3) American - continuously callable at any time on or after the call date. There is usually a notice period of at least 5 business days prior to a call date.

Callable Bonds/Notes. Securities which contain an imbedded call option giving the issuer the right to redeem the securities prior to maturity at a predetermined price and time.

Certificate of Deposit (CD). Bank obligation issued by a financial institution generally offering a fixed rate of return (coupon) for a specified period of time (maturity). Can be as long as 10 years to maturity, but most CDs purchased by public agencies are one year and under.

Collateral. Investment securities, letters of credit or other property that a borrower pledges to secure repayment of a loan, secure deposits of public monies, or provide security for a repurchase agreement.

Collateralization. Process by which a borrower pledges securities, property, or other financial instruments for securing the repayment of a loan and/or security.

Collateralized Mortgage Obligation (CMO). A security that pools together mortgages and separates them into short, medium, and long-term positions (called tranches). Tranches are set up to pay different rates of interest depending upon their maturity. Interest payments are usually paid monthly. In “plain vanilla” CMOs, principal is not paid on a tranche until all shorter tranches have been paid off. This system provides interest and principal in a more predictable manner. A single pool of mortgages can be carved up into numerous tranches each with its own payment and risk characteristics.

Commercial Paper. Short term unsecured promissory note issued by a company or financial institution. Issued at a discount and matures for par or face value. Maturities may range from overnight to 365 days, and given a short-term debt rating by one or more NRSROs.

Convexity. A measure of a bond's price sensitivity to changing interest rates. A high convexity indicates greater sensitivity of a bond's price to interest rate changes.

Corporate Note. A debt instrument issued by a corporation with a maturity of greater than one year and less than ten years.

Counterparty. The other party in a two party financial transaction. "Counterparty risk" refers to the risk that the other party to a transaction will fail in its related obligations. For example, the bank or broker/dealer in a repurchase agreement.

Coupon Rate. Annual rate of interest on a debt security, expressed as a percentage of the bond’s face value.

Current Yield. Annual rate of return on a bond based on its price. Calculated as (coupon rate / price), but does not accurately reflect a bond’s true yield level.

Custody. Safekeeping services offered by a bank, financial institution, or trust company, referred to as the “custodian.” Service normally includes the holding and reporting of the customer's securities, the collection and disbursement of income, securities settlement, and market values.

Dealer. A dealer, as opposed to a broker, acts as a principal in all transactions, buying and selling for his/her own account.

Delivery Versus Payment (DVP). Settlement procedure in which securities are delivered versus payment of cash, but only after cash has been received. Most security transactions, including those through the Fed Securities Wire system and DTC, are done DVP as a protection for both the buyer and seller of securities.

Depository Trust Company (DTC). A firm through which members can use a computer to arrange for securities to be delivered to other members without physical delivery of certificates. A member of the Federal Reserve System and owned mostly by the New York Stock Exchange, the Depository Trust Company uses computerized debit and credit entries. Most corporate securities, commercial paper, CDs, and BAs clear through DTC.

Derivatives. (1) Financial instruments whose return profile is linked to, or derived from, the movement of one or more underlying index or security, and may include a leveraging factor, or (2) financial contracts based upon notional amounts whose value is derived from an underlying index or security (interest rates, foreign exchange rates, equities, or commodities). For hedging purposes, common derivatives are options, futures, interest rate swaps, and swaptions.

Derivative Security. Financial instrument created from, or whose value depends upon, one or more underlying assets or indexes of asset values.

Designated Bond. FFCB's regularly issued, liquid, non-callable securities that generally have a 2 or 3 year original maturity. New issues of Designated Bonds are $1 billion or larger. Re-openings of existing Designated Bond issues are generally a minimum of $100 million. Designated Bonds are offered through a syndicate of two to six dealers. Twice each month the Funding Corporation announces its intention to issue a new Designated Bond, reopen an existing issue, or to not issue or reopen a Designated Bond. Issues under the Designated Bond program constitute the same credit standing as other FFCB issues; they simply add organization and liquidity to the intermediate- and long-term Agency market.

Discount Notes. Unsecured general obligations issued by Federal Agencies at a discount. Discount notes mature at par and can range in maturity from overnight to one year. Very large primary (new issue) and secondary markets exist.

Discount Rate. Rate charged by the system of Federal Reserve Banks on overnight loans to member banks. Changes to this rate are administered by the Federal Reserve and closely mirror changes to the "fed funds rate."

Discount Securities. Non-interest bearing money market instruments that are issued at discount and redeemed at maturity for full face value. Examples include: U.S. Treasury Bills, Federal Agency Discount Notes, Bankers' Acceptances, and Commercial Paper.

Discount. The amount by which a bond or other financial instrument sells below its face value. See also "Premium."

Diversification. Dividing investment funds among a variety of security types, maturities, industries, and issuers offering potentially independent returns.

Dollar Price. A bond's cost expressed as a percentage of its face value. For example, a bond quoted at a dollar price of 95 ½, would have a principal cost of $955 per $1,000 of face value.

Kroll Bond Rating Agency. One of several NRSROs that provide credit ratings on corporate and bank debt issues.

Duration. The weighted average maturity of a security's or portfolio's cash-flows, where the present values of the cash-flows serve as the weights. The greater the duration of a security/portfolio, the greater its percentage price volatility with respect to changes in interest rates. Used as a measure of risk and a

key tool for managing a portfolio versus a benchmark and for hedging risk. There are also different kinds of duration used for different purposes (e.g. MacAuley Duration, Modified Duration).

Fannie Mae. See "Federal National Mortgage Association."

Fed Money Wire. A computerized communications system that connects the Federal Reserve System with its member banks, certain U. S. Treasury offices, and the Washington D.C. office of the Commodity Credit Corporation. The Fed Money Wire is the book entry system used to transfer cash balances between banks for themselves and for customer accounts.

Fed Securities Wire. A computerized communications system that facilitates book entry transfer of securities between banks, brokers and customer accounts, used primarily for settlement of U.S. Treasury and Federal Agency securities.

Fed. See "Federal Reserve System."

Federal Agency Security. A debt instrument issued by one of the Federal Agencies. Federal Agencies are considered second in credit quality and liquidity only to U.S. Treasuries.

Federal Agency. Government sponsored/owned entity created by the U.S. Congress, generally for the purpose of acting as a financial intermediary by borrowing in the marketplace and directing proceeds to specific areas of the economy considered to otherwise have restricted access to credit markets. The largest Federal Agencies are GNMA, FNMA, FHLMC, FHLB, FFCB, SLMA, and TVA.

Federal Deposit Insurance Corporation (FDIC). Federal agency that insures deposits at commercial banks, currently to a limit of $250,000 per depositor per bank.

Federal Farm Credit Bank (FFCB). One of the large Federal Agencies. A government sponsored enterprise (GSE) system that is a network of cooperatively-owned lending institutions that provides credit services to farmers, agricultural cooperatives and rural utilities. The FFCBs act as financial intermediaries that borrow money in the capital markets and use the proceeds to make loans and provide other assistance to farmers and farm-affiliated businesses. Consists of the consolidated operations of the Banks for Cooperatives, Federal Intermediate Credit Banks, and Federal Land Banks. Frequent issuer of discount notes, agency notes and callable agency securities. FFCB debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and agricultural industry. Also issues notes under its “designated note” program.

Federal Funds (Fed Funds). Funds placed in Federal Reserve Banks by depository institutions in excess of current reserve requirements, and frequently loaned or borrowed on an overnight basis between depository institutions.

Federal Funds Rate (Fed Funds Rate). The interest rate charged by a depository institution lending Federal Funds to another depository institution. The Federal Reserve influences this rate by establishing a "target" Fed Funds rate associated with the Fed's management of monetary policy.

Federal Home Loan Bank System (FHLB). One of the large Federal Agencies. A government sponsored enterprise (GSE) system, consisting of wholesale banks (currently twelve district banks) owned by their member banks, which provides correspondent banking services and credit to various financial institutions, financed by the issuance of securities. The principal purpose of the FHLB is to add liquidity to the mortgage markets. Although FHLB does not directly fund mortgages, it provides a stable supply of credit to thrift

institutions that make new mortgage loans. FHLB debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes and callable agency securities. Also issues notes under its “global note” and “TAP” programs.

Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"). One of the large Federal Agencies. A government sponsored public corporation (GSE) that provides stability and assistance to the secondary market for home mortgages by purchasing first mortgages and participation interests financed by the sale of debt and guaranteed mortgage backed securities. FHLMC debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes, callable agency securities, and MBS. Also issues notes under its “reference note” program.

Federal National Mortgage Association (FNMA or "Fannie Mae"). One of the large Federal Agencies. A government sponsored public corporation (GSE) that provides liquidity to the residential mortgage market by purchasing mortgage loans from lenders, financed by the issuance of debt securities and MBS (pools of mortgages packaged together as a security). FNMA debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes, callable agency securities and MBS. Also issues notes under its “benchmark note” program.

Federal Reserve Bank. One of the 12 distinct banks of the Federal Reserve System.

Federal Reserve System (the Fed). The independent central bank system of the United States that establishes and conducts the nation's monetary policy. This is accomplished in three major ways: (1) raising or lowering bank reserve requirements, (2) raising or lowering the target Fed Funds Rate and Discount Rate, and (3) in open market operations by buying and selling government securities. The Federal Reserve System is made up of twelve Federal Reserve District Banks, their branches, and many national and state banks throughout the nation. It is headed by the seven member Board of Governors known as the “Federal Reserve Board” and headed by its Chairman.

Financial Industry Regulatory Authority, Inc. (FINRA). A private corporation that acts as a self-regulatory organization (SRO). FINRA is the successor to the National Association of Securities Dealers, Inc. (NASD). Though sometimes mistaken for a government agency, it is a non-governmental organization that performs financial regulation of member brokerage firms and exchange markets. The government also has a regulatory arm for investments, the Securities and Exchange Commission (SEC).

Fiscal Agent/Paying Agent. A bank or trust company that acts, under a trust agreement with a corporation or municipality, in the capacity of general treasurer. The agent performs such duties as making coupon payments, paying rents, redeeming bonds, and handling taxes relating to the issuance of bonds.

Fitch Investors Service, Inc. One of several NRSROs that provide credit ratings on corporate and municipal debt issues.

Floating Rate Security (FRN or “floater”). A bond with an interest rate that is adjusted according to changes in an interest rate or index. Differs from variable-rate debt in that the changes to the rate take place immediately when the index changes, rather than on a predetermined schedule. See also “Variable Rate Security.”

Freddie Mac. See "Federal Home Loan Mortgage Corporation."

Ginnie Mae. See "Government National Mortgage Association."

Global Notes: Notes designed to qualify for immediate trading in both the domestic U.S. capital market and in foreign markets around the globe. Usually large issues that are sold to investors worldwide and therefore have excellent liquidity. Despite their global sales, global notes sold in the U.S. are typically denominated in U.S. dollars.

Government National Mortgage Association (GNMA or "Ginnie Mae"). One of the large Federal Agencies. Government-owned Federal Agency that acquires, packages, and resells mortgages and mortgage purchase commitments in the form of mortgage-backed securities. Largest issuer of mortgage pass-through securities. GNMA debt is guaranteed by the full faith and credit of the U.S. government (one of the few agencies that are actually full faith and credit of the U.S. government).

Government Securities. An obligation of the U.S. government, backed by the full faith and credit of the government. These securities are regarded as the highest quality of investment securities available in the U.S. securities market. See "Treasury Bills, Notes, Bonds, and SLGS."

Government Sponsored Enterprise (GSE). Privately owned entity subject to federal regulation and supervision, created by the U.S. Congress to reduce the cost of capital for certain borrowing sectors of the economy such as students, farmers, and homeowners. GSEs carry the implicit backing of the U.S. government, but they are not direct obligations of the U.S. government. For this reason, these securities will offer a yield premium over U.S. Treasuries. Examples of GSEs include: FHLB, FHLMC, FNMA, and SLMA.

Government Sponsored Enterprise Security. A security issued by a Government Sponsored Enterprise. Considered Federal Agency Securities.

Index. A compilation of statistical data that tracks changes in the economy or in financial markets.

Interest-Only (IO) STRIP. A security based solely on the interest payments from the bond. After the principal has been repaid, interest payments stop and the value of the security falls to nothing. Therefore, IOs are considered risky investments. Usually associated with mortgage-backed securities.

Internal Controls. An internal control structure ensures that the assets of the entity are protected from loss, theft, or misuse. The internal control structure is designed to provide reasonable assurance that these objectives are met. The concept of reasonable assurance recognizes that 1) the cost of a control should not exceed the benefits likely to be derived and 2) the valuation of costs and benefits requires estimates and judgments by management. Internal controls should address the following points:

1. **Control of collusion** - Collusion is a situation where two or more employees are working in conjunction to defraud their employer.

2. **Separation of transaction authority from accounting and record keeping** - A separation of duties is achieved by separating the person who authorizes or performs the transaction from the people who record or otherwise account for the transaction.

3. **Custodial safekeeping** - Securities purchased from any bank or dealer including appropriate collateral (as defined by state law) shall be placed with an independent third party for custodial safekeeping.

4. **Avoidance of physical delivery securities** - Book-entry securities are much easier to transfer and account for since actual delivery of a document never takes place. Delivered securities must be properly safeguarded against loss or destruction. The potential for fraud and loss increases with physically delivered securities.

5. **Clear delegation of authority to subordinate staff members** - Subordinate staff members must have a clear understanding of their authority and responsibilities to avoid improper actions. Clear delegation of authority also preserves the internal control structure that is contingent on the various staff positions and their respective responsibilities.

6. **Written confirmation of transactions for investments and wire transfers** - Due to the potential for error and improprieties arising from telephone and electronic transactions, all transactions should be supported by written communications and approved by the appropriate person. Written communications may be via fax if on letterhead and if the safekeeping institution has a list of authorized signatures.

7. **Development of a wire transfer agreement with the lead bank and third-party custodian** - The designated official should ensure that an agreement will be entered into and will address the following points: controls, security provisions, and responsibilities of each party making and receiving wire transfers.

Inverse Floater. A floating rate security structured in such a way that it reacts inversely to the direction of interest rates. Considered risky as their value moves in the opposite direction of normal fixed-income investments and whose interest rate can fall to zero.

Investment Advisor. A company that provides professional advice managing portfolios, investment recommendations, and/or research in exchange for a management fee.

Investment Adviser Act of 1940. Federal legislation that sets the standards by which investment companies, such as mutual funds, are regulated in the areas of advertising, promotion, performance reporting requirements, and securities valuations.

Investment Grade. Bonds considered suitable for preservation of invested capital, including bonds rated a minimum of Baa3 by Moody's, BBB- by Standard & Poor's, or BBB- by Fitch. Although "BBB" rated bonds are considered investment grade, most public agencies cannot invest in securities rated below "A."

Liquidity. Relative ease of converting an asset into cash without significant loss of value. Also, a relative measure of cash and near-cash items in a portfolio of assets. Additionally, it is a term describing the marketability of a money market security correlating to the narrowness of the spread between the bid and ask prices.

Local Government Investment Pool (LGIP). An investment by local governments in which their money is pooled as a method for managing local funds, (e.g., TexPool, Texas Range).

Long-Term Core Investment Program. Funds that are not needed within a one-year period.

Market Value. The fair market value of a security or commodity. The price at which a willing buyer and seller would pay for a security.

Mark-to-market. Adjusting the value of an asset to its market value, reflecting in the process unrealized gains or losses.

Master Repurchase Agreement. A widely accepted standard agreement form published by the Securities Industry and Financial Markets Association (SIFMA) that is used to govern and document Repurchase Agreements and protect the interest of parties in a repo transaction.

Maturity Date. Date on which principal payment of a financial obligation is to be paid.

Medium Term Notes (MTN's). Used frequently to refer to corporate notes of medium maturity (5-years and under). Technically, any debt security issued by a corporate or depository institution with a maturity from 1 to 10 years and issued under an MTN shelf registration. Usually issued in smaller issues with varying coupons and maturities, and underwritten by a variety of broker/dealers (as opposed to large corporate deals issued and underwritten all at once in large size and with a fixed coupon and maturity).

Money Market. The market in which short-term debt instruments (bills, commercial paper, bankers' acceptance, etc.) are issued and traded.

Money Market Mutual Fund (MMF). A type of mutual fund that invests solely in money market instruments, such as: U.S. Treasury bills, commercial paper, bankers' acceptances, and repurchase agreements. Money market mutual funds are registered with the SEC under the Investment Company Act of 1940 and are subject to "rule 2a-7" which significantly limits average maturity and credit quality of holdings. MMF's are managed to maintain a stable net asset value (NAV) of $1.00. Many MMFs carry ratings by a NRSRO.

Moody's Investors Service. One of several NRSROs that provide credit ratings on corporate and municipal debt issues.

Mortgage Backed Securities (MBS). Mortgage-backed securities represent an ownership interest in a pool of mortgage loans made by financial institutions, such as savings and loans, commercial banks, or mortgage companies, to finance the borrower's purchase of a home or other real estate. The majority of MBS are issued and/or guaranteed by GNMA, FNMA, and FHLMC. There are a variety of MBS structures with varying levels of risk and complexity. All MBS have reinvestment risk as actual principal and interest payments are dependent on the payment of the underlying mortgages which can be prepaid by mortgage holders to refinance and lower rates or simply because the underlying property was sold.

Mortgage Pass-Through Securities. A pool of residential mortgage loans with the monthly interest and principal distributed to investors on a pro-rata basis. The largest issuer is GNMA.

Municipal Note/Bond. A debt instrument issued by a state or local government unit or public agency. The vast majority of municipals are exempt from state and federal income tax, although some non-qualified issues are taxable.

Mutual Fund. Portfolio of securities professionally managed by a registered investment company that issues shares to investors. Many different types of mutual funds exist (e.g., bond, equity, and money market funds); all except money market funds operate on a variable net asset value (NAV).

Negotiable Certificate of Deposit (Negotiable CD). Large denomination CDs ($100,000 and larger) that are issued in bearer form and can be traded in the secondary market.

Net Asset Value. The market value of one share of an investment company, such as a mutual fund. This figure is calculated by totaling a fund's assets including securities, cash, and any accrued earnings, then subtracting the total assets from the fund's liabilities, and dividing this total by the number of shares outstanding. This is calculated once a day based on the closing price for each security in the fund's portfolio. (See below.)

[(Total assets) - (Liabilities)]/(Number of shares outstanding)

NRSRO. A "Nationally Recognized Statistical Rating Organization" (NRSRO) is a designated rating organization that the Securities and Exchange Commission (SEC) has deemed a strong national presence in the U.S. NRSROs provide credit ratings on corporate and bank debt issues. Recognized SEC rating agencies include Fitch Ratings, Moody's Investor Services, S&P Global Ratings and Kroll Bond Rating Agency, among others.

Offered Price. See also "Ask Price."

Open Market Operations. A Federal Reserve monetary policy tactic entailing the purchase or sale of government securities in the open market by the Federal Reserve System from and to primary dealers in order to influence the money supply, credit conditions, and interest rates.

Par Value. The face value, stated value, or maturity value of a security.

Physical Delivery. Delivery of readily available underlying assets at contract maturity.

Portfolio. Collection of securities and investments held by an investor.

Premium. The amount by which a bond or other financial instrument sells above its face value. See also "Discount."

Primary Dealer. A designation given to certain government securities dealer by the Federal Reserve Bank of New York. Primary dealers can buy and sell government securities directly with the Fed. Primary dealers also submit daily reports of market activity and security positions held to the Fed and are subject to its informal oversight. Primary dealers are the largest buyers and sellers by volume in the U.S. Treasury securities market.

Prime Paper. Commercial paper of high quality. Highest rated paper is A-1+/A-1 by S&P and P-1 by Moody's.

Principal. Face value of a financial instrument on which interest accrues. May be less than par value if some principal has been repaid or retired. For a transaction, principal is par value times price and includes any premium or discount.

Prudent Expert Rule. Standard that requires that a fiduciary manage a portfolio with the care, skill, prudence, and diligence, under the circumstances then prevailing, that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims. This statement differs from the "prudent person" rule in that familiarity with such matters suggests a higher standard than simple prudence.

Prudent Investor Standard. Standard that requires that when investing, reinvesting, purchasing, acquiring, exchanging, selling, or managing public funds, a trustee shall act with care, skill, prudence, and diligence under the circumstances then prevailing, including, but not limited to, the general economic conditions and the anticipated needs of the agency, that a prudent person acting in a like capacity and familiarity with those matters would use in the conduct of funds of a like character and with like aims, to safeguard the principal and maintain the liquidity needs of the agency. More stringent than the "prudent person" standard as it implies a level of knowledge commensurate with the responsibility at hand.

Qualified Public Depository - Per Subsection 280.02(26), F.S., "qualified public depository" means any bank, savings bank, or savings association that:

1. Is organized and exists under the laws of the United States, the laws of this state or any other state or territory of the United States.

2. Has its principal place of business in this state or has a branch office in this state which is authorized under the laws of this state or of the United States to receive deposits in this state.

3. Has deposit insurance under the provision of the Federal Deposit Insurance Act, as amended, 12 U.S.C. ss.1811 et seq.

4. Has procedures and practices for accurate identification, classification, reporting, and collateralization of public deposits.

5. Meets all requirements of Chapter 280, F.S.

6. Has been designated by the Chief Financial Officer as a qualified public depository.

Range Note. A type of structured note that accrues interest daily at a set coupon rate that is tied to an index. Most range notes have two coupon levels; a higher accrual rate for the period the index is within a designated range, the lower accrual rate for the period that the index falls outside the designated range. This lower rate may be zero and may result in zero earnings.

Rate of Return. Amount of income received from an investment, expressed as a percentage of the amount invested.

Realized Gains (Losses). The difference between the sale price of an investment and its book value. Gains/losses are "realized" when the security is actually sold, as compared to "unrealized" gains/losses which are based on current market value. See "Unrealized Gains (Losses)."

Reference Bills: FHLMC's short-term debt program created to supplement its existing discount note program by offering issues from one month through one year, auctioned on a weekly or on an alternating four-week basis (depending upon maturity) offered in sizeable volumes ($1 billion and up) on a cycle of regular, standardized issuance. Globally sponsored and distributed, Reference Bill issues are intended to encourage active trading and market-making and facilitate the development of a term repo market. The program was designed to offer predictable supply, pricing transparency, and liquidity, thereby providing alternatives to U.S. Treasury bills. FHLMC's Reference Bills are unsecured general corporate obligations. This program supplements the corporation's existing discount note program. Issues under the Reference

program constitute the same credit standing as other FHLMC discount notes; they simply add organization and liquidity to the short-term Agency discount note market.

Reference Notes: FHLMC's intermediate-term debt program with issuances of 2, 3, 5, 10, and 30-year maturities. Initial issuances range from $2 - $6 billion with re-openings ranging $1 - $4 billion.

The notes are high-quality bullet structures securities that pay interest semiannually. Issues under the Reference program constitute the same credit standing as other FHLMC notes; they simply add organization and liquidity to the intermediate- and long-term Agency market.

Repurchase Agreement (Repo). A short-term investment vehicle where an investor agrees to buy securities from a counterparty and simultaneously agrees to resell the securities back to the counterparty at an agreed upon time and for an agreed upon price. The difference between the purchase price and the sale price represents interest earned on the agreement. In effect, it represents a collateralized loan to the investor, where the securities are the collateral. Can be DVP, where securities are delivered to the investor's custodial bank, or "tri-party" where the securities are delivered to a third party intermediary. Any type of security can be used as "collateral," but only some types provide the investor with special bankruptcy protection under the law. Repos should be undertaken only when an appropriate Securities Industry and Financial Markets Association (SIFMA) approved master repurchase agreement is in place.

Reverse Repurchase Agreement (Reverse Repo). A repo from the point of view of the original seller of securities. Used by dealers to finance their inventory of securities by essentially borrowing at short-term rates. Can also be used to leverage a portfolio and in this sense, can be considered risky if used improperly.

Safekeeping. Service offered for a fee, usually by financial institutions, for the holding of securities and other valuables. Safekeeping is a component of custody services.

Secondary Market. Markets for the purchase and sale of any previously issued financial instrument.

Securities Industry and Financial Markets Association (SIFMA). The bond market trade association representing the largest securities markets in the world. In addition to publishing a Master Repurchase Agreement, widely accepted as the industry standard document for Repurchase Agreements, the SIFMA also recommends bond market closures and early closes due to holidays.

Securities Lending. An arrangement between and investor and a custody bank that allows the custody bank to "loan" the investors investment holdings, reinvest the proceeds in permitted investments, and shares any profits with the investor. Should be governed by a securities lending agreement. Can increase the risk of a portfolio in that the investor takes on the default risk on the reinvestment at the discretion of the custodian.

Sinking Fund. A separate accumulation of cash or investments (including earnings on investments) in a fund in accordance with the terms of a trust agreement or indenture, funded by periodic deposits by the issuer (or other entity responsible for debt service), for the purpose of assuring timely availability of moneys for payment of debt service. Usually used in connection with term bonds.

Spread. The difference between the price of a security and similar maturity U.S. Treasury investments, expressed in percentage terms or basis points. A spread can also be the absolute difference in yield between two securities. The securities can be in different markets or within the same securities market between different credits, sectors, or other relevant factors.

Standard & Poor's. One of several NRSROs that provide credit ratings on corporate and municipal debt issues.

STRIPS (Separate Trading of Registered Interest and Principal of Securities). Acronym applied to U.S. Treasury securities that have had their coupons and principal repayments separated into individual zero-coupon Treasury securities. The same technique and "strips" description can be applied to non-Treasury securities (e.g., FNMA strips).

Structured Notes. Notes that have imbedded into their structure options such as step-up coupons or derivative-based returns.

Supranational. Supranational organizations are international financial institutions that are generally established by agreements among nations, with member nations contributing capital and participating in management. These agreements provide for limited immunity from the laws of member countries. Bonds issued by these institutions are part of the broader class of Supranational, Sovereign, and Non-U.S. Agency (SSA) sector bonds. Supranational bonds finance economic and infrastructure development and support environmental protection, poverty reduction, and renewable energy around the globe. For example, the World Bank, International Finance Corporation (IFC), and African Development Bank (AfDB) have “green bond” programs specifically designed for energy resource conservation and management. Supranational bonds, which are issued by multi-national organizations that transcend national boundaries. Examples include the World Bank, African Development Bank, and European Investment Bank.

Swap. Trading one asset for another.

TAP Notes: Federal Agency notes issued under the FHLB TAP program. Launched in 6/99 as a refinement to the FHLB bullet bond auction process. In a break from the FHLB’s traditional practice of bringing numerous small issues to market with similar maturities, the TAP Issue Program uses the four most common maturities and reopens them up regularly through a competitive auction. These maturities (2, 3, 5, and 10 year) will remain open for the calendar quarter, after which they will be closed and a new series of TAP issues will be opened to replace them. This reduces the number of separate bullet bonds issued, but generates enhanced awareness and liquidity in the marketplace through increased issue size and secondary market volume.

Tennessee Valley Authority (TVA). One of the large Federal Agencies. A wholly owned corporation of the United States government that was established in 1933 to develop the resources of the Tennessee Valley region in order to strengthen the regional and national economy and the national defense. Power operations are separated from non-power operations. TVA securities represent obligations of TVA, payable solely from TVA's net power proceeds, and are neither obligations of nor guaranteed by the United States. TVA is currently authorized to issue debt up to $30 billion. Under this authorization, TVA may also obtain advances from the U.S. Treasury of up to $150 million. Frequent issuer of discount notes, agency notes, and callable agency securities.

Total Return. Investment performance measured over a period of time that includes coupon interest, interest on interest, and both realized and unrealized gains or losses. Total return includes, therefore, any market value appreciation/depreciation on investments held at period end.

Treasuries. Collective term used to describe debt instruments backed by the U.S. government and issued through the U.S. Department of the Treasury. Includes Treasury bills, Treasury notes, and Treasury bonds.

Also a benchmark term used as a basis by which the yields of non-Treasury securities are compared (e.g., "trading at 50 basis points over Treasuries").

Treasury Bills (T-Bills). Short-term direct obligations of the United States government issued with an original term of one year or less. Treasury bills are sold at a discount from face value and do not pay interest before maturity. The difference between the purchase price of the bill and the maturity value is the interest earned on the bill. Currently, the U.S. Treasury issues 4-week, 13-week, and 26-week T-Bills.

Treasury Bonds. Long-term interest-bearing debt securities backed by the U.S. government and issued with maturities of ten years and longer by the U.S. Department of the Treasury.

Treasury Notes. Intermediate interest-bearing debt securities backed by the U.S. government and issued with maturities ranging from one to ten years by the U.S. Department of the Treasury. The Treasury currently issues 2-year, 3-year, 5-year, and 10-year Treasury Notes.

Trustee. A bank designated by an issuer of securities as the custodian of funds and official representative of bondholders. Trustees are appointed to insure compliance with the bond documents and to represent bondholders in enforcing their contract with the issuer.

Uniform Net Capital Rule. SEC Rule 15c3-1 that outlines the minimum net capital ratio (ratio of indebtedness to net liquid capital) of member firms and non-member broker/dealers.

Unrealized Gains (Losses). The difference between the market value of an investment and its book value. Gains/losses are “realized” when the security is actually sold, as compared to “unrealized” gains/losses which are based on current market value. See also “Realized Gains (Losses).”

Variable-Rate Security. A bond that bears interest at a rate that varies over time based on a specified schedule of adjustment (e.g., daily, weekly, monthly, semi-annually, or annually). See also “Floating Rate Note.”

Weighted Average Maturity (or just “Average Maturity”). The average maturity of all securities and investments of a portfolio, determined by multiplying the par or principal value of each security or investment by its maturity (days or years), summing the products, and dividing the sum by the total principal value of the portfolio. A simple measure of risk of a fixed-income portfolio.

Weighted Average Maturity to Call. The average maturity of all securities and investments of a portfolio, adjusted to substitute the first call date per security for maturity date for those securities with call provisions.

Yield Curve. A graphic depiction of yields on like securities in relation to remaining maturities spread over a time line. The traditional yield curve depicts yields on U.S. Treasuries, although yield curves exist for Federal Agencies and various credit quality corporates as well. Yield curves can be positively sloped (normal) where longer-term investments have higher yields, or “inverted” (uncommon) where longer-term investments have lower yields than shorter ones.

Yield to Call (YTC). Same as “Yield to Maturity,” except the return is measured to the first call date rather than the maturity date. Yield to call can be significantly higher or lower than a security’s yield to maturity.

Yield to Maturity (YTM). Calculated return on an investment, assuming all cash-flows from the security are reinvested at the same original yield. Can be higher or lower than the coupon rate depending on

market rates and whether the security was purchased at a premium or discount. There are different conventions for calculating YTM for various types of securities.

Yield. There are numerous methods of yield determination. In this glossary, see also "Current Yield," "Yield Curve," "Yield to Call," and "Yield to Maturity."

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 4.C.

Title
Consider action to approve Change Order No. 1 and Change Order No. 2 to the City's contract for the Sapphire Bay DPS project with Speed Fab-Crete.

Consider action to adopt a resolution approving and ratifying Change Order No. 1 and Change Order No. 2 to the City's contract for the Sapphire Bay DPS project with Speed Fab-Crete, related to the purchase of furniture, fixtures, and equipment and the Parking Lot for Sapphire Bay Station #5, in the total amount of $608,758; and providing for an effective date.

Staff Representative
Kristoff Bauer, Deputy City Mgr
Lynnette Lawyer, Sr. CIP Manager

Executive Summary
The City of Rowlett has made promoting operational excellence one of its highest priorities. By aiming to support investments in upgraded, consolidated City facilities, Rowlett is building a high-performing organization that delivers exemplary service. The purpose of this item is to seek approval and ratification of Change Order No. 1 and Change Order No. 2 to the City's contract for the Sapphire Bay DPS project with Speed Fab-Crete in the total amount of $608,758.00.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
Promote Operational Excellence	7.3 Support investments in upgraded, consolidated City facilities.

Background Information
On May 6, 2023, Rowlett voters overwhelmingly approved a bond proposition specifically designated for construction of a new joint fire/police station to be located at Sapphire Bay, south of Interstate 30.

Discussion
The proposed Change Order 1 is attached as Exhibit A. It details the purchase of the apparatus bay Plymovent Exhaust System, bunkroom lockers and beds for Fire/Police

Station #5 at Sapphire Bay. To prevent further delays to the Project's construction timeline, the City Manager's Office moved forward with approving the Change Order on 04/09/2025.

Air Cleaning Technologies is the local distributor for the Plymovent Exhaust System, which is the system used throughout all Rowlett's fire stations. Sargo Stone is providing the millwork for the bunkrooms. Originally, the funds for these expenses were in the (FF&E) Furniture, Fixtures, and Equipment budget for the Project. Because these companies are no longer part of a Purchasing Co-Op, this work needed to be moved under the CMaR's (Speed Fab-Crete) scope of work. Funds for this scope of work are included in the overall project budget; therefore, no additional funding will be required. The purpose of this Change Order is add these items to the scope of work for Speed Fab-Crete which will then result in a movement of the funds from the general FF&E budget to Speed Fab-Crete's budget by increasing their Guaranteed Maximum Price.

The proposed Change Order 2 is attached as Exhibit B. It details the cost to revise the parking lot design for Fire/Police Station #5 at Sapphire Bay. To prevent further delays to the Project's construction timeline, the City Manager's Office moved forward with approving the first part of the Change Order on 03/14/2025.

The previous parking lot design did not meet all applicable Codes and Ordinances, nor was functionally efficient. The new design meets City and Federal Codes, and improves overall functionality and site drainage. The additional funds needed to provide for the additional cost of the Parking Lot re-design are $75,000.

Financial/Budget Implications

Budget Account Number and/or Project Code	Account or Project Title	Total Budget	Available Budget	Proposed Amount	Remaining Balance
SP2127 BONDGOVT CONSTRUCT LABOR 3268004 6701	Fire / Police Station #5	$13,145,000	$733,403.26	- $608,758.00	**$124,645.26**
		Original Contract	**Amended Amount**		**New Contract**
	CMaR	$10,648,740	$608,758		$11,241,498
	FF&E	$899,335	-$289,855		$609,480

Recommended Action

Motion to adopt a resolution approving and ratifying Change Order No. 1 and Change Order No. 2 to the City's contract for the Sapphire Bay DPS project with Speed Fab-Crete, related to the purchase of furniture, fixtures, and equipment and parking lot redesign for Sapphire Bay Station #5, in the total amount of $608,758; and provide for an effective date.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS APPROVING CHANGE ORDER NOS. 1 AND 2 TO THE CITY'S CONTRACT WITH SPEED FAB-CRETE IN THE TOTAL AMOUNT OF $608,758.00 FOR APPARATUS BAY PLYMOVENT EXHAUST SYSTEM, BUNKROOM LOCKERS AND BEDS FOR AND PARKING LOT REDESIGN FOR FIRE/POLICE STATION NO. 5 AT SAPPHIRE BAY; APPROVING AND RATIFYING THE CITY MANAGER'S EXECUTION OF SAID CHANGE ORDERS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City has contracted with Speed Fab-Crete for Construction Manager at Risk (CMAR) services related to the Fire/Police Station No. 5 at Sapphire Bay; and

WHEREAS, inasmuch as the original suppliers for apparatus bay Plymovent exhaust system, bunkroom lockers and beds for Station No. 5 are no longer part of the purchasing cooperative, Change Order No. 1 in the amount of $289,855.00 is necessary to transfer these items to the CMAR Speed Fab-Crete; and

WHEREAS, revisions have been required to the designs for the parking lot at Station No. 5. necessitating Change Order No. 2 in the amount of $318,903.00;

WHEREAS, to prevent further delays to the Project’s construction timeline, the City Manager’s Office moved forward with approving Change Orders Nos. 1 and 2; and

WHEREAS, the City Council finds that it serves the health, safety and public welfare to approve Change Order Nos. 1 and 2 and to approve and ratify the City Manager's execution thereof;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS THAT:

SECTION 1. Change Order Nos. 1 and 2 to the City's contract with Speed Fab-Crete, in the total amount of $608,758.00, attached hereto and incorporated herein by this reference as Exhibits "A" and "B", respectively, are hereby approved and the City Manager's execution of said change order is hereby ratified and approved.

SECTION 2. This resolution shall be effective from and after its passage.

Attachments

1. Speed Fab-Crete Change Order 1
2. Speed Fab-Crete Change Order 2

CHANGE ORDER AUTHORIZATION

PROJECT: SAPPHIRE BAY PUBLIC SAFETY FACILITY NO: 1

Description: *(provide detailed information explaining the justification for the expense)*

Air Cleaning Technologies is the local distributor for the Plymovent Exhaust System, which is the system used throughout all of Rowlett's stations. Sargo Stone is providing the millwork for the bunkrooms. Originally, the funds for these expenses were in the FF&E budget. Because these companies are not part of a Purchasing Co-Op, this work will need to be under the General Contractor's scope.

Funds for this scope of work are included in the overall project budget so no additional funding will be required. The purpose of this change order is to move funds from the general FF&E budget into the Speed Fab Crete budget.

Number of Additional Calendar Days	0
New Date of Substantial Completion	9/17/2025

Total cost of this authorization	$ 289,855.00
Initial Amount in FF&E Budget	$ 740,000.00
Amount in FF&E Budget after this Authorization	$ 450,145.00
Initial Guaranteed Maximum Price	$ 10,632,740.00
New Guaranteed Maximum Price	$ 10,922,595.00

This Change Order Authorization requires additional funding from the City

Owner 's Signature Date

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Change Order

PROJECT: *(Name and address)*	CONTRACT INFORMATION:	CHANGE ORDER INFORMATION:
Sapphire Bay DPS 1301 Easy Street Rowlett, TX. 75088	Contract For: General Construction Date: December 19, 2023	Change Order Number: 004 Date: Aril 7, 2025
OWNER: *(Name and address)*	**ARCHITECT:** *(Name and address)*	**CONTRACTOR:** *(Name and address)*
City of Rowlett 4000 Main St Rowlett, TX. 75088	Eikon Consulting 1405 W Chapman Dr Sanger, TX. 76266	Speed Fab-Crete 1150 E Kennedale Pkwy Kennedale, TX. 76060

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)
Add plymovent system, bunk room lockers & beds out of owner FFE budget.

The original Guaranteed Maximum Price was	$	10,632,740.00
The net change by previously authorized Change Orders	$	117,366.00
The Guaranteed Maximum Price prior to this Change Order was	$	10,750,106.00
The Guaranteed Maximum Price will be increased by this Change Order in the amount of	$	289,855.00
The new Guaranteed Maximum Price including this Change Order will be	$	11,039,961.00

The Contract Time will be increased by Zero (0) days.
The new date of Substantial Completion will be

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

Eikon Consulting	Speed Fab-Crete	City of Rowlett
ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
Matt Lumpkin, Senior Designer	ROBERT JAMES CFO	KRISTOFF T. BAUER
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
4/8/2025	4/7/25	4/9/25
DATE	DATE	DATE

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User Notes: (3B9ADA49)

Speed Fab-Crete
GENERAL CONTRACTOR

Rowlett Sapphire Bay
Proposed Contingency Change Order #25R
April 7, 2025

	PROPOSED CHANGES: add plymovent system to contract and bunk room lockers and beds out of owner FFE budget		
1.	Add plymovent vehicle exhaust system to contract from FFE budget	107,900	
2.	Add bunk room beds and lockers to contract from FFE budget	159,740	
	SUBTOTAL:	$267,640	
	SFC Fee 6.5%	$17,397	
	Insurance 1.8%	$4,818	
	TOTAL:	**$289,855**	

Sargo Stone

PO Box 270642
Flower Mound, TX 75027

Provided By: Dennis Sargo
Phone: 972-896-0551
Office: 469-763-3291

Estimate

Name / Address
Speed Fab-Crete GC 1150 E. Kennedale Pkwy Kennedale, TX 76060 817-478-1137 mbraim@speedfab-crete.com

Date	Estimate #	Project	Project Manager
4/5/25	8915	Sapphire Bay DPS_Rowlett	Janis Petry

Custom Surfaces in Natural Stone, Quartz, Laminates and Solid Surfacing

Description	Total
Commercial New Construction Address: 1301 Easy Street Rowlett TX	
CHANGE ORDER ESTIMATE	
(12) BUNK ROOMS with TALL LOCKER CABINETS / BUNK BEDS	
Purchase and Delivery of White Oak Stain Grade Cabinet Materials	67,375.00T
Fabrication and Installation of Stain Grade Shaker Style Tall Cabinets / Bunk Bed Per Spec'd Plans	92,365.00
Note: Electrical Plugs By Other. Cutouts By Sargo.	
Note: Accommodates Increased Depth for Bunk Beds Etc.	
Note: Includes Closet Rods Hardware, Cam Locks, Elevated Access Etc.	
Tax Certificate Provided	0.00

Thanks For The Opportunity To Earn Your Business

Total: $159,740.00

1300 West Detroit St.
Broken Arrow, OK 74012

OFFICE 918-251-8000
FAX 918-251-4977
800-351-1858

www.aircleaningtech.com

December 11, 2024

Ms. Kerrie Crimmins, Project Manager
Fitzpatrick Design Construction Services
PO Box 864784
Plano, Texas 75086-3052

Email: kerrie@fdcstx.com

Dear Ms. Crimmins:

Air Cleaning Technologies, Inc. is pleased to provide the following ***Turnkey* Project Proposal** for all materials and labor for the installation of the *Plymovent* Vehicle Exhaust Ventilation System at the **City of Rowlett Fire Department – Sapphire Bay #5 Station**.

SCOPE OF WORK

Provide all labor, materials, and equipment to install a *Plymovent* Vehicle Exhaust Ventilation System to remove both diesel and automotive exhaust gases and particulate of operating vehicles within the confines of specified station. All necessary controls, motors, fittings, ductwork, blowers, labor and all other equipment and materials specified shall be part of the work.

ROWLETT SAPPHIRE BAY #5 FIRE STATION:

(4) *Plymovent* 65' Mini Rail Profile Systems, Model MRP-652-D, For Drive-thru Apparatus, Each with (2) Hose Drops and (2) Magnetic Grabbers
(1) *Plymovent* 7.5 HP / 3 Phase, 208-230V, Model TEV-585-60 Fan
(1) *Plymovent* Control Panel with Motor Starter, Model OS-3

ROWLETT SAPPHIRE BAY #5 STATION **Total of (8) Hose Drops and (8) Magnetic Grabbers**	**$ 107,900.00**

INCLUDED IN SCOPE OF WORK

- Wireless Start System.
- System Start-up and Training.
- Lot of Clamping Galvanized Duct.
- Professional Core Drilling, if applicable.
- *Plymovent* Material and Workmanship Warranty.
- Includes Standard Tailpipe Conical Adapter and Reducer.
- All Materials and Labor for Complete Mechanical Systems Installation in accordance with the International Mechanical Code and Specifications.
- All workmanship, manufacturing procedures, airflow design and materials are Performance Guaranteed.

1300 West Detroit St.
Broken Arrow, OK 74012

OFFICE 918-251-8000
FAX 918-251-4977
800-351-1858

www.aircleaningtech.com

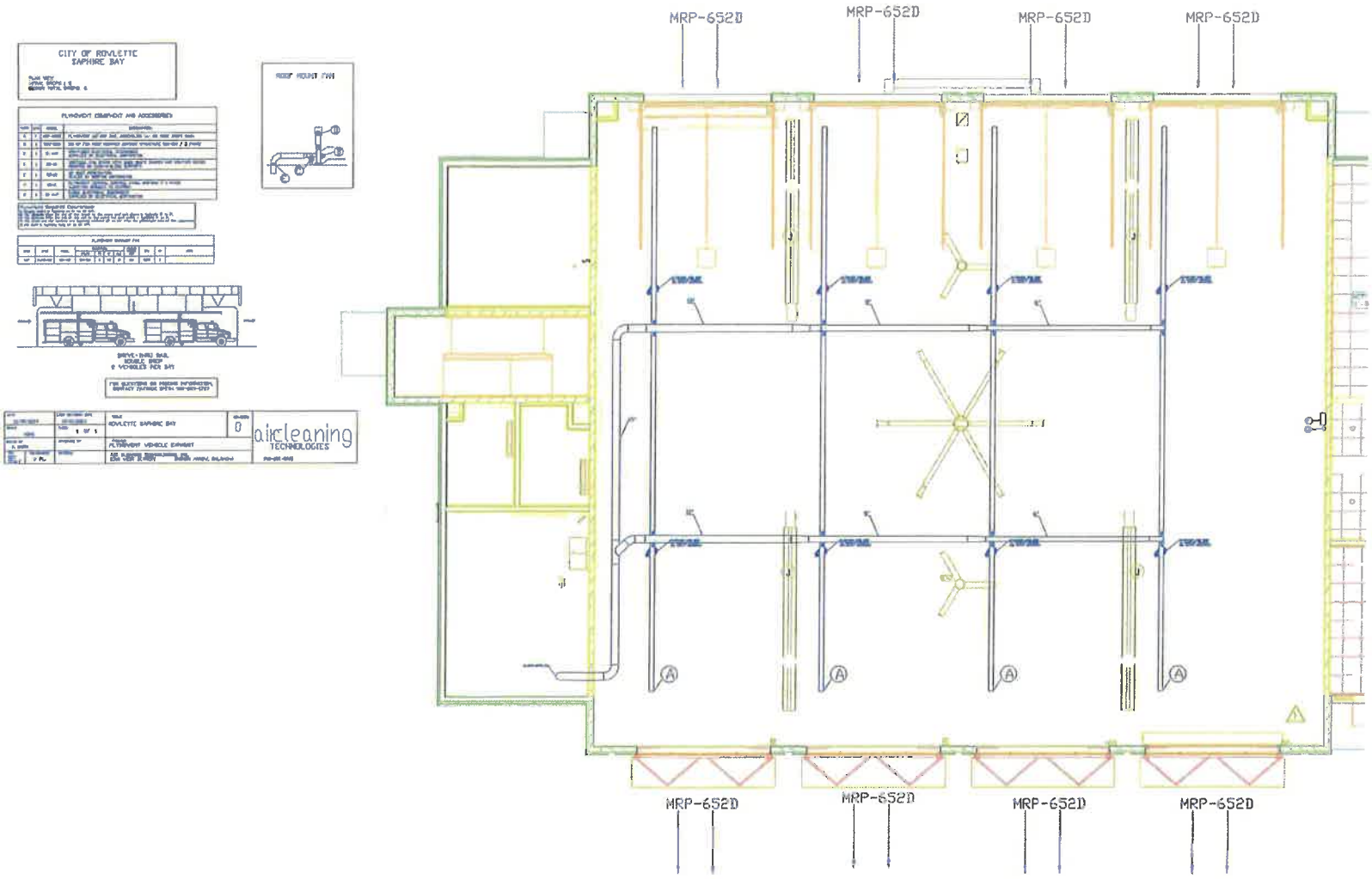
EXCLUSIONS FROM SCOPE OF WORK

- Seismic Engineering/Strapping.
- PE Stamped Structural Drawings.
- Permits or Bonds Not Included, if applicable add 2.5%.
- Electrical Wiring and Conduit by Electrician for the project.
- Paint and Primer for Duct and Structural Supports, if applicable.
- Roof Penetration, Roof Seal and Roof Curb(s) to be provided by others, if applicable.

Thank you for the opportunity to work with you on this project. If you require additional information or have questions, please do not hesitate to contact me directly on my cell, 918-829-1767 or email me, psmith@aircleaningtech.com.

Best regards,

Patrick Smith
Executive Vice President
Air Cleaning Technologies, Inc.
Plymovent Vehicle Exhaust Ventilation Systems
M - 918-829-1767
T – 918-251-8000 / 800-351-1858


CITY OF ROYLETTE
SAPHIRE BAY
MRP-652D
MRP-652D
MRP-652D
MRP-652D
MRP-652D
MRP-652D
MRP-652D
MRP-652D
aircleaning
TECHNOLOGIES

CHANGE ORDER AUTHORIZATION

PROJECT: SAPPHIRE BAY PUBLIC SAFETY FACILITY NO: 2

Description: *(provide detailed information explaining the justification for the expense)*

The original revision to the parking lot included layout, concrete, and utility changes, as well as the addition of a second gate. The work for this revision, a total of $117,366.00, was released and a majority of the work had been completed.

The second revision to the parking lot included further changes to the layout, concrete, and utilities, as well as the addition of bollards, power needed at the two gates, and rip rap needed at the sea wall. This second revision was priced at $201,537.00 for a total change order of $318,903.00.

Number of Additional Calendar Days	60
New Date of Substantial Completion	1/16/2026

Total cost of this authorization	$ 318,903.00
Previously approved Change orders	$ 289,855.00
Total amount of change orders to date	$ 608,758.00
Initial Guaranteed Maximum Price	$ 10,632,740.00
New Guaranteed Maximum Price	$ 11,241,498.00

This Change Order Authorization requires additional funding from the City

Owner ‘s Signature Date

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Change Order

PROJECT: *(Name and address)*	CONTRACT INFORMATION:	CHANGE ORDER INFORMATION:
Sapphire Bay DPS 1301 Easy Street Rowlett, TX. 75088	Contract For: General Construction Date: December 19, 2023	Change Order Number: 003 Date: February 11, 2025
OWNER: *(Name and address)*	**ARCHITECT:** *(Name and address)*	**CONTRACTOR:** *(Name and address)*
City of Rowlett 4000 Main St Rowlett, TX. 75088	Eikon Consulting 1405 W Chapman Dr Sanger, TX. 76266	Speed Fab-Crete 1150 E Kennedale Pkwy Kennedale, TX. 76060

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original Guaranteed Maximum Price was	$	10,632,740.00
The net change by previously authorized Change Orders	$	0.00
The Guaranteed Maximum Price prior to this Change Order was	$	10,632,740.00
The Guaranteed Maximum Price will be increased by this Change Order in the amount of	$	117,366.00
The new Guaranteed Maximum Price including this Change Order will be	$	10,750,106.00

The Contract Time will be increased by Zero (0) days.
The new date of Substantial Completion will be

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

Eikon Consulting	Speed Fab-Crete	City of Rowlett
ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
Matt Lumpkin	ROBERT JAMES	KRISTOFF Bauer Deputy City Mgr.
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
3/13/2025	3/10/25	3/14/25
DATE	DATE	DATE

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User Notes: (3B9ADA3D)

Rowlett
TEXAS

CHANGE ORDER AUTHORIZATION

PROJECT: SAPPHIRE BAY PUBLIC SAFETY FACILITY NO: 3

Description: *(provide detailed information explaining the justification for the expense)*

Parking lot layout changes requested by the city. Supporting documents provided in PCO18.

Number of Additional Calendar Days	0
New Date of Substantial Completion	9/17/2025

Total cost of this authorization $ 117,366.00

This Change Order Authorization requires additional funding from the City

Owner's Signature

Date 1/29/25

1/22/25 APPROVED FOR PAYMENT

1/22/25

Speed Fab-Crete
GENERAL CONTRACTOR

Rowlett Sapphire Bay
Proposed Contingency Change Order #18
January 13, 2025

	PROPOSED CHANGES: ASI #13 Parking lot lay out changes		
1.	Grading changes per parking lot layout changes	11,350	
2.	Parking lot lay out concrete changes	15,821	
3.	Storm drain changes per parking lot lay out	73,750	
4.	Additional gate pricing for gate only provided to owner August 27th see email. There are no specifics as to what will be required. There is no power shown to the gate. This price is for the gate only	7,450	
	SUBTOTAL:	108,371	
	SFC Fee 6.5%	7,044	
	Insurance 1.8%	1,951	
	TOTAL:	**117,366**	

PL

Texas B Excavation, LLC

2105 FM 1139, ROCKWALL, TX 75032
972-979-5553 (Owner)
972-722-3140 (Fax)
214-738-9609 (Estimator)
texasbexcavation@yahoo.com

UPDATED CHANGE PROPOSAL
January 7, 2025

TO: Speed Fab-Crete

ATTN: Janice

RE: Saphire Bay Fire Station
1301 Easy Street
Rowlett, Texas

UPDATED CHANGE PROPOSAL for Parking Lot and New Approach

Based on the parking lot revisions per sheet C1.2 dated 12/18,24, we submit this change proposal to furnish additional labor, materials and equipment necessary to complete the revised parking lot and new approach layout, including re-staking for new paving grades; misc. curb and paving demolition; and earthwork, all as follows:

1. Demo paving and curb at new South approach as required.
2. Re-grade and scarify 6" for new layout and approach.
3. Add additional curb backfill at new center parking area.
4. Blue-top under new paving and approach layout.
5. Re-grade site remainder to grades shown.

Total Additional Cost This Change Proposal - $13,850

-2500
$11,350

All other terms and conditions per our original proposal remain the same.

Price is subject to change if not accepted within 45 days

Accepted by: _____ Date: _____

Thank you for the opportunity of submitting this change proposal

Respectfully Submitted by

Texas B Excavation, LLC

Mr. Brett Brittain

C25007

PL

ROBERT KENT
CONSTRUCTION

CHANGE ORDER REQUEST

PROJECT NAME: Sapphire Bay - Fire Station #5
PROJECT NO: 4063
GENERAL CONTRACTOR: Speed Fab-Crete
ATTENTION: Janis Perty

C.O.R. NO.: 009
DATE: 01.07.2025
REFERENCE: ASI 013

DESCRIPTION OF CHANGE: Added paving and approach per ASI 013. Breakdown, ASI, and takeoff is attached.

Additive Costs		
Lump Sum - See Attached	$15,821.00	
Subtotal of Additive Cost		$15,821.00
Deductive Costs		
Lump Sum - See Attached	$0.00	
Subtotal of Deductive Cost		$0.00
Total Direct Cost		$15,821.00
Mark-up		included
Total Subcontractor Change Request		$15,821.00

Drake Tidwell

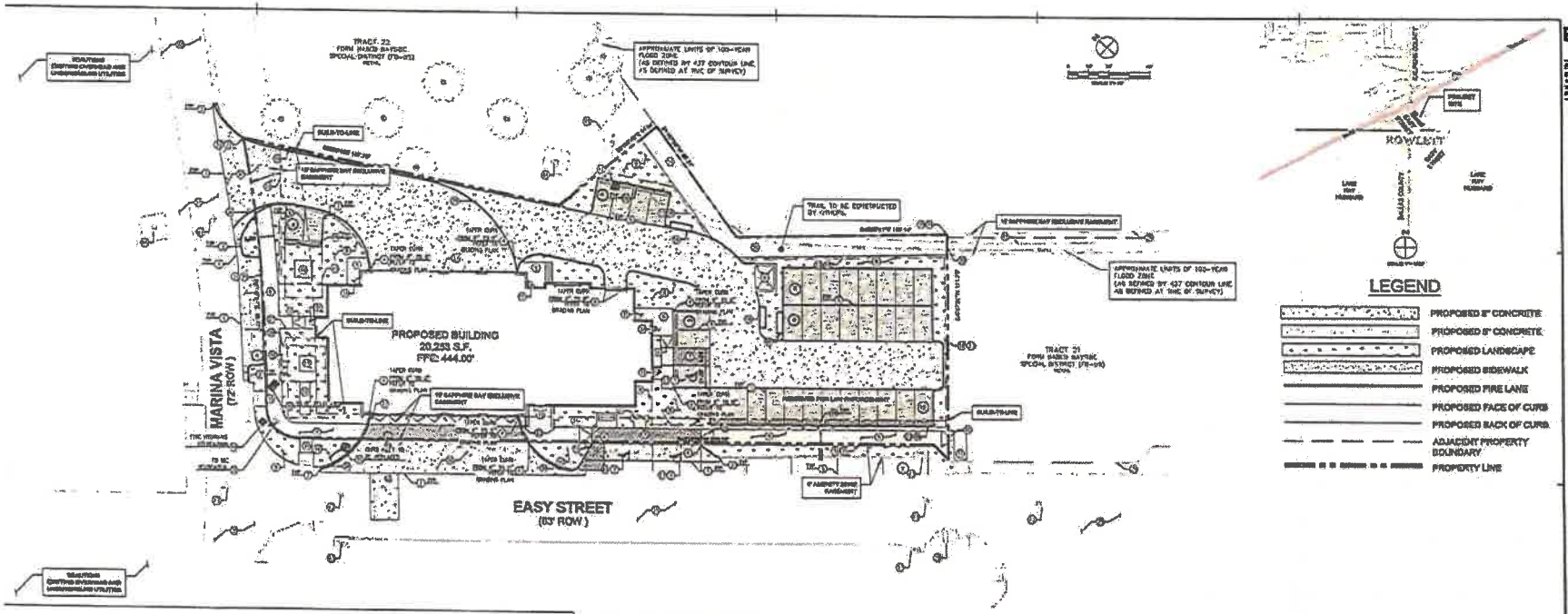
Drake Tidwell, Project Manager

cor #009 - site revisions
(asi 013)
1/7/2025 10:09

description of work	qty	unit	cost	u/c	1.15	total
added paving	1,220.00	sf	13,757.79	11.28	12.97	15,821.46
			13,757.79			15,821.46

added paving

labor (4 men 1 day)	40.00	hr	55.00	2,200.00
operator	5.00	hr	65.00	325.00
added finishers	3.00	ea	375.00	1,125.00
supervisor	10.00	hr	85.00	850.00
safety / sm tools	55.00	hr	1.00	55.00
skidsteer	5.00	hr	125.00	625.00
pickup or flatbed	10.00	hr	15.00	150.00
generator	10.00	hr	10.00	100.00
f/a forms & accessories	1.00	ls	1,420.69	1,420.69
rebar	1,569.00	lb	0.90	1,412.10
concrete	27.00	cy	170.00	4,590.00
pump	27.00	cy	15.00	405.00
survey remodel	1.00	ea	500.00	500.00
				13,757.79



SITE PLAN KEY NOTES:

1. MATCH EXISTING PAVEMENT ELEVATION.
2. MATCH EXISTING CURB.
3. CONCRETE CURB AND GUTTER. (TYPICAL-PER LOCAL CODES)
4. TAPER CURB TO 0".
5. PARKING STALL STRIPING. (TYPICAL-PER LOCAL CODES)
6. DUMPSTER ENCLOSURE. (REFER TO ARCH. PLANS)
7. ACCESSIBLE STRIPING & SYMBOL. (TYPICAL-PER ADA AND LOCAL REQUIREMENTS)
8. LANDSCAPE AREA. (REFER TO LANDSCAPE PLAN)
9. PROPOSED SIDEWALKS. (REFER TO SITE DIMENSIONAL PLAN FOR DIMENSIONS)
10. PROPOSED BARRIER FREE RAMPS.
11. PROPOSED LEVEL LANDINGS.
12. PROPOSED CROSSWALKS.
13. PROPOSED ADA PARKING STALLS.
14. PROPOSED LIGHT POLE. (REFER TO PHOTOMETRIC PLAN)
15. PROPOSED 3 PHASE PAD MOUNTED TRANSFORMER & SCREENING WALL. (REFER TO MEP PLAN)
16. PROPOSED CURB INLET. (REFER TO STORM PLAN)
17. PROPOSED DROP INLET. (REFER TO STORM PLAN)
18. PROPOSED SECURITY FENCE. (REFER TO STRUCTURAL PLANS FOR DETAILS)
19. PROPOSED WHEEL STOPS. (TYPICAL)
20. END OF 10' TRAIL @ PROP. LINE.
21. PUBLIC R.O.W.
22. PROPOSED SLIDING GATE. (REFER TO STRUCTURAL PLANS FOR DETAILS)
23. PROPOSED IRON FENCE. (REFER TO STRUCTURAL PLANS FOR DETAILS)
24. PROPOSED 10' TRAIL. (TO BE CONSTRUCTED BY OTHERS)
25. EXISTING PAVEMENT TO REMAIN.
26. PROPOSED GENERATOR (15'X5')
27. GENERATOR ENCLOSURE.
28. EXISTING FIRE HYDRANT.
29. ADJOINING PROPERTY.
30. PROPOSED ACCESS DRIVE.
31. PROPERTY LINE
32. EXISTING INLET TO BE RELOCATED (REFER TO DEMO PLAN)
33. PROPOSED SITTING WALL. (REFER TO STRUCTURAL PLANS)
34. PROPOSED BENCHES
35. PROPOSED FLAG POLES
36. PROPOSED FDC
37. PROPOSED BOLLARDS (TYP.)
38. PROPOSED FIRE LANE.
39. 26'X20' TRANSFORMER EASEMENT
40. PROPOSED FIRE HYDRANT.
41. EXISTING FIBER OPTIC VAULT/STRUCTURE
42. EXISTING STORM DRAIN MANHOLE
43. EXISTING CURB INLET
44. EXISTING DROP INLET
45. EXISTING EDGE OF WATER.
46. PROPOSED PMC SWITCH GEAR
47. 28.08' X 16.5' PMC SWITCH GEAR EASEMENT

LIST OF WARRANTS

1. BUILD-TO-LINE AND ZONES
   1.1. FORM BASED CODE 2.8.5 REQUIREMENT OF 18-26 FEET NOT BEING MET ALONG EASY STREET. PROPOSED BUILD-TO-LINE ALONG EASY STREET IS 12.21 FEET.
2. PARKING
   2.1. FORM BASED CODE 3.1.3 REQUIREMENT OF 1 PARKING SPACE PER 300 SQUARE FOOT EQUALING A TOTAL OF 68 PARKING SPOTS NOT BEING MET. PROPOSED TOTAL PROVIDED PARKING SPOTS IS 47. PLEASE SEE SITE TABLE FOR DETAILS.
   2.2. FORM BASED CODE 2.8.6 REQUIREMENT OF 1 PARKING TREE ISLAND EVERY EIGHT PARKING SPACES NOT BEING MET. PROPOSED PARKING AREA WILL NOT HAVE PARKING TREE ISLANDS.
   2.3. FORM BASED CODE 3.1.3 REQUIREMENT OF PARKING AREAS NOT TO BE VISIBLE FROM THE PUBLIC STREET. SET BEHIND THE BUILDING, OR 0 FEET BEHIND A FACADE NOT BEING MET. PROPOSED PROVIDED PARKING AREA WILL BE BEHIND A SECURITY FENCE ADJACENT TO THE BUILDING.
3. DRIVEWAYS
   3.1. FORM BASED CODE 2.5.3 REQUIREMENT OF DRIVEWAYS TO NOT EXCEED 12-FEET IN WIDTH WHEN INTERSECTING A SIDEWALK NOT BEING MET. PROPOSED DRIVEWAY AT MARINA VISTA WILL BE 24-FEET IN WIDTH AND INTERSECT SIDEWALK.
4. BUILDING TRANSPARENCY
   4.1. FORM BASED CODE 2.8.6 REQUIREMENT OF 30% - 70% WINDOW GLAZING NOT BEING MET. THE PROPOSED BUILDING WILL HAVE GLAZING OF 5.6%

CITY OF ROWLETT FIRE STATION NO. 5
SAPPHIRE BAY

SITE ADDRESS:	1301 EASY ST., ROWLETT, TX 75088
PROPOSED USE:	FIRE STATION/PUBLIC SAFETY BUILDING
ZONING DISTRICT:	FORM BASED BAYSIDE SPECIAL DISTRICT

TOTAL GROSS INTENSITY (F.A.R.):
20,253 S.F./66,619 S.F. = 1:0.30
(PROPOSED BUILDING)

TOTAL SQUARE FOOTAGE:
10,418 S.F. (PROPOSED 1ST FLOOR)
9,835 S.F. (PROPOSED 2ND FLOOR)
20,253 S.F. (TOTAL PROPOSED)

MAXIMUM LOT COVERAGE:	NONE REQUIRED & NONE PROPOSED
MINIMUM LOT AREA:	NONE REQUIRED & NONE PROPOSED
MINIMUM LOT WIDTH:	NONE REQUIRED & NONE PROPOSED
MINIMUM LOT DEPTH:	NONE REQUIRED & NONE PROPOSED

BUILT TO LINE (FORM BASED CODE)

FRONT:	REQUIRED: 18'-26'	PROPOSED: 12.21'
SIDE INTERIOR:	REQUIRED: 0'	PROPOSED: 0'
SIDE EXTERIOR:	REQUIRED: 18'-26'	PROPOSED: 24.74'
REAR	REQUIRED: 0'	PROPOSED: 0'

MAXIMUM STRUCTURE HEIGHT:	PERMITTED: 3 STORIES	PROPOSED: 2 STORIES (37'-6")
MAXIMUM NO. STORIES/FLOORS:	PERMITTED: 3 STORIES	PROPOSED: 2 STORIES

PARKING: 1/300 S.F.
REQUIRED: 68 SPACES
PROVIDED DISABLED PARKING: 2 SPACES
PROVIDED PARKING SPACES: 46 SPACES
TOTAL PROVIDED SPACES: 48 SPACES

GROSS SITE AREA:	66,619 S.F. (1.529 AC.)
SITE FRONTAGE:	193.02'
SITE WIDTH:	186'
SITE DEPTH:	321'
IMPERVIOUS SURFACE AREA:	49,302.4 S.F. (1.04 AC.)
PERVIOUS SURFACE AREA:	16,810.4 S.F. (0.34 AC.)

SITE PLAN NOTES:

1. REFER TO STRUCTURAL PLANS FOR FENCE & GATE DETAILS.
2. REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSIONS.
3. REFERENCE CIVIL ENGINEERING PLANS FOR SITE ENGINEERING DESIGN.
4. ALL DIMENSIONS ARE FACE TO FACE OF CURB, FACE OF BUILDING, OR AS OTHERWISE NOTED.
5. HANDICAP PARKING DIMENSIONS, MARKINGS AND SIGNS TO MEET APPLICABLE CODES.
6. SEE SHEET C1.1 FOR SITE DIMENSIONS.
7. COORDINATE WITH MEP PLANS FOR DEMO AND NEW UTILITY INSTALLATIONS.
8. REFERENCE LANDSCAPE PLANS FOR SITE LANDSCAPE DESIGN.
9. 10' TRAIL TO BE CONSTRUCTED BY OTHERS.

EXHIBIT B: SITE PLAN

CITY OF ROWLETT FIRE STATION NO. 5 – SAPPHIRE BAY

SAPPHIRE BAY LAND HOLDINGS I, LLC, LOT 53R-3, BLOCK A INST. NO. 20220000024588 O.P.R.R.C.T.

REPLAT, SAPPHIRE BAY, INST. NO. 20220000015334, P.R.R.C.T., 07/11/2022
CALLED 0.955 AC.

OWNER: CITY OF ROWLETT

ENGINEER: EIKON CONSULTING GROUP
500 MOSELEY RD., CROSSROADS, TX 76227
(940) 387-0805

DATE OF SUBMISSION: 07/31/2023

DATES OF RESUBMISSIONS:
1. 09/29/2023
2. 10/26/2023

SAPPHIRE BAY
1301 EASY STREET
ROWLETT, STREET

SITE PLAN

C1.0

Project	**Sapphire Bay DPS**
Change Order	3
Date	12/30/2024
Description	Water line changes & Storm drain Changes Plans Dated 12/18/2024

Contract Total				$256,080.09
ADD				
Storm Add	**Qty**	**Units**	**$59,000.00**	
Remove 18" Pipe	43	FT		
18" RCP CL-III	42	FT		
Connect to Existing 18" RCP Line	2	EA		
Connect to Existing Inlet	4	EA		
Remove Curb Inlet	3	EA		
4'X4' Junction Box 6' deep *M*	3	EA		
Water Add	**Qty**	**Units**	**$130,300.00**	
Connect to Existing 8" Water Line	1	EA		
2" DR-9 PVC W-P	108	FT		
2" DR-9 PVC W-P	44	FT		
Fitting	2	EA		
2" Domestic Service & Meter	1	EA		
16"x 6" Tap Sleeve	1	EA		
6" MJxFLG Valve	1	EA		
D.I.45 Bend Fitting	6	EA		
6" DR-14 W-P	100	FT		
Pot Hole Ex Lines	1	LS		
Steel Riser	1	EA		
Remove Paving Only	785	SF		
Paving Replacement	20	CU YD		
General Conditions Add	**Qty**	**Units**	**$29,500.00**	
Mobilization	1	EA	Split $14,750	
Staking	1	LS		
Trench Safety Plan	1	EA		
Barricades/Steel Plates	1	LS		
Total Plan Change ADDs			**$218,800.00**	
Contract Water --- Deduct			**-$108,146.06**	
Total This C/O				**$110,653.94**
Total Contract With This C/O				**$366,734.03**

Days Added	15	WDs
Price Good For	30	Dys
Native on Site Material for Back Fill	YES	
Rock Excavation	NO	

59,000
+ 14,750
$73,750

-------- Original message --------
From: Lynnette Lawyer <LLawyer@Rowlett.com>
Date: 8/27/24 11:18 AM (GMT-06:00)
To: Jerry Fitzpatrick <jerry@fdcstx.com>
Cc: Kerri <kerrie@fdcstx.com>, Gary Schatz <GSchatz@Rowlett.com>, Ron Hamm <rhamm@speedfab-crete.com>
Subject: Sapphire Bay Station #5 - Parking Lot Pricing

Jerry,

We need to develop pricing for the revised layout of the parking lot. Below is the list of the items we need pricing for. We need these prices asap today. Gary and I will use your unit prices to estimate what the revision will potentially cost the City of Rowlett. Thank you in advance for your assistance!

Concrete Pavement - Need to know if it's by SY or CY. If the latter, we need to know planned thickness.
$650 CY material, labor and monolithic curb. Add 10% markup fee, insurance and bond

6" Barrier Curb – LF
$9 LF monolithic curb. Add 10% markup fee, insurance and bond

4" Sidewalk – SY. This will be used to fill in the islands
$12 SF. Add 10% markup fee, insurance and bond

Sodding – SY
There is no sod on this project it is either decomposed granite or native stone
Decomposed Granite--$2.85 SF includes filter fabric. Add 10% mark up fee, insurance and bond.
Native Stone--$5.85 SF includes filter fabric. Add 10% markup fee, insurance and bond

Striping 4" White – LF
$0.62 LF regular striping. Add 10% markup fee, insurance and bond.
$0.68 LF fire lane striping. Add 10% markup fee, insurance and bond.

Security Fencing – LF
$110.00 LF high fortress iron fence. Add 10% markup fee, insurance and bond

Security Gate for Fencing – EA including opening and access system, and all appurtenances.
$7450 7' V track gate. No access control. Add 10% markup fee, insurance and bond

Have a blessed day,
Lynnette Lawyer, LEED AP
Construction Projects Manager

Rowlett
TEXAS

City of Rowlett, Texas
5702 Rowlett Road
Rowlett, TX 75089
972-463-3956 - office
469-929-3412 - mobile
lowlett.com
Visit the Action Center for answers or to submit a request.

Janis Petry

From: Janis Petry
Sent: Wednesday, August 28, 2024 7:58 AM
To: 'Lynnette Lawyer'
Cc: 'Jerry Fitzpatrick'; 'Kerrie Crimmins'; 'gshatz@rowlett.com'; Ron Hamm
Subject: RE: Sapphire Bay Station #5 - Parking Lot Pricing

See below for the fence and gate pricing. In the past we did not provide the access control on the gate. A city vendor provided that because of the same type access for all the city buildings and the operators in the police and fire trucks.

Janis Graham
Project Manager
Speed Fab-Crete, Inc.
817-676-1271

Speed Fab-Crete
General Contractor

From: Janis Petry
Sent: Tuesday, August 27, 2024 1:16 PM
To: Lynnette Lawyer <LLawyer@rowlett.com>
Cc: 'Jerry Fitzpatrick' <jerry@fdcstx.com>; Kerrie Crimmins <kerrie@fdcstx.com>; 'gshatz@rowlett.com' <gshatz@rowlett.com>; Ron Hamm <rhamm@speedfab-crete.com>
Subject: FW: Sapphire Bay Station #5 - Parking Lot Pricing

Per your request, please see unit pricing below.

Janis Graham
Project Manager
Speed Fab-Crete, Inc.
817-676-1271

Speed Fab-Crete
General Contractor

From: Ron Hamm <rhamm@speedfab-crete.com>
Sent: Tuesday, August 27, 2024 11:27 AM
To: Janis Petry <jpetry@speedfab-crete.com>; Neil Wiersum <nwiersum@speedfab-crete.com>
Subject: FW: Sapphire Bay Station #5 - Parking Lot Pricing

ient from my Verizon, Samsung Galaxy smartphone

Speed Fab-Crete
GENERAL CONTRACTOR

Rowlett Sapphire Bay
Proposed Contingency Change Order #43R
September 30, 2025

	PROPOSED CHANGES: owner directed parking lot changes		
1.	Rip rap at sea wall	19,500	
2	Grade changes at concrete thickness change	4,500	
3	Power for gates	21,675	
4	Utility changes	39,237	
5	Concrete changes	52,217	
6.	Bollards at front entry	1,500	
6.	General Conditions	47,462	
	SUBTOTAL:	186,091	
	SFC Fee 6.5%	12,096	
	Insurance/Bond 1.8%	3,350	
	TOTAL:	**201,537**	

Texas B Excavation, LLC

2105 FM 1139, ROCKWALL, TX 75032
972-979-5553 (Owner)
972-722-3140 (Fax)
214-738-9609 (Estimator)
texasbexcavation@yahoo.com

CHANGE PROPOSAL NO.3
ADD RIP-RAP Pad
September 25, 2025

TO: Speed Fab-Crete

ATTN: Project Manager

RE: Saphire Bay Fire Station Project
1301 Easy Street
Rowlett, Texas

CHANGE ORDER PROPOSAL #3

In review of drawings issued Sept 6, 2025 for final changes in the scope of work on this project, the only other revision we need to make is the item #48 rip-rap pad shown on sheet C1.0, as follows:

CO #3 –
Line 1. ADD a 98SY cement stabilized rip-rap pad (rock to be 8"-12"). The additional cost for this work will be ***$19,500.00.***

Line 2. Cut out 8" concrete instead of 5". The additional cost for this work will be ~~***$5500.00***~~ 4506

Accepted by: _____ Date: _____

ROBERT KENT
CONSTRUCTION

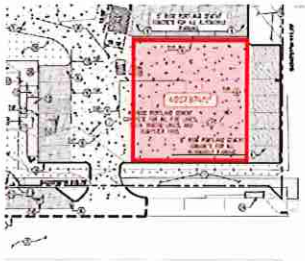
CHANGE ORDER REQUEST

PROJECT NAME: Sapphire Bay - Fire Station #5
PROJECT NO: 4063
GENERAL CONTRACTOR: Speed Fab-Crete
ATTENTION: Janis Perty

C.O.R. NO.: 012
DATE: 10.01.2025
REFERENCE: "Final" Civil Plans (ASI 019R)

DESCRIPTION OF CHANGE: Changes in civil plans from ASI 013 to ASI 019R.
DEDUCT: ($6,300.00) FOR AREA BELOW TO BE 5" IN LIEU OF 8" PER REQUEST.

Additive Costs	
Added Paving + 1,569 SF	$20,748.00
Added Curb Wall + 175 LF	$15,750.00
Added Bollard Base + 3 EA	$2,250.00
Added Pourback at Approach (4s & 18", App. 3600 Mix) + 608 SF	$15,269.00
Added Mobilization (COR #011 Not Executed) + 1 EA	$4,500.00
Subtotal of Additive Cost	$58,517.00
Deductive Costs	
Lump Sum - See Attached	$0.00
Subtotal of Deductive Cost	$0.00
Total Direct Cost	$58,517.00
Mark-up	included
Total Subcontractor Change Request	$58,517.00



Drake Tidwell, Project Manager

ASI #3 - 5" 106 CY
8" 420 CY

ASI #16 - 5" 85 CY
8" 533 CY

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 4.D.

Title
Consider action to approve the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan for the Bayside PID North Improvement Area.

Consider action to adopt an ordinance adopting changes to the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan including the annual update to the Assessment Roll and levy of assessments on property in the PID pursuant to the Service and Assessment Plan for the Bayside PID – North Improvement Area.

Staff Representative
Michael Kuhn, Treasurer & Debt Mgr.

Executive Summary
Annual updates to PIDs are required by the PID Act, Chapter 372, Texas Local Government Code. The purpose of this item is to update the Service and Assessment Plan, the Assessment Roll, and the levy of assessments on property in the Bayside PID North Improvement Area.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
FOSTER ECONOMIC VITALITY	5.3 Cultivate Bayside as a premier destination development.

Background Information
The City Council created the Bayside PID on September 15, 2015.

On March 1, 2016, the City Council approved the Bayside PID North Service and Assessment Plan, the Assessment Roll, and the levy of the assessments on property in the PID.

Annual updates to the Bayside PID North Service and Assessment Plan, the Assessment Roll, and the levy of assessments on property in the PID were approved by City Council as follows:

- December 16, 2016
- July 18, 2017

- December 18, 2018
- September 17, 2019
- September 15, 2020
- October 12, 2021 – Amended and Restated Service and Assessment Plan
- October 18, 2022
- October 17, 2023
- November 12, 2024

Discussion

Annual ordinances will reflect updates to authorized improvements, budget, assessment methodology, parcel status, prepayments for assessment, and annual installments to be collected for PID bonds and obligations. These ordinances will provide for billing of the calculated assessment each year to those property owners included on the approved Assessment Roll.

The summary of updates for the improvement area is as follows:

Sources & Uses of Funds

Table II-A-2
Updated Sources and Uses of Funds

Sources of Funds	Estimated Budget	Budget Changes	Revised Budget[1]	Actual Costs[1]	Variance
Par amount	$13,515,000	$0	$13,515,000	$13,515,000	$0
Owner Contribution	$1,801,172	($917)	$1,800,255	$1,800,255	$0
Other funding sources	$0	$1,882,181	$1,882,181	$1,882,181	$0
Total Sources	**$15,316,172**	**$1,881,264**	**$17,197,436**	**$17,197,436**	**$0**
Uses of Funds					
North Improvements - Hard Costs					
Roadways	$4,400,000	$188,348	$4,588,348	$4,588,348	$0
Wastewater	$2,420,000	$263,718	$2,683,718	$2,683,718	$0
Storm Drainage	$885,000	$6,286	$891,286	$891,286	$0
Water	$1,325,000	($348,467)	$976,533	$976,533	$0
Public Open Space & Trail System	$825,000	$0	$825,000	$825,000	$0
Subtotal: North Improvements Hard Costs	*$9,855,000*	*$109,885*	*$9,964,885*	*$9,964,885*	*$0*
Additional Offsite Improvements - North Portion					
Offsite wastewater improvements	$0	$1,882,181	$1,882,181	$1,882,181	$0
Subtotal: North Improvements and Offsite Improvements	*$9,855,000*	*$1,992,066*	*$11,847,066*	*$11,847,066*	*$0*
North Improvements - Soft Costs					
Bonds & Mobilization	$450,000	($95,988)	$354,012	$354,012	$0
Geotechnical & material testing	$300,000	($229,595)	$70,405	$70,405	$0
Civil eng. Design, surveying, staking & CA services	$500,000	$239,712	$739,712	$739,712	$0
Miscellaneous fees	$150,000	($47,836)	$102,164	$102,164	$0
Inspection Fees - Paving and Utilities only	$315,000	$22,905	$337,905	$337,905	$0
Subtotal: North Improvements Soft Costs	*$1,715,000*	*($110,802)*	*$1,604,198*	*$1,604,198*	*$0*
Bond Issuance Costs					
Capitalized interest	$1,613,845	$0	$1,613,845	$1,613,845	$0
Reserve fund	$1,017,858	$0	$1,017,858	$1,017,858	$0
Other costs of issuance including underwriter's discount	$1,114,469	$0	$1,114,469	$1,114,469	$0
Subtotal: Bond Issuance Costs	*$3,746,172*	*$0*	*$3,746,172*	*$3,746,172*	*$0*
Total Uses	**$15,316,172**	**$1,881,264**	**$17,197,436**	**$17,197,436**	**$0**

1 – According to North Improvements' Draw Request #13 as approved by the City on March 11, 2019.

Summary of Development Update

Table II-C-1
Completed Homes

Status	As of September 26, 2023[2]	Total as of September 4, 2024[3]	Total as of September 10, 2025[3]
Completed Homes	148	190	274

1 – According to DCAD records as of September 26, 2023.
2 – According to DCAD records as of September 4, 2024.
3 – According to DCAD records as of September 10, 2025.

According to DCAD records, the aggregate 2025 market value for Parcels within the North Improvement Area of the PID is $333,090,161.

Annual Assessment by Lot Type

Table II-E-1
Annual Installment Per Unit[2]

Lot Type	No. of Outstanding Units[1]	Total Outstanding Assessments[1]	Percentage of Total Annual Installments[1]	Total Annual Installments	Annual Installments per unit
30' Lot	82	$788,723.54	11.00%	$71,453.24	$871.38
50' Lot	106	$1,199,493.48	16.73%	$108,666.33	$1,025.15
35' Lot	58	$664,530.71	9.27%	$60,202.17	$1,037.97
Condo	52	$264,793.84	3.69%	$23,988.61	$461.32
Townhomes	139	$1,327,151.84	18.51%	$120,231.35	$864.97
22' Townhome	123	$1,174,386.16	16.38%	$106,391.77	$864.97
Multifamily	0	$0.00	0.00%	$0.00	$0.00
Commercial	263,900	$1,679,785.95	23.43%	$152,177.71	$0.58
HOA	1	$71,705.71	1.00%	$6,496.07	$6,496.07
Total		**$7,170,571.24**	**100.00%**	**$649,607.26**	

1 – Includes prepaid Parcels as of July 31, 2025.
2 - Amounts shown above are rounded to the nearest dollar.

Indebtedness

Outstanding Assessments: $7,170,571

Annual Budget

Table II-D-1
Budget for the Annual Installments to be Collected for 2025-26

	North Improvement Area Bonds[1]
Interest payment on March 15, 2026	$209,877
Interest payment on September 15, 2026	$209,877
Principal payment on September 15, 2026	$160,000
Subtotal Debt Service payments	*$579,754*
Administrative Expenses	$48,000
Excess Interest for Delinquency Reserves	$35,853
Subtotal Expenses	*$663,607*
Available Reserve Fund Income	($14,000)
Available Capitalized Interest Account	$0
Available Other Funds	$0
Available Administrative Expenses Account	$0
Subtotal Funds Available	*($14,000)*
Annual Installment to be Collected	**$649,607**

1 – Amounts shown above are rounded to the nearest dollar for presentation purposes, whereas the calculations are to the cent.

Changes to Assessment Methodology

No changes to assessment methodology.

Parcel Subdivision Summary

According to the Developer and DCAD online records, Parcel 441107100C0040000 was subdivided into fifty-eight (58) 35' single family residential lots, one hundred twenty-three (123) 22’ single family townhome lots, and one (1) mixed-use parcel comprised of fifty-two (52) condominium units and 4,900 square feet of commercial development. The Parcels within the Sunset Landing at Bayside plat were billed individually beginning in tax year 2025.

Table IV-A-1
Assessment Allocation - Sunset Landing

Prior to Subdivision				After Subdivision			
Parcel	**Proposed Development**	**Unit Count**	**Outstanding Assessment**	**Parcel**	**Proposed Development**	**Unit Count**	**Outstanding Assessment**
441107100C0040000	35' Lot	58	$664,531	Various	35' Lot	58	$664,531
	22' Townhome	123	$1,174,386	Various	22' Townhome	123	$1,174,386
	Condo	52	$264,794	447760000E0180000	Condo	52	$264,794
	Commercial	4,900	$31,190		Commercial	4,900	$31,190
					Subtotal		*$295,984*
Total			**$2,134,900**				**$2,134,900**

According to the DCAD online records, Parcel 441107100A0010000 was subdivided into three (3) Parcels with an estimated commercial development of 125,000 square feet.

Table IV-A-2
Assessment Allocation – Parcel 441107100A0010000

Prior to Subdivision				After Subdivision			
Parcel	Proposed Development	Unit Count (SF)	Outstanding Assessment	Parcel	Proposed Development	Unit Count (SF)	Outstanding Assessment
441107100A0010000	Commercial	125,000	$795,655	449106500A01R0000	Commercial	46,604	$296,648
				449106500A02R0000	Commercial	18,346	$116,775
				449106500B01R0000	Commercial	60,050	$382,232
Total		**125,000**	**$795,655**			**125,000**	**$795,655**

Prepayment Summary
As of July 31, 2025, four (4) multifamily Parcels, eight (8) fifty-foot Parcels, and seventeen (17) thirty-foot Parcels were prepaid in full.

Financial/Budget Implications
This action has no impact on the City's annual budget. All costs are borne by the property owners within the Bayside Public Improvement District.

Recommended Action
Move to adopt the Ordinance approving the Bayside Public Improvement District North Improvement Area Annual Service Plan Update, the North Improvement Area 2025-2026 Assessment Roll Update, and the levy of the assessments on property in the North Improvement Area.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS, REVIEWING AND UPDATING THE SERVICE PLAN INCLUDING AN UPDATED ASSESSMENT ROLL FOR THE BAYSIDE PUBLIC IMPROVEMENT DISTRICT – NORTH IMPROVEMENT AREA OF THE CITY OF ROWLETT; PROVIDING A SEVERABILITY CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council of the City of Rowlett, Texas, following due and strict compliance with the laws of the State of Texas and the ordinances of the City of Rowlett, Texas, and having given requisite notice by publication and otherwise, and after holding full and fair public hearings, has authorized the creation of the Bayside Public Improvement District (the "District") of the City of Rowlett; and

WHEREAS, the City Council has, following due notice and hearing, adopted and approved Service and Assessment Plans for the North Area Improvements, as described therein, on which assessment rolls have been created and made available for public inspection, and assessments have been levied on the properties within the District; and

WHEREAS, the Service and Assessment Plan and Assessment Roll is required to be reviewed and updated annually for annual budget purposes as required by the Public Improvement District Assessment Act, Chapter 372 of the Texas Local Government Code; and

WHEREAS, the Annual Service Plan Update and updated Assessment Roll summaries for the North Improvement Area, attached as Exhibit A hereto, conform the original Assessment Roll to the principal and interest payment schedule required for the bonds issued by the District, and update the Assessment Rolls to reflect prepayments, property divisions and changes to the budget allocation for District public improvements that occur during the year, if any; and

WHEREAS, the City Council now desires to proceed with the adoption of this Ordinance and to approve and adopt the Annual Service Plan Update and the updated Assessment Roll summary attached thereto for the North Improvement Area, in conformity with the requirements of law; and

WHEREAS, the City Council finds the passage of this Ordinance to be in the best interest of the citizens of Rowlett.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS THAT:

SECTION 1: All matters stated in the preamble to this ordinance are found to be true and correct and are incorporated herein as if copied in their entirety.

SECTION 2: The Bayside Annual Service Plan Update and updated Assessment Roll – North Improvement Area, attached hereto and incorporated herein by this reference as Exhibit A, be and are hereby accepted, adopted and approved.

SECTION 3: The City Secretary is directed to cause a copy of this Ordinance, including the 2025-2026 Annual Service Plan to be recorded in the real property records of Dallas County, Texas, on or before October 28, 2025. The City Secretary is further directed to similarly file each Annual Service Plan Update approved by the City Council, with each such filing to occur within seven days of the date each respective Annual Service Plan Update is approved.

SECTION 4: This Ordinance shall be cumulative of all other City Ordinances and all other provisions of other Ordinances adopted by the City which are inconsistent with the terms or provisions of this Ordinance are hereby repealed.

SECTION 5: It is hereby declared to be the intention of the City Council of the City of Rowlett, Texas, that sections, paragraphs, clauses and phrases of this Ordinance are severable, and if any phrase, clause, sentence, paragraph or section of this Ordinance shall be declared legally invalid or unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such legal invalidity or unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs or sections of this Ordinance since the same would have been enacted by the City Council of the City of Rowlett without the incorporation in this Ordinance of any such legally invalid or unconstitutional, phrase, sentence, paragraph or section.

SECTION 6: This Ordinance shall take effect immediately from and after its passage as the law and charter in such cases provide.

Attachments

1. Exhibit A – Annual Service Plan Update and 2025-26 Assessment Roll update – North Improvement Area

BAYSIDE
PUBLIC IMPROVEMENT DISTRICT

CITY OF ROWLETT, TEXAS

NORTH IMPROVEMENT AREA
ANNUAL SERVICE PLAN UPDATE

(ASSESSMENT YEAR 9/15/25 - 9/14/26)

PRESENTED TO CITY COUNCIL ON:
OCTOBER 21, 2025

PREPARED BY:

MUNICAP, INC.
PUBLIC FINANCE

BAYSIDE
PUBLIC IMPROVEMENT DISTRICT

NORTH IMPROVEMENT AREA
ANNUAL SERVICE PLAN UPDATE
(ASSESSMENT YEAR 9/15/25 – 9/14/26)

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I. INTRODUCTION

The Bayside Public Improvement District (the "PID") was created pursuant to Chapter 372 of the Texas Local Government Code (as amended, the "PID Act") and a resolution of the City Council on September 15, 2015 to finance certain public improvement projects for the benefit of Assessed Property within the PID. The City of Rowlett, Texas (the "City") issued Special Assessment Revenue Bonds, Series 2016 (Bayside Public Improvement District North Improvement Area Project) (the "North Improvement Area Bonds") in the aggregate principal amount of $13,515,000 to finance the costs of constructing the North Improvement Area Improvements for the benefit of the Assessed Property within the North Improvement Area.

The PID consists of approximately 317 acres of property within the City limits. The North Improvement Area consists of approximately 142 acres within the PID. A service and assessment plan (the "Service and Assessment Plan") was prepared at the direction of the City identifying the public improvements (the "North Improvements") to be constructed, the costs of the North Improvements, the indebtedness to be incurred for the North Improvements, and the manner of assessing the benefitted property within the North Improvement Area of the PID for the costs of the North Improvements.

On January 7, 2020, the Service and Assessment Plan was initially amended and restated at the direction of the City to address the manner of assessing the benefitted property within the South Improvement Area of the PID due to the introduction of an updated development plan and new land use types; additionally on October 12, 2021, the Service and Assessment Plan was updated to address the manner of assessing the benefitted property within the North Improvement Area of the PID due to the introduction of an updated development plan and new land use types (the "Amended and Restated Service and Assessment Plan"). Pursuant to the PID Act, the Amended and Restated Service and Assessment Plan must be reviewed and updated annually. This document is the annual update of the Amended and Restated Service and Assessment Plan for 2025-26 (the "Annual Service Plan Update").

The City also adopted an assessment roll (the "Assessment Roll") identifying the Assessments on each Parcel of Assessed Property within the North Improvement Area of the PID, based on the method of assessment identified in the Amended and Restated Service and Assessment Plan. This Annual Service Plan Update also updates the Assessment Roll for 2025-26.

Effective September 1, 2021, the Texas legislature passed House Bill 1543 as an amendment to the PID Act, requiring, among other things, (i) all Service and Assessment Plans and Annual Service Plan Updates be approved through City ordinance or order to be filed with the county clerk of each county in which all or part of the PID is located within seven days and (ii) include a copy of the notice form required by Section 5.014 of the Texas Property Code (the "PID Assessment Notice") as disclosure of the obligation to pay PID Assessments. In light of these amendments to the PID Act, this Annual Service Plan Update includes a copy of the PID Assessment Notice as Appendix D and a copy of this Annual Service Plan Update will be filed with the county clerk in

each county in which all or a part of the PID us located not later than seven (7) days after the date the governing body of the City approves this Annual Service Plan Update.

Section 372.013 of the PID Act, as amended, stipulates that a person who proposes to sell or otherwise convey real property that is located in the PID, except in certain situation described in the PID Act, shall first give to the purchaser of the property a copy of the completed PID Assessment Notice. The PID Assessment Notice shall be given to a prospective purchase before the execution of a binding contract of purchase and sale, either separately or as an addendum or paragraph of a purchase contract. In the event a contract of purchase and sale is entered into without the seller provided the required notice, the purchaser, subject to certain exceptions described in the PID act, is entitled to terminate the contract.

The PID Assessment Notice shall be executed by the seller and must be filed in the real property records of the County in which the property is located at the closing of the purchase and sale of the property.

Capitalized terms shall have the meanings set forth in the Amended and Restated Service and Assessment Plan unless otherwise defined herein.

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II. UPDATE OF THE SERVICE PLAN

A. UPDATED SOURCES AND USES FOR PUBLIC IMPROVEMENTS

According to the original Service and Assessment Plan adopted on March 1, 2016, the initial total estimated costs of the North Improvements, including North Improvement Area costs of issuance, were equal to $15,316,172. According to the Developer's North Improvements Draw Request #13 approved as of March 11, 2019, the actual costs of the North Improvements are $15,315,255 representing a $917 decrease from the original cost estimates.

The City has undertaken the constructing of certain additional offsite wastewater improvements (the "Additional Offsite Wastewater Improvements"), as defined herein, that confer a special benefit to the North Improvement Area, the South Improvement Area and property outside of the PID. Such improvements were funded by the City and are eligible to be reimbursed to the City from excess funds available to the PID to the extent such excess funds are not required to fund existing PID obligations.

The Additional Offsite Wastewater Improvements consists of construction, installation and/or expansion of downstream force main for the Bayside Lift Station, parallel gravity sewer on Miller Road near President George Bush Turnpike, new pump and parallel downstream force main for the Rowlett Road Lift Station, and gravity sewer replacement west of Rowlett Creek. The Additional Offsite Wastewater Improvements will be constructed according to City standards.

Table II-A-1 on the following page summarizes the estimated benefits of the Additional Offsite Wastewater Improvements and the amounts allocated to the North Improvement Area (the "North Improvement Area Portion"), the amounts allocated to the South Improvement Area (the "South Improvement Area Portion") and the amounts allocated to the property outside of the PID (the "City Portion") as provided by the City as of October 5, 2023. The amounts shown in Table II-A-1 are estimates and may be updated in Annual Service Plan Updates.

Table II-A-1
Updated Sources and Uses of Funds

Sources of Funds	Final Cost[1]	North Improvement Area Portion		South Improvement Area Portion		City Portion	
		Allocation %[2]	Amount	Allocation %[2]	Amount	Allocation %[2]	Amount
Additional Offsite Wastewater Improvements							
Downstream force main - Bayside Lift station	$5,589,168	27.71%	$1,548,563	42.79%	$2,391,801	29.50%	$1,648,804
Parallel gravity sewer on Miller Road near President George Bush Turnpike	$1,016,483	16.15%	$164,146	24.94%	$253,527	58.91%	$598,810
Pump for the Rowlett Road Lift Station	$465,569	8.66%	$40,307	13.37%	$62,257	77.97%	$363,005
Parallel downstream force main for the Rowlett Road Lift Station	$1,176,289	8.66%	$101,840	13.37%	$157,296	77.97%	$917,153
Gravity sewer replacement west of Rowlett Creek	$1,293,400	2.11%	$27,325	3.26%	$42,203	94.62%	$1,223,872
Subtotal: Additional Offsite Wastewater Improvement Costs	***$9,540,909***		***$1,882,181***		***$2,907,084***		***$4,751,644***

1 - Additional Offsite Wastewater Improvements of $9,540,909 as of October 5, 2023 were fully funded by the City.

2 – Allocation percentages are provided by the City as of October 5, 2023 and represent the pro rata benefit applicable to each portion.

Table II-A-2 on the following page summarizes the updated sources and uses of funds required to (1) construct the North Improvements, (2) establish the PID, and (3) issue the North Improvement Area Bonds.

For additional North Improvement Area development-related information, refer to the link below:

https://emma.msrb.org/IssueView/Details/ES360858

Table II-A-2
Updated Sources and Uses of Funds

Sources of Funds	Estimated Budget	Budget Changes	Revised Budget[1]	Actual Costs[1]	Variance
Par amount	$13,515,000	$0	$13,515,000	$13,515,000	$0
Owner Contribution	$1,801,172	($917)	$1,800,255	$1,800,255	$0
Other funding sources	$0	$1,882,181	$1,882,181	$1,882,181	$0
Total Sources	**$15,316,172**	**$1,881,264**	**$17,197,436**	**$17,197,436**	**$0**
Uses of Funds					
North Improvements - Hard Costs					
Roadways	$4,400,000	$188,348	$4,588,348	$4,588,348	$0
Wastewater	$2,420,000	$263,718	$2,683,718	$2,683,718	$0
Storm Drainage	$885,000	$6,286	$891,286	$891,286	$0
Water	$1,325,000	($348,467)	$976,533	$976,533	$0
Public Open Space & Trail System	$825,000	$0	$825,000	$825,000	$0
Subtotal: North Improvements Hard Costs	*$9,855,000*	*$109,885*	*$9,964,885*	*$9,964,885*	*$0*
Additional Offsite Improvements - North Portion					
Offsite wastewater improvements	$0	$1,882,181	$1,882,181	$1,882,181	$0
Subtotal: North Improvements and Offsite Improvements	*$9,855,000*	*$1,992,066*	*$11,847,066*	*$11,847,066*	*$0*
North Improvements - Soft Costs					
Bonds & Mobilization	$450,000	($95,988)	$354,012	$354,012	$0
Geotechnical & material testing	$300,000	($229,595)	$70,405	$70,405	$0
Civil eng. Design, surveying, staking & CA services	$500,000	$239,712	$739,712	$739,712	$0
Miscellaneous fees	$150,000	($47,836)	$102,164	$102,164	$0
Inspection Fees - Paving and Utilities only	$315,000	$22,905	$337,905	$337,905	$0
Subtotal: North Improvements Soft Costs	*$1,715,000*	*($110,802)*	*$1,604,198*	*$1,604,198*	*$0*
Bond Issuance Costs					
Capitalized interest	$1,613,845	$0	$1,613,845	$1,613,845	$0
Reserve fund	$1,017,858	$0	$1,017,858	$1,017,858	$0
Other costs of issuance including underwriter's discount	$1,114,469	$0	$1,114,469	$1,114,469	$0
Subtotal: Bond Issuance Costs	*$3,746,172*	*$0*	*$3,746,172*	*$3,746,172*	*$0*
Total Uses	**$15,316,172**	**$1,881,264**	**$17,197,436**	**$17,197,436**	**$0**

1 – According to North Improvements' Draw Request #13 as approved by the City on March 11, 2019.

Authorized Improvement Cost Variances

As stated in Table II-A-2 on the previous page, there are no significant variances to be reported at this time.

B. Five Year Service Plan

According to the PID Act, a service plan must cover a period of five years. According to the Developer's Quarterly Improvement Implementation Report dated as of June 22, 2020, all North Improvements were completed and accepted by the City as of February 25, 2020.

For additional PID development and improvement related information, refer to the link provided in Section II.A. of this report.

The projected Annual Installments for the North Improvements over a period of five years is shown in Table II-B-1 below.

Table II-B-1
Projected Annual Installments (2016-2031)[3]

Assessment Year ending September 15	Principal Payments[1]	Interest Expense	Administrative Expenses	Prepayment Reserve	Delinquency Reserve	Capitalized Interest or Excess Pledged Revenue Balance	Annual PID Installments[2]
2016-2025	$810,000	$4,508,516	$356,711	$149,391	$224,088	($1,701,356)	$4,347,350
2026	$160,000	$419,754	$48,000	$0	$35,853	($14,000)	$649,607
2027	$200,000	$413,463	$48,960	$0	$35,250	$0	$697,673
2028	$210,000	$402,713	$49,939	$0	$34,250	$0	$696,902
2029	$220,000	$391,425	$50,938	$0	$33,200	$0	$695,563
2030	$220,000	$379,600	$51,957	$0	$32,100	$0	$683,657
2031	$250,000	$367,775	$52,996	$0	$0	$0	$670,771
Total	**$2,070,000**	**$6,883,245**	**$659,501**	**$149,391**	**$394,741**	**($1,715,356)**	**$8,441,522**

1 - Principal payments shown above do not include principal redeemed via prepayment-related extraordinary optional redemptions, if any.
2 - Assessment years ending 2016 through 2026 reflect actual Annual Installments and are net of applicable investment income and other credits. Assessment years 2027 through 2031 reflect projected Annual Installments and will be updated in future annual service plan updates.
3 - Amounts shown above are rounded to the nearest dollar.

C. Status of Development

According to the Dallas County Central Appraisal District ("DCAD") records dated as of September 10, 2025, two hundred and seventy-four (274) residential units have been completed and sold to end users, which represents approximately 46.84 percent of the anticipated 585 single-family residential units anticipated to be developed within the North Improvement Area of the PID.

See Table II-C-1 below for the status of completed homes within the PID according to the DCAD records dated as of September 10, 2025.

Table II-C-1
Completed Homes

Status	As of September 26, 2023[2]	Total as of September 4, 2024[3]	Total as of September 10, 2025[3]
Completed Homes	148	190	274

1 – According to DCAD records as of September 26, 2023.
2 – According to DCAD records as of September 4, 2024.
3 – According to DCAD records as of September 10, 2025.

According to DCAD records, the aggregate 2025 market value for Parcels within the North Improvement Area of the PID is $333,090,161.

D. ANNUAL BUDGET

Annual Installments

The Assessment imposed on any Parcel may be paid in full at any time. If not paid in full, the Assessment shall be payable in thirty-one annual installments of principal and interest beginning with the tax year following the issuance of the North Improvement Area Bonds, of which twenty-one (21) Annual Installments remain outstanding.

Pursuant to the Amended and Restated Service and Assessment Plan, each Assessment shall bear interest at the rate on the North Improvement Area Bonds commencing with the issuance of the North Improvement Area Bonds. The effective interest rate on the North Improvement Area Bonds is 5.85 percent for 2025-26. Pursuant to Section 372.018 of the PID Act, the interest rate for that Assessment may not exceed a rate that is one-half of one percent higher than the actual interest rate paid on the debt. As described in the Service and Assessment Plan, the additional interest of one-half of one percent (the "Excess Interest Rate") is included in the Annual Installment calculation for 2025-26. In addition, the estimated annual Administrative Expenses for 2025-26 are included in the Annual Installments for 2025-26. These Annual Installments of the Assessments shall be billed by the City, or any other party designated by the City, in 2025 and will be delinquent on February 1, 2026.

Pursuant to the Service and Assessment Plan, the Annual Service Plan Update shall show the remaining balance of the Assessments and the Annual Installment due for 2025-26 to be collected from each Parcel. The Annual Installment amount shall be allocated to each Parcel based on the percentage of Assessment allocated to each Parcel within the North Improvement, as calculated using the amount of Assessment on a Parcel to the total amount of Assessments within the North Improvement Area of the PID as a whole that are payable at the time of such allocation. Each Annual Installment shall be reduced by any credits applied under an applicable ordinances or Indenture of Trust, such as capitalized interest and interest earnings on any account balances and by any other funds available to the PID.

Annual Budget for the Repayment of Indebtedness

Debt service on the North Improvement Area Bonds will be paid from the collection of the Annual Installments. Administrative Expenses are also to be collected with the Annual Installments to pay expenses related to the collection of the Annual Installments and other PID administration expenses. In addition, 40% of the additional interest amount collected as part of the Annual Installment will be used to fund the Prepayment Reserve and 60% of such additional interest amount collected will be used to fund the Delinquency Reserve until such time as each reserve contains the required amounts, as described in the Service and Assessment Plan and the Indenture of Trust relating to the North Improvement Area Bonds.

Annual Installments to be collected for 2025-26

The budget for the North Improvement Area of the PID will be paid from the collection of Annual Installments collected from the North Improvement Area Assessed Property for 2025-26 as shown in Table II-D-1 below.

Table II-D-1
Budget for the Annual Installments
to be Collected for 2025-26

	North Improvement Area Bonds[1]
Interest payment on March 15, 2026	$209,877
Interest payment on September 15, 2026	$209,877
Principal payment on September 15, 2026	$160,000
Subtotal Debt Service payments	*$579,754*
Administrative Expenses	$48,000
Excess Interest for Delinquency Reserves	$35,853
Subtotal Expenses	*$663,607*
Available Reserve Fund Income	($14,000)
Available Capitalized Interest Account	$0
Available Other Funds	$0
Available Administrative Expenses Account	$0
Subtotal Funds Available	*($14,000)*
Annual Installment to be Collected	**$649,607**

1 – Amounts shown above are rounded to the nearest dollar for presentation purposes, whereas the calculations are to the cent.

Debt Service Payments

Annual Installments to be collected for principal and interest include interest due on March 15, 2026 in the amount of $209,877 and on September 15, 2026 in the amount of $209,877, which equal interest on the outstanding Assessments balance of $7,170,571 for six months each and an effective interest rate of 5.85 percent. Annual Installments to be collected include a principal

amount of $160,000 due on September 15, 2026. As a result, total principal and interest due in 2025-26 is estimated to be equal to $579,754.

Administrative Expenses

Administrative expenses include the City, Administrator, Trustee, dissemination agent expenses, third-party tax collector expenses, and contingency fees. As shown in Table II-D-2 below, the total administrative expenses to be collected for 2025-26 are estimated to be $48,000.

Table II-D-2
Administrative Budget Breakdown

Description	2025-26 Estimated Budget (2/1/25-1/31/26)
City	$5,000
Administrator	$25,000
Trustee	$2,500
Dissemination Agent	$3,500
UTS (Billing)	$10,000
Contingency	$2,000
Total	**$48,000**

Excess Interest for Delinquency Reserve

Annual Installments are anticipated to be collected for excess interest for delinquency reserves in the amount of $35,853, which equals 0.5 percent interest on the outstanding Assessment balance on the North Improvement Area of $7,170,571.

Available Reserve Fund Income

As of July 31, 2025, there has been approximately $42,044 in excess reserve fund income earned above the reserve fund requirement. As a result, a pro rata portion of the excess reserve fund income in the amount of $14,000 is available to be applied as a credit to reduce the 2025-26 North Improvement Area Annual Installment.

Available Administrative Expense Account

As of July 31, 2025, the balance in the Administrative Expense Fund was $50,895. The available Administrative Expense funds are anticipated to be used for the payment of the current year administrative expenses. As a result, there are no funds anticipated to be available in the Administrative Expense Fund to reduce the 2025-26 Annual Installment.

E. ANNUAL INSTALLMENTS PER UNIT

The Actual Costs of the portion of the North Improvements to be financed with the North Improvement Area Bonds shall be allocated to the North Improvement Area Assessed Property by spreading the entire Assessment across all Parcels and Lots within the North Improvement Area based on the ratio of the estimated build out value of each Lot to the total build out value for all Parcels within the North Improvement Area.

The outstanding number of units, total outstanding Assessments, percentage of total Annual Installments, total Annual Installments, and Annual Installments per unit for each Lot Type are shown in Table II-E-1 below.

Table II-E-1
Annual Installment Per Unit[2]

Lot Type	No. of Outstanding Units[1]	Total Outstanding Assessments[1]	Percentage of Total Annual Installments[1]	Total Annual Installments	Annual Installments per unit
30' Lot	82	$788,723.54	11.00%	$71,453.24	$871.38
50' Lot	106	$1,199,493.48	16.73%	$108,666.33	$1,025.15
35' Lot	58	$664,530.71	9.27%	$60,202.17	$1,037.97
Condo	52	$264,793.84	3.69%	$23,988.61	$461.32
Townhomes	139	$1,327,151.84	18.51%	$120,231.35	$864.97
22' Townhome	123	$1,174,386.16	16.38%	$106,391.77	$864.97
Multifamily	0	$0.00	0.00%	$0.00	$0.00
Commercial	263,900	$1,679,785.95	23.43%	$152,177.71	$0.58
HOA	1	$71,705.71	1.00%	$6,496.07	$6,496.07
Total		**$7,170,571.24**	**100.00%**	**$649,607.26**	

1 – Includes prepaid Parcels as of July 31, 2025.
2 - Amounts shown above are rounded to the nearest dollar.

The list of Parcels within the PID, the number of units to be developed on the current outstanding residential Parcels, the total outstanding Assessment, the annual principal and interest, the Administrative Expenses, and the Annual Installment to be collected for 2025-26 are shown in the Assessment Roll Summary attached hereto as Appendix B.

F. BOND REDEMPTION RELATED UPDATES

The North Improvement Area Bonds were issued in March 2016. Pursuant to Section 4.3 of the Indenture of Trust, the City reserves the right and option to redeem the North Improvement Area Bonds before their scheduled maturity dates, in whole or in part, on any interest payment date on or after **March 15, 2026**, such redemption date or dates to be fixed by the City, at the redemption prices and dates shown in the Indenture of Trust.

The Administrator has conducted a preliminary evaluation of the current refunding market conditions, recent PID bond refunding transactions, and other relevant factors. Based on this preliminary evaluation, the Administrator believes a refunding of the North Improvement Area Bonds does not appear viable at this time. The Administrator will continue to monitor the refunding market conditions, applicable PID bond refunding transactions, and other relevant factors to determine if refunding becomes viable in the future and will inform the City accordingly.

(remainder of this page is intentionally left blank)

III. UPDATE OF THE ASSESSMENT PLAN

Pursuant to the Amended and Restated Service and Assessment Plan adopted by the City Council, the Actual Costs of the portion of the North Improvements to be financed with the North Improvement Area Bonds shall be allocated to the North Improvement Area Assessed Property by spreading the entire Assessment across all Parcels and Lots within the North Improvement Area based on the ratio of the estimated build out value of each Lot to the total build out value for all Parcels within the North Improvement Area.

This method of assessing property has not been changed for 2025-26 and the Annual Installment allocation percentage calculations shown in Appendix B, and the Assessed Property will continue to be assessed as provided for in the Amended and Restated Service and Assessment Plan.

(remainder of this page is intentionally left blank)

IV. UPDATE OF THE ASSESSMENT ROLL

Pursuant to the original Service and Assessment Plan, the Assessment Roll shall be updated each year to reflect changes such as:

> (i) the identification of each Parcel; (ii) the Assessment for each Assessed Property, including any adjustments authorized by the Service and Assessment Plan or in the PID Act; (iii) the Annual Installment for the Assessed Property for the year (if the Assessment is payable in installments); and (iv) payments of the Assessment, if any, as provided by Section VI.G of the Service and Assessment Plan.

The summary Assessment Roll is shown in Appendix B. Each Parcel in the PID is identified, along with the Assessment on each Parcel and the Annual Installment to be collected from each Parcel.

A. PARCEL UPDATES

According to the Service and Assessment Plan, upon the subdivision of any Parcel, the Administrator shall reallocate the Assessment for the Parcel prior to the subdivision among the new subdivided Parcels according to the following formula:

$$A = B \times (C \div D)$$

Where the terms have the following meanings:

A = the Assessment for each new subdivided Parcel.
B = the Assessment for the Parcel prior to subdivision.
C = the estimated units to be built on each newly subdivided Parcel
D = the sum of the estimated units to be built on all of the new subdivided Parcels

The calculation of the estimated number of units to be built on a Parcel shall be performed by the Administrator and confirmed by the City Council based on the information available regarding the use of the Parcel. The estimate as confirmed shall be conclusive. The number of units to be built on a Parcel may be estimated by net land area and reasonable density ratios.

According to the Developer and DCAD online records, three (3) single-family estate lots, 47 fifty-foot lots, 57 thirty-foot lots, and one parcel estimated to be developed into 139 townhome units were officially recognized in the county's official roll in 2019. As a result, these respective Parcels were billed accordingly beginning in tax year 2019.

According to DCAD online records, fifteen (15) Parcels were replatted in 2020. As a result, these respective Parcels were billed accordingly beginning in tax year 2020.

According to DCAD online records, a final plat for the Bayside Townhomes representing one hundred thirty-nine (139) residential Parcels were replatted on October 7, 2020. As a result, these respective Parcels were billed accordingly beginning in tax year 2021.

According to the Developer, a replat for the Sunset Hospitality Addition was recorded in 2021. As a result, these respective Parcels were billed accordingly beginning in tax year 2022.

According to the Developer and DCAD online records, Parcel 441107200A0010000 was subdivided into one hundred and nine (109) single family residential lots in 2022. As a result, these respective Parcels were billed accordingly beginning in tax year 2023.

According to the Developer and DCAD online records, Parcel 441107100C0040000 was subdivided into fifty-eight (58) 35' single family residential lots, one hundred twenty-three (123) 22' single family townhome lots, and one (1) mixed-use parcel comprised of fifty-two (52) condominium units and 4,900 square feet of commercial development. The Parcels within the Sunset Landing at Bayside plat were billed individually beginning in tax year 2025. See Table IV-A-1 below for Assessment allocations before and after subdivision for Sunset Landing at Bayside.

Table IV-A-1
Assessment Allocation - Sunset Landing

Prior to Subdivision				After Subdivision			
Parcel	**Proposed Development**	**Unit Count**	**Outstanding Assessment**	**Parcel**	**Proposed Development**	**Unit Count**	**Outstanding Assessment**
441107100C0040000	35' Lot	58	$664,531	Various	35' Lot	58	$664,531
	22' Townhome	123	$1,174,386	Various	22' Townhome	123	$1,174,386
	Condo	52	$264,794		Condo	52	$264,794
	Commercial	4,900	$31,190	447760000E0180000	Commercial	4,900	$31,190
					Subtotal		*$295,984*
Total			**$2,134,900**				**$2,134,900**

According to the DCAD online records, Parcel 441107100A0010000 was subdivided into three (3) Parcels with an estimated commercial development of 125,000 square feet. See Table IV-A-2 on the following page for Assessment allocations before and after subdivision of Parcel 441107100A0010000.

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Table IV-A-2
Assessment Allocation – Parcel 441107100A0010000

Prior to Subdivision				After Subdivision			
Parcel	**Proposed Development**	**Unit Count (SF)**	**Outstanding Assessment**	**Parcel**	**Proposed Development**	**Unit Count (SF)**	**Outstanding Assessment**
441107100A0010000	Commercial	125,000	$795,655	449106500A01R0000	Commercial	46,604	$296,648
				449106500A02R0000	Commercial	18,346	$116,775
				449106500B01R0000	Commercial	60,050	$382,232
Total		**125,000**	**$795,655**			**125,000**	**$795,655**

B. Prepayment of Assessments

As of July 31, 2025, four (4) multifamily Parcels, eight (8) fifty-foot Parcels, and seventeen (17) thirty-foot Parcels were prepaid in full.

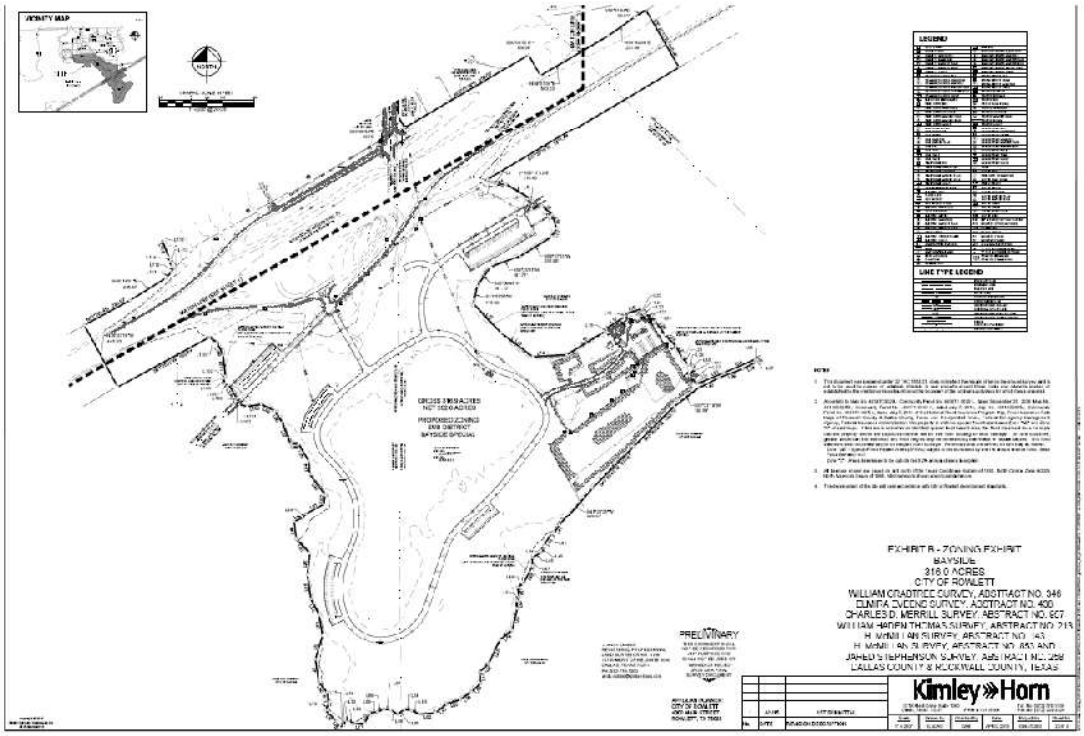
For additional prepayment related information, refer to Appendix C of this report.

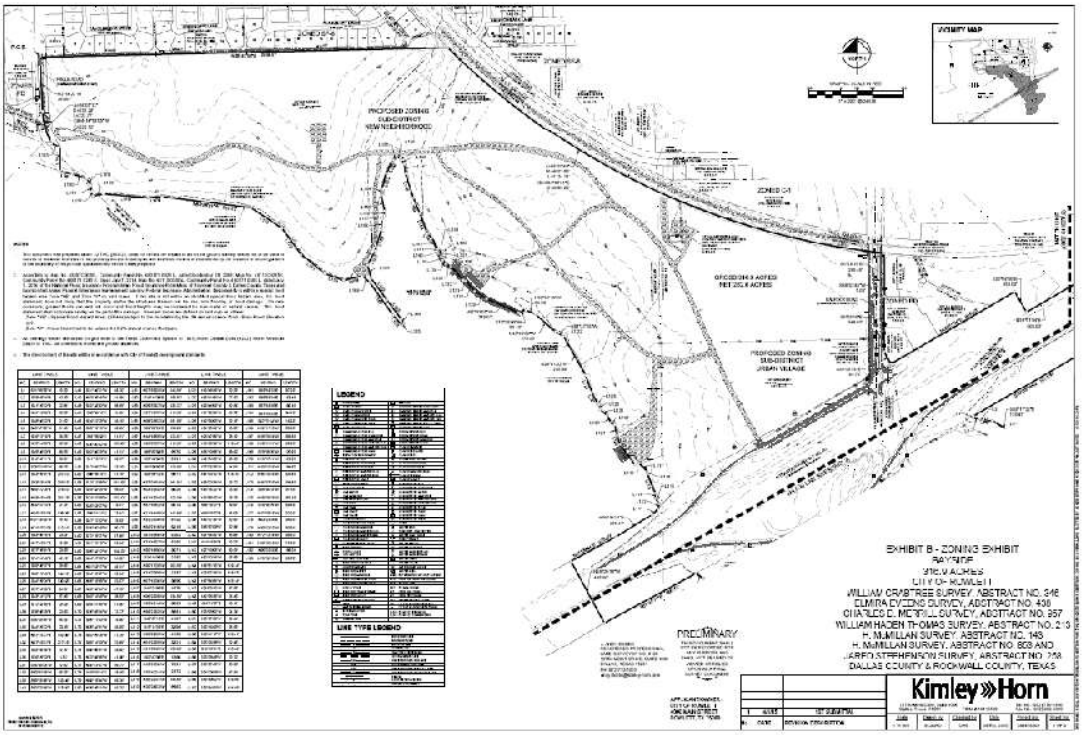
The complete Assessment Roll is available for review at Rowlett City Hall, located at 4000 Main Street, Rowlett, Texas 75088.

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APPENDIX A
PID MAP

MAP SHOWING BOUNDARIES OF THE PID





APPENDIX B
ASSESSMENT ROLL SUMMARY – 2025-26

Appendix B
Assessment Roll Summary - North Improvement Area

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
440527500A0010000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0020000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0030000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0040000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0050000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0060000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0070000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0080000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0090000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0100000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0110000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0120000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0130000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0140000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0150000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0160000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0170000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0180000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0190000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0200000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0210000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0220000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0230000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0240000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0250000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0260000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0270000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0280000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0290000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500A0300000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0010000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0020000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0030000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0040000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0050000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0060000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0070000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0080000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0090000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0100000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0110000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0120000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0130000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0140000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0150000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0160000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0170000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0180000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0190000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0200000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0210000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0220000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0230000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0240000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0250000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0260000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0270000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0280000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0290000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0300000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0310000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0320000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0330000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0340000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0350000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0360000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0370000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0380000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0390000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0400000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0410000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0420000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0430000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500B0440000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0010000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0020000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0030000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
440527500C0040000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0050000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0060000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0070000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0080000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0090000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0100000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0110000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0120000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0130000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0140000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0150000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0160000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0170000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0180000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0190000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0200000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0230000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0240000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0250000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0260000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0270000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0280000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0290000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0300000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C0310000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500C21X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440527500C22X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440527500D0010000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0020000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0030000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0040000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0050000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0060000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0070000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0080000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0090000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0100000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0110000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0120000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0130000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0140000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0150000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0160000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0170000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0180000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0190000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0200000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0220000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0230000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0240000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0250000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0260000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0270000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0280000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0290000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0300000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0310000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0320000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0330000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0340000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0350000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0360000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D0370000	Townhomes	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
440527500D21X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440527500D38X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440527500E0010000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107100B0010000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107100B0040000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107100B0080000	HOA	1.00%	$71,705.71	$1,600.00	$4,057.54	$358.53	$480.00	$6,496.07
441107100B03R0000	Multifamily	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107100C01A0000	Commercial	2.22%	$159,130.92	$3,550.76	$9,004.59	$795.65	$1,065.23	$14,416.23
441107100C02R0000	Multifamily	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107100C03R0000	Multifamily	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A0500000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0510000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0520000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A0530000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0540000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0550000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0560000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
441107200A0570000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0580000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0590000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0600000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A0610000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0620000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0630000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0640000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A0650000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0660000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A0670000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0680000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0690000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0700000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0710000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0720000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0730000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A0740000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A42B0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A75R0000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A76R0000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A77R0000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A78R0000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200A79R0000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A80R0000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A81R0000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200A83X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0010000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0020000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0030000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0040000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0050000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0060000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0070000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0080000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0090000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0100000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0110000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0120000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0130000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0140000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0150000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0160000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0170000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0180000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0190000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0200000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0210000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0220000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0230000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0240000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0250000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0260000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0270000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0280000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0290000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0300000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0310000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0320000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0330000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200F0340000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200F0350000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0010000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0020000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0030000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0040000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0050000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0060000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200G0070000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0080000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0090000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0100000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0110000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0120000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0130000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0140000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0150000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0160000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0170000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0180000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0190000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
441107200G0200000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0210000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107200G0220000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200G23X0000	Open space/ROW	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200G24X0000	Open space/ROW	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200H0010000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0020000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0030000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0040000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0050000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0060000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200H0070000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0080000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0090000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0100000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0110000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0120000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0130000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200H0140000	50' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200H0150000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107200I01X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107200K0050000 441107200K0060000 441107200K0070000	Commercial	0.80%	$57,287.13	$1,278.27	$3,241.65	$286.44	$383.48	$5,189.84
441107400A0010000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0020000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0030000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0040000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0050000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0060000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0070000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0080000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0090000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0100000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0110000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0120000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0130000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0140000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0150000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0160000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0170000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0180000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0190000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0200000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107400A0210000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0220000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0230000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0240000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0250000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0260000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0270000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0280000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0290000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0300000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0310000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0320000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0330000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0340000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0350000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0360000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0370000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0380000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0390000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0400000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0410000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0430000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0440000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0450000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0460000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0470000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0480000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A0490000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400A42A0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107400B0010000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0020000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0030000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0040000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0050000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0060000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0070000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0080000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
441107400B0090000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0100000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0110000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0120000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0130000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0140000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0150000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0160000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0170000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0180000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0190000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400B0200000	50' lot	0.16%	$11,315.98	$252.50	$640.33	$56.58	$75.75	$1,025.15
441107400C0010000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0020000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0030000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0040000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0050000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0060000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0070000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0080000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0090000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0100000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0110000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0120000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0130000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0140000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0150000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0160000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0170000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0180000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0190000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0200000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0210000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0220000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0230000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0240000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400C0250000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107400D0010000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0020000	30' lot	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
441107400D0030000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0040000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0050000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0060000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0070000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0080000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0090000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0100000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0110000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0120000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0130000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0140000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0150000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0160000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0170000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400D0180000	30' lot	0.13%	$9,618.58	$214.62	$544.28	$48.09	$64.39	$871.38
441107400E0010000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
446907500B2R10000	Multifamily	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447757100C01R0000	Commercial	5.90%	$423,383.43	$9,447.13	$23,957.60	$2,116.92	$2,834.14	$38,355.79
447757100C02R0000	Commercial	1.82%	$130,781.19	$2,918.18	$7,400.39	$653.91	$875.45	$11,847.93
447757100C03R0000	Commercial	1.15%	$82,359.04	$1,837.71	$4,660.37	$411.80	$551.31	$7,461.20
447760000A0010000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0020000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0030000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0040000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0050000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0060000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0070000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0080000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0090000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0100000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0110000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0120000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0130000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0140000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0150000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0160000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0170000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0180000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0190000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A01X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000A0200000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
447760000A0210000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0220000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0230000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0240000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0250000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0260000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0270000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0280000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0290000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A02X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000A0300000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0310000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0320000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0330000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0340000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0350000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000A0360000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0010000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0020000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0030000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0040000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0050000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0060000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0070000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0080000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0090000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0100000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0110000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0120000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0130000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0140000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0150000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0160000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0170000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0180000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0190000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B01X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000B0200000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0210000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000B0220000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0230000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0240000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0250000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0260000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0270000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0280000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0290000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B02X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000B0300000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0310000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0320000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0330000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0340000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0350000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0360000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0370000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0380000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0390000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B03X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000B0400000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0410000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0420000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0430000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0440000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0450000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0460000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B0470000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000B04X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000B05X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000B06X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C0010000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0020000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0030000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0040000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0050000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0060000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0070000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0080000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0090000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0100000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0110000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
447760000C0120000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0130000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0140000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0150000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0160000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0170000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0180000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0190000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C01X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C0200000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0210000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0220000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0230000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0240000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0250000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0260000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0270000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0280000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0290000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C02X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C0300000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0310000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0320000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0330000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0340000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0350000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0360000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0370000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0380000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0390000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C03X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C0400000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0410000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0420000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0430000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0440000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0450000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0460000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0470000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0480000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0490000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C04X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C0500000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0510000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0520000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0530000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0540000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C0550000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000C05X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C06X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C07X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000C08X0000	Open space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000D0010000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0020000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0030000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0040000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0050000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0060000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0070000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000D0080000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0090000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0100000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0110000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0120000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0130000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0140000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0150000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0160000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0170000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0180000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0190000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D01X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000D0200000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0210000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0220000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0230000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0240000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0250000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D0260000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000D02X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000D03X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Parcel ID	Proposed Development	Allocation Percentage	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
447760000D04X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000D05X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000D06X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000E0010000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000E0020000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000E0030000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000E0040000	22' Townhome	0.13%	$9,547.85	$213.05	$540.28	$47.74	$63.91	$864.97
447760000E0050000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0060000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0070000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0080000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0090000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0100000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0110000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0120000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0130000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0140000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0150000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0160000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0170000	35' Lot	0.16%	$11,457.43	$255.65	$648.33	$57.29	$76.70	$1,037.97
447760000E0180000	Condo	3.69%	$264,793.84	$5,908.46	$14,983.64	$1,323.97	$1,772.54	$23,988.61
	Commercial	0.43%	$31,189.66	$695.95	$1,764.90	$155.95	$208.78	$2,825.58
447760000E01X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
447760000E02X0000	Open Space	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
449106500A01R0000	Commercial	4.14%	$296,647.99	$6,619.23	$16,786.14	$1,483.24	$1,985.77	$26,874.38
449106500A02R0000	Commercial	1.63%	$116,774.69	$2,605.64	$6,607.82	$583.87	$781.69	$10,579.03
449106500B01R0000	Commercial	5.33%	$382,231.90	$8,528.90	$21,629.00	$1,911.16	$2,558.67	$34,627.73
		100.00%	**$7,170,571.24**	**$160,000.00**	**$405,754.40**	**$35,852.86**	**$48,000.00**	**$649,607.26**

APPENDIX C
PREPAID PARCELS

Bayside Public Improvement District
North Improvement Area
Prepaid Parcels

Parcel ID	Lot Type	Amount	Full/Partial	Prepayment Date
441107100B0020000 441107100B0030000 441107100C0020000 441107100C0030000	Multi-Family	$5,038,320.00	Full	9/30/2017
441107200F0030000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0040000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0060000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0120000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0130000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0170000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0180000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0200000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0320000	30' Lot	$13,997.48	Full	10/31/2019
441107200F0340000	30' Lot	$13,997.48	Full	10/31/2019
441107200H0140000	50' lot	$15,664.91	Full	5/31/2020
441107200H0060000	50' lot	$15,664.91	Full	7/8/2020
441107200F0070000	30' Lot	$13,818.53	Full	1/1/2021
441107200A0520000	50' lot	$15,436.50	Full	2/15/2021
441107200G0220000	30' Lot	$13,818.53	Full	5/7/2021
441107200A78R0000	50' lot	$15,436.50	Full	8/2/2021
441107200A0600000	50' lot	$15,436.50	Full	8/6/2021
441107200A0660000	50' lot	$12,205.84	Full	9/17/2021
441107200A0640000	50' lot	$12,205.84	Full	12/31/2021
441107200A0740000	50' lot	$12,205.84	Full	2/28/2022
441107200G0190000	30' lot	$10,374.96	Full	8/22/2022
441107200F0080000	30' lot	$9,827.19	Full	1/31/2025
441107400D0020000	30' lot	$9,827.19	Full	1/31/2025
441107200G0060000	30' lot	$9,827.19	Full	6/15/2025
441107200F0280000	30' lot	$9,827.19	Full	7/17/2025
TOTAL		**$5,369,872.45**		

APPENDIX D
PID ASSESSMENT NOTICE

PID Assessment Notice

NOTICE OF OBLIGATION TO PAY PUBLIC IMPROVEMENT DISTRICT ASSESSMENT TO THE CITY OF ROWLETT, TEXAS
CONCERNING THE FOLLOWING PROPERTY

[insert property address]

As the purchaser of the real property described above, you are obligated to pay assessments to the City of Rowlett, Texas (the "City"), for the costs of a portion of a public improvement or services project (the "Authorized Improvements") undertaken for the benefit of the property within the Bayside Public Improvement District (the "District") created under Subchapter A, Chapter 372, Local Government Code.

AN ASSESSMENT HAS BEEN LEVIED AGAINST YOUR PROPERTY FOR THE AUTHORIZED IMPROVEMENTS, WHICH MAY BE PAID IN FULL AT ANY TIME. IF THE ASSESSMENT IS NOT PAID IN FULL, IT WILL BE DUE AND PAYABLE IN ANNUAL INSTALLMENTS THAT WILL VARY FROM YEAR TO YEAR DEPENDING ON THE AMOUNT OF INTEREST PAID, COLLECTION COSTS, ADMINISTRATIVE COSTS, AND DELINQUENCY COSTS.

The exact amount of the assessment may be obtained from the City. The exact amount of each annual installment will be approved each year by the City Council in the Annual Service Plan Update for the District. More information about the assessments, including the amounts and due dates, may be obtained from the City or MuniCap, Inc., the District Administrator for the City, located at 600 E. John Carpenter Fwy, Suite 150, Irving, Texas 75062 and available by telephone at (469) 490-2800 or (866) 648-8482 (toll free) and email at txpid@municap.com.

Your failure to pay any assessment or any annual installment may result in penalties and interest being added to what you owe or in a lien on and the foreclosure of your property.

Date: _____

_____ _____
Signature of Seller Signature of Seller

STATE OF TEXAS §
§
COUNTY OF _____ §

The foregoing instrument was acknowledged before me by _____ and _____, known to me to be the person(s) whose name(s) is/are subscribed to the foregoing instrument, and acknowledged to me that he or she executed the same for the purposes therein expressed, in the capacity stated and as the act and deed of the above-referenced entities as an authorized signatory of said entities.

Given under my hand and seal of office on this _____, 20__.

_____
Notary Public, State of Texas

The undersigned purchaser acknowledges receipt of this notice before the effective date of a binding contract for the purchase of the real property at the address described above.

Date: _____

_____ _____
Signature of Purchaser Signature of Purchaser

STATE OF TEXAS §
§
COUNTY OF _____ §

The foregoing instrument was acknowledged before me by _____ and _____, known to me to be the person(s) whose name(s) is/are subscribed to the foregoing instrument, and acknowledged to me that he or she executed the same for the purposes therein expressed, in the capacity stated and as the act and deed of the above-referenced entities as an authorized signatory of said entities.

Given under my hand and seal of office on this _____, 20__.

_____
Notary Public, State of Texas

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 4.E.

Title
Consider action to approve the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan for the Bayside PID South Improvement Area.

Consider action to approve an ordinance adopting changes to the 2025-2026 Bayside Public Improvement District (PID) Service and Assessment Plan including the annual update to the Assessment Roll and levy of assessments on property in the PID pursuant to the Service and Assessment Plan for the Bayside PID – South Improvement Area.

Staff Representative
Michael Kuhn, Treasurer & Debt Mgr.

Executive Summary
Annual updates to PIDs are required by the PID Act, Chapter 372, Texas Local Government Code. The purpose of this item is to update the Bayside Public Improvement District Service and Assessment Plan, including the annual update to the Assessment Roll, and the levy of assessments on property in the Bayside PID South Improvement Area.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
FOSTER ECONOMIC VITALITY	5.3 Cultivate Sapphire Bay as a premier destination development.

Background Information
The City Council created the Bayside PID on September 15, 2015.

On August 15, 2017, the City Council approved the Bayside PID – South Improvement Area Service and Assessment Plan, the Assessment Roll, and the levy of assessments on property within the South Improvement Area of the PID.

Annual updates to the Bayside PID South Improvement Area Service and Assessment Plan, the Assessment Roll, and the levy of assessments on property in the PID were approved by City Council as follows:

- December 18, 2018

- January 7, 2020 – Amended and Restated Service and Assessment Plan
- September 15, 2020
- December 15, 2020 – Interim Annual Service Plan Update
- September 21, 2021
- November 15, 2022
- October 17, 2023
- November 12, 2024

Discussion

Annual ordinances will reflect updates to authorized improvements, budget, assessment methodology, parcel status, prepayments for assessment, and annual installments to be collected for PID bonds and obligations. These ordinances will provide for billing of the calculated assessment each year to those property owners included on the approved Assessment Roll.

The summary of updates for the improvement area is as follows:

Sources & Uses of Funds

Table II-A-3
Updated Sources and Uses of Funds[4]

Sources of Funds	Budget - Annual Service Plan Update 2023-24	Budget Revisions	Updated Budget[1]	Spent to Date[1]	Remaining to be Funded
Bond par amount	$36,435,475	$0	$36,435,475	$34,546,866	$1,888,609
Other Funding Sources	$15,906,992	$0	$15,906,992	$3,639,422	$12,267,570
Total Sources	**$52,342,467**	**$0**	**$52,342,467**	**$38,186,288**	**$14,156,179**
Uses of Funds					
South Improvements					
Roadway Improvements	$6,769,986	$0	$6,769,986	$6,769,986	$0
Water Improvements	$3,082,899	$0	$3,082,899	$3,082,899	$0
Sanitary Sewer Improvements	$2,069,913	$0	$2,069,913	$2,069,913	$0
Storm Sewer Improvements	$2,845,770	$0	$2,845,770	$2,845,770	$0
Professional and Other Development Fees	$4,486,757	$0	$4,486,757	$4,486,757	$0
Other Improvements					
Lagoon Construction Costs[2]	$12,000,000	$0	$12,000,000	$0	$12,000,000
Crystal Lagoon Licensing Fee	$3,142,520	$0	$3,142,520	$3,142,520	$0
Landscape, Hardscape, Surf Lagoon, Beach, Trails, Parks	$1,807,254	$0	$1,807,254	$0	$1,807,254
Seawall	$1,200,000	$0	$1,200,000	$1,126,032	$73,968
TXDOT Bridge Enhancements[2]	$1,000,000	$0	$1,000,000	$732,338	$267,662
Subtotal: Other Improvements	*$19,149,774*	*$0*	*$19,149,774*	*$5,000,891*	*$14,148,884*
Contingency	$787,919	$0	$787,919	$780,623	$7,296
Additional Offsite Improvements - South Portion[2,3]					
Offsite wastewater improvements	$2,907,084	$0	$2,907,084	$2,907,084	$0
Subtotal: All Improvements – South Improvement Area	*$42,100,102*	*$0*	*$42,100,103*	*$27,943,923*	*$14,156,180*
Bond Issuance Costs					
Debt service reserve	$3,024,378	$0	$3,024,378	$3,024,378	$0
Capitalized interest	$4,849,430	$0	$4,849,430	$4,849,430	$0
Other Costs of Issuance	$2,368,557	$0	$2,368,557	$2,368,557	$0
Subtotal	*$10,242,365*	*$0*	*$10,242,365*	*$10,242,365*	*$0*
Total Uses	**$52,342,467**	**$0**	**$52,342,467**	**$38,186,288**	**$14,156,179**

1 – According to South Improvements' Draw Request #19 as approved by the City on July 26, 2022 and Additional Offsite Improvements submitted by the City.
2 – Other funding sources includes $2,907,084 in Additional Offsite Wastewater Improvements, $1,000,000 of investment income earned, and a Subsequent Third Party Owner contribution of $12,000,000. See Appendix B-1 for additional information.
3 - $546,365 is being reimbursed to the City from excess PID funds and the remaining Additional Offsite Wastewater Improvement costs are eligible to be reimbursed to the City from future excess PID funds, if available.
4 - Amounts shown above are rounded to the nearest dollar.

Summary of Development Update

Table II-C-1
Summary of Development Plan Changes by Lot Type

Lot Type	No. of Units (2025-26 Development Plan)	2025-26 Estimated Build Out Value	No. of Units (2024-25 Development Plan)	2024-25 Estimated Build Out Value	Variance to Previously Approved Plan
Retail	331,000	$57,925,000	331,000	$57,925,000	$0
Restaurant	140,000	$31,500,000	140,000	$31,500,000	$0
Office	600,000	$105,000,000	600,000	$105,000,000	$0
Townhomes	76	$53,200,000	76	$53,200,000	$0
Urban MF (5 Story/90 per acre)	1,404	$210,600,000	1,404	$210,600,000	$0
Resort	762	$247,650,000	762	$247,650,000	$0
Surf and Beach Club	36,070	$34,266,500	36,070	$34,266,500	$0
Full Service Spa	0	$0	0	$0	$0
Condominium	300	$225,000,000	300	$225,000,000	$0
Limited Service Hotel	300	$48,000,000	300	$48,000,000	$0
Marina Maintenance	20,000	$3,000,000	20,000	$3,000,000	$0
HOA					
Total		**$1,016,141,500**		**$1,016,141,500**	**$0**

Annual Assessment by Lot Type

Table II-E-1
Annual Installment Per Unit[2]

Lot Type	Estimated Units	Estimated Build Out Value	Total Outstanding Assessments	Percentage of Total Annual Installments[1]	Total Annual Installments	Annual Installments per unit
Retail	331,000	$57,925,000	$1,873,175	6.31%	$171,598.41	$0.52
Restaurant	140,000	$31,500,000	$1,018,763	3.43%	$93,327.21	$0.67
Office	600,000	$105,000,000	$3,395,194	11.43%	$311,028.01	$0.52
Townhomes	74	$51,800,000	$1,674,962	5.64%	$153,440.48	$2,073.52
Townhomes (Prepaid)	2	$1,400,000	PREPAID	PREPAID	PREPAID	PREPAID
Urban MF (5 Story/90 per acre)	694	$104,100,000	$3,366,092	11.33%	$308,362.05	$444.33
Urban MF (Prepaid)	710	$106,500,000	PREPAID	PREPAID	PREPAID	PREPAID
Resort	762	$247,650,000	$8,007,807	26.96%	$733,581.77	$962.71
Surf and Beach Club	36,070	$34,266,500	$1,108,013	3.73%	$101,503.25	$2.81
Condominium	300	$225,000,000	$7,275,415	24.49%	$666,488.59	$2,221.63
Limited Service Hotel	300	$48,000,000	$1,556,469	5.24%	$142,585.49	$475.28
Marina Maintenance	20,000	$3,000,000	$97,553	0.33%	$8,936.67	$0.45
HOA	0		$332,930	1.12%	$30,499.16	$30,499.16
Total		**$1,016,141,500**	**$29,706,372**	**100.00%**	**$2,721,351.09**	

1 – According to the currently approved and updated development plan as provided by the Subsequent Third Party Owner.
2 - Amounts shown above are rounded to the nearest dollar.

Indebtedness

Outstanding Assessments: $29,706,372

Annual Budget

Table II-D-1
Budget for the Annual Installments to be Collected for 2025-26

	South Improvement Area Bonds
Interest payment on March 15, 2026	$992,192.84
Interest payment on September 15, 2026	$992,192.84
Principal payment on September 15, 2026	$600,000.00
Subtotal Debt Service Payments	*$2,584,385.68*
Administrative Expenses	$56,000.00
Excess Interest for Prepayment and Delinquency Reserves	$148,531.86
Subtotal Expenses	*$2,788,917.54*
Available Reserve Fund Income	($67,566.45)
Available Pledged Revenue Account funds	$0.00
Available Administrative Expense Account funds	$0.00
Subtotal Funds Available	*($67,566.45)*
Annual Installment to be Collected	**$2,721,351.09**

Changes to Assessment Methodology

No changes to assessment methodology.

Parcel Subdivision Summary

According to RCAD online records, a Sapphire Bay final plat was filed and recorded in 2023 for the proposed development of twenty-two (22) townhome units. At the time of the 2024-25 Annual Installment billing, the subdivided accounts were not yet available. As a result, the newly recognized Parcels within the South Improvement Area of the PID were individually billed Annual Installments beginning in tax year 2025.

Table IV-A-1
Parcel 330143 Subdivision

Prior to Subdivision				After Subdivision			
Parcel	Estimated Build Out Value	Percent of Outstanding Assessment	Total Assessments	Parcel	Estimated Build Out Value	Percent of Outstanding Assessment	Total Assessments
330143	$170,300,000	18.54%	$5,506,681	Various[1]	$15,400,000	1.68%	$497,962
				330143[2]	$154,900,000	16.86%	$5,008,719
Total	**$170,300,000**	**18.54%**	**$5,506,681**		**$170,300,000**	**18.54%**	**$5,506,681**

1 – Represents the aggregated build out value, percentage of outstanding Assessment, and total Assessment of 22 townhome units.
2 – Represents the estimated development of 200 condominium units and seven (7) townhome units.

Prepayment Summary

A s of September 30, 2025, there were four prepaid Assessments: two multifamily parcels (totaling 710 units) and two townhome parcels (totaling two units).

Parcel ID	Lot Type	Amount	Full/Partial	Prepayment Date
447550000D0010000	Multifamily	$2,073,914.16	Full	2/10/2022
447550000A0350000	Townhome	$23,483.39	Full	10/30/2023
447550000A0040000	Townhome	$23,085.50	Full	10/29/2024
447550000F0010000	Multifamily	$1,568,144.49	Full	12/31/2024
TOTAL		**$3,688,627.54**		

Financial/Budget Implications
This action has no impact on the City's annual budget. All costs are borne by the property owners within the Bayside Public Improvement District.

Recommended Action
Move to adopt the Ordinance approving the Bayside Public Improvement District South Improvement Area Annual Service Plan Update, the South Improvement Area 2025-2026 Assessment Roll Update, and the levy of the assessments on property in the South Improvement Area.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS, REVIEWING AND UPDATING THE SERVICE PLAN FOR THE BAYSIDE PUBLIC IMPROVEMENT DISTRICT – SOUTH IMPROVEMENT AREA OF THE CITY OF ROWLETT INCLUDING UPDATES TO THE ASSESSMENT ROLL; PROVIDING A SEVERABILITY CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council of the City of Rowlett, Texas, following due and strict compliance with the laws of the State of Texas and the ordinances of the City of Rowlett, Texas, and having given requisite notice by publication and otherwise, and after holding full and fair public hearings, has authorized the creation of the Bayside Public Improvement District (the "District") of the City of Rowlett; and

WHEREAS, the City Council has, following due notice and hearing, adopted and approved a Service and Assessment Plan for the South Area Improvements, as described therein, on which assessment rolls have been created and made available for public inspection, and assessments have been levied on the properties within the District; and

WHEREAS, the Service and Assessment Plan and Assessment Roll is required to be reviewed and updated at least annually for annual budget purposes as required by the Public Improvement District Assessment Act, Chapter 372 of the Texas Local Government Code; and

WHEREAS, the Annual Service and Assessment Plan Update and updated Assessment Roll summaries for the South Improvement Area attached as Exhibit A hereto, conform the original Assessment Roll to the principal and interest payment schedule required for the bonds issued by the District, and update the Assessment Rolls to reflect prepayments, property divisions and changes to the budget allocation for

District public improvements that occur during the year prior to this update, if any; and

WHEREAS, the City Council now desires to proceed with the adoption of this Ordinance and to approve and adopt the Annual Service Plan Update and the updated Assessment Roll summary attached thereto for the South Improvement Area, in conformity with the requirements of law; and

WHEREAS, the City Council finds the passage of this Ordinance to be in the best interest of the citizens of Rowlett.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS THAT:

SECTION 1: All matters stated in the preamble to this ordinance are found to be true and correct and are incorporated herein as if copied in their entirety.

SECTION 2: The Bayside Annual Service Plan Update and updated Assessment Roll – South Improvement Area, attached hereto and incorporated herein by this reference as Exhibit A, are hereby accepted, adopted and approved.

SECTION 3: The City Secretary is directed to cause a copy of this Ordinance, including the 2025-2026 Annual Service Plan to be recorded in the real property records of Dallas County, Texas, on or before October 28, 2025. The City Secretary is further directed to similarly file each Annual Service Plan Update approved by the City Council, with each such filing to occur within seven days of the date each respective Annual Service Plan Update is approved.

SECTION 4: This Ordinance shall be cumulative of all other City Ordinances and all other provisions of other Ordinances adopted by the City which are inconsistent with the terms or provisions of this Ordinance are hereby repealed.

SECTION 5: It is hereby declared to be the intention of the City Council of the City of Rowlett, Texas, that sections, paragraphs, clauses and phrases of this Ordinance are severable, and if any phrase, clause, sentence, paragraph or section of this Ordinance shall be declared legally invalid or unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such legal invalidity or unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs or sections of this Ordinance since the same would have been enacted by the City Council of the City of Rowlett without the incorporation in this Ordinance of any such legally invalid or unconstitutional, phrase, sentence, paragraph or section.

SECTION 6: This Ordinance shall take effect immediately from and after its passage as the law and charter in such cases provide.

Attachments

1. Exhibit A – 2025-2026 Annual Service and Assessment Plan Update and

Assessment Roll for the South Improvement Area

BAYSIDE
PUBLIC IMPROVEMENT DISTRICT

CITY OF ROWLETT, TEXAS

SOUTH IMPROVEMENT AREA
ANNUAL SERVICE PLAN UPDATE

(ASSESSMENT YEAR 9/15/25 - 9/14/26)

AS APPROVED BY CITY COUNCIL ON:
OCTOBER 21, 2025

PREPARED BY:

MUNICAP, INC.
PUBLIC FINANCE

BAYSIDE
PUBLIC IMPROVEMENT DISTRICT

SOUTH IMPROVEMENT AREA
ANNUAL SERVICE PLAN UPDATE
(ASSESSMENT YEAR 9/15/25 – 9/14/26)

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I. INTRODUCTION

The Bayside Public Improvement District (the "PID") was created pursuant to Chapter 372 of the Texas Local Government Code (as amended, the "PID Act") and a resolution of the City Council on September 15, 2015 to finance certain public improvement projects for the benefit of Assessed Property within the PID. The City of Rowlett, Texas (the "City") issued Special Assessment Revenue Bonds, Series 2017 (Bayside Public Improvement District South Improvement Area Project) (the "South Improvement Area Bonds") in the aggregate principal amount of $36,450,000 to finance the costs of constructing the South Improvement Area Improvements for the benefit of the Assessed Property within the South Improvement Area.

The PID consists of approximately 317 acres of property within the City limits. The South Improvement Area consists of approximately 119 acres within the PID. A service and assessment plan (the "Service and Assessment Plan") was prepared at the direction of the City identifying the public improvements (the "South Improvements") to be constructed, the costs of the South Improvements, the indebtedness to be incurred for the South Improvements, and the manner of assessing the benefitted property within the South Improvement Area of the PID for the costs of the South Improvements. The Service and Assessment Plan was amended and restated on January 7, 2020 (the "Amended and Restated Service and Assessment Plan") to incorporate a revised and updated development plan, a revised Assessment methodology, and revised cost estimates for the South Improvements.

Pursuant to the PID Act, the Amended and Restated Service and Assessment Plan must be reviewed and updated annually. This document is an annual update of the Amended and Restated Service and Assessment Plan for 2025-26 (the "Annual Service Plan Update").

The City also adopted an assessment roll (the "Assessment Roll") identifying the Assessments on each Parcel of Assessed Property within the South Improvement Area of the PID, based on the method of assessment identified in the Amended and Restated Service and Assessment Plan.

Effective September 1, 2021, the Texas legislature passed House Bill 1543 as an amendment to the PID Act, requiring, among other things, (i) all Service and Assessment Plans and Annual Service Plan Updates be approved through City ordinance or order to be filed with the county clerk of each county in which all or part of the PID is located within seven days and (ii) include a copy of the notice form required by Section 5.014 of the Texas Property Code (the "PID Assessment Notice") as disclosure of the obligation to pay PID Assessments. In light of these amendments to the PID Act, this Annual Service Plan Update includes a copy of the PID Assessment Notice as Appendix F and a copy of this Annual Service Plan Update will be filed with the county clerk in each county in which all or a part of the PID us located not later than seven (7) days after the date the governing body of the City approves this Annual Service Plan Update.

Section 372.013 of the PID Act, as amended, stipulates that a person who proposes to sell or otherwise convey real property that is located in the PID, except in certain situation described in the PID Act, shall first give to the purchaser of the property a copy of the completed PID

Assessment Notice. The PID Assessment Notice shall be given to a prospective purchase before the execution of a binding contract of purchase and sale, either separately or as an addendum or paragraph of a purchase contract. In the event a contract of purchase and sale is entered into without the seller provided the required notice, the purchaser, subject to certain exceptions described in the PID act, is entitled to terminate the contract.

The PID Assessment Notice shall be executed by the seller and must be filed in the real property records of the County in which the property is located at the closing of the purchase and sale of the property.

Capitalized terms shall have the meanings set forth in the Amended and Restated Service and Assessment Plan unless otherwise defined herein.

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II. UPDATE OF THE SERVICE PLAN

A. UPDATED SOURCES AND USES FOR PUBLIC IMPROVEMENTS

According to the Annual Service and Assessment Plan Update approved on September 15, 2020, the total estimated costs of the South Improvements were equal to $26,193,110. According to the revised total cost estimates for the South Improvements approved in the Interim Annual Service and Assessment Plan Update on December 15, 2020, the updated cost estimates are $39,193,110 representing a $13,000,000 increase from the previously approved cost estimates. The projected increase in the budget is anticipated to be funded with $1,000,000 in interest income earned within the project fund of the trust account and $12,000,000 will be funded by the Subsequent Third Party Owner.

The City has undertaken the constructing of certain additional offsite wastewater improvements (the "Additional Offsite Wastewater Improvements"), as defined herein, that confer a special benefit to the North Improvement Area, the South Improvement Area and property outside of the PID. Such improvements were funded by the City and are eligible to be reimbursed to the City from excess funds available to the PID to the extent such excess funds are not required to fund existing PID obligations.

The Additional Offsite Wastewater Improvements consists of construction, installation and/or expansion of downstream force main for the Bayside Lift Station, parallel gravity sewer on Miller Road near President George Bush Turnpike, new pump and parallel downstream force main for the Rowlett Road Lift Station, and gravity sewer replacement west of Rowlett Creek. The Additional Offsite Wastewater Improvements will be constructed according to City standards.

Table II-A-1 on the following page summarizes the estimated benefits of the Additional Offsite Wastewater Improvements and the amounts allocated to the North Improvement Area (the "North Improvement Area Portion"), the amounts allocated to the South Improvement Area (the "South Improvement Area Portion") and the amounts allocated to the property outside of the PID (the "City Portion") as provided by the City as of October 5, 2023. The amounts shown in Table II-A-1 are estimates and may be updated in Annual Service Plan Updates.

Table II-A-1
Updated Sources and Uses of Funds

Sources of Funds	Final Costs [1]	North Improvement Area Portion		South Improvement Area Portion		City Portion	
		Allocation %[2]	Amount[1]	Allocation %[2]	Amount[1]	Allocation %[2]	Amount[1]
Additional Offsite Wastewater Improvements							
Downstream force main - Bayside Lift station	$5,589,168	27.71%	$1,548,563	42.79%	$2,391,801	29.50%	$1,648,804
Parallel gravity sewer on Miller Road near President George Bush Turnpike	$1,016,483	16.15%	$164,146	24.94%	$253,527	58.91%	$598,810
Pump for the Rowlett Road Lift Station	$465,569	8.66%	$40,307	13.37%	$62,257	77.97%	$363,005
Parallel downstream force main for the Rowlett Road Lift Station	$1,176,289	8.66%	$101,840	13.37%	$157,296	77.97%	$917,153
Gravity sewer replacement west of Rowlett Creek	$1,293,400	2.11%	$27,325	3.26%	$42,203	94.62%	$1,223,872
Subtotal: Additional Offsite Wastewater Improvement Costs	***$9,540,909***		***$1,882,181***		***$2,907,084***		***$4,751,644***

1 – Offsite Wastewater Improvements of $9,540,909 as of October 5, 2023 were fully funded by the City.
2 – Allocation percentages are provided by the City as of October 5, 2023 and represent the pro rata benefit appliable to each portion shown above.

Table II-A-2 on the following page summarizes the updated funding sources and uses of funds required to construct the South Improvements and the South Improvement Area's portion of the Additional Offsite Improvements.

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Table II-A-2
Updated Funding Sources and Uses of Funds

Description	PID Funded[1]	City Funded	Subsequent Third Party Owner Funded	Total
Authorized Improvement				
Roadway Improvements				
Earthwork and Erosion Control Improvements	$2,305,515	$0	$0	$2,305,515
Paving Improvements	$4,464,471	$0	$0	$4,464,471
Subtotal: Roadway Improvements	*$6,769,986*	*$0*	*$0*	*$6,769,986*
Water Improvements	$3,082,899	$0	$0	$3,082,899
Sanitary Sewer Improvements[1]	$2,069,913	$0	$0	$2,069,913
Storm Sewer Improvements	$2,845,770	$0	$0	$2,845,770
Professional and Other Development Fees	$4,486,757	$0	$0	$4,486,757
Other Improvements				
Lagoon Construction Costs	$0	$0	$12,000,000	$12,000,000
Crystal Lagoon Licensing Fee	$3,142,520	$0	$0	$3,142,520
Landscape, Hardscape, Surf Lagoon, Beach, Trails, Parks	$1,807,254	$0	$0	$1,807,254
Seawall	$1,200,000	$0	$0	$1,200,000
TXDOT Bridge Enhancements[1]	$1,000,000	*$0*	$0	$1,000,000
Subtotal: Other Improvements	*$7,149,774*	$0	*$12,000,000*	*$19,149,774*
Additional Offsite Improvements - South Portion				
Offsite wastewater improvements	$546,365	$2,360,719	$0	$2,907,084
Contingency	$787,919	$0	$0	$787,919
Total Authorized Improvements	**$27,739,383**	**$2,360,719**	**$12,000,000**	**$42,100,102**

1 – In addition to South Improvement Area Bonds proceeds deposited into the South Improvement Account, Additional Offsite Wastewater Improvements are set to be funded by approximately $546,364 of excess available PID funds. Also, TXDOT bridge enhancements are set to be funded by $1,000,000 of investment interest income earned within the project fund.

Table II-A-3 on the following page summarizes the amounts spent to date that are required to (1) construct the South Improvements, (2) establish the PID, and (3) issue the South Improvement Area Bonds, through South Improvements Draw Request #19.

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Table II-A-3
Updated Sources and Uses of Funds[4]

Sources of Funds	Budget - Annual Service Plan Update 2023-24	Budget Revisions	Updated Budget[1]	Spent to Date[1]	Remaining to be Funded
Bond par amount	$36,435,475	$0	$36,435,475	$34,546,866	$1,888,609
Other Funding Sources	$15,906,992	$0	$15,906,992	$3,639,422	$12,267,570
Total Sources	**$52,342,467**	**$0**	**$52,342,467**	**$38,186,288**	**$14,156,179**
Uses of Funds					
South Improvements					
Roadway Improvements	$6,769,986	$0	$6,769,986	$6,769,986	$0
Water Improvements	$3,082,899	$0	$3,082,899	$3,082,899	$0
Sanitary Sewer Improvements	$2,069,913	$0	$2,069,913	$2,069,913	$0
Storm Sewer Improvements	$2,845,770	$0	$2,845,770	$2,845,770	$0
Professional and Other Development Fees	$4,486,757	$0	$4,486,757	$4,486,757	$0
Other Improvements					
Lagoon Construction Costs[2]	$12,000,000	$0	$12,000,000	$0	$12,000,000
Crystal Lagoon Licensing Fee	$3,142,520	$0	$3,142,520	$3,142,520	$0
Landscape, Hardscape, Surf Lagoon, Beach, Trails, Parks	$1,807,254	$0	$1,807,254	$0	$1,807,254
Seawall	$1,200,000	$0	$1,200,000	$1,126,032	$73,968
TXDOT Bridge Enhancements[2]	$1,000,000	$0	$1,000,000	$732,338	$267,662
Subtotal: Other Improvements	*$19,149,774*	*$0*	*$19,149,774*	*$5,000,891*	*$14,148,884*
Contingency	$787,919	$0	$787,919	$780,623	$7,296
Additional Offsite Improvements - South Portion[2,3]					
Offsite wastewater improvements	$2,907,084	$0	$2,907,084	$2,907,084	$0
Subtotal: All Improvements – South Improvement Area	*$42,100,102*	*$0*	*$42,100,103*	*$27,943,923*	*$14,156,180*
Bond Issuance Costs					
Debt service reserve	$3,024,378	$0	$3,024,378	$3,024,378	$0
Capitalized interest	$4,849,430	$0	$4,849,430	$4,849,430	$0
Other Costs of Issuance	$2,368,557	$0	$2,368,557	$2,368,557	$0
Subtotal	*$10,242,365*	*$0*	*$10,242,365*	*$10,242,365*	*$0*
Total Uses	**$52,342,467**	**$0**	**$52,342,467**	**$38,186,288**	**$14,156,179**

1 – According to South Improvements' Draw Request #19 as approved by the City on July 26, 2022 and Additional Offsite Improvements submitted by the City.
2 – Other funding sources includes $2,907,084 in Additional Offsite Wastewater Improvements, $1,000,000 of investment income earned, and a Subsequent Third Party Owner contribution of $12,000,000. See Appendix B-1 for additional information.
3 - $546,365 is being reimbursed to the City from excess PID funds and the remaining Additional Offsite Wastewater Improvement costs are eligible to be reimbursed to the City from future excess PID funds, if available.
4 - Amounts shown above are rounded to the nearest dollar.

Authorized Improvement Cost Variances

As shown in Table II-A-3 above, the additional costs of the Additional Offsite Improvements will be funded by the City and will not increase the amount of South Improvement Area Assessments.

Refer to Appendix B-1 and Appendix B-2 for a detailed breakdown of the budgeted South Improvement costs and amounts spent to date that are anticipated to be funded through the PID and the costs to be funded through the Subsequent Third Party Owner's contribution.

For additional South Improvement Area development-related information, refer to the link below: https://emma.msrb.org/IssueView/Details/ER381987

B. Five Year Service Plan

According to the PID Act, a service plan must cover a period of five years. According to the Developer's Quarterly Improvement Implementation Report dated as of June 30, 2022, the roadway improvements, the storm drainage improvements, the water improvements, and the sanitary sewer improvements were completed and accepted on March 10, 2022.

The projected Annual Installments for the South Improvements over a period of five years is shown in Table II-B-1 below.

Table II-B-1
Projected Annual Installments (2018-2031)[4]

Assessment Year ending September 15	Principal Payments[1]	Interest Expense	Administrative Expenses	Prepayment & Delinquency Reserves	Capitalized Interest or Other Available Credits[2]	Annual PID Installments[3]
2018-2025	$3,055,000	$18,564,122	$307,412	$1,208,799	($5,334,525)	$17,800,808
2026	$600,000	$1,984,386	$56,000	$148,532	($67,566)	$2,721,351
2027	$645,000	$1,947,888	$57,120	$145,800	$0	$2,795,808
2028	$690,000	$1,904,802	$58,262	$142,575	$0	$2,795,639
2029	$735,000	$1,858,710	$59,428	$139,125	$0	$2,792,263
2030	$790,000	$1,809,612	$60,616	$135,450	$0	$2,795,678
2031	$845,000	$1,756,840	$61,829	$131,500	$0	$2,795,169
Total	**$7,360,000**	**$29,826,360**	**$660,667**	**$2,051,781**	**($5,402,092)**	**$34,496,716**

1 – Other available credits include but is not necessarily limited to interest income earned in the Reserve Fund or excess funds available from the trust accounts.
2 – Assessment years ending 2018 through 2026 reflect actual Annual Installments and are net of applicable investment income and other credits. Assessment years 2027 through 2031 reflect projected Annual Installments and will be updated in future annual service plan updates.
4 - Amounts shown above are rounded to the nearest dollar.

C. Status of Development

As shown in the Interim Annual Service and Assessment Plan Update approved on September 21, 2021, the revised development plan had an estimated build out value of approximately $1,000,191,500. According to the Subsequent Third Party Owner, there have been changes to the revised development plan as of September 26, 2022.

Refer to Table II-C-1 on the following page for a summary of the revised development plan provided by the Subsequent Third Party Owner.

Table II-C-1
Summary of Development Plan Changes by Lot Type

Lot Type	No. of Units (2025-26 Development Plan)	2025-26 Estimated Build Out Value	No. of Units (2024-25 Development Plan)	2024-25 Estimated Build Out Value	Variance to Previously Approved Plan
Retail	331,000	$57,925,000	331,000	$57,925,000	$0
Restaurant	140,000	$31,500,000	140,000	$31,500,000	$0
Office	600,000	$105,000,000	600,000	$105,000,000	$0
Townhomes	76	$53,200,000	76	$53,200,000	$0
Urban MF (5 Story/90 per acre)	1,404	$210,600,000	1,404	$210,600,000	$0
Resort	762	$247,650,000	762	$247,650,000	$0
Surf and Beach Club	36,070	$34,266,500	36,070	$34,266,500	$0
Full Service Spa	0	$0	0	$0	$0
Condominium	300	$225,000,000	300	$225,000,000	$0
Limited Service Hotel	300	$48,000,000	300	$48,000,000	$0
Marina Maintenance	20,000	$3,000,000	20,000	$3,000,000	$0
HOA					
Total		**$1,016,141,500**		**$1,016,141,500**	**$0**

Refer to Appendix C of this report for a map of the updated development plan and a summary of the current development plan as provided by the Subsequent Third Party Owner.

For additional South Improvement Area development and improvement related information, refer to the link provided in Section II.A. of this report.

According to Dallas County Central Appraisal District ("DCAD") and Rockwall Central Appraisal District ("RCAD") records, the aggregate 2025 preliminary values for Parcels within the South Improvement Area of the PID is $203,918,281.

D. ANNUAL BUDGET

Annual Installments

The Assessment imposed on any Parcel may be paid in full at any time. If not paid in full, the Assessment shall be payable in thirty annual installments of principal and interest beginning with the tax year following the issuance of the South Improvement Area Bonds, of which twenty-two (22) Annual Installments remain outstanding.

Pursuant to the Service and Assessment Plan, each Assessment shall bear interest at the rate on the South Improvement Area Bonds commencing with the issuance of the South Improvement Area Bonds. The effective interest rate on the South Improvement Area Bonds is 6.68 percent. Pursuant to Section 372.018 of the PID Act, the interest rate for that Assessment may not exceed a rate that is one-half of one percent higher than the actual interest rate paid on the debt. As described in the

Service and Assessment Plan, the additional interest of one-half of one percent (the "Excess Interest Rate") is included in the Annual Installment calculation for 2025-26. In addition, the estimated annual Administrative Expenses for 2025-26 are included in the Annual Installments for 2025-26. These Annual Installments of the Assessments shall be billed by the City, or any other party designated by the City, in 2025 and will be delinquent on February 1, 2026.

Pursuant to the Service and Assessment Plan, the Annual Service Plan Update shall show the remaining balance of the Assessments and the Annual Installment due for 2025-26 to be collected from each Parcel. The Annual Installment amount shall be allocated to each Parcel based on the percentage of Assessment allocated to each Parcel within the South Improvement, as calculated using the amount of Assessment on a Parcel to the total amount of Assessments within the South Improvement Area of the PID as a whole that are payable at the time of such allocation. Each Annual Installment shall be reduced by any credits applied under an applicable ordinances or Indenture of Trust, such as capitalized interest and interest earnings on any account balances and by any other funds available to the PID.

Annual Budget for the Repayment of Indebtedness

Debt service on the South Improvement Area Bonds will be paid from the collection of the Annual Installments. Administrative Expenses are also to be collected with the Annual Installments to pay expenses related to the collection of the Annual Installments and other PID administration expenses. In addition, 40 percent of the additional interest amount collected as part of the Annual Installment will be used to fund the Prepayment Reserve and 60 percent of such additional interest amount collected will be used to fund the Delinquency Reserve until such time as each reserve contains the required amounts, as described in the Service and Assessment Plan and the Indenture of Trust relating to the South Improvement Area Bonds.

Annual Installments to be collected for 2025-26

The budget for the South Improvement Area of the PID will be paid from the collection of Annual Installments collected from the South Improvement Area Assessed Property for 2025-26 as shown in Table II-D-1 on the following page.

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Table II-D-1
Budget for the Annual Installments
to be Collected for 2025-26

	South Improvement Area Bonds
Interest payment on March 15, 2026	$992,192.84
Interest payment on September 15, 2026	$992,192.84
Principal payment on September 15, 2026	$600,000.00
Subtotal Debt Service Payments	*$2,584,385.68*
Administrative Expenses	$56,000.00
Excess Interest for Prepayment and Delinquency Reserves	$148,531.86
Subtotal Expenses	*$2,788,917.54*
Available Reserve Fund Income	($67,566.45)
Available Pledged Revenue Account funds	$0.00
Available Administrative Expense Account funds	$0.00
Subtotal Funds Available	*($67,566.45)*
Annual Installment to be Collected	**$2,721,351.09**

Debt Service Payments

Annual Installments to be collected for principal and interest include interest due on March 15, 2026 in the amount of $992,193 and on September 15, 2026 in the amount of $992,193, which equal interest on the outstanding Assessments balance of $29,706,372 for six months each and an effective interest rate of 6.68 percent. Annual Installments to be collected include a principal amount of $600,000 due on September 15, 2026. As a result, total Annual Installments to be collected for principal and interest in 2025-26 is estimated to be equal to $2,584,386.

Administrative Expenses

Administrative expenses include the City expenses, Administrator expenses, Trustee expenses, dissemination agent expenses, and contingency amount for potential PID audit and other unanticipated expenses. As shown in Table II-D-2 on the following page, the total administrative expenses to be collected for 2025-26 are estimated to be $56,000.

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Table II-D-2
Administrative Budget Breakdown

Description	2025-26 Estimated Budget
City	$5,000
Administrator	$30,000
Trustee	$2,500
Dissemination Agent	$3,500
UTS (Billing)	$10,000
Contingency	$5,000
Total	**$56,000**

Excess Interest for Prepayment and Delinquency Reserve

Annual Installments to be collected for excess interest for prepayment and delinquency reserves in the amount of $148,532, which equals 0.5 percent interest on the outstanding South Improvement Area Assessment balance of $29,706,372.

Available Reserve Fund Income

As of September 30, 2025, there has been approximately $67,566 in excess reserve fund income earned above the reserve fund requirement. As a result, the excess reserve fund income is available to be applied as a credit to reduce the 2025-26 Annual Installment.

Available Pledged Revenue Account Funds

According to the Trustee account statements as of September 30, 2025, there are no available Pledged Revenue Account funds anticipated to be available to pay a portion of the South Improvement Area Bonds debt service for 2025-26.

Available Administrative Expense Account Funds

As of September 30, 2025, there were $64,328 in administrative expense funds available. The remaining balance is anticipated to be used for the payment of current year administrative expenses through January 31, 2026. As a result, there are no funds anticipated to be available in the Administrative Expense Fund to reduce the 2025-26 Annual Installment.

E. Annual Installments Per Unit

The Actual Costs of the portion of the South Improvements to be financed with the South Improvement Area Bonds shall be allocated to the South Improvement Area Assessed Property by spreading the entire Assessment across all Parcels and Lots within the South Improvement Area

based on the ratio of the estimated build out value of each Lot to the total build out value for all Parcels within the South Improvement Area of the PID.

The outstanding number of units, total outstanding Assessments, percentage of total Annual Installments, total Annual Installments, and Annual Installments per unit for each Lot Type are shown in Table II-E-1 below.

Table II-E-1
Annual Installment Per Unit[2]

Lot Type	Estimated Units	Estimated Build Out Value	Total Outstanding Assessments	Percentage of Total Annual Installments[1]	Total Annual Installments	Annual Installments per unit
Retail	331,000	$57,925,000	$1,873,175	6.31%	$171,598.41	$0.52
Restaurant	140,000	$31,500,000	$1,018,763	3.43%	$93,327.21	$0.67
Office	600,000	$105,000,000	$3,395,194	11.43%	$311,028.01	$0.52
Townhomes	74	$51,800,000	$1,674,962	5.64%	$153,440.48	$2,073.52
Townhomes (Prepaid)	2	$1,400,000	PREPAID	PREPAID	PREPAID	PREPAID
Urban MF (5 Story/90 per acre)	694	$104,100,000	$3,366,092	11.33%	$308,362.05	$444.33
Urban MF (Prepaid)	710	$106,500,000	PREPAID	PREPAID	PREPAID	PREPAID
Resort	762	$247,650,000	$8,007,807	26.96%	$733,581.77	$962.71
Surf and Beach Club	36,070	$34,266,500	$1,108,013	3.73%	$101,503.25	$2.81
Condominium	300	$225,000,000	$7,275,415	24.49%	$666,488.59	$2,221.63
Limited Service Hotel	300	$48,000,000	$1,556,469	5.24%	$142,585.49	$475.28
Marina Maintenance	20,000	$3,000,000	$97,553	0.33%	$8,936.67	$0.45
HOA	0		$332,930	1.12%	$30,499.16	$30,499.16
Total		**$1,016,141,500**	**$29,706,372**	**100.00%**	**$2,721,351.09**	

1 – According to the currently approved and updated development plan as provided by the Subsequent Third Party Owner.
2 - Amounts shown above are rounded to the nearest dollar.

The list of Parcels within the PID, the number of units to be developed on the current Parcels, the total outstanding Assessment, the annual principal and interest, the Administrative Expenses, and the Annual Installment to be collected for 2025-26 are shown in the Assessment Roll Summary attached hereto as Appendix D.

F. Bond Redemption Related Updates

The South Improvement Area Bonds were issued in September 2017. Pursuant to Section 4.3 of the Indenture of Trust, the City reserves the right and option to redeem the South Improvement Area Bonds before their scheduled maturity dates, in whole or in part, on any interest payment date on or after **September 15, 2027**, such redemption date or dates to be fixed by the City, at the redemption prices and dates shown in the Indenture of Trust.

The Administrator has conducted a preliminary evaluation of the current refunding market conditions, recent PID bond refunding transactions, and other relevant factors. Based on this

preliminary evaluation, the Administrator believes a refunding of the South Improvement Area Bonds does not appear viable at this time. The Administrator will continue to monitor the refunding market conditions, applicable PID bond refunding transactions, and other relevant factors to determine if refunding becomes viable in the future and will inform the City accordingly.

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III. UPDATE OF THE ASSESSMENT PLAN

Pursuant to the Amended and Restated Service and Assessment Plan adopted by the City Council on January 7, 2020, the Actual Costs of the portion of the South Improvements to be financed with the South Improvement Area Bonds shall be allocated to the South Improvement Area Assessed Property by spreading the entire Assessment across all Parcels and Lots within the South Improvement Area based on the ratio of the estimated build out value of each Lot to the total build out value for all Parcels within the South Improvement Area.

This method of assessing property has not been changed for 2025-26 and the Annual Installment allocation percentage calculations shown in Appendix D, and the Assessed Property will continue to be assessed as provided for in the Amended and Restated Service and Assessment Plan.

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IV. UPDATE OF THE ASSESSMENT ROLL

Pursuant to the Amended and Restated Service and Assessment Plan, the Assessment Roll shall be updated each year to reflect changes such as:

> (i) the identification of each Parcel; (ii) the Assessment for each Assessed Property, including any adjustments authorized by the Service and Assessment Plan or in the PID Act; (iii) the Annual Installment for the Assessed Property for the year (if the Assessment is payable in installments); and (iv) payments of the Assessment, if any, as provided by Section VI.G of the Service and Assessment Plan.

The summary Assessment Roll is shown in Appendix D. Each Parcel in the PID is identified, along with the Assessment on each Parcel and the Annual Installment to be collected from each Parcel.

A. PARCEL UPDATES

According to the Developer and DCAD and RCAD online records, plats were filed and recorded in 2022, which subdivided parent Parcels 88225, 65034680510230000, and 101982 into various residential, commercial, and mixed use Parcels. The subdivided Parcels will be recognized within the respective county's official roll in 2023. As a result, the newly subdivided Parcels within the South Improvement Area of the PID were individually billed Annual Installments beginning in tax year 2023.

According to RCAD online records, a Sapphire Bay final plat was filed and recorded in 2023 for the proposed development of twenty-two (22) townhome units. At the time of the 2024-25 Annual Installment billing, the subdivided accounts were not yet available. As a result, the newly recognized Parcels within the South Improvement Area of the PID were individually billed Annual Installments beginning in tax year 2025. See Table IV-A-1 below for the South Improvement Area Assessment allocation prior to and after the subdivision of the Parcel 330143.

Table IV-A-1
Parcel 330143 Subdivision

Prior to Subdivision				After Subdivision			
Parcel	**Estimated Build Out Value**	**Percent of Outstanding Assessment**	**Total Assessments**	**Parcel**	**Estimated Build Out Value**	**Percent of Outstanding Assessment**	**Total Assessments**
330143	$170,300,000	18.54%	$5,506,681	Various[1]	$15,400,000	1.68%	$497,962
				330143[2]	$154,900,000	16.86%	$5,008,719
Total	**$170,300,000**	**18.54%**	**$5,506,681**		**$170,300,000**	**18.54%**	**$5,506,681**

1 – Represents the aggregated build out value, percentage of outstanding Assessment, and total Assessment of 22 townhome units.
2 – Represents the estimated development of 200 condominium units and seven (7) townhome units.

The updated development plan within the South Improvement Area and the related Assessment allocation are shown in Appendix C attached hereto.

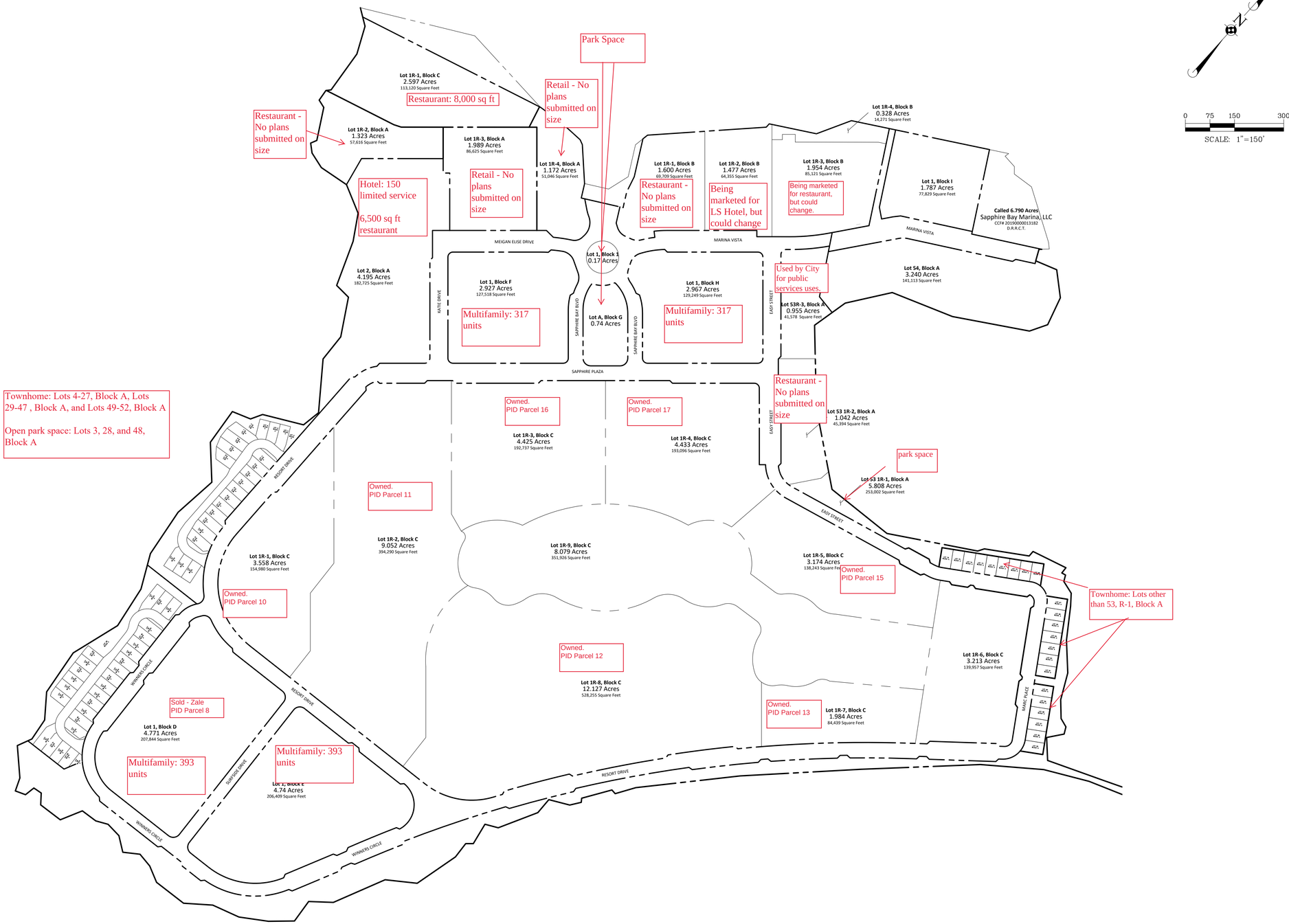
B. Prepayment of Assessments

Refer to Appendix E of this report for a list of all prepaid Assessments received as of September 30, 2025.

The complete Assessment Roll is available for review at Rowlett City Hall, located at 4000 Main Street, Rowlett, Texas 75088.

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APPENDIX A
PID MAP





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SCALE: 1"=150'

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Construction Managers | Environmental Scientists | Landscape Architects | Planners
Texas Board of Professional Engineers and Land Surveyors Registration No. F-21732

SAPPHIRE BAY

CITY OF ROWLETT, TEXAS

SITE EXHIBIT

PROJ. MGR.: BB
PROJ. ASSOC.: ZS
DRAWN BY: ZS
DATE: 07/25/2022

SHEET 1

611.025007

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PENDING

Plot Date: 07/25/22 Data Name: P:\611.025\...\07 Sapphire Bay Engineering Planning\Data\Data\Exhibits\2022-07-25 Overall Lot Exhibit\Sapphire Overall Exhibit.dwg Updated By: bzdeacon

APPENDIX B-1
PID FUNDED SOUTH IMPROVEMENTS

BAYSIDE PID - SOUTH IMPROVEMENT AREA
SAPPHIRE BAY BUDGET UPDATE 09/2025

SOUTH IMPROVEMENTS - PID FUNDED

	BUDGET FOR COMPLETION	PID FUNDS SPENT TO DATE[1]	CITY FUNDS SPENT TO DATE[2,3]	REMAINING FUNDS AVAILABLE
Roadway Improvements				
Earthwork	$2,305,515	$2,305,515	$0	$0
Paving	$4,464,471	$4,464,471	$0	$0
Subtotal: Roadway Improvements	*$6,769,986*	*$6,769,986*	*$0*	*$0*
Water Improvements	$3,082,899	$3,082,899	$0	$0
Sanitary Sewer Improvements	$2,069,913	$2,069,913	$0	$0
Storm Sewer Improvements	$2,845,770	$2,845,770	$0	$0
Professional and other Development Fees	$4,486,757	$4,486,757	$0	$0
Other Improvements				
Crystal Lagoon Licensing Fee	$3,142,520	$3,142,520	$0	$0
Landscape, Hardscape, Surf Lagoon, Beach, Trails, Parl	$1,807,254	$0	$0	$1,807,254
Seawall	$1,200,000	$1,126,032	$0	$73,968
TXDOT Bridge Enhancements	$1,000,000	$732,338	$0	$267,662
Subtotal: Other Improvements	*$7,149,774*	*$5,000,891*	*$0*	*$2,148,884*
Additional Offsite Improvements				
Offsite wastewater improvements	$2,907,084	$546,365	$2,360,719	$0
Contingency	$787,919	$780,623	$0	$7,296
Total	**$30,100,102**	**$25,583,203**	**$2,360,719**	**$2,156,180**

1-PID funds spent to date reflect amounts spent through Draw #19 as approved by the City on July 26, 2022 and excess funds available to reimburse Additional Offsite Improvements.

2 - Total estimated budget and amount allocated are provided by the City as of September 13, 2023.

3 - $546,365 is being reimbursed to the City from excess PID funds and the remaining Additional Offsite Improvements may be reimbursed to the City from future excess PID funds, if available.

APPENDIX B-2
SUBSEQUENT THIRD PARTY OWNER FUNDED SOUTH IMPROVEMENTS

BAYSIDE PID - SOUTH IMPROVEMENT AREA
SAPPHIRE BAY BUDGET UPDATE 09/2025

SOUTH IMPROVEMENTS - SUBSEQUENT THIRD PARTY OWNER FUNDED

	BUDGET FOR COMPLETION	FUNDS SPENT TO DATE[1]	REMAINING FUNDS AVAILABLE
Lagoon Construction Costs	$12,000,000	$0	$12,000,000
Total	**$12,000,000**	**$0**	**$12,000,000**

1-According to the Subsequent Third Party Owner .

APPENDIX C
SOUTH IMPROVEMENT AREA CURRENT DEVELOPMENT PLAN

Bayside Public Improvement District
South Improvement Area
Subsequent Third Party Owner's Current Development Plan

POD Number	Lot Type[1,2]	Units/SF[1,2]	Estimated Value per Unit[1]	Estimated Build Out Value	Total Assessment Percentage	Total Outstanding Assessment
1	Retail	11,700	$175	$2,047,500	0.23%	$66,206
2	Restaurant	8,500	$225	$1,912,500	0.22%	$61,841
3	Retail	22,800	$175	$3,990,000	0.45%	$129,017
4	Retail	45,000	$175	$7,875,000	0.90%	$254,640
5	Limited Service Hotel	150	$160,000	$24,000,000	2.73%	$776,044
	Restaurant	6,500	$225	$1,462,500	0.17%	$47,290
6	Townhomes	19	$700,000	$13,300,000	1.51%	$430,058
6	Townhomes (Prepaid)	2	$700,000	$1,400,000	PREPAID	PREPAID
7	Townhomes	26	$700,000	$18,200,000	2.07%	$588,500
8	Urban MF (5 Story/90 per acre)	393	$150,000	$58,950,000	PREPAID	PREPAID
	Townhomes	0	$700,000	$0	0.00%	$0
9	Urban MF (5 Story/90 per acre)	377	$150,000	$56,550,000	6.43%	$1,828,554
	Townhomes	0	$700,000	$0	0.00%	$0
10	Retail	30,000	$175	$5,250,000	0.60%	$169,760
	Restaurant	30,000	$225	$6,750,000	0.77%	$218,262
	Office	150,000	$175	$26,250,000	2.99%	$848,798
	Resort	250	$325,000	$81,250,000	9.24%	$2,627,233
11	Surf and Beach Club	36,070	$950	$34,266,500	3.90%	$1,108,013
12	Resort	512	$325,000	$166,400,000	18.93%	$5,380,573
	Full Service Spa	0	$0	$0	0.00%	$0
	Restaurant	0	$0	$0	0.00%	$0
	Office	0	$0	$0	0.00%	$0
13	Restaurant	15,000	$225	$3,375,000	0.38%	$109,131
	Condominium	100	$750,000	$75,000,000	8.53%	$2,425,138
14	Condominium	200	$750,000	$150,000,000	17.06%	$4,850,277
	Townhomes	29	$700,000	$20,300,000	2.31%	$656,404
15	Retail	55,000	$175	$9,625,000	1.09%	$311,226
	Restaurant	20,000	$225	$4,500,000	0.51%	$145,508
	Office	150,000	$175	$26,250,000	2.99%	$848,798
16	Retail	48,250	$175	$8,443,750	0.96%	$273,030
	Restaurant	20,000	$225	$4,500,000	0.51%	$145,508
	Office	150,000	$175	$26,250,000	2.99%	$848,798
17	Retail	48,250	$175	$8,443,750	0.96%	$273,030
	Restaurant	20,000	$225	$4,500,000	0.51%	$145,508
	Office	150,000	$175	$26,250,000	2.99%	$848,798
18	Urban MF (5 Story/90 per acre)	317	$150,000	$47,550,000	PREPAID	PREPAID
19	Urban MF (5 Story/90 per acre)	317	$150,000	$47,550,000	5.41%	$1,537,538
20	Restaurant	7,500	$225	$1,687,500	0.19%	$54,566
21	Restaurant	7,500	$225	$1,687,500	0.19%	$54,566
22	Limited Service Hotel	150	$160,000	$24,000,000	2.63%	$780,424
23	Restaurant	5,000	$225	$1,125,000	0.12%	$36,582
	Retail	5,000	$175	$875,000	0.10%	$28,453
	Marina Maintenance	20,000	$150	$3,000,000	0.33%	$97,553
24	Retail	20,000	$175	$3,500,000	0.40%	$113,173
25	Retail	30,000	$175	$5,250,000	0.60%	$169,760
	Retail	15,000	$175	$2,625,000	0.30%	$84,880
HOA	HOA				1.12%	$332,930
	Total	**1,129,912**		**$1,016,141,500**	**100.00%**	**$29,706,372**

1 - Pod #12 - The projected resort and convention center is to include a full-service spa, three restaurants, and approximately 77,000 SF of conference space. The estimated build out value for pod #12 for all projected amenities and uses is captured in the estimated development of the Resort Lot Type classification contemplated within pod #12.

2 - POD #9 - The Subsequent Third Party Owner as of 9/26/2022 proposed changes for POD 9 from 58 Townhomes to 377 multifamily units.

APPENDIX D
ASSESSMENT ROLL SUMMARY – 2025-26

Bayside PID
South Improvement Area
Assessment Roll Summary
2025-26

Parcel ID	Other Parcel ID[1]	POD	Proposed Development	No. of Units (Units/SF)	Total Outstanding Assessments	% of Assessment for allocating Annual Installment	Principal	Interest	Administrative Expense	Excess Interest for Reserves	Annual Installment
447550000A1R10000	-	1	Retail	11,700	$66,206.28	0.22%	$1,337.21	$4,271.99	$124.81	$331.03	$6,065.05
447550000A1R20000	-	2	Restaurant	8,500	$61,841.03	0.21%	$1,249.05	$3,990.32	$116.58	$309.21	$5,665.15
447550000A1R30000	-	3	Retail	22,800	$129,017.36	0.43%	$2,605.85	$8,324.91	$243.21	$645.09	$11,819.06
447550000A1R40000	-	4	Retail	45,000	$254,639.52	0.86%	$5,143.13	$16,430.75	$480.03	$1,273.20	$23,327.10
447550000A0020000	-	5	Limited Service Hotel	150	$776,044.25	2.61%	$15,674.30	$50,074.66	$1,462.93	$3,880.22	$71,092.12
			Restaurant	6,500	$47,290.20	0.16%	$955.15	$3,051.42	$89.15	$236.45	$4,332.18
447550000A0040000	-	6 & 7	Townhome	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID
447550000A0050000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0060000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0070000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0080000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0090000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0100000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0110000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0120000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0130000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0140000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0150000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0160000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0170000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0180000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0190000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0200000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0210000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0220000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0230000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0240000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0250000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0260000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0270000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0280000	-	6 & 7	Open Space/HOA	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
447550000A0290000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0300000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0310000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0320000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0330000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0340000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0350000	-	6 & 7	Townhome	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID
447550000A0360000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0370000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0380000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0390000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0400000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0410000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0420000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0430000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0440000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0450000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0460000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0470000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0480000	-	6 & 7	Open Space/HOA	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00

Bayside PID
South Improvement Area
Assessment Roll Summary
2025-26

Parcel ID	Other Parcel ID[1]	POD	Proposed Development	No. of Units (Units/SF)	Total Outstanding Assessments	% of Assessment for allocating Annual Installment	Principal	Interest	Administrative Expense	Excess Interest for Reserves	Annual Installment
447550000A0490000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0500000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0510000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000A0520000	-	6 & 7	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
447550000D0010000	117388	8	Urban MF (5 Story/90 per acre)	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID
117389	-	9	Urban MF (5 Story/90 per acre)	377	$1,828,554.27	6.16%	$36,932.57	$117,988.42	$3,447.04	$9,142.77	$167,510.80
447550000C1R10000	-	10	Retail	30,000	$169,759.68	0.57%	$3,428.75	$10,953.83	$320.02	$848.80	$15,551.40
			Restaurant	30,000	$218,262.45	0.73%	$4,408.40	$14,083.50	$411.45	$1,091.31	$19,994.66
			Office	150,000	$848,798.40	2.86%	$17,143.76	$54,769.16	$1,600.08	$4,243.99	$77,757.00
			Resort	250	$2,627,233.14	8.84%	$53,064.03	$169,523.59	$4,952.64	$13,136.17	$240,676.43
447550000C1R20000	330139	11	Surf and Beach Club	36,070	$1,108,013.35	3.73%	$22,379.31	$71,495.14	$2,088.74	$5,540.07	$101,503.25
330145	-	12	Resort	512	$5,380,573.48	18.11%	$108,675.14	$347,184.32	$10,143.01	$26,902.87	$492,905.34
330146	-	12	Open Space/Water	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
330144	-	13	Restaurant	15,000	$109,131.22	0.37%	$2,204.20	$7,041.75	$205.73	$545.66	$9,997.33
			Condominium	100	$2,425,138.29	8.16%	$48,982.18	$156,483.32	$4,571.67	$12,125.69	$222,162.86
330143	-	14	Condominium	200	$4,850,276.57	16.33%	$97,964.37	$312,966.63	$9,143.34	$24,251.38	$444,325.72
			Townhomes (Unplatted)	7	$158,442.37	0.53%	$3,200.17	$10,223.58	$298.68	$792.21	$14,514.64
333737		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333738		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333739		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333740		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333741		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333742		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333743		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333744		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333745		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333746		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333747		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333748		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333749		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333750		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333751		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333752		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333753		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333754		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333755		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333756		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333757		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
333758		14	Townhome	1	$22,634.62	0.08%	$457.17	$1,460.51	$42.67	$113.17	$2,073.52
330142	-	15	Retail	55,000	$311,226.08	1.05%	$6,286.05	$20,082.03	$586.70	$1,556.13	$28,510.90
			Restaurant	20,000	$145,508.30	0.49%	$2,938.93	$9,389.00	$274.30	$727.54	$13,329.77
			Office	150,000	$848,798.40	2.86%	$17,143.76	$54,769.16	$1,600.08	$4,243.99	$77,757.00
447550000C1R30000	330140	16	Retail	48,250	$273,030.15	0.92%	$5,514.58	$17,617.41	$514.69	$1,365.15	$25,011.84
			Restaurant	20,000	$145,508.30	0.49%	$2,938.93	$9,389.00	$274.30	$727.54	$13,329.77
			Office	150,000	$848,798.40	2.86%	$17,143.76	$54,769.16	$1,600.08	$4,243.99	$77,757.00
330141	-	17	Retail	48,250	$273,030.15	0.92%	$5,514.58	$17,617.41	$514.69	$1,365.15	$25,011.84
			Restaurant	20,000	$145,508.30	0.49%	$2,938.93	$9,389.00	$274.30	$727.54	$13,329.77
			Office	150,000	$848,798.40	2.86%	$17,143.76	$54,769.16	$1,600.08	$4,243.99	$77,757.00
447550000F0010000	-	18	Urban MF (5 Story/90 per acre)	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID
447550000H0010000	117391	19	Urban MF (5 Story/90 per acre)	317	$1,537,537.67	5.18%	$31,054.70	$99,210.42	$2,898.44	$7,687.69	$140,851.25
330133	-	20	Restaurant	7,500	$54,565.61	0.18%	$1,102.10	$3,520.87	$102.86	$272.83	$4,998.66

Bayside PID
South Improvement Area
Assessment Roll Summary
2025-26

Parcel ID	Other Parcel ID[1]	POD	Proposed Development	No. of Units (Units/SF)	Total Outstanding Assessments	% of Assessment for allocating Annual Installment	Principal	Interest	Administrative Expense	Excess Interest for Reserves	Annual Installment
330134	-	21	Public Services	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
117384	-	22	Limited Service Hotel	150	$780,424.43	2.63%	$15,762.77	$50,357.29	$1,471.19	$3,902.12	$71,493.38
117383	-	23	Restaurant	5,000	$36,582.40	0.12%	$738.88	$2,360.50	$68.96	$182.91	$3,351.25
			Retail	5,000	$28,452.97	0.10%	$574.68	$1,835.94	$53.64	$142.26	$2,606.53
			Marina Maintenance	20,000	$97,553.05	0.33%	$1,970.35	$6,294.66	$183.90	$487.77	$8,936.67
330137	-	24	Retail	20,000	$113,173.12	0.38%	$2,285.84	$7,302.55	$213.34	$565.87	$10,367.60
447550000B1R10000	330135	25	Retail	15,000	$84,879.84	0.29%	$1,714.38	$5,476.92	$160.01	$424.40	$7,775.70
447550000B1R20000	330136	25	Retail	30,000	$169,759.68	0.57%	$3,428.75	$10,953.83	$320.02	$848.80	$15,551.40
		21	Restaurant	7,500	$54,565.61	0.18%	$1,102.10	$3,520.87	$102.86	$272.83	$4,998.66
447550000A0030000	-	HOA	Open Space/HOA	1	$332,929.95	1.12%	$6,724.41	$21,482.48	$627.61	$1,664.65	$30,499.16
447550000A53R1000	-	0	Open Space/HOA	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
447550000G0010000	-	0	Open Space/HOA	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
117390	-	0	Open Space/HOA	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
330132	-	0	Open Space/HOA	0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
330138	-	0		0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
447550000B1R40000	-	0		0	$0.00	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00
					$29,706,372.46	**100.00%**	**$600,000.00**	**$1,916,819.23**	**$56,000.00**	**$148,531.86**	**$2,721,351.09**

1 - Other Parcel ID represents Parcels located within the South Improvement Area of the PID that have a parcel boundary bisected by the county lines of Dallas and Rockwall Counties.

APPENDIX E
PREPAID PARCELS

Bayside Public Improvement District
South Improvement Area
Prepaid Parcels

Parcel ID	Lot Type	Amount	Full/Partial	Prepayment Date
447550000D0010000	Multifamily	$2,073,914.16	Full	2/10/2022
447550000A0350000	Townhome	$23,483.39	Full	10/30/2023
447550000A0040000	Townhome	$23,085.50	Full	10/29/2024
447550000F0010000	Multifamily	$1,568,144.49	Full	12/31/2024
TOTAL		**$3,688,627.54**		

APPENDIX F
PID ASSESSMENT NOTICE

PID Assessment Notice

NOTICE OF OBLIGATION TO PAY PUBLIC IMPROVEMENT DISTRICT ASSESSMENT TO CITY OF ROWLETT, TEXAS
CONCERNING THE FOLLOWING PROPERTY

[insert property address]

As the purchaser of the real property described above, you are obligated to pay assessments to the City of Rowlett, Texas (the "City"), for the costs of a portion of a public improvement or services project (the "Authorized Improvements") undertaken for the benefit of the property within the Bayside Public Improvement District – South Improvement Area (the "District") created under Subchapter A, Chapter 372, Local Government Code.

AN ASSESSMENT HAS BEEN LEVIED AGAINST YOUR PROPERTY FOR THE AUTHORIZED IMPROVEMENTS, WHICH MAY BE PAID IN FULL AT ANY TIME. IF THE ASSESSMENT IS NOT PAID IN FULL, IT WILL BE DUE AND PAYABLE IN ANNUAL INSTALLMENTS THAT WILL VARY FROM YEAR TO YEAR DEPENDING ON THE AMOUNT OF INTEREST PAID, COLLECTION COSTS, ADMINISTRATIVE COSTS, AND DELINQUENCY COSTS.

The exact amount of the assessment may be obtained from the City. The exact amount of each annual installment will be approved each year by the City Council in the Annual Service Plan Update for the District. More information about the assessments, including the amounts and due dates, may be obtained from the City or MuniCap, Inc., the District Administrator for the City, located at 600 E. John Carpenter Fwy, Suite 150, Irving, Texas 75062 and available by telephone at (469) 490-2800 or (866) 648-8482 (toll free) and email at txpid@municap.com.

Your failure to pay any assessment or any annual installment may result in penalties and interest being added to what you owe or in a lien on and the foreclosure of your property.

Date: _____

_____ _____
Signature of Seller Signature of Seller

The undersigned purchaser acknowledges receipt of this notice before the effective date of a binding contract for the purchase of the real property at the address described above.

Date: _____

_____ _____
Signature of Purchaser Signature of Purchaser

STATE OF TEXAS §
§
COUNTY OF _____ §

The foregoing instrument was acknowledged before me by _____ and _____, known to me to be the person(s) whose name(s) is/are subscribed to the foregoing instrument, and acknowledged to me that he or she executed the same for the purposes therein expressed, in the capacity stated and as the act and deed of the above-referenced entities as an authorized signatory of said entities.

Given under my hand and seal of office on this _____, 20__.

_____
Notary Public, State of Texas

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 4.F.

Title

Consider action to approve the 2025-2026 Trails at Cottonwood Creek Public Improvement District (PID) Service and Assessment Plan for the Trails at Cottonwood Creek PID Major Improvement Area (MIA) and Neighborhood Improvement Area #1 (NIA#1).

Consider action to approve an ordinance adopting changes to the 2025-2026 Trails at Cottonwood Creek Public Improvement District (PID) Service and Assessment Plan including the annual update to the Assessment Roll and levy of assessments on property in the PID pursuant to the Service and Assessment Plan for the Trails at Cottonwood Creek PID – Major Improvement Area (MIA) and Neighborhood Improvement Area #1 (NIA#1).

Staff Representative

Michael Kuhn, Treasurer & Debt Mgr.

Executive Summary

Annual updates to PIDs are required by the PID Act, Chapter 372, Texas Local Government Code. The purpose of this item is to update the Trails at Cottonwood Creek Public Improvement District Service and Assessment Plan, including the annual update to the Assessment Roll, and the levy of assessments on property within the District.

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
STRENGTHEN NEIGHBORHOOD LIVABILITY	3.3 Invest in enjoyable places of lasting value and distinctive character.

Background Information

The City Council created the Trails at Cottonwood Creek PID on March 17, 2020.

On May 18, 2021, the City Council approved the Trails at Cottonwood Creek PID Service and Assessment Plan and the Assessment Rolls for the District.

Annual updates to the Trails at Cottonwood Creek PID Service and Assessment Plan, the Assessment Roll, and the levy of assessments on property in the PID were approved by City Council as follows:

- October 18, 2022
- October 17, 2023
- November 12, 2024

This serves as the fourth annually required update to the Service and Assessment Plan, the Assessment Roll, and the levy of assessments on property in the PID. Monies from the bond issues for each of the Major Improvement Area and Neighborhood Improvement Area #1 funded capitalized interest through 2023. Annual installments began 2023-2024, funded by a levy against property owners for the payment of principal and interest on outstanding bonds, administrative expenses, and excess interest for prepayment and delinquency reserves.

Discussion

Annual ordinances will reflect updates to authorized improvements, budget, assessment methodology, parcel status, prepayments for assessment, and annual installments to be collected for PID bonds and obligations. These ordinances will provide for billing of the calculated assessment each year to those property owners included on the approved Assessment Roll.

The summary of 2025-2026 annual updates for the improvement area are as follows:

Sources & Uses of Funds – Major Improvement Area

Table II-A-1
Current Sources and Uses – Major Improvements

Sources of Funds	Initial Estimated Budget	Actual Amount[1]	Variance
Bond par amount	$5,065,000	$5,065,000	$0
Original Issue Discount	($46,442)	($46,442)	$0
Net Par Amount	$5,018,558	$5,018,558	$0
Other funding sources			
Accrued Interest Earnings[2]	$0	$345,290	$345,290
Developer Contributions	$0	$0	$0
Total Sources	**$5,018,558**	**$5,363,848**	**$345,290**
Uses of Funds			
Major Improvements			
Roadway Improvements	$644,812	$901,962	$257,150
Sanitary Sewer Improvements	$1,784,962	$2,077,410	$292,448
Drainage Improvements	$453,094	$483,709	$30,615
Other soft and miscellaneous costs	$818,956	$584,033	($234,923)
Subtotal: Major Improvements	*$3,701,824*	*$4,047,114*	*$345,290*
Bond Issuance Costs			
Debt Service Reserve Fund	$311,650	$311,650	$0
Administrative Expenses	$105,700	$105,700	$0
Capitalized Interest	$472,049	$472,049	$0
Cost of Issuance	$275,385	$275,385	$0
Underwriters Discount/ Underwriters Counsel	$151,950	$151,950	$0
Subtotal: Bond Issuance Costs	*$1,316,734*	*$1,316,734*	*$0*
Total Uses	**$5,018,558**	**$5,363,848**	**$345,290**

1 – According to requisition #6 approved by the City in March 2025.
2 – Represents interest earned on project funds held by the Trustee.

Sources & Uses of Funds – Neighborhood Improvement Area #1

Table II-A-2[3]
Current Sources and Uses – Neighborhood Improvement Area #1

Sources of Funds	Initial Estimated Budget	Actual Amount	Variance
Bond par amount	$2,543,000	$2,543,000	$0
Bond Premium	$14,107	$14,107	$0
Net Par Amount	$2,557,107	$2,557,107	$0
Other funding sources			
Accrued Interest Earnings[2]	$0	$130,308	$130,308
Developer Contributions	$6,234,135	$7,414,846	$1,180,711
Total Sources	**$8,791,242**	**$10,102,260**	**$1,311,018**
Uses of Funds			
Major Improvements			
Roadway Improvements	$218,571	$365,247	$146,676
Sanitary Sewer Improvements	$605,047	$685,780	$80,732
Drainage Improvements	$153,585	$185,551	$31,966
Other soft and miscellaneous costs	$277,601	$148,534	($129,067)
Subtotal: Major Improvements	*$1,254,804*	*$1,385,112*	*$130,307*
NIA #1 Improvements			
Roadway Improvements	$2,557,028	$2,912,292	$355,264
Sanitary Sewer Improvements	$882,739	$882,739	$0
Drainage Improvements	$1,398,646	$1,398,646	$0
Park Improvements	$394,600	$1,575,311	$1,180,711
Other soft and miscellaneous costs	$1,586,224	$1,230,960	($355,264)
Subtotal: NIA #1 Improvements	*$6,819,237*	*$7,999,948*	*$1,180,711*
Bond Issuance Costs			
Debt Service Reserve Fund	$155,130	$155,130	$0
Administrative Expenses	$105,700	$105,700	$0
Capitalized Interest	$215,081	$215,081	$0
Cost of Issuance	$165,000	$165,000	$0
Underwriters Discount/ Underwriters Counsel	$76,290	$76,290	$0
Subtotal: Bond Issuance Costs	*$717,201*	*$717,201*	*$0*
Total Uses	**$8,791,242**	**$10,102,260**	**$1,311,018**

1 – According to requisition #6 approved by the City in March 2025 and Developer's Quarterly Improvement Implementation report as of June 30, 2025.
2 – Represents interest earned on project funds held by the Trustee.
3 – Amounts shown above are rounded to the nearest dollar.

Annual Assessment by Lot Type – Major Improvement Area

Table II-E-2
Annual Installment Per Lot Type – Major Improvement Area

Lot Type	Annual Installment per Equivalent Unit	Equivalent Unit Factor	Annual Installment Per Unit
50 Ft Lots	$727.98	1.00	$727.98
40 Ft Lots	$727.98	0.89	$647.90
Townhomes	$727.98	0.79	$575.10

Annual Assessment by Lot Type – Neighborhood Improvement Area #1

Table II-G-2
Annual Installment Per Lot Type – NIA #1

Lot Type	Annual Installment Per Equivalent Unit	Equivalent Unit Factor	Annual Installment Per Unit
50 Ft Lots	$1,195.13	1.00	$1,195.13
40 Ft Lots	$1,195.13	0.89	$1,069.32
Townhomes	$1,195.13	0.79	$943.52

Indebtedness

Major Improvement Area
Outstanding Assessments: $4,855,000.00

Neighborhood Improvement Area #1
Outstanding Assessments: $2,377,720.37

Annual Budget – Major Improvement Area

Table II-D-1
Budget for the MIA
Annual Installments to be Collected for 2025-26

	MIA Bonds[1]
Interest payment on March 15, 2026	$100,319
Interest payment on September 15, 2026	$100,319
Principal payment on September 15, 2026	$111,000
Subtotal - Debt Service Payments	*$311,638*
Administrative Expenses	$47,000
Excess Interest for Prepayment & Delinquency Reserves	$24,275
Subtotal Expenses	*$382,913*
Available Reserve Fund Income	($4,000)
Available Administrative Expense Funds	($5,000)
Subtotal funds available	*($9,000)*
Annual Installments	**$373,913**

1 – Amounts shown above are rounded to the nearest dollar for presentation purposes, whereas the calculations are to the cent.

Annual Budget – Neighborhood Improvement Area #1

Table II-F-1
Budget for the NIA #1 Annual Installments to be Collected for 2025-26

	NIA #1 Bonds[1]
Interest payment on March 15, 2026	$44,781
Interest payment on September 15, 2026	$44,781
Principal payment on September 15, 2026	$63,000
Subtotal - Debt Service Payments	*$152,562*
Administrative Expenses	$47,000
Excess Interest for Prepayment & Delinquency Reserves	$11,889
Subtotal Expenses	*$211,451*
Available Reserve Fund Income	($2,000)
Available Administrative Expense Funds	($5,000)
Subtotal funds available	*($7,000)*
Annual Installments	**$204,451**

1 – Amounts shown above are rounded to the nearest dollar for presentation purposes, whereas the calculations are to the cent.

Changes to Assessment Methodology

No changes to assessment methodology.

Parcel Subdivision Summary

According to DCAD online records, parent Parcel 65009569510010000 was partially subdivided into one hundred and ninety-four (194) residential lots and thirty-two (32) open space lots within the PID. As a result, individual Parcels within Neighborhood Improvement Area #1 of the PID were individually billed Annual Installments beginning in tax year 2025.

Table IV-A-1
Parent Parcel Subdivision
Neighborhood Improvement Area #1 Assessments

Prior to Subdivision				After Subdivision					
Parcel	Projected Number of Units[1]	Equivalent Units (EU)	Total PID Assessments	Parcel	EU per Lot Type	Number of Units[1]	Total EU	Assessment per Unit	Total Assessments
65009569510010000	191	171.07	$2,377,720	Various (50' Lot)	1.00	72	72.00	$13,899	$1,000,733
				Various (40' Lot)	0.89	53	46.97	$12,436	$652,773
				Various (Townhome)	0.79	66	52.11	$10,973	$724,214
Total	**191**	**171.07**	**$2,377,720**			**191**	**171.07**		**$2,377,720**

1 – There are three less units due to the three Parcels that prepaid their Assessments.

Prepayment Summary

As of August 31, 2025, there has been no prepayment of Assessments within the Major Improvement Area of the PID.

As of August 31, 2025, there have been three full prepayments of Assessments and one partial prepayment within the Neighborhood Improvement Area #1 of the PID.

Development Plan

There are no proposed revisions to the development plan.

DEVELOPMENT PLAN

Land Use	Quantity
50 Ft Lots	182
60 Ft Lots	432
Townhomes	151
Total	765

*Original SAP 5/18/21

Financial/Budget Implications
This action has no impact on the City's annual budget. All costs are borne by the property owners within the Trails at Cottonwood Creek Public Improvement District.

Recommended Action
Move to adopt an ordinance accepting and approving the annual Service and Assessment Plan Update and Assessment Rolls for the Trails at Cottonwood Creek Public Improvement District, and levying special assessments against certain property in the District.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS, REVIEWING AND UPDATING THE SERVICE PLAN INCLUDING UPDATES TO THE ASSESSMENT ROLL FOR THE TRAILS AT COTTONWOOD CREEK PUBLIC IMPROVEMENT DISTRICT OF THE CITY OF ROWLETT; PROVIDING A SEVERABILITY CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council of the City of Rowlett, Texas, following due and strict compliance with the laws of the State of Texas and the ordinances of the City of Rowlett, Texas, and having given requisite notice by publication and otherwise, and after holding full and fair public hearings, has authorized the creation of the Trails at Cottonwood Creek Public Improvement District (the "District") of the City of Rowlett; and

WHEREAS, the City Council has, following due notice and hearing, adopted and approved a Service and Assessment Plan for the District Improvements, as described therein, on which assessment rolls have been created and made available for public inspection, and assessments have been levied on the properties within the District; and

WHEREAS, the Service and Assessment Plan and Assessment Roll is required to be reviewed and updated at least annually for annual budget purposes as required by the Public Improvement District Assessment Act, Chapter 372 of the Texas Local Government Code; and

WHEREAS, the Annual Service and Assessment Plan Update and updated Assessment Roll summaries attached as Exhibit A hereto, conform the original Assessment Roll to the principal and interest payment schedule required for the bonds issued by the District, and update the Assessment Roll to reflect prepayments, property

divisions and changes to the budget allocation for District public improvements that occur during the year prior to this update, if any; and

WHEREAS, the City Council now desires to proceed with the adoption of this Ordinance and to approve and adopt the Annual Service Plan Update and the updated Assessment Roll summary attached thereto for the District, in conformity with the requirements of law; and

WHEREAS, the City Council finds the passage of this Ordinance to be in the best interest of the citizens of Rowlett.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS THAT:

SECTION 1: All matters stated in the preamble of this ordinance are found to be true and correct and are incorporated herein as if copied in their entirety.

SECTION 2: The Trails at Cottonwood Creek Annual Service Plan Update and updated Assessment Roll, attached hereto and incorporated herein by this reference as Exhibit A, are hereby accepted, adopted and approved.

SECTION 3: The City Secretary is directed to cause a copy of this Ordinance, including the 2025-2026 Annual Service Plan to be recorded in the real property records of Dallas County, Texas, on or before October 28, 2025. The City Secretary is further directed to similarly file each Annual Service Plan Update approved by the City Council, with each such filing to occur within seven days of the date each respective Annual Service Plan Update is approved.

SECTION 4: This Ordinance shall be cumulative of all other City Ordinances and all other provisions of other Ordinances adopted by the City which are inconsistent with the terms or provisions of this Ordinance are hereby repealed.

SECTION 5: It is hereby declared to be the intention of the City Council of the City of Rowlett, Texas, that sections, paragraphs, clauses and phrases of this Ordinance are severable, and if any phrase, clause, sentence, paragraph or section of this Ordinance shall be declared legally invalid or unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such legal invalidity or unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs or sections of this Ordinance since the same would have been enacted by the City Council of the City of Rowlett without the incorporation in this Ordinance of any such legally invalid or unconstitutional, phrase, sentence, paragraph or section.

SECTION 6: This Ordinance shall take effect immediately from and after its passage as the law and charter in such cases provide.

Attachments

1. Exhibit A – Trails at Cottonwood Creek PID Service and Assessment Plan Update and 2025-2026 Assessment Roll

THE TRAILS AT COTTONWOOD CREEK
PUBLIC IMPROVEMENT DISTRICT

CITY OF ROWLETT, TEXAS

ANNUAL SERVICE PLAN UPDATE
(ASSESSMENT YEAR 9/15/25 - 9/14/26)

AS APPROVED BY CITY COUNCIL ON:
OCTOBER 21, 2025

PREPARED BY:

MUNICAP, INC.
PUBLIC FINANCE

THE TRAILS AT COTTONWOOD CREEK
PUBLIC IMPROVEMENT DISTRICT

ANNUAL SERVICE PLAN UPDATE
(ASSESSMENT YEAR 9/15/25 – 9/14/26)

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APPENDIX F - PID ASSESSMENT NOTICE

I. INTRODUCTION

The Trails at Cottonwood Creek Public Improvement District (the "PID") was created pursuant to the PID Act and Resolution No. RES-032-20 approved by the City Council of Rowlett, Texas (the "City Council") on March 17, 2020 to finance certain public improvement projects for the benefit of the property in the PID.

On May 18, 2021, the City of Rowlett, Texas (the "City") approved the issuance of the City of Rowlett, Texas Special Assessment Revenue Bonds, Series 2021 (Trails at Cottonwood Creek Public Improvement District Neighborhood Improvement Area #1 Project) (the "NIA #1 Bonds") in the aggregate principal amount of $2,543,000, and the City of Rowlett, Texas Special Assessment Revenue Bonds, Series 2021 (Trails at Cottonwood Creek Public Improvement District Major Improvement Area Project) (the "MIA Bonds") in the aggregate principal amount of $5,065,000, were issued to finance, refinance, provide or otherwise assist in the acquisition, construction and maintenance of the public improvements provided for the benefit of the property in the PID.

A service and assessment plan (the "Service and Assessment Plan") was prepared at the direction of the City identifying the public improvements (the "Authorized Improvements") to be provided by the PID, the costs of the Authorized Improvements, the indebtedness to be incurred for the Authorized Improvements, and the manner of assessing the property in the PID for the costs of the Authorized Improvements. Pursuant to the PID Act, the Service and Assessment Plan must be reviewed and updated annually. This document is the annual update of the Service and Assessment Plan for 2025-26 (the "Annual Service Plan Update").

The City also adopted the Neighborhood Improvement Area #1 (the "NIA #1") Assessment Roll and the Major Improvement Area (the "MIA") Assessment Roll attached as Appendix G and Appendix F, respectively, to the Service and Assessment Plan, identifying the assessments on each Parcel within the PID, based on the method of assessment identified in the Service and Assessment Plan. This Annual Service Plan Update also updates the Assessment Rolls for 2025-26.

Effective September 1, 2021, the Texas legislature passed House Bill 1543 as an amendment to the PID Act, requiring, among other things, (i) all Service and Assessment Plans and Annual Service Plan Updates be approved through City ordinance or order to be filed with the county clerk of each county in which all or part of the PID is located within seven days and (ii) include a copy of the notice form required by Section 5.014 of the Texas Property Code (the "PID Assessment Notice") as disclosure of the obligation to pay PID Assessments. In light of these amendments to the PID Act, this Annual Service Plan Update includes a copy of the PID Assessment Notice as Appendix F and a copy of this Annual Service Plan Update will be filed with the county clerk in each county in which all or a part of the PID is located not later than seven (7) days after the date the governing body of the City approves this Annual Service Plan Update.

Section 372.013 of the PID Act, as amended, stipulates that a person who proposes to sell or otherwise convey real property that is located in the PID, except in certain situations described in

the PID Act, shall first give to the purchaser of the property a copy of the completed PID Assessment Notice. The PID Assessment Notice shall be given to a prospective purchase before the execution of a binding contract of purchase and sale, either separately or as an addendum or paragraph of a purchase contract. In the event a contract of purchase and sale is entered into without the seller provided the required notice, the purchaser, subject to certain exceptions described in the PID act is entitled to terminate the contract.

The PID Assessment Notice shall be executed by the seller and must be filed in the real property records of the County in which the property is located at the closing of the purchase and sale of the property.

Capitalized terms shall have the meanings set forth in the Service and Assessment Plan unless otherwise defined herein.

(remainder of this page is intentionally left blank)

II. UPDATE OF THE SERVICE PLAN

A. UPDATED SOURCES AND USES FOR PUBLIC IMPROVEMENTS

Major Improvements Sources and Uses

Pursuant to the Service and Assessment Plan adopted on May 18, 2021, the initial total estimated costs of the Major Improvements, including bond issuance costs, were equal to $5,018,558. According to requisition #6 approved by the City in March 2025, the actual costs of the Major Improvements were equal to $5,363,848, representing an increase of $345,290 from the initial total estimated costs.

Table II-A-1 on the following page summarizes the updated sources and uses of funds required to (1) construct the Major Improvements, (2) establish the PID, and (3) issue the MIA Bonds.

(remainder of this page is intentionally left blank)

Table II-A-1
Current Sources and Uses – Major Improvements

Sources of Funds	Initial Estimated Budget	Actual Amount[1]	Variance
Bond par amount	$5,065,000	$5,065,000	$0
Original Issue Discount	($46,442)	($46,442)	$0
Net Par Amount	$5,018,558	$5,018,558	$0
Other funding sources			
Accrued Interest Earnings[2]	$0	$345,290	$345,290
Developer Contributions	$0	$0	$0
Total Sources	**$5,018,558**	**$5,363,848**	**$345,290**
Uses of Funds			
Major Improvements			
Roadway Improvements	$644,812	$901,962	$257,150
Sanitary Sewer Improvements	$1,784,962	$2,077,410	$292,448
Drainage Improvements	$453,094	$483,709	$30,615
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Subtotal: Major Improvements	*$3,701,824*	*$4,047,114*	*$345,290*
Bond Issuance Costs			
Debt Service Reserve Fund	$311,650	$311,650	$0
Administrative Expenses	$105,700	$105,700	$0
Capitalized Interest	$472,049	$472,049	$0
Cost of Issuance	$275,385	$275,385	$0
Underwriters Discount/ Underwriters Counsel	$151,950	$151,950	$0
Subtotal: Bond Issuance Costs	*$1,316,734*	*$1,316,734*	*$0*
Total Uses	**$5,018,558**	**$5,363,848**	**$345,290**

1 – According to requisition #6 approved by the City in March 2025.
2 – Represents interest earned on project funds held by the Trustee.

Major Improvement Area Cost Variances

As shown in Table II-A-1 above, the increase in the actual costs of the Major Improvements were funded by project fund interest earnings and did not increase Assessments.

Neighborhood Improvement Area #1 Improvements Sources and Uses

Pursuant to the Service and Assessment Plan adopted on May 18, 2021, the initial total estimated costs of the Neighborhood Improvement Area #1 Improvements, including bond issuance costs, were equal to $8,791,242. According to requisition #6 approved by the City in March 2025 and Developer's Quarterly Improvement Implementation report as of June 30, 2025, the actual costs of the

Neighborhood Improvement Area #1 Improvements were equal to $10,102,260, representing an increase of $1,311,018 from the initial total estimated costs.

Table II-A-2 on the following page summarizes the updated sources and uses of funds required to (1) construct the Neighborhood Improvement Area #1 Improvements, including the proportional share of the Major Improvement costs, (2) establish the PID, and (3) issue NIA #1 Bonds.

(remainder of this page is intentionally left blank)

Table II-A-2[3]
Current Sources and Uses – Neighborhood Improvement Area #1

Sources of Funds	Initial Estimated Budget	Actual Amount	Variance
Bond par amount	$2,543,000	$2,543,000	$0
Bond Premium	$14,107	$14,107	$0
Net Par Amount	$2,557,107	$2,557,107	$0
Other funding sources			
Accrued Interest Earnings[2]	$0	$130,308	$130,308
Developer Contributions	$6,234,135	$7,414,846	$1,180,711
Total Sources	**$8,791,242**	**$10,102,260**	**$1,311,018**
Uses of Funds			
Major Improvements			
Roadway Improvements	$218,571	$365,247	$146,676
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Drainage Improvements	$153,585	$185,551	$31,966
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Subtotal: Major Improvements	*$1,254,804*	*$1,385,112*	*$130,307*
NIA #1 Improvements			
Roadway Improvements	$2,557,028	$2,912,292	$355,264
Sanitary Sewer Improvements	$882,739	$882,739	$0
Drainage Improvements	$1,398,646	$1,398,646	$0
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Bond Issuance Costs			
Debt Service Reserve Fund	$155,130	$155,130	$0
Administrative Expenses	$105,700	$105,700	$0
Capitalized Interest	$215,081	$215,081	$0
Cost of Issuance	$165,000	$165,000	$0
Underwriters Discount/ Underwriters Counsel	$76,290	$76,290	$0
Subtotal: Bond Issuance Costs	*$717,201*	*$717,201*	*$0*
Total Uses	**$8,791,242**	**$10,102,260**	**$1,311,018**

1 – According to requisition #6 approved by the City in March 2025 and Developer's Quarterly Improvement Implementation report as of June 30, 2025.
2 – Represents interest earned on project funds held by the Trustee.
3 – Amounts shown above are rounded to the nearest dollar.

Neighborhood Improvement Area #1 Improvement Cost Variances

As stated in Table II-A-2 on the previous page, the increase in the actual costs of the Neighborhood Improvement Area #1 Improvements were funded by project fund interest earnings and developer contributions and did not increase Assessments.

B. FIVE YEAR SERVICE PLAN

According to the PID Act, a service plan must cover a period of five years.

The projected Major Improvement Area Annual Installments over a period of five years are shown in Table II-B-1 below.

Table II-B-1[3]
Major Improvement Area
Projected Annual Installments (2021-2031)

Assessment Year ending September 15	Principal Payments	Interest Expense	Administrative Expenses	Prepayment & Delinquency Reserves	Capitalized Interest or Other Available Credits[1]	Annual PID Installments[2]
2021-25	$210,000	$885,212	$182,700	$50,135	($602,583)	$725,464
2026	$111,000	$200,638	$47,000	$24,275	($9,000)	$373,913
2027	$115,000	$196,475	$38,643	$23,720	$0	$373,838
2028	$119,000	$192,163	$39,416	$23,145	$0	$373,723
2029	$123,000	$187,700	$40,204	$22,550	$0	$373,454
2030	$128,000	$183,088	$41,008	$21,935	$0	$374,031
2031	$132,000	$178,288	$41,828	$21,295	$0	$373,411
Total	**$938,000**	**$2,023,562**	**$430,799**	**$187,055**	**($611,583)**	**$2,967,832**

1 – Other available credits include but are not necessarily limited to interest income earned in the Reserve Fund or excess funds available from the trust accounts.
2 – Assessment years ending 2021-2026 reflect actual Annual Installments and are net of applicable investment income and other credits. Assessment years 2027 through 2031 reflect projected Annual Installments and will be updated in future annual service plan updates.
3 – Amounts shown above are rounded to the nearest dollar.

The projected Neighborhood Improvement Area #1 Annual Installments over a period of five years are shown in Table II-B-2 on the following page.

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Table II-B-2[3]
Neighborhood Improvement Area #1
Projected Annual Installments (2021-2031)

Assessment Year ending September 15	Principal Payments	Interest Expense	Administrative Expenses	Prepayment & Delinquency Reserves	Capitalized Interest or Other Available Credits[1]	Annual PID Installments[2]
2021-25	$122,000	$403,216	$182,700	$25,130	($330,718)	$402,328
2026	$63,000	$89,562	$47,000	$11,889	($7,000)	$204,451
2027	$65,000	$89,224	$38,643	$11,790	$0	$204,657
2028	$66,000	$87,193	$39,416	$11,465	$0	$204,073
2029	$68,000	$85,130	$40,204	$11,135	$0	$204,469
2030	$70,000	$83,005	$41,008	$10,795	$0	$204,809
2031	$72,000	$80,818	$41,828	$10,445	$0	$205,091
Total	**$526,000**	**$918,147**	**$430,799**	**$92,649**	**($337,718)**	**$1,629,877**

1 – Other available credits include but are not necessarily limited to interest income earned in the Reserve Fund or excess funds available from the trust accounts.
2 – Assessment years ending 2021-2026 reflect actual Annual Installments and are net of applicable investment income and other credits. Assessment years 2027 through 2031 reflect projected Annual Installments and will be updated in future annual service plan updates.
3 – Amounts shown above are rounded to the nearest dollar.

C. STATUS OF DEVELOPMENT

Major Improvement Area

According to the Developer's Quarterly Improvement Implementation Report dated June 30, 2025, the expected completion date for the Major Improvement Area Improvements is the third quarter of 2025.

According to the Developer, all onsite roadway, water, sanitary sewer and storm drainage work is substantially complete. Paving Construction activities have been performed by Mario Sinacola & Sons, Inc, ("Sinacola"). Sinacola has achieved completion of the on-site roadway and alley network and has now completed the roundabout and modification of Vinson Road, the main entry into the subdivision. The paving activities are substantially complete. Utility Contractor Interstate Pipeline Utility Construction, Inc. ("Interstate") has completed punch list and finish out activities. The utility activities are substantially complete.

According to the Developer, a contract for improvements to the Enclave Lift Station, Northside Lift Station and gravity extension has been awarded to Blue Star Utilities. Parts and materials were ordered in the fourth quarter of 2023. Blue Star Utilities mobilized in February 2024 to construct the Waters Lane "Expanded Line" and completed this portion of the project in March 2024. The Waters Lane Expanded Line activities are substantially complete and were accepted by the City on May 15, 2024.

The City of Rowlett released the Lift Station improvements for construction in March 2024. Materials have arrived, and installation of the improvements began on schedule in December 2024 and is expected to be completed in the third quarter of 2025.

Neighborhood Improvement Area #1

According to the Developer's Quarterly Improvement Implementation Report dated June 30, 2025, the expected completion date for the Neighborhood Improvement Area #1 Improvements is the third quarter of 2025.

According to the Developer, all onsite roadway, water, sanitary sewer and storm drainage work is substantially complete. Paving Construction activities have been performed by Mario Sinacola & Sons, Inc, ("Sinacola"). Sinacola has achieved completion of the on-site roadway and alley network and has now completed the roundabout and modification of Vinson Road, the main entry into the subdivision. The paving activities are substantially complete. Utility Contractor Interstate Pipeline Utility Construction, Inc. ("Interstate") has completed punch list and finish out activities. The utility activities are substantially complete.

According to the Developer, a contract for improvements to the Enclave Lift Station, Northside Lift Station and gravity extension has been awarded to Blue Star Utilities. Parts and materials were ordered in the fourth quarter of 2023. Blue Star Utilities mobilized in February 2024 to construct the Waters Lane "Expanded Line" and completed this portion of the project in March 2024. The Waters Lane Expanded Line activities are substantially complete and were accepted by the City on May 15, 2024.

The City of Rowlett released the Lift Station improvements for construction in March 2024. Materials have arrived, and installation of the improvements began on schedule in December 2024 and is expected to be completed in the third quarter of 2025.

The Phase 1 final plat was approved by the Planning and Zoning Commission on March 12, 2024, and the final plat was recorded in the public records of Dallas County on March 13, 2024.

According to the Dallas County Central Appraisal District ("DCAD") records dated as of September 5, 2025, forty-three (43) residential units have been completed and sold to end users, which represents approximately 22.16 percent of the anticipated 194 single-family residential units anticipated to be developed within the Neighborhood Improvement Area #1 of the PID.

D. Annual Budget – Major Improvement Area

The Assessment imposed on any Parcel may be paid in full at any time. If not paid in full, the Assessment shall be payable in thirty Annual Installments of principal and interest beginning with the tax year following the issuance of the MIA Bonds, of which twenty-six (26) Annual Installments remain outstanding.

Pursuant to the Service and Assessment Plan, each Assessment shall bear interest at the rate on the MIA Bonds commencing with the issuance of the MIA Bonds. The effective interest rate on the MIA Bonds for 2025-26 is 4.13 percent. Pursuant to Section 372.018 of the PID Act, the interest rate for that Assessment may not exceed a rate that is one-half of one percent higher than the actual interest rate paid on the debt. Accordingly, the effective interest rate on the MIA Bonds (4.13 percent) plus an additional interest of one-half of one percent are used to calculate the interest on the Assessments. These payments, the "Annual Installments" of the Assessments, shall be billed by the City in 2025 and will be delinquent on February 1, 2026.

Pursuant to the Service and Assessment Plan, the Annual Service Plan Update shall show the remaining balance of the Assessments, the Annual Installment due for 2025-26, and the Administrative Expenses to be collected from each Parcel. Administrative Expenses shall be allocated to each Parcel pro rata based upon the amount the Annual Installment on a Parcel bears to the total amount of Annual Installments in the PID as a whole that are payable at the time of such allocation. Each Annual Installment shall be reduced by any credits applied under an applicable Trust Indenture capitalized interest and interest earnings on any account balances and by any other funds available to the PID.

Annual Budget for the Repayment of Indebtedness

Debt service will be paid on the MIA Bonds from the collection of the Annual Installments. In addition, Administrative Expenses are to be collected with the Annual Installments to pay expenses related to the collection of the Annual Installments. The additional interest collected with the Annual Installments will be used to pay the prepayment and delinquency reserve amounts as described in the Service and Assessment Plan and applicable Trust Indenture.

Annual Installments to be Collected for 2025-26

The budget for the Major Improvement Area of the PID will be paid from the collection of Annual Installments collected for 2025-26 as shown in Table II-D-1 on the following page.

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Table II-D-1
Budget for the MIA
Annual Installments to be Collected for 2025-26

	MIA Bonds[1]
Interest payment on March 15, 2026	$100,319
Interest payment on September 15, 2026	$100,319
Principal payment on September 15, 2026	$111,000
Subtotal - Debt Service Payments	*$311,638*
Administrative Expenses	$47,000
Excess Interest for Prepayment & Delinquency Reserves	$24,275
Subtotal Expenses	*$382,913*
Available Reserve Fund Income	($4,000)
Available Administrative Expense Funds	($5,000)
Subtotal funds available	*($9,000)*
Annual Installments	**$373,913**

1 – Amounts shown above are rounded to the nearest dollar for presentation purposes, whereas the calculations are to the cent.

Debt Service Payments

Annual Installments to be collected for principal and interest include interest due on March 15, 2026, in the amount of $100,319 and on September 15, 2026, in the amount of $100,319, which equals interest on the outstanding Major Improvement Area Assessments balance of $4,855,000 for six months each and an effective interest rate of 4.13 percent. Annual Installments to be collected include a principal amount of $111,000 due on September 15, 2026. As a result, the total principal and interest due for MIA Assessments in 2025-26 is estimated to be equal to $311,638.

Administrative Expenses

Administrative expenses include the City, Trustee, Administrator, auditor, third-party assessment collector, and contingency fees. As shown in Table II-D-2 on the following page, the total Major Improvement Area administrative expenses to be collected for 2025-26 are estimated to be $47,000.

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Table II-D-2
Administrative Budget Breakdown

Description	2025-26 Estimated Budget (9/15/25-9/14/26)
City	$5,000
Administrator	$25,000
Trustee	$4,000
Auditor	$0
Third-Party Assessment Collector	$10,000
Contingency	$3,000
Total	**$47,000**

Excess Interest for Prepayment and Delinquency Reserve

Annual Installments to be collected for excess interest for prepayment and delinquency reserves in the amount of $24,275, which equals 0.5 percent interest on the outstanding MIA Bonds Assessments balance of $4,855,000.

Available Reserve Fund Income

As of August 31, 2025, there has been approximately $16,967 in excess reserve fund income earned above the reserve fund requirement. As a result, a pro rata portion of the excess reserve fund income in the amount of $4,000 is available to be applied as a credit to reduce the 2025-26 Major Improvement Area Annual Installment.

Available Administrative Expense Account

As of August 31, 2025, the balance in the Administrative Expense Fund was $92,406. Based upon this balance, a pro rata portion of the balance in the amount of $5,000 is anticipated to be available to reduce the administrative portion of the 2025-26 Major Improvement Area Annual Installments.

E. ANNUAL INSTALLMENTS PER UNIT - MAJOR IMPROVEMENT AREA

According to the Service and Assessment Plan, the Annual Installments shall be collected in an amount sufficient to pay principal and interest on the MIA Bonds, to fund the Prepayment Reserve and Delinquency Reserve described in the Service and Assessment Plan, and to cover Administrative Expenses of the Major Improvement Area.

According to the Service and Assessment Plan, 571 units representing 513.63 total Equivalent Units are anticipated to be built within the Major Improvement Area of the PID. The Annual Installment due to be collected per Equivalent Unit within the Major Improvement Area of the PID for 2025-26 is shown in Table II-E-1 on the following page.

Table II-E-1
Annual Installment Per Unit – Major Improvement Area

Budget Item	Net Budget Amount[1]	Annual Installment per Equivalent Unit[2]
Principal	$111,000.00	$216.11
Interest	$196,637.50	$382.84
Administrative Expenses	$42,000.00	$81.77
Additional Interest Reserves	$24,275.00	$47.26
Total	**$373,912.50**	**$727.98**

1 – Refer to Table II-D-1 of this report for additional budget details.
2 – Based on the current outstanding 513.63 Equivalent Units.

The Annual Installment due to be collected from each Lot Type in the Major Improvement Area of the PID for 2025-26 is shown in Table II-E-2 below.

Table II-E-2
Annual Installment Per Lot Type – Major Improvement Area

Lot Type	Annual Installment per Equivalent Unit	Equivalent Unit Factor	Annual Installment Per Unit
50 Ft Lots	$727.98	1.00	$727.98
40 Ft Lots	$727.98	0.89	$647.90
Townhomes	$727.98	0.79	$575.10

The list of Parcels within the Major Improvement Area of the PID, the estimated number of units to be developed on the current residential Parcels, the total Assessment, the Annual Assessment, the Administrative Expenses, and the Annual Installment to be collected for 2025-26 are shown in the assessment roll summary attached hereto as Appendix D.

F. ANNUAL BUDGET – NEIGHBORHOOD IMPROVEMENT AREA #1

NIA #1 - Annual Installments – 2025-26

The Assessment imposed on any Parcel may be paid in full at any time. If not paid in full, the Assessment shall be payable in thirty Annual Installments of principal and interest beginning with the tax year following the issuance of the NIA #1 Bonds, of which twenty-six (26) Annual Installments remain outstanding.

Pursuant to the Service and Assessment Plan, each Assessment shall bear interest at the rate on the NIA #1 Bonds commencing with the issuance of the NIA #1 Bonds. The effective interest rate on the NIA #1 Bonds for 2025-26 is 3.77 percent per annum. Pursuant to Section 372.018 of the PID Act, the interest rate for that assessment may not exceed a rate that is one-half of one percent higher than the actual interest rate paid on the debt. Accordingly, the effective interest rate on the NIA #1

Bonds (3.77 percent) plus an additional interest of one-half of one percent are used to calculate interest on the Assessments. These payments, the "Annual Installments" of the Assessments, shall be billed by the City in 2025 and will be delinquent on February 1, 2026.

Pursuant to the Service and Assessment Plan, the Annual Service Plan Update shall show the remaining balance of the Assessments, the Annual Installment due for 2025-26, and the Administrative Expenses to be collected from each Parcel. Administrative Expenses shall be allocated to each Parcel pro rata based upon the amount the Annual Installment on a Parcel bears to the total amount of Annual Installments in the PID as a whole that are payable at the time of such allocation. Each Annual Installment shall be reduced by any credits applied under applicable documents including the Service and Assessment Plan and Trust Indenture such as capitalized interest and interest earnings on any account balances and by any other funds available to the PID.

Annual Budget for the Repayment of Indebtedness

Debt service will be paid on the NIA #1 Bonds from the collection of the Annual Installments. In addition, Administrative Expenses are to be collected with the Annual Installments to pay expenses related to the collection of the Annual Installments. The additional interest collected with the Annual Installments will be used to pay the prepayment and delinquency reserve amounts as described in the Service and Assessment Plan and applicable Trust Indenture.

Neighborhood Improvement Area #1 Annual Installments to be Collected for 2025-26

The budget for Neighborhood Improvement Area #1 of the PID will be paid from the collection of Annual Installments collected for 2025-26 as shown in Table II-F-1 below.

Table II-F-1
Budget for the NIA #1 Annual Installments
to be Collected for 2025-26

	NIA #1 Bonds[1]
Interest payment on March 15, 2026	$44,781
Interest payment on September 15, 2026	$44,781
Principal payment on September 15, 2026	$63,000
Subtotal - Debt Service Payments	*$152,562*
Administrative Expenses	$47,000
Excess Interest for Prepayment & Delinquency Reserves	$11,889
Subtotal Expenses	*$211,451*
Available Reserve Fund Income	($2,000)
Available Administrative Expense Funds	($5,000)
Subtotal funds available	*($7,000)*
Annual Installments	**$204,451**

1 – Amounts shown above are rounded to the nearest dollar for presentation purposes, whereas the calculations are to the cent.

Debt Service Payments

Annual Installments to be collected for principal and interest include interest due on March 15, 2026, in the amount of $44,781 and on September 15, 2026, in the amount of $44,781, which equal interest on the outstanding NIA #1 Assessments balance of $2,377,720 for six months each and an effective interest rate of 3.77 percent. Annual Installments to be collected include a principal amount of $63,000 due on September 15, 2026. As a result, the total principal and interest due for NIA #1 Assessments in 2025-26 is estimated to be equal to $152,562.

Administrative Expenses

Administrative expenses include the City, Trustee, Administrator, auditor, third-party assessment collector, and contingency fees. As shown in Table II-F-2 below, the total NIA #1 administrative expenses to be collected for 2025-26 are estimated to be $47,000.

Table II-F-2
Administrative Budget Breakdown

Description	2025-26 Estimated Budget (9/15/25-9/14/26)
City	$5,000
Administrator	$25,000
Trustee	$4,000
Auditor	$0
Third-Party Assessment Collector	$10,000
Contingency	$3,000
Total	**$47,000**

Excess Interest for Prepayment and Delinquency Reserve

Annual Installments to be collected for excess interest for prepayment and delinquency reserves in the amount of $11,889, which equals 0.5 percent interest on the outstanding NIA #1 Bonds Assessments balance of $2,377,720.

Available Reserve Fund Income

As of August 31, 2025, there has been approximately $8,601 in excess reserve fund income earned above the reserve fund requirement. As a result, a pro rata portion of the excess reserve fund income in the amount of $2,000 is available to be applied as a credit to reduce the 2025-26 Neighborhood Improvement Area #1 Annual Installment.

Available Administrative Expense Account

As of September 30, 2024, the balance in the Administrative Expense Fund was $73,085. Based upon this balance, a pro rata portion of the balance in the amount of $5,000 is anticipated to be available to reduce the administrative portion of the 2025-26 Neighborhood Improvement Area #1 Annual Installments.

G. ANNUAL INSTALLMENTS PER UNIT - NEIGHBORHOOD IMPROVEMENT AREA #1

According to the Service and Assessment Plan, the Annual Installments shall be collected in an amount sufficient to pay principal and interest on the NIA #1 Bonds, to fund the Prepayment Reserve and Delinquency Reserve described in the Service and Assessment Plan, and to cover Administrative Expenses of NIA #1.

According to the Service and Assessment Plan, 194 units, representing 174.11 total Equivalent Units, were anticipated to be built within NIA #1 of the PID. According to the Trustee, three Parcels representing 2.58 Equivalent Units have prepaid their Assessments in full and one Parcel representing 0.46 Equivalent Units has partially prepaid their Assessment, lowering the total outstanding Equivalent Units to 171.07 (174.11 – 3.03 = 171.07). The Annual Installment due to be collected per Equivalent Unit in the NIA #1 for 2025-26 is shown in Table II-G-1 below.

Table II-G-1[3]
Annual Installment Per Unit – NIA #1

Budget Item	Net Budget Amount[1]	Annual Installment per Equivalent Unit[2]
Principal	$63,000.00	$368.27
Interest	$87,562.27	$511.85
Administrative Expenses	$42,000.00	$245.51
Additional Interest Reserves	$11,888.60	$69.50
Total	**$204,450.88**	**$1,195.13**

1 – Refer to Table II-F-1 of this report for additional budget details.
2 – Based on the current outstanding 171.07 Equivalent Units.
3 – Amounts shown above are rounded to the nearest dollar.

The Annual Installment due to be collected from each Lot Type in the NIA #1 of the PID for 2025-26 is shown in Table II-G-2 on the following page.

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Table II-G-2
Annual Installment Per Lot Type – NIA #1

Lot Type	Annual Installment Per Equivalent Unit	Equivalent Unit Factor	Annual Installment Per Unit
50 Ft Lots	$1,195.13	1.00	$1,195.13
40 Ft Lots	$1,195.13	0.89	$1,069.32
Townhomes	$1,195.13	0.79	$943.52

The list of Parcels within NIA #1 of the PID, the number of units to be developed on the current residential Parcels, the corresponding total Equivalent Units, the total outstanding Assessment, the annual principal and interest, the Administrative Expenses, and the Annual Installment to be collected for 2025-26 are shown in the Assessment Roll Summary attached hereto as Appendix E.

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H. BOND REDEMPTION RELATED UPDATES

MIA Bonds

The MIA Bonds were issued in 2021. Pursuant to Section 4.3 of the MIA Trust Indenture, the City reserves the right and option to redeem the Major Improvement Bonds before their scheduled maturity dates, in whole or in part, on any interest payment date on or after **September 15, 2029**, such redemption date or dates to be fixed by the City, at the redemption prices and dates shown in the applicable Trust Indenture.

The Administrator has conducted a preliminary evaluation of the current refunding market conditions, recent PID bond refunding transactions, and other relevant factors. Based on this preliminary evaluation, the Administrator believes a refunding of the MIA Bonds does not appear viable at this time. The Administrator will continue to monitor the refunding market conditions, applicable PID bond refunding transactions, and other relevant factors to determine if refunding becomes viable in the future and will inform the City accordingly.

NIA #1 Bonds

The NIA #1 Bonds were issued in 2021. Pursuant to Section 4.3 of the NIA #1 Trust Indenture, the City reserves the right and option to redeem the NIA #1 Bonds before their scheduled maturity dates, in whole or in part, on any interest payment date on or after **September 15, 2029**, such redemption date or dates to be fixed by the City, at the redemption prices and dates shown in the applicable Trust Indenture.

The Administrator has conducted a preliminary evaluation of the current refunding market conditions, recent PID bond refunding transactions, and other relevant factors. Based on this preliminary evaluation, the Administrator believes a refunding of the NIA #1 Bonds does not appear viable at this time. The Administrator will continue to monitor the refunding market conditions, applicable PID bond refunding transactions, and other relevant factors to determine if refunding becomes viable in the future and will inform the City accordingly.

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III. UPDATE OF THE ASSESSMENT PLAN

The Service and Assessment Plan adopted by the City Council describes that the Authorized Improvement costs shall be allocated to the Assessed Property equally based on the equivalent number of residential dwelling units anticipated to be built on each Parcel once such property is fully developed, and that such method of allocation will result in the imposition of equal shares of the Authorized Improvement costs to Parcels similarly benefited.

Assessment Methodology

This method of assessing property, as updated in prior Annual Service Plan Updates, has not been changed and Assessed Property will continue to be assessed as provided for in the Service and Assessment Plan.

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IV. UPDATE OF THE ASSESSMENT ROLL

Pursuant to the original Service and Assessment Plan, the Assessment Rolls shall be updated each year to reflect:

> (i) the identification of each Parcel (ii) the Assessment for each Parcel of Assessed Property, including any adjustments authorized by the Service and Assessment Plan or in the PID Act; (iii) the Annual Installment for the Assessed Property for the year (if the Assessment is payable in installments); and (iv) payments of the Assessment, if any, as provided by Section VI.I of the Service and Assessment Plan.

The summary of updated Assessment Rolls is shown in Appendix D and Appendix E of this report. Each Parcel in the PID is identified, along with the Assessment on each Parcel and the Annual Installment to be collected from each Parcel. Assessments are to be reallocated for the subdivision of any Parcels.

A. PARCEL UPDATES

According to the Service and Assessment Plan, upon the subdivision of any Parcel, the Administrator shall reallocate the Assessment for the Parcel prior to the subdivision among the new subdivided Parcels according to the following formula:

$$A = B \times (C \div D)$$

Where the terms have the following meanings:

A = the Assessment for each new subdivided Parcel.
B = the Assessment for the Parcel prior to subdivision.
C = the estimated Equivalent Units to be built on each newly subdivided Parcel
D = the sum of the estimated Equivalent Units to be built on all of the new subdivided Parcels

The calculation of the estimated number of units to be built on a Parcel shall be performed by the Administrator and confirmed by the City Council based on the information available regarding the use of the Parcel. The estimate as confirmed shall be conclusive. The number of units to be built on a Parcel may be estimated by net land area and reasonable density ratios.

According to DCAD online records, parent Parcel 65009569510010000 was partially subdivided into one hundred and ninety-four (194) residential lots and thirty-two (32) open space lots within the PID. As a result, individual Parcels within Neighborhood Improvement Area #1 of the PID were individually billed Annual Installments beginning in tax year 2025. Table IV-A-1 on the following page shows the Neighborhood Improvement Area #1 Assessment allocation prior to and after the subdivision.

Table IV-A-1
Parent Parcel Subdivision
Neighborhood Improvement Area #1 Assessments

Prior to Subdivision				After Subdivision					
Parcel	**Projected Number of Units[1]**	**Equivalent Units (EU)**	**Total PID Assessments**	**Parcel**	**EU per Lot Type**	**Number of Units[1]**	**Total EU**	**Assessment per Unit**	**Total Assessments**
65009569510010000	191	171.07	$2,377,720	Various (50' Lot)	1.00	72	72.00	$13,899	$1,000,733
				Various (40' Lot)	0.89	53	46.97	$12,436	$652,773
				Various (Townhome)	0.79	66	52.11	$10,973	$724,214
Total	**191**	**171.07**	**$2,377,720**			**191**	**171.07**		**$2,377,720**

1 – There are three less units due to the three Parcels that prepaid their Assessments.

B. PREPAYMENT OF ASSESSMENTS

As of August 31, 2025, there has been no prepayment of Assessments within the Major Improvement Area of the PID.

As of August 31, 2025, there have been three full prepayments of Assessments and one partial prepayment within the Neighborhood Improvement Area #1 of the PID.

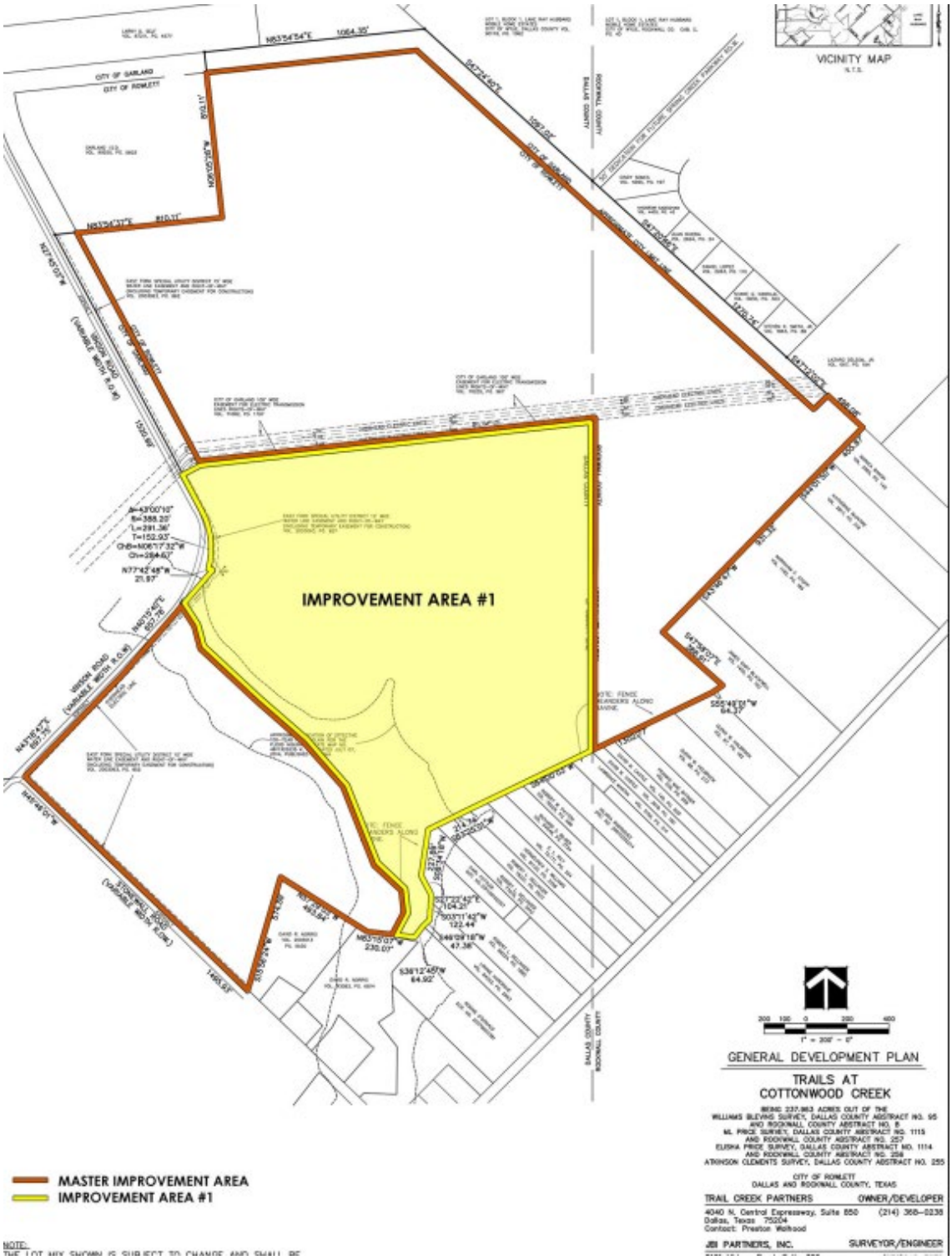
The complete Assessment Roll is available for review at Rowlett City Hall, located at 4000 Main Street, Rowlett, Texas 75088.

APPENDIX A
PID MAP

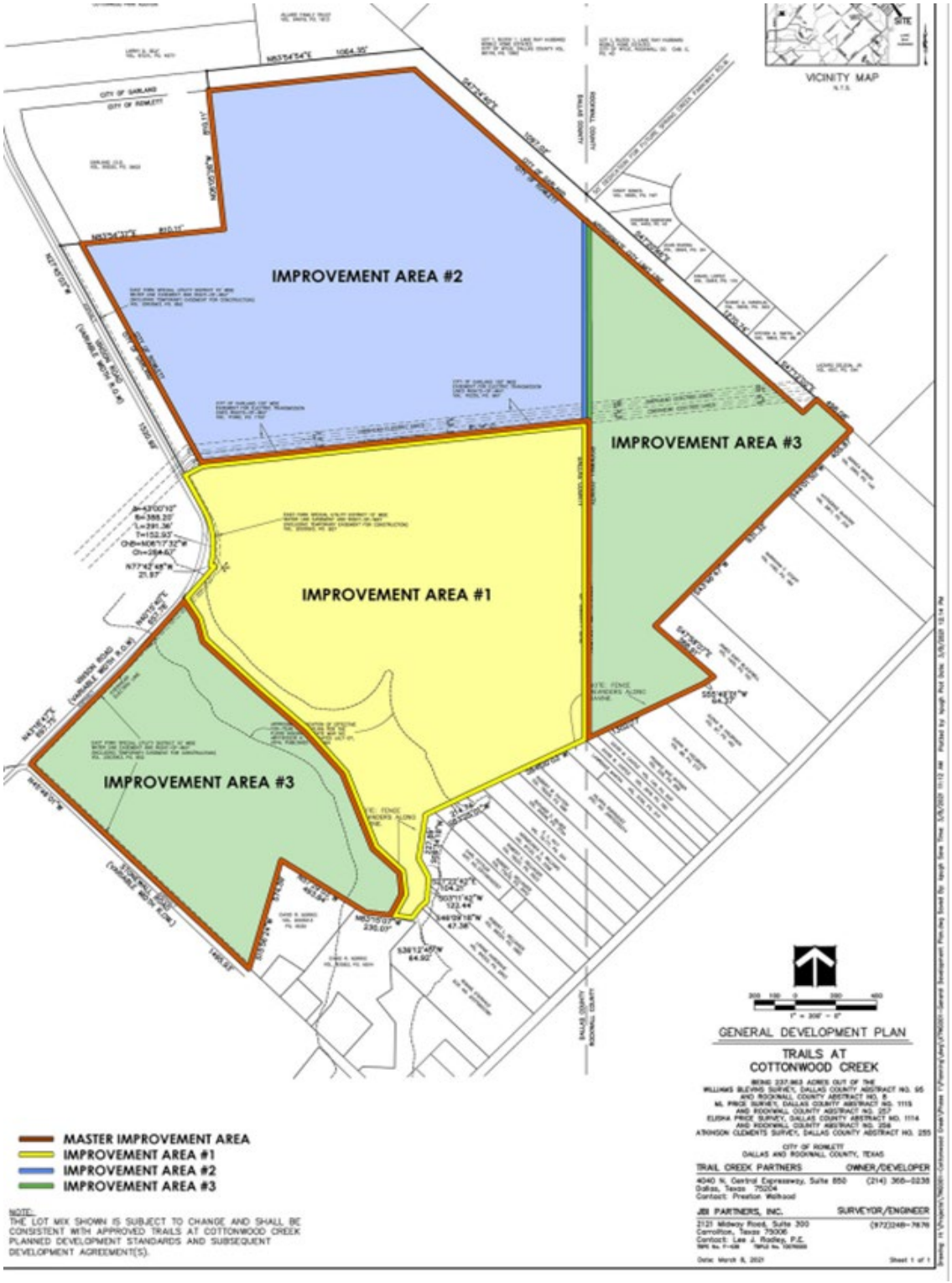
PID MAP


TRAILS AT
COTTONWOOD
CREEK
VINSON RD
STONEWALL RD
LAKE
RAY HUBBARD

NEIGHBORHOOD IMPROVEMENT AREA #1 AND MAJOR IMPROVEMENT AREA MAP



FUTURE NEIGHBORHOOD IMPROVEMENT AREA MAP



APPENDIX B
PREPAID PARCELS

Appendix B
Prepaid Parcels

Parcel ID	Lot Type	Prepayment Date	Amount Paid	Prepayment Type
440226100E0260000	Townhome	1/2025	$11,259.07	FULL
440226100B0100000	40	8/2025	$6,500.00	PARTIAL
440226100B0020000	40	9/2025	$12,760.28	FULL
440226100B0230000	40	9/2025	$12,760.28	FULL
Total				

APPENDIX C
ASSESSED VALUE

Trails at Cottonwood Creek PID
2025 Certified Assessed Value

Parcel	2025 Assessed Value[1]
All Parcels	$46,557,516
Total	**$46,557,516**

1 - Assessed Value per Dallas County Appraisal District and Rockwall County Appraisal District online records as of September 12, 2025.

APPENDIX D
MAJOR IMPROVEMENT AREA ASSESSMENT ROLL – 2025-26

Assessment Roll Summary - Major Improvement Area
2025-26

Parcel	Estimated No. of units	Lot Size	Total Equivalent Units	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
10084 13149 65009569510010000 65111431510110100	178 100 293	Various	513.63	$4,855,000.00	$111,000.00	$196,637.50	$24,275.00	$42,000.00	$373,912.50
	571		**513.63**	**$4,855,000.00**	**$111,000.00**	**$196,637.50**	**$24,275.00**	**$42,000.00**	**$373,912.50**

APPENDIX E
NEIGHBORHOOD IMPROVEMENT AREA #1 ASSESSMENT ROLL – 2025-26

Assessment Roll Summary - Neighborhood Improvement Area #1
2025-26

Parcel	Lot Size	Outstanding Equivalent Units	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
440226100A0010000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0020000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0030000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0040000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0050000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0060000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0070000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0080000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100A0090000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100A10X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100B0010000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0020000	40	0.00	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	$0.00
440226100B0030000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0040000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0050000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0060000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0070000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0080000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0090000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0100000	40	0.44	$6,101.19	$161.66	$224.68	$30.51	$107.77	$524.62
440226100B0110000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0120000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0130000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0140000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0150000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0160000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0170000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0180000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0190000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0200000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0210000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0220000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0230000	40	0.00	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	$0.00
440226100B0240000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0250000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0260000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0270000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B0280000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100B29X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100B30X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100C0010000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0020000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0030000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100C0040000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0050000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0060000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0070000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0080000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0090000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0100000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0110000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0120000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0130000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0140000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0150000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C0160000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100C17X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100C18X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100C19X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D0010000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0020000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0030000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0040000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0050000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0060000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0070000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0080000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0090000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0100000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0110000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52

Parcel	Lot Size	Outstanding Equivalent Units	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
440226100D0120000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0130000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0140000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0150000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0160000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0170000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0180000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0190000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100D0200000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0210000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0220000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0230000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0240000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0250000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0260000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0270000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0280000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0290000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0300000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0310000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0320000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0330000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0340000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0350000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0360000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0370000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0380000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0390000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0400000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0410000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0420000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0430000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0440000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0450000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0460000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0470000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0480000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0490000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0500000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0510000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100D0520000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0530000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0540000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0550000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0560000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0570000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D0580000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100D59X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D60X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D61X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D62X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D63X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D64X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100D65X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E0010000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0020000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0030000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0040000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0050000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0060000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0070000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0080000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0090000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0100000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100E0110000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0120000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0130000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0140000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0150000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0160000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0170000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0180000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0190000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52

Parcel	Lot Size	Outstanding Equivalent Units	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
440226100E0200000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0210000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0220000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0230000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0240000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0250000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0260000	Townhome	0.00	PREPAID	PREPAID	PREPAID	PREPAID	PREPAID	$0.00
440226100E0270000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E0280000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100E29X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E30X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E31X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E32X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E33X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E34X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E35X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100E36X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100F0010000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0020000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0030000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0040000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0050000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0060000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0070000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0080000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0090000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0100000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0110000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0120000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0130000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0140000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0150000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0160000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0170000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0180000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0190000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0200000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0210000	50	1.00	$13,899.06	$368.27	$511.85	$69.50	$245.51	$1,195.13
440226100F0220000	40	0.89	$12,436.00	$329.50	$457.97	$62.18	$219.67	$1,069.32
440226100F0230000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0240000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0250000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0260000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0270000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0280000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0290000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0300000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F0310000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100F32X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100F33X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100F34X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100F35X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100G01X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100H0010000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0020000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0030000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0040000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0050000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0060000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0070000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0080000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0090000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0100000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0110000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0120000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0130000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0140000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0150000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0160000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0170000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0180000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0190000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0200000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52

Parcel	Lot Size	Outstanding Equivalent Units	Total Outstanding Assessment	Principal	Interest	Excess Interest for Reserves	Adminstrative Expense	Annual Installment
440226100H0210000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0220000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0230000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H0240000	Townhome	0.79	$10,972.95	$290.74	$404.09	$54.86	$193.83	$943.52
440226100H25X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100H26X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100I01X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100J01X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100K01X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
440226100L01X0000	0	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total		**171.07**	**$2,377,720.37**	**$63,000.00**	**$87,562.27**	**$11,888.60**	**$42,000.00**	**$204,450.88**

APPENDIX F
PID ASSESSMENT NOTICE

PID Assessment Notice

NOTICE OF OBLIGATION TO PAY PUBLIC IMPROVEMENT DISTRICT ASSESSMENT TO THE CITY OF ROWLETT, TEXAS
CONCERNING THE FOLLOWING PROPERTY

[insert property address]

As the purchaser of the real property described above, you are obligated to pay assessments to the City of Rowlett, Texas (the "City"), for the costs of a portion of a public improvement or services project (the "Authorized Improvements") undertaken for the benefit of the property within the Trails at Cottonwood Creek Public Improvement District (the "District") created under Subchapter A, Chapter 372, Local Government Code.

AN ASSESSMENT HAS BEEN LEVIED AGAINST YOUR PROPERTY FOR THE AUTHORIZED IMPROVEMENTS, WHICH MAY BE PAID IN FULL AT ANY TIME. IF THE ASSESSMENT IS NOT PAID IN FULL, IT WILL BE DUE AND PAYABLE IN ANNUAL INSTALLMENTS THAT WILL VARY FROM YEAR TO YEAR DEPENDING ON THE AMOUNT OF INTEREST PAID, COLLECTION COSTS, ADMINISTRATIVE COSTS, AND DELINQUENCY COSTS.

The exact amount of the assessment may be obtained from the City. The exact amount of each annual installment will be approved each year by the City Council in the Annual Service Plan Update for the District. More information about the assessments, including the amounts and due dates, may be obtained from the City or MuniCap, Inc., the District Administrator for the City, located at 600 E. John Carpenter Fwy, Suite 150, Irving, Texas 75062 and available by telephone at (469) 490-2800 or (866) 648-8482 (toll free) and email at txpid@municap.com.

Your failure to pay any assessment or any annual installment may result in penalties and interest being added to what you owe or in a lien on and the foreclosure of your property.

Date: _____

_____ _____
Signature of Seller Signature of Seller

STATE OF TEXAS §
§
COUNTY OF _____ §

The foregoing instrument was acknowledged before me by _____ and _____, known to me to be the person(s) whose name(s) is/are subscribed to the foregoing instrument, and acknowledged to me that he or she executed the same for the purposes therein expressed, in the capacity stated and as the act and deed of the above-referenced entities as an authorized signatory of said entities.

Given under my hand and seal of office on this _____, 20__.

_____
Notary Public, State of Texas

The undersigned purchaser acknowledges receipt of this notice before the effective date of a binding contract for the purchase of the real property at the address described above.

Date: _____

_____ _____
Signature of Purchaser Signature of Purchaser

STATE OF TEXAS §
§
COUNTY OF _____ §

The foregoing instrument was acknowledged before me by _____ and _____, known to me to be the person(s) whose name(s) is/are subscribed to the foregoing instrument, and acknowledged to me that he or she executed the same for the purposes therein expressed, in the capacity stated and as the act and deed of the above-referenced entities as an authorized signatory of said entities.

Given under my hand and seal of office on this _____, 20__.

_____
Notary Public, State of Texas

City of Rowlett
City Council Agenda Item

Meeting Date: 10/21/2025 **Agenda Item:** 5.A.

Title
Consider action to approve a resolution authorizing the award of a contract for Bid No. 2025-167-B Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid) to Felix Construction Company for a price not to exceed $1,570,547.00 ($1,427,770.00 and a 10% contingency of $142,777.00); authorizing the Mayor or his designee to execute the contract and all necessary and related documents; and providing an effective date.

Staff Representative
Kristoff Bauer, Deputy City Mgr

Executive Summary
As part of an overall strategic priority to invest in transportation and infrastructure, the City Council has adopted a goal to provide a high-quality water distribution system. Ensuring our pump stations have enough pumping capacity is essential for promoting that priority. The purpose of this item is to award a contract to Felix Construction Company for the Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid).

Strategic Priority and Goal(s)

Strategic Priority	Strategic Goal
 **Invest in Transportation & Infrastructure**	6.1 Systematically manage the Capital Improvement Program. 6.7 Provide a high-quality water supply and distribution system.

Background Information
Hydraulic model analyses were conducted to evaluate the system improvements necessary to ensure an adequate water supply for existing and new developments within the upper pressure plane, while maintaining acceptable service levels throughout the area. Steady-state hydraulic simulations were performed using the City's WaterGEMS model under the following demand scenarios: maximum day, maximum day with fire flow, and peak hour.

Based on the modeling results and established design criteria, additional water system improvements were identified as necessary to support new development in the upper pressure plane, supplementing the improvements outlined in the City's 2008 Water Capital Improvement Plan Update.

To address the need for increased pumping capacity, the addition of a pump at the Rowlett Road Pump Station is recommended. This improvement will enhance the conveyance of water from the supply source at the Rowlett Road Pump Station to the upper pressure plane distribution system, including service to the North Shore and Downtown areas.

This pump addition has been designed to support both the upper and lower pressure planes, in case demand changes in the future. This design will provide resilience to the water distribution system, enabling the City to continue supporting its residents.

Freese & Nichols, Inc. (consulting engineer) prepared an Engineer's Opinion of Probable Cost (EOPC) with pricing based on their industry experience, and the City evaluated the EOPC in relation to the bid price history of recent projects. The EOPC is $751,450.00.

This project was previously bid, as indicated by Bid No. 2025-87-B. One response was received from Felix Construction Company in the amount of $1,197,164.00 ($463,564 higher than the City's consulting Engineer's Opinion of Probable Cost). On April 1, 2025, Council rejected the sole bid received (RES-047-25).

The City made minimal revisions to the specifications and re-bid this project, Bid No. 2025-167-B. Six hundred twenty-two (622) vendors were notified through the eProcurement system, and nineteen (19) vendors downloaded the bid documents. One response was received from Felix Construction Company in the amount of $1,427,770.00 ($676,320.00 higher than the City's consulting Engineer's Opinion of Probable Cost).

Discussion

A 'Notice to Bidders' was published in the Dallas Morning News on July 25, 2025, and July 31, 2025. A non-mandatory Pre-Bid Meeting was held on August 5, 2025, at 10:00 AM. Sealed bids were received in the purchasing office until 2:00 PM on August 13, 2025. The sealed bids were publicly opened and read aloud online, in accordance with the Texas Local Government Code.

One firm submitted an itemized bid for the construction of the Rowlett Road Pump Station Upper Pressure Plane Pump Addition. Approximate quantities for the Rowlett Road Pump Station Upper Pressure Plane Pump Addition project include 84 LF 12-inch water line by open cut and 1 vertical turbine pump (1850 GPM,125 HP) with associated mechanical and electrical equipment. The pump will be installed utilizing the existing pump can and connected to the proposed water line. The water line will connect to an existing 12-inch water line located on the pump station site. A single bid was received from Felix Construction Company in the amount of $1,427,770.00, which is included in Attachment 1. Evaluation of the Felix Construction Company bid resulted in the following conclusions:

1. City staff determined that the Felix Construction Company's bid in the amount of $1,427,770.00 conforms with all project requirements and specifications.
2. City staff determined that Felix Construction Company’s financial statements reflect financial stability and a capacity to deliver the project.
3. As the design engineer for this project, Freese & Nichols, Inc., evaluated the bids and recommended awarding the project to Felix Construction Company. Freese & Nichols, Inc.’s recommendation is included in Attachment 1.

Substantial completion of the work will be achieved within 360 calendar days of the date indicated on the Notice to Proceed, and final completion will be achieved within 30 calendar days of substantial completion.

Financial/Budget Implications
CIP Project Budget Financial Table

Project Code	Project Title	Available Budget	Proposed Amount	Remaining Balance
WA2128	Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid)	$1,004,338.50	$1,004,338.50	$0
SS2109	Lift Station/Pump Station Rehabilitation & Replacement	$1,560,907.67	$566,208.50	$954,699.17
TOTAL		$2,565,246.17	$1,570,547.00	$954,699.17

* The contract award for Bid No. 2025-167-B Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid), to Felix Construction Company is for a total amount not to exceed $1,570,547.00. This includes a base price of $1,427,770.00 plus a 10% contingency of $142,777.00.

Recommended Action
Move to approve a resolution authorizing the award of a contract for Bid No. 2025-167-B Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid) to Felix Construction Company for a price not to exceed $1,570,547.00 ($1,427,770.00 and a 10% contingency of $142,777.00); authorize the Mayor or his designee to execute the contract and all necessary and related documents; and provide an effective date.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS AWARDING A CONTRACT TO FELIX CONSTRUCTION COMPANY FOR BID NO. 2025-167-B ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE

ADDITIONS (RE-BID) IN A TOTAL CONTRACT AMOUNT NOT TO EXCEED $1,570,547.00; AUTHORIZING THE MAYOR OR HIS DESIGNEE TO EXECUTE ANY AND ALL NECESSARY DOCUMENTS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City sought bids Under Bid No. 2025-167-B Rowlett Road Pump Station Upper Pressure Plane Additions (Re-bid) (hereinafter referred to as the "Project"); and

WHEREAS, Felix Construction Company has met all bid specifications and is the sole responsive and responsible bidder; and

WHEREAS, Freese & Nichols, Inc., the design engineer for the Project, has recommended acceptance of the bid as the sole responsive and responsible bidder; and

WHEREAS, the City Council has determined that the award of the contract for the Project for a contract amount not to exceed $1,570,547.00 to Felix Construction Company is in the best interest of the citizens of Rowlett;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ROWLETT, TEXAS THAT:

Section 1. The City Council of the City of Rowlett, Texas hereby awards Felix Construction Company the contract for the provision and installation of Rowlett Road Pump Station Upper Pressure Plane Additions, Bid No. 2025-167-B, on the terms and conditions set forth in the bid documents and bid response, copies of which are attached hereto and incorporated herein by this references as Exhibit "A", for a contract price not to exceed $1,570,547.00.

Section 2. The Mayor or his designee is hereby authorized to execute the contract and any and all other necessary and related documents.

Section 3. This resolution shall take effect immediately from and after its passage, and it is accordingly so resolved.

Attachments

1. Location Map-Rowlett Pump Station
2. Attachment 1 2025-167-B Contract Documents and Specifications - for execution
3. Attachment 2- 2025-167-B Recommendation of Award - Consultant



Rowlett TEXAS

LOCATION MAP-ROWLETT ROAD PUMP STATION

N W E S

CONTRACT DOCUMENTS AND SPECIFICATIONS FOR

ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)

BID NO. 2025-167-B

CIP No. WA-2128

JULY 2025

Prepared by:



07/22/2025

FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Freese and Nichols, Inc.
6136 Frisco Square Blvd., Suite 375, Frisco, TX 75034
(972) 624-9201
ROW23118

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SECTION 1 ADVERTISEMENT

Legal Advertisement

City of Rowlett
Notice to Bidders

The City of Rowlett is accepting sealed bids for **BID NO. 2025-167-B ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)**. Bids will be accepted online through bidnetdirect.com or delivered in hard copy to the Purchasing Office, c/o the City of Rowlett Action Center, 4000 Main St., Rowlett, TX 75088, or mailed to PO Box 99, Rowlett, TX 75030-0099, before **2:00pm (CT) on August 13, 2025**. Bids will be publicly opened online and read in compliance with statutory requirements at 2:30pm on the day bids are due via a Microsoft Teams meeting as follows:

Meeting ID: 218 331 402 514 3
Passcode: Xu2Zj334
Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZmQzNjNiN2YtMzhkYS00ODg2LWE3OGMtYWY3MWU1MGNhYWM5%40thread.v2/0?context=%7b%22Tid%22%3a%2285803b12-c237-45fd-bc07-0d2e834e5e62%22%2c%22Oid%22%3a%227d17b5ea-5a46-4540-84b7-f45b211dff03%22%7d

A non-mandatory pre-bid meeting will be held online on Tuesday, August 5, 2025, at 10:00am (CT) as follows:

Meeting ID: 280 003 114 740 4
Passcode: wU7j53MU
Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_YWJhN2RhYjEtNzhiYi00NmUwLWFlMWYtMDBhYjc0OTg2NDk5%40thread.v2/0?context=%7b%22Tid%22%3a%2285803b12-c237-45fd-bc07-0d2e834e5e62%22%2c%22Oid%22%3a%227d17b5ea-5a46-4540-84b7-f45b211dff03%22%7d

Bid documents are available for download at https://www.bidnetdirect.com/texas/cityofrowlett. For questions regarding this project, please email jcalhoun@rowlett.com.

Publish dates: 7/24/2025 and 7/31/2025
Bid Number 2025-167-B

SECTION 2 NOTICE TO BIDDERS

NOTICE TO BIDDERS

The City of Rowlett ("City") is accepting competitive sealed bids for **BID NO. 2025-167-B ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID).** Bids will be accepted online through bidnetdirect.com or delivered in hard to the Purchasing Office, c/o the City of Rowlett Action Center, 4000 Main St., Rowlett, TX 75088, or mailed to PO Box 99, Rowlett, TX 75030-0099 until **2:00pm (CT) on Wednesday, August 13, 2025.** Any bids received after this time will not be accepted and will be returned unopened. **Bids will be publicly opened and read in compliance with statutory requirements at 2:30pm on the day bids are due.** To participate in the public bid opening, please use the following:

Meeting ID: 218 331 402 514 3
Passcode: Xu2Zj334
Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZmQzNjNiN2YtMzhkYS00ODg2LWE3OGMtYWY3MWU1MGNhYWM5%40thread.v2/0?context=%7b%22Tid%22%3a%2285803b12-c237-45fd-bc07-0d2e834e5e62%22%2c%22Oid%22%3a%227d17b5ea-5a46-4540-84b7-f45b211dff03%22%7d

The Project consists of furnishing all labor, equipment and materials (except as otherwise specified), and performing all work necessary for the construction of Rowlett Road Pump Station Upper Pressure Plane Pump Addition. Approximate quantities for Rowlett Road Pump Station Upper Pressure Plane Pump Addition project includes 84 LF 12-inch water line by open cut and 1 vertical turbine pump (1850 GPM, 125 HP) with associated mechanical and electrical equipment. The pump will be installed utilizing the existing pump can and connected to the proposed water line. The water line will connect to an existing 12-inch water line on the pump station site.

The successful bidder will begin construction within 10 calendar days after the issuance of the Notice to Proceed. Substantial completion of the work will be achieved within 360 calendar days of the date indicated on the Notice to Proceed and final completion will be achieved within 30 calendar days after substantial completion.

Each bid submitted shall be accompanied by a cashier's check in the amount of 5% of the maximum amount bid, payable without recourse to the City of Rowlett, or a Bid Bond in the same amount from a reliable surety company as a guarantee that, if awarded the contract, the successful Contractor will execute a Construction Agreement with the City, including all required bonds and other documents.

The successful Contractor shall furnish a Performance Bond in the amount of 115% of the contract amount, and a Payment Bond in the amount of 100% of the contract amount, as well as evidence of all required insurance coverage within ten (10) calendar days of notice of award. The successful Contractor shall also furnish a Maintenance Bond in the amount of 100% of the contract amount covering defects of material and workmanship for two calendar years following the City's approval and acceptance of the construction. An approved surety company, licensed in the State of Texas, shall issue all bonds in accordance with Texas law.

Copies of Plans, Specifications, and Contract Documents may be downloaded free of charge from Current Bidding Opportunities by completing the no-cost vendor registration at the following link:

https://www.bidnetdirect.com/texas/cityofrowlett.

Questions and requests for clarifications in regards to this bid should be submitted in writing through bidnetdirect.com or via email directly to January Calhoun, Purchasing Manager, at jcalhoun@rowlett.com. The deadline for receipt of questions and requests for clarifications is **12:00pm on Wednesday, August 6, 2025.** After that day and time, no further questions or requests for clarifications will be accepted or answered by the Engineer or City.

SECTION 3 INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

1. Instructions: These instructions apply to all bids and become a part of the terms and conditions of any bid submitted unless bidder takes exception in writing when submitting bid.

2. Submittal Deadline: The City of Rowlett (City) is accepting bids until **2:00pm on Wednesday, August 13, 2025.**

3. Submittal Location: Bids will be accepted online through bidnetdirect.com or delivered in hard copy to the Purchasing Office, c/o the City of Rowlett Action Center, 4000 Main St., Rowlett, TX 75088, or mailed to PO Box 99, Rowlett, TX 75030-0099.

4. If submitting a hard copy bid, Bidder shall submit one (1) original and one (1) electronic copy of their bid on a thumb drive in a **sealed envelope clearly marked with their name and BID NO. 2025-167-B ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)**. Bidder shall complete all requested information and submit all required documents.

5. The City may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may, at its sole option and within its sole discretion, waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. No bidder may withdraw a bid within 90 days after actual date of the opening thereof.

6. Bid Opening: **The bid opening will be conducted online on Wednesday, August 13, 2025, @ 2:30pm.** To participate in the bid opening, please use the following:

   Meeting ID: 218 331 402 514 3
   Passcode: Xu2Zj334
   Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZmQzNjNiN2YtMzhkYS00ODg2LWE3OGMtYWY3MWU1MGNhYWM5%40thread.v2/0?context=%7b%22Tid%22%3a%2285803b12-c237-45fd-bc07-0d2e834e5e62%22%2c%22Oid%22%3a%227d17b5ea-5a46-4540-84b7-f45b211dff03%22%7d

7. Bid Documents: Copies of Plans, Specifications, and Contract Documents may be downloaded from Current Bidding Opportunities by completing the no-cost vendor registration at the following link: https://www.bidnetdirect.com/texas/cityofrowlett.

8. Questions and Requests for Clarification: Questions and requests for clarifications in regards to this bid should be submitted in writing through bidnetdirect.com or via email directly to January Calhoun, Purchasing Manager at jcalhoun@rowlett.com. The deadline for receipt of questions and requests for clarifications is **12:00pm on Wednesday, August 6, 2025**. After that day and time, no further questions or requests for clarifications will be accepted or answered by the Engineer or City.

9. Addenda: If it becomes necessary to provide additional information to potential Bidders, the City of Rowlett Purchasing Office will issue an addendum containing the necessary information.

10. Pre-Bid Meeting: A pre-bid meeting will be held for this project **online** at **10:00am, Tuesday, August 5, 2025.** Attendance is optional. To participate in the pre-bid meeting, please use the following:

    Meeting ID: 280 003 114 740 4
    Passcode: wU7j53MU

Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_YWJhN2RhYjEtNzhiYi00NmUwLWFlMWYtMDBhYjc0OTg2NDk5%40thread.v2/0?context=%7b%22Tid%22%3a%2285803b12-c237-45fd-bc07-0d2e834e5e62%22%2c%22Oid%22%3a%227d17b5ea-5a46-4540-84b7-f45b211dff03%22%7d

SECTION 4 STANDARD TERMS AND CONDITIONS FOR PROCUREMENTS

1. **APPLICABILITY**: These standard terms and conditions apply to all goods or services procured by the City of Rowlett, Texas ("City"), unless otherwise stated in the specifications. The instructions contained herein shall be incorporated into the request for bids/proposals or other procurement opportunity advertisement as well as any subsequent purchase order(s) issued for goods or services and shall be included as part of the specifications issued herewith.

2. **NOTIFICATION**: The City advertises formal procurement opportunities through www.rowletttx.gov, bidnet direct by SOVRA, and *The Dallas Morning News*. The City shall not be responsible for information distributed by sources other than those listed.

3. **ADDENDA**: Any revisions to the information contained herein or in the request for bids/proposals will be issued in the form of one or more addenda. The sole issuing authority shall be vested in the City of Rowlett Purchasing Office. If addenda containing material changes to the specifications or pricing form are issued, the vendor shall acknowledge receipt of such addenda in the designated section in the Bid/Proposal document. It is the responsibility of the bidder/proposer to obtain and acknowledge any and all addenda. Failure to acknowledge receipt of any addenda may be cause to deem such submission non-responsive.

4. **SILENCE OF SPECIFICATION**: The apparent silence of the provided specifications as to any detail or the apparent omission from these specifications of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of the specifications shall be made on the basis of this statement.

5. **MINOR DEFECT:** The City reserves the right to waive any minor defect, irregularity, or informality in any bid/proposal. Minor defects, irregularities or informalities will not affect the end product/performance intended by the specifications. The City also reserves the right to reject any or all bids/proposals with or without cause prior to award.

6. **ELECTRONIC SUBMISSIONS:** The City utilizes bidnet direct by SOVRA to advertise and receive bids and proposals electronically over the Internet. Electronic submissions through bidnet direct by SOVRA shall be electronically signed and dated by a duly designated representative or agent of the company submitting the bid/proposal and submitted prior to the stated deadline date and time. Vendors should clearly and concisely provide all requested information as stated in the bid/proposal document. Failure to provide the requested information may be reason to deem such submission non-responsive.

7. **PAPER SUBMISSIONS**: Paper submissions shall be submitted on the forms provided by the City and must be signed and dated by a duly designated representative or agent of the company submitting the bid/proposal. Vendors shall clearly and concisely provide all requested information as stated in the bid/proposal document. Failure to provide the requested information may be reason to deem such submission non-responsive.

8. **PRESENTATION OF BIDS/PROPOSALS**: Paper submissions shall be presented to City Action Center, 4000 Main Street, Rowlett, Texas 75088, prior to the stated deadline date and time. Paper submissions shall be presented in a sealed envelope with vendor's name and the bid/proposal number clearly identified on the outside of the envelope.

9. **LATE SUBMISSIONS**: The date/time stamp located in the City Action Center serves as the official time clock. Submissions received after the stated deadline date and time shall be refused and returned unopened. The City is not responsible for issues encountered with methods of delivery.

10. **PRICING**: Prices offered shall be submitted for units of quantity as specified in the bid/proposal document, extended and totaled. In the case of a discrepancy in the extended price, the unit price shall govern and control. Any alteration, strike-through or erasure of a unit price or extended price made prior to bid/proposal opening shall be initialed by the signer of the bid/proposal, guaranteeing authenticity.

    Prices offered **cannot** be altered or amended after the submission deadline. Bids may not be changed for the purpose of correcting an error in bid price after bid opening.

11. **PROPRIETARY INFORMATION**: All material submitted to the City is subject to public disclosure upon receipt, pursuant to the Texas Open Records Act. If vendor does not desire proprietary information in the bid to be disclosed, each page must be identified and marked proprietary at the time of submittal. The City will, to the extent allowed by law, endeavor to protect such information from disclosure. The final decision as to what information must be disclosed, however, lies with the Texas Attorney General. Failure to identify proprietary information will result in all unmarked sections being deemed non-proprietary upon public request.

12. **TAXES:** The City is exempt from paying federal excise and transportation taxes and Texas State or local sales and use taxes. Tax shall not be included in prices offered. A Tax-Exempt Form will be provided by the City upon request. A request for a Tax-Exempt Form can be submitted in writing to purchasing@rowlett.com or by contacting the Purchasing Office at 972.412.6189.

13. **WITHDRAWAL OF OFFER**: Vendor agrees that an offer may not be withdrawn or cancelled for a period of ninety (90) days following the date and time designated for the receipt of the bid/proposal without written approval of the Purchasing Manager.

14. **F.O.B./DAMAGE**: Prices offered shall be F.O.B. Final Destination, Rowlett, Texas, and shall be all inclusive of shipping, handling and packaging costs. The City accepts and assumes no liability for goods delivered in damaged or unacceptable condition. The successful vendor shall be responsible for handling all claims with carriers, and in case of damaged or unacceptable goods, shall ship replacement goods immediately upon notification by the City.

15. **PREPARATION COST**: All costs associated with the preparation of an offer, bid, or proposal shall be borne by the vendor. The City will not be liable for any costs associated with the preparation, transmittal, or presentation of submissions, or with any materials submitted in response to the request for bid/proposal.

16. **TESTING**: At the City's discretion, testing may be required prior to award of the bid/proposal or prior to delivery of goods or services. Testing shall be performed without expense to the City.

17. **SAMPLES**: At the City's discretion, samples may be required prior to award of the bid/proposal or prior to delivery of goods or services. Samples shall be provided at no cost to the City. Samples should not be enclosed with submission unless specifically requested.

18. **QUALITY**: Any catalog, brand names, or manufacturer's reference in the bid/proposal packet is merely descriptive and **not** restrictive and is intended to indicate the type and minimum quality level desired for comparison purposes, unless otherwise stated herein to the contrary. All products and/or optional equipment offered shall be new and of current manufacture. No items of a demonstrator, leased, reconditioned, rebuilt, repossessed or used nature shall be considered, unless otherwise specifically stated herein.

19. **BID/PROPOSAL OPENINGS**: All bids/proposals will be read aloud at the City's scheduled opening for the designated bid/proposal. However, the reading of an offer shall not be construed as a comment on the responsiveness of such offer, or as any indication that the City accepts such offer as responsive. Neither shall such reading be construed as a comment on the responsibility of the bidder/proposer.

The City will make a determination regarding the responsiveness of offers submitted based upon compliance with all applicable laws and the City's purchasing guidelines and project documents including, but not necessarily limited to, the bid/proposal specifications and contract documents. The City will notify the successful vendor upon award of the contract; and, according to State law all offers received will be available for inspection after award.

For processes other than low bid or best value bid, only the names of vendors will be read aloud at the scheduled opening. Pricing information will not be released until after award of the contract.

20. **SUMMARY SHEET**: Bid/Proposal summary results are typically published within two (2) business days after the scheduled opening. Interested parties desiring a copy of a bid/proposal summary sheet may request the same by submitting a written request to purchasing@rowlett.com. **RESULTS WILL NOT BE RELAYED OVER THE TELEPHONE.**

21. **GRATUITIES**: Gratuities in the form of entertainment, gifts, or otherwise offered or given by the vendor, or any agent or representative of the vendor, to any officer or employee of the City with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or the making or any determinations with respect to the performing of such a contract, are not permissible. In the event this contract is cancelled by City pursuant to this provision, City shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by vendor in providing such gratuities.

22. **ANTI-COLLUSION**: In submitting an offer, vendor certifies that they have not participated in, nor have they been party to any collusion, price fixing or any other illegal or unethical agreements with any company, firm or person concerning the pricing offered.

23. **NO PROHIBITED INTEREST**: Vendor acknowledges awareness of the laws, City Charter, and City Code of Ethics regarding conflicts of interest. No officer, employee or agent of the City shall participate in the negotiation, selection, discussion, award or administration of a contract or procurement supported by public funds if: 1) that individual has a substantial interest in a person or entity, as defined by Section 2-463 of the City's Code of Ordinances and/or Chapter 171 of the Texas Local Government Code, that is the subject of the contract or procurement; or 2) a conflict of interest, either real or apparent, would be involved, as defined therein.

24. **CONFLICT OF INTEREST**: In accordance with Chapter 176, Local Government Code, a person who is a vendor and has a business relationship, as those terms are defined by Section 176.001(1-a), with the City and meets requirements under Section 176.006(a) is required to file a Conflict of Interest Questionnaire with the City Secretary not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code. A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

A complete copy of Chapter 176 of the Local Government Code may be found at https://statutes.capitol.texas.gov/Docs/LG/htm/LG.176.htm.

25. **NON-RESIDENT BIDDERS**: Texas Government Code, Chapter 2252: Non-Resident Bidders. Texas law prohibits city and governmental units from awarding contracts to a non-resident bidder/proposer unless the amount of such bid is lower than the lowest bid by a Texas resident by the amount a Texas resident would be required to underbid the non-resident bidder/proposer on a bid/proposal for goods and services in the non-resident bidder's state.

26. **DELINQUENT TAXES**: Any person, firm, or corporation that is in arrears to the City for delinquent taxes or otherwise, will not be recommended for award of any bid/proposal until the arrearage has been cleared in writing. If a contractor or vendor becomes delinquent while a contract is in force, payment for goods or services provided to the City under said contract or purchase order may be withheld until the arrearage has been cleared in writing.

27. **MINIMUM STANDARDS FOR RESPONSIBILITY**: A prospective vendor must affirmatively demonstrate responsibility. The City of Rowlett may request representation and other information sufficient to determine vendor's ability to meet the minimum standards including but not limited to:

A. Have adequate financial resources, or the ability to obtain such resources as required
B. Ability to comply with the required or proposed delivery schedule
C. Have a satisfactory record of performance
D. Have a satisfactory record of integrity and ethics
E. Be otherwise qualified and eligible to receive an award

28. **AWARD OF CONTRACT**: The City reserves the right to award single or multiple contracts for the goods or services as stated herein, or to reject any and all bids. Furthermore, the City reserves the right to take administration costs into consideration when awarding to multiple vendors.

The City may award bids/proposals to the lowest responsive responsible vendor(s), or to the vendor(s) who provides goods or services at the best value to the City. If using the best value method, the selection criteria will be clearly identified in the bid/proposal document. The best value method may take into consideration, in whole or in part, by way of illustration and not limitation, the following criteria:

A. The purchase price
B. The reputation of the vendor and of the vendor's goods or services
C. The quality of the vendor's goods or services
D. The extent to which the goods or services meet the City's needs
E. The vendor's past relationship with the City
F. The total long-term cost to the City to acquire the vendor's goods or services
G. Any relevant criteria specifically listed herein

29. **ACCEPTANCE:** Vendor agrees that acceptance of any or all items by the City within a reasonable period of time, not to exceed one hundred twenty (120) days following the date and time designated for the receipt of the bid/proposal, shall be binding upon vendor. Vendor shall thereafter execute all documents necessary to enter into a contract in a form acceptable to and properly executed by the City to provide such goods and services.

30. **FUNDING**: The City is a home-rule municipal corporation operated and funded on a fiscal year basis from October 1 to September 30. Accordingly, the City reserves the right to terminate at any time, without liability to the City, any contract for which funding is not available in a subsequent fiscal year.

31. **ASSIGNMENT**: The successful vendor shall not sell, assign, transfer or convey any contract, in whole or in part, to any other person or party without the prior written consent of the City obtained through the City's Purchasing Office.

32. **DELIVERY PROMISE – PENALTIES**: Where indicated, vendors must provide the number of calendar days required to deliver goods or services to the City after receipt of order (ARO). **Do not quote shipping dates**. When a delivery delay can be foreseen, the vendor shall provide advance notice to the Purchasing Manager, who shall have the right to extend the delivery date if the reasons for delay are acceptable. Default in promised delivery, without acceptable reason(s), or failure to meet specifications as contained herein or in the contract documents, authorizes the Purchasing Office to purchase goods or services from an alternate source. The defaulting vendor may be subject to re-procurement costs.

33. **DELIVERY TIMES**: Unless otherwise specified herein, deliveries will only be accepted during normal working hours at the designated City location(s).

34. **INSPECTION**: Upon receipt of goods or services, the same will be inspected for compliance with the specifications contained herein or in the contract documents. If the goods or services do not pass inspection, the vendor will be required to remedy the situation at the vendor's sole expense. The vendor will be required to retrieve the rejected goods at the delivery point and provide the necessary repairs of or replacement and return of the goods in new condition to the original point of delivery; or re-perform services in accordance with the terms and conditions of the contract and to the City's satisfaction.

35. **INVOICES**: Invoices shall be submitted to the attention of the ordering department, P.O. Box 99, Rowlett, Texas 75088, or electronically to the appropriate department representative.

36. **PAYMENT TERMS**: Payment terms are net 30 days, unless otherwise specified by the City in the bid/proposal document.

37. **AUDIT**: The City shall have access to, and the right to examine, monitor and audit all vendor's records, documents, conditions and activities related to contracts awarded by the City. It shall be the responsibility of the vendor to maintain records associated with this procurement for a period of three (3) years after completion of the contract, or in the event of litigation, a claim or audit, the records shall be retained until the resolution of such litigation, claim or audit.

38. **INSURANCE**: The City requires vendor(s) to carry the minimum insurance as required by the greater of the requirements contained in state laws or the insurance requirements contained in the contract documents.

39. **INDEMNITY**: **The bidder shall defend, indemnify and hold the City, its current, former and future officers, agents and employees harmless from any and all costs, expenses, suits, demands, claims, liabilities, liens, encumbrances or damages, including attorneys' fees and costs of suit, of any character, name and description, incurred or resulting from any injuries or damages received or sustained by any person, persons or property on account of any intentional wrongful conduct or negligent act, omission, or fault of the successful bidder, or of any agent, employee, subcontractor or supplier for which the successful bidder is responsible in the execution of, or performance under, any contract which may result from bid award and the bidder so agrees upon the submission of the bid. The bidder shall deliver, if so requested by the City, a written release of all liens or other proper evidence of same, to the satisfaction of the City prior to the issuance of final payment by the City.**

40. **INDEMNITY; PATENT RIGHTS**: **The bidder/proposer agrees to indemnify and hold harmless the City from any claim involving patent right infringement or copyright infringement on goods or services supplied to the City pursuant to the contract documents**.

41. **PROTESTS**: All protests regarding the solicitation process must be submitted in written form to the Purchasing Manager within five (5) working days following the opening of bids/proposals. This includes all protests relating to legal advertisements, deadlines, bid/proposal openings, and all other related procedures under the Local Government Code, as well as any protests relating to alleged improprieties or ambiguities in the specifications contained herein or in the contract documents.

Post-award protests must be submitted in written form to the Purchasing Manager within five (5) working days after award.

The protest must include, at a minimum, the name of the protester, bid/proposal number or description of goods or services, and a statement of the grounds for the protest. The Purchasing Manager, having authority to make the final determination, will respond within ten (10) working days to each substantive issue raised in the protest. Allowances for reconsiderations shall be made only if data becomes available that was not previously known, or if there has been an error of law or regulation.

42. **TERMINATION FOR DEFAULT**: The City reserves the right to enforce the performance of the contract in any manner prescribed by law and deemed to be in the best interest of the City in the event of breach or default of the contract. The City reserves the right to terminate the contract immediately in the event the contracted vendor fails to meet delivery schedules or otherwise perform in accordance with the specifications contained herein or in the contract documents. Breach of contract or default authorizes the City to award the contract to another vendor, or purchase from an alternate source, and charge the full increase in cost plus any additional administrative costs incurred by the City to the defaulting contracted vendor.

43. **REMEDIES**: The successful vendor and the City agree that each party may have rights, duties, and remedies available as stated in the Uniform Commercial Code and any other available remedy, whether in law or equity.

44. **VENUE**: The validity of the contract and of any of its terms or provisions, as well as the rights and duties thereunder or under the contract documents, shall be governed by and construed in accordance with the laws of the State of Texas. Exclusive venue for any legal action shall lie in the state courts of Dallas County, Texas.

45. **ENERGY BOYCOTT:** In accordance with Chapter 2274, Texas Government Code (Acts 2021, 87th Leg., S.B. 13), the City may not enter into a contract with a company, excluding a sole proprietorship, with 10 or more full-time employees for goods or services valued at $100,000 or more unless the contract contains a written verification from the company that the company: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract. The signatory executing the Contract on behalf of Seller verifies Seller does not boycott energy companies and will not boycott energy companies during the term of the Contract. The foregoing verification is made solely to comply with Section 2274.002, Texas Government Code, and does not apply if the City determines the requirements of Subsection 2274.002(b) are inconsistent with the City's constitutional or statutory duties related to the issuance, incurrence or management of debt obligations or the deposit, custody, management, borrowing or investment of funds.

46. **FIREARMS:** In accordance with Chapter 2274, Texas Government Code (Acts 2021, 87th Leg., S.B. 19) the City may not enter into a contract with a company, excluding a sole proprietorship, with 10 or more full-time employees for goods or services valued at $100,000 or more unless the contract contains a written verification from the company that the company: (1) does not have a practice, policy, guidance, or directive

that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The signatory executing the Contract on behalf of Seller verifies Seller does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate during the term of the contract against a firearm entity or firearm trade association. The foregoing verification is made solely to comply with Section 2274.002, Texas Government Code, and does not apply if the City contracts with a sole-source provider or if the City does not receive any bids, if applicable, from a company that is able to provide the required verification.

47. **CRITICAL INFRASTRUCTURE:** In accordance with Chapter 2274, Texas Government Code, the City may not enter into a contract or agreement with a company, excluding a sole proprietorship, with 10 or more full-time employees for goods or services valued at $100,000 or more (1) if the company would be granted direct or remote access to or control of critical infrastructure in Texas, excluding access specifically allowed by the City for product warranty and support purposes and (2) if the City knows the company is (A) owned by or the a majority of stock or other ownership interest of the company is held or controlled by (i) individuals who are citizens of China, Iran, North Korea, Russia, or a designated country or (ii) a company or other entity, including a governmental entity, that is owned or controlled by citizens of or is directly controlled by the government of such countries, or (B) headquartered in such countries. The signatory executing the Contract on behalf of Seller represents that neither Seller nor any of its parent companies, wholly owned subsidiaries, majority-owned subsidiaries, and other affiliates is a company of which the City may not contract pursuant to Section 2274.0102, Texas Government Code. The foregoing verification is made solely to comply with Section 2274.0102, Texas Government Code.

48. **ANTI-BOYCOTT ISRAEL VERIFICATION:** In accordance with Chapter 2271, Texas Government Code, the City may not enter into a contract with a company, excluding a sole proprietorship, with 10 or more full-time employees for goods or services valued at $100,000 or more unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The signatory executing the Contract on behalf of Seller verifies that Seller and its parent company, wholly-owned subsidiaries, majority-owned subsidiaries, and other affiliates, if any, do not boycott Israel and, to the extent the Contract is a contract for goods or services, will not boycott Israel during the term of the Contract. As used in the foregoing verification, "boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes. The signatory understands "affiliate" to mean an entity that controls, is controlled by, or is under common control with the signatory and exists to make a profit. This section does not apply to a Vendor which is a sole proprietorship and/or which has less than 10 full-time employees. This section does not apply to a contract valued at less than $100,000.

49. **IRAN, SUDAN, AND FOREIGN TERRORIST ORGANIZATIONS:** The signatory executing the Contract on behalf of Seller represents that neither Seller nor any of its parent company, wholly-owned subsidiaries, majority-owned subsidiaries, and other affiliates is a company identified on a list prepared and maintained by the Texas Comptroller of Public Accounts under Section 2252.153 or Section 2270.0201, Texas Government Code, and posted on any of the following pages of such officer's internet website:

https://comptroller.texas.gov/purchasing/docs/sudan-list.pdf,
https://comptroller.texas.gov/purchasing/docs/iran-list.pdf, or
https://comptroller.texas.gov/purchasing/docs/fto-list.pdf.

The foregoing representation is made solely to comply with Section 2252.152, Texas Government Code, and to the extent such Section does not contravene applicable Federal law and excludes the entity and

each of its parent company, wholly-owned subsidiaries, majority-owned subsidiaries, and other affiliates, if any, that the United States government has affirmatively declared to be excluded from its federal sanctions regime relating to Sudan or Iran or any federal sanctions regime relating to a foreign terrorist organization. The signatory understands “affiliate” to mean any entity that controls, is controlled by, or is under common control with the signatory and exists to make a profit.

SECTION 5 ADDITIONAL CONDITIONS FOR PUBLIC WORKS CONSTRUCTION CONTRACTS

ADDITIONAL CONDITIONS FOR PUBLIC WORKS CONSTRUCTION CONTRACTS

1. **APPLICATION:** The following additional conditions apply to projects for which a Public Works Construction Contract will be executed.

2. **QUALIFICATIONS OF BIDDER:** The City may make such investigations as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the City all such information and data for this purpose as the City may request. The City reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the City that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated herein. The following list is not exclusive:

   Five (5) Prior Projects: Bidder participants, whether general contractor, prime contractor, joint venture contractor or subcontractor, shall provide documented evidence of having completed at least five (5) projects for the installation and construction of facilities similar in nature to the project being bid and having 10 years experience. Bidder shall be required to submit references of previous projects to enable the City to verify references. This experience documentation shall be submitted prior to, and as a special requirement for, being considered for award of the contract for the subject project. Any bid may be rejected if the City determines that the Bidder has not provided documented evidence of having successfully and timely completed at least five (5) projects that are similar in nature, scope, and size as that contemplated herein. The city may make inquiry with the owners of any other projects. Conditional bids will not be accepted. This information should include at a minimum:

   Names and addresses of similar projects
   Owner's Name
   Owner's representative including telephone number and email address
   Architect or Engineer Name
   Architect or Engineer representative including telephone number and email address

   Financial Statements: A bid may be rejected if the City determines that the bidder lacks sufficient financial resources or soundness to commence, operate and complete the Project. Bidders shall, in addition to other documents required herein, provide recent financial statements covering the two immediately preceding calendar years. Financial statements should be marked or stamped "CONFIDENTIAL" by the Bidder and, to the fullest extent allowed by law, will be kept and maintained as confidential by the City. Financial statements must demonstrate sufficient assets, resources, and income, based on the nature, scope and size of the Project, to demonstrate to the City's sole satisfaction, that the Bidder has the financial capacity to fully perform the Project. The City's review and evaluation of the financial soundness of the Bidder is solely and exclusively within the City's sole discretion.

   Subcontractors: At least 51% of the work must be completed by the primary contractor and the City reserves the right to approve all sub-contractors. Sub-contractor information must be submitted with the bid for evaluation.

3. **BID SECURITY:** Each bid must be accompanied by a certified check of the bidder, or a bid bond, duly executed by the bidder as principal and having as surety thereon a surety company approved by the city, in the amount of 5% of the bid. Such checks will be returned thirty days after the award of the contract, or, if no award has been made within 90 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

   The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the City the security deposited with his bid.

4. **TIME OF COMPLETION AND LIQUIDATED DAMAGES:** Bidders must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the City and to fully complete the project within the specified time as stated in the proposal.

TIME IS OF THE ESSENCE IN THE PERFORMANCE OF THIS PROJECT. THE CITY EMPLOYS A ZERO-TOLERANCE POLICY FOR TIME OF COMPLETION. FAILURE TO MEET THE CONTRACTUAL DEADLINE, OR A DELAY IN MEETING PROJECT SCHEDULES, MAY BE DEEMED A DEFAULT.

Liquidated damages may be imposed per Section 3.4.1 of the Public Works Construction Contract due to work delay.

5. **SECURITY FOR FAITHFUL PERFORMANCE:** Simultaneously with his delivery of the executed contract, the Contractor shall furnish Performance Bond in the amount of one hundred fifteen percent (115%) and Payment Bond in the amount of one hundred percent (100%) of the total contract price as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the Special Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the City.

6. **LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT:** The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the City, as liquidated damages for such failure or refusal, the security deposited with his bid. This liquidated damage amount is not a penalty but is, instead, a reasonable forecast of actual damages that the City may sustain were the bidder to default.

7. **MAINTENANCE BOND:** A Maintenance Bond for two years from the formal date of final acceptance in the amount of 100% of the final contract price to cover defective workmanship of materials is required for all projects as discussed in the Special Conditions.

8. **POWER OF ATTORNEY:** Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

9. **CONDITIONS OF WORK:** Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible, the Contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor and will be responsible for coordination with utilities on site.

10. **ADDENDA AND INTERPRETATIONS:** Bidders are responsible for a thorough review of the contract documents, plans and specifications. Bidders shall assume all risk of any ambiguities. Thus, it is imperative that bidders be familiar with the contract documents as well as the job site. If there is any ambiguity in the plans and specifications that give rise to two or more different interpretations of the work called for, the bidder will be assumed to have bid the most expensive alternative.

    No interpretation of the meaning of plans, specifications, or other pre-bid documents will be made to any bidder orally. Every inquiry or request for such interpretation should be in writing addressed to the Purchasing Office at purchasing@rowlett.com and any architectural or engineering firm included in any special instructions. To be given consideration requests must be received at least three days prior to the date fixed for the opening of bids. All such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted through the eProcurement at https://www.bidnetdirect.com. Bidders are expected to check the eProcurement system for all addenda not later than two days prior to the date fixed for opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

11. **NOTICE OF SPECIAL CONDITIONS:** Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

    a. Inspection and testing of materials

b. Insurance requirements
c. Prevailing Wage rates
d. Stated allowances
e. 100% maintenance bond (Construction projects exceeding $50,000)
f. 100% payment bond (Construction projects exceeding $50,000)
g. 115% performance bond (Construction projects exceeding $100,000)

12. **LAWS AND REGULATIONS:** The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

13. **OBLIGATION OF BIDDERS:** At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve the bidder from any obligation in respect to his bid.

14. **WORK ORDER CHANGES:** It is understood that the quantities of work to be done at unit prices are approximate only and are intended principally to serve as a guide in evaluating bids. Any change order will be approved by the City prior to work being started on said change.

It is further agreed that the quantities of work to be done at unit prices and materials to be furnished may be increased or diminished as may be considered necessary, in the opinion of the Engineer, to complete the work fully as planned and contemplated and that all quantities of work, whether increased or decreased, are to be performed at the unit prices set forth except as provided for in the specifications. The City reserves the right to increase or decrease the amount of work to be done by any amount not to exceed twenty-five percent (25%) of the original contract amount except as noted in the Measurement and Payment Section. In the event the increase pertains to items not originally bid, the Contractor shall submit a bid in writing to the Engineer for approval.

It is further agreed that lump sum prices may be increased to cover additional work ordered by the Engineer but not shown on the plans or required by the specifications, in accordance with the provisions of the general conditions; similarly, they may be decreased to cover deletion of work so ordered.

The City reserves the right to reject the Contractor's bid on such extra work and secure such work to be done other than by said Contractor.

The time for performance set forth in the contract documents contemplates normal bad weather days and typical construction delays. Extensions in the time for performance may be given or allowed for if and only if the extension is approved by the City and the approval is evidenced by a written and signed Change Order.

15. **MINIMUM WAGE RATES:** Each bidder, contractor or subcontractor shall comply with the Texas Minimum Wage Act, Texas Labor Code regarding prevailing minimum wages.

16. **RETAINAGE:** Retainage will be withheld on this project according to Section 5.2.5 of the Public Works Construction contract.

17. **DIGITAL DATA SUBMISSION:** Any contract that requires a mapping submission must meet the standards stated per document “Digital Data Submissions Standards” provided on page 22.

18. **SALES TAX LAW:** Legislation has removed the sales tax exemption previously provided by Section 151.311 of the Tax Code covering tangible personal property purchased by a contractor for use in the performance of a contract for the improvement of City-owned realty.

It is still possible, however, for a contractor to make tax-free purchases of tangible personal property which will be incorporated into and become a part of a City construction project through the use of a "separated contract" with the City. A "separated contract" is one which separates charges for materials from charges for labor. Under such a contract, the Contractor becomes a "seller" of those materials which are incorporated into the project, such as bricks, lumber, concrete, paint, etc. The Contractor issues a resale certificate in lieu of paying the sales tax at the time such items are purchased. The Contractor then receives an exemption certificate from the City for those materials. (This procedure may not be used, however, for materials which do not become a part of the finished product. For example, equipment rentals, form materials, etc. are not considered as becoming "incorporated" into the project.)

Utilization of this "separated contract" approach eliminates the need for bidders to figure in sales tax for materials which are to be incorporated into the project. The bidder should therefore be certain, when completing the bid form, to separate the bid as provided on the bid form. The successful bidder, prior to award of a construction contract, shall furnish a complete bid form separating by each item taxable and non-taxable amounts of the amount bid.

19. **PREFERENCE FOR RECYCLED PRODUCT:** Per Texas Administrative Code, Title 30 Environmental Quality, Part 1 Texas Commission on Environmental Quality, Chapter 328, Subchapter k., Rule 328.203, the City of Rowlett is required to give preference in purchasing to products made of recycled materials if the products meet applicable specifications as to quantity and quality and the average price of the product is not more than 10% greater than the price of comparable nonrecycled products. Preferences will be applied in accordance with state procurement statutes and rules.

The City relies on vendors to correctly represent the products offered in response to a solicitation and will not be responsible for incorrect information provided by an offeror/vendor. Categories of recycled products and recommended percentages of post-consumer materials and total recovered materials content can be found in the Environmental Protection Agency's Comprehensive Procurement Guidelines at Comprehensive Procurement Guideline (CPG) Program | US EPA.

20. **WORKING DAYS AND HOURS:** The contractor must commence work within ten (10) days of the notice to proceed or work order date. Working days will be charged Monday through Friday, excluding national holidays, regardless of weather conditions or material availability. No work is allowed on Sundays or official City holidays. The Contractor has the option of working on Saturdays at the City's discretion. Prior written authorization from the City is required.

Requests for after-hours engineering inspections must be submitted in writing at least 48 hours in advance, with cancellations communicated by 4:00 P.M. the day before to avoid a two-hour minimum fee; same-day cancellations, except for weather-related issues, will incur the same charge. The after-hours inspection fee is $75 per hour, with a minimum of two hours, and project acceptance is contingent upon the full payment of all inspection fees. Any work done without proper inspection is subject to removal and replacement as directed by the City.

Digital Data Submission Standards

The City of Rowlett has adopted geographic information system (GIS) technologies to store, manage, and maintain spatially related (geographic) data. The land development, civil engineering, and surveying communities have also embraced digital technologies in their respective professional communities. Because development plans are now created using computer aided design and drafting (CAD), it is the goal of City of Rowlett to leverage such advanced techniques to expedite the design and plan review processes within the city. For such an effort to succeed, standards must be implemented to allow CAD data to be integrated into the City's GIS while preserving the referential and positional accuracy of the original measurements. These standards will enhance file transfer abilities between the City of Rowlett, developers, and engineers as well as between departments of the City of Rowlett. The process will also improve efficiency in the form of data input time, cost, manpower, and services at the City of Rowlett.

Each submission must contain:

- One digital **CAD** file of the plan **.dwg** or **.dxf** or ESRI **.shp** file.
- One digital **PDF** of the plan.

Digital File Format:

- Autodesk Autocad **.dwg** format version 2000 – 2013 or a **.dxf** format.
- ESRI **.shp** format must also include associated **.dbf**, **.shx** files.
- No polylines or annotation shall be stored in blocks. Explode all blocks that do exist. (Block references migrate to GIS as a single point at the block's insertion point).
- No annotation shall be included in any feature layer and no feature shall be included in any annotation layer. Annotation for each layer shall be placed in annotation layers.
- Drawing features shall include layer names. Systems using numbered levels, such as Microstation, must include a conversion table in the .dxf file creation process that can be used to specify named layers.
- Closure is critical in converting CAD elements to GIS features. If appropriate (ie. parcel boundaries, subdivision boundary, buildings), all polygonal features shall be 'snapped' closed.

Spatial Reference Information:

Digital data provided to or produced for the city must be **georeferenced**. Please tie all surveys to the **State Plane** coordinate system. The standard coordinate system for City:

Projected coordinate system name:	**NAD1983 State Plane Texas North Central FIPS 4202**
Geographic coordinate system name:	GCS North American 1983
Map Projection Name:	Lambert Conformal Conic
Planar Distance Units:	Survey Feet

Delivery:

Send an email with the CAD drawings along with the title of the drawing, type of drawing (e.g., As-built, Final Plat, etc). For any questions, please email gis@rowlett.com

SECTION 6 BID FORMS

BID FORM

BID NO. 2025-167-B

Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid)

			Felix Construction Company		
Item No.	**Quantity**	**Units**	**Description**	**UnitPrice**	**Extended Amount**
1	1	LS	Mobilization (5% Maximum)	$ 45,000.00	$ 45,000.00
2	84	LF	Trench Safety Program	$ 18.00	$ 1,512.00
3	200	SY	Sodding and Topsoil	$ 25.00	$ 5,000.00
4	1	LS	Erosion Control	$ 5,000.00	$ 5,000.00
5	1	LS	Construction of the Rowlett Road Pump Station Upper Pressure Plane Addition Improvements with VFD Complete and in Place as Shown in the Plans and Described in the Specifications	$ 1,292,668.00	$ 1,292,668.00
6	1	LS	Matching to Reset/Level Existing RRUPP P-6 Pump Can Flange as Shown in the Plans and Described in the Specifications	$ 25,000.00	$ 25,000.00
7	1	EA	12-inch Gate Valve	$ 5,150.00	$ 5,150.00
8	84	LF	12-inch AWWA C151 Ductile Iron Pipe (Yard Piping)	$ 510.00	$ 42,840.00
9	1	EA	12-inch X 12-inch Tapping Sleeve	$ 5,600.00	$ 5,600.00
TOTAL BASE BID					**$1,427,770.00**

BID CERTIFICATION FORM
BID NO. 2025-167-B

The undersigned bidder having thoroughly examined the contract documents, including plans, specifications, the site of the project and understanding the amount of work to be done and the prevailing conditions, hereby proposes to do all the work, furnish all labor, equipment, and material, except as specified to be furnished by the City, which is necessary to fully complete all of the work as provided in the plans and contract documents and subject to the inspection and approval of the City of Rowlett, Texas, and binds himself upon acceptance and award of this bid to execute a contract and furnish all required insurance, sureties and bonds, as may be required by the contract documents for the performing and completing of said work. Contractor proposes to do the work within the time stated at the bid prices submitted on the Bid Form and agrees to abide by the terms and statutory requirements governing the solicitation process.

A. FIRM INFORMATION

Legal Name of Vendor: Felix Construction Company

Tax ID Number: 86-0577823 Telephone No: 469.458.0011

State of Formation: Arizona Year of Formation: 1987

Address: 403 International Pkwy, Suite 500, Richardson, TX 75081 (TX Office)

2530 S. 52nd Ave Phoenix, AZ 85043 (HQ)

Contact Name and Title: Ryan Koontz - General Manager

Contact Email Address: ryank@felixconstruction.com

B. ADDENDA

All addenda shall be issued in written form by the Purchasing Office. The City is not bound by any oral representations, clarifications, or changes made in connection to the bid by the City's employees, agents or consultants unless in the form of a properly issued Addendum.

Recognizing this responsibility, the bidder hereby acknowledges receipt of the following Addenda:

Addendum _____ Initial _____ Addendum _____ Initial _____

Addendum_____ Initial _____ Addendum _____ Initial _____

Addendum_____ Initial _____ Addendum _____ Initial _____

The failure of the bidder to contact the Owner to determine the issuance of any Addenda, or to acknowledge receipt of any and all of the Addenda issued in connection with this project, shall entitle the City, at its sole discretion, to (i) reject the bid as being non-responsive, or (ii) to accept the bid, in which event the bidder agrees to be bound by all of the terms and conditions of each unacknowledged Addendum.

C. CERTIFICATION

Within ten (10) days after acceptance of this Proposal, the undersigned will execute the formal contract and will deliver an approved Surety Bond and such other bonds as required by the Contract Documents, for the faithful performance of the Contract. The attached bid security in the amount of 5% is to become the property

of the Owner in the event the contract and bond or bonds are not executed and delivered within the time above set forth, as liquidated damages for the delay and additional work caused thereby.

The undersigned assures that its employees and applicants for employment and those of any labor organization, subcontractors, or employment agency in either furnishing or referring employee applicants to the undersigned are not discriminated against.

The bidder agrees to begin construction within 10 calendar days after the issuance of the Notice to Proceed with Construction (Work Order). **Substantial completion of the work will be achieved within 360 calendar days of the date indicated on the Notice to Proceed and final completion will be achieved within 30 calendar days after substantial completion.**

I certify that I have the legal authority to bind the bidder listed above, and I further certify that there are no objections to any of the terms and conditions listed in this bid document.

Signature of Authorized Representative: 

Printed Name and Title of Authorized Representative: Ryan Koontz, General Manager

Date of Certification: 8/13/2025

SUBCONTRACTOR FORM

List of Major Subcontractors

The Bidder expressly agrees that:

1. If awarded a Contract as a result of this Bid, the major subcontractors used in the prosecution of the work will be those listed below, and

2. The following list includes all subcontractors who will perform work on this contract.

3. The Bidder represents that the subcontractors listed below are financially responsible and are qualified to perform the work required.

Category	Name of Subcontractor	Address	Meets Qualifications
Electrical and Controls	H&H Electrical	8475 Co Rd 271, Terrell, TX 75160	YES

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
Felix Construction Company
403 International Parkway, Suite 500
Richardson, TX 75081

SURETY:
Travelers Casualty And Surety Company Of America
One Tower Square
Hartford, CT 06183

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

OWNER:
City of Rowlett, TX
4310 Industrial Street
Rowlett, TX 75088

BOND AMOUNT: Five Percent of the Amount Bid---------(5%)

PROJECT:
Rowlett Road Pump Station Upper Pressure Plane Additions

Project Number, if any:

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 13th day of August 2025.

(Witness) Victoria Soto

Felix Construction Company
(Principal) (Seal)

(Title) ICHAN KOONTZ - GENERAL MANAGER

(Witness) Stephanie L. Bucholz

Travelers Casualty And Surety Company Of America
(Surety) (Seal)

Gregory P. Griffith, Attorney-in-fact

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA
HARTFORD, CONN.

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TRAVELERS

SURETY BOND ELECTRONIC SIGNATURE & SEAL ADDENDUM
TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA

Travelers Casualty and Surety Company of America ("Travelers") has authorized its Attorneys-in-Fact to utilize an electronic, facsimile, or digital signature (each an "Electronic Signature") to execute bonds on behalf of Travelers and has further authorized its Attorneys-in-Fact to attach this Addendum to any such bonds.

Travelers hereby acknowledges and agrees that the attached bond executed by the Attorney-in-Fact on behalf of Travelers with an Electronic Signature shall have the same force and effect as if executed by the Attorney-in-Fact with a wet ink signature.

Travelers also hereby agrees that the seal below shall be deemed affixed to the attached bond to the same extent as if Travelers' raised corporate seal was physically affixed to the face of the bond.

Dated this 1st day of April, 2023.

Travelers Casualty and Surety Company of America



By:_____
Robert L. Raney, Senior Vice President

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Gregory P. Griffith** of **Mesa** **Arizona** , their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **3rd** day of **February**, **2017.**

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **3rd** day of **February**, **2017**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June**, **2021**

Marie C. Tetreault, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **13th** day of **August** , **2025**

Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney-in-Fact and the details of the bond to which the power is attached.

SECTION 7 INSURANCE REQUIREMENTS AND BOND FORMS

INSURANCE REQUIREMENTS
STANDARD INSURANCE REQUIREMENTS

Company shall procure and maintain for the duration of the contract, insurance coverages outlined herein which may arise from or be in connection with the performance of the work hereunder by the Company, his agents, representatives, employees or subcontractors. Any exceptions to the requirements or provisions herein shall be submitted in writing to the City's Risk Manager for consideration and approval. The decision of the City will be final. The cost of such insurance shall be borne by the Company.

1.0 GENERAL PROVISIONS

1.1 The Company shall obtain and maintain the minimum insurance coverage set forth in this section. By requiring such minimum insurance, the City of Rowlett shall not be deemed or construed to have assessed the risk that may or may not be applicable to the Company. The Company shall assess its own risks and if it deems appropriate and/or prudent, maintain higher limits and/or broader coverage. The Company is not relieved of any liability or other obligation assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types. The insurance requirements listed below do not replace any warranty or surety (performance, payment, or maintenance) bonds if required by preceding or subsequent sections of this contract.

1.2 Company shall cause each subcontractor employed by Company to purchase and maintain insurance of the type specified herein or cover such subcontractor under its insurance coverage.

1.3 The Company agrees that the insurance requirements specified in this section do not reduce the liability Company has assumed in any indemnification/hold harmless section of this contract.

1.4 City reserves the right to approve the security of the insurance coverage provided pursuant to this section by insurers including terms, conditions and the Certificate of Insurance. Failure of the Company to fully comply with requirements of this section during the term of this contract will be considered a material breach of contract and will be cause for immediate termination of the contract at the option of City.

1.5 Insurance coverage required by this section shall:

1.5.1 Be on a primary basis, non-contributory with any other insurance coverage and/or self-insurance carried by City.

1.5.2 Be with an insurer possessing an A-VII A. M. Best Rating or equivalent.

2.0 MINIMUM INSURANCE COVERAGE & LIMITS

2.1 Commercial General Liability. Company shall maintain commercial general liability and, if necessary, commercial umbrella or excess liability (umbrella or excess liability should be provided on follow-form policy).

2.2 Commercial general liability insurance shall be written on an ISO occurrence form CG 00 01 (or a substitute form providing equivalent coverage) and shall cover liability arising from premises, operations, independent Company's, product-completed operations, personal and advertising injury and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

2.3 City shall be included as an additional insured under the commercial general liability using ISO additional insured endorsement CG 20 10 07 04 and CG 20 37 07 04 or their equivalent, including coverage for City with respect to liability arising out of the completed operations of Company.

2.4 Limits of Insurance

Contracts between $0 and $1,000,000		
Type of Insurance	**Amount of Insurance**	**Provisions**
1. Commercial General (Public) Liability to include coverage for: a) Premises/Operations b) Products/Completed Operations c) Independent Contractors d) Personal Liability e) Contractual Liability	• $1,000,000 each occurrence • $2,000,000 general aggregate • $2,000,000 Umbrella/ Excess Liability (follow-form)	City to be listed as additional insured and provided 30-day notice of cancellation or material change in coverage City to be provided a waiver of Subrogation
2. Business Auto Liability	• $1,000,000 per occurrence • $1,000,000 aggregate or; • $1,000,000 combined single limits	City to be named as additional insured
3. Workers' Comp & Employers' Liability	• Statutory Limits • $1,000,000 each accident	City to be provided a waiver of subrogation
4. Builders Risk Policy	• 100% of construction total	If Applicable
5. Other Coverages a) Professional Liability b) E & O coverage c) Cyber Liability	• To be determined by the City's Risk Manager on a per project basis	If Applicable

Contracts between $1,000,000 and $8,000,000		
Type of Insurance	**Amount of Insurance**	**Provisions**
1. Broad Form Commercial General Liability to include coverage for: a) Premises/Operations b) Products/Completed Operations c) Independent Contractors d) Personal Liability e) Contractual Liability	• $2,000,000 each occurrence • $4,000,000 general aggregate • $4,000,000 Umbrella/ Excess Liability (follow-form)	City to be listed as additional insured and provided 30-day notice of cancellation or material change in coverage City to be provided a waiver of Subrogation
2. Business Auto Liability	• $1,000,000 per occurrence • $2,000,000 aggregate or; • $2,000,000 combined single limits	City to be named as additional insured

3. Workers' Comp & Employers' Liability	• Statutory Limits • $1,000,000 each accident	City to be provided a waiver of subrogation
4. Builders Risk Policy	• 100% of construction total	If Applicable
5. Other Coverages a) Professional Liability b) E & O coverage c) Cyber Liability	• To be determined by the City's Risk Manager on a per project basis	If Applicable

2.4.1 If vendor is performing service-related work on City fleet, Garage Keeper Liability is required at a limit of not less than $1,000,000 per occurrence on a special form basis.

2.4.2 If contract has exposure for environmental hazards contact City's Risk Manager for specifications. (Including MCS-90).

2.4.3 Contracts for construction projects taking place in a high-risk flood zone area may require additional coverage requirements.

2.4.4 Insurance specifications for Contracts in excess of $8,000,000 will be determined by the City's Risk Manager.

2.5 Commercial Automobile Liability. Company shall maintain business automobile liability insurance and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 per occurrence.

2.6 Such automobile liability insurance shall cover liability arising out of any auto (including owned, hired, and non-owned automobiles).

2.7 Commercial automobile coverage shall be written on ISO form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to the amount provided in ISO form CA 00 01.

2.8 Company waives all rights against City and its agents, officers, directors and employees for recovery by the commercial automobile liability or commercial umbrella liability insurance obtained by Company pursuant to this section or under any applicable automobile physical damage coverage.

2.9 Workers' Compensation & Employer's Liability. Company shall maintain workers' compensation insurance with a limit of no less than $1,000,000 each incident. The employers' liability limit and, if necessary, commercial umbrella coverage, shall not be less than $1,000,000 each accident for bodily injury by accident or $1,000,000 each employee for bodily injury by disease.

2.10 Company waives all rights against City and its agents, officers, directors and employees for recovery of damages under Company's workers' compensation and employers' liability in connection with scope of contract and completed operations.

3.0 EVIDENCE OF INSURANCE

3.1 Prior to commencement of work, and thereafter upon renewal or replacement of coverage required by this section, Company shall furnish City a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with this section. Company shall furnish copies of all endorsements as required by each section.

3.2 Failure of City to demand such certificate(s) or other evidence of full compliance with these insurance requirements or failure of City to identify a deficiency from evidence that is provided shall not be construed as a waiver of Company's obligation to maintain such insurance.

3.3 City shall have the right, but not the obligation, of prohibiting Company or any subcontractor from entering the project site until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by the City.

3.4 Failure to maintain required insurance may result in termination of this contract at sole option of the City.

3.5 **All Certificates of Insurance need to reference job or contract number in comments section.**

3.6 **Certificate Holder shall be listed as follows: City of Rowlett, 4000 Main St., Rowlett, TX 75088**

WORKERS' COMPENSATION INSURANCE COVERAGE

WC.1 **DEFINITIONS**

Certificate of coverage ("certificate"): A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC- 81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project: Includes the time from the beginning of the work on the project until the contractor's/persons work on the project has been completed and accepted by the governmental entity.

Persons providing services on the project ("subcontractor" in 1.03): Includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, CITY-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries and delivery of portable toilets.

WC.2 The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

WC.3 The contractor must provide a certificate of coverage to governmental entity prior to being awarded the contract.

WC.4 If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

WC.5 The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project, and,

(2) no later than seven (7) days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

WC.6 The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

WC.7 The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within ten (10) days after the contractor knows or should have known, or any change that materially affects the provision of coverage of any person providing services on the project.

WC.8 The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, information all persons providing services on the project that they are required to be offered, and stating how a person may verify coverage and report lack of coverage.

WC.9 The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and,

(b) a new certificate of coverage showing extension of coverage, prior tot he end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one (1) year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery,

within ten (10) days after the person knows or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and,

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1)-(7), with the certificates of coverage to be provided to the person for whom they are providing services.

WC.10 By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

WC.11 The contractor's failure to comply with any of these provision is a breach of contract by the contractor which entities the governmental entity to declare the contract void if the contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the governmental entity.

WC.12 The contractor shall indemnify the governmental entity and hold it harmless for any amounts sought against the governmental entity by any employee or independent sub-contractor. The contractor further agrees to assist City in the defense of any attempts to assert a worker's compensation subrogation lien by any medical insurer, including, but not limited to, the release and disclosure of all files and documents that would be relevant or pertinent to the City's defense.

PERFORMANCE BOND

STATE OF TEXAS

COUNTY OF DALLAS

KNOW ALL MEN BY THESE PRESENTS: That _____ whose address is _____, hereinafter referred to as "Principal", and _____, a corporation organized and existing under the laws of the State of _____, and fully licensed to transact business in the State of Texas, as Surety (herein referred to as "Surety"), are held and firmly bound unto the **CITY OF ROWLETT**, a home-rule municipal corporation organized and existing under the laws of the State of Texas, hereinafter referred to as "Owner", in the penal sum of _____ Dollars ($_____) (one hundred percent (115%) of the total bid price) in lawful money of the United States, to be paid in Dallas County, Texas, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. The penal sum of this Bond shall automatically be increased by the amount of any Change Order or Supplemental Agreement, which increases the Contract price, but in no event shall a Change Order or Supplemental Agreement, which reduces the Contract price, decrease the penal sum of this Bond.

THE OBLIGATION TO PAY SAME is conditioned as follows: Whereas, the Principal entered into a certain Contract with the City of Rowlett, the Owner, dated on or about the _____ day of _____, A.D. 20____, a copy of which is attached hereto and made a part hereof, to furnish all materials, equipment, labor, supervision, and other accessories necessary for the construction of:

BID NO. 2025-167-B

ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)

in the City of Rowlett, Texas, as more particularly described and designated in the above-referenced contract such contract being incorporated herein and made a part hereof as fully and to the same extent as if written herein word for word.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform and fulfill all of the undertakings, covenants, terms, conditions and agreements of said Contract in accordance with the Plans, Specifications and Contract Documents during the original term thereof and any extension thereof which may be granted by the Owner, with or without notice to the Surety, and during the life of any guaranty or warranty required under this Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived; and, if the Principal shall repair and/or replace all defects due to faulty materials and workmanship that appear within a period of one (1) year from the date of final completion and final acceptance of the Work by Owner; and, if the Principal shall fully indemnify and save harmless the Beneficiary from and against all costs and damages which Owner may suffer by reason of failure to so perform herein and shall fully reimburse and repay Owner all outlay and expense which the Owner may incur in making good any default or deficiency, then this obligation shall be void; otherwise, it shall remain in full force and effect.

PROVIDED FURTHER, that if any legal action were filed on this Bond, exclusive Venue shall lie in Dallas County, Texas.

AND PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the Plans, Specifications and Drawings, etc., accompanying the same shall in anywise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the Work or to the Specifications.

This Bond is given pursuant to the provisions of Chapter 2253 of the Texas Government Code, and any other applicable statutes of the State of Texas.

The undersigned and designated agent is hereby designated by the Surety herein as the Resident Agent in Dallas County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Article 7.19-1 of the Insurance Code, Vernon's Annotated Civil Statutes of the State of Texas.

IN WITNESS WHEREOF, this instrument is executed in two copies, each one of which shall be deemed an original, this, the _____ day of _____, 20____.

ATTEST:	**PRINCIPAL**:
	_____ Company Name
By: _____ Signature	By: _____ Signature
_____ Printed Name	_____ Printed Name
_____ Title	_____ Title
_____ Address	_____ Address
_____ City, State, Zip Code	_____ City, State, Zip Code
_____ Phone Number	_____ Phone Number

[*Signatures continued on following page*]

ATTEST:	**SURETY**:
By: _____ Signature	By: _____ Signature
_____ Printed Name	_____ Printed Name
_____ Title	_____ Title
_____ Address	_____ Address
_____ City, State, Zip Code	_____ City, State, Zip Code
_____ Phone Number	_____ Phone Number

The Resident Agent of the Surety in Dallas County, Texas, for delivery of notice and service of the process is:

NAME: _____

STREET ADDRESS: _____

CITY, STATE, ZIP: _____

NOTE: Date on **Page 1** of Performance Bond must be **same date as Contract**. Date on **Page 2** of Performance Bond must be **after date of Contract**. If Resident Agent is not a corporation, give a person's name.

PAYMENT BOND

STATE OF TEXAS

COUNTY OF DALLAS

KNOW ALL MEN BY THESE PRESENTS: That _____ whose address is _____, hereinafter referred to as "Principal", and_____, a corporation organized and existing under the laws of the State of _____, and fully licensed to transact business in the State of Texas, as Surety (herein referred to as "Surety"), are held and firmly bound unto the **CITY OF ROWLETT**, a home-rule municipal corporation organized and existing under the laws of the State of Texas, hereinafter referred to as "Owner", and unto all persons, firms, and corporations who may furnish materials for, or perform labor upon the building or improvements hereinafter referred to in the penal sum of _____DOLLARS ($ _____) (one hundred percent (100%) of the total bid price) in lawful money of the United States, to be paid in Dallas County, Texas, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. The penal sum of this Bond shall automatically be increased by the amount of any Change Order or Supplemental Agreement, which increases the Contract price, but in no event shall a Change Order or Supplemental Agreement, which reduces the Contract price, decrease the penal sum of this Bond.

THE OBLIGATION TO PAY SAME is conditioned as follows: Whereas, the Principal entered into a certain Contract with the City of Rowlett, the Owner, dated on or about the _____ day of _____, A.D. 20___, a copy of which is attached hereto and made a part hereof, to furnish all materials, equipment, labor, supervision, and other accessories necessary for the construction of:

BID NO. 2025-167-B

ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)

in the City of Rowlett, Texas, as more particularly described and designated in the above-referenced contract such contract being incorporated herein and made a part hereof as fully and to the same extent as if written herein word for word.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties and make prompt payment to all persons, firms, subcontractors, corporations and claimants supplying labor and/or material in the prosecution of the Work provided for in the above-referenced Contract and any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modification to the Surety is hereby expressly waived, then this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED FURTHER, that if any legal action were filed on this Bond, exclusive Venue shall lie in Dallas County, Texas.

AND PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the Plans, Specifications and Drawings, etc., accompanying the same shall in anywise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the Work to be performed thereunder.

This Bond is given pursuant to the provisions of Chapter 2253 of the Texas Government Code, and any other applicable statutes of the State of Texas.

The undersigned and designated agent is hereby designated by the Surety herein as the Resident Agent in Dallas County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Article 7.19-1 of the Insurance Code, Vernon's Annotated Civil Statutes of the State of Texas.

IN WITNESS WHEREOF, this instrument is executed in two copies, each one of which shall be deemed an original, this, the _____ day of _____, 20____.

ATTEST:	**PRINCIPAL**:
	_____
	Company Name
By: _____	By: _____
Signature	Signature
_____	_____
Printed Name	Printed Name
_____	_____
Title	Title
_____	_____
Address	Address
_____	_____
City, State, Zip Code	City, State, Zip Code
_____	_____
Phone Number	Phone Number

[*Signatures continued on following page*]

ATTEST:

By: _____
Signature

_____
Printed Name

_____
Title

_____
Address

_____
City, State, Zip Code

_____
Phone Number

SURETY:

By: _____
Signature

_____
Printed Name

_____
Title

_____
Address

_____
City, State, Zip Code

_____
Phone Number

The Resident Agent of the Surety in Dallas County, Texas, for delivery of notice and service of the process is:

NAME: _____

STREET ADDRESS: _____

CITY, STATE, ZIP: _____

NOTE: Date on **Page 1** of Payment Bond must be **same date as Contract**. Date on **Page 2** of Payment Bond must be **after date of Contract**. If Resident Agent is not a corporation, give a person's name.

MAINTENANCE BOND

STATE OF TEXAS

COUNTY OF DALLAS

KNOW ALL MEN BY THESE PRESENTS: That _____ whose address is _____, hereinafter called "Principal:, and_____, a corporation organized and existing under the laws of the State of _____, and fully licensed to transact business in the State of Texas, as Surety (herein referred to as "Surety"), are held and firmly bound unto the **CITY OF ROWLETT**, a home-rule municipal corporation organized and existing under the laws of the State of Texas, hereinafter called "Owner", and unto all persons, firms, and corporations who may furnish materials for, or perform labor upon the building or improvements hereinafter referred to in the penal sum of _____ _____ DOLLARS ($_____) (one hundred percent (100%) of the total bid price) in lawful money of the United States, to be paid in Dallas County, Texas, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. The penal sum of this Bond shall automatically be increased by the amount of any Change Order or Supplemental Agreement, which increases the Contract price, but in no event shall a Change Order or Supplemental Agreement, which reduces the Contract price, decrease the penal sum of this Bond.

WHEREAS, the Principal entered into a certain Contract with the City of Rowlett, the Owner, dated on or about the _____ day of _____, A.D. 20___, a copy of which is attached hereto and made a part hereof, to furnish all permits, licenses, bonds, insurance, products, materials, equipment, labor, supervision, and other accessories necessary for the construction of:

BID NO. 2025-167-B

ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)

in the City of Rowlett, Texas, as more particularly described and designated in the above-referenced contract such contract being incorporated herein and made a part hereof as fully and to the same extent as if written herein word for word.

WHEREAS, in said Contract, the Principal binds itself to use first class materials and workmanship and of such kind and quality that for a period of two (2) years from the completion and final acceptance of the improvements by Owner the said improvements shall require no repairs, the necessity for which shall be occasioned by defects in workmanship or materials and during the period of two (2) years following the date of final acceptance of the Work by Owner, Principal binds itself to repair or reconstruct said improvements in whole or in part at any time within said period of time from the date of such notice as the City Manager or his designee shall determine to be necessary for the preservation of the public health, safety or welfare. If Principal does not repair or reconstruct the improvements within the time period designated, Owner shall be entitled to have said repairs made and charge Principal and/or Surety the cost of same under the terms of this Maintenance Bond.

NOW, THEREFORE, if Principal will maintain and keep in good repair the Work herein contracted to be done and performed for a period of two (2) years from the date of final acceptance and do and perform all necessary work and repair any defective condition (it being understood that the purpose of this section is to cover all defective conditions arising by reason of defective materials, work or labor performed by Principal) then this obligation shall be void; otherwise

it shall remain in full force and effect and Owner shall have and recover from Principal and its Surety damages in the premises as provided in the Plans and Specifications and Contract.

PROVIDED, however, that Principal hereby holds harmless and indemnifies Owner from and against any claim or liability for personal injury or property damage caused by and occurring during the performance of said maintenance and repair operation.

PROVIDED FURTHER, that if any legal action were filed on this Bond, exclusive Venue shall lie in Dallas County, Texas.

AND PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the Plans, Specifications and Drawings, etc., accompanying the same shall in anywise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the Work to be performed thereunder.

This Bond is given pursuant to the provisions of Chapter 2253 of the Texas Government Code, and any other applicable statutes of the State of Texas.

The undersigned and designated agent is hereby designated by the Surety herein as the Resident Agent in Dallas County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Article 7.19-1 of the Insurance Code, Vernon's Annotated Civil Statutes of the State of Texas.

IN WITNESS WHEREOF, this instrument is executed in two copies, each one of which shall be deemed an original, this, the _____ day of _____, 20____.

ATTEST:	**PRINCIPAL**:
	_____
	Company Name
By: _____	By: _____
Signature	Signature
_____	_____
Printed Name	Printed Name
_____	_____
Title	Title
_____	_____
Address	Address
_____	_____
City, State, Zip Code	City, State, Zip Code
_____	_____
Phone Number	Phone Number

[*Signatures continued on following page*]

ATTEST:

By: _____
Signature

_____
Printed Name

_____
Title

_____
Address

_____
City, State, Zip Code

_____
Phone Number

SURETY:

By: _____
Signature

_____
Printed Name

_____
Title

_____
Address

_____
City, State, Zip Code

_____
Phone Number

The Resident Agent of the Surety in Dallas County, Texas, for delivery of notice and service of the process is:

NAME: _____

STREET ADDRESS: _____

CITY, STATE, ZIP: _____

SECTION 8 PREVAILING WAGE RATES

Pertinent Information Regarding Wage Rate Determinations and Monitoring

1. The Prevailing Wage Rate Determination is defined as (1) the Prevailing Wage Rate Determination Information sheet (document number WR1001), (2) the Prevailing Wage Rate Determination for Building Construction Trades, and (3) the Department of Labor (DOL) Heavy Highway Determination. The DOL Heavy Highway rates are to be paid to workers engaged in site work determined to be five (5) feet beyond the building, extending to the property boundary.

2. The General Contractor shall post the applicable Prevailing Wage Rate Determination in a prominent, easily accessible place at the work site. It shall be the responsibility of the City to ensure compliance.

3. The City shall ensure that not less than the posted, specified rates are paid to all classifications of workmen, mechanics and laborers employed by the General Contractor and/or Subcontractors, in the execution of their contract with the City. Contractors and Subcontractors will be monitored to ensure they are paying prevailing wage rates.

   A contractor or subcontractor who violates this section shall pay to the City on whose behalf the contract is made, $60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract.

   The City shall use any money collected under this section to offset the costs incurred in the administration of this task.

4. The City shall take cognizance of wage rate disputes and/or complaints of all violations of the provisions of Chapter 2258 Texas Government Code Title 10. Labor interviews will be conducted as required by the Davis-Bacon Act.

5. The City is not requiring that fringe benefits be paid on the project.

6. The rates specified in the bid documents are journeyman rates. The apprentice rate is commensurate with the experience and skill of the worker, but at a rate not less than 60% of the journeyman's wage. At no time shall a journeyman supervise more than one (1) apprentice.

   Note: The terms journeyman and apprentice apply to both union and independent workers, and are not intended to imply that these positions are union workers only.

Prevailing Wage Rate Determination Information

The following information is taken from Chapter 2258 Texas Government Code Title 10:

2258.021 Duty of Governmental Entity to Pay Prevailing Wage Rates

(a) The state or any political subdivision of the state shall pay a worker employed by it or on behalf of it;
(1) not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed; and
(2) not less than the general prevailing rate if per diem wages for legal holiday and overtime work.

(b) Subsection (a) does not apply to maintenance work.

(c) A worker is employed on a public work for the purposes of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any officer or public body of the state or a political subdivision of the state.

2258.023 Prevailing Wage Rates to be Paid by Contractor and Subcontractor; Penalty

(a) The contractor who is awarded a contract by a public body or a subcontractor of the contractor shall pay not less than the rates determined under Section 2258.22 to a worker employed by it in the execution of the contract.

(b) A contractor or subcontractor who violates this section shall pay to the state or a political subdivision of the state (City) on whose behalf the contract is made, $60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract. A public body awarding a contract shall specify this penalty in the contract.

(c) A contractor or subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided by Section 2258.022.

(d) The public body shall use any money collected under this section to offset the costs incurred in the administration of this chapter.

(e) A municipality is entitled to collect a penalty under this section only if the municipality has a population of more than 10,000.

2258.051 Duty of Public Body to Hear Complaints and Withhold Payment

A public body awarding a contract, and an agent or officer of the public body, shall;

(1) take cognizance of complaints of all violations of this chapter committed in the execution of the contract; and

(2) withhold money forfeited or required to be withheld under this chapter from the payments to the contractor under the contract, except that the public body may not withhold money from other than the final payment without determination by the public body that there is good cause to believe that the contractor has violated this chapter.

Worker Classification Definition Sheet

Asbestos Worker: Worker who removes and disposes of asbestos materials.

Carpenter: Worker who builds wood structures, or structures of any material which has replace wood. Includes rough and finish carpentry, hardware and trim.

Carpet Layer/Floor Installer: Worker who installs carpet and/or floor coverings - vinyl tile.

Concrete Finisher: Worker who floats, trowels, and finishes concrete.

Data Communication-Telecom Installer: Worker who installs data/telephone and television cable and associated equipment and accessories.

Drywall Installer/Ceiling Installer: Worker who installs metal framed walls and ceilings, drywall coverings, ceiling grids and ceilings.

Electrician: Skilled craftsman who installs or repairs electrical wiring and devices. Includes fire alarm systems, and HVAC electrical controls.

Elevator Mechanic: Craftsman skilled in the installation and maintenance of elevators.

Fire Proofing Installer : Worker who sprays or applies fire proofing materials.

Glazier: Worker who installs glass, glazing and glass framing.

Heavy Equipment Operator: Includes but not limited to all cat tractors, all derrick-powered, all power operated cranes, back hoe, back filler, power operated shovel, winch truck, all trenching machines.

Insulator: Worker who applies, sprays, or install insulation.

Iron Worker: Skilled craftsman who erects structural steel framing and installs structural concrete rebar.

Laborer/Helper: Worker qualified for only unskilled or semi-skilled work. Lifting, carrying materials and tools, hauling, digging, clean-up.

Lather/Plasterer: Worker who installs metal framing and lath. Worker who applies plaster to lathing and installs associated accessories.

Light Equipment Operator: Includes but not limited to air compressors, truck crane driver, flex plane, building elevator, form grader, concrete mixer (less than 14 cf), conveyer.

Mason: Craftsman who works with masonry products, stone, brick, block, or any material substituting for those materials and accessories.

Metal Building Assembler: Worker who assembles pre-made metal buildings.

Millwright: Mechanic specializing in the installation of heavy machinery, conveyance, wrenches, dock levelers, hydraulic lifts and align pumps.

Painter/Wall Covering Installer : Worker who prepares wall surfaces and applies paint and/or wall coverings,

tape and bedding.

Pipefitter: Trained worker who installs piping systems, chilled water piping and hot water (boiler) piping, pneumatic tubing controls, chillers, boilers, and associated mechanical equipment.

Plumber: Skilled craftsman who installs domestic hot and cold water piping, waste piping, storm system piping, water closets, sinks, urinals and related work.

Roofer: Worker who installs roofing materials, Bitumen (asphalt and cold tar), felts, flashings, all types roofing membranes and associated products.

Sheet Metal Worker: Worker who installs sheet metal products. Roof metal, flashings, and curbs, ductwork, mechanical equipment, and associated metals.

Sprinkler Fitter: Worker who installs fore sprinkler systems and fire protection equipment.

Terrazzo Worker: Craftsman who places and finishes Terrazzo.

Tile Setter: Worker who prepares wall and/or floor surfaces and applies ceramic tiles to these surfaces.

Waterproofer/Caulker: Worker who applies water proofing material to buildings. Products include sealant, caulk, sheet membrane, liquid membranes, sprayed, rolled, or brushed on.

CURRENT PREVAILING WAGE RATES

The current prevailing wage rates can be found at the following link: https://alpha.sam.gov/

SECTION 9 EQUAL OPPORTUNITY EMPLOYMENT PROVISIONS

SECTION EEO

EQUAL EMPLOYMENT OPPORTUNITY

INDEX

PARAGRAPH	TITLE
EEO.1	DESCRIPTION
EEO.2	WORKING ENVIRONMENT
EEO.3	ON-THE-JOB TRAINING
EEO.4	REVIEW
EEO.5	DISSEMINATION
EEO.6	RECRUITMENT
EEO.7	INVENTORY
EEO.8	MONITORING
EEO.9	FACILITIES
EEO.10	RECORDS
EEO.11	ADHERENCE

SECTION EEO

EQUAL EMPLOYMENT OPPORTUNITY

EEO.1 DESCRIPTION

The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The Contractor shall implement affirmative action steps at least as extensive as described herein.

EEO.2 WORKING ENVIRONMENT

Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two (2) or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

EEO.3 ON-THE-JOB TRAINING

Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs.

EEO.4 REVIEW

Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

EEO.5 DISSEMINATION

Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

EEO.6 RECRUITMENT

Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one (1) month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

EEO.7 INVENTORY

Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

EEO.8 MONITORING

Ensure that seniority practices, job classifications, work assignments, and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

EEO.9 FACILITIES

Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

EEO.10 RECORDS

Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

EEO.11 ADHERENCE

Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

SECTION 10 CONSTRUCTION CONTRACT

CITY OF ROWLETT, TEXAS

CONSTRUCTION CONTRACT

FOR

BID NO. 2025-167-B

ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS (REBID)

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City of Rowlett, Texas

This Contract is made by and between the City of Rowlett, Texas, a home-rule municipality (hereinafter referred to as the "City") and **FELIX CONSTRUCTION COMPANY**, a **FLORIDA CORPORATION**, (hereinafter referred to as the "Contractor") for construction of ROWLETT ROAD PUMP STATION UPPER PRESSURE PLANE ADDITIONS, (hereinafter referred to as the "Project"). The City and the Contractor hereby agreeing as follows:

ARTICLE I

THE CONTRACT AND THE CONTRACT DOCUMENTS

1.1 THE CONTRACT

1.1.1 The Contract between the City and the Contractor, of which this Contract is a part, consists of the Contract Documents. It shall be effective on the date this Agreement is executed by the last party to execute it.

1.2. THE CONTRACT DOCUMENTS

1.2.1 The Contract Documents consist of this Contract, the Invitation to Bid/ Request for Proposal, the Specifications, Plans and Drawings, all Change Orders and Field Orders issued hereafter, any other amendments hereto executed by the parties hereafter, together with the following (if any):

_____

In the event of a conflict in terms among any of the Contract Documents, the provisions of this Contract will prevail. In order of priority in resolving conflicts outside of this Contract, the City's Invitation to Bid/ Request for Proposal, the Contractor's Bid or Best and Final Offer and the Specifications and Drawings shall, in that order, prevail. Irreconcilable conflicts that cannot be resolved by field order shall be resolved by written Change Orders. Documents not enumerated in this Paragraph 1.2.1 are not Contract Documents and do not form part of this Contract.

1.3 ENTIRE AGREEMENT

1.3.1 This Contract, together with the Contractor's performance and payment bonds for the Project, all General Conditions, Special Conditions, Plans and Specifications, and Addenda attached thereto, constitute the entire and exclusive agreement between the City and the Contractor regarding the Project. Specifically, but without limitation, this Contract supersedes any bid documents and all prior written or oral communications, representations and negotiations, if any, between the City and Contractor not expressly made a part hereof.

1.4 NO PRIVITY WITH OTHERS

1.4.1 Nothing contained in this Contract shall create, or be interpreted to create privity or any other contractual agreement between the City and any person or entity other than the Contractor.

1.5 INTENT AND INTERPRETATION

1.5.1 The intent of this Contract is to require complete, correct and timely execution of the Work. Any Work that may be required, implied or inferred by the Contract Documents, or any one or more of them, as necessary to produce the intended result shall be provided by the Contractor for the Contract Price.

1.5.2 This Contract is intended to be an integral whole and shall be interpreted as internally consistent. What is required by any one Contract Document shall be considered as required by the Contract.

1.5.3 When a word, term or phrase is used in this Contract, it shall be interpreted or construed, first, as defined herein; second, if not defined, per its generally accepted meaning in the construction industry; and third, if there is no generally accepted meaning in the construction industry, per its common and customary usage.

1.5.4 The words "include", "includes", or "including", as used in this Contract, shall be deemed to be followed by the phrase, "without limitation".

1.5.5 The specification herein of any act, failure, refusal, omission, event, occurrence or condition as constituting a material breach of this Contract shall not imply that any other, non-specified act, failure, refusal, omission, event, occurrence or condition shall be deemed not to constitute a material breach of this Contract.

1.5.6 Words or terms used as nouns in this Contract shall be inclusive of their singular and plural forms, unless the context of their usage clearly requires a contrary meaning.

1.5.7 The Contractor shall have a continuing duty to read, carefully study and compare each of the Contract Documents, the Shop Drawings, the Product Data, and any Plans and Specifications, and shall give written notice to the City of any inconsistency, ambiguity, error or omission which the Contractor may discover with respect to these documents before proceeding with the affected Work. The issuance, or the express or implied approval by the City or the Engineer of the Contract Documents, Shop Drawings or Product Data shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The City has requested the Engineer to only prepare documents for the Project, including the Drawings and Specifications for the Project, which are accurate, adequate, consistent, coordinated and sufficient for construction. HOWEVER, THE CITY MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO THE CONTRACTOR CONCERNING SUCH DOCUMENTS. By the execution hereof, the Contractor acknowledges and represents that it has received, reviewed and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that the Contractor has not, does not, and will not rely upon any representation or warranties by the City concerning such documents as no such representation or warranties have been or are hereby made. Further, the Contractor represents and warrants that it has had a sufficient opportunity to inspect the Project site and assumes all responsibility for inadequacies or ambiguities in the plans, drawings or specifications as well as for latent conditions of the site where the work is to be performed, subject to the terms and conditions of Subparagraph 8.3.3.

1.5.8 As between numbers and scaled measurements on the Drawings and in the Design, the numbers shall govern, as between larger scale and smaller scale drawings, the larger scale shall govern.

1.5.9 Neither the organization of any of the Contract Documents into divisions, sections, paragraphs, articles, (or other categories), nor the organization or arrangement of the Design, shall control the Contractor in dividing the Work or in establishing the extent or scope of the Work to be performed by Subcontractors.

1.6 OWNERSHIP OF CONTRACT DOCUMENTS

1.6.1 The Contract Documents, and each of them, shall remain the property of the City. The Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Project; provided, however, that in no event shall Contractor use, or permit to be used, any or all such Contract Documents on other projects without the City's prior written authorization.

ARTICLE II

THE WORK

2.1 THE WORK

2.1.1 The Contractor shall perform all the Work required, implied or reasonably inferable from, this Contract.

2.2 WORK

2.2.1 The term "Work" shall mean whatever is done by or required of the Contractor to perform and complete its duties under this Contract, including the following: construction of the whole or a designated part of the Project; furnishing of any required surety bonds and insurance, and the provision or furnishing of labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, permits and licenses required of the Contractor, fuel, heat, light, cooling and all other utilities as required by this Contract. The Work to be performed by the Contractor is generally described as:

The work consists of Approximate quantities for Rowlett Road Pump Station Upper Pressure Plane Pump Addition project includes 84 LF 12-inch water line by open cut and 1 vertical turbine pump (1850 GPM, 125 HP) associated mechanical and electrical equipment. The pump will be installed utilizing the existing pump can and connected to the proposed water line. The water line will connect to an existing 12-inch water line on the pump station site. A detailed scope of work to be performed, including bid specifications, scope of work, and Contractor’s bid response, is attached hereto and incorporated herein by this reference as Exhibit A.

A detailed scope of work to be performed, including bid specifications, scope of work, and Contractor’s bid response, is attached hereto and incorporated herein by this reference as Exhibit A.

2.2.2 The Contractor shall be responsible for paying for and procuring all materials and labor and furnishing all services necessary or appropriate for the full performance of the Work and the for the full completion of the Project. All materials shall be new and materials and workmanship shall be of good quality. Upon request, the Contractor shall furnish satisfactory proof of the type, kind, and quality of materials.

ARTICLE III

CONTRACT TIME

3.1 TIME AND LIQUIDATED DAMAGES

3.1.1 The Contractor shall commence the Work within **10** days of receipt of a written Notice to Proceed and shall achieve Substantial Completion of the Work no later than **60** calendar days from the date specified in the Notice to Proceed. The parties acknowledge that time is of the essence in the performance of the terms of this Contract. The term "calendar days" shall mean all days of the week or month, no days being excepted. It is contemplated by the parties that the progress of the Work may be delayed by certain conditions beyond the control of the parties; these delays have been contemplated by the parties and considered in the time allotted for performance specified herein and includes, but is not limited to delays occasioned on account of adverse weather, temporary unavailability of materials, shipment delays, and the presence and potential interference of other contractors who may be performing work at the Project site unrelated to this Contract.

The number of calendar days from the date on which the Work is permitted to proceed, through the date set forth for Substantial Completion, shall constitute the "Contract Time".

3.1.2 The Contractor shall pay the City the sum of **$500** per day for each and every calendar day of unexcused delay in achieving Substantial Completion beyond the date set forth herein for Substantial Completion of the Work. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the City, estimated at or before the time of executing this Contract, and represent City's sole remedy for delay damages in the event of unexcused delay. When the City reasonably believes that Substantial Completion will be inexcusably delayed, the City shall be entitled, but not required, to withhold from any amounts otherwise due the Contractor an amount then believed by the City to be adequate to recover liquidated damages applicable to such delays. If and when the Contractor overcomes the delay in achieving Substantial Completion, or any part thereof, for which the City has withheld payment, the City shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages.

3.1.3 No claim shall be made by the Contractor to the City, and no damages, costs or extra compensation shall be allowed or paid by the City to the Contractor for any delay or hindrance from any cause in the progress or completion of the Work or this Contract. The Contractor's sole remedy in the event of any delay or hindrance shall be to request time extensions by written change orders as provided for hereinafter. Should the Contractor be delayed by an act of the City, or should the City order a stoppage of the Work for sufficient cause, an extension of time and extended General Conditions shall be granted by the City by written authorization upon written application, which time extension and extended General Conditions shall not be unreasonably denied, to compensate for the delay.

3.1.4 The City shall have the authority to suspend the Work wholly or in part for such period or periods of time as it may deem appropriate due to unsuitable conditions considered unfavorable for the proper prosecution of the work.

3.1.5 Work or for the failure of the Contractor to carry out instructions from the City or City's representative. During any period in which the Work is stopped or during which any of the Work is not actively in progress for any reason, Contractor shall properly protect the site and the Work from damage, loss or harm.

3.2 SUBSTANTIAL COMPLETION

3.2.1 "Substantial Completion" shall mean that stage in the progression of the Work when the Work is sufficiently complete in accordance with this Contract that the City can enjoy beneficial use or occupancy of the Work and can utilize the Work for its intended purpose, even though minor miscellaneous work and/or adjustment may be required.

3.3 TIME IS OF THE ESSENCE

3.3.1 TIME IS OF THE ESSENCE IN THE PERFORMANCE OF THE WORK AND THE COMPLETION OF THE PROJECT ON OR BEFORE THE SCHEDULED COMPLETION DATE. THE SCHEDULED COMPLETION DATE IS A DEADLINE. THE CITY EMPLOYS A ZERO-TOLERANCE POLICY REGARDING THE TIME FOR COMPLETION. The time for completion is an essential and material term of this Contract and the

Contractor's failure to achieve substantial completion on the date stated herein, to comply with work schedules, or achieve milestones in approved construction schedules, shall be a material breach and default of this Contract.

3.3.2 The City shall have the authority to suspend the Work wholly or in part for such period or periods of time as it may deem appropriate due to unsuitable conditions considered unfavorable for the proper prosecution of the Work or for the failure of the Contractor to carry out instructions from the City or City's representative. During any period in which the Work is stopped or during which any of the Work is not actively in progress for any reason, Contractor shall properly protect the site and the Work from damage, loss or harm. The Contractor shall not be compensated for periods of delay caused by a suspension of the work by the City. If work is suspended due to unsuitable conditions through no fault of the Contractor, an extension of time shall be granted by the City by Change Order upon written application, which extension shall not be unreasonably denied, to compensate for the delay.

3.3.3 The Contractor shall not have or assert any claim against the City for damages or back-charges of any kind for any reason, including but not limited to claims for Extra Work, damages, economic loss, additional costs, unknown latent site conditions, and refusals by the City to grant extensions of time, unless supported and authorized by a written Change Order or separate agreement signed by all parties. The Contractor, in entering into this Contract, hereby waives, releases, quitclaims, discharges and holds harmless the City from and against any and all claims, damages, liabilities and losses, save and except those arising under Paragraph 12.1 of this Contract.

ARTICLE IV

CONTRACT PRICE

4.1 THE CONTRACT PRICE

4.1.1 The City shall pay, and the Contractor shall accept, as full and complete payment for all the Work required herein, an amount in current funds equal to the sum of the established unit price for each separately identified item of unit price work times the quantity of that item set forth in the paragraph 4.1.1. Estimated quantities are not guaranteed and determinations of actual quantities and classifications are to be made by the Contractor and the City. The Contract Price is to be paid based upon actual quantities. If actual quantities exceed estimate, Owner may supplement Contract Price with additional moneys to complete original scope of Work. Work will entitle Contractor to change order for that work. City reserves the right to remove Work from Contractor's scope in the event the cost of the Work will exceed the Contract Price.

[SEE SECTION 6, BID FORM]

ARTICLE V

PAYMENT OF THE CONTRACT PRICE

5.1 SCHEDULE OF VALUES

5.1.1 Within ten (10) calendar days of the effective date hereof, the Contractor shall submit to the City and to the Engineer a Schedule of Values allocating the Contract Price to the various portions of the Work. The Contractor's Schedule of Values shall be prepared in such form, with such detail, and supported by such data as the Engineer or the City may require to substantiate its accuracy. The Contractor shall not imbalance its Schedule of Values nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of this Contract. The Schedule of Values shall be used only as a basis for the Contractor's Applications for Payment and shall only constitute such basis after it has been acknowledged and accepted in writing by the Engineer and the City.

5.2 PAYMENT PROCEDURE

5.2.1 The City shall pay the Contract Price to the Contractor as provided below.

5.2.2 ***PROGRESS PAYMENTS*** **-** Based upon the Contractor's Applications for Payment submitted to the Engineer and upon Certificates for Payment subsequently issued to the City by the Engineer, the City shall make progress payments to the Contractor on account of the Contract Price.

5.2.3 APPLICATION FOR PAYMENT - On or before the 25th day of each month after commencement of the Work, the Contractor shall submit an Application for Payment for the period ending the 15th day of the month to the Engineer in such form and manner, and with such supporting data and content, as the City or the Engineer may require. The Contractor may request payment for that portion of the Contract Price properly allocable to Contract requirements properly provided and to labor, materials and equipment properly incorporated in the Work, less retainage and less the

total amount of previous payments received from the City. Such Application for Payment shall be signed by the Contractor and shall constitute the Contractor's representation that the Work has progressed to the level for which payment is requested in accordance with the Schedule of Values, that the Work has been properly installed or performed in full compliance with this Contract, and that the Contractor knows of no reason why payment should not be made as requested. Thereafter, the Engineer will review the Application for Payment and may also review the Work at the Project site or elsewhere to determine whether the quantity and quality of the Work is as represented in the Application for Payment and is as required by this Contract. The Engineer shall determine and certify to the City the amount properly owing to the Contractor. The City shall make partial payments on account of the Contract Price to the Contractor within thirty (30) days following the Engineer's receipt and approval of each Application for Payment. The amount of each partial payment shall be the amount certified for payment by the Engineer less such amounts, if any, otherwise owing by the Contractor to the City or which the City shall have the right to withhold as authorized by this Contract. The Engineer's certification of the Contractor's Application for Payment shall not preclude the City from the exercise of any of its rights as set forth in Paragraph 5.3 hereinbelow.

5.2.4 STATEMENT OF DELAY - Each Application for Payment shall include a Statement of Delay showing the number of days lost due to inclement weather, conflicts with other City contractors, utilities, or design specifications, or other proper reasons. The failure to submit the Statement of Delay shall be a waiver of any claim for additional days or extensions of the scheduled completion date.

5.2.5 RETAINAGE – If the Contract Price set forth in Subparagraph 4.1.1 is between $50,000 and $1,000,000, the City shall withhold retainage of ten (10) percent; if between 1,000,001 and $2,000,000, the City shall withhold retainage of seven and one-half (7½) percent; if over $2,000,000, the City shall withhold retainage of five (5) percent. If a different percentage is set forth in the Invitation to Bid/Request for Proposal, then that percentage shall apply. Retainage shall be withheld from each progress payment to secure performance of the Contract. The City shall deposit in an interest-bearing account that portion of any retainage withheld that exceeds five (5) percent of the progress payment. Interest earned on retainages in excess of five (5) percent of progress payments shall be paid to the Contractor with the final payment.

5.2.6 Statement of Delay - Each Application for Payment shall include a Statement of Delay showing the number of days lost due to inclement weather, conflicts with other City contractors, utilities, or design specifications, or other proper reasons. The failure to submit the Statement of Delay shall be a waiver of any claim for additional days or extensions of the scheduled completion date.

5.2.7 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the City no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which payments have been received from the City shall be free and clear of liens, claims, security interest or other encumbrances in favor of the Contractor or any other person or entity whatsoever.

5.2.8 The Contractor shall promptly pay each Subcontractor out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which such Subcontractor is entitled. In the event the City becomes informed that the Contractor has not paid a Subcontractor as herein provided, the City shall provide written notice to the Contractor. If the Contractor fails to cure such payment issues within ten (10) days of receipt of City's notice, the City shall have the right, but not the duty, to issue future checks in payment to the Contractor of amounts otherwise due hereunder naming the Contractor and such Subcontractor as joint payees. Such joint check procedure, if employed by the City, shall create no rights in favor of any person or entity beyond the right of the named payees to payment of the check and shall not be deemed to commit the City to repeat the procedure in the future.

5.2.9 No progress payment, nor any use or occupancy of the Project by the City, shall be interpreted to constitute an acceptance of any Work not in strict accordance with this Contract.

5.3 WITHHELD PAYMENT

5.3.1 The City may decline to make payment, may withhold funds, and, if necessary, may demand the return of some or all of the amounts previously paid to the Contractor, to protect the City from loss because of:

(a) defective Work not remedied by the Contractor nor, in the opinion of the City, likely to be remedied by the Contractor;

(b) claims of third parties against the City or the City's property;

(c) failure by the Contractor to pay Subcontractors or others in a prompt and proper fashion, subject to Contractor's right to cure;

(d) evidence that the balance of the Work cannot be completed in accordance with the Contract for the unpaid balance of the Contract Price;

(e) evidence that the Work will not be completed in the time required for substantial or final completion;

(f) persistent failure to carry out the Work in accordance with the Contract;

(g) damage to the City or a third party to whom the City is, or may be, liable.

In the event that the City makes written demand upon the Contractor for amounts previously paid by the City as contemplated in this Subparagraph 5.3.1, the Contractor shall promptly comply with such demand. The City shall have no duty to third parties to withhold payment to the Contractor and shall incur no liability for a failure to withhold funds.

5.4 UNEXCUSED FAILURE TO PAY

5.4.1 If within fifteen (15) days after the date established herein for payment to the Contractor by the City, the City, without cause or basis hereunder, fails to pay the Contractor any amount then due and payable to the Contractor, then the Contractor may after ten (10) additional days' written notice to the City and the Engineer, and without prejudice to any other available rights or remedies it may have, stop the Work until payment of those amounts due from the City have been received. Late payments shall not accrue interest or other late charges.

5.5 SUBSTANTIAL COMPLETION

5.5.1 When the Contractor believes that the Work is substantially complete, the Contractor shall submit to the Engineer a list of items to be completed or corrected. When the Engineer on the basis of an inspection determines that the Work is in fact substantially complete, it will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the City and the Contractor for Project security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Guarantees required by the Contract shall commence on the date of Substantial Completion of the Work. The Certificate of Substantial Completion shall be submitted to the City and the Contractor for their written acceptance of the responsibilities assigned to them in such certificate.

Upon Substantial Completion of the Work, and execution by both the City and the Contractor of the Certificate of Substantial Completion, the City shall pay the Contractor an amount sufficient to increase total payments to the Contractor to one hundred percent (100%) of the Contract Price less three hundred percent (300%) of the reasonable cost as determined by the City and the Engineer for completing all incomplete Work, correcting and bringing into conformance all defective and nonconforming Work, and handling all unsettled claims.

5.6 COMPLETION AND FINAL PAYMENT

5.6.1 When all of the Work is finally complete and the Contractor is ready for a final inspection, it shall notify the City and the Engineer thereof in writing. Thereupon, the Engineer will make final inspection of the Work and, if the Work is complete in full accordance with this Contract and this Contract has been fully performed, the Engineer will promptly issue a final Certificate for Payment certifying to the City that the Project is complete and the Contractor is entitled to the remainder of the unpaid Contract Price, less any amount withheld pursuant to this Contract. If the Engineer is unable to issue its final Certificate for Payment and is required to repeat its final inspection of the Work, the Contractor shall bear the cost of such repeat final inspection(s) which cost may be deducted by the City from the Contractor's final payment.

5.6.1.1 If the Contractor fails to achieve final completion within thirty (30) days of Substantial Completion, the Contractor shall pay the City the sum set forth hereinabove as liquidated damages per day for each and every calendar day of unexcused delay in achieving final completion beyond the date set forth herein for final completion of the Work. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the City, estimated at or before the time of executing this Contract. When the City reasonably believes that final completion will be inexcusably delayed, the City shall be entitled, but not required, to withhold from any amounts otherwise due the Contractor an amount then believed by the City to be adequate to recover liquidated damages applicable to such delays. If and when the Contractor overcomes the

delay in achieving final completion, or any part thereof, for which the City has withheld payment, the City shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages.

5.6.2 The Contractor shall not be entitled to final payment unless and until it submits to the Engineer its affidavit that all payrolls, invoices for materials and equipment, and other liabilities connected with the Work for which the City, or the City's property might be responsible, have been fully paid or otherwise satisfied; releases and waivers of lien from all Subcontractors of the Contractor and of any and all other parties required by the Engineer or the City; consent of Surety, if any, to final payment. If any third party fails or refuses to provide a release of claim or waiver of lien as required by the City, the Contractor shall furnish a bond satisfactory to the City to discharge any such lien or indemnify the City from liability.

5.6.3 The City shall make final payment of all sums due the Contractor within thirty (30) days of the Engineer's execution of a final Certificate for Payment.

5.6.4 Acceptance of final payment shall constitute a waiver of all claims against the City by the Contractor except for those claims previously made in writing against the City by the Contractor, pending at the time of final payment, and identified in writing by the Contractor as unsettled at the time of its request for final payment.

5.6.5 Under no circumstance shall Contractor be entitled to receive interest on any payments or monies due Contractor by the City, whether the amount on which the interest may accrue is timely, late, wrongfully withheld, or an assessment of damages of any kind.

ARTICLE VI

THE CITY

6.1 INFORMATION, SERVICES AND THINGS REQUIRED FROM CITY

6.1.1 The City shall furnish to the Contractor, at the time of executing this Contract, all written and tangible material in its possession concerning conditions below ground at the site of the Project.

Such written and tangible material is furnished to the Contractor only in order to make complete disclosure of such material and for no other purpose. By furnishing such material, the City does not represent, warrant, or guarantee its accuracy either in whole, in part, implicitly or explicitly, or at all, and shall have no liability therefor. The City shall also furnish surveys, legal limitations and utility locations (if known), and a legal description of the Project site.

6.1.2 Excluding permits and fees normally the responsibility of the Contractor, the City shall obtain all approvals, easements, and the like required for construction and shall pay for necessary assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

6.1.3 The City shall furnish the Contractor, free of charge, one copy of the Contract Documents for execution of the Work.

6.2 RIGHT TO STOP WORK

6.2.1 If the Contractor persistently fails or refuses to perform the Work in accordance with this Contract, or if the best interests of the public health, safety or welfare so require, the City may order the Contractor to stop the Work, or any described portion thereof, until the cause for stoppage has been corrected, no longer exists, or the City orders that Work be resumed. In such event, the Contractor shall immediately obey such order.

6.3 CITY'S RIGHT TO PERFORM WORK

6.3.1 If the Contractor's Work is stopped by the City under Paragraph 6.2, and the Contractor fails within seven (7) days of such stoppage to provide adequate assurance to the City that the cause of such stoppage will be eliminated or corrected, then the City may, without prejudice to any other rights or remedies the City may have against the Contractor, proceed to carry out the subject Work. In such a situation, an appropriate Change Order shall be issued deducting from the Contract Price the cost of correcting the subject deficiencies, plus compensation for the Engineer's additional services and expenses necessitated thereby, if any. If the unpaid portion of the Contract Price is insufficient to cover the amount due the City, the Contractor shall pay the difference to the City.

ARTICLE VII

THE CONTRACTOR

7.1 The Contractor is again reminded of its continuing duty set forth in Subparagraph 1.5.7. The Contractor shall perform no part of the Work at any time without adequate Contract Documents or, as appropriate,

approved Shop Drawings, Product Data or Samples for such portion of the Work. If the Contractor performs any of the Work knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Engineer, the Contractor shall bear responsibility for such performance and shall bear the cost of correction.

7.2 MUST FOLLOW CONTRACT

7.2.1 The Contractor shall perform the Work strictly in accordance with this Contract.

7.3 PROSECUTION OF WORK

7.3.1 The Contractor shall supervise and direct the Work using the Contractor's best skill, effort and attention. The Contractor shall be responsible to the City for any and all acts or omissions of the Contractor, its employees and others engaged in the Work on behalf of the Contractor.

7.3.2 The Contractor shall give adequate attention to the faithful prosecution of the Work and the timely completion of this Contract, with authority to determine the manner and means of performing such Work, so long as such methods insure timely completion and proper performance.

7.3.3 The Contractor shall exercise all appropriate means and measures to insure a safe and secure jobsite in order to avoid and prevent injury, damage or loss to persons or property.

7.3.4 The City will not interfere with the Contractor's manner and means of performing the Work. However, the City's insistence on strict compliance with the Contract shall not be regarded as an interference with the Contractor's manner and means. In the event that any part of the Work is not in strict compliance with the Contract, the Contractor is and shall be estopped from claiming any interference by the City or Engineer with the Contractor's manner and means of performing that part of the Work.

7.4 WARRANTY

7.4.1 The Contractor warrants to the City that all labor furnished to progress the Work under this Contract will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by this Contract, and that the Work will be of good quality, free from faults and defects and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective. The Contractor warrants and guaranties that it shall complete the work and achieve substantial completion by the scheduled completion date, as may be extended by Contract, strictly in accordance with this contract. Defective work or materials shall be fixed, repaired or replaced free of charge or cost to the City.

7.5 PERMITS; FEES; LICENSES

7.5.1 The Contractor shall obtain and pay for all permits, fees and licenses necessary and ordinary for the Work. The Contractor shall comply with all lawful requirements applicable to the Work and shall give and maintain any and all notices required by applicable law pertaining to the Work.

7.6 SUPERVISION

7.6.1 The Contractor shall employ and maintain at the Project site only competent supervisory personnel. Absent written instruction from the Contractor to the contrary, the superintendent shall be deemed the Contractor's authorized representative at the site and shall be authorized to receive and accept any and all communications from the City or the Engineer.

7.6.2 Key supervisory personnel assigned by the Contractor to this Project are as follows:

NAME	FUNCTION
_____	_____
_____	_____
_____	_____

So long as the individuals named above remain actively employed or retained by the Contractor, they shall perform the functions indicated next to their names unless the City agrees to the contrary in writing. In the event one or more individuals not listed above subsequently assume one or more of those functions listed above, the Contractor shall be bound by the provisions of this Subparagraph 7.6.2 as though such individuals had been listed above.

7.7 WORK SCHEDULE

7.7.1 The Contractor, within fifteen (15) days of commencing the Work, shall submit to the City and the Engineer for their information, the Contractor's schedule for completing the Work. The Contractor's schedule shall be revised no less frequently than monthly (unless the parties otherwise agree in writing) and shall be revised to reflect conditions encountered from time to time and shall be related to the entire Project. Each such revision shall be furnished to the

City and the Engineer. Failure by the Contractor to strictly comply with the provisions of this Section 7.7 shall constitute a material breach of this Contract.

7.8 **7.8 ON-SITE DRAWINGS**

7.8.1 The Contractor shall continuously maintain at the site, for the benefit of the City and the Engineer, one record copy of this Contract marked to record on a current basis changes, selections and modifications made during construction. Additionally, the Contractor shall maintain at the site for the City and Engineer the approved Shop Drawings, Product Data, Samples and other similar required submittals. Upon final completion of the Work, all of these record documents shall be delivered to the City.

7.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

7.9.1 Shop Drawings, Product Data, Samples and other submittals from the Contractor do not constitute Contract Documents. Their purpose is merely to demonstrate the manner in which the Contractor intends to implement the Work in conformance with information received from the Contract Documents.

7.9.2 The Contractor shall not perform any portion of the Work requiring submittal and review of Shop Drawings, Product Data or Samples unless and until such submittal shall have been approved by the Engineer. Approval by the Engineer, however, shall not be evidence that Work installed pursuant thereto conforms with the requirements of this Contract.

7.10 CLEANING THE SITE AND THE PROJECT

7.10.1 The Contractor shall keep the site reasonably clean during performance of the Work. Upon final completion of the Work, the Contractor shall clean the site and the Project and remove all waste, rubbish, temporary structures, and other materials together with all of the Contractor's property therefrom. Contractor shall dispose of all refuse at a Texas Natural Resource Conservation Commission approved landfill. The Contractor shall further restore all property damaged during the prosecution of the Work and shall leave the site in a clean and presentable condition. No additional payment shall be made by the City for this work, the compensation having been considered and included in the contract price.

7.11 ACCESS TO WORK AND INSPECTIONS

7.11.1 The City and the Engineer shall have access to the Work at all times from commencement of the Work through final completion. The Contractor shall take whatever steps necessary to provide access when requested. When reasonably requested by the City or the Engineer, the Contractor shall perform or cause to be performed such testing as may be necessary or appropriate to insure suitability of the jobsite or the Work's compliance with the Contract requirements.

7.12 INDEMNITY AND DISCLAIMER

7.12.1 CITY SHALL NOT BE LIABLE OR RESPONSIBLE FOR, AND SHALL BE INDEMNIFIED, HELD HARMLESS AND RELEASED BY CON-TRACTOR FROM AND AGAINST ANY AND ALL SUITS, ACTIONS, LOSSES, DAMAGES, CLAIMS, OR LIABILITY OF ANY CHARACTER, TYPE, OR DESC-RIPTION, INCLUDING ALL EXPENSES OF LITIGATION, COURT COSTS, AND ATTORNEY'S FEES, FOR INJURY OR DEATH TO ANY PERSON, OR INJURY OR LOSS TO ANY PROPERTY, RECEIVED OR SUSTAINED BY ANY PERSON OR PERSONS, INCLUDING THE CONTRACTOR, OR PROPERTY, ARISING OUT OF, OR OCCASIONED BY, DIRECTLY OR INDIRECTLY, THE PERFORMANCE OF CONTRACTOR UNDER THIS CONTRACT, INCLUDING CLAIMS AND DAMAGES ARISING IN WHOLE OR IN PART FROM THE NEGLIGENCE OF CITY, WITHOUT, HOWEVER, WAIVING ANY GOVERN-MENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. THE PROVISIONS OF THIS INDEMNI-FICATION ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY. IT IS THE EXPRESSED INTENT OF THE PARTIES TO THIS CONTRACT THAT THE INDEMNITY PROVIDED FOR IN THIS CONTRACT IS AN INDEMNITY EXTENDED BY CONTRACTOR TO INDEMNIFY AND PROTECT CITY FROM THE CONSEQUENCES OF THE

CONTRACTOR'S AND THE CITY'S NEGLIGENCE, WHETHER SUCH NEGLIGENCE IS THE SOLE OR PARTIAL CAUSE OF ANY SUCH INJURY, DEATH, OR DAMAGE.

7.12.2 The Contractor will secure and maintain Contractual Liability insurance to cover this indemnification agreement that will be primary and non-contributory as to any insurance maintained by the City for its own benefit, including self-insurance. In addition, Contractor shall obtain and file with City a Certificate of Insurance and copies of policy endorsements evidencing the required coverage.

7.12.3 In claims against any person or entity indemnified under this Paragraph 7.12 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Paragraph 7.12 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

7.13 NONDISCRIMINATION

7.13.1 The Contractor shall not discriminate in any way against any person, employee or job applicant on the basis of race, color, creed, national origin, religion, age, sex, or disability where reasonable accommodations can be effected to enable the person to perform the essential functions of the job. The Contractor shall further ensure that the foregoing nondiscrimination requirement shall be made a part and requirement of each subcontract on this Project.

7.14 PREVAILING WAGE RATES

7.14.1 The Contractor shall comply in all respects with all requirements imposed by any laws, ordinances or resolutions applicable to the Project with regard to the minimum prevailing wage rates for all classes of employees, laborers, subcontractors, mechanics, workmen and persons furnishing labor and services to the Project. The City has adopted a Prevailing Wage Rate Schedule, available to the Contractor by request, which specifies the classes and wage rates to be paid to all persons. The Contractor shall pay not less than the minimum wage rates established thereby for each class, craft or type of labor, workman, or mechanic employed in the execution of this Contract. The failure of the Contractor to comply with this requirement shall result in the forfeiture to the City of a sum of not less than Sixty Dollars ($60.00) for each person per day, or portion thereof, that such person is paid less than the prevailing rate. Upon request by the City, Contractor shall make available for inspection and copying its books and records, including but not limited to its payroll records, account information and other documents as may be required by the City to ensure compliance with this provision.

7.15 JOB SITE SAFETY PRECAUTIONS

7.15.1 The Contractor shall at all times exercise reasonable precautions for the safety of its employees, laborers, subcontractors, mechanics, workmen and others on and near the jobsite and shall comply with all laws, ordinances, regulations, and standards of federal, state and local safety laws and regulations. The Contractor shall provide such machinery guards, safe walkways, ladders, bridges, and other safety devices as may be necessary or appropriate to ensure a safe and secure jobsite and shall require its subcontractors to comply with this requirement. The Contractor shall immediately comply with any and all safety requirements imposed by the Engineer during the progress of the Work.

7.16 WARNING DEVICES AND BARRICADES

7.16.1 The Contractor shall furnish and maintain such warning devices, barricades, lights, signs, pavement markings, and other devices as may be necessary or appropriate or required by federal, state and/or local guidelines to protect persons or property in, near or adjacent to the jobsite. No separate compensation shall be paid to the Contractor for such measures. Where the Work is being conducted in, upon or near streets, alleys, sidewalks, or other rights-of-way, the Contractor shall ensure the placement, maintenance and operation of any and all such warning devices as may be required by the City and shall do so until no longer required by the City. Such devices shall be in compliance with and conform to the manual and specifications for the uniform system of traffic control devices adopted by the Texas Department of Transportation.

7.17 PROTECTION OF UTILITIES AND OTHER CONTRACTORS

7.17.1 The Contractor shall use best efforts to leave undisturbed and uninterrupted all utilities and utility services provided to the jobsite, or which presently exists at, above or beneath the location where the Work is to be performed. In the event that any utility or utility service is disturbed or damaged during the progress of the Work, the Contractor shall forthwith repair, remedy or restore the utility at Contractor's sole expense.

7.17.2 The Contractor understands and acknowledges that other contractors of the City or of other entities may be present at the jobsite performing other work unrelated to the Project. The Contractor shall use best efforts to work around other contractors without impeding the work of others while still adhering to the completion date established herein. In the event that the Contractor's work is or may be delayed by any other person, the Contractor shall immediately give notice thereof to the City and the Engineer and shall request a written Change Order in accordance with the procedures set forth by this Contract. The Contractor's failure to provide such notice and to request such Change Order shall

constitute a waiver of any and all claims associated therewith.

ARTICLE VIII

CONTRACT ADMINISTRATION

8.1 THE ENGINEER

8.1.1 When used in this Contract the term "Engineer" does not necessarily denote a duly licensed, trained or certified engineer; as used herein, the term shall be used interchangeably and shall mean a designated Engineer, Architect, or Contract Administrator (who may not be an architect or engineer) for the City, said person to be designated or redesignated by the City prior to or at any time during the Work hereunder. The Engineer may be an employee of the City or may be retained by the City as an independent contractor but, in either event, the Engineer's duties and authority shall be as set forth hereinafter. The Contractor understands and agrees that it shall abide by the decisions and instructions of the Engineer notwithstanding the contractual relationship between the City and Engineer. All the City's instructions to the Contractor shall be through the Engineer.

In the event the City should find it necessary or convenient to replace the Engineer, the City shall retain a replacement Engineer, and the status of the replacement Engineer shall be that of the former Engineer.

8.2 ENGINEER'S ADMINISTRATION

8.2.1 The Engineer, unless otherwise directed by the City in writing, will perform those duties and discharge those responsibilities allocated to the Engineer as set forth in this Contract. The Engineer shall be the City's representative from the effective date of this Contract until final payment has been made.

8.2.2 The City and the Contractor shall communicate with each other directly through designated representatives and/or project managers, and shall, where appropriate, provide copies of communications to the Engineer.

8.2.3 The Engineer shall be the initial interpreter of the requirements of the drawings and specifications and the judge of the performance thereunder by the Contractor. The Engineer shall render written or graphic interpretations necessary for the proper execution or progress of the Work with reasonable promptness on request of the Contractor.

8.2.4 The Engineer will review the Contractor's Applications for Payment and will certify to the City for payment to the Contractor, those amounts then due the Contractor as provided in this Contract.

8.2.5 The Engineer shall have authority to reject Work which is defective or does not conform to the requirements of this Contract. If the Engineer deems it necessary or advisable, the Engineer shall have authority to require additional inspection or testing of the Work for compliance with Contract requirements.

8.2.6 The Engineer will review and approve, or take other appropriate action as necessary, concerning the Contractor's submittals including Shop Drawings, Product Data and Samples. Such review, approval or other action shall be for the sole purpose of determining conformance with the design concept and information given through the Contract Documents.

8.2.7 The Engineer will review Change Orders that shall be prepared by the Contractor and may authorize minor changes in the Work by Field Order as provided elsewhere herein.

8.2.8 The Engineer shall, upon written request from the Contractor, conduct inspections to determine the date of Substantial Completion and the date of final completion, will receive and forward to the City for the City's review and records, written warranties and related documents required by this Contract and will issue a final Certificate for Payment upon compliance with the requirements of this Contract.

8.2.9 The Engineer's decisions in matters relating to aesthetic effect shall be final if consistent with the intent of this Contract.

8.3 CLAIMS BY THE CONTRACTOR

8.3.1 The Engineer shall determine all claims and matters in dispute between the Contractor and City with regard to the execution, progress, or sufficiency of the Work or the interpretation of the Contract Documents, including but not limited to the plans and

specifications. Any dispute shall be submitted in writing to the Engineer within seven (7) days of the event or occurrence or the first appearance of the condition giving rise to the claim or dispute who shall render a written decision within a reasonable time thereafter. The Engineer's decisions shall be final and binding on the parties. In the event that either party objects to the Engineer's determination as to any submitted dispute, that party shall submit a written objection to the Engineer and the opposing party within ten (10) days of receipt of the Engineer's written determination in order to preserve the objection. Failure to so object shall constitute a waiver of the objection for all purposes.

8.3.2 Pending final resolution of any claim of the Contractor, the Contractor shall diligently proceed with performance of this Contract and the City shall continue to make payments to the Contractor in accordance with this Contract.

8.3.3 ***CLAIMS FOR CONCEALED, LATENT OR UNKNOWN CONDITIONS -*** The Contractor expressly represents that it has been provided with an adequate opportunity to inspect the Project site and thoroughly review the Contract Documents and plans and specifications prior to submission of its bid and the City's acceptance of the bid. Subject to the conditions hereof, Contractor assumes full responsibility and risk for any concealed, latent or unknown condition which may affect the Work. No claims for extra work or additional compensation shall be made by Contractor in connection with concealed, latent or unknown conditions except as expressly provided herein. Should concealed, latent or unknown conditions encountered in the performance of the Work (a) below the surface of the ground or (b) in an existing structure be at variance with the conditions indicated by this Contract, or should unknown conditions of an unusual nature differing materially from those ordinarily encountered in the area and generally recognized as inherent in Work of the character provided for in this Contract, be encountered, the Contract Price shall be equitably adjusted by Change Order upon the written notice and claim by either party made within seven (7) days after the first observance of the condition. As a condition precedent to the City having any liability to the Contractor for concealed or unknown conditions, the Contractor must give the City and the Engineer written notice of, and an opportunity to observe, the condition prior to disturbing it. The failure by the Contractor to make the written notice and claim as provided in this Subparagraph shall constitute a waiver by the Contractor of any claim arising out of or relating to such concealed, latent or unknown condition and the Contractor thereby assumes all risks and additional costs associated therewith.

8.3.4 ***CLAIMS FOR ADDITIONAL COSTS -*** If the Contractor wishes to make a claim for an increase in the Contract Price, as a condition precedent to any liability of the City therefor, the Contractor shall give the Engineer written notice of such claim within seven (7) days after the occurrence of the event, or the first appearance of the condition, giving rise to such claim. Such notice shall be given by the Contractor before proceeding to execute any additional or changed Work. The failure by the Contractor to give such notice and to give such notice prior to executing the Work shall constitute a waiver of any claim for additional compensation.

8.3.4.1 In connection with any claim by the Contractor against the City for compensation in excess of the Contract Price, any liability of the City for the Contractor's costs shall be strictly limited to direct costs incurred by the Contractor and shall in no event include indirect costs or consequential damages of the Contractor. The City shall not be liable to the Contractor for claims of third parties, including Subcontractors. The City shall not be liable to the Contractor for any claims based upon delay to the Contractor for any reason whatsoever including any act or neglect on the part of the City.

8.3.5 ***CLAIMS FOR ADDITIONAL TIME -*** If the Contractor is delayed in progressing any task which at the time of the delay is then critical or which during the delay becomes critical, as the sole result of any act or neglect to act by the City or someone acting in the City's behalf, or by changes ordered in the Work, unusual delay in transportation, supply chain disruptions, unusually adverse weather conditions not reasonably anticipated, fire, pandemic or any causes beyond the Contractor's control, then the date for achieving Substantial Completion of the Work shall be extended upon the written notice and claim of the Contractor to the City and the Engineer, for such reasonable time and extended General Conditions as the Engineer may determine. Any notice and claim for an extension of time by the Contractor shall be made not more than seven (7) days after the occurrence of the event or the first appearance of the condition giving rise to the claim and shall set forth in detail the Contractor's basis for requiring additional time in which to complete the Project. In the event the delay to the Contractor is a continuing one, only one notice and claim for additional time shall be necessary. If the Contractor fails to make such claim as required in this Subparagraph, any claim for an extension of time shall be waived.

8.3.6 ***CLAIMS FOR EXTRA WORK -*** The Contractor shall not claim, request or demand any sum from the City for Extra Work or for additional costs, and hereby waives all such claims, requests and demands and any

right to assert same, unless the conditions of this subparagraph are strictly complied with. "Extra Work" is defined herein to mean any labor, service, materials, equipment, supplies or charges that are directly or indirectly related to the Work, the Project or the Project site, that is not necessarily or fairly required or implied by the Contract Documents.

8.3.7 The parties acknowledge and agree that there shall be no payment made by the City to the Contractor without a written agreement (either a separate contract or a written Change Order) signed by the parties. Should the Contractor perform Extra Work or be requested to perform Extra Work by the Engineer or City, it shall be the Contractor's obligation and duty to first apply for and obtain a written Change Order, approved by the Engineer and executed by the City.

The Contractor's failure to obtain a written, signed Change Order prior to commencement of Extra Work shall constitute a complete and final waiver of any right for compensation for the Extra Work. If the parties are unable to agree to the terms of a Change Order for any Extra Work, the Contractor may reserve its rights to additional time and compensation by filing a claim under section 8.3.

8.4 FIELD ORDERS

8.4.1 The Engineer shall have authority to order minor changes in the Work not involving a change in the Contract Price or in Contract Time and not inconsistent with the intent of the Contract. Such changes shall be effected by Field Order and shall be binding upon the Contractor. The Contractor shall carry out such Field Orders promptly.

8.5 MEDIATION

8.5.1 In the event that a dispute arises under the terms of this Contract, following an adverse determination by the Engineer and proper preservation of the issue as required herein, the parties agree to submit to mediation. In such event, the parties shall agree to a designated person to serve as mediator and each party shall be responsible for payment of one-half of the total mediation fees. The parties shall submit the dispute to mediation as soon as practical and in no event later than one (1) year after the Engineer's written decision on the matter. At least one designated representative of each party must attend and participate in good faith in an effort to resolve the matters in dispute. Mediation shall not be the exclusive remedy available to the Parties.

8.5.2 In no event shall the foregoing provision justify or authorize any delay in the progress of the Work; the parties shall abide by the decision of the Engineer in accomplishing the timely completion of the Project.

ARTICLE IX

SUBCONTRACTORS

9.1 DEFINITION

9.1.1 A Subcontractor is an entity which has a direct contract with the Contractor to perform a portion of the Work. No Subcontractor shall be in privity with the City.

9.2 AWARD OF SUBCONTRACTS

9.2.1 Upon execution of the Contract, the Contractor shall furnish the City, in writing, the names of persons or entities proposed by the Contractor to act as a Subcontractor on the Project. The City shall promptly reply to the Contractor, in writing, stating any objections the City may have to such proposed Subcontractor. The Contractor shall not enter a subcontract with a proposed Subcontractor with reference to whom the City has made timely objection. The Contractor shall not be required to subcontract with any party to whom the Contractor has objection.

9.2.2 All subcontracts shall afford the Contractor rights against the Subcontractor which correspond to those rights afforded to the City against the Contractor herein, including those rights afforded to the City by Subparagraph 12.2.1 below. All subcontracts shall incorporate by reference the provisions hereof and shall provide that no claims, causes or demands shall be made by any Subcontractor against the City.

9.2.3 The Contractor shall indemnify, defend and hold harmless the City from and against any and all claims, demands, causes of action, damage, and liability asserted or made against the City by or on behalf of any Subcontractor or persons working through a Subcontractor.

ARTICLE X

CHANGES IN THE WORK

10.1 CHANGES PERMITTED

10.1.1 Changes in the Work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, may be ordered without invalidating this Contract, by Change Order or by Field Order.

10.1.2 Changes in the Work shall be performed

under applicable provisions of this Contract and the Contractor shall proceed promptly with such changes.

10.2 CHANGE ORDER DEFINED

10.2.1 Change Order shall mean a written order to the Contractor executed by the City and the Engineer, issued after execution of this Contract, authorizing and directing a change in the Work or an adjustment in the Contract Price or the Contract Time, or any combination thereof. The Contract Price and the Contract Time may be changed only by written Change Order.

10.3 CHANGES IN THE CONTRACT PRICE

10.3.1 Any change in the Contract Price resulting from a Change Order shall be determined as follows:

(a) by mutual agreement between the City and the Contractor as evidenced by (1) the change in the Contract Price being set forth in the Change Order, (2) such change in the Contract Price, together with any conditions or requirements related thereto, being initialed by both parties and (3) the Contractor's execution of the Change Order, or (b) if no mutual agreement occurs between the City and the Contractor, then, as provided in Subparagraph 10.3.2 below.

10.3.2 If no mutual agreement occurs between the City and the Contractor as contemplated in Subparagraph 10.3.1 above, the change in the Contract Price, if any, shall then be determined by the Engineer on the basis of the reasonable expenditures or savings of those performing, deleting or revising the Work attributable to the change, including, in the case of an increase or decrease in the Contract Price, a reasonable allowance for direct job site overhead and profit. In such case, the Contractor shall present, in such form and with such content as the City or the Engineer requires, an itemized accounting of such expenditures or savings, plus appropriate supporting data for inclusion in a Change Order. Reasonable expenditures or savings shall be limited to the following: reasonable costs of materials, supplies, or equipment including delivery costs, reasonable costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance, reasonable rental costs of machinery and equipment exclusive of hand tools whether rented from the Contractor or others, reasonable costs of premiums for all bonds and insurance, permit fees, and sales, use or other taxes related to the Work, and reasonable cost of direct supervision and jobsite field office overhead directly attributable to the change. In no event, shall any expenditure or savings associated with the Contractor's home office or other non-jobsite overhead expense be included in any change in the Contract Price. Pending final determination of reasonable expenditures or savings to the City, payments on account shall be made to the Contractor on the Engineer's Certificate for Payment.

10.3.3 If unit prices are provided in the Contract, and if the quantities contemplated are so changed in a proposed Change Order that application of such unit prices to the quantities of Work proposed will cause substantial inequity to the City or to the Contractor, the applicable unit prices shall be equitably adjusted.

10.4 MINOR CHANGES

10.4.1 The Engineer shall have authority to order minor changes in the Work not involving a change in the Contract Price or an extension of the Contract Time and not inconsistent with the intent of this Contract. Such minor changes shall be made by written Field Order, and shall be binding upon the City and the Contractor. The Contractor shall promptly carry out such written Field Orders.

10.5 EFFECT OF EXECUTED CHANGE ORDER

10.5.1 The execution of a Change Order by the Contractor shall constitute conclusive evidence of the Contractor's agreement to the ordered changes in the Work, this Contract as thus amended, the Contract Price and the Contract Time. The Contractor, by executing the Change Order, waives and forever releases any claim against the City for additional time or compensation for matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Order.

10.6 NOTICE TO SURETY; CONSENT

10.6.1 The Contractor shall notify and obtain the consent and approval of the Contractor's surety with reference to all Change Orders if such notice, consent or approval are required by the Contractor's surety or by law. The Contractor's execution of the Change Order shall constitute the Contractor's warranty to the City that the surety has been notified of and consents to, such Change Order and the surety shall be conclusively deemed to have been notified of such Change Order and to have expressly consented thereto.

ARTICLE XI

UNCOVERING AND CORRECTING WORK

11.1 UNCOVERING WORK

11.1.1 If any of the Work is covered contrary to the

Engineer's request or to any provisions of this Contract, it shall, if required by the Engineer or the City, be uncovered for the Engineer's inspection and shall be properly replaced at the Contractor's expense without change in the Contract Time.

11.1.2 If any of the Work is covered in a manner not inconsistent with Subparagraph 11.1.1 above, it shall, if required by the Engineer or City, be uncovered for the Engineer's inspection. If such Work conforms strictly with this Contract, costs of uncovering and proper replacement shall by Change Order be charged to the City. If such Work does not strictly conform with this Contract, the Contractor shall pay the costs of uncovering and proper replacement.

11.2 CORRECTING WORK

11.2.1 The Contractor shall immediately proceed to correct Work rejected by the Engineer as defective or failing to conform to this Contract. The Contractor shall pay all costs and expenses associated with correcting such rejected Work, including any additional testing and inspections, and reimbursement to the City for the Engineer's services and expenses made necessary thereby.

11.2.2 If within one (1) year after Substantial Completion of the Work any of the Work is found to be defective or not in accordance with this Contract, the Contractor shall correct it promptly upon receipt of written notice from the City. This obligation shall survive final payment by the City and termination of this Contract. With respect to Work first performed and completed after Substantial Completion, this one-year obligation to specifically correct defective and nonconforming Work shall be extended by the period of time which elapses between Substantial Completion and completion of the subject Work.

11.2.3 Nothing contained in this Paragraph 11.2 shall establish any period of limitation with respect to other obligations which the Contractor has under this Contract or any obligations pursuant to the maintenance bond. Establishment of the one-year time period in Subparagraph 11.2.2 relates only to the duty of the Contractor to specifically correct the Work.

11.3 CITY MAY ACCEPT DEFECTIVE OR NONCONFORMING WORK

11.3.1 If the City chooses to accept defective or nonconforming Work, the City may do so. In such event, the Contract Price shall be reduced by the greater of (a) the reasonable cost of removing and correcting the defective or nonconforming Work, and (b) the difference between the fair market value of the Project as constructed and the fair market value of the Project had it not been constructed in such a manner as to include defective or nonconforming Work. If the remaining portion of the unpaid Contract Price, if any, is insufficient to compensate the City for its acceptance of defective or nonconforming Work, the Contractor shall, upon written demand from the City, pay the City such remaining compensation for accepting defective or nonconforming Work.

ARTICLE XII

CONTRACT TERMINATION

12.1 TERMINATION BY THE CONTRACTOR

12.1.1 If the Work is stopped for a period of ninety (90) days by an order of any court or other public authority, or as a result of an act of the Government, through no fault of the Contractor or any person or entity working directly or indirectly for the Contractor, the Contractor may, upon ten (10) days' written notice to the City and the Engineer, terminate performance under this Contract and recover from the City payment for the actual reasonable expenditures of the Contractor (as limited in Subparagraph 10.3.2 above) for all Work executed and for materials, equipment, tools, construction equipment and machinery actually purchased or rented solely for the Work, less any salvage value of any such items.

12.1.2 If the City shall persistently or repeatedly fail to perform any material obligation to the Contractor for a period of fifteen (15) days after receiving written notice from the Contractor of its intent to terminate hereunder, the Contractor may terminate performance under this Contract by written notice to the Engineer and the City. In such event, the Contractor shall be entitled to recover from the City as though the City had terminated the Contractor's performance under this Contract for convenience pursuant to Subparagraph 12.2.1 hereunder.

12.2 TERMINATION BY THE CITY

12.2.1 FOR CONVENIENCE

12.2.1.1 The City may for any reason whatsoever terminate performance under this Contract by the Contractor for convenience. The City shall give written notice of such termination to the Contractor specifying when termination becomes effective.

12.2.1.2 The Contractor shall incur no further obligations in connection with the Work, other than job site clean-up and protection, and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the

liabilities and claims arising out of the termination of subcontracts and orders. The City may direct the Contractor to assign the Contractor's right, title and interest under terminated orders or subcontracts to the City or its designee.

12.2.1.3 The Contractor shall transfer title and deliver to the City such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has.

12.2.1.4 (a) The Contractor shall submit a termination claim to the City and the Engineer specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the Engineer. If the Contractor fails to file a termination claim within one (1)

year from the effective date of termination, the City shall pay the Contractor, an amount derived in accordance with subparagraph (c) below.

(b) The City and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.

(c) Absent agreement to the amount due to the Contractor, the City shall pay the Contractor the following amounts:

(i) Contract (unit) prices which shall encompass labor, materials, equipment and other services accepted under this Contract;

(ii) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages), provided however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

(iii) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Subparagraph 12.2.1.2 of this Paragraph. These costs shall not include amounts paid in accordance with other provisions hereof.

The total sum to be paid the Contractor under this Subparagraph 12.2.1 shall not exceed the total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

12.2.2 FOR CAUSE

12.2.2.1 If the Contractor persistently or repeatedly refuses or fails to prosecute the Work in a timely manner, abandons the jobsite and fails to resume work within five (5) days of written notice thereof by the City, fails to grant or allow access to the jobsite by the City or Engineer, fails to supply enough properly skilled workers, supervisory personnel or proper equipment or materials, fails to make prompt payment to Subcontractors or for materials or labor, persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a violation of a material provision of this Contract, then the City may by written notice to the Contractor, without prejudice to any other right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever methods it may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

12.2.2.2 If the unpaid balance of the Contract Price does not exceed the cost of finishing the work, including compensation for the Engineer's additional services and expenses made necessary thereby, such difference shall be paid by the Contractor to the City. This obligation for payment shall survive the termination of the Contract.

12.2.2.3 In the event the employment of the Contractor is terminated by the City for cause pursuant to Subparagraph 12.2.2 and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under Subparagraph 12.2.1 and the provisions of Subparagraph 12.2.1 shall apply.

12.2.2.4 Should the City allow the Contractor to

continue its performance of Work notwithstanding an event of default, or should there be an imminent potential of default, the City, at its sole option and within its sole discretion, may retain a third-party construction manager to document the events of default and oversee further progress of the Work. The use of a third-party construction manager shall not prevent the City from declaring the Contractor to be in default and the City may, at its sole option and within its sole discretion, terminate this Contract at any time. Should the City retain a third-party construction manager, the costs thereof shall be withheld from any amounts due Contractor upon termination. The City's exercise of this option shall be without prejudice to any other right or remedy available to the City by law or under this Contract.

ARTICLE XIII

INSURANCE

13.1 CONTRACTOR SHALL MAINTAIN INSURANCE

13.1.1 The Contractor at his own expense shall purchase, maintain and keep in force during the life of this contract, adequate insurance that will protect the City, the Contractor and/or any Additional Insured from claims which may arise out of or result from operations under this contract. The insurance carriers must be authorized to transact business in Texas, approved by the City, and have an A.M. Best rating of A+ or its equivalent. The insurance required shall provide adequate protections from all claims, whether such operations be by the Contractor or by any Additional Insured or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone whose acts of any of them may be liable and from any special hazards, such as blasting, which may be encountered in the performance of this contract in the amounts as shown below in Paragraph 13.2.1.

13.1.2 The Contractor shall not commence work until the Contractor has obtained all the insurance required under this paragraph and such insurance has been approved by the City.

13.2 TYPES AND AMOUNTS OF CONTRACTOR'S INSURANCE

13.2.1. The Contractor shall furnish and maintain during the life of the contract adequate Worker's Compensation and Commercial General Liability (Public) Insurance in such amounts as follows:

Type of Insurance	Amount
Worker's Compensation	As set forth in the Worker's Compensation Act
Commercial General Liability (Public)	$1,000,000 Each Accident/Occurrence. $1,000,000 Aggregate $1,000,000 Products & Completed Operations Aggregate.
City's Protective Liability Insurance	$600,000 per occurrence $1,000,000 aggregate
Excess/Umbrella Liability	$1,000,000 per occurrence w/drop down coverage Limit of Insurance per Project or City's and Contractor's Protective Liability Insurance for the Project.
Automobile Liability	$500,000 Combined single limit per occurrence.

13.3 ADDITIONAL INSURED

13.3.1 The City shall be named as an additional insured on the Commercial General Liability (Public), City's Protective Liability, and Excess/Umbrella Liability Insurance Policies furnished by the Contractor.

13.4 WRITTEN NOTIFICATION

13.4.1 Each insurance policy shall be endorsed to contain a provision requiring that thirty (30) days prior to expiration, cancellation, non-renewal or any material change in coverage, a notice thereof shall be given by certified mail to the Division of Purchasing, City of Rowlett, 4000 Main Street, Rowlett, Texas, 75088. In the event the insurance company providing insurance is unable to contain such endorsement Contractor shall provide written notice to City of any expiration, cancellation, non-renewal or any material change in coverage.

13.5 PREMIUMS AND ASSESSMENTS

13.5.1 Companies issuing the insurance policies shall have no recourse against the City for payment of any premiums or assessments for any deductibles

which are at the sole responsibility and risk of the Contractor.

13.6 CERTIFICATE OF INSURANCE

13.6.1 Proof that the insurance is in force shall be furnished to the City on City of Rowlett Standard Certificate of Insurance Forms. In the event, any insurance policy shown on the Certificate of Insurance has an expiration date that is prior to the completion and final acceptance of the Project by the City, the Contractor shall furnish the City proof of identical continued coverage no later than thirty (30) days prior to the expiration date shown on the Certificate of Insurance.

13.7 PRIMARY COVERAGE

13.7.1 The coverages provided herein shall be primary and noncontributory with any other insurance maintained by the City for its benefit, including self-insurance.

13.8 SUBROGATION

13.8.1 Companies issuing the insurance policies shall have no recourse against the City for payment of any premiums or assessments for any deductibles which are at the sole responsibility and risk of the Contractor. Insurance Companies shall have no right of subrogation against the City or the Engineer.

13.9 WORKER'S COMPENSATION INSURANCE COVERAGE

13.9.1 The Contractor shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;

(3) provide the governmental entity prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project;

(4) obtain from each person providing services on a Project, and provide to the governmental entity:

(A) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(B) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project;

(7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30-point bold type and text in at least 19- point normal type and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text provided by the Texas Worker's Compensation Commission on the sample notice, without any additional words or changes:

REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing

labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

and

(8) contractually require each person with whom it contracts to provide services on a project, to:

(A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all its employees providing services on the project, for the duration of the project;

(B) provide a certificate of coverage to the contractor prior to that person beginning work on the project;

(C) include in all contracts to provide services on the project the language in subsection (7) of this section;

(D) provide the Contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(E) obtain from each other person with whom it contracts, and provide to the Contractor:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(G) notify the City in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(H) contractually require each other person with whom it contracts, to perform as required by sub-

paragraphs (A) - (G) of this subsection, with the certificate of coverage to be provided to the person for whom they are providing services.

ARTICLE XIV MISCELLANEOUS

14.1 LAWS AND ORDINANCES

14.1.1 The Contractor shall always and in all respects, observe and comply with all federal, state and local laws, ordinances, and regulations applicable to the Project and Work. The Contractor shall further ensure that all Subcontractors observe and comply with said laws, ordinances and regulations.

14.2 GOVERNING LAW

14.2.1 The Contract shall be governed by the laws of the State of Texas. Venue for any causes of action arising under the terms or provisions of this Contract or the Work to be performed hereunder shall be in the state courts of Dallas County, Texas.

14.3 SUCCESSORS AND ASSIGNS

14.3.1 The City and Contractor bind themselves, their respective successors, assigns and legal representatives to the other party hereto and to successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in this Contract. The Contractor shall not assign this Contract without written consent of the City.

14.4 SURETY BONDS

14.4.1 The Contractor shall furnish separate

performance and payment bonds to the City, per the requirements set out in the bid documents and state statutes to guaranty full and faithful performance of the Contract and the full and final payment of all persons supplying labor or materials to the Project. Each bond required by the bid documents or state statute shall set forth a penal sum in an amount not less than the Contract Price. Each bond furnished by the Contractor shall incorporate by reference the terms of this Contract as fully as though they were set forth verbatim in such bonds. In the event the Contract Price is adjusted by Change Order executed by the Contractor, the penal sum of both the performance bond and the payment bond shall be deemed increased by like amount. The performance and payment bonds furnished by the Contractor shall be in form suitable to the City and shall be executed by a surety, or sureties, reasonably suitable to the City and authorized to do business in the State of Texas by the State Board of Insurance.

14.4.2 The Contractor, upon execution of the Contract and prior to commencement of the Work, shall furnish to the City a two-year maintenance bond in the amount of one hundred percent (100%) of the Contract Price covering the guaranty and maintenance prescribed herein, written by an approved surety authorized and duly licensed to conduct business in the State of Texas. The cost of said maintenance bond shall be included in the Contractor's unit bid prices and shall be paid by the Contractor.

14.5 SEVERABILITY

14.5.1 The provisions of this Contract are herein declared to be severable; if any term, provision or part hereof is determined to be invalid, void or unenforceable, such determination shall not affect the validity or enforceability of the remaining terms, provisions and parts, and this Contract shall be read as if the invalid, void or unenforceable portion had not been included herein.

14.6 AMENDMENTS

14.6.1 This Contract may be amended by the parties only by a written agreement duly executed by both parties. The failure of the City to object to any nonperformance or nonconforming work or to enforce any provision hereof shall in no event be regarded as or construed to be a waiver, release or modification of any term or provision in this Contract, nor shall such failure to object or enforce estop the City from insisting on strict compliance with this Contract or from recovering damages, costs or expenses arising because of such nonperformance or nonconforming work.

14.7 FORCE MAJEURE

14.7.1 As used herein, "force majeure" means an incident, situation, or act of a third party that is beyond a party's reasonable control such as an act of God, an act of the public enemy, strikes or other labor disturbances (other than strikes within such party's own labor force), hurricanes, earthquakes, fires, floods, epidemics, embargoes, war, and riots. The Contractor will not be liable or responsible for its failure to perform any obligation under this Contract because of an event of Force Majeure, provided, however, that the Contractor submits notice thereof to the City and Engineer within seven (7) days of such an event, obtains a written Change Order, signed by all parties, that allows an extension of the scheduled completion date, and identifies the specific causes and number of days in the Statement of Delay submitted with the next ensuing Application for Payment.

14.8 NOTICES

14.8.1 All notices required by this Contract shall be presumed received when deposited in the mail properly addressed to the other party or Engineer at the address set forth herein or set forth in a written designation of change of address delivered to all parties and the Engineer.

14.9 IMMUNITIES; DEFENSES

14.9.1 Nothing in this Contract shall be deemed to waive any immunity, sovereign, governmental, official, qualified or otherwise, from liability or suit, which the City may have or assert, except as may be provided by law, all such immunities being hereby expressly retained.

14.10 NO RIGHTS IN THIRD PARTIES

14.10.1 The indemnification provisions of this Contract and the rights and remedies afforded herein are solely for the benefit of the parties to this Contract. Nothing in this Contract is intended nor shall be construed to grant, create or confer any right, benefit, interest or cause of action in any person not a party to this Contract, or to the public in general.

14.11 PROHIBITION OF BOYCOTT ISRAEL

14.11.1 PROHIBITION OF BOYCOTT ISRAEL. The Contractor verifies that it does not Boycott Israel and agrees that during the term of this Contract will not Boycott Israel as that term is defined in Texas Government Code Section 808.001, as amended. For purposes of this verification, "Boycott Israel" means refusing to deal with, terminating business activities

with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

14.11.2 IRAN, SUDAN, AND FOREIGN TERRORIST ORGANIZATIONS. The Contractor represents that neither it nor any of its parent company, wholly- or majority-owned subsidiaries, and other affiliates is a company identified on a list prepared and maintained by the Texas Comptroller of Public Accounts under Section 2252.153 or Section 2270.0201, Texas Government Code, and posted on any of the following pages of such officer's internet website:

https://comptroller.texas.gov/purchasing/docs/sudan-list.pdf,

https://comptroller.texas.gov/purchasing/docs/iran-list.pdf, or

https://comptroller.texas.gov/purchasing/docs/fto-list.pdf.

The foregoing representation is made solely to comply with Section 2252.152, Texas Government Code, and to the extent such Section does not contravene applicable Federal or State law and excludes the Contractor and each of its parent company, wholly-or majority-owned subsidiaries, and other affiliates, if any, that the United States government has affirmatively declared to be excluded from its federal sanctions regime relating to Sudan or Iran or any federal sanctions regime relating to a foreign terrorist organization. The Contractor understands "affiliate" to mean any entity that controls, is controlled by, or is under common control with the Contractor and exists to make a profit.

14.11.3 PROHIBITION OF BOYCOTT ENERGY COMPANIES. Contractor verifies that it does not Boycott Energy Companies and agrees that during the term of this Contract will not Boycott Energy Companies as that term is defined in Texas Government Code Section 809.001, as amended. This section does not apply if Contractor is a sole proprietor, a non-profit entity, or a governmental entity; and only applies if: (i) Contractor has ten (10) or more fulltime employees and (ii) this Contract has a value of $100,000 or more to be paid under the terms of this Contract.

14.11.4 PROHIBITION OF DISCRIMINATION AGAINST FIREARM ENTITIES AND FIREARM TRADE ASSOCIATIONS. Contractor verifies that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (ii) will not discriminate during the term of the contract against a firearm entity or firearm trade association. This section only applies if: (i) Contractor has ten (10) or more fulltime employees and (ii) this Contract has a value of $100,000.00 or more to be paid under the terms of this Contract. However, this prohibition does not apply: (i) if Contractor is a sole proprietor, a non-profit entity, or a governmental entity; (ii) to a contract with a sole-source provider; or (iii) to a contract for which none of the bids from a company were able to provide the required certification.

EXECUTED in single or multiple originals, this___day of__, 2025.

CITY OF ROWLETT, TEXAS

Jeff Winget, Mayor

ATTEST:

Deborah Sorensen, City Secretary

CONTRACTOR:

Felix Construction Company

(Signature)

(Type/Print Name and Title)

403 International Pkwy, Suite 500
(Street Address)

Richardson, Texas 75081
(City/State/Zip)

CORPORATE ACKNOWLEDGMENT

THE STATE OF _____

COUNTY OF _____

BEFORE ME, the undersigned authority, a Notary Public in and for said County and State, on this day personally appeared:

_____ _____
(Print Name) *(Print Title)*

of_____, the Contractor designated herein above, known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the said Contractor, a corporation, that he was duly authorized to perform the same by appropriate resolution of the board of directors of such corporation and that he executed the same as the act and deed of such corporation for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this___ day of_____, A.D., 2025.

_____
Notary Public In and For

_____County, _____

My Commission expires: _____

MAYOR'S ACKNOWLEDGMENT

THE STATE OF
TEXAS COUNTY OF
DALLAS

BEFORE ME, the undersigned authority, a Notary Public in and for said County and State, on this day personally appeared the undersigned, Mayor of the City of Rowlett, Texas, a municipal corporation, known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the said City of Rowlett, Texas, a municipal corporation, that he/she was duly authorized to perform the same by appropriate resolution of the City Council of the City of Rowlett and that he/she executed the same as the act of the said City for purpose and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this____day of_____, A.D., 2025.

_____
Notary Public in and for the State of Texas

My Commission expires:_____

SECTION 11 NCTCOG STANDARD AND SPECIAL CONDITIONS

NCTCOG STANDARD SPECIFICATIONS AND SPECIAL CONDITIONS

The City of Rowlett has adopted the North Central Council of Governments Standard Specifications for Public Works Construction, 5th Edition with the following revisions as shown in *italics.*

Item 103.3.1.1. Performance Bond
- This bond shall provide for the repair and/or replacement of all defects due to faulty materials and workmanship that appear within a period of *two years* from the date of completion and acceptance of the improvement by the OWNER or such lesser or greater period as may be designated in the contract documents.

Item 105.2.2. Special Warranty
- If within *two years* after final acceptance of the work by the OWNER, …

FORM A.2. STANDARD CONSTRUCTION CONTRACT
- Omit and use the City's Standard Form of Agreement

FORM A.3. PERFORMANCE BOND
- 4th paragraph, "…the Principal shall repair and/or replace all defects due to faulty materials or workmanship that appear within a period of *two (2) years* from the date of completion and final acceptance by OWNER…"

- 6th paragraph, "Surety agrees that the bond provides for the repairs and/or replacement of all defects due to faulty materials and workmanship that appear within a period of *two (2) years* from the date of completion and acceptance of the improvements by the OWNER."

SPECIAL CONDITIONS

SC.01 GENERAL

All materials and workmanship shall conform to the City of Rowlett Standards and governed by the North Central Texas Council of Governments (NCTCOG) Standard Specifications For Public Works Construction, 5th Edition. Where indicated for specific pay items noted in the plans, all materials and workmanship shall conform to the Texas Department of Transportation Specifications for Construction and Maintenance of Highways, Streets, and Bridges, as adopted by the Texas Department of Transportation on September 1, 2024.

SC.02 LOCATION OF PROJECT

The work awarded under this contract shall include the following locations:

Rowlett Road Pump Station Upper Pressure Plane Addition project includes 100 LF 12-inch water line by open cut and 1 vertical turbine pump (1850 GPM, 125 HP) with associated mechanical and electrical equipment. The pump will be installed utilizing the existing pump can and connected to the proposed water line. The water line will connect to an existing 12-inch water line on the pump station site.

SC.03 SCOPE OF WORK

The work under this contract includes furnishing all labor, tools, material, and equipment, and for performing all work necessary for construction of ***Rowlett Road Pump Station, Upper Pressure Plane Addition.*** Construction plans were prepared and provided by the City of Rowlett.

SC.04 DISQUALIFICATION OF BIDDERS

Add the following to Item 2 of the Additional Conditions for Public Works Construction Contracts first paragraph:

Within five (5) working days after bid opening, the apparent low bidder shall submit such evidence as the OWNER may require to establish the bidder's qualifications to satisfactorily perform the work included in this project. Information that shall be required shall include the following:

Add the following to Item 2 of the Additional Conditions for Public Works Construction Contracts after the last paragraph:

Should the bidder fail to produce evidence satisfactory to the OWNER on any of the foregoing points, he may be disqualified and the work awarded to the next bidder so qualifying.

SECTION 12 MEASUREMENT AND PAYMENT

MEASUREMENT AND PAYMENT

1. **SCOPE AND CONTRACT PRICE:** This section provides clarification of the measurement and payment for some work items in this Contract.

   The total Contract Price shall cover all Work required by the Contract Documents. All costs in connection with the proper and successful completion of the Work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump sum prices bid. All Work not specifically set forth as a pay item in the Proposal and Bid Form shall be considered a subsidiary obligation of Contractor and all costs in connection therewith shall be included in the prices bid.

2. **ESTIMATED QUANTITIES:** All estimated quantities stipulated in the Proposal and Bid Form or other Contract Documents are approximate and are to be used only (a) as a basis for estimating the probable cost of the Work and (b) for the purpose of comparing the bids submitted for the Work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished. Contractor agrees that it will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts.

3. **SUBSIDIARY PAY ITEMS:** The following items shall be considered subsidiary to the pay items provided for the work under this contract. Other subsidiary items are described herein.

   - **Location of existing utilities.**
   - **Video taping of project site prior to construction.**
   - **Contractor negotiations with property owners for temporary staging areas.**
   - **Construction staking.**
   - **Backfill of utility trenches.**
   - **All fees.**
   - **Repair of damaged fences, walls, irrigation systems, landscaping, and other improvements.**
   - **Final cleanup.**

4. SODDING AND TOPSOIL:

a. Sodding:

The Contractor shall walk the project with the City inspector prior to construction and mark on a construction plan set the limits of all established grass areas that will be disturbed by construction. These areas of existing established grass shall be resodded with Bermuda Grass.

Measurement and payment for sodding be on a lump sum basis for any non-paved areas disturbed by the Contractor.

b. Watering and Fertilizer for Sodding

In the event the area is not adjacent to an existing irrigation system, the Contractor will be required to provide a temporary watering system (water truck application) to provide consistent moisture of the newly planted sod until the City has accepted the grass. The Contractor shall submit a written description of proposed watering method to the City prior to sodding.

No separate measurement or payment shall be made for watering or fertilizer materials and application. This item shall be considered subsidiary to sodding.

c. Topsoil:

The Contractor shall strip a 6" depth of topsoil where disturbed by construction and stockpile in locations to be approved in advance by the City inspector. A minimum 6" layer of topsoil shall be spread under sodding. All work related to striping, stockpiling and spreading topsoil shall be subsidiary to the pay items for sodding.

5. **VIDEO TAPE**:

The Contractor shall be required to video the project prior to beginning construction. A copy of the video shall be furnished to the City prior to beginning construction. No separate bid item.

6. **TRENCH SAFETY PROGRAM**:

The Contractor's trench safety program shall be submitted to the City prior to the start of construction. The preparation of the trench safety program and the installation, maintenance, inspection, and removal of trench protection systems shall be measured and payment made by the unit price bid. Payment shall constitute full compensation for all labor, equipment, and materials necessary to complete this item of the work.

7. **EROSION CONTROL**:

All Erosion Control measures fees, including but not limited to those shown on the Erosion Control Plans and described in the Contract Documents shall be paid on a unit price basis under the pay items provided.

8. CLEAN-UP:

No separate payment shall be made in connection with clean-up and restoration, as specified or required. All costs in connection with clean-up and restoration shall be included in the cost of other pay items. All disturbed areas shall be regraded to their original condition or better and shall be regraded so as to prevent water from ponding.

SECTION 13 SUPPLEMENTAL PROVISIONS

SECTION 14 TECHNICAL SPECIFICATIONS

DIVISION 00
PROCUREMENT AND CONTRACTING REQUIREMENTS

00 01 07 DESIGN PROFESSIONAL SEALS



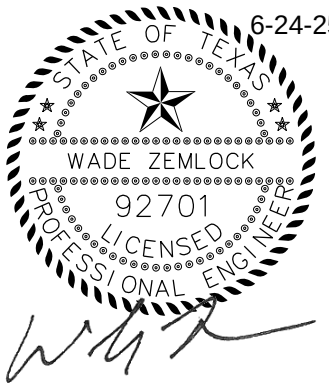
FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Specification Sections Sealed	
Division 00	**Procurement and Contracting Requirements**
-	Legal Advertisement (City)
-	Instruction to Bidders (City)
-	Notice to Bidders (City)
-	Bid Proposal and Bid Form (City)
-	Bid Bond (City)
-	Subconsultants (City)
-	Standard Fixed Price Contract (City)
-	Standard and Special Conditions (City)
-	Special Notice to Contracts (City)
-	Supplemental General Provisions (City)
-	Supplemental Special Provisions (City)
-	Measurement and Payment (City)
-	Technical Specifications
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END OF SECTION

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DIVISION 01
GENERAL REQUIREMENTS

01 11 00 SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Construct Work as described in the Contract Documents.

1. Provide the materials, equipment, and incidentals required to make the Project completely and fully operable.
2. Provide the labor, equipment, tools, and consumable supplies required for a complete Project.
3. Provide the civil, architectural, structural, mechanical, electrical, instrumentation, and all other Work required for a complete and operable Project.
4. Test and place the completed Project in operation.
5. Provide the special tools, spare parts, lubricants, supplies, or other materials as indicated in the Contract Documents for the operation and maintenance of the Project.
6. The Contract Documents do not indicate or describe all Work required to complete the Project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Construction Manager.

1.02 DESCRIPTION OF WORK

A. Work is described in general, non-inclusive terms as:

1. Rowlett Road Pump Station Upper Pressure Plane Pump Addition project includes 100 LF 12-inch water line by open cut and 1 vertical turbine pump (1850 GPM, 125 HP) with associated mechanical and electrical equipment. The pump will be installed utilizing the existing pump can and connect to the proposed water line. The water line will connect to an existing 12-inch water line on the pump station site.

1.03 WORK UNDER OTHER CONTRACTS

A. Owner has no knowledge of work, other than the Work included in this Contract, which may impact construction scheduling, testing, and startup.

B. Completion of the Work described in this Contract may impact the construction and testing of the items listed above.

1. Coordinate construction activities through the Construction Manager.
2. Pay claims for damages which result from the late completion of the Project or any specified Milestones.

1.04 WORK BY OWNER

A. Owner has no knowledge of work, other than the Work included in this Contract that may impact construction scheduling, testing, and startup.

B. Completion of the Work described in this Contract may impact the construction and testing of the items listed above.

1. Coordinate construction activities through the Construction Manager.

2. Pay claims for damages which result from the late completion of the Project or any specified Milestones.

C. Owner will provide normal operation and maintenance of the existing facilities during construction, unless otherwise stated.

1.05 CONSTRUCTION OF UTILITIES

A. Existing utilities will be used for this Project. Coordinate with others performing Work associated with this Project.

B. Power and Electrical Services:

1. Contractor may use the permanent power source in lieu of temporary power source when permanent power is available at the Site.

a. Notify Construction Manager and Owner of intent to use the permanent power source.

b. Arrange with the power utility and pay the charges for connections and monthly charges for use of this power.

1.06 NOMINATED SUBCONTRACTOR

A. Owner has or will select a Subcontractor for furnishing, installing, and testing the following products:

Description	Supplier	Appendix
1850 GPM, 125 hp Vertical Turbine Pump Contact – Shane Keil shanek@smithpump.com Phone: 871-589-2060 xt 404	Flowserve	NA
SCADA Contact – Robert Durham rdurham@dataflowsys.com Phone: 903-330-1548	Data Flow Systems	NA

B. These Subcontractors will be designated as “Nominated Subcontractors.” Contractor to coordinate with each Nominated Subcontractor for costs and agreements for services. Obtain clarification from the Construction Manager in the case of a disagreement between the above list and those specified elsewhere in the Contract Documents.

C. Execute an agreement with each Nominated Subcontractor upon receiving the Notice to Proceed (execution of the Contract Documents).

D. Include the Nominated Subcontractor costs in the Contract Price.

E. Assume responsibilities for Nominated Subcontractors’ products and installation as for those products selected and installed by the Contractor.

F. Coordinate Work performed by Nominated Subcontractors.

G. Provide labor, materials, equipment, tools, consumable supplies, and incidentals not specifically required by the subcontract required to provide a complete and operable Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 26 00 CHANGE MANAGEMENT

PART 1 - GENERAL

1.01 REQUESTS FOR CHANGE PROPOSAL

A. Construction Manager will initiate Modifications by issuing a Request for Change Proposal (RCP).

1. Construction Manager and Design Professional will prepare a description of proposed Modifications.

2. Construction Manager will issue the Request for Change Proposal form to Contractor. A number will be assigned to the Request for a Change Proposal when issued.

3. Return a Change Proposal in accordance with Paragraph 1.02 for evaluation by the OPT.

1.02 CHANGE PROPOSALS

A. Submit a Change Proposal (CP) to the Construction Manager for Contractor initiated changes in the Contract Documents or in response to a Request for Change Proposal. Submit the Change Proposal and attach the forms provided by the Construction Manager.

1. Use the Change Proposal form provided by the Construction Manager.

2. Include with the Change Proposal:

a. A complete description of the proposed Modification if Contractor initiated or proposed changes to the OPT's description of the proposed Modification.

b. The reason the Modification is requested, if not in response to a Request for a Change Proposal.

c. A detailed breakdown of the cost of the change if the Modification requires a change in Contract Price. The itemized breakdown is to include:

1) List of materials and equipment to be installed;

2) Man hours for labor by classification;

3) Equipment used in construction;

4) Consumable supplies, fuels, and materials;

5) Royalties and patent fees;

6) Bonds and insurance;

7) Overhead and profit;

8) Field office costs;

9) Home office cost; and

10) Other items of cost.

d. Provide the level of detail outlined in the paragraph above for each Subcontractor or Supplier actually performing the Work if Work is to be provided by a

Subcontractor or Supplier. Indicate appropriate Contractor mark ups for Work provided through Subcontractors and Suppliers. Provide the level of detail outlined in the paragraph above for self-performed Work.

e. Submit Change Proposals that comply with the General Conditions for Cost of Work.

f. Provide a revised schedule. Show the effect of the change on the Project Schedule and the Contract Times.

B. Submit a Change Proposal to the Construction Manager to request a Field Order.

C. A Change Proposal is required for all substitutions or deviations from the Contract Documents.

D. Request changes to products in accordance with Section 01 33 02 “Shop Drawings.”

1.03 CONSTRUCTION MANAGER WILL EVALUATE THE REQUEST FOR A MODIFICATION

A. Construction Manager will issue a Modification per the General Conditions if the Change Proposal is acceptable to the Owner. Construction Manager will issue a Change Order or Contract Amendment for any changes in Contract Price or Contract Times.

1. Change Orders and Contract Amendments will be sent to the Contractor for execution with a copy to the Owner recommending approval. A Work Change Directive may be issued if Work needs to progress before the Change Order or Contract Amendment can be authorized by the Owner.

2. Work Change Directives, Change Orders, and Contract Amendments can only be approved by the Owner.

a. Work performed on the Change Proposal prior to receiving a Work Change Directive or approval of the Change Order or Contract Amendment is performed at the Contractor’s risk.

b. No payment will be made for Work on Change Orders or Contract Amendments until approved by the Owner.

B. Contractor may be informed that the Change Proposal is not approved and construction is to proceed in accordance with the Contract Documents.

1.04 EQUAL NON-SPECIFIED PRODUCTS

A. The products of the listed manufacturers are to be furnished where the Specifications list several manufacturers and do not specifically list “or equal” or “or approved equal” products. Use of any products other than those specifically listed is a substitution. Follow the procedures in Paragraph 1.05 for a substitution.

B. Contractor may submit other manufacturers’ products that are in full compliance with the Specifications where Specifications list one or more manufacturers followed by the phrase “or equal” or “or approved equal.”

1. Submit a Shop Drawing as required by Section 01 33 02 “Shop Drawings” to document that the proposed product is equal or superior to the specified product.

2. Prove that the product is equal. It is not the OPT's responsibility to prove the product is not equal.

    a. Indicate on a point-by-point basis for each specified feature that the product is equal to the Contract Document requirements.

    b. Make a direct comparison with the specified manufacturer's published data sheets and available information. Provide this printed material with the Shop Drawing.

    c. The decision of the Design Professional regarding the acceptability of the proposed product is final.

3. Provide a certification that, in furnishing the proposed product as an equal, the Contractor:

    a. Has thoroughly examined the proposed product and has determined that it is equal or superior in all respects to the product specified.

    b. Has determined that the product will perform in the same manner and result in the same process as the specified product.

    c. Will provide the same warranties and/or bonds as for the product specified.

    d. Will assume all responsibility to coordinate any modifications that may be necessary to incorporate the product into the construction and will waive all claims for additional Work which may be necessary to incorporate the product into the Project which may subsequently become apparent.

    e. Will maintain the same time schedule as for the specified product.

C. A Change Proposal is not required for any product that is in full compliance with the Contract Documents. If the product is not in full compliance, it may be offered as a Substitution.

1.05 SUBSTITUTIONS

A. Substitutions are defined as any product that the Contractor proposes to provide for the Project in lieu of the specified product. Submit a Change Proposal per Paragraph 1.02 along with documents required for a Shop Drawing as required by Section 01 33 02 "Shop Drawings" to request approval of a substitution.

B. Prove that the product is acceptable as a substitute. It is not the Design Professional's responsibility to prove the product is not acceptable as a substitute.

1. Indicate on a point-by-point basis for each specified feature that the product is acceptable to meet the intent of the Contract Documents requirements.

2. Make a direct comparison with the specified Suppliers published data sheets and available information. Provide this printed material with the Shop Drawing.

3. The decision of the Design Professional regarding the acceptability of the proposed substitute product is final.

C. Provide a certification that, in making the substitution request, the Contractor:

1. Has determined that the substituted product will perform in substantially the same manner and result in the same ability to meet the specified performance as the specified product;
2. Will provide the same warranties and/or bonds for the substituted product as specified or as would be provided by the manufacturer of the specified product;
3. Will assume all responsibility to coordinate any modifications that may be necessary to incorporate the substituted product into the Project and will waive all claims for additional Work which may be necessary to incorporate the substituted product into the Project which may subsequently become apparent; and
4. Will maintain the same time schedule as for the specified product.

D. Pay for review of substitutions in accordance with Section 01 33 02 “Shop Drawings.”

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 29 00 APPLICATION FOR PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Submit Applications for Payment for completed Work and for materials and equipment in accordance with the General Conditions, the Supplementary Conditions, the Agreement, and this Section. The Contract Price is to include costs for:

1. Providing the Work in accordance with the Contract Documents;
2. Installing Owner furnished equipment and materials, if any;
3. Providing Work for alternates and allowances, if any;
4. Providing Work for extra work items, if any and if authorized
5. Commissioning, startup, training, and initial maintenance and operation;
6. Acceptance testing at the manufacturer's facilities or at the Site;
7. All home office overhead costs and expenses, including profit made directly or indirectly from the Project;
8. Project management, contract administration, and field office and field operations staff including supervision, clerical support, and technology system support;
9. Professional services including design fees, legal fees, and other professional services;
10. Bonds and insurance;
11. Permits, licenses, patent fees, and royalties;
12. Taxes;
13. Providing all documentation and Samples required by the Contract Documents;
14. Facilities and equipment at the Site including:
    a. Field offices, office furnishings, and all related office supplies, software, and equipment,
    b. Storage facilities for Contractor's use and storage facilities for stored materials and equipment including spare parts storage,
    c. Shops, physical plant, construction equipment, small tools, vehicles, and technology and telecommunications equipment,
    d. Safety equipment and facilities to provide safe access and working conditions for workers and for others working at the Site,
    e. Temporary facilities for power and communications,
    f. Potable water and sanitation facilities, and
    g. Mobilization and demobilization for all these facilities and equipment.
15. Products, materials, and equipment stored at the Site or other suitable location in accordance with Section 01 31 00 "Project Management and Coordination";

16. Products, materials, and equipment permanently incorporated into the Project;
17. Temporary facilities for managing water including facilities for pumping, storage, and treatment as required for construction and protection of the environment;
18. Temporary facilities for managing environmental conditions and Constituents of Concern;
19. Temporary facilities such as sheeting, shoring, bracing, formwork, embankments, storage facilities, working areas, and other facilities required for construction of the Project;
20. Temporary and permanent facilities for protection of all overhead, surface, or underground structures or features;
21. Temporary and permanent facilities for removal, relocation, or replacement of any overhead, surface, or underground structures or features;
22. Products, materials, and equipment consumed during the construction of the Project;
23. Contractor labor and supervision to complete the Project including that provided through Subcontractors or Suppliers;
24. Correcting Defective Work during the Contract Times, during the Correction Period, or as required to meet any warranty provision of the Contract Documents;
25. Risk associated with weather and environmental conditions, startup, and initial operation of facilities including equipment, processes, and systems;
26. Contractor safety programs, including management, administration, and training;
27. Maintenance of facilities including equipment, processes, and systems until operation is transferred to Owner;
28. Warranties, extended or special warranties, or extended service agreements;
29. Cleanup and disposal of any and all surplus materials; and
30. Demobilization of all physical, temporary facilities not incorporated into the Project.

B. Include the cost not specifically set forth as an individual payment item but required to provide a complete and functional system in the Contract Price.

C. Provide written approval of the surety company providing performance and payment bonds for the Schedule of Values, Application for Payment form, and method of payment prior to submitting the first Application for Payment. Submit approval using the “Consent of Surety Company to Payment Procedures” form provided by the Construction Manager. Payment will not be made without this approval.

D. Construction Manager may withhold processing the Applications for Payment if any of the following processes or documentation is not up to date:
   1. Progress Schedule per Section 01 33 05 “Construction Progress Schedule.”
   2. Project videos and photographs per Section 01 33 06 “Graphic Documentation.”
   3. Record Documents per Section 01 31 13 “Project Administration.”

1.02 SCHEDULE OF VALUES

A. Divide the Contract Price into an adequate number of line items to allow more accurate determination of the earned value for each line item when evaluating progress payments. Submit a detailed Schedule of Values for the Project at least 10 days prior to submitting the first Application for Payment using forms provided by the Construction Manager.

B. Do not apply for payment until the Schedule of Values has been approved by the Construction Manager.

C. Divide the cost associated with each line item in the Schedule of Values into installation and materials components.

1. Installation cost is to include all cost associated with the line item except materials cost.

2. Materials cost is the direct cost (as verified by invoice values) for products, materials, and equipment to be permanently incorporated into the Project associated with the line item.

3. Installation cost is to include all direct costs and a proportionate amount of the indirect costs for the Work associated with each line item. Include costs not specifically set forth as an individual payment item but required to provide a complete and functional system.

4. The sum of materials and installation costs for all line items must equal the Contract Price.

D. Use each unit price line item in the Agreement as a line item in the Schedule of Values. The sum of materials and installation costs for each line item for unit price contracts must equal the value of the line item in the Agreement. In addition to the installation cost described in Paragraph 1.02.C.3, installation costs for unit price items are to include costs for waste and overages.

1. Installation and materials cost may be left as a single installation component if:

a. Contractor does not intend to request payment for stored materials for that line item; or

b. Work in the line item will be completed within a single payment period.

2. Provide adequate detail to allow a more accurate determination of the earned value for installation costs, expressed as a decimal fraction of Work completed, for each line item.

3. Installation cost line items may not exceed $50,000.00. Items that are not subdivided into smaller units may only be included in the Application for Payment when Work on the entire unit is complete.

4. Lump sum items may be divided into an estimated number of units to estimate earned value. The estimated number of units times the cost per unit must equal the lump sum amount for that line item.

5. Include Contractor’s overhead and profit in the installation costs each line item in proportion to the value of the line item to the Contract Price.

6. Include cost not specifically set forth as an individual payment item but required to provide a complete and functional system in the Contract Price for each item.

7. Line items may be used to establish the value of Work to be added or deleted from the Project.

E. Include a breakdown of both mobilization and demobilization costs in the Schedule of Values. The total cost for both mobilization and demobilization may not exceed five percent of the total Contract Price. Payment for mobilization and demobilization will be based on the earned value of Work completed. Refer to Section 5, Rowlett NCTCOG Standard and Special Conditions SC.67. Payment for these costs will only be made for Work completed for the following:

1. Bonds and insurance;

2. Transportation and setup for equipment;

3. Transportation and/or erection of all field offices, sheds, and storage facilities;

4. Salaries for preparation of documents required before the first Application for Payment; and

5. Salaries for field personnel directly related to the mobilization of the Project.

1.03 SCHEDULE OF ANTICIPATED PAYMENTS

A. Submit a schedule of the anticipated Application for Payments showing the anticipated application numbers, submission dates, and the amount to be requested for each Application for Payment on the form provided by the Construction Manager.

B. Update the schedule of anticipated payments as necessary to provide a reasonably accurate indication of the funds required to make payments each month to the Contractor for Work performed.

1.04 ALTERNATES, ALLOWANCES, AND EXTRA WORK ITEMS

A. Include line items and amounts for specified alternate Work and allowances for Work in the Agreement, if any, and as described in Section 01 23 10 “Alternates and Allowances.”

B. Include line items and amounts for Extra Work items in the Agreement, if any, and as described in Section 01 29 01 “Measurement and Basis for Payment.”

1.05 RETAINAGE AND SET-OFFS

A. Retainage will be withheld from each Application for Payment per the Agreement.

B. Reduce payments for set-offs per the General Conditions as directed by the Construction Manager.

1.06 PROCEDURES FOR SUBMITTING AN APPLICATION FOR PAYMENT

A. Submit a draft Application for Payment to the Construction Manager each month at least 20 days before the date established in the Agreement for Owner to make progress payments. Do not submit Applications for Payment more often than monthly. Review the

draft Application for Payment with the Construction Manager to determine concurrence with:

1. Values requested for materials and equipment, stored or incorporated into the Project as documented by invoices;
2. The earned value for installation costs for each line item in the Application for Payment form expressed as a percent complete for that line item;
3. The quantity of Work completed for each unit price item;
4. Amount of retainage to be withheld; and
5. Set-offs included in the Application for Payment.

B. Submit Applications for Payment to the Construction Manager after agreement has been reached on the draft Application for Payment with the Construction Manager.

C. Provide all information requested in the Application for Payment form. Do not leave any blanks incomplete. If information is not applicable, enter "N/A" in the space provided.

1. Number each application sequentially and include the dates for the application period.
2. Complete the "Contract Time Summary" section on the Application for Payment form. If the Final Completion date shows the Project is more than 30 days behind schedule, revise the Schedule of Anticipated Payments to correspond to the updated schedule required per Section 01 33 05 "Construction Progress Schedule."
3. Complete the "Summary of Earned Value and Set-offs" section on the Application for Payment form. Show the total amounts for earned value of original Contract performed, earned value for Work on approved Contract Amendments and Change Orders, retainage and set-offs.
4. Sign and date the Contractor's Certification on the Application for Payment form that all Work, including materials, covered by this Application for Payment have been completed or delivered and stored in accordance with the Contract Documents, that all amounts have been paid for Work, materials, and equipment for which previous Payment has been made by the Owner, and that the current payment amount shown in this Application for Payment is now due.
5. Include "Attachment A - Tabulation of Earned Value of Original Contract Performed" to show the value of materials stored and successfully incorporated into the Project and the earned value for installation of the Work for each line item in the Application for Payment for Work. Attachment A includes Work on the original Contract Price and on approved Contract Amendments and Change Orders.
6. Include "Attachment B - Tabulation of Values for Materials and Equipment" to track invoices used to support amounts requested as materials in Attachment A. Enter materials to show the amount of the invoice assigned to each item in Attachment A if an invoice includes materials used on several line items.
7. Include "Attachment C - Summary of Set-offs" to document set-offs made per the Contract Documents. Show each set-off as it is applied. Show a corresponding line item to reduce the set-off amount if a payment held by a set-off is released for payment.

8. Include “Attachment D - Retainage Calculation” to show method for calculating retainage. The amount of retainage with respect to progress payments is stipulated in the Agreement. Any request for a reduction in retainage must be accompanied by a Consent of Surety to Reduction or Partial Release of Retainage.

9. Include “Attachment E - EVA Calculation” and the EVA Chart showing the anticipated and actual total earned value of fees, Work, and materials. Create a graphic representation (curve) of the anticipated progress on the Project each month. Compare the anticipated cumulative total earned value of fees, Work, and materials to the actual total earned value of fees, Work, and materials to determine performance on budget and schedule. Adjust the table and curve to incorporate Modifications.

D. Submit attachments in Portable Document Format (PDF).

1. Generate attachments to the Application for Payment using the Excel spreadsheet provided by the Construction Manager.

2. Submit PDF documents with adequate resolution to allow documents to be printed in a format equivalent to the document original. Documents are to be scalable to allow printing on standard 8-1/2 x 11 or 11 x 17 paper.

1.07 ADJUSTMENTS TO THE SCHEDULE OF VALUES IN THE APPLICATION FOR PAYMENT

A. Submit a Change Proposal to request any changes to the Schedule of Values incorporated into the Application for Payment once approved. A Field Order will be issued by the Construction Manager to modify the Application for Payment form if approved.

B. Payment for materials and equipment shown in the Application for Payment will be made for the total of associated invoice amounts, up to the value shown for materials in the Application for Payment for that line item.

1. If the total amount for invoices for materials and equipment for a line item are less than the amount shown for the materials component of that line item in the Application for Payment, and it can be demonstrated that no additional materials or equipment are required to complete Work described in that item, the difference between the total invoice for materials and equipment and the materials component for that line item can be added to the installation component of that Work item.

2. Costs for material and equipment in excess of the value shown in the Schedule of Values may not be paid for under other line items.

1.08 CONSTRUCTION MANAGER’S RESPONSIBILITY

A. Construction Manager will review each draft Application for Payment with Contractor to reach an agreement on the amount to be recommended to Owner for payment. Contractor is to revise the Application for Payment to incorporate changes, if any, resulting from this review process.

B. Construction Manager will review the Application for Payment to determine that the Application for Payment has been properly submitted and is in accordance with the agreed to draft Application for Payment.

C. Construction Manager will either recommend payment of the Application for Payment to Owner or notify the Contractor of the reasons for not recommending payment. Contractor

may make necessary corrections and resubmit the Application for Payment. Construction Manager will review resubmitted Application for Payment and reject or recommend payment of the Application for Payment to Owner as appropriate.

D. Construction Manager's recommendation of the Application for Payment constitutes a representation that based on its experience and the information available:

1. The Work has progressed to the point indicated;
2. The quality of the Work is generally in accordance with the Contract Documents; and
3. Requirements prerequisite to payment have been met.

E. This representation is subject to:

1. Further evaluation of the Work as a functioning whole;
2. The results of subsequent tests called for in the Contract Documents; or
3. Any other qualifications stated in the recommendation.

F. Construction Manager does not represent by recommending payment that:

1. Inspections made to check the quality or the quantity of the Work as it was performed were exhaustive or extended to every aspect of the Work in progress; or
2. Other matters or issues that might entitle Contractor to additional compensation or entitle Owner to withhold payment to Contractor exist.

G. Neither Construction Manager's review of Contractor's Work for the purposes of recommending payments nor Construction Manager's recommendation of payment imposes responsibility on the Construction Manager or Owner:

1. To supervise, direct, or control the Work;
2. For the means, methods, techniques, sequences, or procedures of construction, or safety precautions and programs;
3. For Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
4. To make examinations to ascertain how or for what purposes Contractor has used the monies paid on account of the Contract Price; or
5. To determine that title to the Work, materials, or equipment has passed to Owner free and clear of Liens.

1.09 FINAL APPLICATION FOR PAYMENT

A. Include adjustments to the Contract Price in the final Application for Payment for:

1. Approved Change Orders and Contract Amendments;
2. Allowances not previously adjusted by Change Order;
3. Deductions for Defective Work that have been accepted by the Owner;
4. Penalties and bonuses;
5. Deduction for all final set-offs; and

6. Other adjustments if needed.

B. Construction Manager will prepare a final Change Order reflecting the approved adjustments to the Contract Price which have not been covered by previously approved Change Orders and, if necessary, to reconcile estimated unit price quantities with actual quantities.

C. Submit the final Application for Payment per the General Conditions, including the final Change Order. Provide the following with the final Application for Payment:

1. Evidence of payment or release of Liens on the forms provided by the Construction Manager and as required by the General Conditions.

2. Consent from surety to final payment.

D. Final payment will also require additional procedures and documentation per Section 01 70 00 “Execution and Closeout Requirements.”

1.10 PAYMENT BY OWNER

A. Owner is to pay the amount recommended for monthly payments within 30 days after receipt of the Construction Manager’s recommended Application for Payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 29 01 MEASUREMENT AND BASIS FOR PAYMENT

PART 1 - GENERAL

1.01 PAYMENT FOR MATERIALS AND EQUIPMENT

A. Payment will be made for materials and equipment materials properly stored and successfully incorporated into the Project less the specified retainage.

B. Provide a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of Liens. Provide documentation of payment for materials and equipment with the next Application for Payment. Remove items from the tabulation of materials and equipment if this documentation is not provided with the next Application for Payment.

C. Provide evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest.

D. The Work covered by progress payments becomes the property of the Owner at the time of payment. The Contractor's obligations with regard to proper care and maintenance, insurance, and other requirements are not changed by this transfer of ownership until final acceptance in accordance with the General Conditions.

E. Payment for materials and equipment does not constitute acceptance of the product.

1.02 MEASUREMENT AND BASIS FOR PAYMENTS ON LUMP SUM ITEMS

A. Measurement for progress payments is the invoice value for stored materials and the earned value for all other cost for constructing each item. Earned value is expressed as the value of the Work completed divided by the total value of installation cost. The total amount paid will be equal to the total lump sum amount for that item.

1.03 MEASUREMENT AND BASIS FOR PAYMENTS ON UNIT PRICE ITEMS

A. Measure the Work using the unit of measure indicated in this Section for each unit price line item. Payment will be made only for the actual measured unit and/or computed length, area, solid contents, number, and weight unless other provisions are made in the Contract Documents. Payment on a unit price basis will not be made for Work outside dimensions shown in the Contract Documents.

B. Payment will be made for the actual quantity of Work completed and for materials and equipment stored during the payment period. Payment amount is the Work quantity measured per Paragraph A above multiplied by the unit price for that line item in the Agreement.

1.04 MEASUREMENT AND BASIS FOR PAYMENT FOR BASE ITEMS

A. Item 1 - Mobilization:

1. Refer to Section 8, Measurement and Payment.

2. This item shall consist of the mobilization and demobilization of equipment and supplies at the project site in preparation for beginning work on other contract items. Mobilization shall include, but is not limited to, bonds and insurance, the movement of

equipment, materials, supplies, etc. to the project site and the establishment of office and other facilities necessary prior to beginning the work. Demobilization shall include, but is not limited to, the removal of equipment, materials, supplies, project sign, offices and other facilities from the project site.

3. Payment for work covered under this section of the specifications will be made at the lump sum process bid for "Mobilization" which payment shall constitute full compensation for labor, equipment, tools, and incidentals necessary to complete the work specified herein.

4. Partial payments for the lump sum bid for "Mobilization" will be as follows. The adjusted contract amount for construction items as used below is defined as the total contract amount less than lump sum bid for Mobilization.

    a. When 1% of the adjusted contract amount for construction is earned, 50% of the mobilization lump sum bid will be paid.

    b. When 5% of the adjusted contract amount for construction is earned, 75% of the mobilization lump sum bid will be paid. Previous payment under this item will be deducted from the above amount.

    c. When 10% of the adjusted contract amount for construction is earned, 90% of the mobilization lump sum bid will be paid. Previous payment under this item will be deducted from the above amount.

5. Upon completion of all work under this contract, payment for the remainder of the lump sum bid for "Mobilization" will be made.

6. The amount bid for "Mobilization" shall not exceed five percent (5%) of the total amount bid exclusive of this item.

B. Item 2 – Trench Safety Program:

1. Refer to Section 8, Measurement and Payment.

2. Measurement and payment shall be at the unit price bid per linear foot and shall be full compensation for trench safety as outlined in the Specifications including but not limited to furnishing design, materials, tools, labor, equipment, and incidentals necessary, including removal of the system. The contractor shall estimate the quantity of trench safety and include that estimate in the Proposal. In no case shall the estimate quantity be less than 100 LF. Partial payment for trench safety shall be based on the total linear footage of pipe installed and backfilled.

C. Item 3 – Sodding and Topsoil:

1. Refer to Section 8, Measurement and Payment.

2. This item shall consist of the installation and maintenance the sodding and topsoil. This item shall include, but is not limited to, equipment, materials, supplies, etc. to meet the requirements noted in the plans and specifications.

D. Item 4 – Erosion Control:

1. Refer to Section 8, Measurement and Payment.

2. This item shall consist of the installation, maintenance, and removal of the erosion control system. Erosion control shall include, but is not limited to, equipment,

materials, supplies, etc. to meet the requirements noted in the plans and specifications.

3. Measurement and payment shall be at the at the lump sum process bid item “Erosion Control” which payment shall constitute full compensation for labor, equipment, tools, and incidentals necessary to complete the work specified herein.

E. Item 5 – Construction of the Rowlett Road Pump station Upper Pressure Plane Addition Improvements with VFD Complete and in place as shown in the plans and described in the specifications:

1. Measuring of payment is on a lump sum basis. Payment for this item will be based on the earned value of Work completed regarding the following 1850 gpm @ 180- ft Vertical Turbine Pump and 125 HP Motor, associated valves, piping, connections, appurtenances, motors, variable frequency drives, electrical equipment, electrical modifications, electrical conduit, instrumentation and limited SCADA & Control Provisions, and start up and testing. Installation shall be as shown on the plans and described in the specifications.

F. Item 6 – Matching to Reset/Level Existing RRUPP P-6 Pump Can Flange as Shown in the Plans and Described in the Specifications:

1. Measuring for payment is on a lump sum basis. Payment for item shall constitute full compensation for labor, equipment, tools, and incidentals necessary to complete the work specified herein.

G. Item 7 – 12-Inch Gate Valve:

1. Measuring for payment shall be at the unit price bid. Installation of the gate valve shall be as shown on the plans and described in the specifications.

H. Item 8 – 12-Inch AWWA C151 Ductile Iron Pipe (Yard Piping):

1. Measuring for payment is on a linear foot basis. Payment for mobilization will be based on the earned value of Work completed. Installation of the yard piping shall be as shown on the plans and described in the specifications.

I. Item 9 – 12-Inch x 12-Inch Tapping Sleeve:

1. Measuring for payment shall be at the unit price bid. Installation of the tapping sleeve shall be as shown on the plans and described in the specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 31 00 PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. Furnish resources required to complete the Project in accordance with the Contract Documents and within the Contract Times.

B. Construct Project in accordance with current safety practices.

C. Manage Site to allow access to Site and control construction operations.

D. Construct temporary facilities to provide and maintain control over environmental conditions at the Site. Remove temporary facilities when no longer needed.

1.02 STANDARDS

A. Perform Work to comply with:

1. Requirements of the Contract Documents;

2. Laws and Regulations; and

3. Specified industry standards.

1.03 DOCUMENTATION

A. Provide documents in accordance with Section 01 33 00 “Document Management.”

B. Provide copies of Supplier’s printed storage instructions prior to furnishing materials or products and installation instructions prior to beginning the installation.

C. Incorporate field notes, sketches, recordings, and computations made by the Contractor in Record Drawings per Section 01 31 13 “Project Administration.”

1.04 PERMITS

A. Obtain building permits for the Project from the local authorities having jurisdiction. Building permit fees will be waived by the Owner.

B. Obtain environmental permits required for construction at the Site.

C. Provide required permits for transporting heavy or oversized loads.

D. Provide other permits required to conduct any part of the Work.

E. Arrange for inspections and certification by agencies having jurisdiction over the Work and include the cost for these inspections and certifications in the Contract Price.

F. Make arrangements with private utility companies and pay fees associated with obtaining services or inspections.

G. Retain copies of permits and licenses at the Site and comply with all regulations and conditions of the permit or license.

1.05 SAFETY REQUIREMENTS

A. Manage safety to protect the safety and welfare of persons at the Site.

B. Provide safe access to move through the Site. Provide protective devices to warn and protect from hazards at the Site.

C. Provide safe access for those performing tests and inspections.

D. Maintain a supply of personal protective equipment for visitors to the Site.

E. Comply with latest provisions of the Occupational Health and Safety Administration (OSHA) and other Laws and Regulations.

F. Cooperate with accident investigations. Provide two copies of all reports, including insurance company reports, prepared concerning accidents, injuries, or deaths related to the Project to the Construction Manager as Record Data per Section 01 31 13 “Project Administration.”

1.06 ACCESS TO THE SITE

A. Maintain access to the facilities at all times. Do not obstruct roads, pedestrian walks, or access to the various buildings, structures, stairways, or entrances. Provide safe access for normal operations during construction.

B. Provide adequate and safe access for inspections. Leave ladders, bridges, scaffolding, and protective equipment in place until inspections have been completed. Construct additional safe access if required for inspections.

C. Use roadways for construction traffic only with written approval of the appropriate representatives of each entity. Roadways may not be approved for construction traffic. Obtain written approval to use roads to deliver heavy or oversized loads to the Site. Furnish copies of the written approvals to the Construction Manager as Record Data per Section 01 31 13 “Project Administration.”

1.07 CONTRACTOR’S USE OF THE SITE

A. Limit the use of Site for Work and storage to those areas designated on the Drawings or approved by the Construction Manager. Coordinate the use of the Site with the Construction Manager.

B. Provide security at the Site as necessary to protect against vandalism and loss by theft.

C. Park employees’ vehicles in designated areas only.

D. Obtain written permission of the property owner before entering privately-owned land outside of the Owner’s property, rights-of-way, or easements.

E. Cooperate with public and private agencies with facilities operating within the limits of the Project. Provide 48 hours’ notice to any applicable agency when Work is anticipated to proceed in the vicinity of any facility by using Texas 811 or 1-800-344-8377.

F. Conduct of Contractor’s or Subcontractor’s Employees:

1. Do not permit alcoholic beverages or illegal substances on the Site. Do not allow persons under the influence of alcoholic beverages or illegal substances to enter or

remain on the Site at any time. Persons on Site under the influence of alcoholic beverages or illegal substances will be permanently prohibited from returning to the Site. Criminal or civil penalties may also apply.

2. Do not allow the use of offensive language or sexual harassment in any form. These actions will cause immediate and permanent removal of the offender from the premises. Criminal or civil penalties may apply.

3. Require workers to wear clothing that is inoffensive and meets safety requirements. Do not allow sleeveless shirts, shorts, or any exceedingly torn, ripped, or soiled clothing to be worn on the Site.

4. Do not allow the use, possession, concealment, transportation, promotion, or sale of the following prohibited items anywhere on the Site:

    a. Firearms (including air rifles and pistols and BB or pellet guns) and ammunition;

    b. Bows, crossbows, arrows, bolts, or any other projectile weapons;

    c. Explosives of any kind, including fireworks;

    d. Illegal knives;

    e. Other weapons prohibited by state Laws and Regulations; and

    f. Any other item that has been designed or intended to be used as a weapon.

    No exceptions will be made for the possession of a firearm by a person that has a valid state-issued license to carry a firearm. Remove any of the prohibited items listed above from the Site immediately and permanently. Any person found to be in possession of any prohibited item must also be removed from the Site and may be reported to local law enforcement.

1.08 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. Examine the Site and review the available information concerning the Site. Locate utilities, underground facilities, and existing structures. Verify the elevations of the structures adjacent to excavations. Report any discrepancies from information in the Contract Documents to the Construction Manager before beginning construction.

B. Determine if existing structures, poles, piping, or other utilities at excavations will require relocation or replacement. Prepare a Plan of Action per Section 01 31 13 “Project Administration.” Coordinate Work with local utility company and others for the relocation or replacement.

C. Protect utilities, underground facilities and existing structures unless they are shown to be replaced or relocated on the Drawings. Restore damaged items to the satisfaction of the Owner and utility or property owner.

D. Carefully support and protect all structures and/or utilities so that there will be no failure or settlement where excavation or demolition endangers adjacent structures and utilities. Do not take existing utilities out of service unless required by the Contract Documents or approved by the Construction Manager. Notify and cooperate with the utility owner if it is necessary to move services, poles, guy wires, pipelines, or other obstructions.

E. Protect existing trees and landscaping at the Site. Mark trees that may be removed during construction and review with the Construction Manager for approval before removing. Protect trees to remain from damage limiting activity, including stockpiling of materials within the drip line of the tree.

F. Protect buildings from damage when handling material or equipment. Protect finished surfaces, including floors, doors, and jambs. Remove doors and install temporary wood protective coverings over jambs, if needed.

1.09 DISRUPTION TO SERVICES/CONTINUED OPERATIONS

A. Owner's facilities are to continue in service as usual during the construction unless noted otherwise. Owner or utilities must be able to operate and maintain the facilities. Keep disruptions to existing utilities, piping, process piping, or electrical services to a minimum.

1. Do not restrict access to critical valves, operators, or electrical panels.

2. Do not store material or products inside structures unless authorized by the Construction Manager.

3. Limit operations to the minimum amount of space needed to complete the specified Work.

4. Maintain storm sewers and sanitary sewers in service at all times. Provide temporary service around the construction or otherwise construct the Work in a manner that flow is not restricted.

B. Provide a Plan of Action in accordance with Section 01 35 00 "Special Procedures" if facilities must be taken out of operation.

1.10 FIELD VERIFICATION

A. Perform complete field measurements prior to purchasing products or beginning construction for products required to fit existing conditions.

B. Verify property lines, control lines, grades, and levels indicated on the Drawings.

C. Verify pipe class, equipment capacities, existing electrical systems, and power sources for existing conditions.

D. Check Shop Drawings and indicate the actual dimensions available where products are to be installed.

E. Include field measurements in Record Documents as required in Section 01 31 13 "Project Administration."

1.11 REFERENCE DATA AND CONTROL POINTS

A. Construction Manager will provide the following control points:

1. Base line or grid reference points for horizontal control.

2. Benchmarks for vertical control.

B. Locate and protect control points prior to starting the Work and preserve permanent reference points during construction. Designated control points may be on an existing

structure or monument. Do not change or relocate points without prior approval of the Construction Manager. Notify Construction Manager when a reference point is lost, destroyed, or requires relocation. Replace Project control points on the basis of the original survey. Control points or benchmarks damaged, disturbed or destroyed as a result of the Contractor's negligence will be restored by the Construction Manager. Owner will impose a set-off as compensation for the effort required.

C. Provide complete engineering layout of the Work needed for construction.

1. Provide competent personnel. Provide equipment including accurate surveying instruments, stakes, platforms, tools, and materials.

2. Provide Record Data per Section 01 31 13 "Project Administration" and measurements per standards.

1.12 DELIVERY AND STORAGE

A. Deliver products and materials to the Site in time to prevent delays in construction.

B. Deliver packaged products to Site in original undamaged containers with identifying labels attached. Open cartons as necessary to check for damage and to verify invoices. Reseal cartons and store properly until used. Leave products in original packages or other containers until installed. If original packages or containers are damaged, repackage in containers and include packing slips, labels and other information from the original packaging.

C. Deliver products that are too large to fit through openings to the Site in advance of the time enclosing walls and roofs are erected. Set in place, raised above floor on cribs or pallets.

D. Assume full responsibility for the protection and safekeeping of products stored at the Site.

E. Store products at locations acceptable to the Construction Manager and to allow Owner access to maintain and operate existing facilities.

F. Store products in accordance with the Supplier's storage instructions immediately upon delivery. Leave seals and labels intact. Arrange storage to allow access for maintenance of stored items and for inspection. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.

G. Provide additional storage areas as needed for construction. Store products subject to damage by elements in substantial weather-tight enclosures or storage sheds. Provide and maintain storage sheds as required for the protection of products. Provide temperature, humidity control, and ventilation within the ranges stated in the Supplier's instructions. Remove storage facilities at the completion of the Project.

H. Protect the pipe interior. Keep all foreign materials such as dirt, debris, animals, or other objects out of the pipe during the Work.

I. Provide adequate exterior storage for products that may be stored out-of-doors.

1. Provide substantial platforms, blocking, or skids to support materials and products above ground which has been sloped to provide drainage. Protect products from soiling or staining.

2. Cover products subject to discoloration or deterioration from exposure to the elements, with impervious sheet materials. Provide ventilation to prevent condensation below covering.

3. Store loose, granular materials on clean, solid surfaces, or on rigid sheet materials, to prevent mixing with foreign matter.

4. Provide surface drainage to prevent erosion and ponding of water.

5. Prevent mixing of refuse or chemically injurious materials or liquids with stored materials.

6. Pipes and conduits stored outdoors are to have open ends sealed to prevent the entrance of dirt, moisture, and other injurious materials. Protect PVC pipe from ultraviolet light exposure.

7. Store products to prevent wind damage.

J. Protect and maintain mechanical and electrical equipment in storage.

1. Provide Supplier's service instructions on the exterior of the package.

2. Service equipment on a regular basis as recommended by the Supplier. Maintain a log of maintenance services. Submit the log as Record Data Owner Specifications when Owner assumes responsibility for maintenance and operation.

3. Provide power to and energize space heaters for all equipment for which these devices are provided.

4. Provide temporary enclosures for all electrical equipment, including electrical systems on mechanical devices. Provide and maintain heat in the enclosures until equipment is energized.

K. Maintain storage facilities. Inspect stored products on a weekly basis and after periods of severe weather to verify that:

1. Storage facilities continue to meet specified requirements;

2. Supplier's required environmental conditions are continually maintained; and

3. Products that can be damaged by exposure to the elements are not adversely affected.

L. Replace any stored item damaged by inadequate protection or environmental controls.

M. Payment may be withheld for any products not properly stored.

1.13 CLEANING DURING CONSTRUCTION

A. Provide positive methods to minimize raising dust from construction operations and provide positive means to prevent air-borne dust from disbursing into the atmosphere. Control dust and dirt from demolition, cutting, and patching operations.

B. Clean the Site as Work progresses and dispose of waste materials, keeping the Site free from accumulations of waste or rubbish. Provide containers at the Site for waste collection. Do not allow waste materials or debris to blow around or off of the Site. Control dust from waste materials. Transport waste materials with as few handlings as possible.

C. Comply with Laws and Regulations. Do not burn or bury waste materials. Remove waste materials, rubbish, and debris from the Site and legally dispose of these at public or private disposal facilities.

1.14 MAINTENANCE OF ROADS, DRIVEWAYS, AND ACCESS

A. Maintain roads and streets in a manner that is suitable for safe operations of public vehicle during all phases of construction unless the Owner approves a street closing. Do not close public roads overnight. Coordinate and arrange for emergency vehicle access when streets are to be closed.

B. Submit a Notification by Contractor for Owner's approval of a street closing. The request must state:

1. The reason for closing the street.

2. How long the street will remain closed.

3. Procedures to be taken to maintain the flow of traffic.

C. Obtain permits and permissions of the entity that owns the road prior to any Work and provide a copy of the permit or permission Record Data per Section 01 31 13 "Project Administration."

D. Construct temporary detours, including by-pass roads around construction, with adequately clear width to maintain the free flow of traffic at all times. Maintain barricades, signs, and safety features around the detour and excavations. Maintain barricades, signs, and safety features around the Work in accordance with all provisions of the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

E. Assume responsibility for any damage resulting from construction along roads or drives.

1.15 BLASTING

A. Blasting is not allowed for any purpose.

1.16 ARCHAEOLOGICAL REQUIREMENTS

A. Cease operations immediately and contact the Owner for instructions if historical or archaeological artifacts are found during construction.

B. Conduct all construction activities to avoid adverse impact of the sites where significant historical or archaeological artifacts are found or identified as an area where other artifacts could be found.

1. Obtain details for working in these areas from regulatory agencies.

2. Maintain confidentiality regarding the site(s) of artifacts.

3. Adhere to the requirements of applicable local, state, and federal Laws and Regulations.

4. Notify the Construction Manager and any local, state, or federal agency as required by applicable Laws and Regulations.

C. Do not disturb archaeological sites.

1. Obtain the services of a qualified archaeological specialist to instruct construction personnel on how to identify and protect archaeological finds on an emergency basis.
2. Coordinate activities to permit archaeological work to take place within the area.
    a. Attempt to archaeologically clear areas needed for construction as soon as possible.
    b. Provide a determination of priority for such areas.

D. Assume responsibility for any unauthorized destruction that might result to such sites by construction personnel, and pay all penalties assessed by state or federal agencies for non-compliance with these requirements.

E. Contract Times will be modified to compensate for delays caused by such archaeological finds. No additional compensation will be paid for delays.

1.17 ENDANGERED SPECIES RESOURCES

A. Do not perform any activity that is likely to destroy or adversely modify the habitat or jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA) or applicable state Laws and Regulations.

B. Cease Work immediately in the area of the encounter and notify the Construction Manager if a threatened or endangered species is encountered during construction. Construction Manager will implement actions in accordance with the ESA and applicable state statutes. Resume construction in the area of the encounter when authorized to do so by the Construction Manager.

1.18 COORDINATION

A. Coordinate the efforts of various trades having interdependent responsibilities for Work.

B. Conceal ducts, pipes, wiring, and other non-finish items in finished areas, except as otherwise shown. Coordinate locations of concealed items with finish elements. Install access panel or doors where units requiring access for maintenance or operation are concealed behind finished surfaces.

C. Coordinate architectural reflected ceiling plans with the exact location of items installed in suspended ceilings. Request clarification from the Construction Manager prior to proceeding with fabrication or installation of an item if it appears that a conflict exists.

D. Coordinate the installation of items to be installed later, including:
1. Accepted alternates.
2. Products purchased using allowances.
3. Work by others.
4. Owner-supplied, Contractor-installed items.

E. Sequence, coordinate, and integrate the various elements of mechanical, electrical, and other systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical and electrical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction.
4. Coordinate the installation of required supporting devices, sleeves, embedded items, and other structural components to be set in concrete before concrete is placed.
5. Install systems, materials, and equipment to provide the maximum headroom possible where mounting heights are not detailed or dimensioned.
6. Coordinate the connection of systems with exterior underground and overhead utilities and services. Comply with the Laws and Regulations and requirements of franchise service companies. Provide required connection for each service.
7. Install systems, materials, and equipment to conform with approved Shop Drawings, Product Data, and Operation and Maintenance Data. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Adjust routing of piping, ductwork, utilities, and location of equipment as needed to resolve spatial conflicts between the various trades. Document changes in the indicated routings in the Record Documents per Owner Specification.
8. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components.
9. Install systems, materials, and equipment to facilitate servicing, maintenance, and repair or replacement of components.
10. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

1.19 CUTTING AND PATCHING

A. Perform cutting, fitting, and patching required to complete the Work or to:

1. Uncover Work to provide for installation of new Work or the correction of Defective Work.
2. Provide routine penetrations of non-structural surfaces for installation of mechanical, electrical, and plumbing Work.
3. Uncover Work that has been covered prior to observation by the Construction Manager.

B. Submit Notification by Contractor in accordance with Section 01 31 13 “Project Administration” to the Construction Manager in advance of performing any cutting which affects:

1. Work of any other contractor or the Owner;

2. Structural integrity of any structure or system of the Project;
3. Integrity or effectiveness of weather exposed or moisture resistant structure or systems;
4. Efficiency, operational life, maintenance, or safety of any structure or system; or
5. Appearance of any structure or surfaces exposed occasionally or constantly to view.

C. Include in request:
1. Location and description of affected Work;
2. Reason for cutting, alteration, or excavation;
3. Effect on the Work of any separate contractor or Owner;
4. Effect on the structural or weatherproof integrity of the Work;
5. Description of proposed Work, including:
a. Scope of cutting, patching, or alteration;
b. Trades that will perform the Work;
c. Products proposed for use; and
d. Extent of refinishing to be performed.
6. Alternatives to cutting and patching;
7. Written authorization from any separate contractor whose Work would be affected; and
8. Date and time Work will be uncovered or altered.

D. Inspect existing conditions prior to starting the Work, including elements subject to damage or movement during cutting and patching. Uncover elements where required for an adequate inspection. Notify the Construction Manager of any conditions that negatively impact the ability to perform cutting and patching. Contractor is deemed to have accepted the existing conditions and assumed the risk associated with completing the Work when cutting or patching is started after the inspection.

E. Provide adequate support to maintain the structural integrity of facilities, structures, or elements that could be affected by cutting, patching or installing new Work. Provide devices and methods to protect facilities, structures, or elements from damage that could be affected by Contractor's efforts. Provide protection from the weather for portions of the Project that may be exposed by cutting and patching.

F. Make cuts or penetrations using methods that prevent damage to other Work and provide proper surfaces for patching and repairs.

G. Fit and adjust installed products to comply with specified products, functions, tolerances, and finishes.

H. Patch or repair facilities, structures or elements to provide completed Work per the Contract Documents.

I. Fit Work air-tight to pipes, sleeves, ducts, conduit, and other penetrations through the surfaces. Where fire rated separations are penetrated, fill the space around the pipe with

materials with physical characteristics equivalent to fire resistance requirements of penetrated surface. Provide firestop inserts inside pipes, sleeves, ducts, conduit, and other penetrations when required by fire resistance requirements.

J. Patch finished surfaces and building components using new products specified for the original installation. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:

1. For continuous surfaces, refinish to the nearest intersection.
2. For an assembly, refinish the entire unit.

1.20 PRELIMINARY OCCUPANCY

A. Owner may deliver, install, and connect equipment, furnishings, or other apparatus in buildings or other structures. These actions do not indicate acceptance of any part of the building or structure and does not affect the start of warranties or correction periods.

B. Protect the Owner's property after installation is complete.

C. Owner may use any product for testing or to determine that the product meets the requirements of the Contract Documents. This use does not constitute acceptance by OPT. These actions do not indicate acceptance of any part of the product and does not affect the start of warranties or correction periods.

1.21 OCCUPANCY

A. Owner has the right to occupy or operate any portion of the Project that is ready for use after notifying the Contractor of its intent to do so.

B. Testing of equipment and appurtenances including specified test periods, training, and startup does not constitute acceptance for operation.

C. Owner may accept the facility for continued use after startup and testing at the option of the Owner. If acceptance is delayed at the option of the Owner, shut down facilities per approved operation and maintenance procedures.

D. The execution of bonds is understood to indicate the consent of the surety to these provisions for occupancy of the structures and use of equipment.

E. Provide an endorsement from the insurance carrier permitting occupancy of the structures and use of equipment during the remaining period of construction.

F. Conduct operations to ensure the least inconvenience to the Owner and general public.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 31 13 PROJECT ADMINISTRATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Administer contract requirements to construct the Project. Provide documentation per the requirements of this Section. Provide information as requested by the OPT.

1.02 DOCUMENTATION

A. Provide documents in accordance with Section 01 33 00 “Document Management.”

1.03 COMMUNICATION DURING THE PROJECT

A. Construction Manager is to be the first point of contact for all parties on matters concerning this Project.

B. Construction Manager will coordinate correspondence concerning:

1. Contract administration;
2. Clarification and interpretation of the Contract Documents;
3. Contract modifications;
4. Observation of Work and testing; and
5. Claims.

C. Construction Manager will normally communicate only with the Contractor. Any required communication with Subcontractors or Suppliers will only be with the direct involvement of the Contractor.

D. Direct written communications to the Construction Manager at the address indicated at the pre-construction conference. Include the following with communications as a minimum:

1. Name of the Owner;
2. Project name;
3. Contract title;
4. Project number;
5. Date; and
6. A reference statement.

E. Submit communications on the forms referenced in this Section or in Section 01 33 00 “Document Management.”

1.04 PROJECT MEETINGS

A. Pre-Construction Conference:

1. Attend a pre-construction conference;
2. The location of the conference will be determined by the Construction Manager;

3. The time of the conference will be determined by the Construction Manager, but will be after the Notice of Award is issued and not later than 15 days after the Notice to Proceed is issued;
4. OPT, Contractor's project manager and superintendent, representatives of utility companies, and representatives from major Subcontractors and Suppliers may attend the conference; and
5. Provide and be prepared to discuss:
    a. Preliminary construction schedule per Section 01 33 05 "Construction Progress Schedule";
    b. Preliminary Schedule of Documents per Section 01 33 00 "Document Management";
    c. Schedule of Values and anticipated schedule of payments per Section 01 29 00 "Application for Payment Procedures";
    d. List of Subcontractors and Suppliers;
    e. Contractor's organizational chart as it relates to this Project; and
    f. Letter indicating the agents of authority for the Contractor and the limit of that authority with respect to the execution of legal documents, contract modifications, and payment requests.

B. Progress Meetings:
1. Attend meetings with the Construction Manager, Design Professional, and Owner.
    a. Meet monthly or as requested by the Construction Manager to discuss the Project.
    b. Meet at the Site or other location as designated by the Construction Manager.
    c. Contractor's superintendent and other key personnel are to attend the meeting. Other individuals may be requested to attend to discuss specific matters.
    d. Notify the Construction Manager of any specific items to be discussed a minimum of 1 week prior to the meeting.
2. Provide information as requested by the Construction Manager, Design Professional or Owner concerning this Project. Prepare to discuss:
    a. Status of overall project schedule;
    b. Contractor's detailed schedule for the next month;
    c. Anticipated delivery dates for equipment;
    d. Coordination with the Owner;
    e. Status of documents;
    f. Information or clarification of the Contract Documents;
    g. Claims and proposed modifications to the Contract;
    h. Field observations, problems, or conflicts; and

i. Maintenance of quality standards.

3. Construction Manager will prepare a record of meeting proceedings. Review the record of the meeting and notify the Construction Manager of any discrepancies within 10 days of the date the record of the meeting is provided. The record will not be corrected after the 10 days have expired. Corrections will be reflected in the record of the following meeting.

C. Pre-Documentation and Pre-Installation Meetings:

1. Conduct pre-documentation and pre-installation meetings as required in the individual technical Specifications or as determined necessary by the Construction Manager (for example, instrumentation, roofing, concrete mix design, etc.).

2. Set the time and location of the meetings when ready to proceed with the associated Work. Submit a Notification by Contractor in accordance with Paragraph 1.07 for the meeting 2 weeks before the meeting. OPT must approve of the proposed time and location.

3. Attend the meeting and require the participation of appropriate Subcontractors and Suppliers in the meeting.

4. Construction Manager will prepare a record of meeting proceedings. Review the record of the meeting and notify the Construction Manager of any discrepancies within 10 days of the date the record of the meeting is provided. The record will not be corrected after the 10 days have expired. Corrections will be reflected in the record of the following meeting.

D. Weekly Coordination Meetings: Meet on a weekly basis with the Construction Manager or designated on-site representative of the OPT to discuss Work planned for the following week, review coordination issues, testing required, or other issues. Records of these meetings are not required.

1.05 REQUESTS FOR INFORMATION

A. Submit a Request for Information to the Construction Manager to obtain additional information or clarification of the Contract Documents.

1. Submit a separate Request for Information for each item on the form provided by the Construction Manager.

2. Attach adequate information to permit a response without further clarification. Construction Manager will return requests that do not have adequate information to the Contractor for additional information. Contractor is responsible for all delays resulting from multiple reviews due to inadequate information.

3. A response will be made when adequate information is provided. The response will be made on the Request for Information form provided by the Construction Manager.

B. Response to a Request for Information is given to provide additional information, interpretation, or clarification of the requirements of the Contract Documents, and does not modify the Contract Documents.

1. Submit a Change Proposal per Section 01 26 00 “Change Management” if a contract modification is suggested or required.

C. Use the Decision Register to document decisions made at meetings and actions to be taken in accordance with Paragraph 1.06.

D. Use the Action Item Register to document assignments for actions to be taken in accordance with Paragraph 1.06.

1.06 DECISION AND ACTION ITEM REGISTER

A. Construction Manager will maintain a Decision Register to document key decisions made during meetings, telephone conversations, or visits to the Site using the format provided by the Construction Manager:

1. Review the Decision Register prior to each regular meeting.

2. Report any discrepancies to the Construction Manager for correction or discussion at the next monthly meeting.

B. Construction Manager will maintain an Action Item Register in conjunction with the Decision Register to track assignments made during meetings, telephone conversations or visits to the Site using the format provided by the Construction Manager:

1. Review the Action Item Register prior to each regular meeting.

2. Report actions taken after the previous progress meeting on items in the register assigned to the Contractor or through the Contractor to a Subcontractor or Supplier to the Construction Manager. Report on status of progress 1 week prior to each progress meeting established in Paragraph 1.04 to allow Construction Manager to update the register prior to the Progress Meetings.

3. Be prepared to discuss the status at each meeting.

C. Decisions or action items in the register that require a change in the Contract Documents will have the preparation of a Modification as an action items if appropriate. The Contract Documents can only be changed by a Modification.

1.07 NOTIFICATION BY CONTRACTOR

A. Notify the Construction Manager of:

1. Need for testing;

2. Intent to work outside regular working hours;

3. Request to shut down facilities or utilities;

4. Proposed utility connections;

5. Required observation by Construction Manager, Engineer, or inspection agencies prior to covering Work; and

6. Training.

B. Provide notification a minimum of 2 weeks in advance to allow OPT time to respond appropriately to the notification.

C. Use the Notification by Contractor form provided by the Construction Manager.

1.08 REQUESTS FOR MODIFICATIONS

A. Submit requests for Modifications per Section 01 26 00 “Change Management.”

1.09 PLAN OF ACTION

A. Submit a written Plan of Action for approval for shutting down essential services. These include:
   1. Electrical power;
   2. Control power;
   3. Process piping;
   4. Process equipment;
   5. Communications equipment; and
   6. Other designated functions.

B. Describe the following in the Plan of Action:
   1. Scheduled dates for construction;
   2. Work to be performed;
   3. Utilities, piping, or services affected;
   4. Length of time the service or utility will be disturbed;
   5. Procedures to be used to carry out the Work;
   6. Plan of Action to handle emergencies;
   7. List of manpower, equipment, and ancillary supplies;
   8. Backups for key pieces of equipment and key personnel; and
   9. Contingency plan that will be used if the original schedule cannot be met.

C. Submit plan 2 weeks prior to beginning the Work.

1.10 RECORD DATA

A. Submit information required by the Contract Documents that is not related to a product as Record Data using the form provided by the Construction Manager.

1.11 RECORD DOCUMENTS

A. Maintain one complete set of printed Record Documents at the Site including:
   1. Drawings;
   2. Specifications;
   3. Addenda;
   4. Modifications;
   5. Product Data and approved Shop Drawings;

6. Construction photographs;
7. Test Reports;
8. Clarifications and other information provided in Request for Information responses; and
9. Reference standards.

B. Store printed Record Documents and Samples in the Contractor's field office.
1. Record Documents are to remain separate from documents used for construction.
2. Provide files and racks for the storage of Record Documents.
3. Provide a secure storage space for the storage of Samples.
4. Maintain Record Documents in clean, dry, legible conditions, and in good order.
5. Make Record Documents and Samples available at all times for inspection by the OPT.

C. Maintain an electronic record of Specifications and Addenda to identify products provided in PDF format.
1. Reference the Product Data number, Shop Drawing number, and O&M manual number for each product and item of equipment furnished or installed.
2. Reference Modifications by type and number for all changes.

D. Maintain an electronic record of Drawings in PDF format.
1. Reference the Product Data number, Shop Drawing number, and O&M manual number for each product and item of equipment furnished or installed.
2. Reference Modifications by type and number for all changes.
3. Record information as construction is being performed. Do not conceal any Work until the required information is recorded.
4. Mark drawings to record actual construction.
    a. Depths of various elements of the foundation in relation to finished first floor datum or the top of walls.
    b. Horizontal and vertical locations of underground utilities and appurtenances constructed, and existing utilities encountered during construction.
    c. Location of utilities and appurtenances concealed in the Work. Refer measurements to permanent structures on the surface. Include the following equipment:
        1) Piping;
        2) Ductwork;
        3) Equipment and control devices requiring periodic maintenance or repair;
        4) Valves, unions, traps, and tanks;
        5) Services entrance;
        6) Feeders; and

7) Outlets.

d. Changes of dimension and detail.

e. Changes by Modifications.

f. Information in Requests for Information or included in the Decision Register.

g. Details not on the original Drawings. Include field verified dimensions and clarifications, interpretations, and additional information issued in response to Requests for Information.

5. Mark Drawings with the following colors:

a. Highlight references to other documents, including Modifications in blue.

b. Highlight mark ups for new or revised Work (lines added) in yellow.

c. Highlight items deleted or not installed (lines to be removed) in red.

d. Highlight items constructed per the Contract Documents in green.

6. Submit Record Documents to Construction Manager for review and acceptance 30 days prior to Final Completion of the Project.

E. Applications for Payment will not be recommended for payment if Record Documents are found to be incomplete or not in order. Final payment will not be recommended without complete Record Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 33 00 DOCUMENT MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Submit documentation as required by the Contract Documents and as requested by the Construction Manager.

B. Use the Project Management Information System (PMIS) provided by the Construction Manager. Software for the PMIS is FNiManager which has the following system requirements:

1. Operating Systems: Windows 7 or later and OS X v10.8 or later.

2. Supported Internet Browsers: Internet Explorer 11.0 or later, Google Chrome 70.0 or later, Firefox 63.0 or later, Safari 11.0 or later, and Microsoft Edge 17.0 or later.

3. Screen Resolution: The recommended screen resolution is 1280 x 1024 or higher. The minimum screen resolution required to support all features is 1024 x 768.

1.02 QUALITY ASSURANCE

A. Submit legible, accurate, complete documents presented in a clear, easily understood manner. Documents not meeting these criteria will be returned without review as “Not Approved.”

1.03 CONTRACTOR’S RESPONSIBILITIES

A. Review documents prior to submission. Make certifications as required by the Contract Documents and as indicated on Construction Manager provided forms.

B. Provide a Schedule of Documents to list the documents that are to be submitted and the dates on which documents are to be sent to the Construction Manager for review. Use the form provided by the Construction Manager for this list.

C. Incorporate the dates for processing documents into the Progress Schedule required by Section 01 33 05 “Construction Progress Schedule.”

1. Provide documents in accordance with the schedule so construction of the Project is not delayed.

2. Allow a reasonable time for the review of documents when preparing the Progress Schedule. Assume a 14-day review cycle for each document unless a longer period of time is indicated in the Contract Documents or agreed to by Construction Manager and Contractor.

3. Schedule delivery of review documents to provide all information for interrelated Work at one time.

4. Allow adequate time for processing documents so construction of the Project is not delayed.

1.04 FORMS AND WORKFLOWS

A. Use the forms or workflow process provided by the Construction Manager for project documentation.

1.05 DOCUMENT PREPARATION AND DELIVERY PROCEDURES

A. Deliver documents in electronic format as directed by the Construction Manager.

1. Do not leave any blanks incomplete. If information is not applicable, enter NA in the space provided.

2. Deliver all documents in Portable Document Format (PDF).

a. Create PDF document using Bluebeam Revu software.

b. Create PDF documents from native format files unless files are only available from scanned documents.

c. Rotate pages so that the top of each document appears at the top of the monitor screen when opened in PDF viewing software.

d. Provide PDF document with adequate resolution to allow documents to be printed in a format equivalent to the document original. Documents are to be scalable to allow printing on standard 8-1/2 x 11 or 11 x 17 paper.

e. Submit color PDF documents where color is required to interpret the document.

f. Create or convert documents to allow text to be selected for comments or searched using text search features. Run scanned documents through Optical Character Recognition (OCR) software if necessary.

g. Flatten markups in documents to prevent markups made by Contractor from being moved or deleted. Flatten documents to allow markup recovery.

h. Use Bluebeam Revu software to reduce file size using default settings except the option for “Drop Metadata”. Uncheck the “Drop Metadata” box when reducing file size.

i. Add footers to each document with the name of the Project.

1.06 DOCUMENT NUMBERING

A. Assign a document number to the Contractor originated document to allow tracking of the document during the review process.

1. Assign the number consisting of a prefix, a sequence number, and a letter suffix. Prefixes will be as follows:

Prefix	Description
AP	Application for Payment
CP	Change Proposal
CTR	Certified Test Report
EIR	Equipment Installation Report
GD	Graphic Documentation

Prefix	Description
NBC	Notification by Contractor
O&M	Operation and Maintenance Manuals
PD	Product Data
RD	Record Data
RFI	Request for Information
SD	Shop Drawing
SCH	Schedule of Progress

2. Issue sequence numbers in chronological order for each type of document as directed by the Construction Manager.

3. Issue numbers for resubmittals that have the same number as the original document followed by an alphabetical suffix indicating the number of times the same document has been sent to the Construction Manager for processing. For example: SD-025 A represents Shop Drawing number 25 and the letter "A" designates this is the second time this document has been sent for review.

4. Clearly note the document number on each page or sheet of the document.

5. Correct assignment of numbers is essential since different document types are processed in different ways.

B. Include reference to the Drawing number and/or Specification Section, detail designation, schedule, or location that corresponds with the data submitted on the Document Transmittal form. Other identification may also be required, such as layout drawings or schedules to allow the reviewer to determine where a particular product is to be used.

1.07 DOCUMENTATION

A. Furnish documents as indicated in Section 01 33 01 "Document Register" or in the individual Specification Sections. Submit documents per the procedures described in the Contract Documents.

B. Submit documents per the Specification Sections shown in the following table:

Document Type	Specification Section
Application for Payment	01 29 00
Certified Test Report	01 33 02 for approval of product 01 40 00 to demonstrate compliance
Change Management	01 26 00
Equipment Installation Report	01 75 00
Graphic Documentation	01 33 06
Notification by Contractor	01 31 13
Operation & Maintenance Manuals	01 33 04
Product Data	01 33 03
Progress Schedules	01 33 05
Record Data	01 31 13
Request for Information	01 31 13
Schedule of Values	01 29 00

Document Type	Specification Section
Shop Drawing	01 33 02
Substitutions	01 26 00
Suppliers and Subcontractors	01 31 13 01 33 03

1.08 Electronic Documents Protocol

A. The parties shall follow the provisions in this Section, referred to as the Electronic Documents Protocol ("EDP"), for exchange of electronic transmittals.

B. Basic Requirements:

1. Except as otherwise stated elsewhere in the Contract Documents, the OPT and Contractor will send and accept Electronic Documents sent by Electronic Means using the protocols provided in this Section.

2. The contents of the information in any Electronic Document will be the responsibility of the transmitting party. Electronic Documents may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, and are subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

3. Provisions of this Contract regarding Electronic Documents must be incorporated into other agreements or subcontracts on the Project. Nothing in this paragraph reduces or eliminates requirements:

a. to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations;

b. to comply with any applicable Law or Regulation governing the signing and sealing of design documents and related Modifications or the signing and electronic transmission of any other documents; or

c. to comply with the notice requirements.

4. When sending Electronic Documents by Electronic Means the sending party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or sending Electronic Documents.

C. System Infrastructure for Electronic Document Exchange:

1. Contractor will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost. System Infrastructure must comply with these requirements.

2. The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 100 MB. Attachments larger than that may be exchanged in parts or by using large file transfer functions or physical media.

3. Contractor assumes full and complete responsibility for its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying,

licensing, or otherwise enabling its System Infrastructure, including operating systems and software.

4. Contractor is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.
5. Contractor will operate and maintain industry-standard, industry-accepted, ISO standard, commercial-grade security software and systems that are intended to protect others from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. Contractor will not be liable to others for any breach of system security to the extent that Contractor maintains and operates required security software and systems.
6. In the case of disputes, conflicts, or modifications to the use of Electronic Documents required to address issues affecting System Infrastructure, Contractor and OPT will cooperatively resolve the issues; but, failing resolution, OPT is authorized to make and require reasonable and necessary changes meet its original intent. Contractor may submit a Change Proposal if the changes cause additional cost or time to Contractor that could not have reasonably been anticipated.
7. Contractor and OPT are both responsible for their own back-up and archive of documents sent and received during the term of the contract. Contractor and OPT remain solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract as each party deems necessary for its own purposes.
8. If a Contractor or OPT receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.
9. OPT will operate a project information management system (Project Website) for use of OPT and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this Contract, use of the Project Website will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information.

D. Software Requirements:

1. OPT and Contractor will each acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic

Documents received from the other party (and if relevant from third parties), using the following software formats:

Document	Document Format
Email	.htm, .rtf, or .txt without formatting that impair legibility of content on screen or in printed copies
Submittals	Bluebeam PDF
Applications for Payment	Bluebeam PDF and Microsoft® Excel
Progress Schedules	PDF and Schedule in Schedule in Native Format
Layouts and drawings to be submitted to Owner for future use and modification	Autodesk® AutoCAD .dwg format
Document submitted to OPT for future word processing use and modification	Microsoft® Word
Spreadsheets and data submitted to OPT for future data processing use and modification	Microsoft® Excel
Photographs	.jpg or .jpeg
Videos	.mp4, .mpeg, or .avi

2. Software will be the version currently published at the time Contract is signed, unless a specific software version is listed in the Supplementary Conditions. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or convert to comply with this Section.

3. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

E. Requests by Contractor for Electronic Documents in Other Formats:

1. Release of any Electronic Documents developed during the design process (including Contract Documents, Technical Data, Drawings, and computer models) in formats other than those identified in this Section will be at the discretion of the OPT.

2. To the extent determined by OPT, release of Electronic Documents and other project information requested by Contractor (“Request”) in formats other than those identified in this Section will be subject to the provisions of Owner’s response to the Request, and to the following conditions:

a. The content included in the Electronic Documents covered by the Request was prepared by Design Professional as an internal working document or electronic computer model solely for Design Professional’s purposes and not for any construction processes and is being provided to Contractor on an “AS IS” basis without any warranties of any kind, including, any implied warranties of fitness

for any purpose. Contractor is advised and acknowledges that the content may not be suitable for Contractor's application or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Design Professional to Contractor under the Request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and Contractor waives any claims against the Design Professional or Owner arising from use of data in Electronic Documents covered by the Request.

c. **CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND DESIGN PROFESSIONAL AND THEIR SUBCONSULTANTS FROM ALL CLAIMS, DAMAGES, LOSSES, AND EXPENSES, INCLUDING ATTORNEYS' FEES AND DEFENSE COSTS ARISING OUT OF OR RESULTING FROM THE CONTRACTOR'S USE, ADAPTATION, OR DISTRIBUTION OF ANY ELECTRONIC DOCUMENTS PROVIDED UNDER THE REQUEST.**

d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Design Professional, unless such distribution is specifically identified in the Request and is limited to the Contractor's subcontractors. Contractor warrants that subsequent use by the Contractor's subcontractors complies with all terms of the Contract Documents and the Owner's response to Request.

3. In the event that Owner elects to provide or directs Design Professional to provide to Contractor any Contractor-requested Electronic Document versions of project information that is not explicitly identified in the Contract Documents as being available to Contractor, Owner shall be reimbursed by Contractor on an hourly basis for any costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Design Professional in accordance with the General Conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 33 02 SHOP DRAWINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Shop Drawings are required for those products that cannot adequately be described in the Contract Documents to allow fabrication, erection, or installation of the product without additional detailed information from the Supplier.

B. Submit Shop Drawings as required by the Contract Documents and as reasonably requested by the Construction Manager to:

1. Record the products incorporated into the Project;

2. Provide detailed information for the products proposed for the Project regarding their fabrication, installation, commissioning, and testing; and

3. Allow the Design Professional to advise the Owner if products proposed for the Project by the Contractor conform, in general, to the design concepts of the Contract Documents.

C. Contractor's responsibility for full compliance with the Contract Documents is not relieved by the review of Shop Drawings, Samples, or mockups.

D. Submit a Change Proposal per Section 01 26 00 "Change Management" to request modifications to the Contract Documents, including those for approval of "or equal" products when specifically allowed by the Contract Documents or as a substitution for specified products or procedures. Deviations from the Contract Documents can only be approved by Change Order or Field Order.

1.02 QUALITY ASSURANCE

A. Submit legible, accurate, and complete documents presented in a clear, easily understood manner. Shop Drawings not meeting these criteria will not be approved.

B. Demonstrate that the proposed products are in full compliance with the design criteria and requirements of the Contract Documents, or will be if deviations requested per Paragraph 1.11 are approved.

C. Furnish and install products that fully comply with the information included in the Shop Drawings.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Shop Drawings are required for the following items:

Specification Section	Shop Drawing Description
03 30 00.01	Cast-In-Place Concrete
05 50 00	Metal Fabrications
09 96 00.01	High-Performance Coating
26 01 26	Testing of Electrical Systems
26 05 00	Common Work Results for Electrical

Specification Section	Shop Drawing Description
26 05 19	Low-Voltage Electrical Power Conductors and Cables
26 05 23	Control-Voltage Electrical Power Cables
26 05 26	Grounding and Bonding for Electrical Systems
26 05 29	Hangers and Supports for Electrical Systems
26 05 33	Raceways and Boxes for Electrical Systems
26 28 16	Identification for Electrical Systems
26 05 73.01	Electrical Power System Studies
26 28 16	Enclosed Switches and Circuit Breakers
26 29 23	Variable Frequency Motor Controllers
31 23 23.34	Flowable Fill
33 05 01.02	Ductile Iron Pipe and Fittings
33 05 05.31	Hydrostatic Testing
33 11 13.13	Steel Pipe and Fittings
33 10 13	Disinfection of Water Utility Distribution
40 05 43	Check Valves
40 05 61	Gate Valves
40 05 64	Butterfly Valves
40 05 97	Identification for Process Piping and Equipment
40 73 13	Pressure Gauges
40 90 01	Instrumentation
40 90 02	Supervisory Control and Data Acquisition (SCADA) System
43 24 13	Vertical Centrifugal Pumping Units – Line Shaft Type
44 00 00.02	Outside Piping Insulation

B. Include Shop Drawings in the Document Register required by Section 01 33 00 “Document Management” to indicate the Shop Drawings to be submitted, the dates on which Shop Drawings are to be sent to the Construction Manager for review, and proposed dates that the product will be incorporated into the Project.

C. Incorporate the dates for processing Shop Drawings into the Progress Schedule required by Section 01 33 05 “Construction Progress Schedule.”

1. Submit Shop Drawings in accordance with the schedule so construction of the Project is not delayed.
2. Submit Shop Drawings for interrelated Work at one time.
3. Allow adequate time for ordering, fabricating, delivering, and installing products so construction of the Project is not delayed.

D. Complete the following before submitting a Shop Drawing or Sample:

1. Prepare and review the Shop Drawing or Sample. Coordinate the Shop Drawing or Sample with other Shop Drawings and Samples, with the requirements of the Work, and the Contract Documents;

2. Determine and verify specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to Shop Drawings and Samples;

3. Determine and verify the suitability of materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

4. Determine and verify information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

E. Determine and verify:

1. Field measurements, quantities, and dimensions are shown on the Shop Drawing and are accurate;

2. Location of existing structures, utilities, and equipment related to the Shop Drawing have been shown and conflicts between the products, existing structures, utilities, and equipment have been identified;

3. Conflicts that impact the installation of the products have been brought to the attention of the Construction Manager;

4. Shop Drawing is complete for its intended purpose; and

5. Conflicts between the Shop Drawing related to the various Subcontractors and Suppliers have been resolved.

F. Review Shop Drawings prior to submitting to the Construction Manager. Certify that all Shop Drawings have been reviewed by the Contractor and are in strict conformance with the Contract Documents as modified by Addenda, Change Order, Field Order, or Contract Amendment when submitting Shop Drawings except for deviations specifically brought to the Construction Manager's attention on an attached Shop Drawing Deviation Request form in accordance with Paragraph 1.11.

G. Fabrication or installation of any products prior to the approval of Shop Drawings is done at the Contractor's risk. Defective products may be rejected at the Owner's option.

H. Payment will not be made for products for which Shop Drawings or Samples are required until these are approved by the Construction Manager and Design Professional.

1.04 DOCUMENTATION

A. Provide adequate information in Shop Drawings and with Samples so the Design Professional can:

1. Assist the Owner in selecting colors, textures, or other aesthetic features.

2. Compare the proposed features of the product with the specified features and advise Owner that the product does, in general, conform to the Contract Documents.

3. Compare the performance features of the proposed product with those specified and advise the Owner that the product does, in general, conform to the performance criteria specified in the Contract Documents.

4. Review required certifications, guarantees, warranties, and service agreements for compliance with the Contract Documents.

B. Include a complete description of the material or equipment to be furnished, including:

1. Type, dimensions, size, arrangement, model number, and operational parameters of the components;

2. Weights, gauges, materials of construction, external connections, anchors, and supports required;

3. Performance characteristics, capacities, engineering data, motor curves, and other information necessary to allow a complete evaluation of mechanical components;

4. All applicable standards;

5. Fabrication and installation drawings, setting diagrams, manufacturing instructions, templates, patterns, and coordination drawings;

6. Wiring and piping diagrams and related controls;

7. Mix designs for concrete, asphalt, or other materials proportioned for the Project; and

8. Complete and accurate field measurements for products which must fit existing conditions. Indicate on the document that the measurements represent actual dimensions obtained at the Site.

C. Submit Shop Drawings that require coordination with other Shop Drawings for fabrication at the same time. Shop Drawings requiring coordination with other Shop Drawings will not be approved until a complete package is submitted, unless approved by the Construction Manager.

D. Submit information for all of the components and related equipment required for a complete and operational system in one Submittal.

1. Include electrical, mechanical, and other information required to indicate how the various components of the system function together as a system.

2. Provide certifications, warranties, and written guarantees and service contracts with the document package for review when these are required.

1.05 SPECIAL CERTIFICATIONS AND REPORTS

A. Provide all required special certifications, reports, and other documentation with the Shop Drawings as specified in the individual Specification Sections which may include:

1. Certified Test Reports (CTR): A report prepared by an approved testing agency giving results of tests performed on products to indicate their compliance with the Specifications. This report is to demonstrate that the product, when installed, will meet the requirements of the Contract Documents and is part of the Shop Drawing. Field tests may be performed by the Owner to determine that in place materials or products meet the same quality as indicated in the CTR submitted as part of the Shop Drawing.

2. Certification of Local Field Service (CLS): A certified letter stating that field service is available from a factory or supplier approved service organization located within a

300-mile radius of the Site. Include the names, addresses, and telephone numbers of approved service organizations with the certificate.

3. Certification of Adequacy of Design (CAD): A certified letter from the manufacturer of the equipment stating that the equipment has been designed to be structurally stable and to withstand all imposed loads without deformation, failure, or adverse effects to the performance and operational requirements of the unit. The letter must state that mechanical and electrical components have been adequately sized to be fully operational for the conditions specified or normally encountered by the product's intended use.

4. Certification of Applicator/Subcontractor (CSQ): A certified letter stating that the applicator or subcontractor proposed to perform a specified function is duly designated as factory authorized and trained for the application of the specified product.

1.06 WARRANTIES AND SERVICE AGREEMENTS

A. Provide warranties and service agreements per Section 01 78 36 "Warranties and Service Agreements."

1.07 WARRANTIES AND GUARANTEES

A. Provide all required warranties, guarantees, and related documents with the Shop Drawing. The effective date of warranties and guarantees will be the date of Substantial Completion.

B. Identify all extended warranties which are defined as any guarantee of performance for the product or system beyond the one-year correction period described in the General Conditions. Issue the warranty certificate in the name of the Owner. Provide a warranty bond for extended warranties if required by the individual Specification Sections.

C. Include an additional copy of equipment warranties in operation and maintenance manuals.

D. Provide a copy of all warranties in a separate document in accordance with Section 01 70 00 "Execution and Closeout Requirements."

1.08 EXTENDED SERVICE AGREEMENTS

A. Provide Extended Service Agreements and related documents with the Product Data. An Extended Service Agreement is a contract between the Owner and an approved Subcontractor or Supplier to provide service and or maintenance beyond that required to fulfill requirements for warranty repairs, or to perform routine maintenance for a definite period beyond the one-year correction period specified in the General Conditions.

B. An Extended Service Agreement does not relieve the Contractor from obligations under the one-year correction period or warranty provisions specified in the General Conditions.

C. An Extended Service Agreement does not relieve the Contractor from obligations under the maintenance bond, if a maintenance bond is required by the Contract.

D. Requirements for the Extended Service Agreement are described in the Specification Sections for each piece of equipment or system requiring an Extended Service Agreement.

E. Enter into a contract with the service provider and assign the service contract to the Owner on the date Substantial Completion. Once assigned to the Owner, Contract requirements for the Extended Service Agreement will be complete and will not extend the Contract between the Owner and Contractor.

F. Owner may require that a performance bond be provided for the Extended Service Agreement. Provide a separate bond meeting the same requirements as those for the Contractor's performance bond if required. The bond will be in the amount of the Extended Service Agreement.

G. Include an additional copy of Extended Service Agreements in operation and maintenance manuals.

H. Provide a copy of Extended Service Agreements in a separate document in accordance with Section 01 70 00 "Execution and Closeout Requirements."

1.09 SHOP DRAWING SUBMITTAL PROCEDURES

A. Submit Shop Drawings to the Construction Manager. Send all documents in digital format for processing.

1. Provide all information requested. Do not leave any blanks incomplete. If information is not applicable, enter NA in the space provided.

2. Submit all documents in Portable Document Format (PDF) as required by Section 01 33 00 "Document Management." Provide color PDF documents where color is required to interpret the Shop Drawing. Provide Samples and color charts per Paragraph 1.10.

3. Submit each specific product, class of material, or equipment system separately so these can be tracked and processed independently. Do not submit Shop Drawings for more than one independent system in the same Submittal.

4. Submit items specified in different Specification Sections separately unless they are part of an integrated system.

5. Define abbreviations and symbols used in Shop Drawings.

a. Use terms and symbols in Shop Drawings consistent with the Contract Drawings.

b. Provide a list of abbreviations and their meaning as used in the Shop Drawings.

c. Provide a legend for symbols used on Shop Drawings.

6. Mark Shop Drawings to reference:

a. Related Specification Sections;

b. Drawing number and detail designation;

c. Equipment designation or name;

d. Schedule references;

e. System into which the product is incorporated; and

f. Location where the product is incorporated into the Project.

B. Use the following conventions to markup Shop Drawings for review:

1. Make comments and corrections in the color blue. Add explanatory comments to the markup.

2. Highlight items in black (redact) that are not being furnished when the Supplier's standard drawings or information sheets are provided so that only the products to be provided are in their original color.

3. Make comments in yellow where selections or decisions by the Design Professional are required, but such selections do not constitute a deviation from the Contract Documents. Add explanatory comments to the markup to indicate the action requested of the Design Professional.

4. Make comments in orange that are deviation requests. Include the deviation request number on the Shop Drawing that corresponds to the deviation request on the Shop Drawing Deviation Request form. Include explanatory comments in the Shop Drawing Deviation Request form.

5. Mark dimensions with the prefix "FD" to indicate field verified dimensions on the Shop Drawings.

C. Designate a document as requiring priority treatment to place the review of the Shop Drawing ahead of other Shop Drawings previously delivered. Shop Drawings are typically reviewed in the order received, unless Contractor requests that a different priority be assigned. Priority Shop Drawings will be reviewed before other Shop Drawings already received but not yet reviewed. Use of this priority designation for Shop Drawings may delay the review of Shop Drawings previously submitted. Contractor is responsible for delays resulting from the use of the priority designation status on Shop Drawings.

D. Complete the certification required by Paragraph 1.03.G.

1.10 SAMPLE AND MOCKUP SUBMITTAL PROCEDURES

A. Submit color charts and Samples for every product requiring color, texture, or finish selection.

1. Submit color charts and Samples only after Shop Drawings for the products have been approved.

2. Deliver all color charts and Samples at one time.

3. Provide Samples of adequate size to clearly illustrate the functional characteristics of the product, with integrally related parts and attachment devices.

4. Indicate the full range of color, texture, and patterns.

5. Deliver color charts and Samples to the field office and store for the duration of the Project.

6. Notify the Construction Manager that color charts and Samples have been delivered for approval using the Notification by Contractor form.

7. Submit color charts and Samples not less than 30 days prior to when these products are to be ordered or released for fabrication to comply with the Project schedule.

8. Remove Samples that have not been approved. Submit new Samples following the same process as for the initial Sample until Samples are approved.

9. Dispose of Samples when related Work has been completed and approved and disposal is approved by the Construction Manager. At Owner's option, Samples will become the property of the Owner.

B. Construct mockups for comparison with the Work being performed.

1. Construct mockups from the actual products to be used in construction per the detailed specifications.

2. Construct mockups of the size and in the area indicated in the Contract Documents.

3. Construct mockups complete with texture and finish to represent the finished product.

4. Notify the Construction Manager that mockups have been constructed and are ready for approval using the Notification by Contractor form. Allow 2 weeks for Construction Manager to approve of the mockup before beginning the Work represented by the mockup.

5. Remove mockups that have not been approved. Construct new mockups following the same process as for the initial mockup until mockup is approved.

6. Protect mockups until Work has been completed and accepted by the Construction Manager.

7. Dispose of mockups when related Work has been completed and disposal is approved by the Construction Manager.

1.11 REQUESTS FOR DEVIATION

A. Submit a Change Proposal per Section 01 26 00 "Change Management" to request modifications to the Contract Documents, including those for approval of "or equal" products when specifically allowed by the Contract Documents or as a substitution for specified products or procedures.

B. Provide a Shop Drawing with the Change Proposal that clearly identifies deviations for any product or component of the product that does not fully comply with the Contract Documents using the Shop Drawing Deviation Request form provided by the Construction Manager. Mark deviations on the Shop Drawing per Paragraph 1.09.B.

C. Include a description of why the deviation is required and the impact on Contract Price or Contract Times. Include the amount of any cost savings to the Owner for deviations that result in a reduction in cost.

D. Identify each deviation request as a separate item. Include all requested deviations that must be approved as a group together and identify them as a single item.

E. Construction Manager will issue a Field Order or Change Order to approve acceptable deviations. Approval of a requested Shop Drawing deviation by the Design Professional on the Shop Drawings Deviation Request form indicates approval of the requested deviation only on its technical merits as generally conforming to the Contract Documents. Deviations from the Contract Documents can only be approved by a Modification issued by the Construction Manager.

1.12 CONSTRUCTION MANAGER AND DESIGN PROFESSIONAL RESPONSIBILITIES

A. Shop Drawings will be received by the Construction Manager. Construction Manager will log the documents and forward to the Design Professional for review per this Section for general conformance with the Contract Documents.

1. Design Professional's review and approval will be only to determine if the products described in the Shop Drawing or Sample will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Design Professional's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Design Professional's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

B. Comments will be made on items called to the attention of the Design Professional for review and comment. Any marks made by the Design Professional do not constitute a blanket review of the document or relieve the Contractor from responsibility for errors or deviations from the Contract requirements.

1. Design Professional will respond to Contractor's markups by either making markups directly in the Shop Drawing file using the color red or by attaching a Document Review Comments form with review comments keyed to the Drawings or Shop Drawing Deviation Request.

2. Shop Drawings that are reviewed will be returned with one or more of the following status designations:

a. Approved: Shop Drawing is found to be acceptable as submitted.

b. Approved as Noted: Shop Drawing is approved so long as corrections or notations made by Design Professional are incorporated into the Shop Drawing.

c. Not Approved: Shop Drawing or products described are not acceptable.

d. Cancelled: This action indicates that for some reason, the Shop Drawing is to be removed from consideration and all efforts regarding the processing of that document are to cease.

3. Shop Drawings will also be designated for one of the following actions:

a. Documents Filed: Shop Drawing is acceptable without further action and has been filed as a record document.

b. Shop Drawing Not Required: A Shop Drawing was not required by the Contract Documents. Resubmit the document per Section 01 33 03 "Product Data."

c. Cancelled: This action indicates that for some reason, the Shop Drawing is to be removed from consideration and all efforts regarding the processing of that document are to cease.

d. Revise and Resubmit: Shop Drawing has deviations from the Contract Documents, significant errors, or is inadequate and must be revised and resubmitted for subsequent review.

Actions “a” through “c” will close out the Shop Drawing review process and no further action is required as a Shop Drawing. Action “d” requires follow up action to close out the review process.

4. Drawings with a significant or substantial number of markings by the Contractor may be marked “Approved as Noted.” These drawings are to be revised to provide a clean record of the document. Proceed with ordering products as the documents are revised.

5. Dimensions or other data that do not appear to conform to the Contract Documents will be marked as “At Variance With” (AVW) the Contract Documents or other information provided. The Contractor is to make revisions as appropriate to comply with the Contract Documents.

C. Bring deviations to the Shop Drawings to the attention of the Design Professional for approval by using the Shop Drawing Deviation Request form. Use a single line for each requested deviation so the Status and Action for each deviation can be determined for that requested deviation. If approval or rejection of a requested deviation will impact other requested deviation, then all related deviations should be included in that requested deviation line so the status and action can be determined on the requested deviation as a whole.

D. Requested deviations will be reviewed as a possible Modification to the Contract Documents.

1. A requested deviation will be marked as “Not Approved” if the requested deviation is unacceptable. Contractor is to revise and resubmit the Shop Drawing with corrections for approval.

2. A Field Order will be issued by the Construction Manager for deviations approved by the Design Professional if the requested deviation is acceptable and if the requested deviation will not result in a change in Contract Price or Contract Times. Requested deviations from the Contract Documents may only be approved by Field Order.

3. A requested deviation will not be approved if the requested deviation is acceptable but the requested deviation will or should result in a change in Contract Price or Contract Times. Submit any requested deviation that requires a change in Contract Price or Contract Times as a Change Proposal for approval prior to resubmitting the Shop Drawing.

E. Contractor is to resubmit a complete Shop Drawing incorporating revisions until it is acceptable and marked “Approved” or “Approved as Noted” and is assigned an action per Paragraph 1.12.B.3 that indicates that the Shop Drawing process is closed.

F. Information that is submitted as a Shop Drawing that should be submitted as Product Data or other type of document, or is not required may be returned without review, or may be deleted. No further action is required and the Shop Drawing process for this document will be closed.

1.13 RESUBMISSION REQUIREMENTS

A. Make all corrections or changes required by the Design Professional in the document and resubmit to the Construction Manager until approved.

B. Resubmit a complete Shop Drawing for each resubmittal. The last approved Shop Drawing must not rely on previous submissions. The final Shop Drawing is to provide a complete record for the Owner's records.

C. Revise initial drawings or data and resubmit as specified for the reviewed document.

1. Highlight or cloud in green those revisions which have been made in response to the previous reviews by the Design Professional. This will include changes previously highlighted or clouded in yellow to direct attention to Design Professional to items requiring selections, decisions by the Design Professional or highlighted or clouded in orange for a requested deviation from the Contract Documents, or comments in red made by the Construction Manager.

2. Highlight and cloud new items in yellow where selections or decisions by the Design Professional are required, but such selections do not constitute a deviation from the Contract Documents. Add explanatory comments to the markup to indicate the action to be taken by the Design Professional.

3. Highlight and cloud new items in orange that are deviation requests. Include the deviation request number on the Shop Drawing that corresponds to the deviation request on the Shop Drawing Deviation Request form. Numbering for these new items is to start with the next number following the last Shop Drawing deviation requested. Include explanatory comments in the Shop Drawing Deviation Request form.

D. Pay for excessive review of Shop Drawings.

1. Excessive review of Shop Drawings is defined as any review required after the original review has been made and the first resubmittal has been checked to see that corrections have been made.

2. Review of Shop Drawings or Samples will be an additional service requiring payment by the Contractor if the Contractor submits a substitution for a product for which a Shop Drawing or Sample has previously been approved, unless the need for such change is beyond the control of Contractor.

3. Cost for additional review time will be billed to the Owner by the Design Professional for the actual hours required for the review of Shop Drawings by Design Professional and in accordance with the rates listed in Section 00 73 00 "Supplementary Conditions."

4. A set-off will be included in each Application for Payment to pay the cost for the additional review. The set-off will be based on invoices submitted to the Owner for these services.

5. Need for more than one resubmission or any other delay in obtaining Design Professional's approval of Shop Drawings will not entitle the Contractor to an adjustment in Contract Price or an extension of Contract Times.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 33 03 PRODUCT DATA

PART 1 - GENERAL

1.01 SUMMARY

A. Submit Product Data as required by the Contract Documents and as reasonably requested by the Construction Manager. Provide Product Data for all products unless a Shop Drawing is required for the same item.

B. Submit Product Data to provide documents that allow the Owner to:

1. Record the products incorporated into the Project;

2. Record detailed information about products regarding their fabrication, installation, commissioning, and testing; and

3. Provide replacement or repair of products at some future date.

C. Contractor's responsibility for full compliance with the Contract Documents is not relieved by the receipt or cursory review of Product Data.

D. Submit a Change Proposal per Section 01 26 00 "Change Management" to request modifications to the Contract Documents, including those for approval of "or equal" products when specifically allowed by the Contract Documents or as a substitution for specified products or procedures. Deviations from the Contract Documents can only be made by an approved Change Order or Field Order.

1.02 QUALITY ASSURANCE

A. Submit legible, accurate, and complete documents presented in a clear, easily understood manner. Product Data not meeting these criteria will not be accepted and must be resubmitted.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Furnish Product Data for products as indicated in the individual Specification Sections.

B. Include Product Data in the Document Register required by Section 01 33 00 "Document Management" to indicate the Product Data to be submitted, the dates on which documents are to be sent to the Construction Manager for review, and proposed dates that the product will be incorporated into the Project.

C. Complete the following before submitting Product Data:

1. Prepare Product Data and coordinate with Shop Drawings, Samples, Product Data for related products, and with the requirements of the Contract Documents;

2. Determine and verify specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information;

3. Determine and verify the suitability of materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

4. Determine and verify information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

D. Determine and verify:

1. Field measurements, quantities, and dimensions are shown on the Product Data and are accurate;

2. Location of existing structures, utilities, and equipment related to the Product Data have been shown and conflicts between the products, existing structures, utilities, and equipment have been brought to the attention of the Construction Manager;

3. Conflicts that impact the installation of the products have been brought to the attention of the Construction Manager;

4. Product Data is complete for its intended purpose; and

5. Conflicts between the Product Data related to the various Subcontractors and Suppliers have been resolved.

E. Review Product Data prior to submitting to the Construction Manager. Certify that all Product Data has been reviewed by the Contractor and is in strict conformance with the Contract Documents as modified by Addenda, Change Order, Field Order, or Contract Amendment when submitting Product Data.

1.04 DOCUMENTATION

A. Include a complete description of the material or equipment to be furnished, including:

1. Type, dimensions, size, arrangement, model number, and operational parameters of the components;

2. Weights, gauges, materials of construction, external connections, anchors, and supports required;

3. Performance characteristics, capacities, engineering data, motor curves, and other information necessary to allow a complete evaluation of mechanical components;

4. All applicable standards;

5. Fabrication and installation drawings, setting diagrams, manufacturing instructions, templates, patterns, and coordination drawings;

6. Wiring and piping diagrams and related controls;

7. Mix designs for concrete, asphalt, or other materials proportioned for the Project; and

8. Complete and accurate field measurements for products which must fit existing conditions. Indicate on the document that the measurements represent actual dimensions obtained at the Site.

B. Submit information for all components and related equipment required for a complete and operational system in one submittal.

1. Include electrical, mechanical, and other information required to indicate how the various components of the system function together as a system.

2. Provide certifications, warranties, and written guarantees and service contracts with the document package for review when these are required.

1.05 SPECIAL CERTIFICATIONS AND REPORTS

A. Provide all required certifications with the Product Data as specified in the individual Specification Sections:

1. Certified Test Reports (CTR): A report prepared by an approved testing agency giving results of tests performed on products to indicate their compliance with the Specifications. This report is to demonstrate that the product when installed will meet the requirements of the Contract Documents and is part of the Product Data. Field tests may be performed by the Owner to determine that in place materials or products meet the same quality as indicated in the CTR submitted as part of the Product Data.

2. Certification of Local Field Service (CLS): A certified letter stating that field service is available from a factory or supplier approved service organization located within a 300-mile radius of the Site. Include the names, addresses, and telephone numbers of approved service organizations with the certificate.

3. Certification of Adequacy of Design (CAD): A certified letter from the manufacturer of the equipment stating that the equipment has been designed to be structurally stable and to withstand all imposed loads without deformation, failure, or adverse effects to the performance and operational requirements of the unit. The letter must state that mechanical and electrical components have been adequately sized to be fully operational for the conditions specified or normally encountered by the product's intended use.

4. Certification of Applicator/Subcontractor (CSQ): A certified letter stating that the applicator or subcontractor proposed to perform a specified function is duly designated as factory authorized and trained for the application of the specified product.

1.06 WARRANTIES AND SERVICE AGREEMENTS

A. Provide warranties and service agreements per Section 01 78 36 "Warranties and Service Agreements."

1.07 WARRANTIES AND GUARANTEES

A. Provide all required warranties, guarantees, and related documents with the Product Data. The effective date of warranties and guarantees will be the date of Substantial Completion.

B. Identify all Extended Warranties which are defined as any guarantee of performance for the product or system beyond the one-year correction period described in the General Conditions. Issue the warranty certificate in the name of the Owner. Provide a warranty bond for extended warranties if required by Specification Sections.

C. Include an additional copy of equipment warranties in operation and maintenance manuals.

D. Provide a copy of all warranties in a separate document in accordance with Section 01 70 00 "Execution and Closeout Requirements."

1.08 EXTENDED SERVICE AGREEMENTS

A. Provide Extended Service Agreements and related documents with the Product Data. An Extended Service Agreement is a contract between the Owner and an approved Subcontractor or Supplier to provide service and or maintenance beyond that required to fulfill requirements for warranty repairs, or to perform routine maintenance for a definite period beyond the one-year correction period specified in the General Conditions.

B. An Extended Service Agreement does not relieve the Contractor from obligations under the one-year correction period or Warranty provisions specified in the General Conditions.

C. An Extended Service Agreement does not relieve the Contractor from obligations under the maintenance bond, if a maintenance bond is required by the Contract.

D. Requirements for the Extended Service Agreement are described in the Specification Sections for each piece of equipment or system requiring an Extended Service Agreement.

E. Enter into a contract with the service provider and assign the service contract to the Owner on the date of Substantial Completion. Once assigned to the Owner, Contract requirements for the Extended Service Agreement will be complete and will not extend the Contract between the Owner and Contractor.

F. Owner may require that a performance bond be provided for the Extended Service Agreement. Provide a separate bond meeting the same requirements as those for the Contractor's performance bond if required. The bond will be in the amount of the Extended Service Agreement.

G. Include an additional copy of Extended Service Agreements in operation and maintenance manuals.

H. Provide a copy of Extended Service Agreements in a separate document in accordance with Section 01 70 00 "Execution and Closeout Requirements."

1.09 PRODUCT DATA SUBMITTAL PROCEDURES

A. Submit Product Data to the Construction Manager. Send all documents in digital format for processing.

1. Provide all information requested. Do not leave any blanks incomplete. If information is not applicable, enter NA in the space provided.

2. Submit all documents in Portable Document Format (PDF) as required by Section 01 33 00 "Document Management." Provide color PDF documents where color is required to interpret the Product Data.

3. Submit each specific product, class of material, or equipment system separately so these can be tracked and processed independently. Do not submit Product Data for more than one system in the same Submittal.

4. Submit items specified in different Specification Sections separately unless they are part of an integrated system.

5. Define abbreviations and symbols used in Product Data.

a. Use terms and symbols in Product Data consistent with the Contract Drawings.

b. Provide a list of abbreviations and their meaning as used in the Product Data.

c. Provide a legend for symbols used on Product Data.

6. Mark Product Data to reference:

a. Related Specification Sections;

b. Drawing number and detail designation;

c. Equipment designation or name;

d. Schedule references;

e. System into which the product is incorporated; and

f. Location where the product is incorporated into the Project.

B. Complete the certification required by Paragraph 1.03.F.

1.10 CONSTRUCTION MANAGER AND DESIGN PROFESSIONAL RESPONSIBILITIES

A. Product Data will be received by the Construction Manager, logged, and provided to Owner as the Project record.

1. Product Data may be reviewed to see that the information provided is adequate for the purpose intended. Product Data not meeting the requirements of Paragraph 1.02 may not be approved.

2. Product Data is not reviewed for compliance with the Contract Documents. Comments may be returned if deviations from the Contract Documents are noted during the cursory review performed to see that the information is adequate.

3. Contractor's responsibility for full compliance with the Contract Documents is not relieved by the review of Product Data. Contract modifications can only be approved by a Change Order or Field Order.

B. Construction Manager may take the following action in processing Product Data:

1. File Product Data as received if the cursory review indicates that the document meets the requirements of Paragraph 1.02. Document will be marked "Filed as Received" and "Documents Filed." No further action is required on that Product Data.

2. Not approve the Product Data for one of the following reasons:

a. The documentation requirements of the Contract Documents indicate that the document submitted as Product Data should have been submitted as a Shop Drawing. The Product Data will be marked "Not Approved" and "Submit as Shop Drawing." No further action is required on this document as Product Data and the Product Data process will be closed. Resubmit the document as a Shop Drawing per Section 01 33 02 "Shop Drawings."

b. The cursory review indicates that the document does not meet the requirements of Paragraph 1.02. The Product Data will be marked "Not Approved" and "Revise and Resubmit." Contractor is to resubmit the Product Data until it is acceptable and marked "Filed as Received." When Product Data is filed, no further action is required and the Product Data process will be closed.

c. The Product Data is not required by the Contract Documents nor is applicable to the Project. The Product Data will be marked “Not Approved” and “Cancelled.” No further action is required and the Product Data process will be closed.

C. Contractor is to resubmit the Product Data until it is acceptable and marked “Filed as Received.”

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 33 04 OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

A. Prepare a complete and detailed operation and maintenance manual (manual) for each type and model of equipment or product furnished and installed under this Contract.

B. Prepare manuals in the form of an instruction manual for the Owner. The manuals are to be suitable for use in providing the operation and maintenance instructions required by Section 01 79 00 “Training of Operation and Maintenance Personnel.”

C. Provide complete and detailed information specifically for the products or systems provided for this Project. Include the information required to operate and maintain the product or system.

D. Manuals are to be provided in addition to any information packed with or attached to the product when delivered. Remove information packed with or attached to the product and include this information as an attachment to the manual.

E. Include cost for manuals provided by Suppliers and Subcontractors as described in this Section in the Cost of Work for that equipment item.

1.02 DOCUMENTATION

A. Submit manuals in accordance with Section 01 33 00 “Document Management.” Attach a copy of the Operation and Maintenance Manual Review Report form provided by the Construction Manager to each manual with pertinent information completed.

B. Provide one preliminary electronic copy of the manual to the Construction Manager for review within 15 days after review of any equipment submittal by the OPT.

C. Provide one electronic copy and three printed copies of the final manual after:

1. Preliminary manuals have been approved;

2. Field test records have been incorporated into the manual; and

3. Record Documents per Section 01 31 13 “Project Administration” have been approved and have been incorporated in the final manual.

D. Provide copies of the manufacturer’s warranties, guarantees, or service agreements in accordance with Section 01 70 00 “Execution and Closeout Requirements.”

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide digital files for each manual as specified in Paragraph 2.02.

1. Use filenames that correspond to the equipment designation shown in the Contract Documents or other equipment designations provided by the OPT.

2. Submit a preliminary version of the electronic manual for review. Provide a final version of the manual incorporating OPT’s comments.

B. Provide printed copies of each manual as specified in Paragraph 2.03.

2.02 ELECTRONIC MANUAL FORMAT

A. Manual contents are to be submitted in electronic format to the Construction Manager.

B. Provide individual electronic files for each manual.

1. Maximum file size is 75 MB. If manual is greater than maximum allowable file size, provide individual files for each major section of manual.

2. Acceptable file types for written documents are Portable Document File (PDF) or provide manual text in Microsoft Word. Provide drawings in native format and PDF format. All files must be compatible with the latest software version available.

3. Filename must identify the equipment location, equipment manufacturer, and date equipment placed in service, e.g. JCC1-Pump Room-Manufacturer-200503.pdf.

4. Each electronic file must contain a table of contents at the beginning of the file which includes hypertext links or bookmarks to navigate the file contents per section/chapter.

5. Scanned images of written documents are not acceptable. Document must allow character selection. Text within a file must be transferable to other documents.

6. Drawing files must have the ability to turn on/off drawing layers within the file.

2.03 PRINTED MANUAL FORMAT

A. Printed copies of each manual are to be submitted as follows:

1. Print manuals on heavy, first quality 8-1/2 x 11 paper.

a. Reduce drawings and diagrams to 8-1/2 x 11 paper size.

b. When reduction is not practical, fold drawings and place each separately in a clear, super heavy weight, top loading polypropylene sheet protector designed for three-ring binder use. Provide a typed identification label on each sheet protector.

c. Punch paper for standard three-ring binders.

2. Place manuals in heavy duty presentation, d-ring binders with clear front, back, and spine covers.

3. Identify each manual by placing a printed cover sheet in the front cover of the binder and as the first page in the manual. The first page is to be placed in a clear polypropylene sheet protector. The information on first page and the cover page are to include:

a. Name of Owner;

b. Project name;

c. Volume number; and

d. Table of contents.

4. Insert the name of the Project and volume number into the spine covers.

5. Sheet lifters are to be provided.
6. Minimum size is 2-inch capacity. Maximum size is 3-inch capacity. Fill binders to only three-fourths of its indicated capacity to allow for addition of materials to each binder by the Owner.
7. Provide index tabs for each section of the manual. Indexes are to be constructed of heavy-duty paper with a reinforced binding edge. The designation on each index tab is to correspond to the number and letter assigned in the Table of Contents.
8. Manuals for several products or systems may be provided in the same binder. Correlate the data into related groups when multiple products or systems are included in the same binder.
    a. Sections for each product or system must be included in the same binder.
    b. Sections must be in numerical order from volume to volume.

PART 3 - EXECUTION

3.01 MANUAL ORGANIZATION AND CONTENTS

A. Provide a table of contents listing each section of the manual for each product or system.
    1. Assign a number and letter to each section in the manual.
        a. The number is to correspond to the Owner's equipment numbering system or other system designated in the Contract Documents.
        b. The letter assigned will represent the part of the manual, consistent with the manual contents as required by this Section.
    2. Identify each product or system using the nomenclature shown in the Contract Documents. Provide a cross reference to the Owner's numbering system and designations for equipment indicated in the Contract Documents if these are different.
B. Include only the information that pertains to the product described. Annotate each sheet to:
    1. Clearly identify the specific product or component installed;
    2. Clearly identify the data applicable to the installation; and
    3. Delete or strike through references to inapplicable information.
C. Supplement manual information with drawings as necessary to clearly illustrate relations of component parts of equipment and systems, and control and flow diagrams.
D. Manuals for several products or systems may be provided in the same binder.
E. Fill binders to only three-fourths of its indicated capacity to allow for addition of information by the Owner.

3.02 EQUIPMENT AND SYSTEMS MANUAL CONTENT

A. Provide the following information in the first tabbed section of each manual:
    1. A description of the unit and component parts and how it functions.

2. Operating instructions for pre-startup, startup, normal operations, regulation, control, shutdown, emergency conditions, and limiting operating conditions.

3. The sequence of operation by the controls manufacturer. Provide control diagrams by the manufacturer, modified to reflect the as-built, as-installed condition.

4. Include general assembly contract drawings, sections, and photographic views as necessary to completely depict and properly identify the equipment. Indicate the dimensions, weight, capacity, and design conditions for the equipment.

B. Include detailed information to allow for the proper installation, calibration, testing, preventative, and corrective maintenance procedures in the second section of the manual or of each section of the manual information if the manual covers a multi-component equipment system. This information should include the following:

1. Maintenance instructions including assembly, installation, alignment, clearances, tolerances, and interfacing equipment requirements, adjustment, and checking instructions. Include any special rigging required to place the equipment into place, and any special test equipment required to place the equipment in service.

2. A safety subsection which addresses all safety and tag-out procedures necessary to safely operate and maintain the equipment.

3. Lubrication schedule and lubrication procedures. Include a cross reference for recommended lubrication products.

4. Troubleshooting guide.

5. A table showing the schedule of routine maintenance requirements and seasonal work which is not performed at a set frequency. Preventative maintenance tasking must address:

   a. Daily/weekly inspections performed by operations personnel;

   b. Routine preventative maintenance scheduled weekly, monthly, quarterly, semi-annually, or annually through major overhauls by maintenance personnel; and

   c. Predictive maintenance work such as alignment, analysis of the equipment, vibration, flow, oil sampling, etc.

6. Description of sequence of operation by the control manufacturer.

7. Warnings for detrimental maintenance practices.

8. Detailed corrective maintenance procedures including:

   a. Detail equipment for complete disassembly and assembly;

   b. Cross-sectional drawings or exploded views with all parts numbered to correspond with the numbers in the parts list to permit identification of the various parts;

   c. A table of normal clearances, diameters, thickness of new parts, and limits permissible for wearing parts; and

   d. List torque settings for nuts, bolts, and fasteners when critical to the equipment's performance.

C. Include all necessary diagrammatic piping and wiring diagrams and miscellaneous contract drawings and equipment in the third section of the manual or of each section of the manual if the manual covers a multi-component equipment system.

D. Provide spare parts information in the fourth section of the manual including:

1. Part numbers for ordering new parts;
2. Assembly illustrations showing an exploded view of the complex parts of the product;
3. Predicted life of parts subject to wear;
4. List of the manufacturer's recommended spare parts, current prices with effective date, and number of parts recommended for storage;
5. Directory of a local source of supply for parts with company name, address, and telephone number;
6. Complete nomenclature and list of commercial replacement parts; and
7. Complete list of spare parts, spare equipment, tools, and materials that are turned over to the Owner.

E. Provide statistical information from the original equipment manufacturer as to performance such as pump curves, flow charts insulation resistance, calibration, or test data sheets in the fifth section of the manual, including all field testing records used to verify actual performance.

F. Provide equipment name plate data installed on equipment and valves and equipment data sheets as required and furnished by the Owner in the sixth section of the manual.

G. Provide a copy of warranties and the date the warranty expires for equipment in the seventh section of the manual.

3.03 ELECTRICAL AND ELECTRONICS SYSTEMS MANUAL

A. Provide all of the information listed in Paragraph 3.02 as appropriate and include the following information:

1. Control schematics and point to point wiring diagrams prepared for field installation;
2. Circuit directories of panel boards and terminal strips and as installed color coded wiring diagrams; and
3. Other information as may be required by the individual Specification Sections.

3.04 ARCHITECTURAL PRODUCTS MANUAL

A. Provide the following information:

1. Information required for ordering replacement products;
2. Instructions for care and maintenance;
3. List of the manufacturer's recommended lubricants;
4. The manufacturer's recommendations for types of cleaning agents and methods;

5. Cautions against cleaning agents and methods that are detrimental to the product; and

6. Recommended maintenance and cleaning schedule.

B. Final balancing reports for mechanical systems.

C. Other information as may be required by the individual Specification Sections.

3.05 LIST OF SERVICE ORGANIZATIONS

A. Provide a directory of authorized service organizations with company name, address, telephone number, email address, and the contact person for warranty repair.

END OF SECTION

01 33 05 CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.01 SUMMARY

A. Prepare and submit a Progress Schedule for the Work and update the schedule on a monthly basis for the duration of the Project.

B. Provide Progress Schedule in adequate detail to allow Owner to monitor progress and to relate submittal processing to sequential activities of the Work.

C. Incorporate Contract Milestones into the schedule and show activities leading to achievement of these milestones.

D. Assume complete responsibility for maintaining the progress of the Work per the Progress Schedule submitted.

1.02 DOCUMENTATION

A. Submit the schedules to the Construction Manager. Send all documents in digital format for processing.

B. Do not leave any blanks incomplete. If information is not applicable, enter NA in the space provided.

C. Provide schedules, schedule updates and revisions to the Construction Manager in electronic format in its originating software and in Portable Document Format (PDF) as required by Section 01 33 00 “Document Management.”

D. Submit a preliminary Progress Schedule at the pre-construction conference.

E. Submit a detailed Progress Schedule at least 10 days prior to the first payment request.

F. Submit Progress Schedule updates monthly within 10 days after submitting Applications for Payment to indicate the progress made on the Project to the closing date for the Application for Payment. Failure to submit Progress Schedules will cause delay in the review and approval of subsequent Applications for Payment.

1.03 PROGRESS SCHEDULE REQUIREMENTS

A. Progress Schedule is to be in adequate detail to:

1. Ensure adequate planning, scheduling, and reporting during the execution of the Work;

2. Ensure the coordination of the Work of the Contractor and the various Subcontractors and Suppliers;

3. Monitor the progress of the Work; and

4. Evaluate the impact of proposed changes to the Contract Times and Project Schedule.

B. Provide personnel with 5 years’ minimum experience in scheduling construction work comparable to this Project. Prepare the Progress Schedule using acceptable scheduling software.

C. Provide the Progress Schedule in the form of a computer-generated critical path schedule which includes Work to be performed on the Project. It is intended that the Progress Schedule accomplish the following:

1. Give early warning of delays in time for correction.
2. Provide detailed plans for the execution of the Work in the form of future activities and events in sequential relationships.
3. Establish relationships of significant planned Work activities and provide a logical sequence for planned Work activities.
4. Provide continuous current status information.
5. Allow analysis of the Contractor's program for the completion of the Project.
6. Permit schedules to be revised when the existing schedule is not achievable.
7. Log the progress of the Work as it actually occurs.

D. Provide a time-scaled horizontal bar chart which indicates graphically the Work scheduled at any time during the Project. The chart is to indicate:

1. Complete sequence of construction by activity;
2. Identification of the activity by structure, location, and type of Work;
3. Chronological order of the start of each item of Work;
4. The activity start and stop dates;
5. The activity duration; and production rates used to determine the duration;
6. Successor and predecessor relationships for each activity;
7. A clearly indicated single critical path; and
8. Projected percentage of completion, based on dollar value of the Work included in each activity as of the first day of each month.

E. Provide a Progress Schedule for Submittals:

1. Indicate the specific dates each document is to be delivered to the Construction Manager.
2. Allow a reasonable time to review each document, taking into consideration the size and complexity of the document, other documents being processed, and other factors that may affect review time.
3. Include time for making revisions to the Shop Drawings and resubmitting the Shop Drawing for at least a second review.
4. Assume a 14-day review cycle for each time a Shop Drawing is submitted for review unless a longer period is indicated in the Contract Documents or provided by the Construction Manager.
5. Contractor is responsible for delays associated with additional time required to review incomplete or erroneous documents and for time lost when documents are submitted for products that do not meet specification requirements.

1.04 PROGRESS SCHEDULE REVISIONS

A. Revise the Progress Schedule if it appears that the schedule no longer represents the actual progress of the Work.

1. Submit a Plan of Action for schedule recovery if the Progress Schedule or earned value analysis indicates that the Project is more than 30 days behind schedule. The report is to include:

a. Number of days behind schedule;

b. Narrative description of the steps to be taken to bring the Project back on schedule; and

c. Anticipated time required to bring the Project back on schedule.

2. Submit a revised Progress Schedule indicating the action that the Contractor proposes to take to bring the Project back on schedule.

B. Revise the Progress Schedule to indicate any adjustments in Contract Times approved by a Modification.

1. Include a revised Progress Schedule with Change Proposals if a change in Contract Times is requested.

2. Construction Manager will deem any Change Proposal that does not have a revised Progress Schedule and request for a change in Contract Times as having no impact on the ability of the Contractor to complete the Project within the Contract Times.

C. Updating the Progress Schedule to reflect actual progress is not considered a revision to the schedule.

D. Applications for Payment will not be recommended for payment without a revised Progress Schedule and if required, the report indicating the Contractor's plan for bringing the Project back on schedule.

1.05 FLOAT TIME

A. Define float time as the amount of time between the earliest start date and the latest start date of a chain of activities on the construction schedule.

B. Float time is not for the exclusive use or benefit of either the Contractor or Owner.

C. Where several subsystems each have a critical path, the subsystem with the longest time of completion is the critical path and float time is to be assigned to other subsystems.

D. Schedule completion date must be the same as the Contract completion date. Time between the end of construction and the Contract completion date is float time.

1.06 MODIFICATION OF CONTRACT TIMES

A. Contract Times cannot be changed by the submission of a Progress Schedule. Contract Times can only be modified by a Change Order or Contract Amendment.

B. Submit a Change Proposal for any proposed change in Contract Times, and include justification for the change in accordance with the provisions of the Contract Documents.

1.07 NEAR-TERM LOOK AHEAD SCHEDULES

A. Provide a near-term look ahead schedule (NTLA Schedule) every 30 days, typically at periodic coordination meetings, using the form provided by the Construction Manager which shows the days of planned activity for the following:

1. Submittals to be provided and day of anticipated return;
2. Equipment and material deliveries;
3. Arrival and departure of key construction equipment; and
4. Activities for the Contractor and each Subcontractor.

B. Coordinate NTLA Schedule with Project Schedule. Submit a report with each NTLA Schedule identifying deviations from the Project Schedule.

C. Submit a report of near-term work planned in the previous NTLA Schedule that was delayed or not executed by marking actual activity on the previous near term look ahead schedule. Provide explanation of why planned work was not executed and plan to execute in the future and regain time lost.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 33 06 GRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. Furnish an adequate number of photographs of the Site to clearly depict the completed Project.

1. Provide aerial photographs of the completed Project from an angle and height to include the entire Site.
2. Provide a minimum of four different views.
3. Photograph a panoramic view of the entire Site.
4. Photograph all significant areas of completed construction.
5. Do not take completion photographs until all construction trailers, excess materials, trash, and debris have been removed.
6. Employ a professional photographer approved by the Construction Manager to photograph the Project.

B. Provide video recordings of the Site.

1. Record the condition of all existing facilities in or abutting the construction area (right-of-way) including streets, curb and gutter, utilities, driveways, fencing, landscaping, etc., prior the beginning of construction. Provide one copy of the dated and labeled recording to the Construction Manager before the start of construction. Provide additional recording as directed by the Construction Manager if the recording provided is not considered suitable for the purpose of recording pre-existing conditions.
2. Provide a video recording of the Site after the Project is complete and all construction trailers, excess materials, trash, and debris have been removed. Provide a 360-degree view of the Project from a consistent height and angle.
3. Format must allow photographic still shots to be extracted from the video recording.

C. All photographs and video recordings are to become the property of the Owner. Photographs or recordings may not be used for public or private publication or display without the written consent of the Owner.

D. Unmanned Aerial Vehicles used for aerial photography must be registered and piloted by licensed individuals in accordance with Laws and Regulations.

1.02 DOCUMENTATION

A. Submit photographic documentation in accordance with Section 01 33 00 “Document Management.”

1.03 QUALITY ASSURANCE

A. Provide clear photographs and video recordings taken with proper exposure. View photographs and video recordings in the field and take new photographs or video

recordings immediately if photos of an adequate print quality cannot be produced or video quality is not adequate. Provide photographs with adequate quality and resolution to permit enlargements.

PART 2 - PRODUCTS

2.01 PHOTOGRAPHS

A. Provide photographs in digital format with a minimum resolution of 1280x960, accomplished without a digital zoom.

B. Take photographs at locations acceptable to the Construction Manager.

C. Provide a digital copy of each photograph taken.

D. Identify each photograph with:

1. Name of the Project.

2. Date, time, location, and orientation of the exposure.

3. Description of the subject of photograph.

2.02 VIDEO RECORDING

A. Provide video recordings in digital format that can be played with Windows Media Player in full screen mode without loss of resolution.

B. Identify Project on video by audio or visual means.

C. Provide video with file size that does not exceed 1 GB.

D. Provide video resolution of at least 1080p.

E. The quality of the video must be adequate to determine the existing conditions of the construction area. Camera panning must be performed while at rest; do not pan the camera while walking or driving. Camera pans should be performed at intervals to clearly view the entire construction area.

F. Construction stationing is to be annotated in the video.

G. The entire construction area recording must be submitted at once. Sections submitted separately will not be accepted.

H. Site components must be video recorded in an organized sequential order with major components identified.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 35 00 SPECIAL PROCEDURES

PART 1 - GENERAL

1.01 CRITICAL OPERATIONS

A. Owner has identified critical operations that must not be out of service longer than the designated maximum out of service time and/or must be performed only during the designated times. These have been identified in the table below:

Critical Operation	Max. Time Out of Operation	Hours Operation Can Be Shut Down	Liquidated Damages ($/hour)
Pump Station Discharge Header Connection	6 hours	Contractor to coordinate with City	200
12-inch Discharge Water Line Connection	6 hours	Contractor to coordinate with City	200
SWB-1 feeder to new VFD	2 hours	Contractor to coordinate with City	200
SCADA/Instrumentation	2 hours	Contractor to coordinate with City	200

B. Submit a written Plan of Action per Section 01 31 13 “Project Administration” for approval for critical operations.

C. Work affecting critical operations is to be performed on a 24-hour a day basis until Owner’s normal operations have been restored.

D. Consider the sequences, duration limitations, and governing factors outlined in this Section to prepare the schedule for the Work.

E. Perform the Work not specifically described in this Section as required to complete the entire Project within the Contract Times.

F. Provide additional manpower and equipment as required to complete the Work affecting critical operations within the allotted time.

G. Liquidated damages will be assessed if Work on critical operations is not completed within the time indicated.

1. These items are critical to the water supply from the Upper Pressure Plane and/or Lower Pressure Plane.

2. Loss of water supply from the Upper Pressure Plane or Lower Pressure Plane can subject the Owner to loss of revenue, additional operations cost, and fines from regulatory agencies.

3. Liquidated damages have been established for each critical operation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 40 00 QUALITY MANAGEMENT

PART 1 - GENERAL

1.01 OVERVIEW

A. Quality management refers to the overall process of delivering a completed Project to the Owner that complies with the requirements of the Contract Documents. Quality management applies to documentation, products, services, and the Work.

B. Contractor is responsible for the quality of documentation, products, services, and the Work provided.

1. Contractor is to integrate quality control procedures into the execution of the Work that are adequate to produce a Project that meets the requirements of the Contract Documents, while minimizing loss of time and increased costs. Contractor is solely responsible for time and cost impacts of correcting Defective Work.

2. Contractor is to provide all testing and inspection required to control the quality of the Work in progress to determine that completed Work will comply with the requirements of the Contract Documents.

3. Contractor is to provide verification or acceptance testing as required by the Contract Documents to demonstrate that the completed Work complies with the requirements of the Contract Documents, except for those test that the Owner has determined are to be conducted independent of the Contractor and identified as Owner testing in the Owner's Quality Management Plan.

1.02 STANDARDS

A. Provide testing laboratories that comply with the American Council of Independent Laboratories (ACIL) "Recommended Requirements for Independent Laboratory Qualifications."

B. Perform testing in accordance with the published standards and procedures for testing listed in the Specifications and applicable Laws and Regulations.

1.03 DOCUMENTATION

A. Provide documentation which includes:

1. Contractor's Quality Management Plan that establishes the methods of ensuring compliance with the Contract Documents. Submit this plan as Product Data per Section 01 31 13 "Project Administration."

2. A statement of qualifications for any proposed testing laboratory that includes a list of the engineers and technical staff that will provide testing services on the Project, descriptions of the qualifications of these individuals, list of tests that can be performed, equipment used with date of last certification, and a list of recent projects for which testing has been performed with references for those projects.

3. Certified Test Reports for products to be incorporated into the Project. Provide reports to indicate that the proposed products comply with the Contract Documents or indicate that the proposed products do not comply with the Contract Documents and

why those products do not comply. Submit Certified Test Reports as part of a Shop Drawing submitted per Section 01 33 02 “Shop Drawings.”

4. Certified Test Reports for inspections and testing required in this Section and in other Sections of the Specifications. Provide reports to indicate that the Work complies with the Contract Documents or indicate that the Work does not comply with the Contract Documents and why the Work does not comply. Submit these test reports on forms provided by the Construction Manager per Section 01 33 00 “Document Management.”

5. Certified Test Reports of Defective Work and Certified Test Reports documenting that successful corrective action has produced Work that complies with the Contract Documents. Construction Manager will maintain a Defective Work register. Progress on correction of Defective Work will be discussed at progress meetings as described in Paragraph 1.05.E. The final Defective Work register will be incorporated into closeout documentation required per Section 01 70 00 “Execution and Closeout Requirements” as a record that all Defective Work has been corrected.

1.04 OWNER’S QUALITY MANAGEMENT ACTIVITIES

A. Quality management activities of the Owner are for verifying the results of the Contractor’s Work complies with the requirements of the Contract Documents. Performance or non-performance of verification activities by the Owner:

1. Does not relieve the Contractor of its responsibility to provide Work and furnish products that comply with the requirements of the Contract Documents;

2. Does not relieve the Contractor of its responsibility to provide adequate quality control measures to produce quality documents, products, services, or Work;

3. Does not relieve the Contractor of its responsibility for damage to or loss of Work or products before Owner’s acceptance; and

4. Does not affect the continuing rights of the Owner after acceptance of the completed Work.

B. The Work is subject to observations or testing at any time by the OPT. Products which have been tested or inspected and accepted by the Owner at a supply source or staging area may be inspected or tested again by the OPT before, during, or after incorporation into the Work and rejected if products do not comply with the Contract Documents.

C. Verification testing performed by the OPT will be paid for by the Owner, except for testing related to Defective Work as discussed in Paragraph 3.03.

1.05 CONTRACTOR’S RESPONSIBILITIES

A. Review the OQMP and provide a Contractor’s Quality Control Plan (CQCP) outlining testing to be provided by the Contractor per Paragraph 1.07.

B. Implement the CQCP to provide Work that complies with the requirements of the Contract Documents.

1. Provide quality documents meeting the requirements of the Contract Documents.

2. Provide services meeting the requirements of the Contract Documents.

3. Provide the services of a Construction Materials Inspection and Testing (CMIT) provider meeting the requirements of this Section to provide testing required by the Contract Documents to demonstrate that products proposed for the Project in Shop Drawings and Product Data fully comply with the Contract Documents.
4. Inspect and test products to be incorporated into the Project to identify defects before installing them. Do not install Defective products. Conspicuously mark Defective products and remove from the Site. If products are installed before the defect is recognized, remove the Defective products, mark them as Defective and remove them from the Site when the defect is recognized.
5. Integrate production quality control measures into construction activities to produce Work meeting the requirements of the Contract Documents. Inspect self-performed Work and the Work of Subcontractors and Suppliers to identify defects. Correct or replace Defective Work.
6. Provide facilities, equipment, and Samples required for inspections and tests.
    a. Give the Construction Manager adequate notice before proceeding with Work that would interfere with inspections or testing.
    b. Notify the Construction Manager and CMIT provider prior to the time that testing is required, providing adequate lead time to allow arrangements for inspections or testing to be performed.
    c. Do not proceed with Work that would impact the ability to correct defects, or with Work that would require that it be removed to correct defects, until testing is complete, and test results indicate that the corrected Work is acceptable.
    d. Provide safe access for all CMIT activities, including those to be conducted as part of the Owner's Quality Management Program.
    e. Cooperate fully with the performance of sampling, inspection, and testing. Provide personnel to assist with sampling or to assist in making inspections and field tests.
    f. Provide Samples and products in adequate quantities for testing at the Site or at the production source of the product for testing.
    g. Provide facilities required to store and cure test Samples.
    h. Provide calibrated scales and measuring devices for OPT's use in performing inspections and testing.
    i. Provide adequate lighting to allow OPT observations.
    j. Make Contract Documents available to testing agencies when requested.

C. Perform tests as indicated in Contract Documents. All verification testing is to be observed by the Construction Manager or its designated representative.

D. Submit test reports to the Construction Manager.

E. Provide an update on quality control activities performed the previous month and planned for the coming month at monthly progress meetings required by Section 01 31 13 "Project Administration."

F. Determine testing or inspections required to implement the CQCP. Include costs for additional testing and inspections required to meet the Contractor's quality control obligations in the Contract Price.

1.06 CONTRACTOR'S QUALITY CONTROL MANAGER

A. Provide a Quality Control Manager for the Project. Quality Control Manager must have authority to reject Defective Work, redirect the efforts of the Contractor, Subcontractor and Suppliers to correct Defective Work, and implement steps to prevent future Defective Work.

B. The resident superintendent or an approved assistant can serve as Quality Control Manager, provided other duties will allow adequate time to serve in this capacity.

1.07 CONTRACTOR'S QUALITY CONTROL PLAN

A. Provide a CQCP that describes testing and inspections for Work performed at the Site and at remote locations. Include Work by Subcontractors and Suppliers. The CQCP is to include:

1. A description of the quality control organization, including an organization chart showing lines of authority to control the quality of Work.

2. Documentation describing name, qualifications (in resume format), duties, responsibilities, and level of authority of the Quality Control Manager.

3. The name, qualifications (in resume format), duties, responsibilities, and authorities of other persons assigned a quality control function.

4. Procedures for scheduling, reviewing, certifying, and managing documentation including documentation provided by Subcontractors and Suppliers.

5. Control, verification, and acceptance testing procedures for each specific test. Include:

a. Name of tests to be performed;

b. Specification paragraph requiring test;

c. Parameters of Work to be tested;

d. Test frequency;

e. Persons responsible for each test; and

f. Applicable industry testing standards and laboratory facilities to be used for the test.

6. Incorporate the testing specified in the OQMP into the CQCP, specifically identifying the tests or inspections that will be provided by the OQMP;

7. Procedures for tracking and documenting quality management efforts per Paragraph 1.03.

8. Reporting procedures which incorporate the use of forms provided by the Construction Manager.

9. The name of the proposed testing laboratories along with documentation of qualifications per Paragraph 1.03.

B. Use the Contractor's Quality Control Plan Checklist provided by the Construction Manager to review the CQCP before submitting and include a copy of the completed checklist with the CQCP. Do not begin Work until the CQCP is accepted. Submit an interim plan covering only the portion of Work to be performed if the Contractor plans to begin Work prior to submitting the complete CQCP for the Project. Do not begin Work on other parts of the Project until the complete CQCP is accepted.

C. Meet with the OPT 7 days after CQCP is submitted and before start of construction to discuss the CQCP.

D. Notify the Construction Manager of any changes to the CQCP or quality control personnel.

1.08 CONTRACTOR'S USE OF OWNER'S TEST REPORTS

A. Contractor will receive copies of all test reports documenting the Owner's verification tests. Contractor is entitled to rely on the accuracy of these tests results and use these as part of its quality control efforts.

B. Contractor may submit a Change Proposal if the Owner's testing program deviates significantly from the OQMP. Contractor must demonstrate that actual testing and inspection costs were incurred implementing the CQCP as a result of Owner's decision to not provide testing described in the OQMP.

1.09 LIMITATION OF AUTHORITY OF THE TESTING LABORATORY

A. The testing laboratory representatives are limited to providing testing services and interpreting the results of the test performed.

B. The testing laboratory is not authorized to:

1. Alter the requirements of the Contract Documents;
2. Accept or reject any portion of the Work;
3. Perform any of the duties of the Contractor; or
4. Direct or stop the Work.

1.10 TEST REPORTS

A. Certified Test Reports are to be prepared for all tests.

1. Tests performed by testing laboratories may be submitted on their standard test report forms if acceptable to the Owner using the process directed by the Construction Manager. These reports must include the following:
    a. Name of the Owner, Project title and number, and name of the Contractor;
    b. Name, address, and telephone number of the laboratory;
    c. Name and signature of the laboratory personnel performing the test;
    d. Description of the product being sampled or tested;
    e. Date and time of sampling, inspection, and testing;
    f. Date the report was issued;

g. Description of the test performed;

h. Weather conditions and temperature at time of test or sampling;

i. Location at the Site or structure where the test was taken;

j. Standard or test procedure used in making the test;

k. A description of the results of the test;

l. Statement of compliance or non-compliance with the Contract Documents; and

m. Interpretations of test results, if appropriate.

2. Submit reports on tests performed by the Contractor, Subcontractors, or Suppliers as directed by the Construction Manager.

3. OPT will prepare test reports on tests performed by the OPT.

B. Submit test reports as directed by the Construction Manager within 24 hours of completing the test. Flag tests reports with results that do not comply with Contract Documents for immediate attention. Notify the Construction Manager, using acceptable means other than the test report, immediately of any test that fails to comply with the Contract Documents.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Handle and protect test specimens of products and construction materials at the Site in accordance with recognized test procedures. Provide facilities for storing, curing, and processing test specimens as required by test standards to maintain the integrity of Samples. Transport test specimens in a manner to prevent damage to specimens while in transit.

PART 2 - PRODUCTS

2.01 TESTING APPARATUS

A. Furnish testing apparatus and related accessories necessary to perform the tests.

2.02 SAMPLE PRODUCTS

A. Provide Samples of products in adequate quantity for testing.

PART 3 - EXECUTION

3.01 IMPLEMENTING CONTRACTOR'S QUALITY CONTROL PLAN

A. Perform quality control observations and testing as required in each Section of the Specifications and where indicated on the Drawings.

B. Include the phases listed below for each definable work task. A definable work task is one which is separate and distinct from other tasks, has separate control requirements, may be provided by different trades or disciplines, or may be work by the same trade in a different environment.

1. Planning Phase: Perform the following before beginning each definable work task:
    a. Review the Contract Documents.
    b. Review documents the Contractor will submit and determine that they are complete in accordance with the Contract Documents.
    c. Check to ensure that all materials and/or equipment have been tested, submitted, and approved.
    d. Examine the work area to ensure that all required preliminary Work has been completed and complies with the Contract Documents.
    e. Examine required materials, equipment, and sample Work to ensure that they are on hand, conform to Contract Documents, Shop Drawings and Product Data, and are properly stored.
    f. Review requirements for quality control inspection and testing.
    g. Discuss procedures for controlling quality of the Work. Document construction tolerances and workmanship standards for the work task.
    h. Check that the portion of the plan for the Work to be performed incorporates document review comments.
    i. Discuss results of planning phase with the Construction Manager. Conduct a meeting attended by the Construction Manager, Quality Control Manager, superintendent, other quality control personnel as applicable, and the foreman responsible for the work task. Instruct applicable workers as to the acceptable level of workmanship required to meet the requirements of the Contract Documents. Document the results of the planning phase actions by separate meeting minutes prepared by the Quality Control Manager and attached to the quality control report.
    j. Do not move to the next phase unless results of investigations required for the planning phase indicate that requirements have been met.
2. Work Phase: Complete this phase after the planning phase.
    a. Notify the Construction Manager at least 1 week in advance of beginning the Work and discuss the review of the planning phase effort to indicate that requirements have been met.
    b. Check the Work to ensure that it is in full compliance with the Contract Documents.
    c. Verify adequacy of controls to ensure full compliance with the Contract Documents. Verify required control inspection and testing is performed.
    d. Verify that established levels of workmanship meet acceptable workmanship standards. Compare with required Sample panels as appropriate.
    e. Repeat the work phase for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

3. Follow-Up Phase: Perform daily checks to ensure control activities, including control testing, are providing continued compliance with contract requirements.

    a. Make checks daily and record observations in the quality control documentation.

    b. Conduct follow-up checks and correct all defects prior to the start of additional work tasks that may be affected by the Defective Work. Do not build upon nor conceal Defective Work.

    c. Conduct a review of the Work at least 1 month prior to the expiration of the correction period prescribed in the General Conditions with the OPT. Correct defects as noted during the review.

C. Conduct additional planning and work phases if:

1. The quality of on-going Work is unacceptable;

2. Changes are made in applicable quality control staff, on-site production supervision, or crews;

3. Work on a task is resumed after a substantial period of inactivity; or

4. Other quality problems develop.

3.02 DEFECTIVE WORK

A. Immediately correct any Defective Work or notify the Construction Manager why the Work is not to be corrected immediately and when corrective action will be completed.

B. Work performed that is connected or adjacent to Defective Work or Work that would have to be removed to correct Defective Work is also considered to be Defective. Contractor is responsible for all costs associated with replacing any acceptable Work that must be removed, or might be damaged by corrective actions.

C. Document Defective Work, corrective actions taken to correct defects, and that corrected Work complies with the Contract Documents.

D. Implement countermeasures to prevent future Defective Work.

E. No payment will be made for Defective Work. Remove Work from the Application for Payment if Work paid for on a previous Application for Payment is found to be Defective.

F. Owner will withhold payment for Defective Work or Work that has not been tested or inspected in accordance with the CQCP, OQCP, or the Contract Documents.

3.03 VERIFICATION TESTING FOR CORRECTED DEFECTS

A. Provide verification testing on corrected Work when corrective action is complete to demonstrate that the corrected Work complies with the Contract Documents. Conduct the same tests or inspections used to determine that the original Work was Defective. Different tests or methods may be used if approved by the Owner. Document that Defective Work has been corrected with the Construction Manager.

B. Pay for verification testing until Work meets quality requirement set forth in the Contract Documents. OPT may perform verification testing as part of the Owner's Quality Management Program and impose a set-off to recover the cost for this testing.

3.04 OWNER'S PRELIMINARY QUALITY CONTROL PLAN

A. Contractor to reference individual specifications for the requirements, test/frequency, and requirements for OTP or Contractor.

END OF SECTION

01 60 00 PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Provide products for this Project that comply with the requirements of this Section. Specific requirements of the detailed equipment specifications govern in the case of a conflict with the requirements of this Section.

B. Comply with applicable specifications and standards.

1.02 DOCUMENTATION

A. Provide documents in accordance with the Contract Documents.

1.03 QUALITY ASSURANCE

A. Design Criteria:

1. Provide products designed for structural stability and operational capability.

2. Provide members designed to withstand all loads imposed by installation, erection, and operation of the product without deformation, failure, or adversely affecting the operational requirements of the product. Size and strength of materials for structural members are specified as minimums only.

3. Design mechanical and electrical components for all loads, currents, stresses, and wear imposed by startup and normal operations of the equipment without deformation, failure, or adversely affecting the operation of the unit. Mechanical and electrical components specified for equipment are specified as the minimum acceptable for the equipment.

B. Coordination:

1. Provide coordination of the entire Project, including verification that structures, piping, and equipment components to be furnished and installed for this Project are compatible.

2. Determine that the equipment furnished for this Project is compatible with the requirements of the Contract Documents and with the equipment and materials furnished by others.

3. Provide electrical components for equipment that comply with all provisions of the Contract Documents.

4. Apply protective coatings and paints to equipment in the shop that are fully compatible with the final coatings to be field applied in accordance with the Contract Documents.

C. Adapting Substitute Products:

1. The Drawings and Specifications are prepared for the specified products. Make modifications to incorporate the products into the Project if a substitution is requested

for a product is and approved in accordance with Section 01 26 00 “Change Management.”

2. Do not provide a product with a physical size that exceeds the available space. Consideration may be given to the acceptance of these products or equipment if the Contractor assumes all costs necessary to incorporate the item and the OPT approves such revisions.

3. Coordinate electrical requirements for the products to be installed in the Project, including revisions in electrical equipment components wiring and other elements necessary to incorporate the component.

1.04 STANDARDS

A. The applicable industry standards referenced in the Specifications apply as if written here in their entirety.

B. Provide equipment manufactured using structural and miscellaneous fabricated steel conforming to the standards of the American Institute of Steel Construction, except where indicated otherwise.

1.05 WARRANTIES AND GUARANTEES

A. Normal warranty provisions are as stated in the General Conditions and Section 01 78 36 “Warranties and Service Agreements.”

B. Correct Defective Work under the provisions of the General Conditions.

C. Provide warranties and guarantees for periods as defined in the Contract Documents. Individual Sections of the Specifications may have more stringent warranty requirements than stated in the General Conditions. The most stringent warranty will apply in the event of conflicts within the Contract Documents.

D. The Contract Documents may require special warranties that guarantee performance at a specified capacity, power consumption, efficiency, or other operating parameter. Correct defects that prevent products from meeting the specified performance parameters. The requirements of the special warranty that guarantee performance will be satisfied when the specified performance parameters have been met for a period of 1 calendar year of operation, unless Owner elects to accept Defective Work under the provisions of the General Conditions.

E. The Contract Documents may require special warranties for periods extending beyond the one-year correction period specified in the General Conditions. The full warranty provisions and requirements for correction of Defective Work stated in the General Conditions apply throughout the extended warranty period.

F. Provide a warranty bond to provide the same protection as the Contractor's performance bond for extended special warranties. The warranty bond will become effective on the day the performance bond expires which is 1 year after the date of final payment per the General Conditions. The warranty bond will remain in effect until the extended warranty period has expired.

G. In the event that products are repaired, modified, or replaced under the warranty bond, then the warranty period will continue on the date of completion of these repairs for a

period of 6 months or until the end of the original warranty period, whichever is later. In no event will the warranty period extend more than 6 months beyond the end of the original warranty period.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide products according to normally accepted engineering and shop practices, except where a higher standard of quality is required by the Contract Documents.

B. Manufacture like parts of duplicate units to standard sizes and gages that are interchangeable.

C. Two or more items of the same kind are to be identical and made by the same Supplier.

D. Provide products suitable for the intended service.

E. Adhere to the equipment capacities, sizes, and dimensions indicated in the Contract Documents.

F. Do not use products for any purpose other than that for which they were designed.

G. Provide new products. Do not provide equipment that has been in service at any time prior to delivery except for testing in accordance with the Contract Documents.

H. Provide materials suitable for service conditions.

I. Provide iron castings that are tough, close grained gray iron free from blowholes, flaws, or excessive shrinkage and that conform to ASTM A48.

J. Design structural members for shock or vibratory loads.

K. Provide steel that is at least 1/4 inch thick for all elements that will be submerged or subject to splashing all or part of the time during normal operation of the equipment. Chamfer or grind all edges to eliminate sharp exposed edges.

2.02 EQUIPMENT APPURTENANCES

A. Provide a safety guard covering all sides on belt or chain drives, fan blades, couplings, and other moving or rotating parts:

1. Fabricate safety guards from 16 US gauge or heavier galvanized or aluminum clad sheet steel or 1/2-inch mesh galvanized expanded metal;

2. Design guards for easy installation and removal;

3. Provide galvanized supports and accessories for each guard;

4. Provide stainless steel bolts and hardware; and

5. Provide safety guards designed to prevent the entrance of rain and dripping water in outdoor locations.

2.03 ANCHOR BOLTS

A. Provide suitable anchor bolts for each product.

B. Provide anchor bolts with templates or setting drawings in time to permit casting the anchor bolts in the concrete when concrete is placed.

C. Provide two nuts for each bolt.

D. Provide anchor bolts for products mounted on baseplates that are long enough to permit 1-1/2 inches of grout beneath the baseplate and to provide adequate anchorage into structural concrete. Bolts must be long enough to provide full nut engagement and leave three threads exposed. Housekeeping pads are not structural concrete.

E. Provide stainless steel anchor bolts, nuts, and washers.

2.04 SPECIAL TOOLS AND ACCESSORIES

A. Furnish tools, instruments, lifting and handling devices, and accessories necessary for proper maintenance and adjustment that are available only from the manufacturer or are not commonly available.

2.05 EQUIPMENT IDENTIFICATION PLAQUES

A. Provide a plaque for each piece of equipment in accordance with Section 40 05 53 “Identification for Process Piping and Equipment.”

2.06 LUBRICATION SYSTEMS FOR EQUIPMENT

A. Provide equipment lubricated by systems which:

1. Require attention no more frequently than weekly during continuous operation.

2. Do not require attention during startup or shut down.

3. Do not waste lubricants.

B. Provide lubricants to fill lubricant reservoirs and to replace lubricant consumed during testing, startup, and operation prior to acceptance of equipment by the Owner.

2.07 INSULATION OF PIPING

A. Insulate all piping on or related to equipment as required to prevent freezing under any condition. Insulate piping per the manufacturer’s written instruction or per Section 23 07 19 “HVAC Piping Insulation” whichever is more stringent.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install equipment including equipment pre-selected or furnished by the Owner. Assume responsibility for proper installation, startup, and making the necessary adjustments so that the equipment is placed in proper operating condition per Section 01 75 00 “Starting and Adjusting.”

3.02 LUBRICATION

A. Lubricate all products provided or installed for this Project, including products furnished by the Owner, per the manufacturer's written recommendations until the product is accepted by the Owner.

END OF SECTION

01 70 00 EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Comply with requirements of the General Conditions and specified administrative procedures in closing out the Contract.

1.02 DOCUMENTATION

A. Submit affidavits and releases on forms provided by the Construction Manager through the PMIS.

1.03 SUBSTANTIAL COMPLETION

A. The following requirements must be met for the Project or a designated portion of the Work to be Substantially Complete per the General Conditions:

1. Work must be fully functional and able to operate in accordance with the Contract Documents without special or extraordinary efforts on the part of the Owner.

2. The following items of Work must be fully functional and able to operate in accordance with the Contract Documents:

a. Pump and all associated controls. Complete performance testing as noted in technical specifications.

3. Performance Acceptance Testing (PAT) must be complete and indicated compliance with the requirements of the Contract Documents.

4. Operation and maintenance manuals must be approved and operator training conducted to allow the Owner to assume responsibility for operations.

B. Conduct inspections with superintendent, Subcontractors, and Suppliers for the Work or a designated portion of the Work prior to calling for a Substantial Completion inspection by the OPT. Create a list of deficiencies in the Work that must be completed for the Project to qualify for Substantial Completion. Review the list with the Construction Manager or the designated member of the OPT. The Construction Manager or the designated member of the OPT may assist the Contractor with this effort; however, it is the Contractor's responsibility to create and manage this list of deficiencies until corrections are made.

C. Correct the identified deficiencies prior to calling for a Substantial Completion inspection.

D. Notify the Construction Manager that the Work or a designated portion of the Work is Substantially Complete per the General Conditions. Include a list of the items remaining to be completed or corrected before the Project will be considered for Final Completion.

E. OPT will visit the Site to observe the Work within a reasonable time after notification is received to determine the status of the Project.

F. Construction Manager will notify the Contractor that the Work is either Substantially Complete or that additional Work must be performed before the Project will be considered Substantially Complete.

1. Construction Manager will notify the Contractor of items that must be completed before the Project will be considered Substantially Complete.
2. Correct the noted deficiencies in the Work.
3. Notify the Construction Manager when the items of Work in the Construction Manager's notice have been completed.
4. OPT will revisit the Site and repeat the process.
5. Construction Manager will issue a Certificate of Substantial Completion to the Contractor when the OPT considers the Project to be Substantially Complete. The certificate will include a tentative list of items to be corrected before Final Payment will be recommended.
6. Review the list and notify the Construction Manager of any objections to items on the list within 10 days after receiving the Certificate of Substantial Completion.

1.04 TRANSFER OF UTILITIES

A. Transfer utilities to the Owner when the Certificate of Substantial Completion has been issued.

B. Submit final meter readings for utilities and similar data as of the date the Owner occupied the Work.

1.05 CLOSEOUT REQUIREMENTS

A. Provide the following before Final Completion:
1. Record Documents per Section 01 31 13 "Project Administration";
2. Keys and keying schedule;
3. Warranties, bonds, and service agreements;
4. Equipment Installation Reports;
5. Shop Drawings, Product Data, operation and maintenance manuals, and other documentation required by the Contract Documents;
6. Specified spare parts and special tools;
7. Certificates of occupancy, operating certificates, or other similar releases required to allow the Owner unrestricted use of the Work and access to services and utilities;
8. Evidence of continuing insurance and bond coverage as required by the Contract Documents; and
9. Final videos and photographs per Section 01 33 06 "Graphic Documentation."

1.06 WARRANTIES, BONDS, AND SERVICES AGREEMENTS

A. Provide warranties, bonds, and service agreements required by Section 01 33 00 "Document Management" or by the individual Sections of the Specifications.

B. The date for the start of warranties, bonds, and service agreements is established per the General Conditions.

C. Compile warranties, bonds, and service agreements and review these documents for compliance with the Contract Documents.

1. Each document is to be signed by the respective Supplier or Subcontractor.

2. Each document is to include:

a. The product or Work item description;

b. The firm name, with the name of the principal, address, and telephone number;

c. Scope of warranty, bond, or services agreement;

d. Date, duration, and expiration date for each warranty bond and service agreement;

e. Procedures to be followed in the event of a failure; and

f. Specific instances that might invalidate the warranty or bond.

D. Submit digital copies of the documents to the Construction Manager for review.

E. Submit warranties, bonds, and services agreements within 10 days after equipment or components placed in service.

1.07 FINAL COMPLETION

A. Conduct inspections with Superintendent, Subcontractors, and Suppliers prior to calling for a Final Completion inspection by the OPT. Create a list of deficiencies in the Work that must be completed for the Project to qualify for the Final Completion inspection. Review the list with the Construction Manager or the designated member of the OPT. The Construction Manager or the designated member of the OPT may assist the Contractor with this effort; however, it is the Contractor's responsibility to create and manage this list of deficiencies until corrections are made.

B. Identify, list, and correct deficiencies prior to calling for a Final Completion inspection. The Project at the call for Final Completion represents the Contractor's interpretation of a project completed in conformance with the Contract Documents and reflects the Contractor's representation of a quality project meeting the Owner's expectations.

C. Notify the Construction Manager when:

1. Work has been completed and complies with the Contract Documents;

2. Equipment and systems have been tested per the Contract Documents and are fully operational;

3. Final operation and maintenance manuals have been provided to the Owner and all operator training has been completed;

4. Specified spare parts and special tools have been provided;

5. Work is complete and ready for final inspection;

6. Final documentation for all outstanding Modifications and Claims (other than those listed on the Certificate of Final Completion) have been processed and are ready for incorporation into the final Application for Payment; and

7. Closeout requirements in Paragraph 1.05 have been completed.

D. OPT will visit the Site to determine if the Project is complete and ready for final payment within a reasonable time after the notice is received.

E. Construction Manager will notify the Contractor that the Project is complete or will notify the Contractor that Work is Defective.

F. Take immediate steps to correct Defective Work. Notify the Construction Manager when Defective Work has corrected. OPT will visit the Site to determine if the Project is complete and the Work is acceptable. Construction Manager will issue a Certificate of Final Completion to the Contractor when the Project is complete or will notify the Contractor that Work is Defective.

G. Submit the request for final payment with closeout documentation described in Paragraph 1.06 if notified that the Project is complete and the Work is acceptable.

1.08 REINSPECTION FEES

A. Owner may impose a set-off against the Application for Payment in accordance with the General Conditions to compensate the OPT for additional visits to the Project if additional Work is required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 74 23 FINAL CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Perform a thorough cleaning of the Site, buildings, or other structures prior to Owner occupancy of the buildings, and prior to Final Completion. Leave the Project clean and ready for occupancy.

1.02 DOCUMENTATION

A. Provide data for maintenance per Section 01 33 04 “Operation and Maintenance Data.”

1.03 QUALITY CONTROL

A. Use experienced workmen or professional cleaners for final cleaning.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Furnish the labor and products needed for cleaning and finishing as recommended by the manufacturer of the surface material being cleaned.

B. Use cleaning products only on the surfaces recommended by the Supplier.

C. Use only those cleaning products which will not create hazards to health or property and which will not damage surfaces.

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. Thoroughly clean the entire Site and make ready for occupancy.

1. Remove construction debris, boxes, and trash from the Site.
2. Remove construction storage sheds and field offices.
3. Restore grade to match surrounding condition and remove excess dirt.
4. Sweep all drives and parking lots clean of dirt and debris. Use water trucks or hose down paved site to like new appearance.

B. Clean floors and inspect for damage.

1. Remove oil, grease, paint drippings, and other contaminants from floors, then mop repeatedly until thoroughly clean. Replace damaged flooring.
2. Clean resilient flooring with an approved cleaner and provide one coat of liquid floor polish as recommended by the flooring manufacturer. Polish to a buffed appearance with powered floor buffer.
3. Vacuum all carpets with powered floor sweeper to remove dirt and dust. Remove glue or other substances from nap of carpet.

C. Clean and polish inside and outside glass surfaces. Wash with window cleaner and water, apply a coat of high quality glass polish, and wipe clean. Do not scratch or otherwise mar glass surfaces.

D. Clean wall surfaces to remove dirt or scuff marks. Remove excess adhesive along top edges of wall base. Remove adhesive from surfaces of vinyl wall coverings.

E. Align ceiling tile to fit properly in grid and replace cracked or damaged tile. Remove smear marks and other dirt from tile and clean surface of grid system.

F. Spot paint nicks and other damage. Repaint the wall from inside corner to inside corner if spot-painting does not blend into the existing color and texture of the surrounding surfaces. Touch up damaged surfaces on factory finished equipment using special paint furnished by the manufacturer.

G. Clean plumbing fixtures, valves, and trim. Clean toilet seats and covers. Remove labels and adhesive from fixtures. Remove floor drains and clean baskets or buckets. Polish strainers and exposed chrome or brass.

H. Remove dirt, oil, grease, dust, and other contaminants from floors, equipment, and apparatus in mechanical and electrical rooms.

I. Clean and polish ceramic tile floors and wall surfaces to remove mildew or other stains. Tuck point defective joints.

J. Inspect exterior painted surfaces. Spot paint any damaged surfaces.

K. Clean permanent filters and replace disposable filters on heating, ventilating, and air conditioning systems. Clean ducts, blowers, and coils if units were operated without filters during construction.

L. Clean roof areas of debris; flush roof drainage systems with water until clear.

M. Broom clean exterior paved surfaces and rake clean other surfaces of the grounds.

N. Clean and polish all electrical equipment and exposed conduits. Remove paint overspray. Provide a blemish free appearance on all exposed equipment and conduits.

END OF SECTION

01 75 00 STARTING AND ADJUSTING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide step-by-step procedures for starting provided systems, including equipment, pumps, and processes.

B. Provide pre-startup inspections by equipment manufacturers.

C. Place each system in service and operate the system to prove performance and to provide for initial correction of defects in workmanship, calibration, and operation.

D. Provide for initial maintenance and operation.

E. Include costs for starting and adjusting provided by manufacturer's representative in the Cost of Work for the equipment package.

F. Owner will provide chemicals, if any, required for continued operations.

1.02 STANDARDS

A. Comply with the specified standards associated with the testing or startup of equipment.

1.03 DOCUMENTATION

A. Provide the following documents in accordance with Section 01 33 00 "Document Management":

1. A Plan of Action for testing, checking, and starting equipment as Product Data per Section 01 31 13 "Project Administration."

2. Equipment Installation Reports on the form provided by the Construction Manager certifying that the equipment and related appurtenances have been thoroughly examined and approved for startup and operation.

3. Operation and maintenance manuals per Section 01 33 04 "Operation and Maintenance Data." Preliminary operation and maintenance data must be approved before installation, testing, and initial operation of equipment or providing training required by Section 01 79 00 "Training of Operation and Maintenance Personnel."

1.04 SPECIAL JOB CONDITIONS

A. Do not start or test any equipment until the complete unit has been installed and thoroughly checked.

B. Provide the services of a qualified representative of the manufacturer to attend the tests and startup procedures as required by this Section.

C. Do not start or test any equipment until the preliminary operation and maintenance manual per Section 01 33 04 "Operation and Maintenance Data" has been approved.

PART 2 - PRODUCTS

2.01 TESTING INSTRUMENTATION

A. Provide new instrumentation and testing devices needed to conduct tests for maintenance and operation as recommended in the operation and maintenance manuals. This equipment is to become the property of the Owner and transferred in good working order as a spare part at Substantial Completion. This equipment is to be calibrated and ready for use during the startup procedure and for training provided in accordance with Section 01 79 00 “Training of Operation and Maintenance Personnel.”

PART 3 - EXECUTION

3.01 SERVICES OF MANUFACTURER’S REPRESENTATIVES

A. Provide the services of experienced and technically competent representatives of the manufacturer for inspections, tests, supervision of installation, training, and assistance with placing equipment in operation.

B. Perform installation, adjustment, and testing of the equipment under the direct supervision of the manufacturer’s representative where specified. Certify that the equipment and related appurtenances have been thoroughly examined and approved for startup and operation in the Equipment Installation Reports.

C. Provide on-site services as necessary for proper and trouble free operation of the equipment.

3.02 INSPECTION AND STARTUP

A. Inspect equipment prior to placing any equipment or system into operation. Make adjustments as necessary for proper operation. Do not start or test any apparatus until the complete unit has been installed and thoroughly checked.

1. Check for adequate and proper lubrication.
2. Determine that parts or components are free from undue stress from structural members, piping, or anchorage.
3. Adjust equipment for proper balance and operations.
4. Determine that vibrations are within acceptable limits.
5. Determine that equipment operates properly under full load conditions.
6. Determine that the equipment is in true alignment.
7. Ensure that the proper procedure is employed in startup of systems.

3.03 STARTING REQUIREMENTS

A. Refer to the individual Specification Sections for specific startup procedures or other requirements.

3.04 INITIAL OPERATION

A. Start, test, and place equipment and systems into operation for 30 days to allow the OPT to observe the operation and overall performance of the equipment and to determine that controls function as intended.

B. Operate equipment which is used on a limited or part-time basis in the presence of the OPT for a period long enough to demonstrate that controls function as specified.

C. Perform acceptance test as specified in individual Specification Sections. Demonstrate that equipment and systems meet the specified performance criteria.

D. Equipment and systems may be considered as substantially complete at the end of this initial operation period if the equipment is placed in continuous beneficial use by the Owner, unless specifically stated otherwise in the individual equipment Specifications.

3.05 INITIAL MAINTENANCE

A. Maintain equipment in accordance with the operation and maintenance manuals until Project is substantially complete and provisions have been made by the Owner for accepting responsibility for equipment operation in accordance with the General Conditions.

B. Service equipment in accordance with the operation and maintenance manuals immediately before releasing the equipment to the Owner.

END OF SECTION

01 78 36 WARRANTIES AND SERVICE AGREEMENTS

PART 1 - GENERAL

1.01 WARRANTY REQUIREMENTS

A. Provide products for this Project that comply with the requirements of this Section.

1.02 WARRANTIES AND GUARANTEES

A. Guarantee and warrant products furnished by the Contractor against:

1. Faulty or inadequate design;
2. Improper assembly or erection;
3. Defective workmanship or materials; and
4. Leakage, breakage, or other failure.

B. Guarantee and warrant the products installed under this Contract, including Goods furnished by the Owner, against leakage, breakage, or other failure due to improper assembly or erection and against improper installation of the equipment. The correction period is as defined in the General Conditions. Individual Specification Sections may have more stringent warranty requirements than those stated in the General Conditions. The most stringent warranty will be provided in the event of conflicts.

C. Provide all required warranties, guarantees, and related documents with the Shop Drawing. The effective date of warranties and guarantees will be the date of Substantial Completion.

D. Include an additional copy of equipment warranties in operation and maintenance manuals.

E. Provide a copy of all warranties in a separate document in accordance with Section 01 70 00 “Execution and Closeout Requirements.”

1.03 EXTENDED WARRANTIES

A. Extended Warranties are defined as any guarantee of performance for the product or system beyond the one-year correction period described in the General Conditions.

B. Issue the warranty certificate in the name of the Owner.

C. Provide a warranty bond for Extended Warranties as required by the individual Specification Sections.

1.04 SERVICE AGREEMENTS

A. Provide Extended Service Agreements (ESA) and related documents with the Shop Drawing. An Extended Service Agreement is a contract between the Owner and an approved Subcontractor or Supplier to provide service and or maintenance beyond that required to fulfill requirements for warranty repairs or to perform routine maintenance for a definite period beyond the one-year correction period specified in the General Conditions.

B. Requirements for the Extended Service Agreement are described in the Specification Sections for each piece of equipment or system requiring an Extended Service Agreement.

C. Enter into a contract with the service provider and assign the service contract to the Owner on the date of Substantial Completion. Once assigned to the Owner, Contract requirements for the Extended Service Agreement will be complete and will not extend the Contract between the Owner and Contractor.

D. Owner may require that a performance bond be provided for the Extended Service Agreement. Provide a separate bond meeting the same requirements as those for the Contractor's performance bond if required. The bond will be in the amount of the Extended Service Agreement.

E. Include an additional copy of Extended Service Agreements in operation and maintenance manuals.

F. Provide a copy of Extended Service Agreements in a separate document in accordance with Section 01 70 00 "Execution and Closeout Requirements."

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 79 00 TRAINING OF OPERATION AND MAINTENANCE PERSONNEL

PART 1 - GENERAL

1.01 SUMMARY

A. Provide services of Supplier's operation and maintenance training specialists to instruct Owner's personnel in recommended operation and maintenance procedures for equipment furnished. Details for training may be established in the specifications for that equipment.

B. Provide a combination of classroom and hands on training.

C. Training may be conducted at Contractor's or Supplier's facilities provided Contractor pays for travel, lodging, and per diem costs of the Owner.

D. Record training sessions on video and submit to the Owner on DVD disk in MPEG-4 format for Owner's later use in instructing Owner's personnel. Include this recording as part of the final operation and maintenance manual. Provide legal releases or pay additional fees required to allow training by the manufacturer to be recorded.

E. Include the cost for training and startup in the Cost of the Work for each equipment package.

1.02 DOCUMENTATION

A. Provide documentation in accordance with Section 01 33 00 "Document Management" and include:

1. Equipment Installation Reports in accordance with Section 01 75 00 "Starting and Adjusting" on forms provided by the Construction Manager;

2. A lesson plan for training in accordance with Paragraph 3.01.C;

3. Credentials of Supplier's proposed operation and maintenance instructors demonstrating compliance with requirements of Paragraph 1.04; and

4. Operation and maintenance manuals per Section 01 33 04 "Operation and Maintenance Data." Preliminary operation and maintenance data must be approved before installation, testing, and initial operation of equipment or providing training required by the Section.

1.03 SCHEDULING OF TRAINING

A. Coordinate training services with startup and initial operation of equipment on days and times Owner is available.

B. Training may be required outside of normal business hours to accommodate schedules of operation and maintenance personnel.

C. Provide training of Owner's personnel after acceptable preliminary operation and maintenance manuals have been approved.

D. Coordinate training with equipment startup and testing and availability of Owner's personnel.

E. Provide a proposed training schedule for review and acceptance by OPT showing all training required in the Contract Documents. Demonstrate compliance with specified training requirements relative to number of hours of training, number of training sessions, and scheduling.

F. Submit initial training schedule at least 60 days before scheduled start of first training session. Submit final training schedule, incorporating revisions in accordance with OPT's comments, no later than 30 days prior to starting the first training session.

G. Owner reserves the right to modify personnel availability for training in accordance with process or emergency needs.

H. Schedule for training is to be approved by Owner.

1. Schedule training and startup operations for no more than one piece of equipment or system at a time.

2. Owner may require re-scheduling of training if operations personnel are not available for training on a scheduled date.

3. Provide a minimum of 2 weeks' notice if training must be rescheduled.

4. Training is to be limited to 24 hours per week.

5. Time required for training is to be included in the development of the Project schedule.

I. Schedule and coordinate training for equipment or systems which depend upon other equipment or systems for proper operation so that trainees can be made familiar with the operation and maintenance of the entire operating system.

1.04 SERVICES OF SUPPLIER'S REPRESENTATIVE

A. Supplier's instructors must be factory-trained by the equipment manufacturer.

B. Instructors must have knowledge of the theory of operation and practical experience with the equipment or system.

C. Instructors must be proficient and experienced in conducting training of the type required and must have successfully conducted similar training courses.

D. Qualifications of instructors are subject to acceptance by OPT. Provide services of replacement instructor with acceptable qualifications if OPT does not accept qualifications of proposed instructor. Include each instructor's résumé and specific details of instructor's operating, maintenance, and training experience relative to the specific equipment for which instructor will provide training to demonstrate their qualifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 OPERATOR TRAINING

A. Provide classroom and hands-on training of the care and operation of the equipment to the Owner's personnel.

B. Provide training in adequate detail to ensure that the trainees who complete the program will be qualified and capable of operating and maintaining the equipment, products, and systems provided.

C. Provide a training plan that indicates the schedule and sequence of the training programs. The training plan is to include for each course:

1. Number of hours for the course;
2. Agenda and narrative description, including the defined objectives for each lesson;
3. Draft copy of training handbooks;
4. A descriptive listing of suggested reference publications;
5. Audio-visual equipment required for training; and
6. Type and number of tools or test equipment required for each training session.

D. Provide and use training aids to complement the instruction and enhance learning.

1. Provide training handbooks for use in both the classroom and the hands-on phases of training for each course.
2. Instructional materials must include references to the operation and maintenance manuals and identify and explain the use of the manual.
3. Provide a copy of all audio/visual training materials used in the presentations to the Owner.

E. Operations training is to include:

1. Orientation to provide an overview of system/subsystem configuration and operation;
2. Terminology, nomenclature, and display symbols;
3. Operations theory;
4. Equipment appearance, functions, concepts, and operation;
5. Operating modes, practices, and procedures under normal, diminished, and emergency conditions;
6. Startup and shutdown procedures;
7. Safety precautions;
8. On-the-job operating experience for monitoring functions, supervisory, or command activities. Include functions and activities associated with diminished operating modes, failure recognition, and responses to system/subsystem and recovery procedures; and
9. Content and use of operation and maintenance manuals and related reference materials.

F. Provide training for performing on-site routine, preventive, and remedial maintenance of the equipment or system. Maintenance training is to include:

1. Orientation to provide an overview of system/subsystem concept, configuration, and operation;
2. Operations theory and interfaces;

3. Instructions necessary to ensure a basic theoretical and practical understanding of equipment appearance, layout, and functions;
4. Safety precautions;
5. Use of standard and special tools and test equipment;
6. Adjustment, calibration, and use of related test equipment;
7. Detailed preventive maintenance activities;
8. Troubleshooting, diagnostics, and testing;
9. Equipment assembly and disassembly;
10. Repair and parts replacement;
11. Parts ordering practices and storage;
12. Failure and recovery procedures;
13. Cabling and/or interface connectors;
14. Content and use of operation and maintenance manuals and related reference materials;
15. Procedures for warranty repairs;
16. Lubrication; and
17. Procedures, practices, documentation, and materials required to commence system maintenance.

G. Provide training for the equipment listed in the table below. The table indicates the minimum acceptable training time. Provide additional hours of training if required to meet the training objectives described in this Section.

Specification Section	Equipment/System Description	Min Hours
26 29 23	Variable Frequency Motor Controls	2
40 05 64	Butterfly Valves	2
40 90 01	Instrumentation	2
40 90 02	Supervisory Control and Data Acquisition (SCADA) System	2
43 24 13	Vertical Centrifugal Pumping Units	2

END OF SECTION

DIVISION 03
CONCRETE

03 30 00.01 CAST-IN-PLACE CONCRETE (LIMITED APPLICATIONS)

1.00 GENERAL

1.01 SUMMARY

A. This Section specifies normal weight, cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.02 SUBMITTALS

A. Product Data and Material Certifications: For each product or material indicated in Part 2.00 "Products," excluding formwork.

B. Design Mixture: For each concrete mixture submit:

1. Mix design proportions and characteristics.
2. Certifications indicating conformance of aggregate and cementitious materials.
3. Admixture data sheets.
4. Field test data or trial batch mixture data to validate specified compressive strength in accordance with ACI 301, latest edition.

C. Reinforcing bar layout drawing with bar lists clearly marked and referenced to the Drawings.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

B. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

C. Comply with ACI 301, "Specification for Structural Concrete," including the following sections, unless modified by requirements in the Contract Documents:

1. "General Requirements."
2. "Formwork and Formwork Accessories."
3. "Reinforcement and Reinforcement Supports."
4. "Concrete Mixtures."
5. "Handling, Placing, and Constructing."

D. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

2.00 PRODUCTS

2.01 FORMWORK

A. Furnish formwork and formwork accessories according to ACI 301.

1. Form ties shall leave no material within 1-1/2 inches of concrete surface.

2. For fluid bearing and below grade walls, provide single tie rods with midpoint washer to prevent water seepage. Systems that result in a through wall hole are not permitted.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A1064, fabricated from as-drawn steel wire into flat sheets.

C. Supports:

1. Unexposed Surface: CRSI Class 3 – No Protection.

2. Exposed Surface: CRSI Class 1 – Maximum Protection – uniform high density polyethylene (plastic) or fiberglass reinforced plastic (FRP). Plastic protected wire bar supports are not allowed.

2.03 CONCRETE MATERIALS

A. Cementitious Material:

1. Cement:

a. Type I or I/II Portland cement, conforming to ASTM C150.

b. Type IL blended hydraulic cement, conforming to ASTM C595.

c. Type GU hydraulic cement, conforming to ASTM C1157.

2. Fly Ash: ASTM C618, Class F. No more than 25 percent of the cement may be replaced with fly ash. If Class F fly ash is not available, then provide a straight cement mix.

B. Coarse Aggregate:

1. In conformance with ASTM C33, uniformly graded, with a maximum size as indicated in “Concrete Mixtures.”

2. Class: Moderate weathering region, but not less than 3M.

C. Fine Aggregate: Washed and screened natural sands or sands manufactured by crushing stones; conforming to ASTM C33.

D. Water: Potable and complying with ASTM C1602 and ASTM C1602 Table 2.

2.04 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

2.05 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber, or ASTM D1752, cork or self-expanding cork.

B. Repair Materials: Pre-packaged, low-shrink, non-slump, non-metallic, quick setting patching mortar, as approved by the manufacturer for each application.
   1. Sikatop 123 by Sika Corporation.
   2. Five Start Structural Concrete by Five Star Products, Inc.
   3. Approved equal.

C. Non-Shrink Grout: Pre-packaged, non-metallic, precision, non-shrink grout conforming to ASTM C1107/C1107M.

D. Normal Shrinkage Grout: One part cement to three parts of ASTM C33 fine aggregate; proportioning on a volumetric basis. Install for grouted areas not required to be non-shrink grout.

E. Bonding Agent: ASTM C1059, Type II, non-redispersible, acrylic emulsion.

F. Zinc Richer Primer: Coat aluminum surfaces embedded or in contact with concrete. Primer shall be Tneme-Zinc or approved equal.

2.06 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Waterproof Sheet: In accordance with ASTM C171.

D. Water: Potable and complying with ASTM C1602 and ASTM C1602 Table 2.

E. Membrane-Curing Compound: ASTM C309, Type 1, Class B.

2.07 CONCRETE MIXTURES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:

Use	Min. 28-Day Compressive Strength (psi)	Max. Size of Coarse Aggregate	Max. Water/ Cement Ratio	Max Slump (in.)
General	4000	1-1/2”	0.45	5* (+/-1”)
Pipe blocking, lean concrete	1500	1-1/2”	0.70	---
*Slump may be increased to 8 inches with the addition of a HRWR.				

C. Air Content:

1. Air entrain exposed concrete within range permitted by ACI 301 for Exposure Class F1.
2. Do not allow entrapped air to exceed 3 percent in floor slabs to receive troweled finish.

2.08 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94M, and furnish batch ticket information.

3.00 EXECUTION

3.01 FORMWORK

A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.02 STEEL REINFORCEMENT

A. Comply with CRSI’s “Manual of Standard Practice” for fabricating, placing, and supporting reinforcement.

1. Fabricate reinforcement steel to provide lapped connections, bends, and transitions in reinforcement as required for continuity of the typical reinforcement specified on the Drawings.
2. Unless otherwise detailed, intersecting wall and/or beam reinforcement shall extend to the far face and terminate in a standard hook. Reinforcement at the outside face of corners shall be continuous or provide tension lap splices at each side of the corner.

B. Do not weld reinforcement.

3.03 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete. Purposefully roughen joints to a 1/4-inch amplitude and clean.

B. Construction Joints: Locate joints as indicated or as approved by Owner’s Representative.

C. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, and as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.04 CONCRETE PLACEMENT

A. Comply with ACI 301 for measuring, batching, mixing, transporting, and placing concrete.

B. Additional water may only be added to concrete prior to placement and only at Project Site. Slump shall be evaluated prior to and after the addition of all water. Do not take strength cylinders until after addition of all water.

1. Quantity of water shall not exceed the amount withheld at the batch plant. Quantity withheld shall be indicated on the batch ticket. Addition of water shall not result in a slump or water-cement ratio greater than that specified.

C. Do not allow concrete to free fall more than 5 feet. With HRWR concrete may free fall a maximum of 10 feet.

D. Consolidate concrete with mechanical vibrating equipment.

3.05 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface. Do not further disturb surfaces before starting finishing operations.

C. Float Finish: Apply float finish to surfaces to receive trowel finish or nonslip broom finish. Except as indicated below, apply a final “light float” finish to the surface as the concrete hardens. Surface shall have a uniform granular texture and shall meet the straightness requirements.

D. Trowel Finish: Apply a normal steel trowel finish to interior surfaces exposed to view and grouted surfaces in junction boxes.

E. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete sidewalk and ramp surfaces. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.06 FINISHING FORMED SURFACES

A. No Finish: After forms are removed, repair or patch tie-holes and defects. Otherwise, no additional finish is required. Apply to surfaces which are not visible from the inside or outside of the completed structure or less than 12 inches below finish grade (i.e. back of retaining walls below embankment, etc.).

B. Smooth-Formed Finish: As-cast surface texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch. Apply to surfaces exposed to view and 12 inches below finish grade.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching

adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.07 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 301. Additionally, comply with ACI 306.1 for cold-weather protection and with ACI 305.1 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb./sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least 7 days by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:

    a. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.08 MISCELLANEOUS CONCRETE ITEMS

A. Non-Shrink Grout: Install and cure as recommended by manufacturer, and as required here:

1. Clean and roughen exposed concrete surface; remove laitance. Saturate the foundation 24 hours before installation. Surface shall be clear of standing water. Baseplates shall be free of oil, grease, and other objectionable substances.

2. Steel trowel exposed edges.

3. Moist cure as specified by manufacturer, but not less than 3 days.

B. Normal Shrinkage Grout:

1. Clean and roughen exposed concrete surface, remove laitance. Saturate the foundation 24 hours before installation. Surface shall be clear of standing water. Apply scrub coat of grout immediately prior to grout placement. While scrub coat is still moist install grout.

2. Wet cure as specified for concrete.

3.09 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Tests: Perform according to ACI 301.

1. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

3.10 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

B. Repair materials and surface preparation shall be completed in accordance with manufacturer recommendations. Coordinate with Owner's Representative prior to beginning any demolition of defective area.

END OF SECTION

DIVISION 05
METALS

05 50 00 METAL FABRICATIONS

1.00 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 ACTION SUBMITTALS

A. Product Data: For the following:

1. Grout.

1.03 INFORMATIONAL SUBMITTALS

A. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements.

B. Welding certificates.

1.04 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.05 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.06 COORDINATION

A. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

2.00 PRODUCTS

2.01 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.02 FERROUS METALS

A. Steel Plates, Shapes, and Bars: As indicated. ASTM A572, Grade 50, if not indicated.

B. Stainless-Steel: Type 304/304L.

2.03 NONFERROUS METALS

A. Aluminum: Alloy 6061-T6.

2.04 FASTENERS AND ANCHORS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners

B. Anchor Rods: As indicated; with nuts, ASTM A563; and, where indicated, flat washers.

1. Hot-dip galvanized or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

2.05 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

C. Anti-Seize Lubricant: Loctite LB 8023 Marine Grade Anti-Seize lubricant or approved equal.

D. Galvanizing Repair Paint: ZRC Worldwide Galvilite Galvanizing Repair Compound or approved equal.

2.06 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

2.07 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.08 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize all steel and iron to comply with ASTM A153 for steel and iron hardware and with ASTM A123 for other steel and iron products.

2.09 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

C. Bright, Directional Satin Finish: No. 4.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.10 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. As-Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).

3.00 EXECUTION

3.01 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size

limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

1. Post-installed anchors shall be installed in accordance with the anchor manufacturer's printed installation instructions and as indicated on the Drawings.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

G. Anti-Seize Lubricant: Where stainless steel nuts and bolts will be installed, apply anti-seize lubricant to threads as recommended by lubricant manufacturer to prevent seizure of nut and bolt during installation or upon removal at a future date.

H. When installing bearing and leveling plates: Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

1. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
3. Moist cure grout for a minimum of 7 days.

3.02 FIELD QUALITY CONTROL

A. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.03 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780, two 1.5mil DFT coats, and as recommended by cold-galvanizing coating manufacturer recommendations.

END OF SECTION

DIVISION 09
FINISHES

09 96 00.01 HIGH-PERFORMANCE COATINGS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to apply protective coatings to material and equipment as specified herein, including the preparation of surfaces prior to application of coatings.

B. Protective coatings are special coatings to be used at specific locations or on specific surfaces as indicated herein in that every surface of every description, except those which are specifically noted not to receive a coating finish, must be covered by a paint system as specified in this Section.

C. Protective coatings must be applied to the following surfaces:

1. Metal surfaces located inside and outside of buildings and other structures anywhere on the Site.

2. Petrolatum (Wax) Tape at the following locations:

a. Buried flexible couplings.

D. The following must not be coated and must be protected from drips, overspray, etc. unless indicated otherwise

1. Stainless steel piping, materials and equipment.

2. Galvanized steel piping, materials and equipment unless specifically indicated to be coated.

3. Aluminum materials and equipment.

4. Interior electrical items.

E. Special applications for painting include the following:

1. Buried pipe and valves must receive a shop applied protective coating as described in the appropriate Section of the Specifications.

F. Contain, treat, and dispose of any dust, spray, drainage, or spillage resulting from coating operations. It is the Contractor's responsibility to determine if the materials to be disposed of are classified as Hazardous Waste. Disposed of waste, hazardous or otherwise, must be in accordance with applicable regulations. Contractor must be aware of and understand the regulations concerning disposal of waste generated by coating operations.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers:

1. Products which comply with the Contract Documents and are manufactured by the following companies will be acceptable:

a. Tnemec Company, Inc.

b. Carboline.

c. PPG Protective & Marine Coatings.

d. The Sherwin-Williams Company.

e. Akzo Nobel / International Paint, LLC.

f. ICI Devoe High Performance Coatings.

g. Plasite Protective Coatings.

2. It is desired that the paint products be furnished by as few manufacturers as possible to meet the requirements of the Specifications. Coating products of the same type must be supplied by the same manufacturer. Do not mix products from different sources.

B. Applicator's Qualifications: Applicators must be qualified in this line of work and have a minimum of 5 years of experience in the application of the protective coatings of the types specified herein. Submit a list of recent projects and names of references for those projects.

C. Product Quality:

1. Use only the coatings specified in this Section. Use only those thinners and solvents recommended by the manufacturer, only in the amounts necessary to produce the manufacturer's recommended spreading rate, and in amounts not exceeding the maximum quantities stated in the manufacturer's literature.

2. The coating material must not show excessive settling in a freshly opened full can and must be easily re-dispersed with a paddle to a smooth, homogeneous state. It must show no curdling, livering, caking, or color separation and must be free of lumps or skim surfaces.

D. Inspection:

1. Inspect and provide substrate surfaces prepared in accordance with the Contract Documents and the printed directions and recommendations of paint manufacturer whose product is to be applied.

2. Provide Engineer minimum 3 days of notice prior to start of surface preparation work or coating application work.

3. Perform Work only in the presence of Engineer, unless Engineer grants prior approval to perform such Work in Engineer's absence. Approval to perform Work in the Engineer's absence is limited to the current day unless specifically noted to extend beyond the completion of the workday.

4. Inspection by the Engineer, or the waiver of inspection of any particular portion of the Work, must not be construed to relieve the Contractor of responsibility to perform the Work in accordance with the Contract Documents.

5. Contractor is solely responsible for testing for this Section, at no further cost to the Owner. Engineer may also make such tests if it is considered necessary. Cooperate with the Engineer, providing equipment, scaffolds, and other equipment as requested by the Engineer.

E. Testing Equipment: Furnish the testing apparatus necessary for testing coatings, including the following:

1. One set of U.S. Department of Commerce thickness calibration plates, certified by the National Bureau of Standards, to test dry film thickness.
2. Wet-film thickness gauges. Give one to Owner's representative. Each painter must keep one to test paint as it is applied.
3. One electronic dry-film thickness gauge capable or measuring 0-200 mils with calibration standards approved by the Bureau of Standards.
4. One Elcometer 319 Dewpoint Meter or approved equal.
5. One Tinker and Rasor Model M 1 Holiday Detector and recommended wetting agent and/or High Voltage Holiday Detector if required for coating thickness specified.
6. One set of SSPC-VIS 1**,** 3 and 4 **-** Visual Standards as applicable.

F. Testing Reports: Submit an inspection report for each coating applied on the Project. The testing report must be completed on a form furnished by the Engineer and must bear the signature of the Contractor and the Owner's representative.

G. Contractor must schedule a construction conference prior to any field work being completed. The meeting will be at the Site and will include the Owner, Contractor, painting superintendent, Engineer, Owner's representative and coating manufacturer's representative. At this meeting the coating plan and schedule will be reviewed in detail.

1.03 SUBMITTALS

A. Submittals must be in accordance with Section 01 33 00 "Document Management."

B. The following Product Data for products, including manufacturer's data sheets, are due prior to ordering coating and surface preparation materials:

1. Coating manufacturer's color selection literature for coating materials and caulk.
2. Sample warranty document for products.
3. Provide certification from the manufacturer that all coatings will not contain more than 0.06 percent by weight of lead in the cured coating for each coat applied.
4. Coating manufacturer's Product Information and Safety Data Sheets (SDS) for each coating and caulk material. Product Information must include the following:
    a. The manufacturer's published instructions for use in specifying and applying all proposed coatings.
    b. Application instructions written and published by the coating manufacturer.
    c. All anticipated limitations, precautions and requirements that may adversely affect the coating, that may cause unsatisfactory results after the application or that may cause the coating not to serve the purpose for which it was intended, must be clearly and completely stated in the instructions. Limitations and requirements must include, but are not necessarily limited to the following:
        1). Surface preparation.

2). Method(s) of application.

3). Thickness of each coat (maximum and minimum DFT).

4). Drying and curing time of each coat.

5). Time (minimum and maximum) allowed between coats.

6). Thinner and use of thinner.

7). Proper mixing of coating before application.

8). Weather limitations during and after application (temperature and humidity, time weighted).

9). Physical properties of coating, including percent solids content by volume.

10). Equipment settings (air cap, fluid tip, equipment pressure settings, etc.).

11). Pot life at various temperature and humidity conditions.

12). Provide documentation that interior coating system is compatible with the cathodic protection system.

C. The following samples are required prior to ordering the materials:

1. Three samples of selected exterior finish colors for approval on 6-inch by 6-inch swatches. Label each swatch with the manufacturer's name, coating name/type, color name and number.

D. The following Product Data is required prior to coating Work:

1. Coating Plan:

a. Anticipated coating process schedule by date, including dates when hold-point inspections are anticipated. Schedule must indicate detailed activities on a daily basis.

b. Detailed procedures and schedule for all pre-cleaning, surface preparation and application of coating, including touch-up and repair procedures for all coating systems.

c. Recoat schedule on the submitted coating materials.

d. Data sheets must include curing characteristics and recommendations regarding complete coating curing.

e. Provide a written plan documenting how spent cleaning debris and/or paint over spray or droplets will be contained/confined to the jobsite and tank site during the surface preparation and coating application operations. Reasonable care must be exercised by the Contractor to prevent damage, nuisance, or hazardous conditions to adjacent or nearby property owners. Include all materials and method to be used for protection of exterior surfaces and allow for recovery and disposal of paint scraps and blast media.

2. Provide documentation on proposed containment system methods for blasting and coating operations.

3. Contractor must submit evidence of notification of the appropriate office of the Texas Commission on Environmental Quality (TCEQ) prior to abrasive blasting as required. Submit copies of any obtained permits.
4. Coating Manifest - Within 48 hours of coating delivery to the jobsite, the Contractor must record the batch number stamped on each coating container and submit a typed list to the Owner's representative. Minimum information required is listed below.
    a. Date of delivery to jobsite.
    b. Name and signature of superintendent recording the data.
    c. List of batch number including corresponding coating identification, color, date of manufacture and volume of each container.

E. The following Certified Test Report(s) are required prior to coating Work:
1. SDS sheets for all abrasive to be used on the Project.
2. Certification and laboratory test results indicating recycled metallic abrasive per SSPC-AB 2 or 4 and atomic absorption test results.

1.04 STANDARDS

A. The applicable provisions of the following standards apply as if written here in their entirety. Adhere to the latest standards and codes published by the following organizations.

B. In the event of a conflict between the published standards, codes, and this Section, the more stringent requirement govern as interpreted by the Engineer.
1. NSF International (NSF) / American National Standards Institute (ANSI):

NSF/ANSI Standard 61	Drinking Water System Components – Health Effects
NSF/ANSI/CAN 600	Health Effects Evaluation and Criteria for Chemicals in Drinking Water

2. ASTM International (ASTM):

ASTM D523	Standard Test Method for Specular Gloss
ASTM D610	Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces
ASTM D2244	Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
ASTM D3359	Standard Test Methods for Rating Adhesion by Tape Test
ASTM D4214	Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D4258	Standard Practice for Surface Cleaning Concrete for Coating
ASTM D4259	Standard Practice for Abrading Concrete
ASTM D4260	Standard Practice for Liquid and Gelled Acid Etching of Concrete
ASTM D4263	Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM D4285	Standard Test Method of Indicating Oil and Water in Compressed Air
ASTM D4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel

ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester
ASTM D4787	Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates
ASTM D5162	Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates
ASTM D6386	Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
ASTM D7234	Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Pull-Off Adhesion Testers
ASTM D7682	Standard Test Method for Replication and Measurement of Concrete Surface Profiles Using Replica Putty
ASTM E337	Standard Practice Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures)
ASTM F1869	Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

3. American Water Works Association (AWWA):

AWWA C210	Liquid-Epoxy Coating and Linings for Steel Water Pipelines
AWWA C222	Polyurethane Coatings and Linings for Steel Water Pipe and Fittings

4. Consumer Product Safety Act, Part 1303.
5. Environmental Protection Agency (EPA).
6. International Concrete Repair Institute (ICRI):

Technical Guideline No. 03732	Selecting and Specifying Concrete Surface Preparation for Coatings, Sealers and Polymer Overlays
Standard 310.2	Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays and Concrete Repair with CSP Chips

7. NACE International (NACE):

NACE TPC2	Coating and Lining for Immersion Service: Chapter Safety, Chapter 2 Surface Preparation, Chapter 3 Curing, and Chapter 4 Inspection
NACE SP0178	Design Fabrication, and Surface Finish Practices for Tanks and Vessels to be Lined for Immersion Service
NACE SP0188	Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
NACE SP0178	Surface Finishing of Welds Prior to Coating; Weld Replica Only to be used with NACE SP0178
NACE RP0287	Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces Using a Replica Tape

8. National Association of Pipe Fabricators (NAPF):

NAPF 500-03	Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings

9. Occupational Safety & Health Administration (OHSA):

1915.35 Standards - 29 CFR	Painting
1926.62 Standards - 29 CFR	Lead

10. The Society for Protective Coatings (SSPC):

SSPC-VIS 1	Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
SSPC-VIS 3	Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaning
SSPC Vol. 1	Good Painting Practices
SSPC-AB 1	Mineral and Slag Abrasives
SSPC-AB 2	Cleanliness of Recycled Ferrous Metallic Abrasives
SSPC-AB 3	Ferrous Metallic Abrasives
SSPC-AB 4	Recyclable Encapsulated Abrasive Media in a Compressible Matrix
SSPC-SP 1	Solvent Cleaning
SSPC-SP 2	Hand Tool Cleaning
SSPC-SP 3	Power Tool Cleaning
SSPC-SP 11	Bare Metal Power Tool Cleaning
SSPC-SP I6	Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals
SSPC-PA 1	Shop, Field and Maintenance Painting of Steel
SSPC-PA 2	Determining Compliance to Required DFT
SSPC-PA 10	Guide to Safety and Health Requirements for Industrial Painting Projects
SSPC-PA 17	Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements
SSPC Guide 6 (CON)	Containment of Debris
SSPC Guide 12	Illumination of Painting Projects
SSPC Guide 15	Retrieval and Analysis of Soluble Salts

11. SSPC/NACE International Joint Standards:

SSPC-SP 5/NACE 1	White Metal Blast Cleaning
SSPC-SP 6/NACE 3	Commercial Blast Cleaning
SSPC-SP 7/NACE 4	Brush - Off Blast Cleaning
SSPC-SP 10/NACE 2	Near - White Metal Blast Cleaning
SSPC-SP 13/NACE 6	Surface Preparation of Concrete

12. Texas Commission on Environmental Quality (TCEQ):

30 TAC Chapter 290, Subchapter D	Rules and Regulations for Public Water Systems

1.05 DELIVERY AND STORAGE

A. Deliver coating products to the jobsite in original unopened containers, with manufacturer's label and batch number attached. Do not apply products until the Owner's field representative has approved the product for use.

B. Use one location at each jobsite for the storage of coating products. Protect the floor from spills and other damage. Protect the products from extreme heat or cold. Keep containers covered. Keep the storage rooms clean of trash and debris. Dispose of oily or used rags daily. Under no circumstances will they be allowed to accumulate. Take precautions to prevent fires. The storage of flammable liquids must comply with the city, state, or other fire codes.

C. Storage of coatings and other products must be in accordance with the manufacturer's requirements. Coatings that have been damage or not stored properly must not be applied and must be removed from the jobsite.

D. All products and coatings that are not approved for the Project must be removed from the jobsite and must not be stored at the jobsite.

E. All materials must be delivered to the jobsite in original sealed containers with the date of manufacture and batch number stamped thereon by the coating manufacturer. Materials are subject to random observations by the Owner's representative at the jobsite.

1.06 ENVIRONMENTAL CONDITIONS

A. Do not apply coatings under conditions that are unsuitable for the production of good results. Remove trash and debris from enclosed buildings and thoroughly clean prior to application of coatings. Do not begin application of coatings in areas where other trades are working, or where construction activities result in airborne dust or other debris. Do not apply coatings in conditions which do not conform to the recommendations of the coatings manufacturer.

B. Coatings must only be applied when conditions fall within the parameters listed in the manufacturer's printed data.

C. Contractor must provide dehumidification equipment sized to maintain dew point temperature 5 deg F or more above surface temperature of metal surfaces to be prepared and coated.

D. Do not apply any coatings when weather conditions are unfavorable. In the event that climatic conditions are not conducive for best results, postpone application of coatings until conditions conform to the manufacturer's recommendations and the provisions of this Section.

E. Do not apply coatings to a wet or damp surface in wet or damp weather conditions, or when there is dust in the air. Surfaces exposed to direct sunlight must be shaded by awnings or other protective devices while coatings are being applied, if recommended by coating manufacturer. When necessary, provide temporary heating devices of a type that produces no fumes or water vapor which will discolor the paint system.

F. Heating and Dehumidification:

1. Dehumidification equipment must be used to control the environment during surface preparation, rehabilitation, coating application and coating curing at no additional cost to the Owner, if acceptable environmental conditions cannot be met.

2. If the Contractor cannot meet the required environmental conditions to apply the interior coating system per this Section and the coating manufacturer's written recommendations, Contractor will cease operations until approved dehumidification equipment has been provided and acceptable environmental conditions are achieved.

3. If coating system is applied without dehumidification or in conditions not acceptable by this Section and by the coating manufacturer's written requirements, Contractor must fully remove coating system applied and replace per the Engineer's direction.

4. Contractor must furnish all labor, materials, equipment, fabrication and quality control inspections, and all other incidentals required to control and maintain the environment of the reservoir within the parameters stated in this Section and must incorporate these and any other expenses into its bid.

5. Owner reserves the rights, in the event the dehumidification equipment is not performing to the minimum requirements stated in this Section, to require the Contractor to modify and or add additional equipment to satisfy the conditions of this Section, at the sole cost to the Contractor.

6. It is the Contractor's responsibility to provide adequate dehumidification equipment to meet this specification and the coating manufacturer's requirements of this Section and coating manufacturer's requirements. The coating manufacturer's limits of surface temperature, tank inside air temperature and relative humidity requirements will govern, if more stringent than the requirements stated within this Section.

G. Forced Ventilation:

1. Provide continuous forced fresh air ventilation when working inside of containment systems or enclosed areas that are not openly vented from the beginning of surface preparation through final coating operations and coating curing.

2. Forced ventilation must be supplied per the recoat time required by the coating manufacturer and at least 48 hours after the final coat has been applied.

3. From the beginning of interior coating applications to until the coating system is cured, the Contractor must monitor the air for the lower explosion limit (LEL) as published in the coating manufacturer's product SDS.

4. Contractor is responsible for supplying, installing and maintaining the forced ventilation system.

H. Containment System:

1. Contractor must provide containment methods, either full or partial, which allows for the containment of the environmentally sensitive waste, dust and paint over spray that will be generated during the abrasive blasting and painting operation.

2. Minimum Containment for Field Surface Preparation:

    a. Provide a minimum SSPC Guide 6 (CON) Class 3A.D1.E3 containment system when dry abrasive blasting.

    b. Provide a minimum SSPC Guide 6 (CON) Class 2W containment system when wet abrasive blasting. All water must be contained and properly disposed of.

    c. Provide a minimum SSPC Guide 6 (CON) Class 2P.E3 containment system when power tool cleaning.

3. The ground surrounding the project area must be protected from all debris, emissions, dust, and other materials generated in the cleaning operations with a minimum of two layers of polyethylene covered with plywood or the same material used for the perimeter containment system.

4. Containment is not required when blasting on the interior of a completely enclosed area (i.e. roof is in place) as long as no visible emissions are created.

5. Contractor must ensure that no spent cleaning/blasting debris, dust, overspray, coating droplets, or emissions of any kind, escape to the atmosphere, or to adjacent buildings, private property, work sites, parking lots, etc.

6. Owner reserves the right to stop Work or require containment, additional containment or different containment methods if the Contractor's operations create a nuisance beyond the tank site property line in the sole opinion of the Owner, the Engineer, the Owner's representative, any regulatory agency, or neighbor. All costs of providing an adequate containment system must be included by the Contractor in the Base Bid.

7. Contractor will be responsible for all materials that are used and for any apparatus used to contain dust emissions, debris, overspray, and coating droplets. The containment system attachments to existing or proposed structures must be designed by a professional engineer, licensed in the state where the Project is located, not to impose excessive loading on the structure. Contractor must submit the designed and sealed details of the containment system on the tank.

8. Any damage to the structure(s) as a direct or indirect result of the containment system must be repaired or sections replaced by the Contractor at no additional cost to the Owner. Neither the Owner, nor the Owner's Engineer, assumes any responsibility for the structural ability of the structure to support the containment system.

9. If tarps are used as part of the containment system, the tarps must be an impervious, solid, flame-resistant material, reinforced with a fiber mesh and must allow as much light as possible to pass through the material.

I. Visible Emissions:

1. Contractor must control visible emissions and releases while dust producing activities are underway.

2. Visible emissions more than SSPC Guide 6, Level 1 (1 percent of the workday or 5 minutes in an 8-hour shift) are unacceptable. Sustained emissions of more than 1 minute, regardless of the total time of emissions for the day is unacceptable. If unacceptable emissions are observed, Contractor must shut down immediately and

correct the situation and clean up any debris generated from the release to the satisfaction of the Engineer before continuing Work.

1.07 WORKING CONDITIONS

A. Provide adequate lighting at any location that coatings are being applied or testing is performed. Illumination must be of sufficient intensity to achieve good results. Provide explosion-proof lighting when required.

B. Temporary ladders and scaffolds must conform to applicable safety requirements. Erect temporary scaffolds where needed to cover large areas. Provide ladders or scaffolding during testing procedures.

1.08 WARRANTY/GUARANTEE

A. Protective coating must be guaranteed for a period of 2 year from the date of the Owner's acceptance of the Project.

B. A warranty inspection must be conducted prior to the end of the warranty period. Any Defective Work discovered at this date must be corrected by the Contractor in accordance with the Contract Documents at no additional cost to the Owner.

2.00 PRODUCTS

2.01 GENERAL COATING REQUIREMENTS

A. All coatings must be free of heavy metals such as arsenic, barium, chromium, selenium, silver, lead, mercury and cadmium.

B. All coatings in contact with potable water must meet the applicable requirements of NSF/ANSI/CAN 600 according to the requirements of NSF/ANSI/CAN 61, including the most current health effects criteria for xylenes, toluene and ethylbenzene for the application and volume of tank on the Project.

C. All coatings submitted or used on this Project must comply with the EPA's Clean Air Act for maximum VOC (volatile organic compound) limits.

D. Finish coatings must be from the same batch.

2.02 MATERIALS

A. Coating products are to be as follows:

Type A - Alkyd-Phenolic Universal Primer	
Manufacturer	**Approved Coating**
Tnemec	Series 37H Chem-Prime H.S.
Sherwin-Williams	Kem Kromik Universal
Akzo Nobel / International Paint, LLC	Interlac 573
Devoe Coatings	Devprime 1403
Carboline	Carbocoat 150UP

Type A - Alkyd-Phenolic Universal Primer	
Manufacturer	**Approved Coating**
PPG	Multiprime 4360

Type B - Epoxy-Polyamide Primer	
Manufacturer	**Approved Coating**
Tnemec	Series 66
Sherwin-Williams	Macropoxy 240
Akzo Nobel / International Paint, LLC	Intergard 251; Intergard 269 for valves and gates, submerged structural steel and misc. metals, and submerged piping
Devoe Coatings	Devran 201V Series
Carboline	890
PPG	Amercoat 385

Type C - Penetrating Epoxy Pre-Primer	
Manufacturer	**Approved Coating**
Tnemec	Approved Equal
Sherwin-Williams	Macropoxy 920 Pre-Prime
Akzo Nobel / International Paint, LLC	Interbond 600
Devoe Coatings	Approved Equal
Carboline	Rustbond Penetrating Sealer
PPG	Amerlock Sealer

Type D - Inorganic Zinc Primer (Minimum 80% Zinc by Weight)	
Manufacturer	**Approved Coating**
Tnemec	Series 90-98 Tneme-Zinc
Carboline	Carbozinc 11 VOC
Sherwin-Williams	Zinc Clad II Plus
PPG	Dimetcote 9 VOC
Approved Manufacturer	Approved Equal

Type E - Organic Zinc Primer (Minimum 80% Zinc by Weight)	
Manufacturer	**Approved Coating**
Tnemec	Series 90-97 or 90G-1K97 Tneme-Zinc
Carboline	Carbozinc 859
Sherwin-Williams	Corothane I Galvapac

Type E - Organic Zinc Primer (Minimum 80% Zinc by Weight)	
Manufacturer	**Approved Coating**
PPG	Amercoat 68HS
Akzo Nobel / International Paint, LLC	Interzinc 52
Approved Manufacturer	Approved Equal

Type F - Alkyd Enamel	
Manufacturer	**Approved Coating**
Tnemec	Series 2H Hi-Build Tneme-Gloss
Sherwin-Williams	DTM Alkyd Enamel
Akzo Nobel / International Paint, LLC	Interlac 665
Devoe Coatings	Devlac 1431
Carboline	Carbocoat 8225
PPG	Fast Dry 35

Type G - Epoxy-Polyamide Coatings	
Manufacturer	**Approved Coating**
Tnemec	Series 66
Sherwin-Williams	Macropoxy 646 Epoxy
Akzo Nobel / International Paint, LLC	Intergurd 475HS; Interseal 670HS for valves and gates, PVC pipe and conduit, submerged structural steel and misc. metals, and submerged piping
Devoe Coatings	Bar-Rust 235
Carboline	Carboguard 60
PPG	Amerlock 385

Type H - Epoxy-Polyamide Coatings for Potable Water (NSF 61 Certified)	
Manufacturer	**Approved Coating**
Tnemec	Series 20 Pota-Pox or N140 Pota-Pox Plus
Sherwin-Williams	Tank Clad Epoxy
Akzo Nobel / International Paint, LLC	Interline 850 or Interseal 670HS (NSF colors)
Devoe Coatings	Bar-Rust 233H Series
Carboline	Carboguard 61
PPG	Amerlock 2/400

Type I - Aliphatic Polyurethane Enamel	
Manufacturer	**Approved Coating**
Tnemec	Series 1074 Endura-Shield II
Sherwin-Williams	Hi-Solids Polyurethane
Akzo Nobel / International Paint, LLC	Interthane 990 Series
Devoe Coatings	Devthane 379 Series
Carboline	Carbothane 133HB (Satin) or Carbothane 134HG (High Gloss)
PPG	Pitthane Ultra Series

Type J - Silicone Aluminum Coatings for High Temperature	
Manufacturer	**Approved Coating**
Tnemec	Series 39 Silicone Aluminum
Sherwin-Williams	Silver Brite Aluminum B59S8
Akzo Nobel / International Paint, LLC	Intertherm 50 Series
Devoe Coatings	Intertherm 50 Series
PPG	Hi-Temp 500
Carboline	Carbozinc 11; Finish: Thermaline 4700 Series (up to 1000 deg F); Thermaline 4900 (up to 450 deg F)

Type K- Epoxy Concrete Coating	
Manufacturer	**Approved Coating**
Tnemec	Series 46H-413 Hi-Build Tneme-Tar
Sherwin-Williams	Tar Guard Epoxy
Akzo Nobel / International Paint, LLC	Interzone 954
Devoe Coatings	Devtar 5A Series
PPG	Amercoat 78HB Coal Tar Epoxy
Carboline	Bitumastic 300M

Type L - Novolac Vinyl Ester/Novolac Epoxy Concrete Coating - High Friction Surface (HFS)	
Manufacturer	**Approved Coating**
Tnemec	Series G436 Perma-Shield / Chembloc Series 252SC
Sherwin Williams	Dura-Plate 8200

Type L - Novolac Vinyl Ester/Novolac Epoxy Concrete Coating - High Friction Surface (HFS)	
Manufacturer	**Approved Coating**
Akzo Nobel / International Paint, LLC	Ceilcote 380 / 242GF Flakeline System
PPG	SFT 675 / FlakeRez 8303
Carboline	Carboguard 510 Series / Plasite 4500 Series

Type M - High Solids Epoxy Siloxane	
Manufacturer	**Approved Coating**
Carboline	Carboxane 2000
Sherwin-Williams	Sher-Loxane 800
PPG	PSX 700 Polysiloxane
Approved Manufacturer	Approved Equal

Type N - Epoxy Mastic	
Manufacturer	**Approved Coating**
Carboline	Carbomastic 15
Sherwin-Williams	Epoxy Mastic II
PPG	Amerlock 2/400 AL
Tnemec	Chembuild Series 135
AkzoNobel/International Paint, LLC	Interseal 670HS

Type O - Elastomeric Polyurethane Hybrid	
Manufacturer	**Approved Coating**
Carboline	Reactamine 760 Series
Sherwin-Williams	Poly-Cote 115
PPG	Amerthane 490
Tnemec	Elasto-Shield Series 406
AkzoNobel/International Paint, LLC	Polibrid 705E Elastomeric

Type P - Glass Flake Reinforced Epoxy	
Manufacturer	**Approved Coating**
Carboline	Carboguard 890GF
Sherwin-Williams	Sher-Glass FF
PPG	Amerlock 2/400 GF

Type P - Glass Flake Reinforced Epoxy	
Manufacturer	**Approved Coating**
Tnemec	Tnemec Series G435
AkzoNobel/International Paint, LLC	Approved Equal

Type Q - 100 Percent Solids Epoxy for Wastewater	
Manufacturer	**Approved Coating**
Carboline	Plasite 4550-S Novolac Epoxy
Sherwin-Williams	Dura-Plate 6000 Amine Epoxy
PPG	Novaguard 890 or Novaguard 810 Novolac Epoxy
Tnemec	Perma-Glaze Series G435 or Series G436 Modified Polyamine Epoxy
AkzoNobel/International Paint, LLC	Approved Equal

B. Petrolatum (Wax) Tape:

1. Petrolatum (wax) tape must be installed per the manufacturer's written recommendations. Provide all primers and appurtenant materials as required for installation per the recommendations.
2. Approved Manufacturers:
    a. Trenton Corp. - Trenton Primer and #1 Wax-Tape.
    b. Denso North America, Inc. - Denso Paste and Densyl Tape.
    c. Approved equal.

C. Pipe Wrap Tape System:

1. System must be designed to mechanically protect coated piping from corrosion and abrasion in above ground, below ground and submerged conditions and be compatible with specified pipe coating system(s).
2. System must be UV resistant and may be constructed of HDPE, PVC, or fiberglass with an adhesive backing on one side for application to coated piping.
3. System must include a fiberglass reinforced outer shield for abrasion resistance and be able to be top coated for aesthetics.
4. Approved Manufacturers:
    a. SealForLife.
    b. Denso North America, Inc.
    c. Approved equal.

2.03 COLOR SELECTION

A. The color chart must include the complete available range of colors, including tints and shades. Owner will select the colors during construction.

B. Use a multi-color system coating for any surface receiving more than one coat. Each coat must be tinted differently from the preceding coat in a manner that will allow the various coats to be easily distinguished. Colors must generally be from light to dark shades, but the Contractor may have the option to select tint shades to insure coats will receive adequate coverage without bleeding or otherwise showing through the preceding coat.

C. Piping and equipment must be color coded or labeled in accordance with the requirements of the TCEQ.

3.00 EXECUTION

3.01 GENERAL

A. All coatings must be applied in strict conformance with the coating manufacturer's published specifications, this Section, or as approved by the Engineer.

B. Surfaces which will be inaccessible after installation must be coated prior to installation or must be coated and approved in stages as the Work is installed.

C. Engineer will approve surfaces for application of coatings at each stage. Any material that is coated prior to the Engineer's approval will be stripped back to bare metal and repainted.

D. At least 7 days or as required by the coating manufacturer, must be allowed for drying of finished surfaces before any machinery can be placed into service.

E. The number of coats called for in this Section are considered the minimum required. If more coats are required to provide the specified dry film thickness or for complete coverage and uniform appearance, they must be provided at no additional cost to the Owner.

F. Illumination equipment must be provided by the Contractor in accordance with SSPC Guide 12. Explosion-proof lights and electrical equipment must be provided. The minimum illumination at the surface of the work during surface preparation and coatings is 215 lux (20 fc). The minimum illumination during inspection is 538 lux (50 fc). Whenever required by the Owner's representative, the Contractor must provide additional illumination and necessary supports to cover all areas to be inspected.

3.02 STEEL SURFACE PREPARATION

A. The adequacy of the preparation of steel surfaces will be determined by comparing the surface with SSPC VIS 1 "Pictorial Surface Preparation Standards for Painting Steel Surfaces" and SSPC VIS 3 "Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaning." Prepare surfaces in accordance with the following requirements:

1. SSPC-SP 1 — Solvent Cleaning.
2. SSPC-SP 2 — Hand Tool Cleaning.
3. SSPC-SP 3 — Power Tool Cleaning.
4. SSPC-SP 5 / NACE 1 — White Metal Blast Cleaning.

5. SSPC-SP 6 / NACE 3 — Commercial Blast Cleaning.
6. SSPC-SP 7 / NACE 4 — Brush-Off Blast Cleaning.
7. SSPC-SP 10 / NACE 2 — Near-White Blast Cleaning.
8. SSPC-SP 11 — Power Tool Cleaning to Bare Metal.

B. The resulting surface profile must be in accordance with the coating manufacturer's recommendations.

C. "Solvent Cleaning" must be performed prior to subsequent surface preparation, including abrasive blast cleaning.

D. All sharp edges and welds must be ground smooth to a rounded contour and all weld splatter must be removed prior to abrasive blasting. Edges of metal to be coated must be rounded to a minimum of 1/16-inch radius of chamfered a minimum of 1/16 inch at an angle of 45 degrees.

E. Welds and adjacent areas:

1. Prepared such that there is:
    a. No undercutting or reverse ridges on the weld bead.
    b. No weld spatter on or adjacent to the weld or any other area to be painted.
    c. No sharp peaks or ridges along the weld bead.
    d. Grind embedded pieces of electrode or wire flush with the adjacent surface of the weld bead.
2. Weld profiles must conform to NACE RP0178, Profile 'D'.

3.03 DUCTILE IRON PIPE AND FITTINGS SURFACE PREPARATION

A. Prepare surfaces in accordance with the following requirements:

1. NAPF 500-03-01 — Solvent Cleaning.
2. NAPF 500-03-02 — Hand Tool Cleaning.
3. NAPF 500-03-03 — Power Tool Cleaning.
4. NAPF 500-03-04 — Abrasive Blast Cleaning for Ductile Iron Pipe.
5. NAPF 500-03-05 — Abrasive Blast Cleaning for Cast Ductile Iron Fittings.

B. "Solvent Cleaning" must be performed prior to subsequent surface preparation as specified in NAPF 500-03.

3.04 PETROLATUM (WAX) TAPE

A. Petrolatum (wax) tape must be installed per the manufacturer's written recommendations. Provide all primers and appurtenant materials as required for installation per the recommendations.

B. Tape must be installed on all buried flexible couplings and at locations indicated on the Drawings and as specified.

3.05 PIPE WRAP TAPE SYSTEM

A. Tape must be installed per the manufacturer's written recommendations. Provide all primers and appurtenant materials as required for installation per the recommendations.

B. Tape must be installed on all piping at the transition between above grade and below grade. Coat piping a minimum of 2 feet vertically above and below the ground surface.

C. Paint wrap to match adjacent piping.

3.06 CONCRETE SURFACE PREPARATION

A. The adequacy of the preparation of concrete surfaces will be determined by comparing the surface with ICRI Surface Finish Comparators. Prepare surfaces in accordance with the following requirements and the coating manufacturer's recommendations:

1. SSPC-SP 13 / NACE 6 — Surface Preparation of Concrete.

2. ICRI CSP 3 – 5, or as required by the coating manufacturer.

B. Allow a minimum of 28 days curing time to elapse before coatings are applied. Concrete surfaces which are scheduled to receive coatings must be in accordance with the coating manufacturer's moisture requirements. Contractor must provide any primers required by the coating manufacturer to address outgassing, as needed.

C. Contractor must field verify that the pH of the concrete is suitable for application per the coating manufacturer's product requirements.

D. Bug holes, air pockets, voids or imperfections in the concrete surface must be filled or patched with a cementitious resurfacing material approved by the coating manufacturer.

E. All coating terminations points, including from concrete to metal are to include a 1/4-inch key cut.

F. Concrete Surface Preparation Inspection:

1. Adhesion Testing:

a. Tensile testing of the surface preparation must be performed by the Contractor using a Type 4 or Type 5 pneumatic adhesion testing equipment in accordance with ASTM D7234 using 2-inch diameter dollies for concrete surface adhesion testing. Provide a minimum of three tests (dollies) per area and coating system. Engineer will select location of test dollies.

b. Concrete surface or applied coating must be scored for concrete adhesion testing.

c. Adhesive failure greater than 50 percent of the dolly surface area indicate inadequate surface preparation.

d. Cohesive failures which result in loss of sound concrete will be acceptable provided the loss is greater than 50 percent of the dolly surface area.

e. Low adhesion cohesive failures with a thin layer of concrete due to weak concrete or laitance over 50 percent of the dolly surface will be rejected.

2. Concrete Soundness: Concrete soundness will be determined using the scratching or hammer impact methods as defined in SSPC-SP 13.

3. Moisture Content: Moisture must be tested as specified in SSPC-SP 13 and in accordance with ASTM D4263 and ASTM F1869 (for conditioned spaces). Moisture content cannot exceed the moisture content recommended by the coating manufacturer.

3.07 SURFACE PREPARATION

A. Clean and degrease surfaces prior to abrasive blasting by solvent cleaning as specified using solvents, detergent/water, emulsions, and steam. Proposed method must be documented in the coating plan. Contractor must contain and properly dispose of all runoff and debris from cleaning.

B. If the following conditions exist or are prevalent, surface preparation and coating must be delayed or postponed until conditions are favorable. Each day's coating must be completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions or changes. No surface preparation can begin or coating applied:

1. When the surface, air or material is below or above the manufacturer's printed instructions.
2. When surfaces are wet or damp.
3. During weather conditions of rain, snow, fog or mist.
4. When the air and steel temperature is less than 5 deg F above the dew point temperature.
5. If the relative humidity is above 85 percent.
6. When it is expected that the dew point, air and/or surface temperature will be below or above the coating manufacturer's recommended temperatures within 4 hours after applications of coating, minimum. Coating manufacturer may require additional time between application and temperature and weather changes.

C. Shop Surface Preparation:

1. Notify Engineer at least 7 days prior to start of shop blast cleaning to allow for inspection of the Work during surface preparation and shop application of paints. Work is subject to the Engineer's approval before shipment to the jobsite.
2. Items such as structural steel, metal doors and frames, metal louvers, and similar items as reviewed and approved by the Engineer may be shop prepared and primed. Centrifugal wheel blast cleaning is an acceptable alternate to shop blast cleaning. Blast clean and prime in accordance with the Specifications.
3. Prepare surfaces by abrasive blasting as specified and apply shop prime coat. Shop primed steel plates must not have primer extended within 4 inches along all edges to be welded. All primer within 4 inches of an area to be welded must be removed prior to welding. Welding of painted surfaces will not be allowed.

D. All pre-assembled shop primed items must be prepared in accordance with these specifications and inspected by the Owner's representative before and after priming.

E. Abrasive Blasting:

1. Prior to commencing abrasive blasting operations, the Contractor must perform a test blast to verify that the surface cleanliness and profile meet the requirements of this Section and meet the coating manufacturer's requirements for the coating to be applied. If the test section does not meet the requirements, the Contract must make changes to the abrasive materials and/or methods to provide suitable blast.
2. Abrasive blast only the amount of surface area which can be primed the same day or before any rust starts to form, whichever occurs first. Areas which are not painted the same day must be re-blasted on the day the prime coat is applied.
3. Shrouding or recovery of all blast material will be mandatory during all exterior blasting.
4. Contractor must contain all waste and process discharge in accordance with the accepted methods for the process and materials that are in abatement.
5. Where abrasive blast cleaning will not remove or properly prepare metal surfaces, hand and/or power tool cleaning must be used to remove such conditions as weld splatter, laminations and radius-sharp edges. Hand tool or power tool must be used on areas less than 2 feet in diameter or smaller or on corners and edges.
6. All abrasive blast equipment must be equipped with, including but not limited to the following:
    a. Noise reducing devices.
    b. Hose coupling safety devices.
    c. Electrical grounding devices.
    d. Moisture traps and filters.
    e. Fresh air hoods for all blasters.
    f. "Dead Man" switches on all blast hoses.
    g. Air dryers.

F. Surface profile must be in accordance with manufacturer's printed requirements.

G. The adequacy of the preparation of surfaces must be determined by comparing the surface with SSPC-VIS 1, SSPC-VIS 3, NACE RP0178 and ICRI Surface Finish Comparators.

H. Adequate surface preparation must be verified throughout surface preparation per SSPC-PA 17. Minimum testing requirements:

1. Test the surface profile within the first 15 minutes and one additional time during each work shift or 12-hour period, whichever is shorter for each gun or blasting apparatus used or at any time the process producing the acceptable profile indicated above is changed, as interpreted by the Engineer.
2. Select a minimum of three 6-inch square locations and take two readings. The average to the two readings is a "profile measurement." The group of three locations is the "location average." The location average must be within the specified profile range.
3. Contractor must report the location averages (lowest location average and highest location average, and the profile measurement for each surface preparation apparatus.

4. If the substrate has been previously coated, an existing profile may exist. Contactor must adjust blast media size to ensure that the resulting surface profile meets the profile required.

I. Wherever the words “solvent cleaning”, “hand tool cleaning”, “wire brushing”, or “blast cleaning”, or similar words of equal intent are used in the Specifications or in paint manufacturer’s specifications, they are understood to refer to the applicable specifications indicated.

J. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacuum-blasting methods may be required. Coating manufacturer’s recommendations for wet blast additives and first coat application will apply.

K. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wiped with a tack cloth.

3.08 PREPARATION OF HOT-DIP GALVANIZED COATED STEEL, STAINLESS STEEL AND NON-FERROUS METALS

A. For galvanized coated steel, remove all soluble and insoluble contaminants. Prepare hot-dipped galvanized coated iron and steel products in accordance with ASTM D6386.

B. Abrasive blast per SSPC-SP I6 to achieve an angular anchor profile as required by the coating manufacturer.

C. Contractor is responsible for coordinating with the coating manufacturer to verify compatibility of the specified coating system with the provided surface preparation.

3.09 PREPARATION OF EXISTING COATED OR SHOP PRIMED SURFACES

A. General:

1. Factory-applied primers to equipment must be those specified or verified by the Contractor to be compatible with the specified coating systems. Where possible, notify manufacturers which shop prime coats will be required in order to be compatible with field-applied finish coats.

2. Where equipment is purchased which has the manufacturer’s standard primer or a factory finish which is other than as specified in this Section, remove the factory-applied paint system or apply passivators or other special coatings as required to make the surface compatible with the finish coat specified.

3. Do not apply any coating to machinery, piping, or other surfaces before testing has been completed and systems approved. Any damage to coatings resulting from subsequent corrective procedures must be stripped back to bare metal and repainted with the appropriate paint system as directed by the Engineer.

4. Check for compatibility when applying coatings over existing coatings. Apply a test patch of the recommended coating system, covering at least 2 to 3 square feet or as directed by the Engineer. Allow to cure 1 week before testing adhesion per ASTM D3359 in the presence of the Engineer. If adhesion does not meet the manufacturer’s published data, consult with the Engineer.

5. Shop primed or coated surfaces must be reviewed with the Engineer to determine if the extent of damage to the coating and suitability of finish coats to adhere to shop applied coats.
6. If a cured epoxy, polyurethane, or plural-component material is to be top coated provide brush-off blast as specified herein or as recommended by the coating manufacturer.
7. Surface preparation recommendations of coating manufacturer are subject to approval of the Engineer.

B. To Be Recoated or Final Coated:

1. Solvent clean.
2. Perform touch-up repairs of existing coating.
3. Asphaltic coated ductile iron pipe will require an application of a seal coat prior to the application of a cosmetic finish coat.

C. Touch-Up Repairs:

1. Clean loose, abraded, or damaged coatings to substrate by power tool to bare metal per SSPC-SP 11 and/or NAPF 500-03-03 “Power Tool Cleaning.”
2. Feather surrounding intact coating.
3. Apply one spot coat of the specified primer to bare areas overlapping the prepared existing coating.
4. Apply one full finish coat of the specified primer or finish coat(s) overall.

D. Application of a Cosmetic Coat:

1. The exact nature of shop-applied coatings is not known in all cases.
2. Check compatibility by application to a small area prior to starting the coating.
3. If lifting or other problems occur, request disposition from the Engineer.

3.10 APPLICATION

A. Contractor and painting technicians are responsible for the application of the coating system and must have current applicator approvals from the coating manufacturer, as required.

B. After abrasive blast cleaning, dust and spent abrasive must be removed from the surfaces by vacuum process or with clean, dry, oil-free compressed air.

C. The prime coat must be applied as soon as possible after the blasting and surface cleaning is completed, inspected and approved by the Inspector. Blasted surfaces must be coated before rust forms on the surface. No prepared surface will be allowed to receive a coating if “rust bloom” or surface discoloration has occurred. All blasted surfaces must be coated to within 6 inches of the edge of a blasted area. No visible rust must be coated under any circumstances, including rust bloom or if discoloration has occurred, regardless of elapsed time between blasting and coating. Leave an uncoated strip of exposed metal to clearly identify where abrasive blasting was halted.

D. Provide mist coat if recommended by the coating manufacturer.

E. All weld seams, gaps, edges, bolts and difficult areas to coat must receive a stripe coat. Stripe coat must be a contrasting color. Stripe coat may be applied with intermediate or finish coating, but must be applied prior to the installation of the finish coat.

F. Contractor must apply each coat at the rate and in the manner specified by the coating manufacturer, except as may be modified herein. If material has thickened or must be diluted for application, coating must be built up to achieve the dry film thickness as specified for each coat of the complete system.

G. Maximum and minimum DFT must be per the supplied coating manufacturer's printed requirements and as required by this Section. DFT will be measured per SSPC-PA 2, Level 2 with an allowable measurement of spot DFT of:

   1. Minimum DFT, as specified.

   2. 120 percent of maximum DFT specified.

H. Contractor and painting technicians are responsible for the application of coating system and must have current applicator certifications from the coating manufacturer. Submit certifications with coating submittal.

I. Coatings which have an expired shelf or pot life may not be used and must be removed from the jobsite.

J. Coating must be applied by skilled workmen and must be brushed out or sprayed evenly, without runs, crazing, sags, or other blemishes.

K. Sand between coats to remove over spray and dry fall.

L. Apply the first coat to the surface, including cutting in around edges, before the second coat is applied. The second coat and any successive coats must not to be applied before notifying the Owner's field representative and obtaining approval. Each coat must be tested before the successive coat is applied.

M. The coating curing period must be adjusted to compensate for less than adequate weather conditions, as recommended by the coating manufacturer, for complete curing of the entire coating system. The full curing time recommended by the manufacturer must be provided.

N. Coating must be continuous and must be accomplished in an orderly manner to facilitate proper inspection control.

O. Where a roller or brush is used to apply the coating, additional coats may be necessary to achieve the recommended dry film thickness and/or to achieve total coverage of the underlying surface. Coated surfaces must be totally free of all roller nap, roller marks, brush bristles and brush marks.

P. When using conventional coating spray equipment for coating operations, effective oil and water separators combined with after coolers or deliquescent dryers must be used in compressed air lines to remove detrimental oil and moisture from the air. Separators must be placed as far as practical from the compressor. Compressors must be tested periodically by the Contractor for oil and water contamination of compressed air. Testing must follow ASTM D4285 "Standard Test Method of Indicating Oil and Water in Compressed Air." All compressor units found to produce unacceptable amounts of oil and or water, as determined by results of ASTM D4285 test data must be replaced with a compressor that is acceptable.

Q. For porous surfaces, such as concrete or masonry, a prime coat may be thinned to provide maximum penetration and adhesion. The type and amount of thinning must be determined by the coating manufacturer and is dependent on surface density and type of coating.

R. Concrete and Steel Floors and Walks, including Bulk Storage Areas:

1. Provide non-skid surface in walkway areas and on floors.

2. Contractor is to include non-skid additive such as aluminum oxide to coatings or may use 50 mesh dry wash silica sand broadcasted into the film and back rolled to encapsulate as recommended by the coating manufacturer.

3. Contractor is to provide a test area to confirm with Owner that the non-skid surface is adequate and consistent. Contractor must modify method or products used as required to provide an acceptable surface.

3.11 WATER AND WASTEWATER PIPE COLORS

A. General coating colors in accordance with the TCEQ are as follows for general selection of pipe coatings. Contractor must provide samples for Engineer's approval prior to ordering as specified.

Pipe/Pumps/Valves System Description	Color
Backwash Waste/Drain	Dark grey
Settled Water	Green
Effluent after Clarification	Dark green
Filter Effluent	Light blue
Gray Water	Purple with yellow lettering
Heated Water	Blue with 6-inch red bands, spaced 30-inches apart
Potable Water/Treated Water	Light blue
Power Conduits	In compliance with the National Fire Protection Association 70 National Electrical Code
Raw Water	Tan
Reclaimed Water	Purple with black lettering
Sewage	Grey
Sludge	Brown

Chemical Lines	Color
Liquid Alum	Yellow w/orange bands
Alum (solution)	Yellow w/ green bands
Ammonia	Yellow w/ brown bands
Chlorine (gas, liquid, or vent)	Yellow
Chlorine (solution)	Yellow w/ red bands

Chemical Lines	Color
Ferric Chloride	Brown with red bands
Ferric Sulfate	Brown with yellow bands
Fluoride	White with yellow bands
Liquid Caustic	White with red bands
Caustic (solution)	White with orange bands
Polymers	White with green bands (varies for water or WW applications)
Ozone	Stainless steel with white bands
Settled Water	Green
Sulfur Dioxide	Lime green with yellow bands

Other Lines	Color
Compressed Air	Light green
Instrument Air	Light green with dark green bands

3.12 FIELD QUALITY CONTROL

A. Field Tests: Make wet film tests during painting operations to assure proper thicknesses of coating are being applied. After each coat has been applied, test the paint film thickness with a nondestructive, magnetic type thickness gauge. The total dry-film thickness for each coat must be per Paragraph 3.10.G. Apply additional coats until the specified thickness is reached or exceeded.

B. Holiday Testing:

1. Holiday testing must be performed in accordance with NACE SP0188 or ASTM D5162 for steel substrates and ASTM D4787 for concrete substrates.

2. Test the entire surface of coated steel and piping in moderate or severe environments, as determined by the Engineer, with a holiday detector. For thickness between 10 and 20 mils (250 to 500 microns) a non-sudsing type wetting agent, as recommended by the holiday detector manufacturer, must be added to the water prior to wetting the detector sponge.

3. Holiday detect coatings in excess of 20 mils with high voltage holiday testers as recommended by the coating manufacturer.

4. Mark and repair failures in accordance with the manufacturer's printed instructions, then retest failure areas. No failures or other irregularities will be permitted in the final coats. Areas containing holidays must be repaired until tests indicate no holidays.

3.13 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted.

B. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.

C. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.

D. Mask openings in motors to prevent paint and other materials from entering the motors.

3.14 DAMAGED COATINGS, PINHOLES, AND HOLIDAYS

A. Feather edges and repaired in accordance with the recommendations of the paint manufacturer.

B. Repair fusion bonded coatings to be as recommended by the original applicator. Applicator must provide liquid repair kits for this purpose as recommended by the coating manufacturer.

C. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.

3.15 UNSATISFACTORY APPLICATION

A. If the item has an improper finish color, or insufficient film thickness, clean and topcoat surface with specified paint material to obtain the specified color and coverage. Obtain specific surface preparation information from the coating manufacturer.

B. Hand or power sand visible areas of chipped, peeled, or abraded paint and feather the edges. Follow with primer and finish coat in accordance with the Specifications. Depending on the extent of repair and its appearance, a finish sanding and topcoat may be required.

C. Evidence of runs, bridges, shiners, laps, or other imperfections are cause for rejection.

D. Repair defects in coating system per written recommendations of coating manufacturer.

E. Leave all staging up until the Engineer has inspected the surface or coating. Replace staging removed prior to approval by Engineer.

3.16 COATING INSPECTION

A. General:

1. All coats will be subject to inspection by the Engineer and the coating manufacturer’s representative.

2. Visually inspect concrete, nonferrous metal, plastic, and wood surfaces to ensure proper and complete coverage has been attained.

3. Give particular attention to edges, angles, flanges, and other areas where insufficient film thicknesses are likely to be present and ensure proper millage in these areas.

B. Coating Thickness Testing:

1. Owner’s representative may conduct coating thickness testing as necessary and without limitation.

2. Measure coating thickness specified in mils with an electronic type dry film thickness gauge.

3. Check each coat for the correct millage.

4. Tests for concrete coating thickness may be taken using a Tooke Gauge or gauge approved for testing coatings over concrete substrates. Contractor must repair coating after thickness testing, if required.

C. Coating Continuity (Holiday) Testing: Owner's representative will witness holiday testing performed by the Contractor.

3.17 CLEANING AND ADJUSTING

A. Promptly remove trash and debris resulting from painting operation from the Site. Remove drop cloths, masking tapes and other protective coverings. Remove paint spills, splatters, overlap of paint from adjacent material and other defects. Spot paint nicks and other defects.

B. Remove paint containers and waste products. Thoroughly clean paint storage rooms, removing spilled paint from walls and floors.

C. Damages due to over spray on buildings, vehicles, trees, or other surfaces not specified to be painted would be the responsibility of the Contractor.

3.18 SCHEDULE

A. Protective coatings must be applied in accordance with the following paint schedule. If additional or alternate primers, etc. are recommended by the coating manufacturer for any of the coatings specified, they must be provided at no additional cost to the Owner to provide a complete and compatible coating system, as approved by the Engineer.

PROTECTIVE COATINGS PAINT SCHEDULE

System	Application	Surface Prep	Product Type	No. of Coats	DFT/Coat (mils)
No. 1	**Submerged Metal - Potable Water** All metal surfaces new and existing below a plane 1 ft. above the maximum liquid surface, metal surfaces above the maximum liquid surface which are a part of the immersed equipment, concrete embedded surfaces of metallic items under submerged or buried conditions, such as wall pipes, pipes, wall or floor sleeves, access manholes, gate guides and thimbles, and structural steel. Not to be used for potable water storage tanks. All coatings must be NSF 61 certified.	SSPC-SP 1 SSPC-SP 10 NAPF 500-03-01 NAPF 500-03-04 NAPF 500-03-05	TYPE H - Epoxy-Polyamide TYPE H - Stripe Coat TYPE H - Epoxy-Polyamide	1 2	4.0 4.0
				Total Minimum Dry Film Thickness	**12.0 mils**
No. 2	**Above-Grade Interior/Exterior Steel and D.I. Piping Non-Immersion/Non-Corrosive Environment** All metal surfaces new and existing, such as inside pump station buildings, exterior piping and valves, exterior structural steel, etc. **Application Notes:** 1. Proposed piping and valves may be provided with factory applied prime coat(s), with fusion bonded epoxy or Type H epoxy. For damaged factory applied coatings spot prime with Epoxy Mastic. Provide application of Type C and Type M coatings in the field. 2. Proposed Field Coated and Existing Previously Coated Piping and Valves: Prepare as indicated and provide full coat of Epoxy Mastic and continue with stripe, intermediate and top coat as indicated.	**For New Piping and Valves:** SSPC-SP 1 SSPC-SP 6 NAPF 500-03-01 NAPF 500-03-04 NAPF 500-03-05 **For Previously Coated Piping and Valves:** SSPC-SP 1 SSPC-SP 3 NAPF 500-03-01 NAPF 500-03-03	TYPE N - Epoxy Mastic TYPE C - Penetrating Epoxy Pre-Primer TYPE M - Stripe Coat Type M - HS Epoxy Siloxane	1 1 1	5.0 2.0 5.0-7.0
				Total Minimum Dry Film Thickness	**12.0 mils**
No. 3	**New and Existing Metal Piping and Valves within Vaults and Under Insulation** **Moderate to Severe Environment** All metal surfaces new and existing that will be installed in areas where temporary submerged conditions can occur, such as within vaults and for piping and valves covered with insulation. **Application Notes:** 1. Proposed piping and valves may be provided with factory applied prime coat(s), with fusion bonded epoxy or Type H	**For New Piping and Valves:** SSPC-SP1 SSPC-SP6 NAPF 500-03-01 NAPF 500-03-04 NAPF 500-03-05	TYPE N – Epoxy Mastic TYPE C – Penetrating Epoxy Pre-Primer TYPE G - Stripe Coat TYPE G – Epoxy-Polyamide	1 1 2	4.0 2.0 4.0

System	Application	Surface Prep	Product Type	No. of Coats	DFT/Coat (mils)
	epoxy. For damaged factory applied coatings spot prime with Epoxy Mastic. Provide application of Type C and Type M coatings in the field. 2. Proposed Field Coated and Existing Previously Coated Piping and Valves: Prepare as indicated and provide full coat of Epoxy Mastic and continue with stripe, intermediate and top coat as indicated.	**For Previously Coated Piping and Valves:** SSPC-SP1 SSPC-SP3 NAPF 500-03-01 NAPF 500-03-03			
				Total Minimum Dry Film Thickness	**12.0 mils**

END OF SECTION

26 01 26 TESTING OF ELECTRICAL SYSTEMS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, material, equipment and incidentals of an independent testing agency.

B. These specifications cover the suggested field tests and inspections that are available to assess the suitability for initial energization and final acceptance of electrical power equipment and systems.

C. The purpose of these specifications is to assure that electrical equipment and systems are operational, are within applicable standards and manufacturer's tolerances, and are installed in accordance with design specifications.

D. The Work specified in these specifications may involve hazardous voltages, materials, operations, and equipment. These specifications do not purport to address all of the safety issues associated with their use. It is the responsibility of the user to review all applicable regulatory limitations prior to the use of these specifications.

E. Testing shall be inclusive of all low voltage equipment including conductors that are provided under this Contract.

F. Testing shall include all relay protective schemes and operation of the low voltage equipment.

1.02 QUALITY ASSURANCE

A. Testing Organization:

1. The testing organization shall be an independent, third party entity which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems being evaluated.

2. Testing organization shall be regularly engaged in the testing of electrical equipment devices, installations, and systems.

3. The Testing organization shall use technicians who are regularly employed for testing services.

4. An organization having a designation of NETA Accredited Company issued by the International Electrical Testing Association meets the above criteria.

5. Independent testing agency shall follow all tests and recommendations in NETA Acceptance Testing Specification for all equipment provided.

6. Testing Organization performing the Work shall submit appropriate documentation to demonstrate that it satisfactorily complies with these requirements.

7. Acceptable Testing Agencies:

a. National Field Services.

b. Real Power Technologies.

c. Shermco Industries.

d. Electrical Power Systems.

8. Testing Personnel:

a. Technicians performing these electrical tests and inspections shall be trained and experienced concerning the apparatus and systems being evaluated. These individuals shall be capable of conducting the tests in a safe manner and with complete knowledge of the hazards involved. They must evaluate the test data and make a judgment on the serviceability of the specific equipment.

b. Technicians shall be certified in accordance with ANSI/NETA ETT, Standard for Certification of Electrical Testing Technicians. Each on-site crew leader shall hold a current certification, Level 3 or higher, in electrical testing.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Electrical Qualifications & List of Test Submittals: 60 days prior to any testing taking place, Contractor shall submit to the Owner/Engineer the name of the testing agency; a list of all tests to be conducted shall also be submitted at this same time. No testing shall take place until this has been submitted and approved by the Engineer.

2. Electrical Testing Plan: A minimum of 2 weeks before testing is to take place, Contractor shall submit a detailed testing plan of the different configurations to be tested for the Owner’s and Engineer’s approval.

3. Electrical Testing Report:

a. A written report shall be submitted by the testing agency performing installation checks, operation and testing of the low voltage equipment. This report shall certify that:

1). The equipment has been properly installed.

2). Is in accurate alignment.

3). Meets the acceptance testing specifications of NETA and the equipment manufacturer.

b. Provide a detailed list of all tests that were performed and the test results as part of the Electrical Testing Report.

c. Electrical Testing Report(s) shall be submitted to the Engineer for approval no later than 1 week after testing has been conducted.

1.04 STANDARDS

A. The applicable provisions of the following standards shall apply as if written here in their entirety:

1. American National Standards Institute (ANSI).

2. Association of Edison Illuminating Companies (AEIC).

3. ASTM International (ASTM).

4. Electrical Apparatus Service Association (EASA).
5. Institute of Electrical and Electronic Engineers (IEEE).
6. Insulated Cable Engineers Association (ICEA).
7. International Electrical Testing Association (NETA).
8. National Electrical Manufacturers Association (NEMA).
9. National Fire Protection Association (NFPA).
10. Occupational Safety and Health Administration (OSHA).
11. State and local codes and ordinances.
12. Underwriters Laboratories, Inc. (UL).

2.00 PRODUCTS (NOT APPLICABLE)

3.00 EXECUTION

3.01 GENERAL

A. All testing shall be witnessed by the Owner's representative. Types of equipment required to be tested by these specifications shall include but not be limited to the following:
   1. Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables"
   2. Section 26 05 23 "Control-Voltage Electrical Power Cables"
   3. Section 26 05 26 "Grounding and Bonding for Electrical Systems"
   4. Section 26 29 33.11 "Variable Frequency Drives"
   5. Section 26 28 16 "Enclosed Switches and Circuit Breakers"

B. At a minimum, unless indicated otherwise, all testing shall be in accordance with the manufacturer's recommendations for energization and startup of the equipment.

C. Testing shall include a complete functionality testing of electrical equipment under all the different operating parameters identified by the Owner and Engineer.

D. Electrical testing instrument calibration shall be as indicated in ANSI/NEMA ATS-2017.

3.02 TEST REPORT

A. The test report shall include the following:
   1. Summary of the Project.
   2. Description of equipment tested.
   3. Description of tests.
   4. Test data.
   5. Analysis and recommendations.

B. Test data records shall include the following minimum requirements:
   1. Identification of the testing organization.

2. Equipment identification.
3. Nameplate data.
4. Humidity, temperature, and other conditions that may affect the results of the tests and/or calibrations.
5. Date of inspections, test, maintenance, and/or calibrations.
6. Identification of the testing technician.
7. Identification of inspections, tests, maintenance, and/or calibrations to be performed and recorded.
8. Identification of expected results when calibrations are to be performed.
9. Identification of as-found and as-left results, as applicable.
10. Identification of all test results outside of specified tolerances.
11. Sufficient spaces to allow all results and comments to be indicated.

C. The testing organization shall furnish a copy or copies of the complete test report as specified.

3.03 TEST DECAL

A. The testing organization shall affix a test decal on the exterior of equipment or equipment enclosure of protective devices after performing electrical tests.

B. The test decal shall be color-coded to communicate the condition of maintenance for the protective device. Color scheme for condition of maintenance of overcurrent protective device shall be:

1. White: Electrically and mechanically acceptable.
2. Yellow: Minor deficiency not affecting fault detection and operation, but minor electrical or mechanical condition exists.
3. Red: Deficiency exists affecting performance, not suitable for service.

C. The decal shall include:

1. Testing organization.
2. Project identifier.
3. Test date.
4. Technician identifier.

3.04 POWER SYSTEM TESTING

A. Contractor shall test the operation of the power distribution system, i.e. transformers, automatic throw over, double throw disconnect switches, 480V MCC, etc., for the various possible system configurations under load conditions.

B. Testing shall include, but not be limited to the following:

1. Normal power from Utility Source.

2. Back-up power from Standby Generator.

C. Contractor shall submit a detailed testing plan of the different configurations to be tested for the Owner's and Engineer's approval.

END OF SECTION

26 05 00 COMMON WORK RESULTS FOR ELECTRICAL

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary for complete and operational electrical systems, as specified herein.

B. This Section, as well as Division 1, concerns all other Sections in Division 26 shall be considered a part of each of those Sections as if written in their entirety.

C. Permanent Utilities:

1. Contractor shall be responsible to coordinate power at the Site with local utility company.

D. Temporary utilities:

1. Contractor may need to include generator power for outages, depending on the Contractors' means and methods of connecting to existing power equipment.

2. Contractor shall provide electrical testing and inspection services for temporary connections to existing equipment.

3. Fusing for temporary equipment shall be coordinated with upstream devices to ensure the fuses will terminate before interrupting electrical service to plant process equipment.

E. Electrical outages must be coordinated with operations, as well as the electrical, instrumentation and inspections divisions.

1.02 QUALITY ASSURANCE

A. Electrical Contractors' Qualifications:

1. Use adequate numbers of skilled workmen, trained and experienced in their crafts, and who are familiar with the Specifications and methods of performing the Work in this Division. A licensed Journeyman shall be on-site at all times when electrical Work is being performed. Electrical Work shall be performed under the direct supervision of a Master Electrician who holds a valid license in Texas. Contractor shall provide a monthly report to the Owner/Engineer for review stating that the Master Electrician has been to the Site and thoroughly reviewed the Work. The report shall be signed by the Master Electrician and include the data and time the Master Electrician was on the Site.

2. Contractor's company must have 5 years of experience with performing electrical Work within pump stations.

B. Workmanship: Work shall be performed in accordance with quality, commercial practices. The appearance of finished Work shall be of equal importance with its operation. Materials and equipment shall be installed based upon the actual dimensions and conditions at the Site. Locations for materials or equipment requiring an exact fit shall be field measured.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Submittals shall be submitted separated by specification section. Combined submittals will not be reviewed. Submittal will be marked not approved, revise and resubmit.
2. Incomplete submittals will not be reviewed and will be marked revise and resubmit.
3. Resubmittals shall be marked with a red strike-through for the items removed from the submittal and clouded with the items added to the submittal. Submittals shall be marked to track changes between resubmittals.
4. Component catalog number and manufacturing data sheet, indicating pertinent data and identifying each component by the item number and nomenclature as specified.
5. Component drawings showing dimensions, mounting, and external connection details in AutoCAD format.
6. Operation and maintenance manuals shall contain the Shop Drawings, submittals, spare part lists, schematics, project-specific final wiring diagrams with any changes made during startup and maintenance procedures.
7. Unless other additional information is required by the detailed equipment specifications, the following information shall be included for motors:
    a. Motor identification number and nomenclature as specified.
    b. Make and motor type.
    c. Brake horsepower of the motor.
    d. Locked rotor current at full load.
    e. Motor efficiency at full load (3-phase motors only).
    f. Starting torque.
    g. Method of insulating and impregnating motor coils (3-phase only).
    h. Speed of the motor at full torque.
    i. Full load current.
    j. Service factor.
    k. Motor temperature rise measured by resistance over 40 degrees C ambient.

B. Delays during submittals due to the Contractor not following the format mentioned above shall not be the fault of the Owner or Engineer.

C. Contractor shall provide a monthly report to the Owner/Engineer for review stating that the Master Electrician has been to the Site and thoroughly reviewed the Work. The report shall be signed by the Master Electrician and include the data and time the Master Electrician was on the Site.

D. Contractor shall:

1. Prepare, and keep up-to-date, the Record Drawings and detailed construction drawings.

2. Record the exact locations of each of these differences, sizes and details of the Construction Work as executed, with cross-references to and other requirements on the Record Drawings.
3. Keep the Record Drawings on the Work Site;
4. Upon completion of the Work, or at such other time as may be determined by the Engineer, submit the Record Drawings and copies to the Owner's representative in accordance with the Owner's Requirements.
5. Underground Interference drawing showing all underground duct banks, ground rods, ground conductors, pipes, piers, vaults, manholes, pull boxes, etc. that clearly identifies the location and routing of these systems. All interferences shall be brought to the Engineer's attention.
6. Provide revised drawings in AutoCAD noting any changes made to equipment during startup.

1.04 STANDARDS

A. Electrical Work shall be executed in accordance with local, state and national codes, ordinances and regulations which have jurisdiction or authority over the Work. If the standards and codes conflict with each other, the most stringent shall apply. The applicable provisions of the following standard shall apply as if written here in their entirety:
   1. American National Standards Institute (ANSI).
   2. Association Edison Illuminating Companies (AEIC).
   3. ASTM International (ASTM).
   4. Environmental Protection Agency (EPA).
   5. Institute of Electrical and Electronic Engineers (IEEE).
   6. Insulated Power Cable Engineers Association (IPCEA).
   7. International Electrical Testing Association (NETA).
   8. International Electrotechnical Commission (IEC).
   9. Local electrical ordinance.
   10. Local utility companies.
   11. National Electrical Code (NEC).
   12. National Electrical Contractors Association (NECA).
   13. National Electrical Manufacturers Association (NEMA).
   14. National Electrical Safety Code (NESC).
   15. National Fire Protection Association (NFPA).
   16. Occupational Safety and Health Administration (OSHA).
   17. Rural Electrification Association (REA).
   18. Texas Commission on Environmental Quality (TCEQ).

19. Underwriters Laboratories (UL).

20. Uniform Building Code (UBC).

1.05 DELIVERY AND STORAGE

A. Follow the manufacturer's directions for the delivery, storage and handling of equipment and materials. Tightly cover equipment and materials and protect it from dirt, water, chemical or mechanical injury and theft. Major electrical equipment shall be stored indoors and space heaters energized where applicable. Equipment that will be stored indoors for an extended period of time and that do not have space heaters shall have a 100-watt incandescent light placed in it and energized to eliminate the build-up of condensation in the equipment. Coordinate with equipment manufacturer for storage requirements. Damaged equipment shall not be acceptable. Upon installation, protect the materials until the Work is completed and accepted by the Owner.

1.06 JOB CONDITIONS

A. Permits, licenses and inspections shall be secured and paid for as required by law for the completion of the Work. Certificates of approval shall be secured, paid for, and delivered to the Owner before receiving the final acceptance of the Work.

B. The location of materials, equipment, devices and appliances indicated are approximate and subject to revisions at the time the Work is installed. Final location shall be as proposed by the Contractor and approved by the Engineer.

C. Should project conditions require any rearrangement of Work, or if equipment or accessories can be installed better than the general arrangement of Work on the Drawings, the Contractor shall prepare and submit plans of the proposed rearrangement for the Engineer's review and approval.

D. Motor horsepower ratings identified are anticipated ratings. If the actual equipment is a different size, the Contractor shall provide the appropriate wiring, conduit, over current protection, starters and accessories for a complete and working system at no cost to the Owner.

E. Contractor is required to abide by the Owner’s construction safety and health program where applicable.

F. Clearances indicated in the National Electrical Code must be maintained around equipment.

2.00 PRODUCTS

2.01 MATERIALS

A. Supplemental or alternative materials supplied and installed by the Contractor shall be approved prior to installation. Materials installed without pre-approval, through the submittals process, shall be removed from the Site and replaced at no additional cost to the Owner. No exceptions.

B. Discrepancies between the Drawings and Specifications shall be addressed prior to bidding the Project, otherwise the most expensive of the two options shall be assumed.

3.00 EXECUTION

3.01 INSTALLATION

A. All enclosures for equipment unless specifically identified otherwise shall be:

1. NEMA 12 316 stainless steel for indoor air conditioned areas.

2. NEMA 4X 316 stainless steel enclosures for all other areas.

B. Maintain waterproof integrity of conduit penetrations through enclosures, the roof, exterior walls and floors.

C. Install steel reinforced concrete foundations below floor mounted switchboards, panelboards, motor control centers, transformers, and other floor mounted electrical equipment. Concrete foundations shall not be less than 4 inches high. Neaptly chamfer top edges. Concrete foundations shall be 4 inches wider and 4 inches longer than the base of the equipment being installed. Concrete shall be in accordance with Division 03, and shall be reinforced with a minimum of 6-inch x 6-inch #6 welded wire mesh.

D. Route all conduits parallel to building lines, columns, or steel route conduits near to columns and roof beams.

3.02 CUTTING AND PATCHING

A. Provide adequate support during cutting operations to prevent any damage to the affected masonry. Where openings are cut through masonry walls, provide lintels or structural supports to protect the remaining masonry. The cutting of structural members shall not be permitted without the specific written approval of the Engineer.

3.03 PAINTING

A. Painting shall be in accordance with Division 09. Maintain the original factory finish on material and equipment installed, unless specifically indicated on the Drawings or Specifications. If the finish is marred in transit or during installation, re-finish to a neat, workmanlike appearance. Leave equipment and raceway systems clean and free of grease, dirt, rust, and in a suitable condition for painting.

3.04 EXCAVATION, TRENCHING, BACKFILLING AND GRADING

A. Prior to any excavation or trenching, notify the Owner's representative, utility companies and Owner's facilities department. Allow sufficient time for utilities to be located prior to excavation to avoid disruption of services. Provide a minimum of 72 hours written notice to the Owner prior to trenching or excavation. Do not proceed with trenching or excavation until authorized by the Owner. Utilities or services which are damaged, which are identified prior to excavation or trenching, or where confirmation by utility companies has not been obtained verifying that utilities are marked, shall be repaired to operable condition immediately, at no cost to the Owner.

B. Barricade open trenches and excavations for the entire duration of the Project. Barricades for excavations shall have warning lights maintained during hours of darkness. Trenches shall be marked with warning tape, or access to trenches shall be prohibited with readily identifiable sawhorses, warning tape or other acceptable means. Barriers shall be

illuminated or recognizable during hours of darkness. Barriers and tape shall be properly maintained at all times.

C. Protect all adjacent Work, structures and properties. Damage to adjacent Work, structures or properties shall be repaired, or the cost of repair reimbursed in full.

D. All construction areas shall be finally graded as indicated on the Contract Documents, or to the conditions of the Site prior to construction. Grading shall bring the Site back to the existing conditions as close as practical. Turfed areas shall be sodded, or hydro-mulched with matching turf. Landscaping shall be replaced with identical shrubbery, ground cover, or plants as existed. Contractor shall be responsible for maintaining water on new turf and landscaping until established. If new turf and landscaping is impractical due to weather conditions, Contractor shall provide satisfactory arrangements to have turf and landscaping furnished and installed at the earliest opportunity thereafter. Provide a 90-day warranty on new turf and landscaping.

E. Determine if irrigation systems exist prior to trenching and excavation. Obtain record or as-built drawings and locate control wiring and pressure main branches and devices. Determine by actual operation that systems are functional and repair or replace damaged systems to their original condition prior to beginning construction.

F. In cases where high voltage ductbanks may exist, Contractor shall employ safe drilling/excavating techniques such as vacuum excavation, etc.

3.05 LOCKING OF ELECTRICAL FACILITIES

A. Install locks immediately upon the installation of the electrical facility. Provide padlocks for exterior electrical facilities subject to unauthorized entry. Furnish the Owner with two keys per lock up to a quantity of 10 keys. Furnish locks to match the Owner's locking system.

3.06 CLEANING AND ADJUSTING

A. Remove shipping labels, dirt, paint, grease, and stains from equipment. Remove debris as it accumulates. Clean electrical equipment and the entire electrical installation upon completion of the Work.

END OF SECTION

26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1.00 GENERAL

1.01 WORK INCLUDED

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Building wires and cables rated 2000 V and less.
2. Connectors, splices, and terminations rated 2000 V and less.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Product Data: For each type of product.
2. Product Schedule: Indicate type, use, location, and termination locations.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA.

1. Testing Agency’s Field Supervisor: Certified by NETA to supervise on-site testing.

1.06 DELIVERY AND STORAGE

A. Deliver cable and wire to the Site in the original packages. Conductors with damaged insulation or exposed nylon jacketing shall not be permitted.

B. Where cut lengths are specified, mark reel footage accordingly. Each reel shall contain one continuous length of cable.

C. Check for reels not completely restrained, reels with interlocking flanges or broken flanges, damaged reel covering or any other indication of damage. Provide impact protection by wood lagging or suitable barrier across the traverse of the reel.

D. Do not drop reels from any height.

E. Unload reels using a sling and spreader bar. Roll reels in the direction of the arrows shown on the reel and on surfaces free of obstructions that could damage the wire and cable.

F. Store cable on a solid, well drained location. Cover cable reels with plastic sheeting or tarpaulin. Do not lay reels flat.

G. Provide moisture protection by using manufacturer's standard procedure or heat shrinkable self-healing end caps applied to both ends of cable. Do not remove end caps until cables are ready to be terminated.

2.00 PRODUCTS

2.01 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alpha Wire Company.
2. Belden Inc.
3. Encore Wire Corporation.
4. General Cable Technologies Corporation.
5. Southwire Company.
6. Okonite.
7. Houston Wire & Cable.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable used in VFC circuits.

E. Conductors: Copper, complying with NEMA WC 70/ICEA S-95-658.

1. Conductor Insulation: Conductor with thermoplastic insulation rated at 600 volts. Wire shall be water tank tested and approved as machine tool wire, in accordance with National Machine Tool Builders Association. Comply with NEMA WC 70/ICEA S-95-658 for Type XHHW-2.

F. Cable: Comply with NEMA WC 70/ICEA S-95-658 for armored cable, Type AC with ground wire.

2.02 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. 3M Electrical Products.
2. Ideal Industries, Inc.
3. ILSCO.
4. O-Z/Gedney; a brand of Emerson Industrial Automation.
5. AFC Cable Systems, Inc.
6. Hubbel Power systems, Inc.

7. Thomas & Betts Corporation, A Member of the ABB Group.
8. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Connectors, Compression, Copper, 600 Volt: The appropriate hole sizes and spacing which are in accordance with NEMA standards; two holes in the tongue for use on conductor sizes 250 kcmil or larger; not required for connections to the circuit breakers in the lighting and/or receptacle panels. All compression connectors shall be long-barrel type, no exceptions.

D. 600-Volt Plastic Tape: Minnesota Mining & Manufacturing Company No. 35.

E. Wirenuts: Silicone-based pre-filled spring wire connecting devices with plastic covering; UL listed for damp and wet locations. Wirenut shall meet requirements of UL 486D for Sealed Wire Connector Systems. Wirenut shall be spring insulated, properly sized and resistant to vibration may be used for No.12 through No.10 solid gauge conductor for lighting and branch circuits only.

F. Split Bolts: Shall be usable for connecting conductors which are both copper, both aluminum or one copper and one aluminum. Split bolts shall have a spacer between the two conductors, which it connects.

G. Mechanical Set Screw Connector: Consisting of an aluminum body which has openings on opposite ends for insertion of the conductors. Conductors inserted into these holes shall each be clamped by two set screws. Connectors shall be suitable for use with copper conductors.

H. Rubber Tape: Scotch 2210.

I. Vinyl Tape: Scotch 88.

J. Arc Proofing Tape: 3M “Scotch 77 Fire and Electric Arc Proofing Tape”. Fireproofing shall be done with a half-lapped layer of arc proofing tape, anchored at each end with a double wrap of 3M “Scotch 69 Glass Cloth Electrical Tape”.

K. Insulating Resin: Scotch 3576, 3577, or 3578.

L. Power Distribution Blocks: Rated for 600 VAC and termination of copper conductors. Individual poles shall be constructed of tin plated aluminum and mounted on an insulating base.

3.00 EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper for feeders smaller than No. 4 AWG; copper for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.02 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders: Type XHHW-2, single conductors in raceway.

B. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

C. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Completely swab raceway system before installing conductors. Do not use cleaning agents and lubricants which have a deleterious effect on the conductors or their insulation.

B. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

C. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 “Raceways and Boxes for Electrical Systems” prior to pulling conductors and cables.

D. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer’s recommended maximum pulling tensions and sidewall pressure values.

E. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

F. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

G. Support cables according to Section 26 05 29 “Hangers and Supports for Electrical Systems.”

H. Install raceway first as a complete system without conductors. Do not install pull wires and conductors until the raceway system is in place in accordance with the NEC and these specifications. Exception: Only flexible connections to motors shall be permitted to be installed after the installation of the remainder of the raceway system. The installation of these conductors shall be limited to exposure to damage for a maximum of 1 week prior to installing flexible connection and making final terminations. Any conductors exposed to damage (i.e. not installed in raceway) longer than 1 week shall be subject to rejection by the Owner and/or Engineer. If rejected, the cables shall be removed, discarded, replaced, reinstalled and retermination at the Contractor’s expense.

I. Installed unapproved wire shall be removed and replaced at the Contractor’s expense.

J. Grouping conductors together into one conduit shall not be allowed where the plans indicate the conductors to be placed in separate conduits. Each home run shown on the plans shall be in its own conduit.

K. Neatly train wiring inside boxes, equipment and panelboards. Pull conductors into a raceway at the same time and use UL listed, wire pulling lubricant for pulling No. 4 AWG and larger wire.

L. Except for hand-pulled conductors into raceways, all wire and cable installation shall be installed with tension-monitoring equipment. Where conductors are found to have been installed without tension-monitoring, the conductors and cables shall be immediately removed from the raceways, permanently identified as rejected material, and removed from the Site. New conductors and cables shall be reinstalled, tagged and raceways resealed, all at the Contractor's expense.

M. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radii. Where pulling compound is used, use only UL listed compound compatible with the cable outer jacket and with the raceway involved.

N. All wire and cable installed in cable trays shall be UL Listed as Type TC, for cable tray use.

O. Where single conductors and cables in manholes, hand holes, vaults, cable trays, and other indicated locations are not wrapped together by some other means such as arc and fireproofing tapes, bundle throughout their exposed length all conductors entering from each conduit with nylon, self-locking, releasable, cable ties placed at intervals not exceeding 4 inches on center.

P. Properly support cables in accordance with the NEC and manufacturer's recommendations in all raceways. Provide strain relief as required.

Q. Arrange wiring in cabinets and panels neatly cut to proper length, remove surplus wire, and bundle and secure in an acceptable manner. Identify all circuits entering motor control centers or other control cabinets in accordance with the conductor identification system specified herein and in Section 26 05 53 "Identification for Electrical Systems."

R. Cap and label each side of spare conductors not terminated with the UL listed end caps.

S. Where conductors pass through holes or over edges in sheet metal, remove all burrs, chamfer all edges, and install bushings and protective strips of insulating material to protect the conductors.

T. For conductors that will be connected by others, provide at least 6 feet spare conductors in free standing panels and at least 2 feet spare in other assemblies. Provide additional spare conductor in any particular assembly where it is obvious that more conductor will be needed to reach the termination point.

U. Each circuit shall include a ground wire. Sharing grounds or neutrals is not allowed.

3.04 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps compatible with conductor material.

C. Power Conductors: Splicing of existing power conductors shall be permitted where specifically indicated on the plans. Splices for all other circuits shall be disallowed. Splice in junction boxes or at outlets only for lighting and receptacle branch circuits. Splices for all other circuits shall be disallowed. All splices are subject to the Engineer's approval. Obtain approval from Engineer before installing any splices.

D. For existing installations, splices of 120 V circuits shall use twist-on wire nuts.

E. Where pre-approved by Engineer, 480 V splices shall terminate conductors using power distribution blocks mounted in a junction box.

F. No splicing of conductors shall be performed in any below ground structure.

G. Condulet type fittings shall not contain splices. Under no condition shall conductors of a different color be spliced together.

H. For No. 10 and smaller, connect conductors with a silicone filled twist-on spring wirenut. If a splice or tap is below 3 feet above the final grade, fill the spring connectors with an electrical insulating resin so that the resin encapsulates conductor and spring materials. Conductor splices and taps inside the MCC, VFDs, panels, etc. shall be on the terminal strips or power distribution blocks.

I. For No. 8 and larger, connect conductors with a split bolt type of connector or a mechanical, set screw type connector. Wrap splices and taps with a single half-lapped layer or rubber tape followed by successive layers of vinyl tape until a vinyl tape layer thickness of twice the original conductor insulation thickness is achieved. If splice or tap is below 3 feet above the finished grade, the tape or splice shall have a final outer coating or insulating resin. Splices must be pre-approved by the Engineer.

J. Furnish and install power distribution blocks as required for terminating conductors at their load connection point with conductors of smaller size. Install power distribution blocks with the number of poles and sizes needed for connecting the phase, neutral, and ground conductors.

K. Tighten all screws and terminal bolts using torque type wrenches and/or drivers to tighten to the inch-pound requirements of the NEC and UL.

L. Use crimp connectors on all stranded conductors.

M. Soldered mechanical joints insulated with tape will not be acceptable.

N. SINGLE CONDUCTORS: Sufficient wire shall be left at outlets to make connections to equipment without straining. Light switches and receptacles shall be connected with pig-tails and crimp-on connectors.

3.05 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 26 05 53 “Identification for Electrical Systems.”

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.06 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer’s Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections**:**

1. After installing conductors and cables and before electrical circuitry has been energized, test conductors feeding the following critical equipment and services for compliance with requirements.
2. Perform each of the following visual and electrical tests:
    a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
    b. Test bolted connections for high resistance using one of the following:
        1). A low-resistance ohmmeter.
        2). Calibrated torque wrench.
        3). Thermographic survey.
    c. Inspect compression applied connectors for correct cable match and indentation.
    d. Inspect for correct identification.
    e. Inspect cable jacket and condition.
    f. Insulation-resistance test on each conductor with respect to ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a 1-minute duration.
    g. Continuity test on each conductor and cable.
    h. Uniform resistance of parallel conductors.

D. Cables will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
4. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

26 05 23 CONTROL-VOLTAGE ELECTRICAL POWER CABLES

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals necessary to install 600-volt wires and cables. Electrical Work shall be in accordance with Section 26 05 00 “Common Work Results for Electrical.”

B. Work shall include building wire, cable, wiring connections and terminations, and modular wiring systems.

1.02 SUMMARY

A. Section Includes:

1. Category 6 balanced twisted pair cable.
2. Low-voltage control cabling.
3. Control-circuit conductors.

1.03 DEFINITIONS

A. When used in this Section, the terms listed below will be defined as follows:

1. EMI: Electromagnetic interference.
2. Low-Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 volts or for remote-control and signaling power-limited circuits.
3. Plenum: A space forming part of the air distribution system to which one or more air ducts are connected. An air duct is a passageway, other than a plenum, for transporting air to or from heating, ventilating, or air-conditioning equipment.
4. UTP: Unshielded twisted pair.

1.04 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Shop Drawings: For each type of product.
2. Qualification Data: For testing agency, RCDD, layout technician, installation supervisor, and field inspector.
3. Source quality-control reports.
4. Field quality-control reports.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.

2.00 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262, by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.

1. Flame Travel Distance: 60 inches or less.
2. Peak Optical Smoke Density: 0.5 or less.
3. Average Optical Smoke Density: 0.15 or less.

C. Flame Travel and Smoke Density for Riser Cables in Non-Plenum Building Spaces: As determined by testing identical products according to UL 1666.

D. Flame Travel and Smoke Density for Cables in Non-Riser Applications and Non-Plenum Building Spaces: As determined by testing identical products according to UL 1685.

E. RoHS compliant.

2.02 CATEGORY 6 BALANCED TWISTED PAIR CABLE

A. Description: Four-pair, balanced-twisted pair cable, to meet transmission characteristics of Category 6 cable at frequencies up to 250MHz.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AMP NETCONNECT; a TE Connectivity Ltd. company.
2. Belden Inc.
3. Berk-Tek Leviton; a Nexans/Leviton alliance.
4. CommScope, Inc.
5. General Cable; Prysmian Group North America.
6. Hitachi Cable America Inc.
7. Mohawk; a division of Belden Networking, Inc.
8. SYSTIMAX Solutions; a CommScope Inc. brand.
9. West Penn Wire.

C. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568-C.2 for Category 6 cables.

D. Conductors: 100-ohm, 23 AWG solid copper.

E. Shielding/Screening: Unshielded twisted pairs (UTP)

F. Cable Rating: Riser.

G. Jacket: White thermoplastic.

2.03 LOW-VOLTAGE CONTROL CABLE

A. Paired Cable: NFPA 70, Type CMG.

1. Individually and overall shielded multi-pair, twisted, No. 18 AWG, stranded {7x28} tinned-copper conductors with 0.021-inch extruded PVC; 0.004-inch nylon insulation twisted into pairs, stranded into a core and enclosed by a non-hygroscopic core tape, 100 percent coverage, helically wound, aluminum foil shield, and drain wire. Pairs shall be black/red or black/white numbered. Cables shall be 600 volts in accordance with NEC-725 and IEEE 383 and shall be suitable for wet location.

2. Shielded.

3. Extruded PVC jacket minimum 0.050.

4. Flame Resistance: Comply with UL 1685.

2.04 CONTROL-CIRCUIT CONDUCTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. General Cable; General Cable Corporation.

2. Southwire Company.

3. Alpha.

4. Okonite.

5. Belden.

6. Houston Wire and Cable.

B. General:

1. Wires and cables shall be soft-drawn, annealed copper with a conductivity of not less than that of 98 percent pure copper, UL 83 and UL 1063 listed, rated 600 volts and certified for continuous operation at maximum conductor temperature of 90 degrees Celsius in dry locations and in wet locations.

2. Control, signal and instrumentation circuits and as specifically indicated on the Drawings the minimum conductor permitted is #12.

C. Single Conductor Cables: Conductor with thermoplastic insulation rated at 600 volts and insulated with type XHHW-2 insulation. Wire shall be water tank tested and approved as machine tool wire, in accordance with National Machine Tool Builders Association.

D. Class 1 Control Circuits: Stranded copper, Type XHHW-2, complying with UL 44 in raceway

E. Class 2 Control Circuits: Stranded copper, Type XHHW-2, complying with UL 44 in raceway

F. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type XHHW-2, complying with UL 44 in raceway

2.05 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test twisted pair cables according to TIA-568-C.2.

C. Factory test optical-fiber cables according to TIA-568-C.3.

D. Cable will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.00 EXECUTION

3.01 EXAMINATION

A. Test cables on receipt at the Site.

1. Test each pair of twisted pair cable for open and short circuits.

3.02 INSTALLATION OF RACEWAYS AND BOXES

A. Comply with requirements in Section 26 05 33 “Raceways and Boxes for Electrical Systems” for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or modified in this Section.

1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2. Outlet boxes for cables shall be no smaller than 4 inches square by 2-1/8 inches deep with extension ring sized to bring edge of ring to within 1/8 inch of the finished wall surface.

3. Flexible metal conduit shall not be used.

B. Comply with TIA-569-B for pull-box sizing and length of conduit and number of bends between pull points.

C. Install manufactured conduit sweeps and long-radius as required elsewhere in the Drawings and Specifications or as required to meet cable bend radius requirements.

D. Raceway Installation in Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard if a single piece of plywood is installed, or in the corner of the room if multiple sheets of plywood are installed around perimeter walls of the room.

2. Install cable trays to route cables if conduits cannot be located in these positions.

3. Secure conduits to backboard if entering the room from overhead.

4. Extend conduits 3 inches above finished floor.

5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

E. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly and form smooth gap-free corners and joints.

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with NECA 1 and NFPA 70.

B. General Requirements for Cabling:

1. Terminate all conductors and optical fibers; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
2. Cables may not be spliced and shall be continuous from terminal to terminal. Do not splice cable between termination, tap, or junction points.
3. Cables serving a common system may be grouped in a common raceway. Install network cabling and control wiring and cable in separate raceway from power wiring. Do not group conductors from different systems or different voltages.
4. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
5. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems" and Ch. 6, "Optical Fiber Structured Cabling Systems." Install lacing bars and distribution spools.
6. Do not install bruised, kinked, scored, deformed, or abraded cable.
7. Remove and discard cable if damaged during installation and replace it with new cable.
8. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Do not use heat lamps for heating.
9. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems" and Ch. 6, "Optical Fiber Structured Cabling Systems." Monitor cable pull tensions.
10. Support: Do not allow cables to lay on removable ceiling tiles.
11. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.

C. Balanced Twisted Pair Cable Installation:

1. Comply with TIA-568-C.2.
2. Do not untwist balanced twisted pair cables more than 1/2 inch at the point of termination to maintain cable geometry.

D. Installation of Control-Circuit Conductors:

1. Install wiring in raceways.
2. Use insulated spade lugs for wire and cable connection to screw terminals.
3. Comply with requirements specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend copper cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 30 inches apart.

3. Cable shall not be run through or on structural members or in contact with pipes, ducts, or other potentially damaging items. Do not run cables between structural members and corrugated panels.

F. Installation of Cable Routed Exposed under Raised Floors:

1. Install plenum-rated cable only.
2. Install cabling after the flooring system has been installed in raised floor areas.
3. Below each feed point, neatly coil a minimum of 72 inches of cable in a coil not less than 12 inches in diameter.

G. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA-569-B recommendations for separating unshielded copper voice and data communications cable from potential EMI sources including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
   a. Electrical Equipment or Circuit Rating Less Than 2 kVA: A minimum of 5 inches.
   b. Electrical Equipment or Circuit Rating Between 2 and 5 kVA: A minimum of 12 inches.
   c. Electrical Equipment or Circuit Rating More Than 5 kVA: A minimum of 24 inches.
3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
   a. Electrical Equipment or Circuit Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
   b. Electrical Equipment or Circuit Rating Between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment or Circuit Rating More Than 5 kVA: A minimum of 12 inches.
4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
   a. Electrical Equipment or Circuit Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment or Circuit Rating Between 2 and 5 kVA: A minimum of 3 inches.
   c. Electrical Equipment or Circuit Rating More Than 5 kVA: A minimum of 6 inches.
5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or 5 HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.04 REMOVAL OF CONDUCTORS AND CABLES

A. Remove abandoned conductors and cables. Abandoned conductors and cables are those installed that are not terminated at equipment and are not identified for future use with a tag.

3.05 CONTROL-CIRCUIT CONDUCTORS

A. Minimum Conductor Sizes:

1. Class 1 remote-control and signal circuits; No. 14 AWG.

2. Class 2 low-energy, remote-control, and signal circuits; No. 16 AWG.

3. Class 3 low-energy, remote-control, alarm, and signal circuits; No. 12 AWG.

3.06 GROUNDING

A. For data communication wiring, comply with ANSI-J-STD-607-A and with BICSI TDMM, "Bonding and Grounding (Earthing)" Chapter.

B. For low-voltage control wiring and cabling, comply with requirements in Section 26 05 26 "Grounding and Bonding for Electrical Systems."

3.07 IDENTIFICATION

A. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

B. Identify data and communications system components, wiring, and cabling according to TIA-606-B; label printers shall use label stocks, laminating adhesives, and inks complying with UL 969.

C. Identify each wire on each end and at each terminal with a number-coded identification tag. Each wire shall have a unique tag.

3.08 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections:

1. Visually inspect cable jacket materials for UL or third-party certification markings. Inspect cabling terminations to confirm color-coding for pin assignments and inspect cabling connections to confirm compliance with TIA-568-C.1.

2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.

3. Test cabling for direct-current loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not after cross-connection.

a. Test instruments shall meet or exceed applicable requirements in TIA-568-C.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

D. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide or transfer the data from the instrument to the computer, save as text files, print, and submit.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

3.09 PREPARATION

A. Completely swab raceway system before installing conductors. Do not use cleaning agents and lubricants which have a deleterious effect on the conductors or their insulation.

3.10 INSTALLATION

A. General:

1. Conductors shall be continuous from terminal block to terminal block without splices.

2. Condulet type fittings shall not contain splices. No splicing of conductors shall be performed in any below ground structure.

3. If rejected, the cables shall be removed, discarded, replaced, reinstalled and re-terminated at the Contractor's expense.

4. Grouping conductors together into one conduit shall not be allowed where the Drawings indicate the conductors to be placed in separate conduits. Each home run shown on the Drawings shall be in its own conduit.

5. Properly support cables in accordance with the NEC and manufacturer's recommendations in all raceways. Provide strain relief as required.

6. The cable shall not be bent to a radius no smaller than the manufacturer cable's minimum bending radius.

7. All terminated conductors shall be labeled as specified prior to testing and final terminations being done. Any conductor that is de-terminated for any reason shall be re-tested. All associated controls, if tested before, shall be re-tested following final re-termination.

B. Paired Shielded and Triad Shielded Cable:

1. Ground paired shielded and triad shielded cables at the instrument panel or starter end only and insulate from ground elsewhere.

2. The shield shall be continuous for the entire run.

3. The paired shielded and triad shielded cable shall not be laced with or placed in the same conduit with power cables and control cables.

4. The shield of pair shielded cable and triad shielded cable shall only be broken when the conductors are terminated on terminal strips.

5. Each conductor and shield shall be landed on its own terminal. Double terminations of any conductor or shield shall not be allowed.

C. Ground Conductors:

1. Conduits and other raceway shall contain an insulated equipment grounding conductor whether the raceway is metallic or not.
2. Conduits, cabinets, and other equipment shall be properly grounded in accordance with National Electrical Code requirements.
3. Where ground wire is exposed to mechanical damage, install wire in rigid aluminum conduit.
4. Bond each end of each of the conduit to the ground system. Make connections to equipment with solderless connections.

END OF SECTION

26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals necessary to modify an existing grounding system in strict accordance with Article 250 of the National Electrical Code (NEC) as shown on the Drawings or as specified herein. Electrical Work shall be in accordance with Section 26 05 00 “Common Work Results for Electrical.”

1.02 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.03 SUBMITTALS

A. Submittal shall be in accordance with Section 01 33 00 “Submittal Procedures” and shall include:

1. Product Data: For each type of product indicated.
2. Ground Conductors.
3. Connectors.
4. Qualification Data: For testing agency and testing agency’s field supervisor.
5. Field quality-control reports in accordance with Section 26 01 26 “Testing of Electrical Systems.”

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

B. Testing Agency’s Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise on-site testing specified in Part 3.

2.00 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.02 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Burndy; Brand of Hubbell Electrical Systems.
2. ERICO ; brand of nVent Electrical plc.
3. Harger Lightning & Grounding.
4. ILSCO.
5. O-Z/Gedney; a brand of Emerson Electric Company.
6. Thomas & Betts Corporation, A Member of the ABB Group.

2.03 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.04 CONDUCTORS

A. Insulated Conductors: Tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable code or authorities having jurisdiction.

B. Bare Tin-Plated Copper Conductors:

1. Solid Conductors: ASTM B3.
2. Stranded Conductors: ASTM B8.
3. Tinned Conductors: ASTM B33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
5. Bonding Conductor: No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 inch by 4 inches in cross-section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.05 CONNECTORS

A. Listed and labeled by a NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless exothermic-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

F. Conduit Hubs: Mechanical type, terminal with threaded hub.

G. Lay-in Lug Connector: Mechanical type, aluminum terminal with set screw.

H. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.

I. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.

J. Straps: Solid copper, cast-bronze clamp. Rated for 600 A.

K. U-bolt type with malleable-iron clamp and copper ground connector.

2.06 MISCELLANEOUS

A. Conduit Ground Fittings: Fittings for bonding ground cable to the conduit shall be Thomas & Betts No. 3951 series.

B. Exothermic Welding Process: CADWELD MATERIALS – as manufactured by ERICO products or approved equal.

3.00 EXECUTION

3.01 PROCESSES

A. All grounding system connections to building steel and ground rods shall be exothermically welded including all cable connections, and cable steel terminations. The use of mechanical type connections is not acceptable.

B. Any concealed connection (buried, encased in concrete, or otherwise sealed) shall be done only with exothermic welds.

C. All materials involved must be from the same sources to insure compatibility. Connections made from this process shall meet the requirements of IEEE Standards 80 and 837 and as listed in MIL 419 and other standards, National Electrical Code, etc.

3.02 GROUNDING SYSTEM

A. Provide a complete grounding system that includes all connections and the testing of ground rods, ground cables, ground buses, conduits, fittings, anchor supports, thermite process materials and equipment and other materials required for a complete installation. Grounding system shall be installed and sized in accordance with the National Electrical Code.

3.03 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.

2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted/clamp type connectors.

2. Underground Connections: Welded connectors except at test wells and as otherwise indicated. Exothermically welded connectors.

3. Connections to Ground Rods at Test Wells: Exothermically welded connectors. Bolted connectors.

4. Connections to Structural Steel: Exothermically welded connectors.

5. Connections to Equipment: NEMA ground pads and insulated jumpers.

6. Connections to Ground Pad: Exothermic.

7. The use of “pig tails” for connections to ground loops or equipment shall not be allowed. Welded connectors.

3.04 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.05 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.

2. Three-phase motor and appliance branch circuits.

C. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

D. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-inch by 2-inch by 12-inch grounding bus.

E. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

F. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.06 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor and install in conduit.

C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except were routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

D. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated tin-plated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

E. Ground electrical Work in accordance with the National Electrical Code Article 250 and local codes.

F. Install ground cables continuously between connections. Splices shall not be permitted, except were indicated on the Drawings. Where ground cables pass through floor slabs. buildings, etc., and when not in metallic enclosures, provide a sleeve of approved, non-metallic materials.

G. Install a green-colored, equipment grounding conductor in raceways. Size conductors in accordance with NEC Article 250.

H. Where ground wire is directly buried in earth or concrete, use standard bare tinned- copper cable, in all other cases install a green-colored insulation, equipment grounding conductor in accordance with Section 26 05 19 “Low Voltage Electrical Power Conductors and Cables.” Size conductors in accordance with NEC Article 250. Provide grounding conductors as required per the NEC.

I. Metal conduits stubbed up into switchgear, motor control center or other electrical equipment shall be terminated with insulated grounding bushings and connected to the equipment ground bus. Size the grounding wire in accordance with applicable sections of the National Electrical Code.

J. Grounding extensions to an existing stubbed-up grounding conductor shall be exothermic weld connections.

K. Liquid tight flexible metal conduit in sizes 1-1/2 inches or larger shall have bonding jumpers. Bonding jumpers shall be external, run in parallel (not spiraled) and fastened with plastic tie wraps. Contractor shall provide bonding jumpers sized in accordance with the National Electrical Code.

L. All equipment enclosures, motor and transformer frames, conduit systems, cable armor, exposed structural steel and all other equipment and materials required by the NEC to be grounded, shall be grounded, and bonded in accordance with the NEC. Provide grounding and bonding jumpers as required per the NEC.

M. Where exothermic bonding is used, molds shall be of the appropriate size for the wire and rod used. All bonds shall remain exposed for inspection of the Owner’s representative.

N. At each convenience outlet, install a grounding clip attached to the outlet box and leave a sufficient length of #12 wire with green-colored insulation to connect to the grounding terminal at the receptacle.

O. A ground pad shall be installed in concrete foundations for connections to equipment and the grounding system. Flat plate all copper alloy Erico CADWELD B164-2Q or approved equal. Connections between the ground pad and ground cables shall be an exothermic weld.

1. Motor Grounding: Provide a ground pad in the concrete slab. Provide a #4/0 bare copper to the grounding system. Provide two-hole spade terminals connected to a #4/0 bare copper conductor at each end and connect to the motor enclosure and to the ground pad and to the pump frame.

2. The use of “pig tails” for connections to ground loops or equipment shall not be allowed.

3.07 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections. Testing shall be in accordance with Section 26 01 26 “Testing of Electrical Systems” andthe latest version of NETA Acceptance Testing Specification.

B. Perform tests and inspections.

C. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect the grounding and bonding system conductors and connections for tightness and proper installation.
3. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
4. Use Biddle Direct Reading Earth Resistance Tester or equivalent to measure resistance to ground of the system. Perform testing in accordance with the test instrument manufacturer's recommendation using the fall of potential method.
5. All test equipment provided under this section shall be approved by the Engineer.
6. Resistance to ground testing shall be performed during dry season when the ground is dry. Submit test results in the form of a graph showing the number of points measured (12 minimum) and the numerical resistance to ground. The Contractor shall test the grounding system at each ground rod shown on the Drawings.
7. Testing shall be performed before energizing the distribution system.
8. A separate test shall be conducted for each building or system.
9. Notify the Engineer immediately if the resistance to ground for any building or system is greater than 5 ohms. Provide additional ground rods and conductors as required to bring the resistance to 5 ohms.
10. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.
    a. Measure ground resistance no fewer than 2 full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.
11. Prepare dimensioned drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

D. Grounding system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

F. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.

3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm.

G. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Owner/Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION

26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1.00 GENERAL

1.01 WORK INCLUDED

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Product Data: For each type of product.
    a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
        1). Hangers.
        2). Steel slotted support systems.
        3). Nonmetallic support systems.
        4). Trapeze hangers.
        5). Clamps.
        6). Turnbuckles.
        7). Sockets.
        8). Eye nuts.
        9). Saddles.
        10). Brackets.
    b. Include rated capacities and furnished specialties and accessories.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Structural members to which hangers and supports will be attached.
3. Size and location of initial access modules for acoustical tile.

1.05 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M.

2. AWS D1.2/D1.2M.

2.00 PRODUCTS

2.01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allied Tube & Conduit; a part of Atkore International.

b. B-line, an Eaton business.

c. ERICO International Corporation.

d. Flex-Strut Inc.

e. GS Metals Corp.

f. G-Strut.

g. Thomas & Betts Corporation, A Member of the ABB Group.

h. Unistrut; Part of Atkore International.

2. Material: Stainless Steel, Type 304.

3. Channel Width: 1-5/8 inches.

4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

5. Channel Dimensions: Selected for applicable load criteria.

B. Conduit and Cable Support Devices: Stainless-steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1). Hilti, Inc.

2). ITW Ramset/Red Head; Illinois Tool Works, Inc.

3). MKT Fastening, LLC.

4). Simpson Strong-Tie Co., Inc.

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1). B-line, an Eaton business.

2). Empire Tool and Manufacturing Co., Inc.

3). Hilti, Inc.

4). ITW Ramset/Red Head; Illinois Tool Works, Inc.

5). MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.

4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.

5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A325.

6. Toggle Bolts: Stainless-steel springhead type.

7. Hanger Rods: 304 Threaded stainless steel.

2.02 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Section 05 50 00 “Metal Fabrications” for steel shapes and plates.

3.00 EXECUTION

3.01 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.

B. Comply with requirements for raceways and boxes specified in Section 26 05 33 “Raceways and Boxes for Electrical Systems.”

C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 3/8 inch in diameter.

D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps

3.02 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 pounds.

C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Existing Concrete: Expansion anchor fasteners.

2. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts

3. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

END OF SECTION

26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install a complete conduit system for each type of electrical system. Electrical Work shall be in accordance with Division 26.

B. Furnish labor, materials, equipment and incidentals necessary to install concrete electrical manholes and pull boxes, as specified and indicated on the Drawings. Manhole sizes shown on the Drawings are the minimum size allowed. Contractor shall be responsible for sizing all manholes and pull boxes in accordance with the latest edition of the National Electrical Code (NEC), Article 370 and relevant sections of the NEC. Contractor shall be responsible for setting elevations at manhole and cable entry locations to meet the intent of the Contract Documents.

C. Contractor shall be responsible for sizing all pull boxes and junction boxes per the NEC Article 314 and all other relevant sections of the NEC. Electrical Work shall be in accordance with Section 26 05 00 “Common Work Results for Electrical”.

1.02 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Nonmetal wireways and auxiliary gutters.
5. Surface raceways.
6. Boxes, enclosures, and cabinets.
7. Handholes and boxes for exterior underground cabling.

1.03 DEFINITIONS

A. GRC: Galvanized rigid steel conduit.

B. LFMC: Liquidtight flexible metallic conduit.

1.04 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
2. Samples: For wireways and for each color and texture specified, 12 inches long.

3. Contractor shall provide detailed conduit layout showing number, size, and location of conduits entering the manholes. Cables routed in conduits shall be clearly identified. Details shall also show elevation of conduits entering manholes. Manhole details shall be submitted to the Engineer for approval prior to the duct bank/manhole system being installed.
4. Manholes, Pull and Junction Boxes Sizing Calculations: Detailed calculations shall be submitted to the Engineer with the manholes, pull and junction boxes' initial submittal. Submittals submitted without sizing calculations shall not be accepted.

2.00 PRODUCTS

2.01 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AFC Cable Systems; a part of Atkore International.
   2. Allied Tube & Conduit; a part of Atkore International.
   3. Anamet Electrical, Inc.
   4. Electri-Flex Company.
   5. FSR Inc.
   6. O-Z/Gedney; a brand of Emerson Industrial Automation.
   7. Picoma Industries, Inc.
   8. Republic Conduit.
   9. Robroy Industries.
   10. Calbond.
   11. Southwire Company.
   12. Thomas & Betts Corporation, A Member of the ABB Group.
   13. Western Tube and Conduit Corporation.
   14. Wheatland Tube Company.
B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
C. GRC: Comply with ANSI C80.1 and UL 6.
D. ARC: Comply with ANSI C80.5 and UL 6A.
E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Fittings for Rigid Aluminum:
      a. Material: Aluminum.

1). Type: Form 7

b. Class I and II Hazardous Locations:

1). Material: Copper-free aluminum.

2). Type: Series OE, LBH and LBY.

3). Covers: Copper-free aluminum.

2. Fittings for GRC:

a. Non-Hazardous Locations:

1). Material: Feraloy iron alloy.

2). Type: Form 7

b. Class I and Div. II Hazardous Locations:

1). Material: Feraloy iron alloy.

2). Type: Series OE, EKC, ET, LBH and LBY.

3). Covers: Feraloy iron alloy.

3. Fittings for PVC Coated Rigid Aluminum:

a. Material: PVC Coated Cast Aluminum.

b. Type: Form Form 7.

c. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inches, with overlapping sleeves protecting threaded joints.

G. Expansion Fittings: PVC, aluminum, or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper, Crouse Hinds XJG 4 inches or equal with bonding jumper for aluminum or steel. Where expansion/deflection fitting is specified on the Drawings, provide Crouse Hinds XJGD or equal.

H. Insulated Grounding Bushings: Threaded bushings, O-Z Type ABLG with lay-in means of grounding conduit.

I. Fittings for LFMC:

1. Fittings for aluminum LFMC shall be aluminum with reinforced sealing gaskets with Thomas and Betts stainless steel retaining ring, external grounding lugs, and insulated throat. Fittings shall be Emerson STB-L or equal.

2. Fittings for steel LFMC shall be steel with reinforced sealing ring, external grounding lug, and insulated throat. Fittings shall be Emerson STB-L or equal.

J. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

1. Steel Conduit: Kopr Sheild CP8-TB or approved equal.

a. UL Listed.

b. Rated up to 8kV applications.

K. Sealing Compound:

1. Hazardous Locations: Chico “A” or Chico SpeedSeal, Hydra-Seal S-60 or approved equal.

L. Lubricants:

1. Hazardous locations Class I, Div. II Locations:

a. Metal-to-Metal Joint: STL thread lubricant.

1). Applicable to dissimilar metals.

2). Maintain grounding continuity.

2.02 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Adalet.
2. Crouse-Hinds, an Eaton business.
3. EGS/Appleton Electric.
4. Erickson Electrical Equipment Company.
5. FSR Inc.
6. Hoffman; a brand of Pentair Equipment Protection.
7. Hubbell Incorporated.
8. Kraloy.
9. Milbank Manufacturing Co.
10. MonoSystems, Inc.
11. Oldcastle Enclosure Solutions.
12. O-Z/Gedney; a brand of Emerson Industrial Automation.
13. RACO; Hubbell.
14. Robroy Industries.
15. Spring City Electrical Manufacturing Company.
16. Stahlin Non-Metallic Enclosures.
17. Thomas & Betts Corporation, A Member of the ABB Group.
18. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Metal Floor Boxes:

1. Material: Cast metal

2. Type: Fully adjustable.

3. Shape: Rectangular.

4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

H. Gangable boxes are prohibited.

I. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 4X with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: 316 stainless steel. Steel, finished inside and out with manufacturer's standard enamel.

2. Interior Backplane Panels: Steel; all sides finished with manufacturer's standard enamel.

3. Enclosures shall include a grounding kit.

3.00 EXECUTION

3.01 CONDUIT INSTALLATION SCHEDULE

A. Conduit types shall be installed in accordance with the following schedule:

1. Above Grade Non Concealed Conduit: ARC unless noted otherwise.

2. PVC Coated Rigid Aluminum Conduit: Shall be used for conduit stub-ups through concrete and concrete wall penetrations.

3. Rigid Aluminum Conduit: May be used in all locations. PVC coated rigid aluminum conduit shall be used in corrosive environments or where in contact with concrete.

4. Liquid Tight Flexible Metallic Conduit: Shall only be used to equipment in non-hazardous locations not subject to physical damage or excessive temperatures, requiring vibration isolation unless otherwise indicated, 6 feet maximum length. The bending radius shall be in accordance with Chapter 9, Table 2 of the NEC and shall not deform or alter the flex jacket.

5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

6. Boxes and Enclosures, Aboveground: NEMA 250, NEMA 4X 316 stainless steel.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: ARC

2. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC

3. Damp or Wet Locations: ARC
4. Boxes and Enclosures: NEMA 250, Type 1, 4X 316 stainless steel
5. 600 Volt and Below Electrical Rooms:
    a. Exposed Conduit: ARC
    b. Boxes and Enclosures: NEMA 250, Type 1, 4X 316 stainless steel

C. Minimum Raceway Size:
1. Exposed 1/2 inch for light fixture whips, 3/4 inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid Aluminum Conduit: Use threaded rigid aluminum conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
3. PVC Externally Coated, Rigid Aluminum Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
4. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
5. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where indicated on the Drawings.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg. F.

3.02 CONDUIT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on the Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Use the conduit route where shown on the Drawings. Route conduits that do not have a specified route in the most direct path between the two points, i.e. home runs shown with an arrow symbol. Route conduits parallel to building lines. Concealed conduits on the Drawings shall be below grade, within walls, or above ceilings.

C. Route conduit through roof openings for piping and ductwork where possible. Otherwise, route conduit through the roof with pitch pocket. Conduit shall not penetrate ductwork. Exposed conduit shall not be installed on the roof without the Engineer's prior approval.

D. Install conduit at elevations which maintain headroom, and at locations which avoid interference with other Work requiring grading of pipe, the structure, finished walls, etc. Avoid crossing other Work. Conduits shall not be placed in close proximity to equipment,

systems, and service lines. Maintain a minimum of 3 inches of separation, except in crossing which shall be a minimum of 1 inch. Conduits shall not be installed/concealed in water bearing walls.

E. Conduits in buildings shall be exposed on unfinished ceilings and basements, as shown on the Drawings. Rigidly support conduits to the building structures using hardware bolted or screwed to the structure. The mounting hardware shall not mount the conduit directly on concrete walls and ceilings, but shall space the conduit away from the surfaces using mineralac-type hardware, strut channel clamps, or one hole straps with clamp backs.

F. Group conduit in parallel runs where practical. Use a conduit rack constructed of channels with conduit straps or clamps. Provide space for an additional 25 percent conduit.

G. Parallel runs of conduit shall have bends and offsets made at the same point such that the angle of bend is the same in each conduit and the conduits remain parallel throughout the run. Conduits not installed in this manner shall be removed and reinstalled at the Contractor's expense. Conductors that are installed shall be removed and replaced at the Contractor's expense.

H. Conduits installed in parallel shall be arranged such that crossings are eliminated.

I. Nuts, bolts, concrete anchor bolts and other metallic fasteners shall be 304L stainless steel.

J. Install conduit with threaded couplings and other threaded fittings. Threadless, or clamp type fittings shall not be used on metallic conduit. Rigid aluminum conduit shall have each set of threads coated with an oxidation inhibitor, Ilsco, De-Ox, ITT Noalox, Blackburn Contax or approved equal.

K. Use suitable conduit caps to protect installed conduit against entry of dirt and moisture. The use of duct tape or any other tape shall be prohibited.

L. Use watertight hubs to fasten conduit to metal boxes, etc. in wet or damp locations per the National Electrical Code.

M. Provide at least 1/4 inch air space between the back of boxes, equipment and the wall.

N. Size conduits as required by the National Electrical Code for the number and sizes of wires to be drawn into the conduit.

O. Conduits terminating inside an air conditioned space from outside shall be sealed to prevent moisture/condensation from entering the enclosure.

P. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

Q. Where applicable, aluminum conduit, straps, and struts shall not be in direct contact with concrete. Provide a neoprene washer between the two materials.

R. PVC conduit shall not be installed above grade level, above concrete slab level, or for any exposed installations unless specified.

S. Conduit system shall be swabbed clean prior to installation of conductors.

T. Ground conduits in accordance with the National Electrical Code and Section 26 05 26 "Grounding and Bonding for Electrical Systems."

U. Complete raceway installation before starting conductor installation.

V. Cut conduit perpendicular to the length. For conduits 2 inches trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

W. Comply with requirements in Section 26 05 29 “Hangers and Supports for Electrical Systems” for hangers and supports.

X. Arrange stub-ups so curved portions of bends are not visible above finished slab.

Y. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction or where conduit penetrates through a floor, wall, or transitions from underground. Conduits transitioning from underground to be supported by a structure shall include an expansion fitting before the conduit is strapped at its first conduit support.

Z. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

AA. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-pound tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

BB. Install conduit drain assemblies in outside or underground conduits to provide for draining.

3.03 SURFACE RACEWAY INSTALLATION

A. Install surface raceway with a minimum 2 inches radius control at bend points.

B. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer’s written instructions. Tape and glue are not acceptable support methods.

3.04 LIQUID TIGHT FLEXIBLE CONDUIT INSTALLATION

A. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC in damp or wet locations not subject to severe physical damage.

3.05 SIZING AND INSTALLATION OF WIREWAYS, PULL BOXES AND JUNCTION BOXES

A. Contractor shall be responsible for providing and sizing all wireways, pull boxes and junction boxes per the National Electrical Code (NEC) Article 314 and all other relevant sections of the NEC.

B. Install Products in accordance with manufacturer’s instructions.

C. Use screws, clips, and straps to fasten raceway channel to surfaces. Mount plumb and level.

D. Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

E. Wireway Supports: Per manufacturer's recommendations. Contractor shall support the wireway rigidly to the building structures using hardware bolted or screwed to the structure. Supporting wireways from corrugated metal structures shall not be allowed.

F. Close ends of wireway and unused conduit openings.

G. Use separate pull boxes and junction boxes for electric power, control and communication systems.

H. Install pull boxes in interior conduit at not more than 100 feet apart when conduit runs are not broken by junction or outlet boxes.

I. Pull and junction boxes shall be accessible and not buried.

J. Do not install boxes back to back in walls and provide a minimum of 6 inches separation, except in acoustic-rated walls, provide 24 inches separation.

K. Support boxes independently of conduit except for cast boxes that is connected to two rigid metal conduits, both supported within 12 inches of box.

L. Box shall be mounted using mounting lugs. Drilling through the box to mount is prohibited. Any box drilled to mount will be rejected and shall be removed and replaced at the Contractor's expense.

3.06 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

3.07 CONDUIT TERMINATIONS

A. Conduit terminations at enclosures shall maintain the NEMA rating of the enclosure. Conduit terminations damaging enclosures shall not be permitted. Damaged enclosures will not be accepted and shall be replaced at the Contractor's expense.

B. Use grounding myers hubs for termination of conduits into enclosures.

C. Locknut termination of conduits shall not be used on this Project except were liquid tight fittings require locknuts to maintain UL listings. Locations utilizing liquid tight fittings shall include a stainless steel banded sealing gasket. Damaged bands or gaskets due to overtightening shall be replaced by the Contractor.

D. For exterior, wet locations, and where conduit enters from exterior or wet locations, conduit terminations shall not penetrate the top of NEMA 4X enclosures. Enclosures with top penetrations shall be removed and replaced with conduits re-routed for side or bottom penetration at the Contractor's expense. If conductors have been installed and are too short to accommodate the re-routed conduit, then they shall be removed and replaced at the Contractor's expense.

E. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

F. Use suitable conduit caps to protect installed conduit against entry of dirt and moisture. The use of duct tape or any other tape shall be prohibited.

G. Conduits terminating inside an air conditioned space from outside shall be sealed to prevent moisture/condensation from entering the enclosure.

H. Where locknuts are allowed, do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.

I. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

3.08 JUNCTION BOX INSTALLATION

A. Junction boxes shall be installed so they are accessible from the front.

B. Junction boxes shall have terminal strips/distribution blocks for splicing conductors where approved by the Engineer or as shown/specified on the Drawings. Terminal strips shall be manufactured by Allen-Bradley, Phoenix Contact or approved equal. Distribution blocks shall be per Section 26 05 19.01 “Wire Connections and Devices.” No top entry in junction boxes with a terminal strip.

C. Use watertight hubs to fasten conduit to metal boxes, etc. in wet or damp locations per the National Electrical Code.

D. Metallic Junction boxes shall be grounded with NEC approved grounding fasteners and by means allowed by the enclosure manufacturer. Enclosures drilled for grounding fasteners that do not meet code shall be replaced at the cost of the Contractor.

END OF SECTION

26 05 53 IDENTIFICATIONS FOR ELECTRICAL SYSTEMS

1.00 GENERAL

1.01 WORK INCLUDED

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels, including arc-flash warning labels.
8. Miscellaneous identification products.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Product Data: For each type of product.
    a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
2. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.
3. Delegated-Design Submittal: For arc-flash hazard study.

2.00 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.02 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.

2. Legend: Indicate voltage and system or service type.

B. Raceways and Cables Carrying Circuits at More Than 600 V:

1. Black letters on an orange field.

2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."

C. Warning labels and signs shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.03 LABELS

A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Brady Corporation.

b. Champion America.

c. emedco.

d. Grafoplast Wire Markers.

e. LEM Products Inc.

f. Marking Services, Inc.

g. Panduit Corp.

h. Seton Identification Products.

B. Snap-Around Labels for Raceways and Cables Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters of raceways they identify, and that stay in place by gripping action.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Brady Corporation.
    b. Marking Services, Inc.
    c. Panduit Corp.
    d. Seton Identification Products.
2. Preprinted, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
    a. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized to fit the cable diameter, such that the clear shield overlaps the entire printed legend.
3. Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
    a. Nominal Size: 3.5-by-5-inch.
4. Marker for Tags: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

2.04 BANDS AND TUBES:

A. Snap-Around, Color-Coding Bands for Raceways and Cables: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters of raceways or cables they identify, and that stay in place by gripping action.
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
        a. Brady Corporation.
        b. Marking Services, Inc.
        c. Panduit Corp.

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameters of and shrunk to fit firmly around cables they identify. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
        a. Brady Corporation.
        b. Panduit Corp.

2.05 TAPES AND STENCILS:

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Carlton Industries, LP.

b. Champion America.

c. Ideal Industries, Inc.

d. Marking Services, Inc.

e. Panduit Corp.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Brady Corporation.

b. Carlton Industries, LP.

c. emedco.

d. Marking Services, Inc.

C. Tape and Stencil for Raceways Carrying Circuits 600 V or Less: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background that extends full length of raceway or duct and is 12 inches wide. Stop stripes at legends.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. LEM Products Inc.

b. Marking Services, Inc.

c. Seton Identification Products.

D. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Carlton Industries, LP.

b. Seton Identification Products.

E. Underground-Line Warning Tape

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Brady Corporation.

b. Ideal Industries, Inc.

c. LEM Products Inc.

d. Marking Services, Inc.

e. Reef Industries, Inc.

f. Seton Identification Products.

2. Tape:
    a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical utility lines.
    b. Printing on tape shall be permanent and shall not be damaged by burial operations.
    c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
3. Color and Printing:
    a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
    b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE"
    c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE"
4. Tag: Type I:
    a. Pigmented polyolefin, bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    b. Width: 3 inches.
    c. Thickness: 4 mils.
    d. Weight: 18.5 lb/1000 sq. ft.
    e. Tensile according to ASTM D 882: 30 lbf and 2500 psi.
5. Tag: Type II:
    a. Multilayer laminate, consisting of high-density polyethylene scrim coated with pigmented polyolefin; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    b. Width: 3 inches.
    c. Thickness: 12 mils.
    d. Weight: 36.1 lb/1000 sq. ft.
    e. Tensile according to ASTM D 882: 400 lbf and 11,500 psi.
6. Tag: Type IID:
    a. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    b. Width: 3 inches.
    c. Overall Thickness: 8 mils.
    d. Foil Core Thickness: 0.35 mil.
    e. Weight: 34 lb/1000 sq. ft.

f. Tensile according to ASTM D 882: 300 lbf and 12,500 psi.

F. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.06 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Brady Corporation.

b. Carlton Industries, LP.

c. emedco.

d. Marking Services, Inc.

e. Seton Identification Products.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Brady Corporation.

b. Carlton Industries, LP.

c. emedco.

d. Grafoplast Wire Markers.

e. LEM Products Inc.

f. Marking Services, Inc.

g. Panduit Corp.

h. Seton Identification Products.

C. Write-On Tags:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Carlton Industries, LP.

b. LEM Products Inc.

c. Seton Identification Products.

2. Polyester Tags: 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to raceway, conductor, or cable.

3. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.07 SIGNS

A. Baked-Enamel Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches.
4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    a. Carlton Industries, LP.
    b. Champion America.
    c. emedco.
    d. Marking Services, Inc.

B. Metal-Backed Butyrate Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 10 by 14 inches.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Brady Corporation.
    b. Champion America.
    c. emedco.
    d. Marking Services, Inc.

C. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
    a. For signs up to 20 sq. inches, minimum 1/16-inch-.
    b. For signs larger than 20 sq. inches, 1/8 inch thick.
    c. Engraved legend with black letters on white face .
    d. Punched or drilled for mechanical fasteners.
    e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Brady Corporation.
    b. Carlton Industries, LP.
    c. emedco.
    d. Marking Services, Inc.

2.08 CABLE TIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    1. Ideal Industries, Inc.
    2. Marking Services, Inc.
    3. Panduit Corp.

B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
    1. Minimum Width: 3/16 inch.
    2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
    3. Temperature Range: Minus 40 to plus 185 deg F.
    4. Color: Black, except where used for color-coding.

2.09 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

3.00 EXECUTION

3.01 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.02 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

G. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.

2. In Spaces Handling Environmental Air: Plenum rated.

H. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

I. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

J. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

K. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.

3.03 IDENTIFICATION SCHEDULE

A. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Self-adhesive vinyl labels. Install labels at 10-foot maximum intervals.

B. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30A and 120V to Ground: Identify with self-adhesive vinyl label. Install labels at 10-foot maximum intervals.

C. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels containing the wiring system legend and system voltage. System legends shall be as follows:

1. "EMERGENCY POWER."

2. "POWER."

3. "UPS."

D. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.

b. Colors for 208/120-V Circuits:

1). Phase A: Black.

2). Phase B: Red.

3). Phase C: Blue.

c. Colors for 480/277-V Circuits:

1). Phase A: Brown.

2). Phase B: Orange.

3). Phase C: Yellow.

d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

E. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic preprinted tags colored and marked to indicate phase, and a separate tag with the circuit designation.

F. Install instructional sign, including the color code for grounded and ungrounded conductors using adhesive-film-type labels.

G. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use adhesive vinyl labels with the conductor or cable designation, origin, and destination.

H. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive vinyl labels with the conductor designation.

I. Conductors To Be Extended in the Future: Attach marker tape to conductors and list source.

J. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

2. Use system of marker-tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

K. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

1. Install underground-line warning tape for direct-buried cables and cables in raceways.

L. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless

otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

M. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.

1. Comply with 29 CFR 1910.145.
2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
    a. Power-transfer switches.
    b. Controls with external control power connections.

N. Arc Flash Warning Labeling: Self-adhesive thermal transfer vinyl labels.

1. Comply with NFPA 70E and ANSI Z535.4.
2. Comply with Section 26 05 74 "Overcurrent Protective Device Arc-Flash Study" requirements for arc-flash warning labels.

O. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

P. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

Q. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.

1. Labeling Instructions:
    a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine plastic label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
    b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
    c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    d. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
2. Equipment To Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic or melamine label.

b. Enclosures and electrical cabinets.

c. Access doors and panels for concealed electrical items.

d. Switchgear.

e. Switchboards.

f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.

g. Emergency system boxes and enclosures.

h. Enclosed switches.

i. Enclosed circuit breakers.

j. Enclosed controllers.

k. Variable-speed controllers.

l. Power-transfer equipment.

m. Contactors.

n. Remote-controlled switches, dimmer modules, and control devices.

o. Power-generating units.

p. Monitoring and control equipment.

END OF SECTION

26 05 73.01 ELECTRICAL POWER SYSTEM STUDIES

1.00 GENERAL

1.01 DESCRIPTION

General: This section specifies that the Contractor prepare a short circuit and protective device coordination study, load flow, and an arc flash hazard analysis for the electrical power system as shown on the plans for the complete electrical system at the Devers 1st Pump Station.

No equipment provided under this contract is to be energized until the Power System Studies have been approved by the Engineer, the protective relays and breakers have been set per the Short Circuit and Protective Device Coordination Study and the arc flash labels have been installed on the equipment. No exceptions.

Short Circuit and Protective Device Coordination Study, Arc Flash Analysis, and Load Flow Study.

The studies shall provide an evaluation of the electrical power system and the model numbers and settings of the protective relays or devices and metering or motor monitoring devices for setting by the Contractor. The Studies shall include settings for all protective relays and circuit breakers, power meters and electric system monitoring provided under this contract. The Contractor shall obtain any needed data or information for the electrical equipment from Contract Documents, various suppliers, and from conducting his own field investigations.

A. Scope:

1. The Contractor is responsible for providing all pertinent information necessary for the successful completion of the Short Circuit and Protective Device Coordination Study, Load Flow and Motor Starting Study, and Arc Flash Analysis. All cable and raceway data, data from all new and existing electrical equipment - Switchgear, transformers, variable frequency drives, panelboards, and separately mounted fuses, circuit breakers shall be obtained by the Contractor. Obtain all existing or new protective device information to include all present settings. The Contractor shall obtain any needed data or information from Contract Documents, various suppliers, the Electric Utility and from conducting his own field investigations. The data obtained shall be organized and submitted to the Engineer to show that all the necessary data gathering work has been done.
2. Calculations shall utilize actual X/R and three phase short circuit values obtained by the Contractor from the Electric Utility. The use of infinite bus fault current calculation is not acceptable.
3. The Contractor shall redo the Power System Studies if any changes are made during the field testing checkout and/or start-up and shall re-submit the updated study for engineer approval.
4. Provide a complete short circuit study. Include three phase and phase-to-ground calculations. Provide an equipment interrupting or withstand evaluation based on the actual equipment and model numbers provided on this project. Generic devices are not acceptable. Normal system operating method, alternate operation, and operations that could result in maximum fault conditions shall be thoroughly addressed in the study.
    a. The study shall assume all motors operating at rated voltage with the exception that motors identified as "standby" shall not be included.

b. Electrical equipment bus impedance shall be assumed zero.

c. Short circuit momentary duties and interrupting duties shall be calculated on the basis of maximum available fault current at the electrical equipment busses.

d. The Study shall be performed using actual available short circuit currents available and system impedances as obtained from the Electric Utility and Generator manufacturer. An assumption of infinite bus for the purposes of the Study is not acceptable.

e. Study shall use actual motor X/R and subtransient reactance data obtained from equipment suppliers.

5. A protective device coordination study shall be performed to determine appropriate relay settings. The study shall include all electrical equipment provided under this contract and any up-stream equipment that has an impact on the coordination study. The study shall show transformer damage curves, cable short circuit withstand curves and motor curves. Include all low voltage switchgear, variable frequency drives, and panelboards main circuit breakers. Complete the short circuit study down to the main breaker or main lugs on all panelboards. Panelboard branch circuit devices need not be considered. The phase over current and ground-fault protection shall be included as well as settings for all other adjustable protective devices. All motor monitoring relays and protective or monitoring devices that are a part of a supplier's equipment (such as variable frequency drives, switchgear) shall be in included. Include the last protective device in the Electric Utility's system feeding each facility being considered.

6. Provide Time-Current Curves on 11X17 log-log paper. Do not put more than one branch of protective devices on any one coordination curve. Include a one-line diagram and the names of each protective device in the branch. Use the names designated in the Contract Documents. Include motor and transformer damage curves, and cable short circuit withstand curves. Coordination study time-current curves (11x17 log-log type) including the instrument transformer ratios, model numbers of the protective relays, and the relay settings associated with each breaker. Organize the curves as specified here in. Ground fault time current curves shall be on a separate sheet.

7. An equipment evaluation study shall be performed to determine the adequacy of the fault bracing of all bus from the panelboard level up to the main Switchgear or protective device. Include circuit breakers, controllers, surge arresters, busway, switches, and fuses by tabulating and comparing the short circuit ratings of these devices with the available fault currents.

8. Provide arc flash hazard analysis in accordance with the applicable NFPA, ANSI, and IEEE standards.

9. The studies shall be performed, sealed and signed by a Registered Professional Engineer licensed in the state of Texas.

10. Any problem areas or inadequacies in the equipment shall be promptly brought to the Engineer's attention.

11. Use industry standard short circuit software, SKM CAPTOR and DAPPER or an equal approved by the Engineer.

12. The report shall include a comparison of short circuit duties of each bus to the interrupting capacity of the equipment that is protecting that bus.
13. The report shall include all data that was used as input to the report. This data shall include cable impedance, conduit type, source impedance, equipment ratings, motor X/R and subtransient reactance data, etc.
14. Provide and program all settings for all power meters, motor protection relays, feeder protection relays, etc.
15. The Contractor shall coordinate with the Utility, Shaina White 409-785-2115 with Entergy, for electrical data required for the studies .

1.02 REFERENCES

A. This Section contains references to the following documents. They are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

Reference	Title
IEEE 141	Recommended Practice for Electric Power Distribution for Industrial Plants
IEEE 242	Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
NFPA 70E	Handbook for Electrical Safety in the Workplace
IEEE 1584	IEEE Guide for Performing Arc-Flash Hazard Calculations
NEC	National Electrical Code

1.03 SCHEDULE

A. The report shall be provided to the Engineer NO LATER THAN 60 days before the equipment is shipped to the Work site. SHIPMENT AND DELIVERY OF EQUIPMENT WILL NOT BE ACCEPTED AT THE JOBSITE UNTIL THE STUDY HAS BEEN COMPLETED, SUBMITTED AND APPROVED BY THE ENGINEER.

1.04 SUBMITTAL PROCEDURES

Submittal Procedures shall be in accordance with Section 01 30 00, “Document Management” and shall include:

A. Shop Drawings:

1. Short Circuit and Protective Device Coordination Study. Time current curves shall be on 11x17 log-log type paper. The 11x17 paper with the TCC shall also include a one-line diagram for the branch that the TCC on that sheet corresponds with. The Contractor can provide time current curves on 8 ½ x 11 log-log type paper as a supplement but not as a replacement.
2. Provide a list of all recommended settings for all power meters, motor protection relays, feeder protection relays, circuit breakers, etc.

3. Load Flow Study

4. Contractor shall coordinate with the VFD manufacturers for all data required to perform the motor starting analysis. The preliminary starting analysis shall determine the maximum inrush allowed when starting the motor to not drop out the loads under the worst operating conditions.

5. Arc Flash Hazard Analysis

    a. Provide a color copy of project specific Arc Flash labels for each panelboard, switchboard, switchgear, disconnect, Motor Control Center, VFDs, starters, transfer switches, including all existing electrical equipment – switchgear, starters, motor control center, panelboards, starters, etc.

    b. Provide a copy of the one-line diagrams color-coded to show the incident ranges at each bus. The one-lines shall be on 11x17 paper.

        1). The one-line shall also include the information specified in section 2.04 below.

B. After the report and one-line has been approved, provide a color copy in PDF format of the finalized 11x17 one-line diagram to the Contractor for the Contractor's use to frame in the electrical room as specified in section 26 05 00, "Common Work Results for Electrical". The one-line shall reflect all changes made including but not limited to changes made during construction

C. The Contractor shall redo the Power System Studies if any changes are made during the field testing checkout and/or start-up. The Contractor shall re-submit the Power System Studies for Engineer Approval. The Studies shall include an updated copy of the color copy Arc Flash Labels.

D. A CD with all SKM input files and a PDF of all output files is required for both the preliminary and final power system studies Submittal Procedures.

1. Two Software copies of actual power systems computer program project data files burned in on a CD. The Contractor shall provide an electronic copy on a CD-ROM of all files used to develop the electrical system model in the power system analysis program and all files for the written study analysis and summary data tables. For instance, if SKM software is used for the power system studies, then the SKM files shall be burned in on a CD-ROM and provided to the Owner/Engineer. This shall include any library files used for circuit breakers, fuses, etc. for the power system analysis.

2.00 EXECUTION

2.01 GENERAL

A. Provide a short-circuit and protective device coordination study load flow study, and arc flash hazard analysis on the electrical power distribution system, as specified. The studies shall be performed in accordance with IEEE Standards 141 and 242, IEEE 1584, ANSI, and the NEC and shall utilize the ANSI method of short circuit analysis in accordance with ANSI C37.010. The studies shall be performed using actual equipment data for all equipment. The coordination studies shall use the data from the manufacturer of protective devices.

2.02 QUALIFICATIONS

A. The studies shall be performed by a consultant who is regularly engaged in power system studies. A Licensed Professional Engineer with proficiency in electrical power engineering shall conduct the studies and shall seal and sign the studies. The Professional Engineer shall be licensed to practice engineering in the State of Texas. A study submitted without a Professional Engineer's seal will not be reviewed and returned Not Approved, Revise & Resubmit. **EQUIPMENT MANUFACTURERS SHALL NOT BE ALLOWED TO PERFORM THE STUDIES, NO EXCEPTIONS.**

B. Acceptable Power System Study Providers:

1. Strategic Engineering – Jeff Wilbanks, P.E. (214) 679-0092
2. Coordinated Power Systems, Inc. – Robert Stockinger, P.E. (414) 425-5993
3. All others shall submit qualifications to the Owner and the Engineer for review and approval prior to bid submittal no later than one week after bid advertisement date. Any submittals after this time period shall not be evaluated. Qualifications shall include Power Systems Studies providers who have had at least 5 years of successful experience in the performing studies of similar projects with a generator and pump station configurations. Qualifications shall include a list of similar projects within the last 5 years with the name of the project and contact information of the Owner**.**

2.03 OPERATING SCENARIOS

A. The following Operating Scenario(s) shall be included in the study:

1. Devers 1st Pump Station: The maximum number of pumps total that can run simultaneously at the Pump Station during normal operations is 4 pumps plus miscellaneous loads.

2.04 SHORT CIRCUIT STUDY

A. The Contractor shall be responsible for obtaining and verifying all data needed to perform the study.

B. As a minimum, each short circuit study shall include the following:

1. One-Line Diagram:

a. Location and function of each protective device in the system, such as relays, direct-acting trips, fuses, etc.

b. Type designation, current rating, range or adjustment, manufacturer's style and catalog number for all protective devices.

c. Power and voltage ratings, impedance, primary and secondary connections of all transformers. Use the ratings (i.e. Impedance, X/R, etc.) of the actual transformers being provided where available.

d. Type, manufacturer, and ratio of all instrument transformers energizing each relay.

e. Nameplate ratings of all motors with their subtransient reactances and transient reactances of synchronous motors. Obtain data on the actual equipment being provided. Generic or average data numbers are not acceptable.

f. Sources of short circuit currents such as utility ties, generators, synchronous motors, and induction motors. Provide short circuit studies using each source of power separately. The study shall determine if there is sufficient short circuit current to adequately cause interruption of a protective device using the weaker power source (typically local generation), and shall determine if the equipment can safely interrupt the fault if the greater power source is connected. Additional short circuit calculations shall include emergency as well as normal switching conditions as well as normal and emergency power sources described here in.

   1). Show short circuit calculations listing short circuit levels at each bus. Provide the same data in tabular from.

g. All significant circuit elements such as transformers, cables, breakers, fuses, reactors, etc. shall be included.

h. The time-current setting of existing adjustable relays and direct-acting trips, if applicable.

i. One-Line showing available fault current at each bus all the way down to the 120/240V and 208Y/120V panelboards.

2. Impedance Diagram:

   a. Available MVA or impedance from the utility company.

   b. Local generated capacity impedance.

   c. Bus impedance.

   d. Transformer and/or reactor impedances.

   e. Cable impedances.

   f. Equipment impedances.

   g. System voltages.

   h. Grounding scheme (resistance grounding, solidly grounding, or no grounding).

   i. Motor contribution assuming the new and existing motors as shown on the plans all running at the same time.

3. Calculations:

   a. Determine the paths and situations where short circuit currents are the greatest. Assume bolted faults and calculate the 3-phase and line-to-ground short circuits of each case.

   b. Calculate the maximum and minimum fault currents.

   c. A discussion section evaluating the adequacy or inadequacy of the equipment method of calculation and formulas used such that all calculations can be verified manually by the Engineer, with recommendations as required for improvements to the system.

   d. Any inadequacies shall be called to the attention of the Engineer and recommendation made for improvements.

2.05 PROTECTIVE DEVICE COORDINATION STUDY

A. As a minimum, the coordination study for the power distribution system shall include the following on 5-cycle, log-log graph paper:

1. The time-current coordination analysis shall be performed with aid of a digital computer.

a. Time-current curves for each device shall be positioned to provide for maximum selectivity to minimize system disturbances during fault clearing, but still maintain a low incident energy level. Where selectivity cannot be achieved, the Engineer shall be notified as to the cause.

2. Time-current curves for each device shall be positioned to provide for maximum selectivity to minimize system disturbances during fault clearing. Where selectivity cannot be achieved, the Engineer shall be notified as to the cause.

3. Time-current curves and points for cable and equipment damage.

4. Circuit interrupting device operating and interrupting times.

5. Indicate maximum fault values on the graph.

6. Sketch of bus and breaker arrangement.

2.06 ARC FLASH HAZARD ANALYSIS

A. The study shall be performed in accordance with the NEC and all applicable OSHA, ANSI, and IEEE standards.

B. The Contractor shall adjust all adjustable time-current devices such that the trip settings lower the arc flash exposure and minimizing the clearing time. However, the Contractor shall adjust the time-current devices to avoid nuisance tripping.

C. The Contractor shall utilize fault current values from the short circuit analysis to determine the Incident energy, limited approach boundary, restricted approach boundary, prohibited approach boundary and appropriate PPE required.

D. The Contractor shall provide project specific arc-flash labeling. The arc-flash labeling shall be placed on the outside of the cover of the variable frequency drive, etc. such that it can be read without opening the electrical equipment. Mount arc-flash labels a maximum of 6’-6” AFF, include the housekeeping pad in the mounting height. The Contractor shall provide arc-flash labeling on all existing panelboards, switchboards, distribution panel, etc. where breakers are added or work is performed in or on the electrical equipment.

E. Arc Flash Labels shall be chemical resistant, UV resistant, water resistant, scratch resistant, and made of 3.0 mil vinyl tape as manufactured by DuraLabel, Brady or approved equal. The lettering shall be performed by thermal transfer print.

1. Arc Flash labels and label lettering shall be sized large enough to be legible at a distance outside the hazard area.

2. Arc Flash Labels shall be placed on the door(s) of the room if the hazard area reaches or extends beyond the electrical room door(s).

3. The arc flash label shall include a DANGER header when the incident energy is above 40cal/cm^2, and a WARNING header for all other incident energy levels.

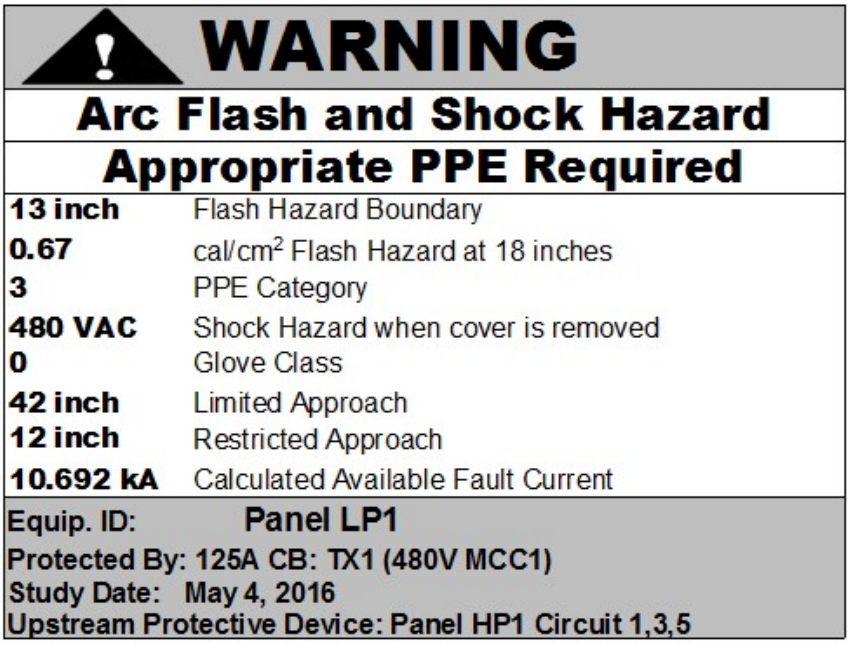
F. To ensure a safe workplace, and that the labeling meets NEC, OSHA, IEEE, and NFPA requirements, use specialized arc flash software to calculate protection boundaries. These protection boundaries shall include the Flash Protection Boundary, Limited Approach Boundary, Restricted Approach Boundary and the Prohibited Approach Boundary.

G. Arc-flash label shall be provided all the way down to the 120/240V and 208Y/120V panelboards.

H. The arc-flash analysis shall be based on calculated fault from the Short Circuit Study at each respective bus. The arc-flash software program shall be used to calculate the available arcing fault at each bus in the system, the resultant flash protection boundary based on the applicable protective device operating times and the associated incident energy that workers may be exposed to at the specified working distances.

I. The report shall include the following information: Arc-flash evaluation table, arc-flash and shock hazard label definitions, arc-flash evaluation information, arc-flash and shock hazard labels and definitions of terms used in the arc-flash hazard analysis.

J. Arc Flash labels shall be similar to the following example:



2.07 LOAD FLOW STUDY

A. SCOPE: Determine the active and reactive power, voltage, current, and power factor throughout the electrical system. Provide an analysis of all possible operating scenarios.

B. PROCEDURE: The load flow study shall be performed in accordance with the recommended practices and procedures set forth in IEEE 399.

C. STUDY REPORT: Results of the load flow study shall be summarized in a final report containing the following items:

1. Basis, description, purpose, and scope of the study.
2. Tabulation of data used to model the system components and a corresponding one-line diagram.
3. Description of scenarios evaluated and the basis of each.
4. Tabulation of power and current flow versus equipment ratings. The tabulation shall identify percentage of rated load and the scenario for which the percentage is based. Overloaded equipment shall be clearly noted.
5. Tabulation of system voltage versus equipment ratings. The tabulation shall identify percentage of rated voltage and the scenario for which the percentage is based. Voltage levels outside the ranges recommended by equipment manufacturers, IEEE C84.1 or other appropriate standards shall be clearly noted.
6. Tabulation of system real and reactive power losses with area of concern clearly noted.
7. Provide One-line showing voltage at major busses down to the 120/240V and 208Y/120V panelboards.
8. Conclusions and recommendations.

END OF SECTION

26 28 16 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install disconnects. Electrical Work shall be in accordance with Division 26 Specifications.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Fusible switches.

2. Enclosures.

B. Related Requirements:

1. Section 01 33 04 “Operation and Maintenance Data.”

1.03 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.04 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers’ technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

a. Enclosure types and details for types other than NEMA 250, Type 1.

b. Current and voltage ratings.

c. Short-circuit current ratings (interrupting and withstand, as appropriate).

d. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

2. Drawings: For enclosed switches and circuit breakers.

a. Include plans, elevations, sections, details, and attachments to other Work.

b. Include wiring diagrams for power, signal, and control wiring.

3. Qualification Data: For qualified testing agency.

a. Field quality-control reports.

B. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 01 33 04 “Operation and Maintenance Data,” include the following:

a. Manufacturer’s written instructions for testing and adjusting enclosed switches and circuit breakers.

C. Spares: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

2. Fuse Pullers: Two for each size and type.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency’s Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.06 FIELD CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.

2. Altitude: Not exceeding 6600 feet.

1.07 WARRANTY

A. Manufacturer’s Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year(s) from date of Substantial Completion.

2.00 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

C. Comply with NFPA 70.

2.02 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. GE/ABB Inc.
2. Eaton.
3. SIEMENS Industry, Inc.; Energy Management Division.
4. Square D; by Schneider Electric.

B. Type HD, Heavy Duty:

1. Single throw.
2. Three pole.
3. 600 VAC.
4. 200 amps and smaller.
5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.03 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location

B. Enclosure Finish: The enclosure shall be finished with a brush finish on Type 304 stainless steel (NEMA 250 Type 4-4X stainless steel).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

D. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

3.00 EXECUTION

3.01 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Commencement of Work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.02 PREPARATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager and Owner no fewer than 7 days in advance of proposed interruption of electric service.

2. Indicate method of providing temporary electric service.

3. Do not proceed with interruption of electric service without Owner's written permission.

4. Comply with NFPA 70E.

3.03 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 4X, 316 stainless steel.

2. Other Wet or Damp, Indoor NEMA 250, Type 4X, 316 stainless steel.

3.04 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

D. Install fuses in fusible devices.

E. Comply with NFPA 70 and NECA 1.

3.05 IDENTIFICATION

A. Comply with requirements in Section 26 05 53 “Identification for Electrical Systems.”

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.

2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.06 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections for Switches:

1. Visual and Mechanical Inspection:

a. Inspect physical and mechanical condition.

b. Inspect anchorage, alignment, grounding, and clearances.

c. Verify that the unit is clean.

d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.

e. Verify that fuse sizes and types match the Specifications and Drawings.

f. Verify that each fuse has adequate mechanical support and contact integrity.

g. Inspect bolted electrical connections for high resistance using one of the two following methods:

1). Use a low-resistance ohmmeter.

a). Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.

2). Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer’s published data or NETA ATS Table 100.12.

a). Bolt-torque levels shall be in accordance with manufacturer’s published data. In the absence of manufacturer’s published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.

i. Verify correct phase barrier installation.

j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:

a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar

connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

c. Perform insulation-resistance tests for 1 minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.

d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.

e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

1. Test procedures used.

2. Include identification of each enclosed switch and circuit breaker tested and describe test results.

3. List deficiencies detected, remedial action taken, and observations after remedial action.

3.07 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as specified in Section 26 05 73 "Overcurrent Protective Device Coordination Study."

END OF SECTION

26 29 33.11 VARIABLE FREQUENCY DRIVES

1.00 GENERAL

1.01 WORK INCLUDED

A. Design, manufacture, factory test, and deliver and install Variable Frequency Drives as described herein and shown on the project drawings. The VFDs shall operate on 480 VAC, 3-phase, 60 Hz with harmonic filters, drive isolation transformers, and all appurtenances needed to meet the requirements of these specifications. The VFDs shall be suitable to drive the pumping units over the range specified in specification 43 24 13 "Vertical Centrifugal Pumping Units - Line Shaft Type."

B. The manufacturer shall provide the services of factory field engineers for start-up, field tests, troubleshooting, Owner training and the supervision of storage and installation. The manufacturer field services shall include a minimum of the following:

1.	Start up	3 days
2.	Field Tests/start-up	3 days
3.	Troubleshooting/start-up	3 days
4.	Owner Training	1 day

These times do not include travel time and include a minimum of 8 working hours per day.

C. The Contractor shall coordinate the design, testing and manufacturing of the drive with the motor supplier to provide a complete unit, free of defects and fully compatible with the pumping unit. Letter of Compatibility: The VFD supplier in conjunction with the motor supplier shall issue a letter of compatibility stating that the VFD and motor are compatible

D. Perform harmonic analysis, torsional analysis. Test VFDs to verify harmonic analysis results.

E. VFD's shall be 18 pulse type.

1.02 QUALITY ASSURANCE

A. 18 PULSE DRIVE ACCEPTABLE MANUFACTURERS

1. Eaton (Model: CPX9000)

2. No other Manufacturer's shall be accepted.

The VFD manufacturer shall demonstrate 5 year's experience with the drives of the type and size herein specified.

B. Variable frequency drives shall be of sufficient size for the duty to be performed and shall not exceed their full rated capacity when the driven equipment is operating as specified.

C. The variable frequency drive manufacturer shall maintain, as part of a national network (United States), engineering service facilities within 250 miles of the project site to provide start-up service, emergency service calls, repair work, service contracts, and maintenance and training of customer personnel. When requested by the Engineer, documentation shall be provided showing compliance, capabilities, and references for this requirement.

D. All equipment shall be NEMA rated. IEC or dual rated IEC/NEMA shall not be acceptable.

E. Complete VFD integrated line-up shall be U.L. listed.

F. The Contractor shall be responsible for the adequacy and compatibility of the pump/motor combination and variable frequency drives (VFDs). The pump motor manufacturer shall be responsible for coordinating with the VFD manufacturer to meet the design and performance requirements of the specification. The VFDs shall be provided by the Construction Contractor.

1.03 FACTORY INSPECTION AND TESTS

A. GENERAL

1. Equipment furnished under these specifications shall be subject to inspection during manufacturing by a representative of the Owner who shall be afforded proper facilities for determining compliance with the specifications.

2. The Owner may, at his option, elect to have the factory test witnessed by the Owner, or a designated representative of the Owner. If the option is taken to witness the test, then payment will be in accordance with the appropriate item of the Proposal.

3. If tests are to be witnessed by the Owner or Owner's representative, the manufacturer shall notify the Owner at least 10 days in advance of the dates that tests will be made, so that the Owner can make arrangements for his representative to be present. The Owner will pay for the cost of the representative's time, travel lodging, meals and other expenses for the tests, for a maximum of one trip. The manufacturer shall bear all other costs for performing the witnessed test. If a test must be re-run due to failure in meeting the specified requirements, then the witness expenses for the re-test shall be born by the manufacturer. Witness tests shall be conducted in North America.

B. The VFD manufacturer shall provide the following quality assurance steps within his factory:

C. Incoming inspection of all components.

D. In-process inspection of assemblies.

E. 100% test and inspection of power devices.

F. The VFD printed circuit boards shall be tested per the manufacturer's standard testing procedure. The VFD manufacturer shall provide certification that the tests have been completed.

G. Witnessed factory tests shall include a test and demonstration of all equipment functions, per manufacturer's standard testing procedures. The purpose of the test shall be to verify the functionality, performance, and stability of each VFD. The test shall include, but not be limited to, a complete operational test demonstrating all controls, trips, inputs, outputs, etc., shown on the attached pump control schematic. A clearly labeled test box with dedicated switches, lights, etc. for each I/O shall be provided and used to demonstrate all controls, trips, inputs, outputs, etc. The manufacturer shall submit two weeks in advance of the day that test will be made a detailed testing plan. This plan shall be subject to the Engineer's approval.

H. After all tests have been performed, each adjustable frequency controller shall undergo a 24-hour burn-in test. The controllers shall be burned in at 100 percent motor load connected to a dynamometer for 4 hours without an unscheduled shutdown. During this

test, the efficiency of the VFD shall be measured by simultaneously measuring the total KW input to the VFD and the KW output of the VFD. Simultaneous KW measurements shall be made with two wattmeter's with required accessories to confirm compliance with specified efficiencies.

I. The VFD manufacturer shall submit the factory test report to the Engineer prior to the equipment being shipped from the factory.

J. The variable frequency drive manufacturer shall provide the actual test data, observations, and certification that the tests have been completed prior to shipment to the Engineer for approval.

K. FIELD QUALITY CONTROL: The manufacturer shall furnish an equipment test report after installation, start-up, and testing.

1.04 SUBMITTALS

A. Submittals shall be in accordance with 01 33 00, SUBMITTAL PROCEDURES, and shall include:

B. Shop Drawings

1. Drawings shall show equipment dimensions, stub-up locations, shipping splits, shipping weights, ventilation details, nameplate schedule, front elevation with designation of equipment and devices on doors, catalog cut sheets of major components, power equipment's, project specific control schematics, wiring diagrams, true and displacement power factor and efficiency and a complete bill of material. True and displacement power factor and efficiency data.

2. Harmonic distortion analysis: The manufacturer of the drive equipment shall perform a bus voltage and/or current distortion calculation for each bus that supplies a drive. The harmonic study shall be performed to determine the harmonic content expected on the Purchaser's supply bus due to the addition of the variable frequency drive and to determine the harmonic filter requirements. The total harmonic distortion shall not exceed THD values as recommended by IEEE - 519, 1992 under normal worst case operating conditions. The recommended harmonic filter shall be supplied by the drive manufacturer. Harmonic analysis shall be provided prior to or with the VFD shop drawings for approval. Submittals for the VFD submitted prior to or without the harmonic analysis shall be considered incomplete and not reviewed.

3. Torsional analysis: The drive manufacturer shall conduct a torsional analysis covering the motor, shaft coupling and driven equipment combination to identify torsional resonance and vibration problems in the system speed range. The torsional analysis shall be performed for all operating conditions, all continuous operating conditions, (constant load), all dynamic (accelerating and decelerating) operating conditions and worst case electrical fault conditions. VFD manufacturer shall obtain all data from the pump and motor manufacturers as required to conduct the torsional analysis.

4. Spare parts list

5. Letter of Compatibility. The VFD supplier in conjunction with the motor supplier shall issue a letter of compatibility stating that the VFD and motor are compatible.

6. FACTORY TEST DATA – Factory test data shall include a summary of all tests performed at the factory, both those specifically identified in this specification and other factory standard tests.
7. FIELD TEST DATA – Equipment Installation Report
8. Field test data shall include summary of all tests performed in the field specifically identified in this specification and other factory standard tests.

C. Operation and Maintenance Manuals

1. Operation and maintenance manuals shall contain the shop drawings, submittals, spare part lists, schematics, final wiring diagrams with any changes made during start-up and maintenance procedures.

1.05 STANDARDS

A. The applicable provisions of the following standards shall apply as if written here in their entity.

1. Local Laws and Ordinances
2. State and Federal Laws
3. National Electrical Code (NEC)
4. Underwriters' Laboratories (UL)
5. American National Standards Institute (ANSI)
6. National Electrical Manufacturers Association (NEMA)
7. Institute of Electrical and Electronics Engineers (IEEE)

1.06 DELIVERY AND STORAGE

A. The manufacturer shall be responsible for delivery of the equipment and accessories, f.o.b. to the jobsite or to such a storage site as may be designated by the Contractor in good condition and undamaged.

B. Unloading and storage of the equipment shall be the responsibility of the Contractor who shall inspect the equipment for apparent damage. Equipment which is found to be damaged will not be accepted until properly repaired or replaced by the VFD manufacturer or his representative.

C. Store materials according to manufacturer’s instructions. Equipment shall be stored indoors. Provide 100-watt incandescent light bulbs in each VFD section to eliminate the build-up of condensation during extended storage.

1.07 WARRANTY

A. All equipment furnished under this section shall be warranted by the Supplier for a period of three (3) years after Final Acceptance, including all parts, labor, travel and all related expenses. Final acceptance shall be understood to mean 100 hours of trouble free operation of all VFDs without a single failure or problem with the equipment and operating per the specifications.

B. Upon receipt of notice from the Owner or Owner's representative of failure of any part of the system equipment during the warranty period, the Contractor/VFD manufacturer shall replace the affected part or parts within three (3) days at no cost to the Owner.

1.08 HARMONICS ANALYSIS

A. Provide an electrical system harmonics analysis for the electrical distribution system including the electric utility. The goal of the study shall be to determine requirements for the variable frequency drives and isolation/phase shifting transformers to comply with the harmonic distortion levels.

B. The harmonics analysis shall verify compliance with the harmonics and line notching requirements specified herein. The location of the point of common coupling shall be defined at the main bus of the 480V main circuit breaker in the VFD. The study shall evaluate all VFDs (new and existing) operating at the lowest operating speed as specified in the pump specification, all VFDs operating at the full speed condition, and ten percent speed increments between these points. The study shall contain, as a minimum, the following:

1. Preliminary harmonic levels without VFDs installed.
2. Explanation of method used to perform the study.
3. Explanation of study results.
4. All calculations and/or computer printouts used to arrive at the recommendations.
5. Voltage and Current harmonic content up to the fiftieth harmonic, for the conditions specified above.

C. The harmonic distortion for voltage and current distortion levels and line notching shall meet the requirements of IEEE 519, latest version without the need for any ancillary filtering equipment.

D. The manufacturer shall be responsible to obtain all data necessary to perform the study. This includes feeder cable sizes, approximate feeder length, motor data, switchgear data, electric utility data, and any other information relevant to the study. The analysis shall use actual system impedance, Utility transformer impedance, and available fault current from the Utility.

E. The harmonic analysis shall take into consideration all variable frequency drives, existing and new, operating.

F. If harmonic filters are required to meet the requirements of the IEEE 519, the VFD manufacturer must provide the filters, and is responsible for the design and manufacturer of the filters at no cost to the Owner.

G. The report shall be provided prior to or with the variable frequency drive shop drawings for approval. Submittals for the variable frequency drives submitted prior to or without the study will be considered incomplete and not reviewed.

H. Compliance shall be verified with onsite field measurements of both the voltage and current harmonic distortion at the defined point of common coupling with and without the VFDs operating.

I. VFD manufacturer shall coordinate with the local Utility for electrical data required for the harmonic analysis.

2.00 PRODUCTS

2.01 GENERAL

A. Any modifications to a standard product required to meet this specification shall be performed by the VFD manufacturer only.

B. Drive shall be air cooled. Liquid cooled systems shall not be acceptable. The VFD shall consist of an incoming main circuit breaker section with an AIC rating of 65,000, input rectifier grade drive isolation transformer, input converter/DC bus/output inverter and control logic section. All components shall be integral to the VFD lineup, factory wired and tested as a complete system.

C. VFD system shall maintain a .95 minimum true power factor from 30% to 100% speed. VFD system include power factor correction and/or harmonic filter shall never have a leading power factor under utility or generator operation. VFD manufacturer is to supply a power factor correction system, if required, to meet this requirement. Power factor correction system shall include a separate input isolating contractor with fuses, power factor correction grade capacitors and series harmonic decoupling reactors, all mounted and wired as part of the drive system. Power factor correction system shall be mounted in the VFD.

2.02 SEQUENCE OF OPERATIONS

A. Refer to the Contract Drawings for control schematic.

2.03 VARIABLE FREQUENCY DRIVES

A. Ratings

1. Guaranteed minimum VFD efficiency shall be 96.5% at 100% speed and 100% load and minimum 95% at 80% speed. Losses shall include drive isolation transformer, input harmonic filters and power factor correction system, if applicable, converter/DC bus/Inverter, and output harmonic filter. Auxiliary control, such as internal VFD control boards, cooling fans or pumps, shall be included in all loss calculations.

2. Rated Input Power: Non-phase sequence sensitive, 380-480 Volts, +/-10%, 3-phase, 60 Hz.

   a. Voltage Dip Ride-through: VFD shall be capable of sustaining continued operation with a 30% dip in nominal line voltage. Output speed may decline only if current limit rating of VFD is exceeded.

   b. Power Loss Ride-through: VFD shall be capable of 5 cycle power loss ride-through without fault activation.

   c. All 120VAC power for VFD control logic and cooling fans or pumps shall be fused and supplied by the integral to the VFD.

3. Output Power: 400 HP, 480V, 6 to 60 HZ (VFD manufacturer shall coordinate with pump and motor manufacturers for exact HP requirements).

4. Ambient Temperature Range: 0 to 40□C.
5. Humidity: 95% non-condensing.
6. Elevation: Up to 3300 feet (1000 meters) above MSL without derating.
7. Power Unit Rating Basis: 100% rated current continuous, 150% rated current for one minute, at rated temperature.

B. CONSTRUCTION

1. The control logic section shall be fully digital and not require analog adjustment pots or fixed selector resistors. A power failure will not necessitate a re-load of any drive parameters or configurations. The controller shall be suitable for any standard NEMA-B squirrel-cage induction motor having a service factor of 1.15. The inverter output shall be generated by IGBT's. The VFD shall not create excessive power losses in the motor.

C. BASIC FEATURES

1. The VFD shall be capable of producing an adjustable AC voltage/frequency output to provide continuous operation over the normal system 30%-100% speed range. The VFD must be capable of sustained operation at 1/10 speed to facilitate checkout and maintenance of the driven equipment.
2. The door of each unit shall include the door mounted components as shown on the VFD control schematic. Operator interface and control logic shall be 120VAC. All control and signal wires shall be shielded and fully protected against EMI/RFI interference.
3. The VFD shall include a customer selectable automatic restart feature. When enabled, the VFD shall automatically attempt to restart after a trip condition resulting from overcurrent, overvoltage, under voltage, or overtemperature. For safety, the drive shall shut down and require manual reset and restart if the automatic reset/restart function is not successful within a maximum of three attempts within a customer programmable time period. Auto-Restart shall be programmable to allow for individual fault selection. If required to provide this function, the VFD manufacturer must supply and mount within the VFD a separate programmable logic controller to provide this feature.
4. A door-mounted keypad as provided by the manufacturer as their standard interface with shall be furnished, capable of controlling the VFD and setting drive parameters. The keypad shall include the following features:
    a. The digital display must present all diagnostic message and parameter values in English engineering units when accessed, without the use of codes.
    b. The keypad module shall contain a "self-test" software program which can be activated to verify proper keypad operations.
    c. The digital keypad shall allow the operator to enter exact numerical settings in English engineering units. A plain English user menu shall be provided in software as a guide to parameter setting (rather than codes). Driver parameters shall be factory set in EEPROM and resettable in the field through the keypad. Six (6) levels of password security shall be available to protect drive parameters from unauthorized personnel. The EEPROM stored drive variables must be able to be transferred to new boards to reprogram spare boards.
    d. The following door mounted digital indications shall be supplied:

1). Speed demand in percent

2). Input current in amperes

3). Output current in amperes

4). Output Frequency in hertz

5). Input voltage

6). Output voltage

7). Total 3-phase KW

8). Kilowatt hour meter

9). Elapsed time running meter (electro mechanical)

10). Output speed in percent.

e. VFD shall be capable of direct communication to an IBM or compatible computer for serial link setup of parameters, fault diagnostics, trending and diagnostic log downloading. A USB port shall be door-mounted for computer interface.

5. Printed circuit boards shall be conformal coated.

D. ENCLOSURE: All VFD components including transformer shall be mounted and wired by the VFD manufacturer in a grounded enclosure meeting the following requirements without exception:

1. Power conversion and auxiliary equipment enclosure sections shall be NEMA-1 design.

2. All relays, pushbuttons, etc. shall be housed in a separate 20" auxiliary equipment enclosure that shall be a part of the VFD enclosure.

3. Maximum dimensions for VFD enclosure, including transformer, shall be 95" H x 78" W x 26" D.

4. VFD shall be bottom entry for incoming conductors and conduit and bottom exit for outgoing conductors and conduits. Incoming conductors and conduit shall be 3#4/0, #3G., 3"C. Outgoing conductors and conduit shall be 3#4/0, #3G., 3"C. VFD shielded interlocked armored drive cable as manufactured by Service Wire Company or approved equal.

5. All power conductors (bus or cable) shall be insulated.

6. All relays and pushbuttons shall be NEMA rated, heavy duty type. IEC or dual IEC/NEMA rated equipment shall not be acceptable.

7. All wiring shall be located internally within the VFD enclosure. External ductwork or wireways shall not be utilized.

8. Terminal blocks shall be NEMA rated, 600V.

9. All wiring shall be identified with wiring markers with alphanumeric characters. The identification of each wire shall be the same as that shown on the electrical schematic. Each wire shall be identified at each end. Each end of every wire shall be provided with a heat shrinkable or equivalent sleeve-type wire marker-labeled in accordance with the electrical schematic. Use of adhesive and clip-on type markers is prohibited.

10. INSTRUMENT CURRENT TRANSFORMERS: Each instrument current transformer shall be indoor wound type, meter class. Insulation shall be equal to that necessary to meet the requirements of the IEEE standards. At normal rated amperes, under usual service conditions, no part of the transformer shall exceed the heating limits specified in the IEEE standards. Each current transformer shall be capable of carrying continuously its rated primary amperes, under conditions of accidental open secondary circuit, without damage to the primary insulation. Accuracy shall have ANSI accuracy classification C400.
11. CONTROL RELAYS: Industrial type; contacts rated for 10 amps at 600 VAC; Allen-Bradley Bulletin 700 Type PK, Square D Class 8501 Type X, or approved equal. Relays shall have the capability of having contact decks added in the field. Contacts shall be field convertible to normally open or normally closed. Coils and contacts shall each be replaceable without replacing any other part of the relay. Where control relays are indicated on the Plans, industrial control relays shall be furnished whether the relay coil is operated with 120 VAC or 24 VDC.
12. TIMING RELAYS: Solid state. Ranges shall be as shown on the Plans. The timing relays shall have both normally open and normally closed contacts by having two sets of form C contacts. Timing relays where shown on the Plans shall be Square D, Class 9050 Type JCK60, or Allen-Bradley Type 700-HRM time delay relay, or approved equal model for operation on the control voltage of the equipment it is used in. Timing relay shall be provided with restraining strap.
13. INDICATING LIGHTS, SWITCHES, PUSHBUTTONS: Heavy duty and oil tight (30 mm); Square D Class 9001 or approved equal. Pilot lights shall be push to test (Cluster LED type) and shall be Square D SK or approved equal.
14. Maximum door swing clearance shall not exceed 36".
15. After fabrication, metal structures shall be thoroughly cleaned, bonderized as a unit and then given a primary coat, a coat of rust preventative and a finishing coat of quick-drying lacquer. Unless otherwise specified, the color of the panels and the exteriors of structures shall be gray ANSI-61. Instruments, relays, and meters shall have dull black standard finish.
16. Air shall be exhausted through the top and front of the VFD enclosure. No air shall be exhausted through the rear of the enclosure.
17. Enclosure shall be bottom entry and bottom exit. Incoming conductors and conduit shall be 3-#4/0, #3G., 3”C. Outgoing conductors and conduit shall be 3#4/0, #3G., 3”C.
18. VFD shall be provided with an elapsed time meter; Yokogawa Type 240, or approval equal. The meter shall be of a non-reset type, for totalizing of hours and shall operate on 120 VAC, 60 Hertz.
19. Provide a print pocket pouch with the control schematic drawings on the inside of the VFD door. The control schematic drawings shall be the final version of the drawings and shall include any field revisions made during start-up.
20. Lights, pushbuttons, switches, displays, motor protection relay, etc. shall be mounted no higher than 6’-6” AFF. Front drive panel layout showing exact mounting heights shall be submitted to the Engineer for approval.

2.04 NAMEPLATES

A. Externally visible, permanent nameplates shall be provided to identify each instrument, switch, indicating light, etc. Equipment and terminal blocks shall be suitably identified. This shall include items on the back side of doors and panel mounted items. Nameplates shall be black with white lettering and attached with stainless steel screws.

B. Equipment nameplates and designations shall be 2 in. by 5 in. minimum, not less than 1/16 in. thick, engraved laminated plastic fastened with stainless steel screws. Nameplates shall be 1 in. white lettering on black background and shall indicate equipment designations as shown on the drawings.

C. Provide legend plates or 1 in. by 3 in. engraved nameplates with ¼ in. lettering for identification of all pilot devices and meters. Legend nameplates shall be secured with stainless steel screws.

D. Provide permanent warning signs as follows:

1. "DANGER – HIGH VOLTAGE – KEEP OUT" on all enclosure doors.

2. "WARNING – HAZARD OF ELECTRIC SHOCK – DISCONNECT POWER BEFORE OPENING OR WORKING ON THIS UNIT"

E. Provide arc flash labeling in accordance with the National Electrical Code Article 110.16 and per the Arc Flash Hazard Analysis (performed by other). See Specification 26 05 73.01 ELECTRICAL POWER SYSTEM STUDIES for more information.

2.05 PROTECTIVE FEATURES AND CIRCUITS

A. The VFD controller shall include the following alarms and protective devices:

1. Static instantaneous overcurrent and overvoltage trip.

2. Power loss protection.

3. Power unit over-temperature alarm and protection. Upon sensing an over-temperature condition VFD is to annunciate an alarm and automatically reduce output speed in order to shed load maintaining process operation. If over-temperature continues beyond specified period, unit to trip on over-temperature.

4. Electronic motor inverse time overload protection.

5. The VFD shall be protected from damage due to the following, without requiring an output contractor:

a. Single-phase fault or three-phase short circuit on VFD output terminals.

b. Failure to communicate inverter thyristor due to severe overload or other conditions.

c. Loss of input power due to opening of VFD input disconnect device or utility power failure during VFD operation.

d. Loss of one (1) phase of input power.

e. Motor regeneration due to backspin or loss of VFD input power.

6. The VFD shall be able to withstand the following fault conditions without damage to the power circuit components.
    a. Failure to connect a motor to the VFD output.
    b. VFD output open circuit that may occur during operation.
    c. The VFD shall have auto frequency roll-back capability during overload or overtemperature and conditions to minimize nuisance tripping.
    d. Control functions such as speed setpoint, start, stop, alarm, and status functions shall be transmitted as discrete I/O to the station PLC. The VFD shall be capable of communicating setup parameters for 4 diagnostics, trending information, and diagnostic log down loading over a RS485 data highway to the station PLC. The RS485 data highway shall use a Modbus Interface Protocol.
    e. All I/O, discrete, analog and RS485 signals shall be wired to terminal blocks for customer's use. Using drive internal terminal blocks is not acceptable.

2.06 PARAMETER SETTINGS

A. The following system configuring settings shall be provided, without exception, field adjustable through the keypad/display unit or via the serial communication port only. Except for Motor Nameplate Data, all parameters must be adjustable while the processor is on-line, and the drive is running.
    1. Motor Nameplate Data
        a. Motor frequency
        b. Number of poles
        c. Full load speed
        d. Motor volts
        e. Motor full load amps
        f. Motor KW
        g. Current limit, max.
    2. VFD Limits
        a. Manual accel rate
        b. Manual decel rate
        c. Auto accel rate
        d. Auto decel rate
        e. Motor flux buildup delay: time/amount
        f. I boost
        g. Overload trip curve select (Inverse or Constant)
        h. Min/Max speed (frequency)
        i. Auto reset for load or voltage trip select

j. Overload trip time set

3. VFD Parameters

a. Voltage loop gain

b. Controller Adjustments

c. PID control enable/disable

d. Setpoint select

e. Proportional band select

f. Reset time select

g. Rate time select

h. Input signal scaling

i. Input signal select:

1). (4-20 mA/0-5 Volts)

j. Auto start functions:

1). On/Off, Delay On/Off,

2). Level Select On/Off

k. Speed Profile:

1). Entry, Exit, Point Select

l. Min, Max Speed Select

m. Inverse Profile Select

n. Critical speed avoidance select

B. All drive setting adjustments and operation parameters shall be stored in a parameter log which lists allowable maximum and minimum points as well as the present set values. This parameter log shall be accessible via fiber optic as well as on the keypad display.

2.07 DIAGNOSTIC FEATURES AND FAULT HANDLING

A. The VFD shall include a comprehensive microprocessor based digital diagnostic system which monitors its own control functions and displays faults and operating conditions. Microprocessor systems must be products of the same manufacturer as the VFD (to assure single source responsibility, availability of service and access to spare parts).

B. A "FAULT LOG" shall record, store, display and print upon demand, the following for the 10 most recent events (minimum):

1. VFD mode (HAND-OFF-AUTO)

2. Date and time of day

3. Type of fault

4. Reset mode (Auto/Manual)

C. A "HISTORIC LOG" shall record, store, display and print upon demand, the following control variables at 2.7 M/Sec. intervals for the 50 intervals immediately preceding a fault trip:

1. VFD mode (LOCAL-OFF-REMOTE)
2. Speed demand
3. VFD output frequency
4. Demand (output) Amps
5. Feedback (motor) Amps
6. VFD output volts
7. Type of fault
8. REMOTE enable

3.00 EXECUTION

3.01 INSTALLATION

A. Manufacturer's representative shall be available to advise and assist the installation of the VFDs by others.

B. Furnish the services of a competent manufacturer's service representative who shall be experienced in the assembly and wiring of the VFD drive units of similar size and character. He shall direct the installation of the equipment and shall assist and advise with the electricians or other workmen who are performing the actual work of installing the VFD drive units. He also shall assist in the adjustment and testing of the equipment.

C. Adjust the calibration of protective relays according to the relay coordination study (provided by others) and test the settings. Prepare a card index for the relays, the settings, the test results and marked thereon, and submit to the Owner.

D. Instruct the operating and maintenance personnel in principle of operating of all major devices and the care and maintenance of components included in the VFD drive units, for a period of not less than one (1) eight (8) hour day.

E. Time spent on the job by the service representative shall be adequate for performing the above functions.

F. All costs (travel expenses, testing equipment, etc.) required for testing start-up, and training shall be the responsibility of the equipment manufacturer/Contractor.

G. Training shall include theory of operation, application and trouble shooting. A training outline and manual of training course material shall be provided to the Owner two weeks in advance of the course. The one day, eight hour training session shall be broken up into two segments each of 4-hours with a 15 minute break every two hours. Lunch break will be one hour. Training session shall be conducted by VFD manufacturer personnel. Training session shall be scheduled and coordinated with the Owner.

3.02 FIELD QUALITY CONTROL

A. Testing, checkout, and start-up of the VFD equipment shall be performed under the technical direction of the manufacturer's service engineer from the factory. Under no circumstances are any portions of the drive system to be energized without authorization from the manufacturer's representative.

B. Once the drive has been installed, testing shall be provided by the manufacturer or manufacturer's testing agency to verify conformance with the specifications for the following:

   1. Harmonics
   2. Efficiency
   3. Power Factor

C. The VFD Supplier shall provide readings with printouts of the harmonic current at each harmonic as well as the total voltage distortion. The following readings shall be provided:

   1. At point of common coupling:
      a. With all drives running with load
      b. With all drives off
   2. At the power connection to each drive:
      a. With the drive running loaded
      b. With drive off
   3. All the above data shall be submitted to the engineer in a written report format for review and approval by the Engineer. If these tests show that the drives are not in compliance with the Specifications, the drive manufacturer shall make all changes required to comply with the Specifications at no cost to the Owner. If required, this could mean replacing the drives that are not in compliance.
   4. A copy of all tests and checks performed in the field, complete with meter readings and recordings, where applicable, shall be submitted to the Engineer and Owner as an official submittal.

D. The tests shall be witnessed by the Owner and Engineer. Provide at least two (2) weeks notice to the Owner and Engineer prior to conducting these tests. Final acceptance of the VFD installation will not be considered until the Owner and Engineer have witnessed the test described above and a formal written report has been submitted and approved by the Engineer.

E. The VFD manufacturer or manufacturer representative shall submit a written Equipment Installation Report certifying the equipment is properly installed and has been operated under all operating conditions and is operating under all operating conditions and is operating satisfactorily per the requirements of the specification.

F. Provide for the Engineer's review a complete list of test procedures, standards, equipment and calibration reports of the measuring and testing equipment used.

G. Any deficiencies with regard to these specifications shall be corrected by the manufacturer at no expense to the Owner. Prior to any corrective action, a plan of correction shall be submitted to the Engineer for approval.

3.03 SPARE PARTS

A. The following spare parts of the type and size furnished shall be provided:

1. Ten of each type of power and control fuse rated 600V or less.
2. Five of each type of panel lamp.
3. One spare relay and timer of each type.
4. One of each type of printed circuit board, including diagnostic systems.
5. One microprocessor-based interface display and monitoring panel, and keypad.
6. One of each fan or blower installed.

3.04 CLEAN AND ADJUST

A. The manufacturer shall furnish sufficient touch-up paint of the same type and color used at the factory to repair damages incurred in installation. Perform touch up painting to achieve the original paint thickness, quality, and appearance.

END OF SECTION

DIVISION 33
UTILITIES

33 05 01.02 DUCTILE IRON PIPE & FITTINGS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install ductile iron pipe and fittings, including taps, connections, and appurtenances as required for a functional system as indicated herein. Unless otherwise noted, all above grade exposed pipe, fittings, and appurtenances shall be flanged while below grade piping, fittings and appurtenances shall be mechanical joint or push on joints. Trenching, backfilling, and pipe embedment shall be as shown on the Drawings and in accordance with NTCOG “Trenching and Backfill.”

1.02 QUALITY ASSURANCE

A. Factory Testing: The manufacturer shall perform all tests as required by AWWA C151. Welded outlets shall be hydrostatically tested at a pressure of 250 psi for a period of 1 hour. No leakage shall be allowed.

B. Experience Requirements: Pipe shall be the product of a manufacturer who has a minimum of 10 years’ successful experience manufacturing pipe of the particular type specified and the total pipeline shall be the product of one pipe manufacturer. The manufacturer shall have a minimum of 10 years’ successful experience in the design and manufacturing of pipe joints of similar design, working pressure, pipe diameter and wall thickness as specified.

C. Owner Testing and Inspection:

1. Pipe may be subject to inspection by an independent testing laboratory, which laboratory will be selected and retained by the Owner. Representatives of the laboratory or the Engineer shall have access to the Work whenever it is in preparation or progress, and the pipe manufacturer shall provide proper facilities for access and for inspection. The pipe manufacturer shall notify the Owner in writing, at least 2 weeks prior to the pipe manufacture so that the Owner may advise the manufacturer as to the Owner's decision regarding tests to be performed. Material and pipe which are discovered to be defective, or which do not conform to the requirements of this Section shall be subject to rejection at any time prior to final acceptance of the pipe. After final acceptance, each joint of pipe shall be stamped as approved by the laboratory.

2. It is anticipated that production of pipe shall be done over a normal period of time and without "slow-downs" or other abnormal delays. In the event that an abnormal production time is required, and the Owner is required to pay excessive costs for inspection, then the Contractor shall be required to reimburse the Owner for such laboratory costs over and above those which would have been incurred under a normal schedule of production.

D. Pipe Classification: Pipe manufacturer shall manufacture the pipe to meet the installation conditions, cover depth, and bedding and backfill requirements as shown on the Drawings or specified and furnish the correct class of pipe to meet these conditions. If additional requirements are required, pipe manufacturer shall coordinate their requirements with the Contractor.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01330 “Document Management” and shall include:

1. Record Data: Catalog data, including dimensions of new pipe and fittings and recommendations for handling and storage; details of lining and coating; thrust restraint provisions; hydrostatic pressure test plan and results; affidavit stating the pipe furnished complies with AWWA C151, AWWA C104, AWWA C110, AWWA C111, and these specifications; mill certificates, including chemical and physical test results for each heat of metal, if requested during pipe manufacturing operations; record drawings, including a schematic location-profile and a tabulated layout schedule, referenced to the pipeline stationing.

2. Shop Drawings: Mechanical joint connections; connections to differing pipe materials.

3. Certified Test Data: Certified Test Reports from the manufacturer’s testing facility or an Owner approved testing laboratory; results of factory hydrostatic tests; pipe and fitting certification for conformance to ANSI/NSF 61.

1.04 REFERENCE SPECIFICATIONS

A. Section 09 96 00.01 “High-Performance Coatings.”

B. Section 33 05 05.31 “Hydrostatic Testing.”

C. Section 33 10 13 "Disinfecting of Water Utility Distribution.”

1.05 STANDARDS

A. Except as modified herein, the applicable provisions of the following standards shall apply as if written here in their entirety:

1. American Water Works Association (AWWA) Standards:

AWWA C104	Standard for Cement Mortar Lining for Ductile Iron Pipe and Fittings
AWWA C105	Standard for Polyethylene Encasement for Ductile Iron Piping
AWWA C110	Standard for Ductile Iron and Gray Iron Fittings
AWWA C111	Standard for Rubber Gasket Joints for Ductile Iron Pipe and Fittings
AWWA C150	Standard for Thickness Design of Ductile Iron Pipe
AWWA C151	Standard for Ductile Iron Pipe
AWWA C153	Standard for Ductile-Iron Compact Fittings for Water Service
AWWA C600	Standard for Installation of Ductile Iron Water Mains and Appurtenances
AWWA C606	Grooved and Shouldered Joints

2. Steel Structures Painting Council (SSPC) Standard: SSPC SP6, Commercial Blast Cleaning.

3. All ductile iron pipe and fittings for potable water systems shall conform to American National Standards/National Science Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI.

1.06 DELIVERY AND STORAGE

A. Handling and storage of pipe and fittings shall comply with AWWA C600 and the manufacturer's recommendations.

1.07 GUARANTEES

A. The product shall be warranted and guaranteed per the General Conditions of the Specifications.

2.00 PRODUCTS

2.01 MATERIALS

A. Ductile Iron Pipe:

1. Ductile iron pipe shall be made of ductile iron in accordance with AWWA C151. All ductile iron pipe shall have a minimum working pressure as indicated on the Drawings. Pipe shall be rated for pressure in accordance with AWWA C151 for pressure class of pipe as indicated. Standard joint length shall be 18 to 20 feet. Flanged ductile iron pipe shall be in accordance with AWWA C115.

2. Pipe manufacturer shall manufacture the pipe to meet the installation conditions, cover depth, and bedding and backfill requirements as shown on the Drawings or specified and furnish the correct class of pipe to meet these conditions.

B. Fittings: Fittings shall be ASTM A536 ductile iron or ASTM A48 cast iron in accordance with AWWA C110. Fittings shall be rated for a minimum working pressure of 250 psi, unless specified otherwise. Factory welded outlets may be used in lieu of tee fittings for 18-inch and larger tee fittings. Factory welded outlets shall have a minimum pressure rating of 250 psi. Factory welded outlets may not be used near sources of vibration, such as pump stations or roads.

C. Joints for Pipe and Fittings:

1. Joints shall be in accordance with AWWA C110, AWWA C111, and AWWA C151. Standard joints for ductile iron pipe and fittings shall be push-on. Where indicated, joints shall be mechanical joint, flanged, or grooved.

2. Flanged joints shall have pressure ratings equal to or greater than adjacent pipe. Flange pattern shall match pattern of valve, fitting, or appurtenance to be attached. Flanges on ductile iron pipe shall be ductile iron.

D. Provisions for Thrust:

1. Thrust at bends, tees, plugs, or other fittings shall be resisted by restrained joints. If thrust cannot be accommodated using restrained joints, thrust blocking or concrete anchors to restrain thrust may be used on a case-by-case basis when approved by the Engineer.

2. Restrained joints shall be used for a sufficient distance from each bend, tee, plug, or other fitting to resist thrust which will be developed at the design pressure of the pipe. For the purpose of thrust restraint, design pressure shall be 1.5 times the design working pressure class indicated.

3. The length of pipe with restrained joints to resist thrust forces shall be determined by the pipe manufacturer in accordance with Thrust Restraint Design for Ductile Iron Pipe, Ductile Iron Pipe Research Association using the following parameters:

    a. Laying condition equal AWWA C600 Type 4 bedding.

    b. If polyethylene encasement is used, restrained length shall be doubled to account for reduced soil to pipe friction resistance.

4. Where indicated and where required for thrust restraint, joints shall be restrained. Restrained joints shall be mechanically interlocking joints. Restrained joints shall be U.S. Pipe "TR Flex", American Ductile Iron Pipe "Flex Ring", or Clow Corporation "Super-Lock". Restraining fittings using set screws, restraining gaskets, gripper type glands, and field-cuts of restrained joints shall be Mega-Lug, or approved equal. Field welding shall not be allowed. Restrained joints shall be capable of sustaining the design pressure as specified herein.

E. Coating:

1. Coat the exterior of the pipe and fittings with a 1 mil bituminous coating in accordance with AWWA C110 and AWWA C151, unless specified otherwise.

2. In addition to the factory applied asphaltic coating, all buried ductile iron pipe and fittings shall have a tube-type polyethylene encasement in accordance with AWWA C105. Polyethylene encasement shall be 8 mils thick. Both ends of the pipe shall be thoroughly sealed with adhesive tape or plastic tie straps at the joint overlap. Place circumferential wraps of tape at 2-foot intervals along the barrel of the pipe to minimize the space between the encasement and the pipe.

F. Lining: Ductile iron pipe and fittings shall have a cement mortar lining in accordance with AWWA C104 and bituminous seal coat. Thickness of lining shall be as specified in AWWA C104. Air piping shall not be lined.

G. Flexible Joint Couplings:

1. Flexible joint couplings shall be Dresser Style 38, Rockwell Style 411, Victaulic Depend-O-Lok - E x E, Type II or approved equal, unless otherwise shown.

2. Provide restrained flexible joint couplings or restrained flexible joints on all pipes connecting to concrete structures and at other locations shown on the Drawings. Restrained flexible couplings shall be Victaulic Depend-O-Lok F x F Type II or approved equal. Restrained flexible joints shall be U.S. Pipe "TR Flex", American Ductile Iron Pipe "Flex Ring", Clow Corporation "Super-Lock", or approved equal.

3.00 EXECUTION

3.01 INSTALLATION

A. Furnish labor, materials, equipment and incidentals necessary to install ductile iron pipe and fittings, including taps, connections, and appurtenances as required for a functional system as indicated herein. Unless otherwise noted, all above grade exposed pipe, fittings, and appurtenances shall be flanged while below grade piping, fittings and appurtenances shall be mechanical joint or push on joints. Trenching, backfilling, and pipe embedment shall be as shown on the Drawings and in accordance with NTCOG “Trenching and Backfill.”

B. Pipe Laying: Lower pipe, fittings, and special castings into trench by crane or other suitable method. Do not roll in or "dump" into the trench. Handle pipe and fittings with belts, slings, or other equipment designed to prevent damage to the pipe and coating. Remove dirt and trash that may be in the barrel of the pipe, on the spigot or in the bell while the pipe is suspended. Keep the pipe clean during the laying operation and free of sticks, dirt, and trash, and at the close of each operating day seal the open end of the pipe with a gasketed night cap. Do not lay pipe in water.

C. Pipe Alignment: Install pipe and fittings to the line and grade indicated. In areas where the line and grade indicated cannot be achieved using standard manufactured bends and fittings, make slight adjustments by deflecting joints. Joint deflections may not exceed the lesser of the maximum deflections stipulated in AWWA C600 or 75 percent of the manufacturer’s maximum recommended deflection. Resolve any conflicts with existing utilities and structures.

D. Joint Making:

1. Jointing Mechanical Joint Pipe:

    a. Joint this type of pipe in accordance with the manufacturer's recommendations, with uniform torque on bolts.

    b. After carefully cleaning both spigot and bell and after slipping the follower ring and gasket over the spigot end, slip the spigot into the bell. Apply a lubricant to the spigot to assist in assembly.

    c. Carefully seat the gaskets by hand to be even in the bell at all points.

    d. After drawing up the follower ring to uniform bearing against the gasket, insert the bolts and tighten by hand in pairs using bolts opposite each other.

    e. Tighten the nuts to hold the required pressure. Extension wrenches or pipes over wrench handles shall not be permitted. Use 10-inch ratchet wrenches to tighten the nuts to a uniform torque.

    f. The finished joint shall be watertight.

2. Making Flanged Joints: Erect flanged pipe in accordance with the controlling dimension as specified. Thoroughly clean each piece of flanged pipe to remove dirt, rust, grease, and other foreign matter. Thoroughly wire brush flanged faces to ensure even bearing for gaskets and mating flanges. Place full face gasket, use drift pins to align holes, and tighten flange bolts, each in turn, at a uniform torque around the joint. Finished joints shall be watertight.

3. Making Push-On Joints:

    a. The jointing of this type of joint shall be as recommended by the manufacturer. The procedure for jointing shall be generally as follows:

        1). Thoroughly clean and dry the spigot and bell before starting the assembly of the joint. Wipe the gasket clean with a cloth.

        2). Place the gasket into the gasket seat in the bell.

3). Apply a thin film of lubricant to the surface of the gasket that will come in contact with the entering pipe spigot. If necessary, also apply lubricant to the spigot.

4). Make the joint by exerting sufficient force on the entering pipe so that its plain end will move past the gasket to the seat of the bell.

5). If restrained joints are used, orient pipe to permit ease of assembly. Place locking device after installation of spigot into bell.

4. Making Split-Sleeve Coupling Joints:

a. Exterior surfaces of the pipe shall be clean, smooth and free from weld beads, seams, scars, indentations, roll marks, exterior coatings and flat spots.

b. Install split-sleeve couplings in accordance with the manufacturer's latest installation instructions.

E. Polyethylene Encasement: Wrap bituminous coated ductile iron pipe in polyethylene encasement in accordance with AWWA C105. Repair or replace encasements which have tears, rips, or punctures in the polyethylene wrap.

F. Painting: Paint piping which is submerged or exposed to the atmosphere in accordance with Section 09 96 00.01 "High-Performance Coatings."

3.02 FIELD QUALITY CONTROL

A. Perform a hydrostatic test as specified in Section 33 05 05.31 "Hydrostatic Testing."

B. Disinfect the piping system as specified in Section 33 10 13 "Disinfecting of Water Utility Distribution."

END OF SECTION

33 05 05.31 HYDROSTATIC TESTING

1.00 GENERAL

1.01 WORK INCLUDED

A. Hydrostatically test new pipe between valves or plugs at the pressure and for the duration specified.

B. Additional plugs may be installed to reduce the length of each test section. No additional compensation will be paid if additional plugs are used.

C. Provide a pressure reducing backflow preventer and all temporary piping, pumping, fittings and gauges required to fill, test and then drain the pipe.

D. Do not begin test until pipe has been backfilled for at least 7 days.

1.02 SUBMITTALS

A. Submit detailed hydrostatic test procedure 10 days prior to conducting the test.

B. Submit Hydrostatic Pipe Test Reports per Section 01 33 00 “Document Management.”

1.03 STANDARDS

A. The applicable provisions of the following standards shall apply as if written here in their entirety:

1. ASTM International (ASTM):

ASTM F2164	Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure

2. American Water Works Association (AWWA):

AWWA C200	Steel Water Pipe, 6 In (150 mm) and Larger
AWWA C600	Installation of Ductile-Iron Mains and Their Appurtenances
AWWA C604	Installation of Buried Steel Water Pipe – 4 In. (100 mm) and Larger
AWWA C605	Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings
AWWA M9	Concrete Pressure Pipe
AWWA M11	Steel Pipe – A Guide for Design and Installation
AWWA M23	PVC Pipe – Design and Installation
AWWA M41	Ductile-Iron Pipe and Fittings
AWWA M55	PE Pipe – Design and Installation

2.00 PRODUCTS

2.01 WATER FOR TESTING

A. Obtain water for filling and testing the pipeline and provide all temporary pumps and piping necessary to fill the pipeline.

B. Chlorinated potable water should be dechlorinated before disposal per all regulations.

2.02 TEST PLUGS

A. Design plugs or blind flanges to withstand the test pressure on either side with only atmospheric pressure on the opposite side.

B. Provide a 30-inch access manhole in one side of the plug and a 12-inch flanged outlet on the other side of the plug unless shown differently on the Drawings.

3.00 EXECUTION

3.01 GENERAL

A. Perform hydrostatic test in accordance with this Section, AWWA Standards, AWWA Manuals, and the supplier's recommendations.

3.02 TEST PRESSURE

A. The Ductile Iron and Steel Pipe shall be at the system psi for the higher or lower pressure plane.

3.03 TEST PREPARATION

A. Fill pipe at 0.5 feet per second in the main pipe.

B. Verify all air valves are working and air is vented from temporary taps. Plug taps after test.

C. Allow cement mortar lined pipe to sit with a slight pressure for 48-hours before beginning test.

D. Examine bulkheads, valves, manholes, flanges, and connections for leaks during this period. Stop any leaks before continuing.

E. If an existing valve is in the test section, then coordinate with the Construction Manager to determine an approved method for measuring any leakage past the valve. Furnish all necessary equipment and include the cost for this effort in the Contract Price.

3.04 TEST DURATION

A. Test the test section for 8 hours.

3.05 EXAMINATION UNDER PRESSURE

A. Increase pressure to the specified test pressure.

B. Protect the gauge from direct sunlight during the test.

C. Inspect the pipe during the test to locate any leaks or breaks, defective joints, cracked or defective pipe, fittings, or valves. Correct defective Work identified during the pressure test.

D. Correct all identified leaks even if leakage is within the parameters for permissible make up water per Paragraph 3.06.

E. Test the pipe again after defective Work has been corrected. Repeat the test and correction of defective Work until satisfactory test results are obtained.

3.06 PERMISSIBLE MAKEUP WATER

A. No makeup water is allowed for welded steel pipe. Retest if the pressure drops more than 5 psi during the test.

B. Measure make up water. Make up water is the amount of water added to the test section to maintain the pressure within 5 psi of the specified test pressure.

C. The maximum acceptable volume of makeup water for gasketed pipe is 1 gallon per inch of pipe diameter per mile of pipe tested per day.

3.07 CORRECTIONS OF DEFECTS

A. Repair any defective joints, cracked or defective pipe, fittings, or valves discovered in performance of this pressure test with sound material meeting the requirements of the Contract Documents and repeat the test until satisfactory results are obtained. Repair all noticeable leaks even if the actual leakage is within the allowable limits.

3.08 REMOVAL OF TEST PLUGS

A. Remove test plugs once both sides of the pipeline have been tested. If another contractor may need the plug, then coordinate with them – the last contractor to need the plug shall remove it and repair the mortar lining.

B. Leave the pipeline full of water upon completion of the hydrostatic test, except where internal test plugs must be removed to allow construction to continue.

END OF SECTION

33 10 13 DISINFECTING OF WATER UTILITY DISTRIBUTION

1.00 GENERAL

1.01 WORK INCLUDED

A. Disinfect the facilities for pumping, storing, or conveying potable water to comply with the standards for potable water of the regulatory agency of jurisdiction. Potable water is defined as any water that has been filtered, disinfected or otherwise treated to the meet regulatory standards (in the water treatment plant this includes the inside surfaces of the filters).

B. Disinfect piping systems that are used to convey water, solutions, or chemicals to the potable water facilities.

C. Test water from the disinfected system per regulatory standards to verify that water is acceptable. Repeat procedure if tests do not meet standards.

D. For critical operations identified in Section 01 35 00 “Special Procedures” the Contractor shall plan and perform the repairs/work in a manner to allow the Bac-T samples to be taken by noon. In accordance with Texas Commission on Environmental Quality (TCEQ) Chapter 290 regulations, disinfection must be performed when repairs are made to existing facilities and before new facilities are placed into service. When it is necessary to return the facility back to service as rapidly as possible, it is acceptable to increase the doses to 500 mg/l and the contact time reduced to 30 minutes. This Project will require the critical operations to be disinfected by 500 mg/l for 30 minutes followed by flushing prior to the sample being taken. The Owner will take the sample and have it tested. Contractor may also take a sample to be tested. Cost for failed tests and all associated re-disinfection, flushing shall be borne by the Contractor. Prior to the 30 minute test time, all new valves shall be fully closed and opened.

1.02 STANDARDS

A. The Applicable provisions of the following standards apply as written here in their entirety:

1. American Water Works Association (AWWA) Standards:

AWWA B300	Hypochlorites
AWWA B301	Liquid Chlorine
AWWA C651	Disinfecting Water Mains
AWWA C652	Disinfection of Storage Facilities
AWWA C653	Disinfection of Water Treatment Plants

2. NSF International (NSF) / American National Standards Institute (ANSI) Standards:

NSF/ANSI Standard 60	Drinking Water Treatment Chemicals – Health Effects

1.03 QUALITY ASSURANCE

A. Demonstrate that :

1. Disinfection Chemicals are in compliance with AWWA B300 or AWWA B301 and AWWA C651, AWWA C652 or AWWA C653.
2. Disinfection Chemicals are in compliance with NSF/ANSI Standard 60.

1.04 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:
   1. Shop Drawings: Manufacturer’s data sheet demonstrating compliance with appropriate AWWA/NSF/ANSI Standards for materials not listed in the approved manufacturers list in Part 2.00 - Materials Article.
   2. Record Data: Materials to be used from the approved manufacturers listed in Part 2.00 – Materials Article.

2.00 PRODUCTS

2.01 MATERIALS

A. Liquid Chlorine: Meeting the requirements of AWWA B301 and NSF/ANSI Standard 60 certified for use in potable water systems.
B. Calcium or Sodium Hypochlorite: Meeting the requirements of AWWA B300 and NSF/ANSI Standard 60 Certified for use in potable water systems.
C. Calcium hypochlorite intended for use in swimming pools will not be accepted (AWWA C651 Item 4.1.3).
D. Approved Manufacturers:
   1. AllChem Performance - Chlor Mor Cal Shock.
   2. Arch Chemicals - Dry Tec Granular.
   3. Brentag Southwest Inc. - Sodium Hypochlorite, 12.5%.
   4. Alliance Chemical - Sodium Hypochlorite, 10-15%.
   5. Olin Corporation - Sodium Hydrochlorite Solution.
   6. Approved equal.

3.00 EXECUTION

3.01 NEW FACILITIES

A. New facilities shall be thoroughly disinfected in accordance with AWWA C651 - Disinfecting Water Mains, AWWA C652 - Disinfection of Storage Facilities, and AWWA C653 - Disinfection of Water Treatment Plants, and then flushed and sampled before being placed in service. Samples shall be collected and tested in accordance with the TCEQ Rules and Regulations, Chapter 290.
B. During construction keep basins, pipe, fittings, equipment, and appurtenances free from dirt and debris.

1. Clean basins thoroughly before disinfection.
2. Seal the open ends of pipe with water-tight plugs when pipe is not being laid.
3. Pump water from trenches before removing the plug when water accumulates in the trench.

C. Complete hydrostatic test of the line prior to disinfection.

D. Wash the surfaces to be disinfected.

1. Flush pipelines. The minimum quantity of water used for flushing must exceed the capacity of the line to ensure that clean water has traversed the entire length of pipe.
2. Power wash the surfaces of basins and reservoirs using high pressure wash systems.

E. Disinfect facilities per the following procedures of AWWA:

1. Water Mains: AWWA C651 - latest revision.
2. Water Storage Facilities: AWWA C652 - latest revision.
3. Water Treatment Plants: AWWA C653 - latest revision.

F. Fill the system with potable water. Test the water to see that it meets the requirements of the regulatory agency of jurisdiction for potable water. Monitor the system for 2 days. If water test fails to meet the prescribed standards, repeat the disinfection process until water meets quality standards for disinfection.

3.02 REPAIRS OR CONNECTIONS TO EXISTING LINES

A. Clean and sterilize the interior surfaces of new piping, fittings, equipment, and appurtenances to be installed in an existing potable water system or connected to an existing system.

B. Clean and sterilize the existing pipe or facilities for a minimum distance of 3 pipe diameters back from the ends of the pipe. Plug the ends of the line when work is not being performed on the pipe.

C. Perform sterilization by swabbing each item with a concentrated chlorine solution.

1. Each piece is to be disinfected prior to being assembled for installation in the existing pipe.
2. Disinfect each piece just prior to assembly to help prevent re-contamination.
3. Plug the ends of the assembly until a new item is to be added to the assembly.
4. Store disinfected materials on blocks to prevent contact with the ground.

3.03 DISPOSAL OF FLUSHING AND DISINFECTION WATER

A. Chlorinated water used in flushing and disinfecting pipelines, storage tanks, or vessels prior to connection to the distribution system shall be disposed of by the Contractor in an acceptable manner. Chlorinated water must be “de-chlorinated” prior to disposal to eliminate adverse impacts to the surrounding environment. Water released to the environment shall meet all AWWA, EPA, and TCEQ regulatory requirements.

1. Contractor is responsible for complying with all of the applicable requirements of the TPDES General Permit TXG670000, issued by the TCEQ, regarding the discharge of hydrostatic test water. Maximum discharge chlorine concentration for compliance is 0.10 mg/l. Discharges within the Edwards Aquifer recharge area must meet special requirements under the terms of the General Permit. Contractor compliance is required.
2. Residual chlorine concentrations may be reduced using sulfur dioxide, sodium bisulfite, sodium sulfite, sodium thiosulfate, or ascorbic acid.
3. The discharge must be to a splash pad or paved area, and may not be located within 300 feet of the intake for a domestic drinking water supply or 500 feet of any public or private water well.
4. An effluent water sample must be taken during the first hour of discharge at a location immediately near the point of discharge, and collected prior to commingling with storm water, wastewater, or other flows.
5. For discharges that extend beyond an hour in duration, a second sample must be taken of the last 10 percent of the effluent.
6. Sampling protocol, sample containers, holding times, preservation methods, and analytical methods must follow the requirements set forth in the general permit.
7. The effluent grab sample(s) must be analyzed for total residual chlorine by an accredited and certified laboratory.
8. Any noncompliance that endangers human health or safety, or the environment must be reported to the TCEQ in accordance with the general permit.
9. Any effluent violation which deviates from the permitted effluent limitation by more than 40 percent must be reported to the TCEQ in accordance with the general permit.
10. Contractor must record all hydrostatic test water sample results on an approved Discharge Monitoring Report (EPA Form 3320-1). These monitoring records shall be retained for a period of 3 years from the date of the record and be readily available for review by the TCEQ upon request.

B. With the written permission of the Owner of the system, chlorinated water may be disposed of in a sanitary sewer system if one is available. In the case of larger pipelines and the larger volumes of water involved, the Contractor will not be permitted to use the sanitary sewer system for disposal even if one is available.

END OF SECTION

33 11 13.13 STEEL PIPE AND FITTINGS

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals necessary to install steel pipe, fittings, and specials as specified, including connections, and appurtenances, as required for the proper installation and function of the pipe as indicated herein.

B. The pipeline coating shall be in accordance with Section 09 97 16 “Pipeline Coatings and Linings.” The coating shall be polyurethane unless the use of mortar-coated or epoxy-coated steel pipe is indicated on the Drawings.

1.02 QUALITY ASSURANCE

A. Experience Requirements:

1. Pipe shall be the product of one manufacturer who has had not less than 5 years of successful experience manufacturing pipe of the type and size indicated. Pipe manufacturing operations (fabrication of pipe and fittings, lining, and coating) shall be performed at one location unless otherwise approved by the Engineer. The lining and coating for the pipe or the fitting shall be done at the same location as the manufacture of the pipe or fittings. The pipe and fittings may be manufactured at different locations. The Engineer will waive the requirement for 5 years of experience in manufacturing of the pipe when, at the sole discretion of the Engineer, the manufacturer’s experience and capabilities meet the intent of the experience requirement. All pipe shall be new and not supplied from inventory. All pipe and fittings shall be manufactured in the continental U.S.A., and shipping over salt waterways will not be allowed.

2. The lining for pipe diameters 108 inches and smaller shall be shop-applied, spun cement mortar lining per Section 09 97 16 “Pipeline Coatings and Linings.”

3. The manufacturer shall be certified under Steel Pipe Fabricators Association (STI/SPFA) or ISO 9001 quality certification program for steel pipe and accessory manufacturing.

4. Approved manufacturers are:

a. Thompson Pipe Group.

b. Northwest Pipe.

c. American Spiralweld.

d. Hallmark Industrial Supply.

e. Mid America Pipe Fabricating and Supply, LLC

f. Jifco, Inc.

B. Testing and Inspection:

1. Pipe may be subject to inspection by an independent testing laboratory selected and retained by the Owner. Representatives of the laboratory or the Engineer shall have access to the Work whenever it is in preparation or progress, and the pipe manufacturer shall provide proper facilities for access and for inspection. The pipe manufacturer shall

notify the Owner, in writing, a minimum of 2 weeks prior to the pipe fabrication so that the Owner may advise the manufacturer as to the Owner's decision regarding tests to be performed by an independent testing laboratory. Material, fabricated parts, and pipe which are discovered to be defective and/or do not meet the Specifications shall be subject to rejection at any time prior to Owner's final acceptance of the product. Pipe manufacturer shall be responsible for repairs to the polyurethane coating system that are required as a result of Owner testing at no additional cost to the Owner.

2. The inspection and testing by the independent testing laboratory anticipates that production of pipe shall be done over a normal period of time and without "slow-downs" or other abnormal delays. In the event that an abnormal production time is required, and the Owner is required to pay excessive costs for inspection, then the Installation Contractor shall reimburse the Owner for costs over and above those which would have been incurred under a normal schedule of production as determined by the Engineer.

C. Factory Testing: The manufacturer shall perform all tests as required by the applicable AWWA standards and as listed herein.

D. Cement Mortar Lining: Shop-applied cement mortar linings shall be as specified in Section 09 97 16 “Pipeline Coatings and Linings” and tested in accordance with AWWA C205.

E. Pipe Coatings: Pipe coatings shall be as specified in Section 09 97 16 “Pipeline Coatings and Linings.”

F. Hydrostatic Pressure Testing:

1. Each joint of pipe shall be hydrostatically tested prior to application of lining and coating. The internal test pressure shall be that which results in a fiber stress equal to 75 percent of the minimum yield strength of the steel used. Each joint of pipe tested shall be completely watertight under maximum test pressure. As a part of testing equipment, the pipe manufacturer shall maintain a recording pressure gauge and reference number of pipe tested, at a minimum. The pipe shall be numbered in order that the pressure gauge information can be recorded.

2. Fittings shall be fabricated from hydrostatically tested pipe. Fittings shall be tested by hydrostatic test, air test, ultrasonic, or magnetic particle test. Air test shall be made by applying air to the welds at 40 psi pressure and checking for leaks around and through welds with a soap solution. In addition, 10 percent of welds shall be checked with x-ray or ultrasonic testing by a third party Certified Welding Inspector paid for by the Owner.

G. Charpy V-Notch Test: Each heat of steel for plates or coil used for pipe barrels 1/4 inches and thicker shall be tested to verify minimum full-size impact values of 25 ft-lb at 30 F in accordance with ASTM A370. Minimum Charpy values for sub size samples shall be defined by ASTM A370.

H. Elongation: For the tensile test specified in ASTM A370, 2-inch test specimens shall show elongations not less than 22 percent for each heat of steel. When 8-inch test specimens are used in lieu of 2-inch test specimens, the specimens shall show elongations not less than 18 percent for each heat of steel.

I. Mill Certification: The Owner will require the manufacturer to furnish mill test certificates on reinforcing steel or wire, steel plate, steel coil, and cement. The manufacturer shall perform the tests described in AWWA C200 for all pipe, fittings, and specials.

J. Manufacturer's Technician for Pipe Installation:

1. During the construction period, the pipe manufacturer shall furnish the services of a factory trained, qualified, job-experienced technician to advise and instruct as necessary in pipe laying and pipe jointing. The technician shall assist and advise the Installation Contractor in his pipe laying operations and shall instruct construction personnel in proper joint assembly and joint inspection procedures. The technician is not required to be on-site full time; however, the technician shall be on-site during the first 2 weeks of pipe laying and thereafter as requested by the Engineer, Owner, or Installation Contractor.

2. The pipe manufacturer shall provide the services of a representative from both the polyurethane coating manufacturer and the heat-shrink sleeve manufacturer, for a period of not less than 1 week at the beginning of pipe laying operations. Representatives shall advise the Installation Contractor and Owner regarding installation, including but not limited to, handling and storage, cleaning and inspecting, coating repairs, field-applied coating, heat-shrink sleeve installation procedures, and general construction methods and how they may affect the pipe coating.

3. The manufacturer's representative shall be required to return if, in the opinion of the Engineer, the polyurethane coating or the Installation Contractor's construction methods do not comply with the Specifications. Cost for the respective manufacturer’s representative to return to the Site shall be at no additional cost to the Owner.

K. Welders and Welding Operations:

1. Shop Welders: Qualified by testing in accordance with ASME BPVC Section IX or AWS D1.1.

2. Field Welders: Qualified by testing in accordance with AWS D1.1.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Shop Drawings:

a. Prior to the fabrication of the pipe, submit fabrication and laying drawings to the Engineer which shall include:

1). Schematic location; including a profile and a tabulated layout schedule, both of which shall reference the stationing shown on the plan and profile sheets.

2). Any deviation from the Drawings necessary to avoid conflicts with existing utilities and structures. The specific number of each pipe and fitting, location of each pipe, and direction of each fitting in the pipeline shall be depicted.

3). Full details of reinforcement and dimensions for pipe and fittings.

4). Location of all outlets as required by the Installation Contractor to install welds.

5). Location and details for the fabrication of all fittings and specials. The line layout shall include the pipe station and invert elevation at all changes in grade or horizontal alignment.

6). Provisions for thrust restraint, external loading, bedding, and vacuum collapse.

7). Welding requirements, welding procedures, provisions for thermal stress control, and provisions for control of coating damage for locations where welded joints are required.

8). Provide details and design calculations for fittings, specials, closures, outlets, joints, and special requirements for pipe in tunnels.

9). Provide certification for gasket joints, indicating it is designed to meet AWWA Standards and these documents.

10). Design calculations shall show methods and processes used to satisfy the pipe and fittings design criteria specified in the Contract Documents. All calculations shall be prepared, signed, and sealed be a professional engineer licensed in the state the Project is located in.

11). Shop and Field Welding Data:

a). On a weld map, show the location, type, size, and extent of welds, with reference called out for Welding Procedure Specification (WPS) and non-destructive examination (NDE) numbers in tail of welding symbols, in accordance with AWS 2.4.

b). Submit welding terms and definitions in accordance with AWS 3.0.

c). Indicate by welding symbols or sketches, details of welded joints, and preparation of base metal.

d). Distinguish between shop and field welds.

e). Submit welding data together with Shop Drawings as a complete package.

12). Flanged Joints:

a). For each flanged connection, provide: reference standard; dimensional data; bolt hole number, pattern, and diameter; bolt diameter and length; and face condition.

b). Gaskets and Bolting: Technical data sheets itemizing chemical composition, and technical and performance information that indicates compliance with this Specification.

c). Installation: Provide installation instructions including recommended bolt tightening sequence, torque, lubricant, and gasket.

2. Certification of Compliance with Contract Documents: Prior to shipment of the pipe, submit an affidavit certifying that the pipe, fittings, specials, and other products and materials furnished, comply with the Specifications and Drawings, NSF 61 and the applicable requirements of the AWWA standards.

3. Certified Test Reports:
    a. Submit the following Certified Test Reports prior to shipment of the pipe:
        1). Results of factory hydrostatic tests and test of fittings.
        2). Mill certificates; including chemical and physical test results for each heat of steel, Charpy v-notch tests, and elongation tests.
        3). From the coating manufacturer, indicating that the coatings were applied in accordance with manufacturer's requirements and in accordance with the Specifications on all pipe, fittings, and joints made in the factory.
        4). Welder Qualifications Records (WQR) in accordance with AWWA C206, ASME BPVC Section IX, or AWS D1.1 as required for both factory and field welders.
        5). Cement mortar tests.
        6). Gasket certification, in accordance to AWWA C200, shall be provided where bell and spigot gasket joint pipe is specified.
        7). All manufacturer's factory quality control tests.
4. Record Data:
    a. Prior to fabrication, submit the following:
        1). Inspection procedures to be used by manufacturer for quality control and assurance for materials and welding.
        2). Standard repair procedures that describe in detail shop and field work to be performed.
        3). Certification showing calibration within the last twelve months for equipment such as scales, measuring devices, and calibration tools used in manufacture of pipe. Each device used in manufacture of pipe is required to have tag recording date of last calibration. Devices are subject to inspection by Owner.
    b. Prior to pipe delivery, submit "Release for Manufacture" layout sheets.
    c. Daily welding reports for field welding showing welder and joint welded shall be submitted monthly. Indicate welder's name, joint welded with identification number assigned to match lay drawings.
    d. After construction, the pipe manufacturer shall provide AutoCAD drawings of the pipe plan and profile layout sheets showing each joint of pipe and all appurtenances to the same coordinate system as used on the Drawings.
    e. After construction, the Installation Contractor shall provide ASCII electronic record data showing top-of-pipe survey every 50 feet along the pipeline and at horizontal and vertical deflections.

1.04 STANDARDS

A. Except as modified or supplemented herein, the steel pipe, coatings, fittings, and specials shall conform to the applicable requirements of the following standard specifications, latest edition:

1. American National Standards Institute (ANSI) / NSF International (NSF):

   a. ANSI/NSF 61 — Drinking Water System Components – Health Effects.

2. American Society of Civil Engineers (ASCE):

   a. MOP 79 — Manual of Practice: Steel Penstocks.

3. American Society of Mechanical Engineers (ASME):

   a. BPVC-IX — Boiler and Pressure Vessel Code: Section IX – Welding, Brazing, and Fusing Qualifications.

4. ASTM International ASTM:

ASTM International (ASTM)	
ASTM A193	Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A307	Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength
ASTM A370	Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM A563	Specification for Carbon and Alloy Steel Nuts
ASTM C33	Specification for Concrete Aggregates
ASTM C35	Specification for Inorganic Aggregates for Use in Gypsum Plaster
ASTM C150	Specification for Portland Cement
ASTM D16	Terminology for Paint, Related Coatings, Materials, and Applications
ASTM D522	Test Methods for Mandrel Bend Test of Attached Organic Coatings
ASTM D1000	Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
ASTM E165	Practice for Liquid Penetrant Examination for General Industry
ASTM E709	Guide for Magnetic Particle Testing
ASTM E1444	Practice for Magnetic Particle Testing
ASTM F436	Specification for Hardened Steel Washers

5. American Welding Society (AWS):

American Welding Society (AWS)	
AWS B2.1	Specification for Welding Procedure and Performance

American Welding Society (AWS)	
AWS D1.1	Structural Welding Code – Steel

6. American Water Works Association (AWWA):

American Water Works Association (AWWA)	
AWWA C200	Steel Water Pipe 6-Inch and Larger
AWWA C205	Cement-Mortar Protective Lining and Coating for Steel Water Pipe 4-Inch and Larger – Shop Applied
AWWA C206	Field Welding of Steel Water Pipe
AWWA C207	Steel Pipe Flanges for Waterworks Service – Sizes 4-Inch Through 144-Inch
AWWA C208	Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C210	Liquid-Epoxy Coating and Linings for Steel Water Pipe and Fittings
AWWA C216	Heat Shrinkable Cross-Linked Polyolefin Coatings for Steel Water Pipe and Fittings
AWWA C217	Petrolatum and Petroleum Wax Tape Coatings for the Exterior of Connections and Fittings for Steel Water Pipelines
AWWA C222	Polyurethane Coatings for the Interior and Exterior of Steel Water Pipe and Fittings
AWWA C602	Cement-Mortar Lining of Water Pipelines in Place – 4-Inch and Larger
AWWA C604	Installation of Buried Steel Water Pipe – 4-Inch and Larger
AWWA M11	Manual: Steel Pipe – A Guide for Design and Installation

7. Society for Protective Coatings (SSPC):

Society for Protective Coatings (SSPC)	
SSPC-SP1	Solvent Cleaning
SSPC-SP2	Hand Tool Cleaning
SSPC-SP3	Power Tool Cleaning
SSPC-SP10	Near-White Blast Cleaning
SSPC-PA2	Procedure for Determining Conformance to Dry Coating Thickness Requirements
SSPC-PA Guide 10	Guide to Safety and Health Requirements

1.05 DELIVERY AND STORAGE

A. Packing:

1. The pipe shall be prepared for shipment to afford maximum protection from normal hazard of transportation and allow pipe to reach the Site in an undamaged condition. Pipe segments damaged in shipment that require more than two repairs per segment will not be accepted at the Site. No more than 10 percent of all segments shall have damage repairs or all damaged pipe segments will be rejected. Normal factory repair of lining and coating for fabrication of fittings and specials is acceptable.

2. Pipe sections shall be handled in accordance with Paragraph **[3.01.C]**. In all instances deliver, handle, and store pipe in accordance with the manufacturer's recommendations to protect coating systems. Upon delivery of the pipe, notify the Engineer so that inspection can be made.

3. For mortar-lined pipe, after the completed pipe and fittings have been removed from the final cure at the manufacturing plant, the pipe lining shall be protected from drying by means of plastic end covers banded to the pipe ends. Covers shall be maintained over the pipe ends at all times until ready to be placed in the trench. Moisture shall be maintained inside the pipe by periodic addition of water as necessary.

4. Pipes shall be carefully supported during shipment and storage. Pipe, fittings, and specials shall be separated so that they do not bear against each other, and the whole load shall be securely fastened to prevent movement in transit. Ship pipe on padded bunks with tie-down straps approximately over stulling. Store pipe on padded skids, sand or dirt berms, tires, or other suitable means to protect the pipe from damage. Each end and middle of each length of pipe, fitting, or special shall be internally supported and braced with stulls to maintain a true circular shape. Stulling shall meet the following requirements:

    a. Install stulling in 36-inch and larger pipe, specials, and fittings in accordance with approved submittal and as soon as practical after pipe is fabricated or for shop-lined pipe after lining has been applied. Six-point stulls shall be equally spaced circumferentially (approximately 60-degree spacing) within the pipe. Additional stulls shall be included, as determined by the pipe manufacturer, to protect the pipe from damage. The pipe manufacturer's stulling shall meet or exceed the standards listed in ASCE MOP No. 79.

    b. Pipe shall be rotated so that one stull remains vertical during storage, shipment and installation.

    c. Stulls shall not be removed until pipe is laid, set to grade, and backfilled.

    d. Internal stulls shall consist of timber or steel, firmly wedged and secured so that stulls remain in place during storage, shipment, and installation. Timber stulls will be allowed in diameters above 84 inches, if it can be demonstrated that the timbers will stay in place until backfilling. All timber for stulls must be cured wood. Vertical stull shall be 4-inch by 6-inch timber (min.), Cross stulls shall be 4-inch by 4-inch timber (minimum). Connect stulls with bolts. Shim as needed to maintain tight fit and roundness of pipe.

    e. Install stulling in a manner that will not harm lining. Pipe and liner shall be protected from damage from stulls using wood pads, or similar devices, unless it can be demonstrated that the wood pads are not required to prevent damage to the pipe lining. Pad shall be shaped to conform to pipe diameter. Pad shall be 4-inch by 6-inch timber and a minimum of 18 inches in length.

    f. Stulls shall not be welded directly to the pipe, except at the end of the pipe where the mortar is held back.

B. Marking for Identification:

1. Each joint of pipe, fitting, and special shall have plainly marked on one end of the exterior: the class for which it is designed, the date of manufacturer, and the identification number as shown on the Shop Drawings. Beveled pipe shall be marked with the amount of bevel. The top centerlines shall be marked on all fittings and specials.

2. Each joint of pipe, fitting, and special shall also be marked at each end on the interior lining, near but not inside the bell or spigot, with the section designation and pipe identification number as shown on the approved Shop Drawings. Markings should be visible from inside the pipe after installation, during and after field welding, joint grouting, and inspection. Markings should be applied a minimum of 3 inches in height with a waterproof paint or dye resistant to fading due to UV exposure.

C. Point of Delivery: Whenever possible, pipe shall be hauled directly from the manufacturing plant to the Site and strung along pipeline route, avoiding re-handling and the possibility of damage to the pipe. Where a fully loaded truck and trailer cannot operate along the pipeline route, pipe may be unloaded at access points along the route and brought to the trench side by approved methods; however, the Installation Contractor shall be responsible for pipe being undamaged at the time of installation.

2.00 PRODUCTS

2.01 MATERIALS

A. Flanges, Nuts, Bolts, and Gaskets: Furnish and install all bolts, nuts, flange gaskets, and insulation kits.

1. Flanges shall conform to the AWWA C207 class equal to or greater than the pipe class, unless otherwise specified, and shall match the class of valves or appurtenances which are attached.

2. All nuts, bolts, and washers exposed inside buildings or vaults shall be steel and coated in accordance with the specifications for adjacent pipe. All bolts shall be long enough that a minimum of three threads are exposed beyond the nut. Use an anti-seize compound during installation. Bolts shall conform to ASTM A193, Grade B7. Nuts shall conform to ASTM A194, Grade 2H heavy hex nuts. Washers shall conform to ASTM F436.

3. All buried nuts, bolts, and washers shall be Type 316 stainless steel of suitable strength to meet the service requirements. Bolts shall conform to ASTM A193, Grade B8M. Nuts shall conform to ASTM A194, Grade 8M. Washers shall conform to ASTM A193. All bolts shall be long enough that a minimum of three threads are exposed beyond the nut. Use an anti-seize compound during installation.

4. Non-Insulated Flange Gaskets:

a. For working pressures up to 175 psi, gaskets shall be rubber.

b. For working pressures above 175 psi, gaskets shall be non-asbestos compressed fiber.

c. Gasket configuration shall be in accordance with AWWA C207. Gasket shall be NSF 61 certified. Acceptable manufacturers are Gasket Resources, Garlock, or approved equal.

5. Flange Insulating Kits:

a. Flange insulating kits shall be installed within 6 months of the date of manufacture of all components.

b. Do not store insulating flange gaskets, sleeves, or washers under direct sunlight or at temperatures exceeding 110 F.

c. Insulating gaskets shall be full-face, Type E with an EPDM O-ring seal. Minimum total gasket thickness shall not be less than 1/8 inch. The gasket shall have the same outside diameter as the pipe flange. For steel pipe the gasket's inside diameter shall be equal to the inside diameter of the pipe's steel cylinder. The complete assembly shall have a pressure rating equal to or higher than that of the joint and pipeline. The gasket material shall be resistant to intended chemical exposure, operating temperatures, and pressures in the pipeline. Insulating sleeves shall be one-piece, full-length, Mylar or NEMA G10 fiberglass reinforced epoxy with a minimum thickness of 1/8 inch.

d. Insulating washers shall be NEMA G10 fiberglass reinforced epoxy.

e. Gasket configuration shall be in accordance with AWWA C207. Gasket shall be NSF 61 certified. Acceptable manufactures are GPT, Houston, TX; or Georg Fischer Central Plastics LLC, Shawnee, OK.

f. Flange bolt holes shall be oversized for bolt insulating sleeves.

B. Steel: Steel shall meet the requirements of AWWA C200 and shall be of continuous casting. Steel shall be homogeneous and shall be suitable for field welding, fully killed, and of a fine austenitic grain size. Steel shall have a minimum yield strength of 42,000 psi.

C. Bend Fittings: All bend fittings shall have a minimum radius of 2.5 times the pipe diameter to permit easy passage of pipeline pigs unless otherwise shown on the Drawings.

D. Threaded Outlets: No threaded outlets will be allowed.

E. Outlets for Weld Leads: Installation Contractor may use factory manufactured outlets for access for weld leads. Outlets shall be welded after use. Outlet configuration shall be shown in the Shop Drawings. Spacing of outlets shall be no closer than 500 feet. Outlets for appurtenances shall be used in the calculation of outlet spacing. Outlet configuration shall be approved by the Engineer.

F. Joint Bonds for Steel Pipe with Rubber Gasket Joints: Bond shall be a solid copper strap, 1-1/4-inch wide by 1/16-inch thick (equivalent to 1/0 AWG wire). Strap bonds shall be manufactured by ERICO Products, Continental Industries, or approved equal. Connection of joint bond to pipe shall be with the thermite weld method using the cartridge and recommended by the bond manufacturer. Additional requirements based on the joint type include:

1. For Coated Steel Pipe: Provide two punched holes for thermite welding to the pipe. Strap bond shall be 12 inches long, maximum. Provide three joint bonds per pipe joint.

2. For Flexible Coupling, Flanged Coupling Adapter, and Other Non-Standard Joints: Provide five punched holes for thermite welding to the coupling and pipe. Strap bond shall be fabricated for the length of the coupling with sufficient additional length for 1 inch of joint movement. Provide two bonds per joints for pipe less than 60 inches in diameter and three bonds per joint for pipe 60 inches or greater in diameter.

3. For Insulated Flexible Coupling Joints: Provide four punched holes for thermite welding to the coupling and pipe. Strap bond shall be fabricated for the length of the coupling with sufficient additional length for one-inch of joint movement.

G. Cement Mortar Linings: Cement mortar linings shall be shop-applied (plant-spun) for pipe sizes 108 inches and smaller. Shop-applied cement mortar linings shall be provided in accordance with Section 09 97 16 “Pipeline Coatings and Linings.”

H. Epoxy Lining: Where indicated on the Drawings, at all insulating joints, and at all above grade piping provide epoxy lining in accordance with Section 09 97 16 “Pipeline Coatings and Linings.”

I. Epoxy Coating: Where indicated on the Drawings, and for exposed piping, pipe shall have an epoxy coating per Section 09 96 00.01 “High Performance Coatings” and Section 09 97 16 “Pipeline Coatings and Linings.”

J. Polyurethane Coating: Where indicated on the Drawings, and for buried piping, pipe shall have a polyurethane coating in accordance with Section 09 97 16 “Pipeline Coatings and Linings.”

K. Test Bulkheads: Furnish test bulkheads in accordance with the Drawings. Additional test bulkheads not shown in the Contract Drawings but requested by the Installation Contractor shall be paid for by the Installation Contractor.

1. Each test plug or bulkhead shall be designed to withstand the test pressure on either side with only atmospheric pressure on the opposite side. The manufacturer may use either one or two plugs to allow testing on each side.

2. Each test plug or bulkhead specified shall have a 30-inch flanged outlet on each side of the plug. The 30-inch outlets shall be supplied with a 30-inch by 16-inch reducing flange with a 16-inch blind flange. If pipeline diameter is less than 30 inches, the flanged outlet shall match the pipe diameter.

L. Special Coatings in Tunnels and Casings: Pipe to be laid in casing or tunnel shall have a full, continuous mortar coating over the polyurethane coating. The coating shall have at least two mortar bands at a minimum of 2 inches thick, or thick enough to be a larger outside diameter than the bell, including heat shrink sleeve. The mortar coating is to allow the pipe to be installed by skidding on pipe rings. The manufacturer shall design the mortar bands and reinforcement sufficiently to prevent damage to the coating from the installation process.

2.02 MIXES

A. Mortar for Interior and Exterior Joints: Mortar shall be one-part cement to two-parts sand. Cement shall be ASTM C150, Type II. Sand shall be of sharp silica base and shall not leach in water. Sand shall be washed plaster sand meeting ASTM C33. Exterior joint mortar shall be mixed to the consistency of thick cream. Interior joint mortar shall be mixed with as little

water as possible so that the mortar is very stiff, but workable. Water for cement mortar shall be treated and suitable for drinking water.

B. Mortar for Pipe Patching for Shop-Applied Cement Mortar Lining: Mortar for patching shall be as per interior joints.

C. Bonding Agent: Bonding agent for cement mortar lining patching shall be a non-shrink cement mortar with a 3:1 sand to cement ratio per AWWA C205.

2.03 MANUFACTURED PRODUCTS

A. Pipe:

1. Pipe Design Criteria:

a. Steel pipe shall be designed, manufactured, and tested in conformance with AWWA C200, AWWA M11, and with the criteria specified herein. Sizes and pressure classes (working pressure) shall be as shown on the Drawings. For pipe design, the transient pressure plus working pressure shall be 1.5 times the working pressure class specified. Fittings, specials, and connections shall be designed for the same pressures as the adjacent pipe. Pipe design shall be based on trench conditions and the design pressure in accordance with AWWA M11 using the following parameters:

Pipe Design Criteria	
Unit Weight of Fill (w)	130 pcf
Live Load	AASHTO HS 20 (at all locations except railroads)
	Coopers E 80 at railroad
Trench Depth	As indicated on the Drawings
Deflection Lag Factor (D_l)	1.1
Coefficient (K)	0.10
Maximum Calculated Deflection ($D_y = D_x$)	2% (polyurethane coated steel pipe) 1% (mortar coated or concrete coated steel pipe)
Soil Reaction Modulus (E')	1500 psi (typical gravel embedment trench section) 3000 psi (where encased in flowable fill or concrete)

b. The fittings and specials shall be designed in accordance with AWWA C208 and AWWA M11, except that crotch plates shall be used for outlet reinforcement for all pressure diameter values (PDVs) greater than 6000. Where indicated on the Drawings, collars or wrappers shall be used in lieu of crotch plates to allow for working space and supports.

c. Where the pipe requires additional external support to meet the specified maximum deflection, the Installation Contractor and the Supplier will be required to furnish alternate methods for pipe embedment. No additional compensation will be made to the Installation Contractor by the Owner where this method is required.

d. Trench depths indicated shall be verified after existing utilities are located. Vertical alignment changes required because of existing utility or other conflicts shall be

accommodated by an appropriate change in pipe and embedment design depth. In no case shall pipe be installed deeper than its design allows.

e. Pipe shall be designed for full vacuum conditions without buckling or damage to lining, coating, or pipe joints.

f. The pipe shall be designed for a maximum calculated deflection limit of 3 percent for polyurethane coated steel pipe and 2 percent for mortar/concrete coated steel pipe for any of the following future loadings:

1). Additional fill of 8 feet above the finished grade over the pipeline.

2). A fully loaded Link Belt Hylab 5 crane (150 ton capacity) or equivalent model. The crane will be parked over the pipeline for 2 days, maximum, during repair operations. The design shall assume the worst case scenario for the track orientation. For the purposes of design, the construction load will be considered a live load. This design vehicle translates to a design load in the following table:

Live Loads at the Top of Steel Pipe (lb/lf)									
Nominal Pipe Diameter	Transient Load on Steel Pipe (plf) at Various Covers (ft)								
	4	5	6	8	10	12	14	16	18
36	2900	2500	2200	1700	1500	1300	1100	1000	900
42	3400	2900	2600	2000	1700	1500	1300	1100	1000
48	3900	3400	2900	2400	2000	1700	1500	1300	1200
54	4400	3800	3300	2700	2200	1900	1700	1500	1300
60	5000	4300	3700	3000	2500	2100	1900	1700	1500
66	5500	4700	4100	3300	2800	2400	2100	1900	1700
72	6000	5200	4600	3700	3000	2600	2300	2000	1800
78	6600	5700	5000	4000	3300	2900	2500	2200	2000
84	7200	6200	5400	4300	3600	3100	2700	2400	2200
90	7800	6700	5900	4700	3900	3400	3000	2600	2400
96	8400	7200	6300	5100	4200	3600	3200	2800	2500
102	9000	7800	6800	5500	4600	3900	3400	3000	2700
108	9700	8300	7300	5800	4900	4200	3700	3300	2900

2. Provisions for Thrust:

a. Thrust at valves, bends, tees, or other fittings shall be resisted by restrained joints. Thrust at bends adjacent to casing shall be restrained by welding joints through the casing and a sufficient distance each side of the casing. No thrust restraint contribution shall be allowed for pipe in casing unless the annular space in the casing is filled with grout.

b. Restrained joints shall be used a sufficient distance from each side of the valve, bend, tee, plug, or other fitting to resist thrust which develops at the design

pressure of the pipe. For the purposes of thrust restraint, design pressure shall be 1.5 times the working pressure class. Restrained joints shall consist of welded joints unless other joint types are specifically shown on the Drawings.

c. Thrust restraint design shall be the complete responsibility of the pipe manufacturer. The length of pipe with restrained joints to resist thrust forces shall be determined by the pipe manufacturer in accordance with AWWA M11 and the following:

1). The Weight of Earth shall be calculated as the weight of the projected soil prism above the pipe. Assume the water table matches the ground elevation.

2). Soil Density = 60 pcf buoyant weight.

3). Coefficient of Friction = 0.15 (maximum value to be used for polyurethane coated steel pipe).

4). Coefficient of Friction = 0.25 (maximum value to be used for mortar/concrete coated steel pipe)

5). For horizontal and vertical bends, the length of pipe to be restrained shall be calculated in accordance with AWWA M11.

3. Inside Diameter: The inside diameter, including the cement mortar lining, shall be a minimum of the nominal diameter of the pipe specified, unless otherwise indicated on the Drawings.

4. Wall Thickness:

a. The minimum pipe wall steel thickness shall be 0.183 inches or Pipe I.D./230, whichever is greater for pipe and fittings. All pipe, fittings, and specials shall have a maximum minus tolerance of 0.005 inches. Where indicated on the Drawings, pipe and fittings shall have thicker steel pipe wall. The minimum steel wall thickness shall also be such that the fiber stress shall not exceed 50 percent of the specified yield strength of the steel, nor the following, at the specified working pressure:

Pipe Type	Maximum Stress at Working Pressure
Polyurethane Coated Steel	23,000 psi
Mortar/Concrete Coated Steel Pipe	18,000 psi

b. Pipe which is placed in casing or tunnel shall have a minimum pipe steel wall thickness of 0.25 inches or Pipe I.D./144, whichever is greater.

c. Fittings and pipe that are above grade or exposed (not in a trench, casing, or tunnel) shall have a minimum thickness of 0.25 inches or Pipe I.D./144, whichever is greater.

d. Pipe, fittings, and specials shall be designed such that the maximum stresses in the pipe due to thrust loading will not exceed 21,000 psi nor 50 percent of the steel yield strength at the thrust design pressure (1.5 times working pressure). Fittings shall meet the requirements of AWWA C208 and AWWA M11.

5. Seams: Except for mill-type pipe, the piping shall be made from steel plates rolled into cylinders or sections, with the longitudinal and girth seams butt-welded; or shall be spirally formed and butt-welded. There shall be not more than two longitudinal seams.

Girth seams shall be butt welded and shall not be spaced closer than 6 feet, except in specials and fittings.

6. Joint Length: Maximum joint length shall not exceed 50 feet. Maximum joint length of steel pipe installed in casing shall not exceed 25 feet.

B. Pipe Ends: Pipe ends shall be rubber gasket joint, lap-welded slip joint, butt-strap joint, flanged joint, or flexible-coupled joint.

1. Rubber Gasket Joints: Rubber gasket joints shall be a rolled spigot joint with rubber gasket for diameters 48-inch and smaller with pressure classes up to 250 psi. Joints shall conform to AWWA C200. The joint shall consist of a flared, bell end formed and sized by forcing the pipe over a plug die or by expanding on segmental dies. The spigot end shall be an integral rolled groove, steel joint ring in accordance with AWWA C200 and as shown in AWWA Manual M11. The difference in diameter between the I.D. of bell and the O.D. of spigot shoulder, at the point of full engagement and with an allowable deflection, shall be no more than 0.00 to 0.04 inches as measured on the circumference with a diameter tape. The gasket shall have sufficient volume to approximately fill the area of the groove and shall conform to AWWA C200. The joint shall be suitable for 400 psi pressure and a maximum deflected joint pull. Joints shall be of clearances such that water tightness shall be provided under all operating and test conditions with a pipe diameter deflection of 3 percent. At the pipe manufacturer's option, all steel pipe joints may be lap-welded slip joints in lieu of rubber gasket joints.

2. Lap-Welded Slip Joint:

a. Lap-welded slip joint shall be provided in all locations for pipe larger than 48 inches, for pressure class greater than 250 psi, and where joints are welded for thrust restraint. Ends of pipe, fittings, and specials for field-welded joints shall be prepared with one end expanded in order to receive a plain end, making a bell and plain end type of joint. Bells formed by rolling will not be allowed unless approved by the Engineer. Dimensional tolerance of bell and spigots shall be consistent, so that match marking of pipe ends will not be required, and joints are interchangeable in the field. Clearance between the surfaces of lap joints shall not exceed the requirements of AWWA C206.

b. The depth of bell shall be such as to provide for a minimum clear distance of 2 inches between the weld and the nearest tangent of the bell radius when welds are to be located on the inside of the pipe.

c. The depth of bell shall be such as to provide for a minimum lap of 2 inches or three times the thickness of the belled pipe, whichever is greater. Provide a deeper bell every 400 feet to accommodate thermal movement for which the minimum lap shall be 4 inches.

d. Lap-welded slip joints may be welded from the inside or outside for pipe diameters 42 inches and larger. All other sizes shall be welded from the outside.

e. Double welded lap joints and butt strap joints shall be tapped and drilled for testing from the outside in accordance with AWWA C206 and the Drawings.

f. For pipe 30-inches in diameter and larger, precisely paint a circumferential 3/4-inch insertion band (leading edge of band indicating minimum insertion; trailing edge of

band indicting maximum insertion; pulled joints to occur within the band around entire circumference). Band shall be around the outside of spigot end to indicate location at which spigot end has reached required penetration into bell.

3. For Fittings with Flanges: Flanged joints shall be provided at connections to valves and where indicated. Ends to be fitted with slip-on flanges shall have the longitudinal or spiral welds ground flush to accommodate the type of flanges provided. Pipe flanges and welding of flanges to steel pipe shall conform to the requirements of AWWA C207 and AWWA C206. Pipe flanges shall be of rated pressure equal to or greater than the adjacent pipe class. Flanges shall match the fittings or appurtenances which are to be attached. Flanges shall be spot-faced or back-faced parallel to the front face.

4. Flexible Couplings: Flexible couplings shall be provided where shown on the Drawings. Ends to be joined by flexible couplings shall be of the plain-end type, prepared as stipulated in AWWA C200. Pipe ends shall be truly circular to within 1/4 inches or the coupling manufacturer's tolerance, whichever is smaller. In addition, the welds on the pipe ends that are to be joined by couplings shall be ground flush, to permit sliding the coupling in at least one direction to clear the pipe joint. Harness bolts and lugs shall comply with the Drawings.

5. Butt-strap Closure Joints: Where necessary to make closure to pipe previously installed, closure joints shall be installed using butt-strap joints in accordance with AWWA C206 and applicable provisions of this Section. Where butt-strap closure joints cannot be hydrostatically tested in the field with the main pipeline, the butt strap shall have an inside and outside weld and shall be air tested. Air test shall be operated at 5 psi for a minimum of 5 minutes, from a threaded fitting between the welds.

3.00 EXECUTION

3.01 INSTALLATION

A. General:

1. Install steel pipe, fittings, specials, and appurtenances as required for the proper functioning of the completed pipeline. Install pipe, fittings, and specials in accordance with the manufacturer's recommendations, AWWA M11, and AWWA C604. Pipe shall be laid to the lines and grade indicated. Immediately before each joint of polyurethane-coated steel pipe is lowered into the trench, it is to be inspected and tested for holidays. All damaged areas and holidays are to be repaired before the pipe is lowered into the trench.

2. The requirements of Section 31 23 33.16 "Trenching and Backfill" govern for the excavation and backfilling of trenches for laying steel pipe, fittings, and specials. Conformance with pipe deflection requirements shall be as follows:

   a. Average allowable pipe deflection is limited to 2 percent for polyurethane-coated steel pipe and 1 percent for mortar and shotcrete-coated steel pipe. In no case shall a single measurement in any direction exceed 1.5 times the average allowable

deflection. These measurements include the allowable tolerance for lining thickness. Percent deflection shall be calculated as:

$$Percent\ Deflection = \frac{actual\ (plan)\ ID - installed\ (measured)\ ID}{actual\ (plan)\ ID} \times 100$$

b. Deflection measurements shall be made by the Installation Contractor in the presence of the Owner. Method for taking measurements shall be agreed to by the Owner and Engineer, in writing, prior to installing the first joint of pipe.

c. The Installation Contractor shall measure deflection approximately 30 days after backfill to final grade. At the beginning of the Project, the first mile of pipe shall be checked 7 days after backfill and again 30 days after backfill. Payment for pipe installation will not be made until pipe deflection is measured, unless otherwise approved by the Owner. No pipe may be measured for compliance prior to fifteen days.

d. The Owner may, at his discretion, perform additional verification measurements on any area prior to Substantial Completion.

e. Average deflection shall be determined by averaging the pipe's measured horizontal and vertical deflection as indicated below. Locations where measurements are taken shall be clearly marked on the interior of the pipe.

f. For pipe joints 36 feet in length or less, measurements shall be taken at two locations, one-quarter distance from each pipe end. Approximately 10 feet from each end.

g. For pipe joints longer than 36 feet, measurements shall be taken at three locations, including one-quarter distance from each pipe end and at the pipe midpoint.

h. If the average calculated deflections for any segment of pipe or any single measurement fails to meet specifications, the entire segment of pipe shall be reworked in accordance with the manufacturer's recommendations and as directed by the Engineer, at no additional cost to the Owner. This may include uncovering the pipe and re-compaction of the pipe embedment, and repair of the coating. It is the Installation Contractor's responsibility to continuously measure and calculate pipe deflection to verify it meets specification. A pipe segment shall be defined as a length of manufactured pipe between manufactured or field-constructed joints.

i. Installed pipe joints will also be examined for flat spots and internal lining stress cracks by the Owner. Lining damage shall be repaired in accordance with the manufacturer's recommendations and as directed by the Engineer, at no additional cost to the Owner. Repair of flat spots may include uncovering the pipe and re-compaction of the pipe embedment, and repair of the coating.

j. Where pipe has been reworked to comply with the deflection requirements, Installation Contractor shall re-measure for deflection no earlier than 7 days after the repaired pipe is backfilled. Owner will re-inspect for flat spots at this time.

k. No pipe installation shall be accepted until the entire installation complies with the above deflection requirements.

3. All costs associated with measuring for pipe deflection and any repairs or rework associated with meeting these requirements shall be borne by the Installation Contractor.
4. Keep the pipe clean during the laying operation and free of sticks, dirt, animals, and trash. At the close of each operating day, effectively seal the open end of the pipe against the entrance of water using a gasketed night cap. Do not lay pipe in water. The Installation Contractor may install a vent at the top of the night cap to prevent flotation of the pipe in the event of heavy rain during the night.
5. Install bonds at all pipe joints, other than welded joints or insulated joints.
6. Pipe Deflection Reports:
    a. A monthly report shall be submitted as Record Data showing the following for each joint of pipe:
        1). Allowable deflection and 1.5 times allowable deflection for each pipe diameter installed.
        2). Deflection measurements and calculated deflection for each location measured per joint.
        3). It is the responsibility of the Installation Contractor to verify that the nominal pipe diameter meets specifications at all measured locations. Installation Contractor shall coordinate pipe replacement with the pipe manufacturer for any pipe not meeting the specified internal diameter.

B. Line, Grade and Cover Over Top of Pipe:
1. It is intended that the pipe be laid to the depth specified or shown on Drawings. Cover shall be defined as the distance from the top of the pipe barrel to the natural ground surface. The Installation Contractor shall be required to lay the pipe to conform to the profiles shown on the approved Shop Drawings within 6 inches vertically and 1 foot horizontally.
2. The grades shall be constructed to provide a uniform grade between low points and high points, and intermediate high and low points shall be eliminated. No additional compensation shall be made for extra trench depth required to meet these conditions.
3. Use survey equipment to indicate alignment and grade. Take at least one elevation reading every 50-feet along the pipeline and at horizontal and vertical deflections. Make periodic elevation measurements with surveying instruments to verify accuracy of grades.

C. Pipe Handling: Pipe shall be handled at all times with a minimum of two non-abrasive slings, belts, or other equipment designed to prevent damage to the coating or lining. The equipment shall be kept in such repair that its continued use is not injurious to the coating. The spacing of pipe supports required to handle the pipe shall be adequate to prevent cracking or damage to the lining or coating.

D. Line Up and Bends:
1. Line up pipe for joining so as to prevent damage thereto. Thoroughly clean the bell and spigot ends of each joint of pipe of foreign matter, rust, and scale before placing spigot

into bell. Welded joints shall have an overlap of 2 inches minimum to 4 inches maximum.

2. All under-stabbed joints shall be butt-strapped or outside welded. Over-stabbed joints shall not be acceptable. A joint shall be considered over-stabbed if the stabbed section is within 2 inches of the tangential bend on the bell, or the inside mortar gap is less than 1/4 inch. All over-stabbed joints shall be either butt-strapped and welded or outside welded only.
3. Where abrupt changes in grade and direction occur, the Installation Contractor shall employ special shop-fabricated fittings for the purpose. Field cutting the ends of the steel pipe to accomplish angular changes in grade or direction of the line shall not be permitted.
4. Where pipe horizontal alignment is on a curve, Installation Contractor may pull joints to make a curved alignment. Pulled joints that are welded shall meet the overlap requirements mentioned above. Pulled rubber gasket joint deflection shall not exceed 75 percent of the manufacturers' recommended allowable deflection.
5. After joining rubber gasket joints, check the position of the gasket with a feeler gauge. If the gasket is out of position, disassemble the joint and repeat the joint laying operation. Upon completion of pipe jointing, the interior of the pipeline shall be left broom clean.

E. Pipe Laying - Rubber Gasket Joints: Join rubber gasket joints in accordance with the manufacturer's recommendations. Clean bell and spigot of foreign material. Lubricate gaskets and bell and relieve gasket tension around the perimeter of the pipe. Engage spigot as far as possible in bell, allowing for a minimum gap of 0.5 inch for inside joint grouting after any joint deflection. Joint deflection or pull shall not exceed 75 percent of the manufacturer's recommended maximum pull. Check gasket with feeler gauge all around the pipe.

F. Pipe Laying – Welded Joints:

1. Weld joints in accordance with the AWWA C206 and AWS D1.1. Installation Contractor shall provide adequate ventilation for welders and for Owner's representative to observe welds. Unless otherwise specified, welds shall be full circle fillet welds. Welding may be completed before application of field-applied joint coating. At his option, the Installation Contractor may weld pipe joints after the exterior joint coating and backfilling is complete. Installation Contractor shall demonstrate that this procedure will not damage the exterior joint coating.
2. Contractor shall submit a welding procedure for approval according to Paragraph **[1.03]**. The welding procedure shall be approved by the Engineer before welding of joints begins. The procedure shall be in accordance with AWWA C206 and AWS D1.1. Contractor must follow approved welding procedure only.
3. Provide a deeper bell every 400 feet to accommodate thermal movement.
4. Adequate provisions for reducing temperature stresses shall be the responsibility of the Installation Contractor.
5. After the pipe has been joined and properly aligned and prior to the start of the welding procedure, the spigot and bell shall be made essentially concentric by shimming or

tacking to be within the maximum clearance tolerance around the periphery of the joint per AWWA C206. Tighter tolerance may be required to prevent damage to heat shrink sleeves for weld-after-backfill. In no case shall the clearance tolerance be permitted to accumulate.

6. Before welding, thoroughly clean pipe ends to bare metal. Joint shall be dry before welding. All welding shall be hand welded to minimize damage to heat shrink sleeves, unless it can be demonstrated that wire fed welding will not cause unacceptable damage to the heat shrink sleeve. Welding shall be performed so as not to damage lining or coating. Cover the polyurethane coating as necessary to protect from welding.
7. Furnish labor, equipment, tools, and supplies, including shielded-type welding rod, to construct the Work as required in the Contract Documents. Protect welding rod from any deterioration prior to its use. If any portion of a box or carton is damaged, reject the entire box or carton. Contractor will provide and maintain a jacking or fitting tool to minimize the joint gap tolerance of each joint from the pipe interior. This tool shall be adequate to force the bell and spigot joint gap tolerance to 1/8 inch or less. The tool shall remain with each welding operation to ensure the equipment is readily accessible to the welders and is not overlooked when fitting is required.
8. All welding shall be completed with a minimum of two weld passes. Three passes or more will be required for steel thickness greater than 0.375 inches, and as required to meet the specified welding procedures. These requirements are in addition to the maximum coating temperature limitations.
9. In all welding, the metal shall be deposited in successive passes. Not more than 1/8 inch of metal shall be deposited in each pass. Each pass except the final one, whether in butt or fillet welds, shall be thoroughly bobbed or peened to relieve shrinkage stresses and to remove dirt, slag, or flux before the succeeding bead is applied. Each pass shall be thoroughly fused into the plates at each side of the welding groove or fillet and shall not be permitted to pile up in the center of the weld. Undercutting along the side shall not be permitted.
10. Welds shall be free from pin holes, non-metallic inclusions, air pockets, undercutting and/or any other defects.
11. If the ends of the pipe are laminated, split or damaged to the extent that satisfactory welding contact cannot be obtained, the pipe will be replaced at no additional cost to the Owner and the defective joint removed from the Site.
12. Furnish each welder employed with a steel stencil for marking the welds, so that the work of each welder may be identified. Have each welder stencil the pipe adjacent to the weld with the stencil assigned to him. In the event any welder leaves the job, his stencil shall be voided and not duplicated if another welder is employed.
13. Keep daily welding reports which identify the welder's name and the joint welded. Joints must be shown on the daily welding reports with the identification number assigned in the lay drawings (ex. ID#1 – ID#2). Provide three copies of all daily welding reports to Owner's representative each month.
14. Use only competent, skilled, and qualified workmen. Each welder employed by the Installation Contractor shall be AWWA C206 and AWS D1.1 certified according to the Welding Procedure Qualification approved for the Project. All welders shall have been

certified within the last 6 months or shall provide a welding continuity log to be allowed to weld on the line. Field welding shall be provided by one of the following firms:

a. Thompson Pipe Group, (972) 262-3600.

b. Fuller's Service Company, Barry Fuller, (817) 477-3841.

c. Scott's Welding, Scott Fowler, (972) 978-7865.

d. Eddie's Welding Service, Eddie Pierce, (817) 909-6089.

e. National Welding Corporation, Nash Williams, (801) 255-5959.

f. Rangeline Pipeline Services, LLC, (888) 722-7457.

g. Others may be accepted pending approval by Owner or Engineer.

15. After each welder has qualified in the preliminary tests referred to above, inspections shall be made of joints in the line. Any welder making defective welds shall not be allowed to continue to weld.

16. Visual tests and magnetic particle tests in accordance with AWWA C206, ASTM E709, and E1444 shall be performed by the Installation Contractor's independent testing laboratory on all welded joints. Welds that prove to be defective will be replaced or repaired, whichever is deemed necessary by the Engineer, at Installation Contractor's expense. The Installation Contractor shall provide adequate ventilation and a safe environment for welding inspector. Inspections will be made on a weekly or bi-weekly basis as determined by the Owner. The Installation Contractor shall cooperate with the welding inspector to allow efficient inspections.

17. If the Installation Contractor disagrees with the Engineer's interpretation of welding tests, test sections may be cut from the joint for physical testing. The Installation Contractor shall bear the expense of repairing the joint, regardless of the results of physical testing. The procedure for repairing the joint shall be approved by the Engineer before proceeding.

G. Inside Joint Grouting for Pipe with Shop-Applied Mortar Lining: Upon completion of backfilling of the pipe trench and inspection of interior welds, fill the inside joint recess with a stiff cement mortar. Prior to placing of mortar, clean out dirt or trash which has collected in the joint, and moisten the concrete surfaces of the joint space by spraying or brushing with a wet brush. Where the mortar joint opening is 2 inches or wider, apply a bonding agent to mortar and steel surface prior to placing joint mortar. Ram or pack the stiff mortar into the joint space and take extreme care to ensure that no voids remain in the joint space. After the joint has been filled, level the surfaces of the joint mortar with the interior surfaces of the pipe with a steel trowel so that the surface is smooth.

H. Flanged Joints: Flange bolt torque and sequence shall be determined by the pipe manufacturer in accordance with AWWA C604 and AWWA M11. Use lubricant for threads and washers. Before the joint is assembled, thoroughly clean the flange faces of foreign material. Center the gasket in the connecting flanges and draw-up watertight, without unnecessarily stressing the flanges. Tighten bolts in a progressive diametrically opposite sequence and torqued with a suitable, approved, and calibrated torque wrench. Torque values shall be as recommended by the pipe manufacturer. Apply clamping torque to the nuts only.

I. Special Requirements for Weld-After-Backfill:

1. Quality Control:

a. If Installation Contractor elects to weld-after-backfill any joints, special techniques shall be used to limit damage to the exterior heat shrink sleeves. Weld procedures for weld-after-backfill shall meet the heat limitations of the proposed coating system.

b. Each welder shall be required to demonstrate that no unacceptable damage will occur to the heat shrink sleeve. Each welder shall demonstrate their ability to perform welding of the joints in compliance with the welding requirements, including weld profile, penetration depth, travel speed control, and temperature control. The following information shall be recorded for each joint tested:

1). Welder's name.

2). Weld procedure to be used.

3). Voltage setting of the welder.

4). Amperage setting of the welder.

5). Average electrode speed (inches per minute).

6). Calculation of the heat input to the weld, in Joules. Use the following equation:

$$Amperage\ (I) \times Voltage\ (E) \times 60 = Heat\ Input\ Travel\ Speed\ (V)$$

7). Record steel pipe temperature measurements in 11.5-degree increments around the circumference of the joint. Read the temperature using heat stick methods or with a digital infrared thermometer. Record the temperature at the weld immediately following the completion of the weld. Record the temperature at locations 1 inch, 2 inches, and 3 inches from the weld, on either side of the weld, during the welding process.

8). Measure and record the highest interior weld temperature produced during successful weld-after-backfill testing. Measure the temperature at approximately 3 inches below the welding arc concurrent to the welding. Welders shall not exceed this temperature while using this welding procedure.

c. The test joint shall be backfilled and each welder proposed for the Project shall be tested. Tests shall be conducted on prototype test joint with the minimum wall thickness for each type of sleeve used on the Project.

d. Each welder shall provide a complete weld for a minimum of 2 feet of weld overhead and below head.

e. The test joint will be excavated after welding and destructively tested.

1). After welding, a visual inspection of the sleeve will be made to verify there is no unacceptable damage to the exterior heat shrink sleeve and coating protection. Sleeves shall have no visible burns, excessive wrinkles, or holidays. Sleeves shall not have areas of dis-bonded coating or dis-bonding of the heat-shrink sleeve, except for limited carbonization zone.

2). The heat shrink sleeve shall be tested by an adhesion test in accordance with ASTM D1000, AWWA C216, and C222. Test shall meet an adhesion value of 15 lb-inch. Test shall be performed directly over the weld (parallel) and perpendicular to the weld. The sleeve backing shall not rip, tear, split or separate from the adhesive material. The test shall be done a minimum of 24 hours after welding.

3). Demonstration section shall be completely removed and legally disposed of after successful completion of the demonstration, or prior to final acceptance of the Project.

f. Excavate the first two joints for evaluation of the joint coating condition. Engineer will randomly select up to three additional post-welded joints for excavation by Installation Contractor for evaluation of joint coating condition. Joint coating will be destructively evaluated by the Engineer. Should the inspection of the exterior coating reveal damage in the opinion of the Engineer, the test will be considered a failure and the coating will be removed and replaced at no additional cost to the Owner. The test for the failed welder may be repeated on another joint, with the approval of the Engineer.

g. If any excavated weld-after-backfill joint exhibits any heat related damage, Installation Contractor shall modify and test a new weld-after-backfill procedure prior to completing any additional welded joints. Installation Contractor shall demonstrate that the revised joint welding procedure will not significantly damage the coating by repeating the weld-after-backfill evaluation requirements, including excavation of the three additional joints randomly selected for destructive evaluation.

h. Installation Contractor will remove and replace joint heat shrink sleeve upon completion of the evaluation.

2. Materials:

a. “Weld-After-Backfill” or post-welded joints are defined as welded pipe joints that have been coated and backfilled prior to completing interior welds.

b. Weld-after-backfill joints shall be coated and protected as follows. Approved materials shall be in accordance with Section 09 97 16 “Pipeline Coatings and Linings.” Joint coatings shall be heat shrink joint sleeves only. Tape wrapped joints will not be acceptable.

c. Holdback primer shall be suitable for weld-after-backfill conditions. Primer shall not result in running or melting of the coating or cause toxic fumes when heated during weld-after-backfill joints. Primer shall not exhibit binder breakdown in the heat-affected zone. Binder breakdown causes loss of joint coating adhesion to the holdback primer. Tape primers are not allowed.

d. Filler mastic materials shall be high-temperature materials with 500 F minimum melting point.

e. Filler mastic will be Denso North America or Trenton Corporation products.

3. Installation:

    a. Installation of heat shrink sleeves shall comply with the requirements of the Specifications and AWWA C216.

    b. Joints shall be buried prior to welding, with not less than 12 inches of soil or flowable fill material above the pipe, including side and bottom of trench.

    c. Prior to welding, remove hold-back primer from I.D. of bell and O.D. of spigot with a power steel brush to prevent contamination of welds.

    d. Welding of the Joints:

        1). All welding shall be wire-fed or with stick electrodes. Provide two or more weld passes as required to meet the approved AWS welding procedures and maximum coating temperature limitations. Not more than 1/8 inch shall be deposited per weld pass. Weld-after-backfill procedures must be approved by the Engineer based on field testing demonstrating the welding procedures can comply with the requirements herein and Section 09 97 16 “Pipeline Coatings and Linings”.

        2). Welding speed, amperage, and voltage shall be as required to maintain a maximum heat input of 23,000 joules or a maximum surface temperature at the coating/steel interface of 500 F, whichever is least.

        3). Maximum weld temperature and duration shall not result in significant carbonization of the joint coating adhesive or adversely affect the integrity of the sleeve. Significant carbonization is the loss of volatile organic compounds that results in substantial loss of tackiness, adhesion to the steel, and corrosion protection properties.

        4). Finished joint coating shall not have any visible creases or folds in more than 50 percent of the joint coating backing material or that extend through both the inner protective layer and outer joint sleeve. A slight surface deformation of the sleeve may be deemed acceptable if the underlying layers are not compromised beyond slight carbonization.

    e. The heat-shrink sleeve shall be electrically tested for holidays per Section 09 97 16 “Pipeline Coatings and Linings.”

3.02 PROTECTIVE COATINGS SYSTEM

A. Perform field coating of joints in accordance with Section 09 97 16 “Pipeline Coating and Lining.” For weld-after-backfill, heat tolerant heat-shrink joint wrapping and special welding techniques will be used. At the start of the Project, at least one joint of pipe per welder shall be uncovered at no additional cost to the Owner to verify the exterior joint wrap is not damaged. Should a change of materials be required, or a new welder employed, additional test joints may be directed by the Engineer.

B. The Installation Contractor is responsible for ensuring his operations do not damage the factory or field applied coating system.

C. Protection of Buried Metal: Buried ferrous metal such as flanges, bolts, nuts and couplings which cannot be protected with factory or field-applied polyurethane coatings or heat

shrink sleeves shall be coated with two wraps of wax tape meeting AWWA C217 as specified in accordance with Section 09 97 16 “Pipeline Coatings and Linings” and encased in flowable fill.

D. Repair of Mortar Lining:

1. Repair lining cracks larger than 1/8 inch in width with approved methods. Pipes with loose and dis-bonded linings will be rejected. Excessive repair of lining shall not be permitted. Apply bonding agent to patch area. Patching of lining shall be allowed where area to be repaired does not exceed 4 square feet and has no dimension greater than 24 inches. In general, there shall be not more than one patch in the lining of any joint of pipe. Patching for the manufacture of fittings and specials is acceptable, and not limited to the maximum square footage described above.

2. Wherever necessary to patch the pipe, make the patch with the mortar indicated. Do not install patched pipe until the patch has been properly and adequately cured and unless approved for laying by the manufacturer's technician and by the Engineer.

3. Shop-applied mortar lined pipe joints requiring patches that exceed the size allowed by 09 97 16 “Pipeline Coatings and Linings” shall be rejected and replaced at no additional cost to the Owner. The opinion of the Engineer shall be the sole factor in determining the acceptability of the required repair.

E. Quality Control of Field-Applied Polyurethane Coating: See Section 09 97 16 “Pipeline Coatings and Linings.”

F. Pipe Through Vaults: Where piping is to be inside a vault, such as for meters or valves, the vault floor shall be cast, then the piping installed, then the vault walls constructed.

3.03 FIELD QUALITY CONTROL

A. Disinfect the piping system in accordance with Section 33 10 13 “Disinfecting Water Utility Distribution.”

B. Perform a field hydrostatic test in accordance with Section 33 05 05.31 “Hydrostatic Testing.”

END OF SECTION

DIVISION 40
PROCESS INTEGRATION

40 05 43 MISCELLANEOUS VALVES

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install miscellaneous valves complete and ready for operation as shown on the Drawings and specified herein.

B. The equipment shall include, but not be limited to, the following; however, not all items specified herein may be included in this Project.

1. General Requirements.
2. Check Valves

1.02 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Shop Drawings.
2. Operation and maintenance manuals.

1.03 GUARANTEE AND WARRANTY

A. Manufacturer shall warrant the equipment and materials furnished under this Section against defects in materials and workmanship and operational failure for a period of 1 year from the date of Owner acceptance.

B. In the event of failure of any part or parts of the equipment during the first year of service, provided that the equipment has been operated and maintained in accordance with good practice, the manufacturer shall furnish and deliver a replacement for the defective part or parts at the manufacturer’s own expense. Manufacturer is also responsible for equipment freight.

1.04 REFERENCE STANDARDS

A. ASTM International (ASTM):

1. ASTM A36 - Standard Specification for Carbon Structural Steel
2. ASTM A48 - Standard Specification for Gray Iron Castings
3. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings
4. ASTM A240 - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels
5. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
6. ASTM A380 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
7. ASTM A436 - Standard Specification for Austenitic Gray Iron Castings

8. ASTM A536 - Standard Specification for Ductile Iron Castings
9. ASTM B30 - Standard Specification for Copper-Base Alloys in Ingot Form
10. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings
11. ASTM B98 - Standard Specification for Copper-Silicon Alloy Rod, Bar and Shapes
12. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications
13. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
14. ASTM F1970 - Standard Specification for Special Engineered Fittings, Appurtenances or Valves for use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems

B. American Water Works Association (AWWA):
1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
2. AWWA C511 - Reduced-Pressure Principle Backflow-Prevention Assembly
3. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants
4. AWWA C800 - Underground Service Line Valves and Fittings

C. American National Standards Institute (ANSI):
1. ANSI ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers
2. ANSI B1.20.1 - Specifications, Dimensions, Gauging for Taper and Straight Pipe Threads (except dry seals)
3. ANSI B16.1/B16.5 - Pipe Flanges and Fittings Package
4. ANSI B16.10 - Face-to-Face and End-to-End Dimensions of Valves

D. Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS):
1. MSS SP-25 - Standard Marking System for Valves, Fittings, Flanges, and Unions
2. MSS SP-72 - Ball Valves with Flanged or Butt-Welding Ends for General Services
3. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends

1.05 QUALITY ASSURANCE

A. Experience Requirements: Manufacturer shall have had successful experience in manufacturing valves for this type of service in the sizes indicated. Manufacturer shall have at least 10 years of experience in the manufacture of the valves.

B. Uniformity Requirements: Units of the same type shall be the product of one manufacturer.

C. Inspection of units may also be made by the Engineer or other representative of the Owner after delivery. Equipment shall be subject to rejection at any time due to failure to meet

any of specified requirements, even though submittal data may have been accepted previously. Equipment rejected after delivery shall be marked for identification and shall be removed from the Site at once.

2.00 PRODUCTS

2.01 GENERAL

A. Valves and appurtenances shall be of size shown on the Drawings or as noted.

B. Valves and appurtenances shall have name of maker, nominal size, flow directional arrows, working pressure for which they are designed and standard referenced, cast in raised letters or via riveted stainless steel nameplate upon some appropriate part of the body.

C. Unless otherwise noted, all valves and fittings shall have a minimum working pressure of 150 psi or shall be rated for the test pressures associated with the pipe they connect to, whichever is higher.

D. Joints, size and material - unless otherwise noted or required by the Engineer:

1. Except where noted, joints referred to herein shall be of same type, nominal diameter, material and with a minimum rating equal to pipe or fittings they are connected to.

2. Valves and appurtenances shall be of same nominal diameter as pipe or fittings they are connected to.

E. Despite any of these specified requirements, coatings and lubricants in contact with potable water shall be NSF61 certified as acceptable for use with that fluid.

F. Unless otherwise noted, interior ferrous surfaces of valves shall be given a shop finish of an epoxy conforming to AWWA C550 with a minimum thickness of 6 mils.

G. Exterior surface of various parts of valves, operators, floor stands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter; and thereafter, one shop coat of an approved rust-inhibitive primer shall be applied in accordance with Division 9.

H. Special tools and the manufacturer's standard spare parts, if required for normal operation and maintenance, shall be supplied with the equipment. Tools shall be packaged, clearly and permanently marked on the exterior to indicate equipment for which tools are intended.

I. Provide special adaptors as required to ensure compatibility between valves, appurtenances, and adjacent pipe.

J. Where valve handwheels are installed with a centerline higher than 6 feet, the valve shall be installed in an orientation and equipped with a chainwheel to allow for operation from standing at grade. Chain and accessories shall be stainless steel. Chain wheels shall be:

1. Ductile iron coated per Section 09 96 00.01 "High Performance Coatings"; or

2. Stainless steel.

2.02 SWING CHECK VALVES

A. The valve disc shall absolutely prevent the return of water back through the valve when the inlet pressure decreases below the delivery pressure, on pump shutoff or power failure. The valve shall be tight-seating.

B. Swing check valves shall be furnished with ANSI 125/150 pound flat faced flanges. Valve exterior and interior shall be painted with Fusion Epoxy Paint per AWWA C550.

C. The valve body and cover shall be ASTM A126, Class B cast iron with flow area equal or grater than the nominal flow area. Disc shall be EPDM, having an O-ring seating edge and be internally reinforced with steel.. Rubber flapper valves shall be Val-Matic Series 500, APCO Series 100 or Crispin Series RF.

D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. APCO Valve.
2. Val-Matic.
3. Crispin.

3.00 EXECUTION

3.01 INSTALLATION

A. Carefully handle and install valves in a manner that prevents damage to any part of the valves. Install valves in accordance with the manufacturer's instructions.

3.02 FIELD QUALITY CONTROL

A. Upon completion of installation of the equipment, conduct an acceptance test to verify the satisfactory operation of each unit. The test shall be conducted in a manner approved by and in the presence of the Engineer and/or Owner. The unit shall be checked for general operation and leakage. The unit must perform in a manner acceptable to the Engineer before final acceptance will be made by the Owner.

END OF SECTION

40 05 61 GATE VALVES

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals necessary to install gate valves and appurtenances, including valve boxes, operators, bolts, nuts, and gaskets.

1.02 QUALITY ASSURANCE

A. The intent of these specifications is to purchase a quality product of the manufacturer's latest design, meeting the minimum standards set forth.

B. The services of the manufacturer's technical representative shall be provided for pre-startup installation checks, startup assistance, training of Owner's operating personnel, troubleshooting and other services as required in Section 01 75 00 "Starting and Adjusting."

C. Experience Requirements: The manufacturer shall have at least 10 years of experience in the manufacture of valves used in the water and wastewater treatment environment. References and installation list shall be provided on request.

D. Acceptable Manufacturers:

1. American Flow Control.
2. Mueller.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 "Document Management" and shall include:

1. Shop Drawings.
2. Operation and Maintenance Manuals.

1.04 STANDARDS

A. The applicable provisions of the following standards shall apply as if written here in their entirety:

1. American Society of Mechanical Engineers (ASME) Standards:

ASME B16.1	Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250

2. ASTM International (ASTM) Standards:

ASTM A126	Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A536	Standard Specification for Ductile Iron Castings

3. American Water Works Association (AWWA) Standards:

AWWA C111/A21.11	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C500	Metal-Seated Gate Valves for Water Supply Service
AWWA C509	Resilient Seated Gate Valves for Water Supply Service
AWWA C515	Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
AWWA C550	Protective Interior Coatings for Valves and Hydrants

1.05 GUARANTEE AND WARRANTY

A. Manufacturer shall warrant the equipment and materials furnished under this Section against defects in materials and workmanship and operational failure for a period of 2 years from the date of Owner acceptance.

B. In the event of failure of any part or parts of the equipment during the first 2 years of service, provided that the equipment has been operated and maintained in accordance with good practice, the manufacturer shall furnish, deliver, and install a replacement for the defective part or parts at the manufacturer's own expense. Manufacturer is also responsible for equipment removal, reinstallation, and freight.

2.00 PRODUCTS

2.01 GATE VALVES

A. General:

1. Gate valves 3 inches through 36 inches shall be resilient wedge type with non-rising stem in strict accordance with AWWA C509/C515.

2. Gate valves smaller than 3 inches shall be bronze, non-rising stem with wedge disc and screwed ends for 300-psi W.O.G. working pressure. Bronze gate valves shall be Crane No. 636E or approved equal.

3. Gate valves 30 inches and larger shall be equipped with non-rising stem and with spur-gears in enclosed oil or grease lubricated gear cases. Gear boxes shall be factory lubricated. Flanges shall conform to ANSI, Class 125 or 250.

B. Gate: Gate for double disc valves shall be ductile iron with bronze mounted wedges and seats. Gate for resilient seated valves shall be ductile iron with rubber-seat compound bonded to the valve gate.

C. Manual Operators: Operators shall turn counterclockwise to open the valve. Exposed valves shall have handwheel operators unless otherwise designated. A directional arrow and the word "open" shall be cast on the handwheel. Valves for buried service shall have a 2-inch square nut operator and shall be installed with extension stems where required to extend operating nut to within 12 inches of the finished grade. Provide a cast iron valve box to enclose the operating stem. Valve box shall be three-piece extension type equal to Mueller No. 10380 or Clow F2450.

D. Stem and Seal: The non-rising stem shall be bronze or stainless steel with inside screw. Shaft seal shall employ O-rings or V-type packing.

E. Bell Ends: Where designated, valves shall be mechanical joint or rubber gasketed push on joints in accordance with the applicable requirements of AWWA C111/A21.11.

2.02 TAPPING SLEEVES AND VALVE ASSEMBLY

A. Tapping sleeves shall have a ductile iron body, mechanical joint, with a Class 125 flanged outlet. All sleeves and valves shall be ductile iron and have a minimum of 150 psi working pressure. All taps shall be machine drilled; no burned taps will be allowed. Furnish Mueller, American Flow Control, Kennedy, or equal.

B. Tapping valves shall be AWWA C515 resilient seat gate valves with a Class 125 flange inlet with a mechanical joint outlet. Furnish American Flow Control Series 2500, Mueller T-2360 or equal.

2.03 PROTECTIVE COATINGS AND LININGS

A. The exterior surfaces of all exposed valves shall be furnished with a factory applied rust-inhibitive primer. Primer shall be coordinated with field painting to ensure compatibility.

B. The valve manufacturer's standard paint will be acceptable provided it is functionally equivalent to the specified paint and is in accordance with the field painting specified in Section 09 96 00.01 "High-Performance Coatings."

C. Provide factory coatings and linings per AWWA C550.

3.00 EXECUTION

3.01 INSTALLATION

A. Carefully handle and lower buried valves into position to prevent damage to any part of the valves. Place the valve in the proper position with stem truly vertical and securely hold until connections have been made. Furnish bolts, nuts, and gaskets. Contractor shall be responsible for adjusting the valve boxes to the proper length to conform with the ground surface.

3.02 BLOCKING UNDER GATE VALVE

A. Gate valves 18 inches and larger which are buried shall rest on a concrete pad. Pad shall extend for the full width of the trench and from back of hub to back of hub (or flange). Care shall be taken to not interfere with the jointing. Concrete shall be minimum 1500-psi compressive strength.

3.03 FIELD QUALITY CONTROL

A. Upon completion of installation of the equipment, an acceptance test to verify the satisfactory operation of each unit shall be conducted. The test shall be conducted in a manner approved by and in the presence of the Engineer. The unit shall be checked for general operation and leakage. The unit must perform in a manner acceptable to the Engineer before final acceptance will be made by the Owner.

3.04 SCHEDULES

A. Equipment shall be supplied in accordance with the following schedule: The required equipment and certain pertinent data are given below. This list is given to facilitate description of the various equipment and as an aid to plan take-off and is not guaranteed to be complete.

Location	Size (In.)	Type	End Connect.	Process Fluid	Max. Diff. Pressure (psi)	Operator Type	Installation (Buried/ Exposed)	Service
Sta 1+00	12	RS	FxMJ	POTABLE	150	MANUAL	BURIED	O/C

Type: MS = Metal Seated, RS = Resilient Seated
End Connection: F = Flange, MJ = Mechanical Joint, PJ = Push-on Joint
Service: O/C = Open/Close, T = Throttling, M = Modulating

END OF SECTION

40 05 64 BUTTERFLY VALVES

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install butterfly valves.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers:

1. American-Flow Control.
2. Mueller.
3. M&H.
4. Val-Matic.
5. DeZurik.
6. CMB/K-Flo.
7. Pratt.

B. Experience Requirements: The Manufacturer shall have had successful experience in manufacturing tight-closing, rubber-seated butterfly valves for this type service in the sizes indicated. The Manufacturer shall have at least 10 years' experience in the manufacture of valves.

C. Manufacturer's Representative for Startup and Testing: The Valve Vendor or Manufacturer shall provide the services of a competent manufacturer's representative for an indefinite period of time as required to insure proper adjustment, installation, and operation of the valve.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 "Document Management" and shall include:

1. Shop Drawings (needed if electric actuators are used).
2. Operation and Maintenance Manuals.

1.04 STANDARDS

A. The applicable provisions of the following standards shall apply as if written here in their entirety:

1. American National Standards Institute (ANSI) Standards:

ANSI B16.1	Cast Iron Pipe Flanges and Fittings

2. American Society for Testing and Materials (ASTM) Standards:

ASTM A48	Standard Specification for Gray Iron Castings
ASTM A126	Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A276	Standard Specifications for Stainless Steel Bars
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM B148	Standard Specifications for Aluminum Bronze Coatings

3. American Water Works Association (AWWA) Standards:

AWWA C504	Standard for Rubber-seated Butterfly Valves
AWWA C550	Standard for Protective Interior Coatings for Valves and Hydrants

2.00 PRODUCTS

2.01 VALVE CONSTRUCTION

A. General: Butterfly valves supplied under this Contract shall be of the tight-closing, rubber seated type with rubber seats that are securely attached to the valve disc or body. Valves shall be bubble tight at rated pressures with flow in either direction and shall be satisfactory for applications involving valve operation after long periods of inactivity. Butterfly valves shall conform to the applicable requirements of AWWA C504 and AWWA C550. All valves for potable water service shall comply with NSF61 standards.

B. Valve Bodies: Valve bodies shall be constructed of cast iron ASTM A126, Class B or ASTM A48, Class 40 or ductile iron in accordance with ASTM A536, Grade 65/45/12. Valve class shall be suitable for the pressure class of the adjacent pipe in which it is installed**.**

C. Valve Discs: Valve discs shall be cast iron conforming to ASTM A126, Class B, aluminum bronze conforming to ASTM B148, or ductile iron conforming to ASTM A536, Grade 65/45/12.

D. Valve Shafts: Valve shafts shall be turned, ground and polished, constructed of stainless steel conforming to ASTM A276. Valve shafts may consist of a one-piece unit extending completely through the valve disc, or may be of the “stub shaft” type, which comprises two separate shafts inserted into the valve disc hubs. If of the “stub shaft” construction, each stub shaft shall be inserted into the valve disc hubs for a distance of at least 1-1/2 shaft diameters. The shaft shall be tightly connected to the disc using tapered or wedged keying devices.

E. Valve Seats: Valves shall have EPDM or other synthetic rubber resilient seats for use with chlorinate water to provide tight shut off at the pressure specified. The mating seat surface shall be ASTM A276, 18-8 stainless steel or a 95 percent pure nickel overlay. All valves shall have replaceable, adjustable seats. Valves 30 inches and larger shall have in-line replaceable seats.

F. Valve Bearings: Valve shall be fitted with sleeve type bearings. Bearings shall be of corrosion-resistant and “self-lubricated” materials that will not deteriorate natural or synthetic rubber.

G. Valve Shaft Seals: Where shafts project through the valve bodies for operator connection, a split-V or O-ring type shaft seal shall be provided.

2.02 VALVE OPERATORS:

A. General: The valve operator shall be designed and manufactured in accordance with the applicable requirements of AWWA C504 and AWWA C540, and shall be arranged for horizontal or vertical valve shaft installation.

B. Manual Operators:

1. Manual operators shall have all gearing totally enclosed and shall be pre-lubricated or grease packed. Operators shall be of the worm gear or travelling nut and link type with field adjustable stops to prevent over travel in the open or closed positions. The direction of the manual rotation shall be clockwise to close.

2. Operators for exposed valves shall be provided with a valve position indicator and a handwheel or chain and sprocket device. Provide chain and sprocket for valves greater than 6 feet above walking surface.

3. Operators for buried valves shall have an extended stem with a 2-inch square operating nut within 12 inches of the finished grade. Provide a cast iron valve box to enclose the operating stem. Valve box shall be three-piece extension type equal to Mueller No. 10380 or Clow F2450. For valves which are installed with the shaft vertical, provide a level gear for vertical operation of the operating nut.

2.03 ELECTRIC MOTOR OPERATORS

A. General:

1. The valve operators shall be of the reversible motor type. The rate torque capacity of each operator shall be sufficient to seat, unseat, and rigidly hold in any position the valve disc that is controlled under the operating conditions.

2. Operators shall be self-contained units comprising housing, motor reversing contactor, limit switches, torque switches, relays, control transformer, gear train and auxiliary handwheel. Approved valve operator manufacturers shall be Limitorque or approved equal**.**

3. Operator shall move the valve from fully open to fully closed position, or from fully closed to fully open, in approximately 300 seconds. Time of travel shall be based on a geared reducer, not jogging the motor.

B. Construction:

1. Operators shall be equipped with an auxiliary handwheel to provide for actuation of the valve in the event of a power failure. The handwheel shall have a clutch so that it will not turn during normal operation of the valve. The clutch shall lockout the motor so that it will not engage when the wheel is turning.

2. Each operator shall have an integral three-phase, full voltage, reversing contactor with electrical and mechanical interlocks and three over-load sensing relays. The contactor shall operate on 120 VAC and shall have a control transformer 460/230 VAC to 120 VAC.

The control transformer shall be sized with sufficient capacity to operate the contactor and the motor switch compartment heaters.

3. Limit switches shall be furnished for the following functions:
    a. Start Permissive (Limit switch closed until valve is off the valve seat)
    b. Valve Open (Limit switch closed until valve is 100% open, one spare)
    c. Two Valve Closed (Limit switch closed until valve is 100% open, one spare)
    d. Value Failure (Limit switch closed until valve is 95% open)
    e. Pump Start/ Stop Command (Limit switch closes when valve is 5% open and remains closed until 95% closed)
    f. Limit switches shall be independently adjustable at the open and close limits. Auxiliary limit switches for remote Open, Closed and Intermediate indication shall have isolated Form C contacts rated at 120 VAC.
4. The operator enclosure shall be NEMA 4X. Space heaters with thermostat shall be provided in the enclosure of wattage suitable for keeping the compartment dry at all times. There shall be installed also a suitable breather and drain. A laminated schematic wiring diagram shall be attached and protected from the environment for maintenance use. A terminal strip shall be provided in the switch compartment. Controls and switch compartments shall be shop wired to terminal strip complete and ready for field installation. All wires to terminal strip shall be identified.
5. Motor shall be for 460/230-VAC, 3-phase, 60-Hertz service and control voltage shall be 120 VAC provide by an internal transformer. Motor shall be designed for continuous use.
6. Valves shall have Local-Remote selector switch, Open/Stop/Close Pushbuttons and Open and Closed indicator lights mounted on the operator. Selector switches and pushbuttons shall be provided with water-tight boots.
7. Non-modulating valves shall receive an open signal and a closed signal from remote, and shall provide contacts for REMOTE STATUS, OPENED, CLOSED, HIGH TORQUE.
8. Refer to electrical design sheets for Control Schematics.

3.00 EXECUTION

3.01 INSTALLATION

A. Installation shall be in accordance with the Manufacturer's instructions. Valve shaft shall be truly vertical or horizontal as indicated.

3.02 FIELD QUALITY CONTROL

A. Upon completion of installation of the butterfly valves an acceptance test shall be conducted to verify the satisfactory operation of the valves. The valves must perform in a manner acceptable to the Engineer before final acceptance will be made by the Owner.

3.03 SCHEDULES; VALVES

A. The required valves and certain pertinent data is given below. This list is given to facilitate description of the various valves and as an aid to plan take off and is not guaranteed to be complete.

Item No.	Service	Number Required	Size and Ends	AWWA Class	Max. Diff. (psi)	Type Operator
5	Discharge	3	12”	150	150	MOTORIZED

END OF SECTION

40 05 97 IDENTIFICATION FOR PROCESS PIPING AND EQUIPMENT

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish and install identification markings on process piping and equipment as specified in this Section.

B. Provide identifying devices for the following:

1. Process piping.
2. Process equipment.
3. Valves.
4. Electrical equipment.

1.02 RELATED WORK

A. Identification for Non-process Piping Systems and Equipment:

1. Electrical Systems: Refer to Section 26 05 53 “Identification for Electrical Systems.”

B. Process Piping Coatings: Refer to Section 09 96 00.01 “High-Performance Coatings” for information regarding coating systems for process piping. Process piping color selections are provided within this Section.

1.03 REFERENCES

A. American National Standard Institute/American Society of Mechanical Engineers (ANSI/ASME) Standard A13.1 – Scheme for the Identification of Piping Systems.

B. ANSI/National Electrical Manufacturers Association (NEMA) Z535.1 – American National Standard for Safety Colors.

C. United Nations (UN) ST/SG/AC.10/30 – Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

1.04 DEFINITIONS

A. Combustible: The material classification for fluids that can burn, but that are not flammable.

B. Fire Quenching: The material classification including water, foam, or and carbon dioxide used in sprinkler systems and fire-fighting piping systems.

C. Flammable: The material classification for fluids that, under ambient or expected operating conditions, are a vapor or produce vapors that can be ignited and continue to burn in air. The term may apply, depending on service conditions, to fluids defined for other purposes as flammable or combustible.

D. Oxidizing: The material classification for fluids that may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.

E. Piping: Conduits used to convey, distribute, mix, separate, discharge, meter, control, or snub fluid flows.

F. Piping Systems: Piping of any kind, including fittings, valves, and pipe coverings.

G. Toxic and Corrosive: The material classification for fluids that are toxic or corrosive, or that will produce toxic or corrosive substances when released.

1.05 PROJECT CONDITIONS

A. All items specified herein shall be specifically suited for the intended service and the environmental conditions encountered in this installation.

B. When installed in wastewater treatment areas, the environment will be moist and corrosive, exhibiting hydrogen sulfide and other corrosive gases encountered with the handling and treating of municipal wastewater.

C. When installed in areas with chlorine gas, chlorine solution, or sodium hypochlorite, the environment may be moist with chlorine present in gas or solution form.

D. When installed in chemical storage, feed, or dosing areas, the identification products may be impacted by chemicals. These chemicals may include aluminum sulfate, aluminum chlorohydrate, ammonium sulfate, anhydrous ammonia, chlorine dioxide, citric acid, ferric chloride, ferric sulfate, hydrochloric acid, Hydrofluosilicic acid, polyaluminum chloride, polymer (anionic and cationic), lime, oxygen (gas and liquid), ozone, soda ash, sodium bisulfite, sodium chlorite, sodium hypochlorite, sodium hydroxide, sulfuric acid, etc.

E. When installed outdoors, devices specified herein will be exposed to ambient temperatures, freezing conditions, ultraviolet (UV) radiation from sunlight exposure, precipitation (fog, rain, snow, ice, etc.).

1.06 SUBMITTALS

A. Submittals shall be furnished in accordance with Section 01 33 00 “Document Management” and shall include the following items:

1. Product sheets for identifying devices.

2. A list of where devices are to be installed, and the data to be included on each identifying device.

3. Sample valve/gate and equipment tags for general formatting confirmation.

4. Equipment tag schedule including the following items:

a. Equipment tag number.

b. Equipment description.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Contractor must closely check the materials upon delivery for damage. If damaged, do not accept the materials. Handle the material with care to prevent inadvertent damage during installation.

B. Upon delivery, the Contractor shall off-load, store, handling and install the materials in full conformance with the manufacturer's written instructions and guidelines.

1.08 WARRANTY

A. All devices and items associated and furnished under this Section shall be warrantied against defects in material and workmanship for a period defined in Division 01 of the Contract Documents.

B. The cost for the removal, shipment, replacement, and installation by the Contractor shall be included in the warranty, as well as correction of defective Work.

2.00 PRODUCTS

2.01 EXPOSED PROCESS PIPING IDENTIFICATION

A. Exposed process piping that is defined as piping located above ground or within pipe chases, vaults, galleries, etc. where the piping is observed without excavation.

B. Piping Markers:

1. Piping markers must include the process identify wording along with flow direction arrows.

2. Manufacturers: Subject to compliance with the requirements of this Section, available manufacturers offering products that may be incorporated into the Work include the following:

   a. Marking Services, Inc. – MS-970 Coiled Pipe Markers.

   b. Seton – Setmark Snap-Around Pipe Markers.

   c. Brady B-915.

3. Materials:

   a. Piping markers must be indoor/outdoor grade vinyl with ANSI specifications for background and letter colors, length of color field, and letter height.

   b. Marker minimum thickness must be 20 mil.

   c. Markers must be suitable for a service temperature of -40 through 160 deg. F.

   d. Strapping shall be nylon for larger diameter pipes.

4. Size of Piping Identification:

   a. The sizing criteria provided below is the minimum acceptable standard:

Pipe Diameter (Including Insulation)	Length of Color Field	Character Height	Marker Type
1/4" to 3/8"	3"	1/4"	Coil-On
1/2" – 1"	8"	1/2"	Coil-On
1-1/8" – 2-1/4"	8"	3/4"	Coil-On
2-3/8" – 3-1/4"	12"	1-1/4"	Coil-On

Pipe Diameter (Including Insulation)	Length of Color Field	Character Height	Marker Type
3-3/8" – 4-1/2"	12"	1-1/4"	Coil-On
4-5/8" – 5-7/8"	12"	1-1/4"	Coil-On
6" – 7-7/8"	12"	1-1/4"	Coil-On
8" – 10"	24"	2-1/2"	Strap-On
> 10"	32"	3-1/2"	Strap-On

5. Marker Colors: The following colors below are based on the ANSI/ASMI A13.1 standard.

Classification	Lettering	Background
Fire Quenching Liquids	White	Safety Red
Toxic and Corrosive Fluids	Black	Safety Orange
Flammable and Oxidizing Fluids	Black	Safety Yellow
Combustible Fluids	White	Safety Brown
Potable, Cooling, Boiler Feed, and Other Water	White	Safety Green
Compressed Air	White	Safety Blue

C. Piping Coating and Piping Banding Tape:

1. Piping coatings must as be specified in Section 09 96 00.01 "High-Performance Coatings.

   a. For pipes with color bands in addition to the base color, the following spacing criteria should be followed:

      1). The sizing criteria provided below is the minimum acceptable standard:

Pipe Diameter (Including Insulation)	Band Color Spacing	Length of Band Color Field
1/4" to 3/8"	3"	1"
1/2" – 1"	8"	3"
1-1/8" – 2-1/4"	8"	3"
2-3/8" – 3-1/4"	12"	4"
3-3/8" – 4-1/2"	12"	4"
4-5/8" – 5-7/8"	12"	4"
6" – 7-7/8"	12"	4"
8" – 10"	24"	8"
> 10"	32"	10"

2. Process Piping Coating and Banding Tape Color Schedule:

   a. Texas Commission on Environmental Quality Water Treatment Facilities (Plants, Pump Stations, Storage, Etc.):

Process / Service Fluid	Pipe Color
Alum Sulfate (Liquid)	Yellow with Orange Bands
Aluminum Sulfate (Solution)	Yellow with Green Bands
Air Scour	None
Ammonia	Yellow with Brown Bands
Caustic / Caustic Soda / Sodium Hydroxide (Liquid)	White with Red Bands
Caustic / Caustic Soda / Sodium Hydroxide (Solution)	White with Orange Bands
Chlorine (Gas, Liquid, or Vent)	Yellow
Chlorine (Solution)	Yellow with Red Bands
Chlorine Dioxide (Solution)	Yellow with Blue Bands
Compressed Air	Light Green
Drain	Dark Gray
Ferric Chloride	Brown with Red Bands
Ferric Sulfate	Brown with Yellow Bands
Filter Backwash Supply	Light Blue
Filter Backwash Waste	Dark Grey
Filter Effluent	Light Blue
Fluoride	White with Yellow Bands
Instrument Air	Light Green with Dark Green Bands
Raw Water	Tan
Settled Water	Green
Ozone	Stainless Steel with White Bands
Polymer	White with Green Bands
Potable Water	Light Blue

b. Texas Commission on Environmental Quality Wastewater Treatment Facilities (Plants, Lift Stations, Storage, Etc.):

Process / Service Fluid	Pipe Color
Aluminum Sulfate (Liquid)	Yellow with Orange Bands
Aluminum Sulfate (Liquid)	Yellow with Orange Bands
Aluminum Sulfate (Solution)	Yellow with Green Bands
Compressed Air	Light Green
Chlorine	Yellow
Effluent After Clarification	Dark Green

Process / Service Fluid	Pipe Color
Ferric Chloride	Brown with Red Bands
Ferric Sulfate	Brown with Yellow Bands
Gray Water	Purpose with Yellow Writing
Heated Water	Blue with 6-inch Red Bands Spaced 30-inches Apart
Instrument Air	Light Green with Dark Green Bands
Natural Gas	Red
Ozone	Stainless Steel with White Bands
Polymer	White with Green Bands
Potable Water	Light Blue
Power Conduit	In Compliance with the National Fire Protection Associate 70 National Electric Code
Raw Water	Tan
Reclaimed Water	Purpose with Black Lettering
Sewage	Gray
Sludge	Brown
Sulfur Dioxide	Lime Green with Yellow Bands

2.02 BURIED PIPING IDENTIFICATION

A. Buried Piping Warning Tape:

1. Manufacturers: Subject to compliance with the requirements of this Section, available manufacturers offering products that may be incorporated into the Work include the following:

   a. Brady.

   b. Kris-Tech.

   c. Marking Services, Inc.

   d. Surv-Kap.

   e. Seton.

2. Materials:

   a. Underground Warning Tape: Non-adhesive, 4-mil (minimum) thick polyethylene tape, surface printed. Tape must have a width of 6 inches.

   b. Detectable Underground Warning Tape: Non-adhesive, 4.5-mil (minimum) thick, aluminum detectable warning tape. Tape must have a width of 6 inches.

c. Message: “CAUTION” with the name of the name of the service, followed by LINE BURIED BELOW” in black letting on colored background in accordance with approved American Public Works Association (APWA) colors:

1). Potable Water: Blue.

2). Reuse: Purple.

3). Sanitary Sewer: Green.

4). Telephone: Orange.

5). Gas and Other Services: Yellow.

B. Tracer Wire:

1. Manufacturers: Subject to compliance with the requirements of this Section, available manufacturers offering products that may be incorporated into the Work include the following:

a. Copperhead Industries.

b. EGW Utility Solutions.

c. Kris-Tech.

d. Performance Wire and Cable, Inc.

2. Materials:

a. Solid copper conductor with a minimum thickness of 10-gauge.

b. Insulation should be minimum 30-mil high molecular wight polyethylene (HMWPE), UF type for direct bury. Insulation color should match the color of detector type being installed.

3. Splicing Kit 3M Kit 82-A1 or engineer approved equivalent for direct bury applications.

4. Station Box:

a. Manufacturers: Subject to compliance with the requirements of this Section, available manufacturers offering products that may be incorporated into the Work include the following:

1). Copperhead Industries – Snakepit Roadway.

2). EGW Utility Solutions.

3). Engineer approved equivalent.

b. Lid and Collar Materials: Cast iron, H20 rated.

2.03 VALVE AND GATE IDENTIFICATION

A. Manufacturers: Subject to compliance with the requirements of this Section, available manufacturers offering products that may be incorporated into the Work include the following:

1. Marking Services, Inc. – MS-215R MaxTek Valve and Equipment Tags.

2. Brady B-418 Durable Rigid Plastic Tags.

3. Engineer approved equivalent.

B. Provide an identification tag for the following valves and gates on the Project:

1. All gates.
2. All 4-inch diameter and larger valves.

C. Valve Tag Size: Tag shall be sized to accommodate the required text, but at a minimum must be 2 inches by 4 inches in size.

D. Materials:

1. Base Material: 0.1-inch (minimum) thick rigid polymer.
2. Total thickness: 0.120-inch (minimum) thickness to accommodate double sided use (2 each base product, labels, protective outer layers).
3. Service Temperature: -40 through 200 deg. F.
4. Outdoor Durability: Tested to ASTM D7869 with an expected durability of more than 5 years.
5. UV Resistance: Excellent resistance and UV stable. Product must resist yellowing and hazing.
6. Finish: The tag must be furnished with a matte finish with beveled edges.
7. Tag Color:

a. The following colors below are based on the ANSI/ASMI A13.1 standard.

Classification	Lettering	Background
Fire Quenching Liquids	White	Safety Red
Toxic and Corrosive Fluids	Black	Safety Orange
Flammable and Oxidizing Fluids	Black	Safety Yellow
Combustible Fluids	White	Safety Brown
Potable, Cooling, Boiler Feed, and Other Water	White	Safety Green
Compressed Air	White	Safety Blue

b. The tag color shall match the piping markers specified in Paragraph 2.01 “Exposed Process Piping Identification” of this Section.

E. Mounting:

1. Attach tags in such a way as to allow free and full operation of the valve or gate.
2. Each tag shall be equipped with a pre-installed stainless-steel grommet to accommodate the use of fasteners.
3. Exposed Valves and Gates: Exposed valves and gates shall have the tags connected to the valves and piping using stainless-steel jack chain, bead chain, or lead meter seals.
4. Buried Valves and Gates: Buried valves and gates shall have the tags attached to valve box concrete pad with the use of stainless-steel (type 316) fasteners. Contractor shall coordinate with the tag manufacturer for fastener type and size.

F. Tag Text:

1. Each valve tag shall be furnished with four lines of text.
2. Each line of text shall accommodate at least 14 characters.
3. The following text must be included on the tag:
    a. Identification (tag) number.
    b. Description of piping fluid or process.
    c. Normal position of valve or gate (open or close).
    d. Valve or gate description/function.
4. Contractor shall submit the tag list for review and approval by the Engineer prior to furnishing and installing the valve and gate tags.

2.04 EQUIPMENT NAMEPLATE

A. Manufacturers: Subject to compliance with the requirements of this Section, available manufacturers offering products that may be incorporated into the Work include the following:

1. Marking Services, Inc. – MS-215R MaxTek Valve and Equipment Tags.
2. Engineer approved equivalent.

B. Equipment Tag Size: Tag shall be sized to accommodate the required text, but at a minimum must be 1 inch by 3 inches in size.

C. Materials:

1. Base Material: 0.100-inch (minimum) thick rigid polymer.
2. Total thickness: 0.110-inch (minimum) thickness to accommodate single sided use (base, labels, protective outer layers).
3. Service Temperature: -40 through 200 deg. F.
4. Outdoor Durability: Tested to ASTM D7869 with an expected durability of more than 5 years.
5. UV Resistance: Excellent resistance and UV stable. Product must resist yellowing and hazing.
6. Finish: The tag must be furnished with a matte finish with beveled edges.
7. Tag Color:
    a. The following colors below are based on the ANSI/ASMI A13.1 standard.

Classification	Lettering	Background
Fire Quenching Liquids	White	Safety Red
Toxic and Corrosive Fluids	Black	Safety Orange
Flammable and Oxidizing Fluids	Black	Safety Yellow
Combustible Fluids	White	Safety Brown

Classification	Lettering	Background
Potable, Cooling, Boiler Feed, and Other Water	White	Safety Green
Compressed Air	White	Safety Blue

b. The tag color shall match the piping markers specified in Paragraph 2.01 “Exposed Process Piping Identification” of this Section.

D. Mounting: Each tag shall be equipped with a pre-drilled holes with washers to support mounting with stainless steel (type 316) fasteners.

E. Tag Text:

1. Each valve tag shall be furnished with two lines of text.
2. Each line of text shall accommodate at least 14 characters.
3. The following text must be included on the tag:
   a. Identification (tag) number.
   b. Equipment description.
4. Contractor shall submit the tag list for review and approval by the Engineer prior to furnishing and installing the equipment tags.

2.05 WATER HYDRANT AND OUTLETS (POTABLE AND NON-POTABLE WATER)

A. Provide tags at every water hydrant.

B. Equipment Tag Size: Tag shall be sized to accommodate the required text, but at a minimum must be 1 inch x 3 inches in size.

C. Materials:

1. Base Material: 0.100-inch (minimum) thick rigid polymer.
2. Total thickness: 0.110-inch (minimum) thickness to accommodate single sided use (base, labels, protective outer layers).
3. Service Temperature: -40 through 200 deg. F.
4. Outdoor Durability: Tested to ASTM D7869 with an expected durability of more than 5 years.
5. UV Resistance: Excellent resistance and UV stable. Product must resist yellowing and hazing.
6. Finish: The tag must be furnished with a matte finish with beveled edges.
7. Tag Color:
   a. The following colors below are based on the ANSI/ASMI A13.1 standard.

Classification	Lettering	Background
Potable, Cooling, Boiler Feed, and Other Water	White	Safety Green

b. The tag color shall match the piping markers specified in Paragraph 2.01 “Exposed Process Piping Identification” of this Section.

D. Mounting: Each tag shall be equipped with a pre-drilled holes with washers to support mounting with stainless steel (type 316) fasteners.

E. Tag Text:

1. Each valve tag shall be furnished with one line of text.

2. Each line of text shall accommodate at least 14 characters.

3. The following text must be included on the tag:

a. Potable Water, or

b. Non-Potable Water.

4. Contractor shall submit the tag list for review and approval by the Engineer prior to furnishing and installing the tags.

3.00 EXECUTION

3.01 PREPARATION

A. For piping identified in Section 09 96 00.01 “High-Performance Coatings” to be coated, prepare and coat surfaces as specified in Section 09 96 00.01 “High-Performance Coatings” prior to the installation of any identification devices. For piping identified in Section 09 96 00.01 “High-Performance Coatings” to be excluded from coating, prepare surfaces for identification devices.

B. Install piping complete with insulation, valves, and gates in place prior to installing identification devices.

C. Piping shall be dry and free of oil, grease, or other contaminants that will interfere with the installation of the identification devices.

3.02 EXPOSED PROCESS PIPING IDENTIFICATION

A. Identify process piping, valves, and gates that are exposed to view, in any location inside of buildings or structures, in underground valves, pump station, basements, accessible pipe chases, or other exposed locations with lettering or tags designating services of each piping system with flow directional arrows and color code.

B. Install piping labels and process flow arrows on piping exposed to view, in any location inside of buildings or structures, in underground valves, pump station, basements, accessible pipe chases, or other exposed locations.

C. Color Code:

1. Coat or band piping with the colors identified in Piping Coating and Banding Tape Color Schedule of this Section.

2. Piping that is not coated that will receive piping banding tape, must receiving banding tape as identified previously and as follows:

a. At least one label in each area or room.

b. At connection to equipment, basins, and tanks.

c. Adjacent to all valves.

d. At both sides of floor or wall penetrations.

e. Adjacent to changes in directions.

D. Lettering and Flow Direction Arrows:

1. Piping labels and process arrows must be located so that they are visible from the Owner's position in walkway or working platform near piping. Locate markers along the horizontal centerline of piping, unless better visibility is achieved elsewhere. Install labels in rows with uniform spacings where several pipes run parallel to each other.

2. Piping label and process arrows must be installed at the following locations:

a. At least one label in each area or room.

b. At connection to equipment, basins, and tanks.

c. Adjacent to all valves.

d. At both sides of floor or wall penetrations.

e. Adjacent to changes in directions.

f. Every 25 feet in straight runs of pipe.

3.03 BURIED PIPING IDENTIFICATION

A. Underground Warning Tape: Place continuing run of warning tape in pipe trench, 12 inches above the pipe.

B. Tracer Wire:

1. Install on non-metallic pipe.

2. Install an electrically continuous run of tracer wire along the entire length of the pipe with wire terminations in valve boxes, vaults, or structures.

3. Install tracer wire on top of the pipe and secure to pipe with tape a minimum spacing of 10 feet.

4. Where approved by the Engineer, splice sections of wire together using approved splicing system.

C. Witness Markers:

1. Install over pipe in unpaved open-space areas at intervals not greater than 100 feet.

2. Place markers at appurtenances located in unpaved areas.

3. Embed markers at least 18 inches into the soil.

3.04 VALVE AND GATE IDENTIFICATION

A. Install a valve and gate tag on all valves and gages. Attached the tag to the hand wheel of valve and gate stems so that it does not interfere with the operation of valve or gate.

END OF SECTION

40 73 13 PRESSURE GAUGES

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install pressure gauges and cocks. Dial gauges shall indicate pressure or vacuum on a graduated dial by means of a pointer utilizing an elastic element (Bourdon tube or coil), and actuating linkage as necessary for indicating pressure or vacuum.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers:

1. Ametek.
2. Ashcroft.
3. Marshalltown Instruments.
4. Weksler.
5. Approved equal.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 “Document Management” and shall include:

1. Product data including product data sheets and catalog information. Clearly indicate on data sheets which option(s) are selected.

2.00 PRODUCTS

2.01 MANUFACTURED PRODUCTS

A. Pressure Gauges:

1. The gauges shall be the manufacturer’s standard industrial product. The gauges shall be new and shall embody the design characteristics stated for the respective size, type, etc. scheduled herein.
2. Pressure gauges shall be equipped with white faces, black numerals, and black pointers.
3. Gauge cases shall be stainless steel.
4. Gauges shall be liquid filled.
5. Bourdon tube, socket, and connecting tube shall be 316 stainless steel.
6. Gauge accuracy should be 1 percent of its full range.
7. Gauge suitable for ambient and process temperatures from 20 to 150 deg. F.
8. Select gauge range so that:

a. The normal operating value is in the middle third of the dial.

b. Maximum operating pressure does not exceed 75 percent of the full-scale range.

9. Unless otherwise required by codes, provide stem mounted or flush mounted, as required, with dial diameter as follows:

Pipe Size	Dial Size	Gauge Connection
1-1/2” or less	3-1/2”	1/4” NPT
Larger than 1-1/2”	4” or 4-1/2”	1/4” NPT

B. Gauge Accessories:

1. All accessories are to be stainless steel materials.
2. Provide accessories at each gauge unless noted otherwise.
3. Pulsation Dampeners:
   a. Furnish and install a pulsation dampener, Mid-West Model 150, Vari-Damp Pulsation Dampener, or approved equal.
4. Gauge Cocks: Gauge cocks for insolating standard product gauges shall be 316 stainless steel with tee handle and bottom threaded connections with male and female ends.

3.00 EXECUTION

3.01 INSTALLATION

A. Provide tap and connection piping to install the pressure gauges. Connection shall comprise of 316 stainless steel nipples, fittings, gauge cock, diaphragm seal and pulsation dampener. Install the gauge and protect the gauge until project acceptance by the Owner.

B. Calibrate gauges at job site for pressure and temperature in accordance with manufacturer’s instructions.

C. Vent liquid filled gauges with scale range of 300 psi or less as recommended by manufacturer.

D. Gauge tapping position to be clear of equipment functions and movements, and protected from maintenance and operation of equipment.

E. Gauge to be readable from an accessible standing position.

3.02 SCHEDULES

A. The pressure gauges to be furnished are listed on the schedule included on the following page. The list does not include the gauges to be furnished as part of the equipment. The list has been prepared to facilitate takeoff and may or may not include all pressure gauges necessary, which is the responsibility of the Contractor.

Facility	Gauge Location	Unit	Range	Normal WP
Lower Pressure Plane PS	Pump RRUPP P-6 Discharge	PSI	0-200	≤ 200

END OF SECTION

40 90 01 INSTRUMENTATION

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install all equipment for complete instrumentation and controls. Contractor's work shall include but not be limited to the following:

1. Installation of equipment furnished under this contract.
2. Interconnections between equipment furnished under this contract.
3. Interconnection between equipment furnished under this contract and the existing instrumentation and control equipment or that furnished and installed under other contracts.

B. The Contractor's attention is directed to the fact that instrumentation is an integrated system and as such shall be furnished by one vendor or system integrator who shall provide all the equipment and appurtenances, regardless of manufacture, and be responsible to the Contractor for satisfactory operation of the entire system.

C. Supervision, labor, tools, and materials necessary for installation of the instrumentation equipment and material furnished herein and their interconnection shall be provided by the Contractor. Installation work shall conform to applicable city, state, and national building and electrical codes.

D. Coordinate the work of the system manufacturer's service personnel during construction, testing, calibration and acceptance of the instruments.

1.02 QUALITY ASSURANCE

A. GENERAL: Equipment shall be the Manufacturer's latest and proven design. Specifications and drawings call attention to certain features, but do not purport to cover all details entering into the design of the instrumentation system. The completed system shall be compatible with the functions required and the equipment furnished by the Contractor.

B. OPERATING VOLTAGE: Electrical components of the system shall operate on 120 volt, single-phase, 60 Hertz, except as otherwise noted in the specifications.

C. POWER SUPPLIES: The drawings and specifications indicate the energy sources that will be provided. Any other devices or power supplies necessary to obtain proper operation of the instrument system from these energy sources shall be furnished with the instrumentation.

D. PROTECTION

1. The instrumentation system supplier shall be responsible for input-output isolation of all incoming and outgoing signals.
2. Each 4-20 mA DC process measurement current loop installed on this contract which extends outside the RTU enclosure shall be protected by insertion of a 1/16 amp fuse, Buss Type MKB. Fuses shall be installed in standard fuse blocks behind the RTU enclosure door.

3. The necessary fuses or switches required by the Instrumentation Manufacturer shall be provided with the equipment. The instruments requiring an internal power supply shall have an internal ON-OFF switch.

E. INPUT/OUTPUT

1. In general and unless specifically stated otherwise, inputs and outputs involving instrumentation systems shown shall be 4-20 mA DC process measurement signals. Current loop isolators, current repeaters, or other signal isolators shall be furnished and installed as required to meet instrument specifications and to make instrumentation system fully operational.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00, SUBMITTALS and shall include:

1. Shop Drawings

a. Shop drawings shall be submitted to the Engineer for approval before fabrication or shipment to the job. Equipment shall not be fabricated or shipped to the job before receipt of approved shop drawings from the Engineer. Submittals for approval shall include component manufacturing data sheet indicating pertinent data and identifying each component by item number and nomenclature:

b. The submittal shall be organized with a cover sheet listing each instrument being provided. Each instrument shall be listed with the associated tag name, model number, and specified options.

c. Separated by tabbed sections, each section shall include the product cut sheets from the manufacturer.

d. Component drawing showing: dimensions, mounting, external connection details

e. Full description of operation

f. Component identification on the schematic

g. The manufacturer shall be responsible for preparation of the required sets of these drawings for distribution as indicated in Division 0 and Division 1 specifications.

h. Shop drawings submitted for all equipment furnished under this section of the specifications, shall be submitted at the same time in the same package. Partial submittals will not be reviewed. Sales bulletins and other general publications are not acceptable as submittals for approval.

2. Equipment installation Report.

a. Contractor shall provide an Equipment Installation Report for each instrument (flow meter, level transmitter, etc.) to the Engineer for approval. The equipment installation report shall include documentation stating that the instrument was installed and properly calibrated per the manufacturer's recommendations by an Authorized representative of the instrument manufacturer. All parameters required for programming of the instrument shall be provided in a hard copy format as part of the equipment installation report. Documentation stating that the person

performing the calibration and start-up is an authorized representative shall be provided as well.

3. Operation and Maintenance Manuals

    a. Operating instructions shall incorporate a functional description of the entire system including the system schematics which reflect "as-built" modifications.

    b. Wiring diagrams shall clearly show terminal numbers and wire numbers as they actually are in the instrumentation system.

    c. Instrument panel wiring shall be such that each wire installed has its own number designation at each end and such that no number is repeated.

    d. Setup parameters: O&M shall include an ISA datasheet with each instrument. The ISA form shall be filled out with ordering information, setup parameters, ranges, and approximate location.

    e. Special maintenance requirements particular to the system shall be clearly defined along with special calibration and test procedures.

1.04 STANDARDS

A. The applicable provisions of the following standards shall apply as if written here in their entirety:

1. ASTM A-126 Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings

2. ASTM B-61 Specification for Steam and Valve Bronze Castings

1.05 JOB CONDITIONS

A. SPARE PARTS

1. Furnish all standard recommended spare parts as indicated in the Manufacturer's instruction manuals, for each component in the system.

B. SPECIAL TOOLS: Furnish a kit which contains special size wrenches and other types of tools, not normally available, which are necessary for assembling, disassembling, aligning, and calibrating each piece of equipment. In addition, any piece of equipment (meter, test set, etc.) required by the Manufacturer to align, adjust, or otherwise calibrate any item under this section of the specification shall be furnished.

2.00 PRODUCT

2.01 REMOTE EQUIPMENT

A. Controls for remote electrically operated or motor driven equipment shall be complete, including the necessary auxiliary relays so as to require only wiring and connections to the equipment control circuit. Contacts for control of remote motor operated or electrically operated equipment shall be rated not less than 10 amperes at 120 volts unless otherwise specified herein.

B. Remote motor operated or electrically operated equipment shall have a separate 120 volt control circuit which operates through the dry contacts provided by the instrumentation system.

2.02 PRESSURE TRANSMITTER

A. Gauge Pressure transmitter shall be of the capacitance type with a process isolated diaphragm with silicone oil fill, microprocessor based "smart" electronics, and a field adjustable rangeablility of 20:1 input range. Span and zero shall be continuously adjustable externally over the entire range. Span and zero adjustments shall be capable of being disabled internally. Transmitters shall be NEMA 4X weatherproof and corrosion resistant construction with low copper aluminum body and 316 stainless steel process wetted parts. Accuracy, including nonlinearity, hysteresis and repeatability errors shall be plus or minus 0.100 percent of calibrated span, zero based. The maximum zero elevation and maximum zero suppression shall be adjustable to anywhere within sensor limits. Output shall be linear isolated 4 20 mA, 24 VDC. Power supply shall be 24 VDC, two-wire design. Each transmitter shall be furnished with a 4 digit LCD indicator capable of displaying engineering units and/or milliamps and mounting hardware as required.

B. Transmitter shall be a Rosemount 3051 or pre-approved equal by addendum. Transmitter shall be supplied with a 316 Stainless Steel Block and Bleed Valve, Rosemount or pre-approved equal by addendum.

Tag	Service	Range
PIT-209-01	Pump RRUPP-P6 Discharge Pressure	0-150 psig

3.00 EXECUTION

3.01 INSTALLATION

A. Wire each device requiring power so that when wires are removed from any one device, power is not be disrupted to any other device. Ground the case of each device either by mounting directly on a steel frame or by a third wire.

3.02 FIELD QUALITY CONTROL

A. The supervisory service of a factory-trained service engineer who is specifically trained on the type of equipment herein specified shall be provided during construction to assist the Contractor in the location of sleeves; methods of installing conduit and special cable; mounting, piping, and wiring one of each type of device, and the methods of protecting all of the equipment prior to placing it into service. Upon completion of the installation, the services of the above service engineer shall be provided for calibration and start up of the equipment and for instructing the operating personnel. The Manufacturer shall provide sufficient service to place the system in satisfactory operation.

B. Upon completion of installation of sample pumps, an acceptance test to verify the satisfactory operation of each unit shall be conducted. The test shall be conducted in a manner approved by and in the presence of the Engineer. The unit shall be checked for

excessive noise, vibration, alignment, general operation, etc. The unit must perform in a manner acceptable to the Engineer before final acceptance will be made by the Owner.

C. Check out and calibrate the system upon completion of the installation.

D. Prior to the Owner turning on any form of energy to the system, the Contractor shall provide the Engineer with a certified statement of approval of the installation including his supplier's authorization for turning on energy to the system.

END OF SECTION

40 90 02 SUPERVISORY CONTROL AND DATA ACQUPISITION (SCADA) SYSTEM

1.00 GENERAL

1.01 SCOPE

This section specifies furnishing, installing, testing, and start-up operations of a complete control sub-system as indicated in the Plans and as specified herein. The system shall be set up to be totally integrated with the City of Rowlett's system. The integrator shall also assign IP address as required by the Owner for all affected systems. Coordinate all requirements with the Owner. The SCADA system shall be set up as a stand-alone system and shall be capable of connecting into the Owner's system. The SCADA contractor shall set up address for the SCADA system at the PLC such that the Owner's system can pull all information from the from these systems. The system shall be configured to operate as a Distributed Control System having an open system architecture.

1. There is one area of work in the SCADA and Instrumentation Work in this project as described below:

    a. The Instrumentation System Integrator Contractor shall provide all hardware as required, software, and configuration and integration associated with the PLC based Instrumentation and Process Control system. Provide a complete and operational system in accordance with these Contract Documents:

        1) Provide instrumentation, hardware, conductors and raceway required for a complete and operable system that is above that specified in the Contract Documents. Provide all labor and materials specified in the Contract Documents.

        2) Modify existing PLC and provide additional I/O cards as required. Provide all required labor, materials and PLC programming and system configuration and integration to interconnect the PLC to the existing PLC and HMI system located at the LPP and UPP Pump Stations.

        3) Provide all required software and programming in the PLC for a complete and operational system in accordance with these Contract Documents.

        4) Coordinate and fully cooperate with system programmer to provide all required hardware and PLC hardware and PLC programming necessary to interface with the existing HMI system.

        5) Provide personnel to check out, test and commission the system.

        6) Provide personnel to train the Owner's staff as specified

        7) Provide all required software and programming in the PLC and existing computer system at the City of Rowlett's HMI for a complete and operational system in accordance with these Contract Documents.

        8) Coordinate and fully cooperate with the OWNER to provide all required hardware and PLC hardware and PLC programming necessary to interface with the existing system.

9) Provide factory trained personnel to train the OWNER's staff as specified.

10) Provide software programming to create new screens on the computer system as specified. Provide a copy of all screens to the Owner as an official submittal when screens are developed.

A. Provide PLC programming, interconnection, wiring, etc. as required by the Process and Instrumentation Sheets: The system will consist of the following major components and subsystems:

1. LPP Pump Station PLC
    a. Existing RTU Cabinet
2. UPP Pump Station PLC
    a. Existing RTU Cabinet
    b. Tank Low Level Cutoff Panel

B. Software Requirements - Provide the following software modifications:

1. Program the PLC at the Pump Stations. Integrate the I/O as shown on the Contract Documents.
2. Modify existing SCADA system and screens at the OWNER’s control room.
3. Two (2) software copies of all PLC programming and all required software licenses shall be provided to the Owner at the end of the project.

C. Reference Standards:

1. American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE):
    a. C37.90.1, IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
    b. C37.90.2, Trial Use Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers.
    c. Electronic Industries Association (EIA):
    d. RS-232-C, Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange.
    e. RS-422-A, Electrical Characteristics of Balanced Voltage Digital Interface Circuits.
2. National Electrical Manufacturers Association (NEMA):
    a. ICS 1, General Standards for Industrial Control and Systems.
    b. ICS 1.1, Safety Guidelines for the Application, Installation and Maintenance of Solid State Control.
    c. ICS 4, Terminal Blocks for Industrial Use.
    d. ICS 6, Enclosures for Industrial Controls and Systems.
    e. Publication No. 250, Enclosures for Electrical Equipment (1000 V maximum).

3. National Electrical Code.
4. ISA Standards
5. IEC 2 KV Isolation test
6. IEEE472/ANSI C37-90A Surge withstand capability test.
7. IEEE 802.3

1.02 SUBMITTALS

A. Submittals shall conform to the requirements set forth in section 01 33 00, “Document Management” and Section 40 90 00, “Instrumentation & Control for Process Systems”.

B. Loop diagrams shall be prepared according to ISA Standard ISA-S5 and using loop numbers provided.

C. Shop Drawings

1. Loop diagrams shall be prepared according to ISA Standard ISA-S5 and using loop numbers.
2. Schematic ladder diagrams shall include all terminal blocks, hardware devices, software interlocks, software data links, and control.
3. Project specific Interconnection diagrams of all devices. Interconnection diagrams shall include terminal blocks and wire tags.
4. A schedule defining all I/O, database reference, and point of origin or destination, and PLC system internal address.
5. Software manuals shall be provided to configure the central system and technical review information. Provide sample program documentation from previous projects.
6. Complete spare parts list with catalog and part numbers and quantities.
7. Sample screens for the updates to the existing HMI shall be submitted for Owner/Engineer for approval.
8. Training Agenda.

D. The Contractor shall submit upon approval of shop drawings and ordering of equipment but prior to beginning of construction the following documents to the Owner for review and approval:

1. Point to point wiring diagrams
2. Cable Schedule
3. AC and DC wiring diagram
4. Installation Details

E. Factory Test Reports.

F. OPERATION AND MAINTENANCE MANUALS

1. Operation and maintenance manuals shall contain the shop drawings, submittals, spare parts lists, schematics, and maintenance procedures.

2. Operating instructions shall incorporate a functional description of the entire system including the system schematics which reflect "as-built" modifications. Wiring diagrams shall be furnished as a part of the Operation and Maintenance Manuals which clearly show terminal numbers and wire numbers as they actually are in the instrumentation system. Instrument panel wiring shall be such that each wire installed has its own number designation at each end and such that no number is repeated. Instrument panel wire tagging instructions as specified in section 26 05 19, LOW VOLTAGE ELECTRICAL POWER CONDUCTORS & CABLES shall be followed.
3. Special maintenance requirements particular to the system shall be clearly defined along with special calibration and test procedures.
4. A schedule defining all I/O, database reference, and point of origin or destination, and PLC system internal address.
5. Submit written description of functions, loops, and logic.
6. Submit all SAMA Logic and Wiring Diagrams and ISA Logic Diagrams for all equipment requiring programming at the PLC, with all set points and ranges indicated.
7. Final point to point interconnection diagrams showing actual field terminals on both ends, cable numbers, wire tags, etc. An example of the final point to point interconnection diagrams shall be submitted to the Engineer for review and approval. Once the final point to point interconnection diagrams have been approved, the Contractor shall provide two copies of the AutoCAD files of the interconnection diagrams burned in on a CD as an official submittal.
8. The Contractor's retainage will not be paid until the point to point interconnection diagrams have been submitted and approved by the Owner/Engineer.
9. One software copy of actual program files burned in on a CD/DVD.
10. Provide hardcopy of PLC programming logic in O&M manuals.
11. One PDF copy of the "as-built" wiring diagrams and associated drawings burned on a CD.

    a. Maximum file size is 5MB. If manual is greater than maximum allowable file size, provide individual files for each major section of manual.

    b. All files shall be compatible with the latest software version available.

    c. Filename shall identify the plant site, plant area, equipment manufacturer, and date equipment placed in service.

    d. Each electronic file shall contain a table of contents at the beginning of the file which includes hypertext links or bookmarks to navigate the file contents per section/chapter. The chapter labels shall identify the information included in that chapter i.e.: PLC Cabinet Layout.

    e. Scanned images of written documents are not acceptable. Document must allow character selection. Text within a file shall be transferable to other documents.

    f. Submit a preliminary version of the electronic format of the manual for review. Upon approval of the preliminary submittal, the Contractor shall provide the number of copies required per Division 01 of the electronic manual to the Owner.

G. Factory Test Reports

H. Equipment Installation Report

1.03 QUALITY ASSURANCE

A. The following Instrumentation System Integrator Contractor's, PLC programming and system configuration and integration are pre-qualified with the City of Rowlett for PLC and HMI programming:

1. Data Flow Systems (DFS)
2. No others shall be accepted.

B. Suppliers Qualifications: The complete system shall be configured, programmed, and installed by one qualified system supplier who is regularly engaged and qualified in designing and building instrument control systems. The system suppliers shall assume complete systems responsibility, including coordination and interfacing with all subsystems and equipment suppliers and manufacturers. The installation supervisor shall have had experience in overseeing installation and start-up of at least three similar installations. The bidder shall submit, upon ENGINEER's request, complete company history, resumes of full time project manager for this project, other key full-time system analysts, programmers, technicians, and submit project list with costs, OWNER, contact person, phone number, etc.

C. Tests: The complete system shall be assembled and tested at the job site. The OWNER'S representative and the ENGINEER'S presence will be required at the time of final testing at the job site.

D. Standards: All applicable NEC, ISA, IEEE, NEMA, UL, ANSI, IEC, FCC, FM standards shall apply. All equipment shall be new and UL listed and labeled.

E. Assembly, Storage, & Handling: Once assembled and tested, the system shall be stored in air-conditioned and heated rooms. Ship the unit to job site only after the Pump Station HVAC system is in operation.

1. The OWNER may approve partial payment for SCADA equipment ready to be onsite but is stored off site. Partial payment may be disallowed by the OWNER.
    a. For partial payment, the OWNER shall receive as a minimum a sales receipt, lien release, proof of insurance and the OWNER’s name shall be stenciled on the equipment being paid for.

1.04 SYSTEM DESCRIPTION

A. Modify the existing programmable controller-based supervisory control and data acquisition system configured as a distributed processing network as defined by the Contract Documents. Control functions shall include digital logic control, PID control, and setpoint control.

B. Include all hardware, firmware, software, and application programming and configuration, as necessary, to make the system completely functional and operational in accordance with the Contract Documents. All necessary components and equipment which are not specifically described in the Contract Documents, but which are necessary to configure an operational distributed control system as described herein, shall be identified, furnished, and installed by

the CONTRACTOR. The system provided shall be the vendor's standard; a prototype system will not be accepted.

1.05 WARRANTY

A. The Equipment supplier and the CONTRACTOR shall warrant to the OWNER that the equipment delivered with reference to this specification complies with this specification.

B. The equipment supplier and the CONTRACTOR shall warrant the equipment as to defects in material and workmanship for a period of one year from the date of final acceptance of the project. Vendor shall include a copy of his special equipment warranty with the shop drawings. The warranty specified by this specification shall be exclusive, and in lieu of all other warranties whether written, implied, orally presented, or statutory.

C. Warranty for equipment shall be through the equipment manufacturer and shall include the option to purchase additional service agreements/extended warranties after the initial warranty for up to five years.

2.00 PRODUCTS

2.01 COMPONENTS

A. Existing PLC shall remain and be used. Additional I/O cards to be added if required.

B. Additional components shall be new.

C. Components shall be UL Listed.

D. Provide the following components in sufficient quantities to enable the successful operation of the SCADA system as illustrated and described in the Contract Documents:

2.02 COMPONENTS

A. Input/Output (I/O) Modules

1. Provide plug-in modular-type I/O racks in each PLC enclosures if required, with cables to connect to all other required PLC system components.
2. Provide I/O system with:

a. I/O solid state boards with status lights indicating I/O status and board failure.

b. Electric isolation between logic and field device.

c. Individually fused outputs with blown fuses indication.

d. Interchangeable modules for similar I/O type to allow substitution of operating modules for failed units by the operator.

e. Incorporate noise suppression design.

f. Capable of meeting or exceeding surge-withstand capability tests, per ANSI/IEEE C37.90.1.

g. Capable of meeting or exceeding electrical noise tests, NEMA ICS1-109.60-109.66.

3. Discrete I/O Modules:

    a. Interface to ON/OFF devices

    b. I/O status indicator module front

    c. Voltage rating to match circuit voltage

    d. Output module current rating:

        1) Match maximum circuit current draw

        2) Minimum 1.5 A/point for 120 V AC applications

    e. Isolated modules for applications where one module interfaces with devices utilizing different sources of power.

    f. Individually fused with blown fuse indication.

4. Analog I/O Modules:

    a. Input modules to accept signals indicated on Drawings or in the Specifications

    b. Minimum 16 bit resolution

    c. I/O chassis supplied power for powering connected field devices

    d. Isolated (differential) inputs and outputs

    e. User configurable for desired fault response state

    f. Provide output signals as indicated on Drawings and in the Specifications

    g. Individual D/A converter for each output module

    h. Individual A/D converter for each input module

3.00 EXECUTION

3.01 INSTALLATION

A. All work shall be in accordance with manufacturer’s recommended practices. Care shall be exercised to avoid damage to equipment during installation. Damaged equipment shall be replaced by CONTRACTOR at no expense to the OWNER.

B. System equipment shall be installed where indicated in the Contract Documents. Power and signal connections between components shall provide the specified functions. Install according to equipment manufacturer's instruction.

C. The system Supplier Contractor shall utilize their own printers, monitors, and computers for programming, testing, and start-up. The use of the OWNER's computers, monitors, or printers shall not be acceptable until the entire system has been installed, debugged, programmed, and operated to ENGINEER's satisfaction.

3.02 DOCUMENTATION

A. Following delivery to the site, the equipment manufacturer, in the presence of the OWNER’S REPRESENTATIVE, shall demonstrate operation of the complete system.

B. The CONTRACTOR shall provide documentation for all application software. Documentation system shall be diagrams in ladder-rung format, and shall show all input devices to the left of the left "power rail" and all outputs to the right of the right "power rail." The diagrams shall show all device codes and functional description used in the project manual, and shall also show PLC address codes, element codes, and I/O assembly codes, modules numbers, and terminal numbers.

3.03 TESTS

A. All elements of the SCADA system, both hardware and software, shall be tested to demonstrate that the total system satisfies all of the requirements of the Specifications.

B. The CONTRACTOR shall furnish and install the field instruments, remote input/output (RI/O), and interface equipment in a schedule to meet the construction sequencing.

C. As a minimum, the testing shall include the following:

1. Operational Readiness Tests (ORT)

2. Functional Demonstration Tests (FDT)

3. 30-Day Acceptance Test

D. Each test shall be in the cause and effect format. The person conducting the test shall initiate an input (cause) and, upon the system's or subsystem's producing the correct result (effect), the specific test requirement will have been satisfied.

E. All tests shall be conducted in accordance with Engineer-approved procedures and documented. Each specific test to be performed shall be described and a space provided after it for signoff by the appropriate party after its satisfactory completion.

F. Copies of signoff test procedures, forms, and checklists will constitute the required test documentation.

G. Provide all special testing materials and equipment. Wherever possible, perform tests using actual process variables, equipment, and data. Where it is not practical to test with real process variables, equipment, and data, provide suitable means of simulation. Define these simulations techniques in the test procedure.

H. Coordinate all testing with other Contractors, the OWNER, and the OWNER'S REPRESENTATIVE.

I. The OWNER and/or OWNER'S REPRESENTATIVE will actively participate in many of the tests. The OWNER and/or OWNER'S REPRESENTATIVE reserves the right to test or retest any and all specified functions whether or not explicitly stated in the approved test procedures. The OWNER and/or OWNER'S REPRESENTATIVE reserve the right to observe and/or inspect the work during any phase.

J. The OWNER'S REPRESENTATIVE decision shall be final regarding the acceptability and completeness of all testing.

3.04 OPERATIONAL READINESS TEST (ORT)

A. General: Prior to start-up, the installed system shall be certified (inspected, tested, and documented) that it is ready for operation. Download all database on job computers from this test onwards. The OWNER and OWNER'S REPRESENTATIVE shall be notified when ORT starts. Copies of ORT forms that have been signed off by the CONTRACTOR shall be copied and sent to the OWNER and OWNER'S REPRESENTATIVE on a daily basis for record purposes only. No signature by the OWNER'S REPRESENTATIVE or OWNER is required for ORT forms.

B. Loop/Component Inspections and Tests: The system shall be checked for proper installation, calibrated, and adjusted on a loop-by-loop and component-by-component basis to ensure that it is in conformance with related submittals and these specifications. Actual real-time signals generated from the field devices shall be used. Simulation of field signals shall not be permitted. This test is intended to actually operate the entire process and to find and correct all real-time operational deficiencies.

1. The Loop/Component Inspections and Tests shall be implemented using Engineer-approved forms and checklists.
    a. Each loop shall have a Loop Status Report to organize and track its inspection, adjustment, and calibration. These reports shall include the following:
        1) Project name
        2) Loop number
        3) Tag number for each component
        4) Checkoffs/signoffs for each component
            a) Tag/identification
            b) Installation
            c) Termination - wiring
            d) Termination - tubing
            e) Calibration/adjustment
        5) Checkoffs/signoffs for the loop
            a) Panel interface terminations
            b) I/O interface terminations
            c) I/O signal operation
            d) Inputs/outputs operational: received/sent, processed, adjusted
            e) Total loop operational
            f) Space for comments
            g) Space for signoff by CONTRACTOR
    b. Each active analog subsystem element and each I/O module shall have a Component Calibration Sheet. These sheets shall include the following:
        1) Project name
        2) Loop number
        3) Component tag number or I/O module number
        4) Component code number analog system
        5) Manufacturer (for analog system element)
        6) Model number/serial number (for analog system)
        7) Summary of functional requirements, for example:
            a) For indicators and recorders: Scale and chart ranges
            b) For transmitters/converters: Input and output ranges

c) For computing elements: Function
d) For controllers: Action (direct/reverse) control modes (PID)
e) For switching elements: Unit range, differential (fixed/adjustable), reset (auto/manual)
f) For I/O modules: Input or output

8) Calibrations; for example:
a) For analog devices: Required and actual inputs and outputs at 0, 10, 50, and 100 percent of span, rising and falling.
b) For discrete devices: Required and actual trip points and reset points
c) For controllers: Mode settings (PID)
d) For I/O modules: Required and actual inputs or outputs of 0, 10, 50, and 100 percent of span, rising and falling.

9) Space for comments
10) Space for signoff by the CONTRACTOR

2. Maintain the Loop Status Reports and Component Calibration Sheets at the jobsite and make them available to the OWNER'S REPRESENTATIVE and OWNER upon request.
3. These inspections and tests do not require witnessing. However, the OWNER'S REPRESENTATIVE will review the Loop Status Reports and Component Calibration Sheets and spot-check their entries periodically and upon completion of the Operational Readiness Test. Any deficiencies found shall be corrected.

3.05 FUNCTIONAL DEMONSTRATION TEST (FDT)

A. Once ORT has been completed and operational readiness has been confirmed, a witnessed Functional Demonstration Test shall be performed on the complete system to demonstrate that it is operating and in compliance with the Contract Documents. Each specified function shall be demonstrated on a paragraph-by-paragraph, loop-by-loop, and component-by-component basis. This test shall be scheduled and conducted only after all new pipeline construction is complete and the new pipeline and metering construction is completed and operational.

B. Loop-specific and non-loop-specific tests shall be the same as specified under SOFTWARE and OPERATIONAL READINESS TESTS except that the entire installed PICS shall be tested and all functions demonstrated.

C. Simulation of field signals, or simulation of the response of the process, or the response of individual components, or the functions being monitored or controlled, shall not be permitted. Simulation may be permitted with the express permission of the OWNER'S REPRESENTATIVE. The decision to simulate is the OWNER'S REPRESENTATIVE's alone. The CONTRACTOR shall include in the Contract Price the time necessary to wait for all process responses.

D. Updated versions of the documentation called for under SOFTWARE and OPERATIONAL READINESS TESTS shall be made available to the OWNER'S REPRESENTATIVE at the jobsite both before and during the test. In addition, one copy of the approved Instrumentation O&M Manual shall be made available to the OWNER'S REPRESENTATIVE at the jobsite both before and during testing. The approved schedule shall be followed strictly on an item-by-item basis. Combining of test items shall be at the discretion of the OWNER'S REPRESENTATIVE alone.

The CONTRACTOR shall include in the Control Price adequate time necessary to complete each test item one at a time.

E. The daily schedule called for under SOFTWARE and OPERATIONAL READINESS TESTS shall also be followed during the Functional Demonstration Test.

F. The OWNER'S REPRESENTATIVE will observe each test once on a pass-fail basis. The OWNER'S REPRESENTATIVE alone has the authority to determine if a test passes or fails. Only one (1) fifteen minute window per day will be allowed during the test procedure to make corrections to software or to field equipment and successfully pass a re-test; otherwise, that test will be declared a failure. If a test fails, it will be put on a retest schedule. If other tests to follow rely on a particular test which has failed, then the following tests will also be placed on a retest schedule even though they were not tested. Retesting shall not interrupt the test schedule. The CONTRACTOR may schedule retest days during the testing period, but not more than two per week. All retesting shall only occur on a day designated in the schedule or at the end of testing.

G. All time and expense incurred by the OWNER'S REPRESENTATIVE and/or OWNER'S staff for all retests shall be borne by the CONTRACTOR and paid to the OWNER. Time and expense incurred shall be on a time and material basis tracked by the OWNER'S REPRESENTATIVE and OWNER for their own staff and presented to the CONTRACTOR on a periodic basis.

H. The CONTRACTOR shall expedite the repair or correction of any deficiency discovered during testing. The CONTRACTOR shall have personnel representing each trade to standby during the test period to immediately correct, repair, or adjust any item of hardware, software or field equipment causing a test to fail.

I. The system shall operate continuously for 100 hours without failure before this test will be considered successful.

3.06 30-DAY ACCEPTANCE TEST

A. All database errors must be corrected prior to the start of the 30-Day Acceptance Test. The 30-Day Acceptance Test will not be considered successful until all databases are correct.

B. Any malfunction during the test shall be analyzed and corrections made by the CONTRACTOR. The OWNER'S REPRESENTATIVE and OWNER will determine whether any such malfunctions are sufficiently serious to warrant a repeat of the test. The cost of a retest shall be borne by the CONTRACTOR as specified.

C. After completion of the Functional Demonstration Test and Plant Start-up, the CONTRACTOR shall be responsible for operation of the entire System for a period of 30 consecutive days, under conditions of full plant process operation, without single non-field repairable malfunction.

D. During this test, CONTRACTOR personnel shall be present as required. The CONTRACTOR shall provide personnel for this test who have an intimate knowledge of the hardware and software of the system and also are familiar with the overall plant process. The Supplier shall be on

call for the 30-Day Acceptance Test. During the test period the supplier shall be available and on the job site within 48 hours of any failure.

E. While this test is proceeding, the OWNER shall have full use of the system. Only plant operating personnel shall be allowed to operate equipment associated with live plant processes.

F. Any malfunction, during this 30 consecutive day test period, which cannot be corrected within 24 hours of occurrence by the CONTRACTOR's personnel, or more than two similar failures of any duration, will be considered as a non-field-repairable malfunction.

G. Upon completion of repairs, by the Supplier, the test shall be repeated as specified herein.

H. In the event of rejection of any part or function, the Supplier shall perform repairs within 5 days or replacement within 30 days.

I. Upon successful completion of the 30-Day Acceptance Test, approval of all as-built drawing and O&M Manuals, completion of all related OWNER training, and delivery of all spare, expendable, and test equipment, the systems shall be considered substantially complete and the warranty period shall commence.

3.07 TRAINING

A. Provide an integrated training program for the Owner's personnel at the jobsite. The Contractor shall submit a detailed training schedule and syllabus for approval. Tailor the training program to meet the specific needs of the Owner's personnel. Include training sessions, classroom and field, for managers, engineers, operators, and maintenance personnel.

B. System Integrator shall submit the proposed training agenda to the Owner/Engineer for review a minimum of 30 days prior to the training taking place.

C. The training shall be carried out by technically competent and experienced instructors.

D. An "instructor week" shall consist of 40 hours of actual instruction time. An "instructor day" shall consist of 8 hours of actual instruction time. Provide instruction on as needed to accommodate the Owner's personnel schedule. The actual training schedule shall be coordinated with the Owner. Training shall be a minimum of one day.

3.08 OPERATIONS AND MAINTENANCE TRAINING

A. O&M training for each subsystem shall be in accordance with the requirements specified under the related Instrumentation specification sections.

B. All training shall be given using only equipment identical to the equipment provided on this Contract or currently owned by the Owner.

C. Unless otherwise specified, hardware maintenance training shall be suitable for instrument technicians who have at least a 2-year associate engineering or technical degree, or equivalent education and experience in electronics, instrumentation, or digital systems.

3.09 ON-SITE SUPERVISION

A. The Supplier shall provide, on-site, an experienced resident engineering manager to supervise and coordinate all of the on-site activities. This resident engineering manager shall be on-site as required during the total period to affect all the activities relating to the PICS.

3.10 START-UP AND TESTING TEAM

A. The Supplier shall provide, on-site, a team of experienced engineering, technician, trades personnel, and software/configuring personnel during the total construction period to:

1. Thoroughly check the installation, termination, and adjustment of all the subsystems and their components.
2. Perform and complete all on-site tests.
3. Provide start-up assistance.

END OF SECTION

DIVISION 43
PROCESS GAS & LIQUID HANDLING

43 24 13 VERTICAL CENTRIFUGAL PUMPING UNITS - LINE SHAFT TYPE

1.00 GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to design, manufacture, fabricate, test, deliver, and install a total of one vertical line shaft pumping unit and electric motor drive to be used in the Owner's Rowlett Road Upper Pressure Plane Pump Station. The unit shall be furnished for the Rowlett Road Upper Pressure Plane Pump Station and shall be designated as:

1. One water pumping units shall be furnished for Rowlett Road Upper Pressure Plane Pump Station, which is housed in Rowlett Road Lower Pressure Plane Pump Station and shall be designated as:

a. RRUPP P-6

B. Pumping unit shall include, but not necessarily be limited to, bowl and impeller assembly, suction bell, line shaft, shaft bearings, column, motor stand, motor, motor coupling, flange bolts and gaskets, special services, spare parts, all lubrication and motor oil. Accessories shall be furnished as required for a complete functioning pumping unit in accordance with the specified performance and installation conditions.

C. For this Section, the Equipment Manufacturer is defined as the pump manufacturer or its designated representative. Equipment Manufacturer is responsible for supplying and coordinating the design, testing, and supervising the installation of the pump and motor. Equipment Manufacturer shall be responsible for the adequacy and compatibility of the pump and motor. The motor manufacturer shall act as a subcontractor of the Equipment Manufacturer. The motor manufacturer shall provide a representative who is capable of coordinating the design, testing, and installation of the motor. Contractor will install the pumping unit under the supervision and guidance of the Equipment Manufacturer's representative.

D. Equipment Manufacturer is responsible for verifying that the existing barrel is within acceptable tolerances.

E. Equipment Manufacturer shall also furnish a total of one variable frequency drives (VFD) as specified in Section 26 29 23 "Variable Frequency Motor Controllers" and shall also be responsible for coordinating the design, testing and installation of the VFDs and motors. Supplier shall be responsible for the adequacy and compatibility of the pump, motor and VFD. The motor manufacturer and the VFD manufacturer shall act as a subcontractor of the pump manufacturer. The motor manufacturer shall provide a representative who is capable of coordinating the design, testing, and installation of the motors.

F. VFD equipment will be purchased by Contractor. In the case where VFD is needed by the pump manufacturer for pump factory testing, the Contractor will make the VFD available and the pump manufacturer will be responsible for compliance with shipping, handling, testing, warranty and other requirements of this and other specifications.

G. The existing overhead crane will be rated for 3 tons with a maximum lifting range (floor to hook eye) of 16 feet and 6 inches. The fully assembled pumping unit, plus rigging less motor

only, shall not exceed the crane's 3-ton rated capacity. The unit shall be segmented to allow installation with a 16.5-foot crane, including the rigging.

H. Pumping units must meet the minimum guaranteed efficiencies submitted with the Proposal, as well as the minimum performance requirements indicated herein.

1.02 ACCEPTABLE MANUFACTURERS

A. Pumps:

1. Flowserve.
2. No other manufacturers will be accepted.

B. Motors:

1. General Electric.
2. TECO-Westinghouse.
3. Nidec (US Electric Motors).
4. No other manufacturers will be accepted.

1.03 QUALITY ASSURANCE

A. Experience Requirements:

1. Pump and motor shall be the product of manufacturers who have had at least 10 years of successful experience in the design, manufacture, and application of pumping units of the type, size, and performance capabilities as specified. The pump manufacturer shall have at least three similar size pumps of the model, type, and size of pump in service and operational for at least 5 years. It will be acceptable for the manufacturer to meet the pump installation experience requirements by referencing installations belonging to the pump's heritage line (previous ownership of the pump by a different company). The pumps referenced for the experience requirement shall be the same pump being proposed and the pump shall not have undergone substantial, material changes in engineering, design, and/or hydraulic characteristics.
2. Equipment Manufacturer shall maintain a quality assurance system in compliance with ISO 9001:2015 during the life of the contract.
3. All components of the pump shall be supplied, assembled, and warranted by one of the approved pump manufacturers. Pump components shall NOT be acquired from separate entities and assembled as a final product by a manufacturer's representative.

B. Factory Inspection and Tests:

1. General:

a. Equipment furnished under these Specifications shall be subject to inspection during manufacture by a representative of the Owner who shall be afforded proper facilities for determining compliance with the Specifications.

b. Owner may, at its option, elect to have the factory performance tests witnessed by the Owner or its designated representatives. All pump and motor factory performance test may be witnessed by a representative of the Owner. Machining

accuracy tests may be witnessed by a representative of the Owner, as indicated hereafter. The cost of performing witnessed factory tests and witnessed machining tests shall be included in the appropriate item of the Proposal. The cost for witness travel and lodging expenses should not be included in the Proposal.

c. If tests are to be witnessed by the Owner or its representatives, the manufacturer shall notify the Owner sufficiently in advance (minimum 30 days) of the dates that tests will be made, so that the Owner can make arrangements for a representative to be present.

d. Remote Witness Tests:

   1). Test will be witnessed remotely by the Owner's representative. The test will be observed on commercially available collaboration software such as MS Teams, Webex, Zoom, or equal that is hosted by the Equipment Manufacturer. The meeting must allow for at least eight personnel from the Owner's representative to participate.

   2). Provide multiple HD camera views of the test. Include one fixed wide-angle camera showing the full test set up, and one handheld HD camera with audio during the testing. The purpose of the handheld camera will be to take the place of what the Engineer typically does during the test, providing visual inspection during the test and listening to the operation of the equipment. The manufacturer shall either screen share or provide a camera of the performance test data collection screens. Other cameras should be set up on instruments that do not show up on the data collection screen (pressure, temperature gauges, noise instruments, etc.). Cameras displaying screens or instruments shall provide a clear, focused image for the duration of the test.

   3). Provide a computer with screen sharing capability to show measured values including flow, pressure, NPSH, etc. A single camera view of fixed instruments which can be clearly read and free of glare may be provided as an alternative to the shared computer screen.

   4). One week prior to the test, a 30-minute demonstration meeting will be held as a mock test in order to work through any meeting software and camera problems. Owner's representative may request additional cameras as necessary.

   5). Provide an opportunity for the Owner's representative to conduct a remote visual inspection during the performance test or shortly thereafter for all pumping units.

   6). Provide a detailed agenda for dates and specific time intervals on pump testing and remote visual inspection.

   7). Manufacturer's technical representative to be in communication with the Owner's representative during the test to narrate the status and current state of procedures throughout the duration of the test.

e. Manufacturer's technical representative shall be present throughout the testing period to aid the Owner's representative in performing and verifying all calculations. The technical representative shall be fully versed in the testing methods and calculations and shall be capable of certifying test results.

f. Tests shall be performed on consecutive days if more than one unit is to be tested during that trip. If testing requires more than 5 consecutive days, testing shall be split up into separate trips that are a minimum of 1 week apart. Do not conduct tests on Saturdays, Sundays, or holidays. Tests may not start any sooner than 12 hours after arrival at hotel for trips outside the continental United States.

g. Manufacturer shall submit the testing agenda for approval at least 30 days prior to the test date, or the test date shall be rescheduled, with no change in the Contract Price or Contract Times. The agenda shall include a detailed list of all tests to be done.

h. For each additional trip after the first that is required due to witnessed testing partial/complete failure or incomplete occurrence because the Equipment Manufacturer is not ready, any component of the equipment is not ready for testing, or any reason caused by the Equipment Manufacturer, Contractor, or subcontractors/suppliers, the Equipment Manufacturer shall pay all costs described in this Section. In addition, the Equipment Manufacturer shall reimburse the Owner's representative for labor at standard rates for all representatives.

i. Under no circumstances, will the equipment be approved for shipment, nor will the equipment be accepted by the Owner, if witness testing is specified, and the equipment is shipped without the testing being witnessed.

2. Pump:

a. Pump shall be factory performance tested and certified copies of test data and test curve shall be furnished to the Engineer. The efficiency, capacity, and horsepower requirements for field conditions shall be determined for not less than 10 points throughout the specified head range from shut-off to maximum specified operating capacity. The tested points shall include Shutoff Head, MCSF, POR high flow, BEP, POR low flow and AOR high flow at 100 percent speed. In addition, test for all rated points.

b. All pumps may be tested with a calibrated factory test motor or a previously tested job motor at maximum speed. Test with the complete pump bowl assembly.

c. Test procedures, interpretation, and conversion of data shall conform to the latest requirements of the Hydraulic Institute standard for Hydraulic Performance Acceptance Tests (ANSI/HI 14.6), except as modified herein.

d. Vibration levels shall not exceed the factory testing limits specified in the latest Hydraulic Institute standard for Vibration Measurements and Allowable Values (9.6.4).

e. Equipment Manufacturer shall submit a test procedure booklet which provides a plan and profile view of the test piping layout including locations of the test instruments at least 30 days prior to the shop test. A description of the test shall be included along with the calibration sheets on the proposed instrumentation. Provide example calculations for the wire-to-water efficiency if the complete unit will not be shop tested.

f. Test results shall show no minus tolerance or margin with respect to capacity, total head or guaranteed efficiency at the specified conditions. Pumps shall have a

continuous down slope in the head-capacity curve. Pumps shall be within the following plus tolerance, in accordance with HI 14.6, Grade 1U, except as modified below:

1). At rated head: 0 to +10 percent of rated capacity.

2). At rated capacity: 0 to +6 percent of rated head.

3). Pump head capacity curve must pass through both tolerance bands.

4). The tested pump horsepower cannot exceed 95 percent of the nameplate motor horsepower when operating at any head between shutoff and minimum specified operating heads.

5). The "line from origin" method may be allowed for evaluation of guaranteed efficiency.

g. Following completion of factory tests, the Equipment Manufacturer shall furnish four certified copies of all test data and test curves for each pump to the Engineer for review and approval. Test curves shall also show calculated curves for expected performance at 100 percent speed for all pumps and 80 percent of rated speed for variable speed pumps. Engineer shall promptly review test data and will give authorization for shipment upon determining that the pump meets contract requirements. Shipment shall not be made without written approval of test data by the Engineer, except at the risk of the Equipment Manufacturer. Copies of pump test data shall also be sent to the motor and VFD suppliers.

h. The Equipment Manufacturer shall make thorough visual inspection and perform non-destructive tests on all bowl and impeller castings before assembly. Perform visual inspection in accordance with MSS SP-55.

1). Cast Steel or Stainless Steel: Perform non-destructive testing on all steel bowl and impeller castings before assembly. Testing may be radiographic test or ultrasonic test. Perform radiographic testing in accordance with ASME Section V, Articles 2 and 22. Perform ultrasonic testing in accordance with ASME Section V, Articles 5 and 23. Acceptance criteria will be per ASME Section VIII, Division I, Appendix 7. Perform testing prior to drilling and tapping holes.

2). Cast Gray Iron or Ductile Iron: Radiographic or ultrasonic testing will not apply for cast gray and ductile iron bowl assemblies. Non-destructive testing of cast gray and ductile iron bowl assemblies will include magnetic particle inspection of machined surfaces in accordance with ASME Section V, Articles 7 and 25. Acceptance criteria will be per ASME Section VIII, Division I, Appendix 7.

i. Equipment Manufacturer or its representative shall make metallurgical analysis from coupons cast on the piece of each pour of metal going into the castings and shafting, and shall provide certified reports to the Owner, showing that the specified alloys are being furnished, and the materials meet ASTM standards.

j. The Equipment Manufacturer shall stress relieve with heat all fabricated components including column pipes and discharge head in accordance with ASME Code Section VIII, Division 1 prior to final machining.

k. Manufacturer shall perform a hydrostatic pressure test on the bowl assembly at 1.5 times the shut-off head for a minimum of 30 minutes with no leakage.

l. Pumps for potable water service must be thoroughly cleaned and disinfected if testing was completed using non-potable water. Disinfection chemicals should be removed, and surfaces flushed such that corrosive chemicals are not in prolonged contact with pump parts.

3. 460-Volt Motors:

a. All motors shall receive a short commercial test in accordance with NEMA MG-1 and IEEE 112, latest version.

b. In addition, all motors shall receive a complete test in accordance with IEEE 112, and certified copies of the test data recorded on appropriate forms of IEEE 112, together with a certified statement of compliance with minimum specified power factor and efficiencies shall be furnished to the Owner's representative. The recorded data on the forms shall be of sufficient clarity and detail to permit third-party longhand validation and verification of any computer-generated results. Any longhand calculations shall be done in English.

c. Tests to be performed on each motor shall include, but not be limited to the following:

1). Reference Resistance per IEEE Std. 112, latest version.

2). Reference Ambient of 25 degrees centigrade.

3). Efficiency using one of the following:

a). Efficiency using an equivalent circuit with direct measurement of stray load loss per IEEE Method F.

b). Efficiency at rated voltage and frequency by dynamometer (IEEE Method B), six points minimum. Dynamometer correction shall be applied.

4). Bearing Loss Stabilization.

5). Locked Rotor Test (two line method).

6). Slip.

7). Core Losses and Friction and Windage Losses.

8). Power Factor.

9). Load test at rated temperature rise (Stable to 1 deg. C within 30 minutes).

10). Speed-Torque and Speed Current Curves.

11). Stator Temperature Rise Measurements by embedded detector and resistance at rated load per IEEE Std. 112, latest version.

12). High Potential Tests.

13). Winding Resistance Measurements.

14). Bearing Insulation Tests.

15). Noise Measurements per IEEE Std. 85, latest version (4 positions).

16). Vibration Measurements.

17). No load amps and power factor.

18). Locked rotor power factor.

19). Measured values of motor weight. Measured values shall be within 5 percent of stated value.

d. Substitutions for or waivers of the tests and methods listed above will not be permitted.

e. The Owner or Owner's representative may witness the tests of all motors. A detailed testing plan shall be officially submitted to the Owner's representative for approval a minimum of 30 days in advance prior to date of testing.

f. Following completion of factory tests, the Equipment Manufacturer shall furnish certified copies of all test data and test curves for each motor to the Owner's representative for review and approval. Owner's representative shall promptly review test data and will give authorization for shipment upon determining that the motor meets contract requirements. Shipment shall not be made without written approval of test data by the Owner's representative, except at the risk of the Equipment Manufacturer.

C. Assembly:

1. Equipment Manufacturer shall be responsible for coordination with the motor manufacturer to ensure that no undue difficulty in assembly will be occasioned when units are received at the Project Site. If the motor does not match properly, the defect shall be corrected to the satisfaction of the Owner. Any delays beyond the scheduled delivery time which are caused by these defects shall be subject to late delivery charges as provided in the Special Conditions.

D. Service of Manufacturer's Representative:

1. Pump Manufacturer's Representative:

a. Pump manufacturer shall furnish the services of a competent pump mechanic, who shall have had a minimum of 5 years of experience in the installation, adjustment, and operation of the equipment which is being furnished under this Section. This service is to ensure proper installation and adjustment of the equipment; instructing operating personnel in proper operation, maintenance, and care of the equipment; for making operation tests of equipment and making recommendations for obtaining the most efficient use thereof.

b. Contractor shall be responsible for installing the pumping units including all labor, tools, and equipment required for assembling, setting, aligning, connecting, adjusting, and testing the pump and motor assemblies.

c. Pump manufacturer representative shall be at the Site at any time the Contractor is assembling, setting, aligning, connecting or adjusting and testing the pump and motor assembly.

d. The pump manufacturer's representative shall certify in writing to the Owner that the pumping unit installations have been properly completed and operated

satisfactorily during acceptance tests. Contractor shall coordinate the field installation and testing.

e. Pump manufacturer shall have total responsibility to see that all connections (mechanical, electrical, and control) made to the installed pumping units are correct prior to startup and testing.

2. Motor Manufacturer Representative:

a. Motor manufacturer shall furnish the services of a competent pump and motor mechanic, who shall have had a minimum of 5 years of experience in the installation, adjustment, and operation of the equipment which is being furnished under this Section. This service is to ensure proper installation and adjustment of the motor; instruct personnel in proper operation, maintenance, and care of the equipment; for making operation tests of equipment, and recommendations for obtaining the most efficient use thereof. The motor technician shall be an employee of the motor manufacturer unless otherwise approved by the Engineer.

b. The service representative shall verify the proper installation, alignment, wiring, lubrication, and connection of all appurtenances prior to startup. Representative shall be present during testing, and startup and shall certify to the Owner in writing that the motors have been properly installed and operate satisfactorily.

1.04 SUBMITTALS

A. All submittals shall be in English with US Customary units. Submittals shall be in accordance with this Section, the General Requirements, and Section 01 33 00 "Document Management." ANY DEVIATIONS FROM THE SPECIFICATIONS MUST BE CLEARLY NOTED AND IDENTIFIED IN THE SUBMITTALS.

B. Proposal Submittal:

1. Submit the following information in order to evaluate the Proposals:

a. General: Furnish a complete description of all equipment offered under these Specifications, including catalogs, cuts, and pertinent engineering data. Where the proposed product differs from the specified requirements and/or catalog description, each point of difference shall be clearly stated. This requirement is set forth to facilitate review of the Proposals and should not be construed as a waiver of any of the requirements of the Specifications.

b. Characteristic Pump Curves: Characteristic curves for the pumps offered shall be submitted with the Proposal. Curves shall show the capacity, head, minimum continuous stable flow (MCSF), preferred operating range (POR), best efficiency point (BEP), allowable operating range (AOR), efficiency, required NPSH, and brake horsepower throughout the operating range of the pump from shut-off to maximum specified operating capacity. Overlay the system curves included in Appendix A. Submit curves with the above data at speeds of 60 to 100 percent**.** Characteristic curves shall have the capacity plotted as abscissa and the operating head, brake horsepower, efficiency and required NPSH plotted as ordinates. Provide four quadrant curves, if available, and WR^2 for the pump. In the event four quadrant curves are unavailable for the specific pump being proposed, the Owner may

consider allowing the submittal of four quadrant curves based on other similar pumps.

c. Data Sheet: Submit information requested on the Data Sheet (for both the pump, Attachment A, and motor, Attachment B), included with the Proposal forms.

d. Outline Drawings: Submit dimensional outline drawings of the pumps, motors, and appurtenances, showing layout dimensions of the proposed equipment and materials to be used. Owner's representative must approve any revisions to these dimensions after the Proposal is awarded. Submit "wet" and "dry" weights of all equipment.

e. Pump and Motor Testing Information: Provide information on the pump and motor testing facility, location, and test method. Provide a testing schedule and plan. Provide pump test facility limitations on voltage, horsepower, flow limit, pressure limit, sump capacity, sump depth, and NPSH available if these affect the Proposal. Include a pump test piping layout drawing.

f. Provide a plan and schedule indicating dates for manufacturing, submittals, testing, and delivery.

g. Provide a list of at least three units in service for at least the last 5 years and a name and telephone number for an operations personnel reference for each of these installations. Units shall be the same pump model and size.

h. Provide a description of the components that will be shipped separately, thus requiring field assembly. Provide a general description of the installation requirements, including sequence and installation tolerances.

C. Shop Drawings:

1. Drawings shall show complete physical description and performance capabilities of the equipment, including, but not necessarily limited to dimensions, weights, materials, assemblies, sectional views, performance curves, four quadrant curves and WR^2 power requirements and ratings, rated voltage and amperage, wiring diagrams as may be applicable, and on-site storage requirements.

2. Submittal shall include all information requested in the Data Sheet (for both the pump and motor located in Proposal Form Exhibit A) submitted with the Proposal. The data sheet shall be updated as necessary.

3. Submit drawings as a complete package of all equipment furnished. Partial drawings will not be reviewed. Shop Drawings shall include the following:

a. Pump Outline drawings showing all components, anchor bolts, external connections, and appurtenances.

b. Pump Sectional drawings with all components and materials of construction identified.

c. Sole plate drawings.

d. Pump intake barrel drawings.

e. Characteristic Pump Curves: Curves shall show the capacity, head, minimum continuous stable flow (MCSF), preferred operating range (POR), best efficiency

point (BEP), allowable operating range (AOR), efficiency, required NPSH, and brake horsepower throughout the operating range of the pump from shut-off to maximum specified operating capacity. Overlay the system curves included in Appendix A. Submit curves with the above data at speeds of 60 to 100 percent. Characteristic curves shall have the capacity plotted as abscissa and the operating head, brake horsepower, efficiency and required NPSH plotted as ordinates. Provide four quadrant curves, if available, and WR^2 for the pump. In the event four quadrant curves are unavailable for the specific pump being proposed, the Owner may consider allowing the submittal of four quadrant curves based on other similar pumps.

f. Data Sheet: Submit information requested on the Data Sheet (for both the pump, Attachment A, and motor, Attachment B).

g. Pump speed vs. torque curves for applicable starting conditions. This information should be provided with the submittal package and updated after factory performance testing is complete.

h. Pipe layout drawings for drainage and seal piping.

i. Weights, including “wet” and “dry” weights of equipment, shipping weights and dimensions, and center of gravity for lifting.

j. Bearing information, cut sheets, plan and section, data sheets, and bearings life calculations for pump and motor.

k. Name plate data sheets.

l. Identify sequence and tags for terminal strips and wiring.

m. Submit drawings of lab testing set-ups, test procedures, testing equipment calibration certification, and sample performance calculations.

n. Provide a description of the components that will be shipped separately, thus requiring field assembly. Provide a general description of the installation requirements, including sequence and installation tolerances.

o. Submit motor documentation as required per Paragraph 2.02.I. Incomplete data submitted will not be reviewed and will be returned “Not Approved, Revise and Resubmit.”

p. Provide a copy of the Equipment Manufacturer’s quality system registration to ISO 9001:2015.

q. Provide resume of the Equipment Manufacturer’s proposed representative for field services.

r. Provide an updated plan and a schedule indicating dates for submittals, manufacturing, testing, and delivery.

s. Provide a quality control plan that indicates materials and components included in the pump, the quality control procedure, and whether a Certified Test Report will be provided to the Engineer.

D. Operation and Maintenance Manuals:

1. Submit manuals with instructions for installation, adjustment, lubrication, operation and maintenance of the equipment in accordance with Section 01 33 00 “Document Management” and Section 01 33 04 “Operation and Maintenance Data.”

2. Manuals shall be prepared by the Equipment Manufacturer and shall incorporate storage and installation instructions, operation and maintenance procedures, appropriate final Shop Drawings, Certified Test Reports, certified performance curves, and test data. Manuals shall include nameplate data including serial numbers. Provide O&M data for all pump, motor, and accessories. Provide set points for vibration sensors, motor thermal switches, and all other protection devices. Manuals may be manufacturer’s standard instructions but shall be supplemented as necessary to cover any special feature not included in standard material. Submit preliminary manuals for review prior to delivery of the equipment. Separate or combined manuals may be provided for the pump and motor. Draft manuals shall be in electronic format. Final manuals shall be in hard copy and electronic format.

E. Certified Test Reports:

1. Submit the following Certified Test Reports (CTR) for pump and motor at the time of factory pump performance test. Shipment shall not be made without written approval of test data by the Engineer, except at the risk of the Equipment Manufacturer.

   a. Provide CTR for pump factory performance tests.

   b. Provide CTR for motor factory performance tests.

   c. Provide CTR for non-destructive testing of bowl and impeller castings.

   d. Provide CTR for metallurgical analysis of castings and shafting.

   e. Provide CTR for bowl hydrostatic tests.

   f. Provide CTR for pump concentricity and parallelism machining measurements.

   g. Provide CTR for stress relieving of components.

   h. Provide CTR for pump coatings (DFT and holiday test).

2. Submit the following Certified Test Reports for pump and motor at the time of installation and field pump performance test.

   a. Provide CTR for sole plate level measurements.

   b. Provide CTR for barrel mounting flange level measurements.

   c. Provide CTR (with EIR) for pump field tests.

   d. Provide CTR (with EIR) for motor field tests.

F. Equipment Installation Report (EIR):

1. Submit Equipment Installation Reports from the motor manufacturer, pump manufacturer, indicating the equipment was installed in accordance with the manufacturers’ instructions and that the equipment was adjusted and aligned to be in the best operating condition.

2. The report shall indicate that the equipment is operating satisfactorily in accordance with the Specifications.

1.05 STANDARDS

A. The applicable provisions of the following standards (latest edition unless otherwise indicated) apply as if written here in their entirety:

1. American Water Works Association (AWWA):

a. AWWA C210 – Liquid Epoxy Coating Systems

b. AWWA E103 – Horizontal and Vertical Line-Shaft Pumps

2. American National Standards Institute (ANSI):

a. ANSI B16.1 – Cast Iron Pipe Flanges and Fittings

b. NSF/ANSI Standard 61 – Drinking Water System Components – Health Effects

c. NSF/ANSI Standard 372 – Drinking Water System Components – Lead Content

3. Hydraulic Institute Standards (ANSI/HI):

a. All applicable sections for Centrifugal and Rotodynamic Pumps

4. ASTM International (ASTM):

a. ASTM A27 – Standard Specification for Steel Castings, Carbon, for General Application

b. ASTM A36 – Standard Specification for Carbon Structural Steel

c. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

d. ASTM A48 – Standard Specification for Gray Iron Castings

e. ASTM A216 – Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service

f. ASTM A276 – Standard Specification for Stainless Steel Bars and Shapes

g. ASTM A283 – Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

h. ASTM A345 – Standard Specification for Flat-Rolled Electrical Steels for Magnetic Applications

i. ASTM A351 – Standard Specification for Castings, Austenitic, for Pressure-Containing Parts

j. ASTM A479 – Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels

k. ASTM A487 – Standard Specification for Steel Castings Suitable for Pressure Service

l. ASTM A536 – Standard Specification for Ductile Iron Castings

m. ASTM A564 – Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes

n. ASTM A582 – Standard Specification for Free-Machining Stainless Steel Bars

o. ASTM B271 – Standard Specification for Copper-Base Alloy Centrifugal Castings

p. ASTM E689 – Standard Reference Radiographs for Ductile Iron Castings

q. ASTM E802 – Standard Reference Radiographs for Gray Iron Castings up to 4 1/2 in. (114 mm) in Thickness

5. American Society of Mechanical Engineers (ASME):

   a. Section V – Nondestructive Examination

   b. Section VIII – Pressure Vessels

   c. Section IX – Welding, Brazing, and Fusing Qualifications

6. American Petroleum Institute (API):

   a. API 610 – Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries

7. International Standards Organization (ISO):

   a. ISO 21940-11:2016 – Mechanical vibration -- Rotor balancing -- Part 11: Procedures and tolerances for rotors with rigid behavior

   b. ISO 9001:2015 – Quality Management systems – Requirements

8. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS):

   a. SP-55 – Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components, Visual Method for Evaluation of Surface Irregularities

9. National Electrical Manufacturers Association (NEMA).

10. Institute of Electrical and Electronic Engineers (IEEE).

11. National Electrical Code (NEC).

12. Underwriters Laboratories (UL).

1.06 DELIVERY AND STORAGE

A. The pumping units (pumps, column, shafts, couplings, and head) may be assembled for shipment when the size allows for one unit to be shipped on one truck. The bowl assemblies (bowls, suction bell, impellers, pump shaft, and pump bearings) can be shipped assembled only if measures are taken to prevent any damage to the pump and components. Assembled pumps must be shipped with an accelerometer.

B. Pump assemblies and motors shall be shipped with sealed accelerometer devices (horizontal and vertical) in good working order for determining excessive impact during transit and handling. Devices shall be mounted to the bowl assembly. Devices shall be read in presence of carrier, Contractor, Owner, Owner's representative, and Equipment Manufacturer. Any readings in excess of 2g or a malfunctioned accelerometer shall result in return of the equipment to the factory for full disassembly, inspection, testing, and repeat of the performance testing as directed by the Owner's representative.

C. Openings shall be covered in a manner to protect the opening and interior. Provide steel plugs at threaded openings. Do not use non-metallic plugs or caps.

D. Coat exterior machined surfaces with rust preventative.

E. Identify lifting points and lifting lugs on equipment or equipment package. Identify recommended lifting arrangement on boxed equipment.

F. Manufacturer shall be responsible for delivery of the pumps, drivers, and accessories, to the job site in good condition and undamaged. Equipment may be delivered prior to time of installation to a storage site as may be designated by the Contractor and approved by the Owner's representative in good condition and undamaged. The manufacturer shall submit a shipping notice and storage and installation instructions at least 1 week prior to shipment.

G. Unloading and storage of the equipment shall be the responsibility of the Contractor who shall inspect the equipment for apparent damage. Equipment which is found to be damaged will not be accepted until properly repaired or replaced by the manufacturer.

H. The pumps, motors, and accessories shall be stored indoors, and the motor space heaters shall be energized upon delivery. If motors are to be stored for longer than 14 days, the oil reservoirs should be filled. Contractor shall rotate the motor rotor and pump impeller by hand several rotations each week until the pumping unit is placed into service.

I. Pumps and motors shall be shipped and stored per these Specifications and the manufacturer's recommendation.

J. Shipping and storage crating provided by the pump supplier shall allow the impeller assembly shaft to be rotated periodically. Manufacturer shall make recommendations for rotation frequency and procedure.

K. Spare parts shall be shipped and suitable for long term storage at a location designated by the Owner.

L. Furnish anchor bolts, intake barrel, sole plate as necessary to meet the Contractor's schedule.

1.07 EQUIPMENT WARRANTY

A. Equipment Manufacturer shall warrant the equipment furnished under this Section for a period of 2 years against defects in materials and workmanship, equipment design, and operational failure.

B. In the event of failure in material, workmanship, or equipment design of any part or parts of the equipment during the warranty period, and provided that the equipment has been operated and maintained in accordance with good practice, the Equipment Manufacturer shall furnish, deliver, and install a replacement for the defective part or parts at its own expense. During the warranty period, the Contractor will remove and load the Goods on a vehicle provided by the Equipment Manufacturer if it is necessary to return the Goods to the Equipment Manufacturer for correction of defects during the Warranty Period. Contractor will reinstall the Goods when they are returned to the Site after defects have been corrected. Equipment Manufacturer is to provide all parts, labor and incidental cost for making repairs, shipping the Goods to the Site and providing startup services in accordance with the Specifications.

C. The warranty period shall be interpreted as the 12-month period following the installation, adjusting and acceptance testing, and the start of actual operation of the equipment or 24 months after complete delivery, whichever occurs first.

1.08 PUMPING CRITERIA, PERFORMANCE REQUIREMENTS, AND SETTING

A. General Criteria:

1. Liquid to be pumped is potable water with chlorine/chloramine residual.
2. The pumps will pump from a closed suction barrel and be supported on a sole plate spanning the suction barrel. The suction barrels will be filled with water with submergence equal to the water elevation in the wetland pool minus minor losses in the suction pipe. Each pumping unit will be installed in existing barrels that were installed as part of the original pump station construction in 2013 (See Appendix D for Existing Pump Barrel Shop Drawings).
3. The pumps shall have product lubricated bearings.
4. Pumps will be started against a check valve and partially open (+/- 5 percent) butterfly valve. The butterfly valve will open and close slowly (approximately 5 minutes per cycle). During power failure, the check valve will quickly close to prevent reverse flow through the pump.
5. In the event of power or pump failure, water from the system will flow in reverse through the pumps while the check valve is slowly closing. The motor manufacturer shall supply a non-reverse ratchet and provide certification that the pump and motor are designed to withstand forces caused by reverse flow through the pump.
6. The pumps will be varied by a VFD controller and will operate for extended periods of time at speeds from 60 to 100 percent of the rated synchronous motor speed. Pumps may be operated at different speeds simultaneously. The exact speed range will be verified upon submittal of pump curves. Motor manufacturer shall confirm that operation in low speed ranges is acceptable or shall provide supplemental lubrication and motor cooling as necessary to allow operation in the low speed ranges.
7. The pumps will be started with a VFD which will ramp from 0 to 60 percent speed in about 5 to 10 seconds, thus filling the pump column with water. The pump discharge piping will have a flanged outlet for an air valve assembly which will release air at pump startup and allow air into the pump column when the pump stops.
8. The design of the pumping units shall be compatible with the mode of operation as set forth in Section 26 29 23 “Variable Frequency Drives.”
9. Pump shall operate alone, as well as in parallel with other pumps. The system curves in Appendix A show the maximum and minimum system heads at which the pumps will operate.
10. The pumping heads tabulated below are total dynamic heads (TDH) under field conditions and are inclusive of all pump losses from suction bell to pump discharge. The more explicit definition is “Pump Total Head” as defined by ANSI/HI 14.6, Table 14.6.1.3a, Row 3.1.31. The Total Discharge Head component of the Total Head calculation shall be understood as the head produced at the discharge flange of the pump as installed in the field. The heads shown in Paragraph 1.08.C are not “Bowl

Assembly Total Heads" as measured in a factory performance test (as defined by ANSI/HI 14.6, Table 14.6.1.3a, Row 3.1.31.1). "Bowl Assembly Total Heads" shall require the addition of calculated losses which are not accounted for in the test procedure (i.e., column losses, drive-shaft bearing losses, suction basket, etc.) in order to produce the correct value for the Pump Total Head in accordance with the Hydraulic Institute Standards.

11. It is desired that the pump has its highest efficiency at or slightly to the right of the Rate Point shown in the Performance Requirements table below. A pump with a BEP to the left of the rate point will not be accepted. In addition, the efficiency at the minimum and maximum operating heads may be used in evaluating the pumps.
12. Pumps shall have a continuously rising performance curve from pump run-out to shutoff head, with no intermediate flat places.
13. Horsepower requirements cannot exceed 95 percent of nameplate motor horsepower when operating at any head between shutoff and minimum specified operating heads.
14. All wetted materials shall be designed for drinking water contact and shall meet the intent of NSF/ANSI 61 and NSF/ANSI 372. Leaded bronze materials shall not be used.
15. The weight of each motor and the fully-assembled pump (exclusive of motor) shall not exceed 3 Tons. This weight limitation allows assembly and disassembly of the pumping units with the bridge crane rated capacity. Additionally, the maximum hook height is approximately 16.5 feet measured from the finished floor elevation, and the pumping units shall be designed to allow assembly and disassembly of the pumping units with the bridge crane capacity and hook height, including the rigging.

B. Performance Requirements:

1. The tabulations below show the required flows and various head conditions at which the pumps must operate and the pump setting requirements. See Appendix A for System Curves.

PUMPING CONDITIONS AT FULL SPEED (U.N.O.)	**RRUPP-P6**
Capacity at Rated Head 1, (gpm) (full speed)	1850
Rated Head 1, (ft) (full speed)	166
Minimum Capacity at Duty Point 2, (gpm) (reduced speed)	1104
Head at Duty Point 2, (ft) (reduced speed)	135.9
Maximum Shut-Off Head, (ft)	303
Maximum Operating Head, (ft) (full speed, w/in POR)	213
Minimum Operating Head, (ft) (full speed, w/in POR)	140
Impellers	Ni Al Bz

PUMPING CONDITIONS AT FULL SPEED (U.N.O.)	RRUPP-P6
Available Minimum Submergence of Suction Bell, (ft)	5.50
Line Shaft (Open or Enclosed)	Open
Line Shaft Bearings	Rubber
Line Shaft Lubrication	Product
Motor Voltage	460
Motor Enclosure	
Maximum Motor Horsepower, (HP)	125
Maximum Motor Speed, (RPM)	1770
Maximum Number of Stages	4
Maximum Suction Specific Speed	12,000
Preferable Maximum Impeller Specific Speed	4,000
Minimum Speed (% of max rated)	95
Minimum Pump Efficiency at Duty Points (%)	
Full Speed Rated Point 1850 gpm @ 166' TDH	80%
Reduced Speed Duty Point #1, 1104 gpm @ 139.5' TDH Manufacturer to Confirm Speed	80%

2. Pumps shall meet the flow and head at the rated points. There are also other duty points with specified head requirements that shall be met as shown on the Pump Curve Exhibits, attached as Appendix A. The pump efficiencies will be evaluated at the specified heads shown in the table.

C. Pump Setting Requirements:

PUMP SETTING REQUIREMENTS	RRUPP-P6
Ex. Elev. Pump Station Operating Floor, (ft)	503.00*
Elev. Pump Discharge Centerline, (ft)	506.50*
Ex. Elev. Bottom Pump Suction Bell[1] (w/o Suction Screen), (ft)	491.00*
Pump Discharge Diameter (I.D.), (in)	12
Existing Parameters for Pump in Barrel	
Ex. Elev. Barrel Flange[1], (ft)	503.83*
Ex. Elev. Pump Barrel Intake Pipe Centerline, (ft)	495.00*
Ex. Pump Barrel Intake Pipe Diameter (I.D.), (in)	18*

PUMP SETTING REQUIREMENTS	RRUPP-P6
Ex. Elev. Bottom of Barrel, (ft)	489.75*
Ex. Pump Barrel Diameter (O.D.), (in)	24*
*To be confirmed by Contractor prior to shop drawing submittal	

1. Elevation of suction bell to be confirmed by Equipment Manufacturer and determined during pump submittal phase.
2. Manufacturer to field verify sole plate opening diameter and mounting bolt circle diameters and determine suitability for proposed pumping unit.

D. The pump shall have suitable Net Positive Suction Head Required (NPSHR). Note that NPSHR is defined as the 3 percent head drop net positive suction head requirement. The NPSH margin, (i.e., ratio of NPSHA to NPSHR) shall be consistent with the suction energy conditions as defined by the HI standards. Minimum margin shall be 10 percent within POR, or 5 feet, whichever is greater. The NPSHR with the margin applied within POR shall be less than the NPSHA with the minimum suction water level as shown in the pump setting table.

2.00 PRODUCTS

2.01 PUMPS

A. General:

1. Pumps shall be line shaft type, single or multi-stage vertical turbine or flow pumps with above floor discharge. The pump shall have product lubricated shaft bearings with an open line shaft. The pumps shall have enclosed impellers.
2. Pumps shall be designed, manufactured, inspected and tested in accordance with the applicable requirements of AWWA E103, the Hydraulic Institute Standards and special requirements of this Section.
3. The down-thrust load imposed on the impellers and line shaft will be carried by the upper thrust bearing of the motor, which shall be designed for the maximum load imposed. The impellers may be thrust balanced at the option of the manufacturer to assure the adequacy of the motor bearings to carry the load.
4. If an up-thrust load occurs at any specified pumping condition, including pump startup, the pumping units shall be designed to withstand the worst-case load without any damage to the units. Equipment Manufacturer shall make such measurements during the factory tests to determine that no damaging up-thrust condition exists and shall be responsible for correcting such problems that may occur.
5. Pumps shall be designed, manufactured, and installed to meet all requirements of the ANSI/HI 9.6.4-2016 standards for “Allowable Field Vibration Limits” except as modified below:
    a. For Pumps < 268 HP:
        1). Pumps shall have less than 0.10 in/sec RMS unfiltered in the x, y and z direction when measured at the bottom motor flange.

2). Pumps shall have less than 0.15 in/sec RMS unfiltered in the x, y and z direction when measured at the top of the motor upper bearing housing.

b. For Pumps > 268 HP:

1). Pumps shall have less than 0.13 in/sec RMS unfiltered in the x, y and z direction when measured at the bottom motor flange.

2). Pumps shall have less than 0.19 in/sec RMS unfiltered in the x, y and z direction when measured at the top of the motor upper bearing housing.

c. These limits shall apply anywhere within the preferred operating range of the pump and at the full and variable rotational speed. The limits shall not be exceeded by more than 30 percent outside of the preferred operating range but within the allowable operating range.

d. Variable speed pumps shall operate over their specified speed range without exceeding the higher vibration limit specified above.

6. The pump supplier shall stress relieve all fabricated components, column pipe, and discharge head prior to final machining in accordance with ASME Code, Section VIII, Division 1, ASME Code Section IX, and API Standard 610.

B. Bowl Assembly:

1. Bowls:

a. The suction bell and pump bowls shall be of cast iron, ASTM A48 Class 30; cast ductile iron, ASTM A536; or cast steel, ASTM A27 Class 65-35 or ASTM A216 Grade WCB. Castings shall be free of blow holes, sand holes, or other detrimental defects, with smooth water passages. The top case, impeller case and suction bell shall be located by a register fit for ease of re-assembly and to maintain alignment during operation. All bowl flange fasteners shall be stainless steel.

2. Bearings:

a. The lower bowl shall have a suitable suction bell and permanently sealed grease lubricated lower bearing. Bowl assembly shall have a shaft bearing above and below each impeller. Bearings shall be bronze, ASTM B271 Alloy C93200.

b. The lower bowl shall have a suitable suction bell and a sealed grease lubricated lower bearing. Bowl assembly shall have a shaft bearing above and below each impeller. The bottom bowl bearing shall be bronze, ASTM B271, alloy C93200. A grease line shall feed the bottom bowl bearing and shall be pressurized from a weighted grease cylinder in the pump room. The grease cylinder shall contain a minimum of 30 days usage of lubricant.

1). The bearing system between the top impeller and the bypass port shall support the shaft and provide pressure relief so that the oil tube is not pressurized. Provide a throttle bearing material and shaft journal system that will protect against rapid erosion by grit suspended in the pumped liquid during pressure breakdown across the bearing system. For the top bowl bearing and intermediate bearings between stages, the pump manufacturer shall furnish bearing and journal materials that have longer life than standard bronze bearing

and stainless steel shaft. Include references and case studies that confirm requirements have been met.

3. Wear Rings and Bowl Liners:

    a. Bowls for enclosed impellers shall be fitted with renewable wear rings at the running joints between the impeller and bowl. Rings shall be securely attached or doweled to prevent rotation in their seats.

    b. Bowls for semi-open or axial flow impellers shall be fitted with renewable bowl liners and wear rings at the running joint(s) with the impeller.

    c. Wear rings shall have straight face only, no L-shaped rings will be allowed.

    d. Wear ring material shall be 400 Series stainless steel and compatible with the stainless steel impeller material and shall be an alloy with a Brinell hardness of 100 points greater than the impeller wear rings.

C. Rotating Assembly:

1. Impeller Shaft: The impeller shaft shall be stainless steel, rotary stress relieved, ASTM A479 Type 410 Condition 1, ASTM A582 Type 416, or ASTM A564 Type 17-4PH. Keyways in the shaft shall be provided with Type 410 stainless steel keys that shall properly space the impellers on the shaft and transfer thrust and torsion loads from impeller to shaft. Assemble using anti-seize compound on fasteners as necessary to prevent galling.

2. Impellers:

    a. Impellers shall be of strong dense castings free of structural defects with uniform thickness of vanes and shrouds. They shall have smooth water passages for high efficiency and shall be statically and dynamically balanced. Perform a single or two plane dynamic balance to ISO 21940-11 Balance Grade G2.5 or better.

    b. Balancing shall be on the impeller hub only. Do not thin the shroud or vanes.

    c. Thinning of the shroud shall be allowed only when uniform and spread over as wide an area as possible. An engineering evaluation shall be made by the manufacturer as to the amount of thinning which can be done and still preserve the integrity of the casting. In no case shall the thickness of the shroud be less than this value.

    d. Impellers shall be of cast nickel aluminum bronze, ASTM B148 C95800.

    e. Impellers shall be enclosed type design.

    f. Welding on the raw castings will be allowed as long as the proposed repaired defect is within allowable standards and prior to any machining, polishing, and/or balancing. Welding, fillers, or coatings for head, flow, and/or efficiency performance reasons will not be allowed. Notify the Owner's representative prior to making major repairs on the impeller. Major repairs are defined as those that are: 1) > 20 percent of material thickness; 2) 1 inch or greater in depth; or 3) exceed 10 square inches. Submit welding procedures and welder qualifications prior to welding on impeller castings. Welders must be qualified to ASME Section IX.

3. Wear Rings:

    a. Enclosed impellers shall be fitted with renewable wear rings at the running joints with the bowl. Rings shall be securely attached or doweled to prevent rotation in

their seats. Wear rings shall have straight face only, no L-shaped rings will be allowed. No spin cast rings will be allowed. Wear rings shall be forgings.

b. Wear ring material shall be 400 Series stainless steel and compatible with the stainless steel impeller material and shall be an alloy with 100 points Brinell softer than the bowl wear rings.

c. Semi-open or axial flow impellers shall be machined to the exact contour of the bowl liner surface.

D. Open Line Shaft and Bearings:

1. Shaft:

a. Line shaft and couplings shall be stainless steel, rotary stress relieved, ASTM A479 Type 410 Condition 1, ASTM A582 Type 416, or ASTM A564 Type 17-4PH, of size conforming to AWWA E103 and shall be furnished in interchangeable sections with lengths not greater than 10 feet. Shafts shall have butting faces, machined square to the axis of the shaft to ensure accurate alignment.

b. The top line shaft section shall have a stainless steel shaft packing sleeve where it passes through the shaft seal and bushing. The shaft sleeve shall be Type 410 stainless steel and shall be 50 points Brinell greater hardness than the shaft, minimum.

c. Assemble using anti-seize compound on fasteners to prevent galling.

d. Shafting shall be straight to within 0.003-inches TIR at any point along the length of the shaft. Any shaft not meeting this requirement shall be replaced. Repairing or straightening shafts shall not be allowed.

2. Couplings:

a. Shaft couplings shall be designed with a safety factor of 1.5 times the shaft design strength.

b. Couplings for shafts shall be the split ring key type couplings to prevent loosening from reverse or forward torque of the shaft. Couplings may be threaded for shafts less than 2.5 inches in diameter. Cross pin and thrust stud type couplings shall not be allowed.

c. All parts shall be stainless steel, and threaded parts shall be assembled using an anti-seize compound.

3. Bearings:

a. Line shaft bearings shall be cutless rubber, Neoprene 65 shore, and shall be bronze backed marine style with low swell rubber compound. Pop-in or glue-in bearings are not acceptable.

b. Bearings shall be lubricated with the liquid being pumped and mounted securely in bearing retainers which are integrally welded to the column at each top column flange. The bore of the integrally welded bearing retainer shall be machined concentric to the column flange registers and perpendicular to the flange faces.

E. Pump Column:

1. Column pipe material shall conform to ASTM A53.
2. The column pipe shall be such that the friction loss does not exceed 5 feet per 100-feet of column at the rated capacity of the pump. Column pipe 24 inches in diameter and larger shall have a minimum wall thickness of 0.5-inches. Column pipe less than 24 inches in diameter shall have a minimum wall thickness of 0.375 inches. The pipe shall be furnished in interchangeable sections of not more than 10-foot lengths.
3. Column pipe shall be connected with flanged type connections using stainless steel bolts and nuts with hardened washers on both ends, and anti-seize compound. Column flanges shall have an O-ring suitable for pump shut-off pressure. O-ring groove shall be on the upward facing flange of each segment.
4. Column pipe shall be stress relieved with heat prior to machining of flanges and shaft retainers.
5. The ends of each flanged section shall be faced parallel and machined accurately with register fit to ensure proper alignment when assembled. Concentricity of shaft bearing to column flange register fit shall be 0.005 inches TIR or manufacturer's recommended tolerance, whichever is less. Parallelism of column pipe shall be 0.005 inches TIR or manufacturer's recommended tolerance, whichever is less. All flange registers shall be identical so that any section of column and shaft can be installed in any location in the column.
6. For column pipe 24 inches in diameter or larger, include two combination lifting lugs and support pads welded on all column sections. Lifting lugs and support brackets on each column section shall be capable of supporting the full weight of the pump assembly including the discharge head.

F. Discharge Head Assembly:

1. Discharge head assembly material shall conform to ASTM A36, A283 or A53.
2. The horizontal discharge shall be located above the pump base and shall terminate with an AWWA C207 standard flange end, as shown in Appendix D. Coordinate with discharge piping. Discharge shall be drilled and tapped for 1-inch pressure gauge connection. Design the discharge head and flange to withstand shut-off head of the pump.
3. The 90-degree elbow shall be designed to minimize turbulence and pressure drop and shall consist of at least three miter sections.
4. Pump base shall be machined flat and perpendicular to the shaft centerline on the bottom and designed to support the pump and driver and attach to an appropriate sole plate.
5. Machine flange faces to be parallel to within 0.005 inches TIR or manufacturer's recommended tolerances, whichever is less. Machine motor, stuffing box, and column flange registers to be concentric to within 0.005 inches TIR or the manufacturer's recommended tolerances whichever is less.
6. Stress relieve head fabrications with heat prior to machining.

G. Sole Plate:

1. Provide a steel sole plate of material matching the discharge head for anchoring to the structure with appropriate size opening to remove the pump. Pump base will attach to the sole plate. Furnish top O-ring gasket and stainless steel bolts to attach the pump base to the sole plate and assemble with anti-seize compound. O-ring shall be suitable for 50-psi pressure.

2. The top surface of the sole plate mounting flange shall be sufficiently flat to allow the Contractor to level these surfaces to within 0.002 inches per foot of diameter. Provide sole plate jacking bolts to assist the leveling process. Design jacking bolts so they can be removed after the grout has cured. Provide sufficient instruction to the Contractor so that the leveling process is accomplished without undue trouble. After installation, the sole plate flange shall be level within 0.002 inches per foot of diameter. If this is not the case, then the manufacturer shall re-machine the sole plate flange in the field to be within 0.002 inches per foot of diameter or shall replace the sole plate.

3. Drill the sole plate to receive a suitable number of foundation bolts as shown on the Drawings. Provide stainless steel foundation bolts.

4. The sole plate thickness shall be a minimum of 2 inches. Evaluate the thickness, dimensions and additional reinforcement required for the installation as part of the pump design analyses specified above. In no case will the slab opening size be modified. Include proposals for revised base plate dimensions with Shop Drawings.

5. If additional reinforcing is welded to the sole plate, provide stress relief of the sole plate prior to drilling of holes.

H. Shaft Seal:

1. For open line shaft pumps, provide the discharge head with a renewable bronze bushing, ASTM B271, Alloy C93200, a replaceable stainless steel shaft sleeve keyed to the shaft with an O-ring seal between the shaft and the sleeve, and a shaft seal and ASTM A48 cast iron bleed-off style packing box with split bronze packing gland and bronze gland bolts. Provide 5/8-inch minimum Rains-Flow Granulated, Flowable Metallic (GFM) tin based packing material or approved equal.

I. Motor Stand:

1. Provide a motor stand above the discharge head to support the motor above and the pump below. The motor stand may be an integral part of the discharge head or a separate stand bolted to the pump base of material matching the pump base. Provide a motor stand with openings with heavy duty hinged stainless steel guard screens on opposite sides to permit access to the shaft seal, lubrication connections and shaft coupling.

2. Machine the base plate bearing surface, stuffing box mounting surface, and motor flange surface parallel to one another and perpendicular to the shaft axis. Machine the column and stuffing box aligning registers concentric to one another and the shaft axis. Stress relieve the motor stand with heat prior to final machining.

3. Provide four heavy duty jack bolts on the motor stand for pump/motor shaft alignment purposes. Provide stainless steel bolts for bolting motor to motor stand.

4. Provide 3/4-inch minimum drain connection and facilities to completely drain all packing discharge and all water which collects in the motor stand. Adequately slope motor base to drain so the water does not pond. Non-shrink grout may be used in the motor base to provide a sloped bottom.

5. Provide connections for the motor bearings cooling systems (if required). Provide pressure regulating or flow control valves. Field piping will be furnished and installed by the Contractor.

J. Motor Couplings: Motor to pump coupling for solid shaft motors shall be a three-piece rigid adjustable coupling for adjusting the impeller setting. Zinc plate or anodize the non-machined coupling parts to reduce corrosion. Provide aligning registers on mating surfaces on coupling components. Furnish all coupling bolts, nuts, washers and keys.

K. Pump Painting:

1. The pumping unit, except for the exterior of discharge head and interior of bowl, shall be painted (interior and exterior) per System No. SS-5 as specified in Section 09 96 00.01 "High-Performance Coatings." The prime coatings and the final coat shall be shop-applied prior to shipment. Discharge head (exterior) shall be painted per System No. SS-2 as specified in Section 09 96 00.01 "High-Performance Coatings." The prime coatings shall be shop-applied prior to shipment and the final coat shall be field-applied prior to installation to match adjacent piping. Between the prime coat and intermediate coat, apply a separate stripe coat on all angles, edges, welds, and bolted connections where coating film build will be reduced. Color of the exposed sections shall be matched to adjacent piping.

2. Coat interior of pump bowls with a ceramic epoxy coating to enhance pump efficiency. Prepare surface to SSPC-SP 5 minimum, or as recommended by the coating manufacturer. Prime and finish coat shall be 10 mils each DFT Belzona 1341 NSF efficiency enhancement coating system for potable water.

3. Holiday test all coatings using high voltage spark testing at a maximum voltage of 125 volts per mil. Wet sponge holiday testing will not be acceptable.

L. Pump Marking and Nameplates:

1. Pump and motor shall each have a standard manufacturer's stainless steel nameplate securely affixed with tapping screws in a conspicuous place, showing the ratings, speed, rotation direction, serial number, model number, manufacturer, and other pertinent data. Pump nameplate shall include impeller setting data if applicable. Nameplate must be on vertical section of pump head.

2. Provide a nameplate with the pump tag number at a readily visible location on the pump head opposite the discharge outlet. Use polymer nameplates, white with black lettering, and attach with stainless steel screws. Lettering is to be minimum 3-inches tall. Provide Safe-T-Mark by Rowmark or equal.

3. Pump column sections and shafts shall be marked to indicate the installation sequence.

2.02 460-VOLT MOTORS

A. General:

1. Motors shall be vertical, air cooled, solid shaft, copper wound stator, NEMA design B, random wound, copper bar rotor construction, squirrel cage induction type. Motors shall be designed for use with variable frequency drives and across-the-line starters.
2. Motors shall be of a premium efficiency design and rated for inverter duty in accordance with MG-1, Part 31. The variable speed pumps will be varied by a VFD motor controller and will be operated for extended periods of time at speeds from 60 to 100 percent of rated synchronous motor speed.
3. The VFD and motor shall be completely compatible electrically. VFD manufacturer and motor manufacturer shall together issue a letter of compatibility at the time Shop Drawings are submitted. The VFD and motor manufacturer shall determine the insulation voltage rating required to accommodate common mode voltages and prevent insulation failure.
4. Horsepower nameplate rating of motor, at the 1.0 service factor, shall be equal to or greater than the total horsepower requirement of the pump when operating at any head between maximum and minimum specified operating heads as specified in Paragraph 1.08.A, including power requirements for bowl assembly, column and line shaft bearing loss, and motor thrust bearing loss from pump load. Motor shall have a service factor of 1.15 and shall be designed and manufactured in accordance with applicable provisions of the latest NEMA Standard Publication for Motors and Generators, MG-1 Part 20, subject to modifications and additions as herein set forth.
5. The locked rotor torque and breakdown torque shall not be less than shown in NEMA MG-1 20.10.
6. The locked rotor KVA/HP shall not exceed NEMA code Letter G, 6.29 KVA/HP.
7. Motor shall have a sound power level of no more than 85 dBA average at 1-meter (3.3 ft) distance when measured per IEEE Std. 85 “Test Procedure for Airborne Measurements on Rotating Electrical Machinery.”
8. Rotor shall be precision balanced to within an amplitude, peak to peak, in accordance with the requirement of NEMA MG-1.
9. Rotor bars and end rings shall be copper or copper alloy (no substitution). The rotor bars shall be swaged. The end rings shall be joined to the rotor bars by high frequency induction brazing. The rotor cores shall be held together by through-bolts and end plates.
10. The stator shall have all connections brazed with silver brazing alloy. The stator shall be braced and supported to eliminate any detrimental winding movement.
11. Motor shall be rated at 480 volts, 3 phase, 60 Hertz.
12. Motor efficiency shall not be less than 95 percent and (uncorrected) power factor not less than 85 percent when operating at maximum speed, full load, and rated voltage and frequency.

13. Motors shall be capable of bringing the pumps up to speed with a closed control valve and 80 percent of rated voltage.
14. The motor leads shall have the same insulation level as the motor.
15. Motors shall be painted in the factory with two coats of manufacturer's standard exterior enamel. Furnish touch-up paint for the Contractor's use. Motor color shall be selected by the Owner.
16. Motors shall be provided with non-reverse ratchets.
17. Motor shall be rated for VFD use.

B. Enclosure: Motor enclosure shall be Weather Protected NEMA Type I as indicated in pumping conditions schedule and in accordance with NEMA MG-1. Arrange air discharge louvers to direct air in an upward/outward direction. Air intake shall be at the front of the motor (pump discharge side). Provide adequate circulation for all operating speeds and loads.

C. Insulation:

1. Motor windings shall be full Class F insulated. After stator assembly, the stator assembly shall be sealed vacuum-pressure impregnation (VPI) of epoxy resin. The stator shall receive two VPI treatments, each treatment consisting of a dip followed by an oven bake. After the final cure, the stator assembly shall receive a final (third) coating of a durable epoxy varnish to further protect against dust, moisture, and chemical degradation. The windings shall comply with the latest applicable provisions of NEMA MG 1, and end winding coils shall be braced to limit displacement to no more than 5.0 mils under any condition of starting or running.
2. Motor shall operate continuously at rated voltage and frequency (6 to 60 Hz) at 50 deg. C ambient temperature, with a temperature rise not to exceed both.
    a. A Class B rise (70 deg. C), per NEMA MG-1 20.8 measured by resistance at a 1.0 service factor when operating at 100 percent of the nameplate rated horsepower.
    b. And a Class B rise (80 deg. C) per NEMA MG-1 20.8 measured by embedded resistance temperature detector (RTD) at a 1.0 service factor when operating at 100 percent of the nameplate rated horsepower.
3. Insulation shall be capable of preventing failure as a result of common mode voltages.

D. Bearings:

1. Motor bearings shall be designed for the maximum load imposed by the pump and motor and shall be selected for a 5-year minimum life and a 25-year average life as defined by the AFBMA. Bearings shall be insulated as necessary to prevent shaft-bearing-frame current. Insulating means shall also be provided for any oil-supply connections and monitoring equipment to prevent electrical bypassing of the bearing insulation.
2. Thrust bearing on top of motor shall be of the anti-friction with oil reservoir and other necessary appurtenances. Lower radial guide bearings shall be oil-lubricated, anti-friction with oil reservoir. Thrust bearing shall be of the air-cooled type.

E. Motor Terminal Box:

1. Motor terminal box shall be suitable for terminations without exceeding the minimum bending radius of the conductors per the National Electrical Code.

2. Motor terminal box shall be oversized to accept the following without exceeding the minimum bending radius of the conductors per the National Electrical Code:

   a. 125 HP Motor: one sets of 3-#4/0 per phase, #3 ground conductor (3”-inch conduits).

3. Motor terminal box shall be NEMA Type II with motor leads landing on three-phase, insulated bus drilled with NEMA 2-hole pads to terminate the feeder cables. Direct cable-to-cable connections shall not be permitted. Motor terminal box shall be located 90 degrees clockwise from the pump discharge. Bottom and front of box shall be removable. Motor terminal box shall receive motor cables from the bottom. Terminal box shall be adequately insulated to prevent excessive vibration.

4. Terminal box size, position, and layout shall be submitted to the Owner’s representative for review and approval.

F. Accessories Terminal Boxes:

1. Motor shall have accessory leads from space heaters and Thermal Switch terminated in separate boxes. Leads for space heaters and shall be terminated on barrier type terminals with stainless steel screws. Lead shall be brought to the same box. Leads shall be suitably marked and identified with heat shrink markers. Accessories terminal boxes shall be located 90 degrees counter-clockwise from motor terminal box. Accessories boxes shall have phenolic nameplates, black and white letters, attached with stainless steel screws. The nameplates shall say “SPACE HEATER”, “Thermal Switches”, etc. Accessories boxes shall be bottom or side entry.

2. Terminal boxes shall have provisions for terminating the following conduits:

   a. Thermal Switch

   b. Space Heater Box: one 3/4-inch conduit.

G. Grounding Means: Provide a grounding lug threaded into the motor frame within the motor terminal box and other motor conduit boxes. Lug shall be similar and equal to Burndy KC Servit and suitable for terminating #2/0 ground wire. Provide two NEMA 2-hole ground pads located near the base of the motor mounted 180 degrees apart. Ground pads shall be stainless steel and suitable for terminating #4/0 ground conductor.

H. Appurtenances:

1. All wires and electrical connections shall be copper. All wiring penetrating motor frame shall be protected against chaffing with a rubber grommet.

2. Space Heaters: Motor shall be equipped with space heaters for operation on 120-volt, 60-Hertz, single-phase power. They shall maintain the internal temperature above dew point when motor is not operating. Space heaters shall not be located directly in the access holes where they may pose a danger of burn or shock to servicemen. Space heater wiring shall be routed to prevent wire being between the frame and space heater.

3. Winding Thermostats: Motor shall be equipped with bi-metallic, snap action, temperature actuated switches on the end turns of each phase of the windings. Thermostats shall have normally closed contacts wired in series and be wired to a set of terminals for customers use.
4. All appurtenance boxes shall be laid out to avoid overlap and access limitation to the boxes. Appurtenance boxes shall be secured with stainless steel.
5. Conduits:
    a. Liquidtight flexible metal conduit shall be Anaconda Sealtite, Type HTUA by Anamet Electrical, or equal. Fittings used with liquidtight flexible metal conduit shall be of the screw-in type with insulated throat by Thomas & Betts Co.; no equals.
    b. Rigid aluminum conduit, couplings, factory elbows, and fittings shall be 6063 alloy by Allied Tube & Conduit Co. or approved equal. Conduit hubs shall be insulated throat by Crouse-Hinds.
    c. Liquidtight strain relief cord and cable connectors shall be Series LS by Crouse-Hinds or approved equal.
    d. Design neat layout of conduit from vibration sensors and bearing RTDs to the accessory terminal boxes. Submit a detailed layout drawing to the Owner's representative for review.
    e. All conduits and wire shall be routed and installed in an identical fashion for like motors.
    f. Minimum conduit size shall be 3/4 inch.
6. Mounting Hardware: All mounting hardware including but not limited to strut channels, clamps, etc. shall be 316 stainless steel.

I. Documentation:
1. Motor manufacturer shall supply documentation for the motors as follows:
    a. Complete dimensional data including the following:
        1). Dimensional outline drawings.
        2). Maintenance clearances.
        3). locations and sizes of lubrication connections, vents, drains, etc.
    b. Data Sheet: Fill out and submit with the Shop Drawing submittal the information requested on the Motor Submittal Data Sheet (Attachment B) for each size motor being provided.
    c. Complete nameplate data.
    d. Letter of Compatibility: The pump/motor supplier in conjunction with the VFD supplier shall issue a letter of compatibility stating that the VFD and motor are compatible.
    e. Allowable time periods between starts.
    f. Subtransient reactance and X/R.

g. Speed-torque curve at 100 percent and 80 percent of rated voltage.

h. Speed-current curve at 100 percent and 80 percent of rated voltage.

i. Acceleration time at 100 percent and 80 percent of rated voltage.

j. Thermal damage curve (I^2t).

k. Locked rotor withstand time.

l. Rotor inertia.

m. Schematic and interconnection diagrams.

n. Bearing descriptions.

o. Motor weights.

p. Alarm and Trip temperatures for winding and bearing RTDs.

q. Alarm and shutdown values (in./sec.) for vibration sensors (X and Y axis).

r. Detailed conduit layout for motor.

s. Cutsheets on terminal blocks used in accessories terminal boxes.

t. Dimensions (internal and external) and layouts of terminal box and accessories terminal boxes. For main motor terminal box, clearly show the distance from the bottom of the enclosure to the termination lugs. Indicate all dimensions in inches. Final dimension and location are subject to approval by the Engineer.

u. Motor insulation voltage rating.

v. Results of motor tests.

w. Measured locked rotor current and torque and locked rotor power factor.

x. Motor no load data (i.e., amps, power factor, etc.).

y. Maximum kVAR allowed for power factor correction. Maximum kVAR shall be included on motor nameplate as well.

z. Locked rotor power factor.

aa. Instruction manual.

bb. Bill of Materials with manufacturer's cut sheets for all major equipment, RTD's, bearings, vibration sensors and transducers, terminal blocks, etc. Clearly identify on cut sheets the exact model number of equipment being provided.

2. All documentation listed above shall be supplied with the motor's initial submittal with the exception of the motor test results and instruction manual which shall be furnished later in the Project. Incomplete submittals will be returned "NOT APPROVED - REVISE AND RESUBMIT."

2.03 SPECIAL TOOLS

A. Furnish with the equipment, a lifting bar/bracket for the motor and one set of any special tools or devices required for the assembly, operation, and maintenance of all equipment furnished.

2.04 LUBRICANT

A. Pump and motor lubricants shall be supplied of the type and grade recommended by the equipment manufacturers. Furnish with the equipment in sufficient quantity for prelube, initial filling and for operation during acceptance tests. Advise the Owner of type and available sources of pump and motor lubricants.

B. Pump lubrication oil and grease shall be FDA food grade.

2.05 SPARE PARTS

A. Provide spare parts as follows:

1. Provide a sufficient quantity of lubricant for required service during the first 12 months after startup.
2. One complete set of line shaft bearings.
3. One complete set of bowl bearings.
4. One complete set of bowl wear rings.
5. One complete set of impeller wear rings.
6. One shaft sleeve.
7. One complete set of gaskets and O-rings.
8. One complete stuffing box assembly.
9. Three sets of packing for the pump stuffing box.
10. One complete set of mechanical seals.

3.00 EXECUTION

3.01 GENERAL

A. Equipment Manufacturer's representative, including the pump and motor manufacturer, have responsibilities in the installation and field testing of the equipment as described in this Section. Installation of equipment shall be performed by the Contractor who shall be required to assemble the equipment and install it in accordance with installation, operation and maintenance instructions which shall be furnished by the Equipment Manufacturer, the installation drawings for this Project and applicable installation instructions of the Hydraulic Institute Standards.

B. Contractor shall schedule the service of the Equipment Manufacturer to assist in the assembly installation, lubrication, adjustment, testing, and acceptance of the equipment.

C. Contractor shall furnish all labor, tools, equipment, and machinery necessary to receive, inspect, unload, store, protect, and install completely, in proper operating condition, the equipment. Contractor shall protect and store the motors indoors and as recommended by the manufacturer, keeping bearings lubricated and the motor space heaters energized during storage and until they are put into service.

D. Contractor shall also furnish such incidental items not supplied with the equipment, but which may or may not be described in the Drawings and Specifications, for complete

installation, such as welding, motor cooling and drain lines, piping supports, air valve and drain lines, gaskets, flange bolts for discharge piping, connecting piping, wiring, conduit, ducts, mounting brackets, strut assemblies, anchors, and other appurtenances as necessary.

E. Certain items of equipment due to its size or character will be disassembled for shipping and shall be assembled by the Contractor as it is installed. It is the Contractor's responsibility, in establishing its costs for installation, to determine the degree of disassembly that the equipment will be shipped in.

F. Equipment Manufacturer shall inspect and determine that the pump barrel mounting flange has been installed correctly and to the recommended tolerance prior to installation of the pump. The recommended tolerance is that the discharge head connection nozzle is in alignment with the piping to within +/- 1/16-inch and that the mounting flange is level to within 0.002 in/ft of span. This determination shall be made prior to grouting with the mounting flange properly shimmed. Before placing the grout scarify the adjoining concrete and pour a non-shrink epoxy grout. After properly curing, remove the temporary wedges or shims and hand pack voids with grout. Then torque the anchor bolts to the appropriate values. A second inspection shall be made after the mounting flange has been completely grouted in place, but prior to installation of the pump. Installation includes leveling and grouting the pump barrel.

G. Contractor shall make the power, control, and instrumentation connections at points designated by the Equipment Manufacturer.

3.02 INSTALLATION

A. Install one vertical line shaft pumping unit.

B. Assemble the bowl assembly, column, line shaft and discharge head and anchor to sole plate.

C. Set and align motor, assemble shaft coupling and adjust impeller setting. After running the pumping unit, readjust impeller.

D. Make up the thrust harness components and make all other necessary connections as part of the assembly and alignment activities.

E. Furnish and install drain lines.

F. Furnish and install wiring, conductors, conduits, cable trays, and connections for motor leads, control wiring, etc.

G. Conduct acceptance tests and submit an installation report as required in Paragraph 3.03.

H. Equipment Manufacturer's representatives shall be present for all equipment installation and testing.

3.03 FIELD QUALITY CONTROL

A. General:

1. Equipment Manufacturer shall inspect and determine that the pump barrel and pump barrel flange has been installed correctly and to the recommended tolerance prior to welding flange to barrel and installation of the pump.

2. Calibrated testing equipment shall be provided by the Equipment Manufacturer to measure setting, alignment, speed, noise, temperature and vibration of the pump. Vibration data shall be recorded with a Vibscanner as manufactured by Pruftechnik or approved equal.

3. The motor manufacturer shall provide a testing apparatus to check the proper installation and calibration of RTDs, prior to final acceptance. The apparatus shall be Altek RTD calibrator model 211 or equal.

4. Equipment Manufacturer shall supply calibrated pressure gauges on discharge of pump for use during testing.

B. Preliminary Operational Test:

1. After the pumps have been installed, including all piping connections, and electrical system construction is complete, and after the piping has been tested, the Contractor shall perform preliminary operational tests over a period of not less than 8-hour test. Refer to Section 01 75 00 "Starting and Adjusting." The test shall be conducted in a manner approved by and in the presence of the Owner's representative. Equipment shall be checked for excessive noise, alignment, vibration and lateral deflection, general performance, etc.

2. The pumping units shall be operated throughout their full range of operating heads, including backspin, if possible, recording data including pump discharge pressure, pump speed, flow rates, water levels, motor voltage, current, power factor, vibration, noise, motor bearing temperatures, and motor winding temperatures, as applicable. This information shall be properly documented and included in the Equipment Installation Report. The unit must perform in a manner acceptable to the Owner and Engineer before Final Acceptance of the installation will be made.

3. Vibration shall be no greater than the "Allowable Field Vibration Limits" as defined by the Hydraulic Institute Standards and as modified by this Section above. Vibration shall be measured in the x, y and z direction at the bottom motor flange and at the motor upper bearing housing.

4. A field "bump" test of the installed pump and motor shall be made under the supervision of the Equipment Manufacturer to confirm that the Reed Frequency is not within 25 percent of any operational exciting frequency.

5. Contractor and Equipment Manufacturer shall be responsible for operating the equipment and recording and submitting the necessary data from the test. All information required above shall be properly documented and included in the Equipment Installation Report. The units must perform in a manner acceptable to the Owner and Engineer prior before Final Acceptance of the installation will be made.

6. Equipment Manufacturer shall submit an Equipment Installation Report to the Contractor certifying that the equipment is properly installed, lubricated, is in accurate alignment and is free from undue stress from connecting appurtenances, that it has been operated under full load conditions and that it is operating satisfactorily. Contractor shall provide copies of the report as required by this Section and Section 01 33 00 "Document Management."

7. The cost for power required for the test shall be borne by the Owner. Refer to Section 01 11 00 “Summary of Work” regarding cost of power.

C. System Operational Test:

1. After the preliminary operational test is complete and prior to final acceptance of the Project, the Contractor shall conduct a 30-day system operational test. Owner will be responsible for operating the equipment and recording data during this test. Equipment Manufacturer, Contractor, and any subcontractors will be responsible for troubleshooting and adjustments to the equipment during the test. The purpose of the test is to demonstrate and check the ability of the pump to operate continuously as the system requires. The 30-day test is not required to achieve Substantial Completion.

2. The cost for power for the System Operational Test shall be borne by the Owner. Refer to Section 01 11 00 “Summary of Work” regarding cost of power.

3.04 PAINTING

A. Touch-up all damage of painting of the pumping unit with extra paint furnished by the manufacturer.

END OF SECTION

SECTION 43 24 13.01 "VERTICAL CENTRIFUGAL PUMPING UNITS - LINE SHAFT TYPE" – ATTACHMENT A, SUBMITTAL PUMP DATA SHEET

Equipment Supplier: _____

Submit the following data for each size of Pumping Unit:

Pump Data	**Tag:**
Make and Type Design	
Rated Speed	
Bowl Size	
Number of Bowls	
Impeller Diam. vs. Max. Impeller Diam. for Bowls	
Impeller Material	
Bowl Shaft Diameter and Material	
Line Shaft Diameter and Material	
Enclosing Tube Diameter and Material	
Column Diameter and Thickness	
Maximum Shaft Thrust Load	
Shutoff Head	
Max Allowable Operating Head at 100% Speed	
Min Allowable Operating Head at 100% Speed	
Impeller Specific Speed	
Maximum Backspin Speed	
Suction Specific Speed	
Maximum Brake Horsepower	
NPSH Required at Rated Head	
NPSH Required at Minimum Head	
Wire-to-Water Efficiency at Rated Point No. 1	
Wire-to-Water Efficiency at Rated Point No. 2	
Rotor polar moment of inertia WR^2	
Weights	
Pump and Motor Stand	
Motor	
Complete Unit (Dry)	
Complete Unit (Wet)	
Miscellaneous Information	
Motor Factory Test Location (City, State, Country)	
Pump Factory Test Location (City, State, Country)	
Pump Factory Test Requires Job VFD (Yes or No)*	

*If Project VFD required, cost of providing VFD to Equipment Manufacturer to be considered in evaluating Proposals based on price proposed by VFD manufacturer.

THIS FORM MUST BE RETURNED WITH THE SHOP DRAWING

END OF SECTION 43 24 13.01 – ATTACHMENT A

SECTION 43 24 13.01 "VERTICAL CENTRIFUGAL PUMPING UNITS - LINE SHAFT TYPE" – ATTACHMENT B, SUBMITTAL MOTOR DATA SHEET

Submit the following data for each size and type of motor:

Manufacturer		Motor HP	
Frame		Enclosure	
Type		RPM	
Voltage		Phase	
Starting Method		Hertz	
Shaft Size		Rotor WK2 (lb-ft^2)	
Insulation Class		Duty	
Full Load Amps		No Load Amps	
Locked Rotor Amps		Locked Rotor Torque	
Locked Rotor Torque		% Breakdown Torque	
Locked Rotor KVA/HP			

NEMA Design	
Service Factor	
Inrush Current (% of Full Load)	
Max Safe Stalled Time (seconds)	
Number of Safe Starts Per Day	
Number of Consecutive Starts	
*Full Load Temp Rise, in Degree Celsius over 50 deg. C Ambient (at 1.0 S.F.)	
*Service Factor Temp Rise, in Degree Celsius over 50 deg. C Ambient (at 1.15 S.F.)	
*Limiting Temperature Rise	

Resistance (at 25 deg. C)		Bearings:	
Exhaust Air (CFM)		Type/Size	
Exhaust Air Temp Rise (F)		Life	
		Lubrication	

	Efficiency	Power Factor	Current
1.15 S.F. Load			
4/4 Load			
3/4 Load			
1/2 Load			
1/4 Load			

Vibration Alarm and Trip Set Points	
RTD Types and Mounting	
RTD (Winding & Bearing) Trip Set Points	
Motor Sound Power Level	
Maximum kVAR Allowed for power factor correction without overexciting the motor	
Space Heater Voltage	
Space Heater Wattage	

THIS FORM MUST BE RETURNED WITH THE SHOP DRAWING

END OF SECTION 43 24 13.01 – ATTACHMENT B

DIVISION 44
POLLUTION AND WASTE CONTROL EQUIPMENT

44 00 00.02 OUTSIDE PIPING INSULATION

1.00 GENERAL

1.01 WORK INCLUDED

Furnish labor, materials, equipment and incidentals necessary to install piping insulation for exposed piping, valves and fittings on lines as scheduled. An exposed line is one that is not buried nor in a building with a controlled environment. Unless otherwise specified, insulation shall be provided from a point 6" below the finished ground and shall be designed for temperatures down to -10° F.

1.02 QUALITY ASSURANCE

A. ACCEPTABLE MANUFACTURERS

1. Knauf Fiberglass
2. Owens/Corning Fiberglass Corporation
3. Pittsburg Corning
4. Armstrong World Industries
5. Imcoa

B. FACTORY TESTING

Insulation shall be tested and listed by U.L. Laboratories and shall have the following minimum properties: flame spread not to exceed 25 and smoke development not to exceed 50. Insulation shall conform to ASTM C-547, Class 1.

1.03 SUBMITTALS

Submittals shall be in accordance with Section 01 33 00, DOCUMENT MANAGEMENT.

2.00 PRODUCTS

2.02 SYSTEM A – ABOVE GRADE

A. PIPE INSULATION: 1-1/2" thick, heavy density preformed insulation composed of fine glass fiber bonded together with a thermosetting resin molded to form a single longitudinal seam. Insulation shall have a vapor barrier jacket, sealed with an adhesive self-sealing lap feature with a minimum 2" overlap. An outside protective jacket made of sheet aluminum not less than 0.016" in thickness with integral vapor barrier, shall be installed over the insulation.

B. PIPE FITTINGS, VALVES, AND ACCESSORIES: Fittings, valves, and accessories, except moving parts, shall be insulated using preformed fiberglass fittings or mitered sections of pipe insulation. The insulation shall be of the same thickness as the adjacent pipe insulation with matching aluminum jacket.

3.00 EXECUTION

3.01 PREPARATION

Outer surfaces shall be clean and free of dust or other materials. Test pipe for leaks prior to insulation application.

3.02 INSTALLATION

A. Insulation shall be installed by qualified personnel in accordance with the Manufacturer's recommendations.

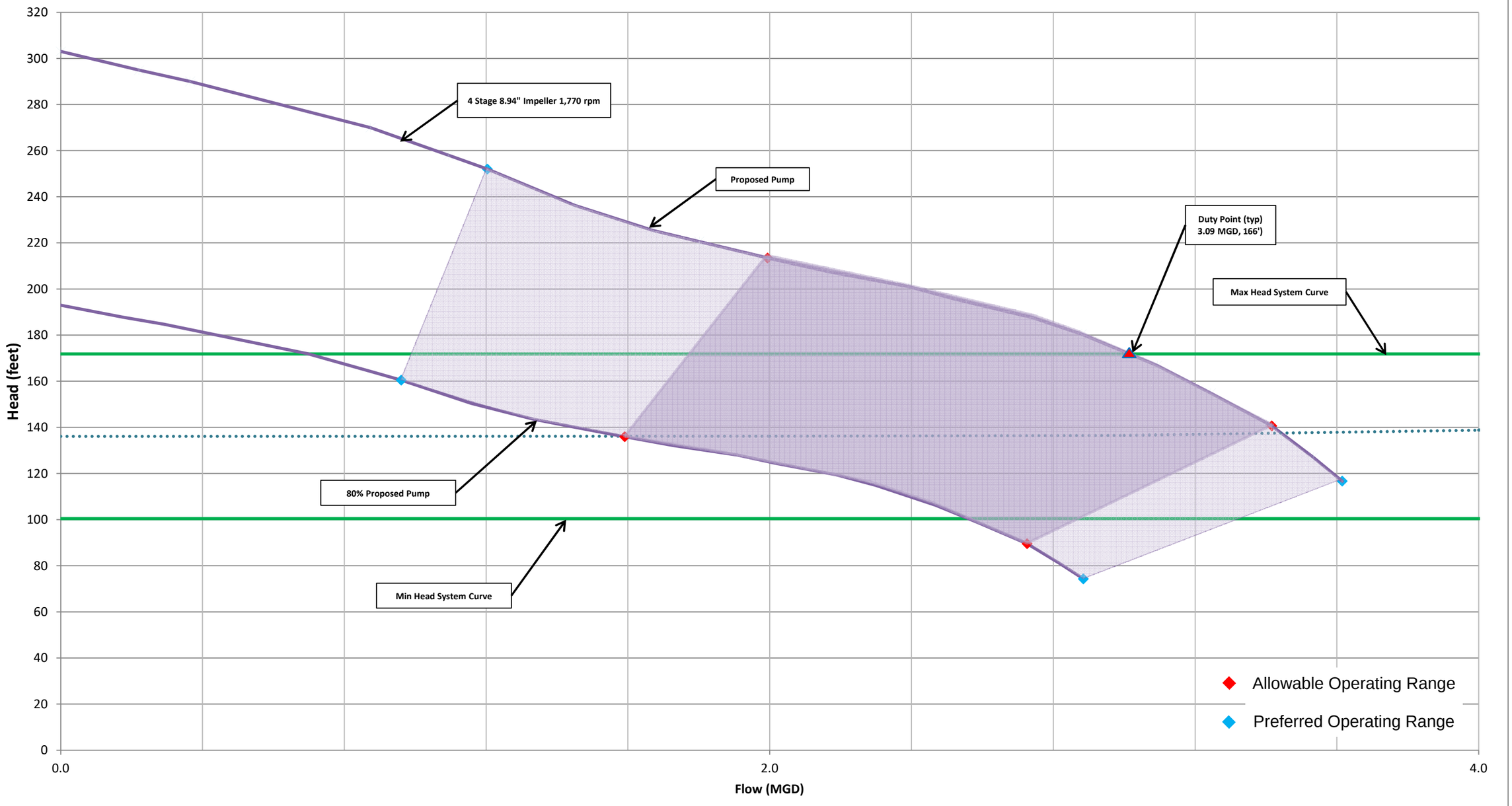
B. Apply insulation over clean and dry pipe. Exposed piping shall have continuous insulation. Position longitudinal lap downward to avoid dirt and moisture infiltration.

C. Completely seal joints along the longitudinal seam and apply so as to shed water. Seal circumferential joints by the use of preformed butt strips, minimum 2" wide. Butt strips shall overlap adjacent jacketing a minimum of 1/2". Seal and cover insulation with an aluminum jacket. Secure jacket and butt strips using 1/2" bands and seals. Spacing of bands shall be as recommended by the Manufacturer.

END OF SECTION

APPENDIX A
PUMP CURVES

Appendix A: Pump Curve



APPENDIX B
GEOTECHNICAL REPORTS

MEMORANDUM

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www.freese.com

TO: Jimmy Sibert, P.E.

CC: Peter Bartels, P.E., Misty Thomison, P.E.

FROM: Marc Miller, P.E., Holly Murphy, E.I.T.

SUBJECT: Rowlett Road Low Pressure Plane Pump Station
City of Rowlett, Texas

DATE: June 5, 2013

PROJECT: ROW13161



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING
FIRM F- 2144

INTRODUCTION

This memo summarizes the results of the geotechnical investigation for the proposed pump station, electrical building, access drive and parking areas as part of the Rowlett Road Lower Pressure Plane (LPP) Pump Station (PS) project in Rowlett, Texas. This work was provided as part of FNI project number ROW13161, and authorized by the contract with the City of Rowlett.

PURPOSE AND SCOPE

This memo presents the results of a geotechnical investigation for the proposed pump station, electrical building, access drive and parking areas in Rowlett, Texas. The purpose of the study has been to provide recommendations for use during the design of the project. To accomplish this purpose, the study was planned based on the following original scope:

1. Review the Geologic Atlas of Texas to assess expected subsurface conditions;
2. Drill six borings to obtain samples for observation and testing, and observe subsurface conditions;
3. Perform laboratory tests on selected samples to determine classification and engineering properties on the subsurface; and
4. Perform an analysis using the collected data to develop recommendations for use during design of the pump station, electrical building, access drives and parking areas.

FIELD INVESTIGATION

The field investigation included six borings, B-1 through B-6. Three borings (B-1 through B-3) were located at the proposed pump station location, one boring (B-4) was located at the proposed electrical building, and the other two borings (B-5 and B-6) were located at the proposed access drive and parking area. Site access was coordinated with the City of Rowlett. The drilling was performed on May 8, 2013 by W.E.S.T. Drilling using a CME-75 truck-mounted drilling rig. Ms. Holly Murphy, E.I.T. of FNI supervised the drilling and logged the borings.

The borings were drilled using hollow stem auger techniques. Push tubes were used to collect samples for laboratory tests and TxDOT Cone Penetrometer Tests were performed to evaluate rock consistency. At the completion of drilling, the borings were backfilled with auger cuttings up to existing ground surface. The borings were observed for indications of subsurface water entry during drilling and were checked for accumulated water before being backfilled with soil cuttings.

The boring logs were prepared from the field logs, the laboratory test reports, and additional inspection of recovered samples in the laboratory. The logs are presented in Attachment A. The vicinity location map and boring location map are shown on Figures 1 and 2, respectively.

LABORATORY INVESTIGATION

Laboratory testing was performed by Gorrondona & Associates, Inc. on selected samples collected from the borings. These samples were selected by FNI as being generally representative of that stratum and/or boring. Testing was performed to allow for material classification according to the Unified Soil Classification System (ASTM D 2487), and to determine the engineering properties of the materials. These tests include:

- Moisture content
- Atterberg limits
- Percent passing #200 sieve
- Absorption pressure swell
- Unconfined compression
- Unit dry weight

The results of these tests are presented at the corresponding depth on the boring log provided in Attachment A, and the Summary of Laboratory Results in Attachment B.

GEOLOGIC AND SUBSURFACE CONDITIONS

Geology

The Dallas City Sheet of the Geologic Atlas of Texas (revised 1991) indicates that the site is located in the Ozan Formation (also known as the Taylor Marl) and nearby Alluvium deposits. The Ozan Formation is described as "clay, calcareous, silt and sand content increases upward, montmorillonitic, blocky, conchoidal fracture, medium gray; some glauconite, phosphate pellets, hematite nodules, and pyrite nodules; some very thin limestone lenses locally in lower part; weathers light brownish gray with poor fissility, grades upward to Wolfe City Formation; marine megafossils; thickness 500 +/- feet." These materials are commonly described as shale and/or marl, and weather to form relatively deep deposits of fine-grained clays that exhibit significant expansive behavior.

Alluvium deposits are described as "flood-plain deposits including indistinct low terrace deposits; gravel, sand, silt, silty clay, and organic matter." Some alluvial material may be present in the upper portion of the site, but it is generally fine-grained and not readily distinguished from the residual material.

Stratigraphy

Based on the results of the borings, the subsurface conditions at the site indicate the presence of clay and marl, and can be generalized as shown in Table 1. Refer to the Logs of Borings in Attachment A for specific subsurface descriptions and thickness of particular strata. Note that the thickness of the strata is based on the discrete borings, and that actual in-situ transitions may be gradual.

Table 1. Generalized Subsurface Stratigraphy

Stratum	Thickness, feet	Description
Clay	24.5 – 29.5	Yellow-brown, brown and gray, stiff to hard, moist, calcareous, trace sand
Marl	Extends Beyond Boring Depths (50'+)	Dark gray, soft to hard, shaly

Groundwater

The borings were advanced using techniques that allow for direct and indirect observations of seepage and groundwater during drilling operations. Seepage was observed during drilling in boring B-2 at a depth of 28 feet below grade and in boring B-3 at a depth of 38 feet below grade. The remaining borings were dry during drilling. Refer to the boring logs for specific observations made during the course of our field investigation. It is relatively common for water to occur intermittently in stiff, weathered clays. Water is typically present in perched seams that can be released when exposed by excavations. The excavations will often seep for a relatively short period and then taper off to low flows.

The occurrence of and variations of groundwater can vary due to many factors. These factors include seasonal changes, site topography, surface runoff, the layering and permeability of subsurface strata, water levels in waterways, utilities, and other factors not evident at the time of this study. Findings apply only to the time and place indicated.

Expansive Soil

The subgrade at this site is expansive soil and will exhibit shrink and swell behavior. The amount of shrink/swell behavior that can occur will depend upon moisture fluctuations that occur over the design life of the structure. The total magnitude of the shrink/swell behavior will also be dependent upon the thickness of the expansive soil and the depth of the active moisture zone. Moisture fluctuations occur due to seasonal cycles, but can also be influenced to varying degrees by drainage conditions; site grades/sloping ground, landscaping, irrigation practices, the presence of vegetation, groundwater, and the presence of flatwork or other impervious barriers. This large number of variables complicates the determination of the magnitude of shrink/swell movements that could occur.

An estimate of the potential expansive soil movement was made using a variety of sources, including the Potential Vertical Rise (PVR) Method 124-E published by TxDOT, the results of laboratory index and swell testing, engineering judgment, and experience. Based on this information, the estimated soil movement or PVR is about 3 to 5 inches for a full seasonal moisture cycle. Recognize that this value range is not exact, and is only an indication of the potential movements due to expansive soil for seasonal moisture fluctuations. Actual

movements may be significantly larger than estimated due to inadequate site grading, poor drainage, ponding surface water, and/or leaks in utility lines. Significant changes to existing site grades can also alter actual PVR movements by changing the thickness of the expansive soil and/or altering the active moisture zone depth.

DESIGN RECOMMENDATIONS

The proposed pump station and electrical buildings will have a finished floor elevation close to the existing grade and the existing structures. The pump station will include vertical pump cans that extend about 12 feet below the finished floor. The buildings will include CMU block, and the resulting structural loads will be relatively low to moderate. Although the structural loads are moderate, the highly expansive soil will potentially subject the structures to significant movement. Because concrete and masonry structures are sensitive to movements in excess of about 3/4 to 1 inch, the structure should be supported on a deep, drilled shaft foundation system that places the structural support below the active expansive zone. Recommendations for the foundation system and floor slabs are presented in the following sections.

Drilled Shaft Foundation

Design

Drilled shaft foundations are recommended for the support of the structure. The shafts should be straight-sided, steel reinforced concrete, and designed based on the recommendations presented in Table 2.

Table 2. - Drilled Shaft Design Values

Design Item	Design Value
Bearing Stratum Description	Marl, dark gray, shaly
Bearing Stratum Depth	24.5 to 29.5 feet below existing grade
Minimum Penetration	5 feet into bearing stratum
Net Allowable Bearing Pressure	15 ksf
Allowable Side Shear, Compression	1,500 psf, within bearing stratum
Allowable Side Shear, Tension	1,000 psf, within bearing stratum
Side Shear to Neglect	Upper 3 feet of bearing stratum
Minimum Shaft Diameter	24 inches

The design values have been selected to include a minimum factor of safety of three. Foundations designed based on these values should experience minor settlement due to loading when properly constructed, but we recommend that the design account for one-half inch of potential settlement. Because of potential variations in the depth of the bearing material, the depth of the shafts should be based upon the recommended penetration, and not upon a predetermined elevation.

Shafts with a center-to-center spacing less than 3 diameters should include a bearing pressure reduction factor. The bearing pressure reduction factor should be 0.65 for shafts with a center-to-center spacing of 1 diameter, and should be 1 for shafts with a center-to-center spacing of 3 diameters. The reduction factor between these points can be linearly interpolated. For two shafts with different diameters, the larger shaft size should govern. The analysis of more than two grouped shafts should be performed on a case-by-case basis.

Grade beams should be supported by and structurally tied to the drilled shafts. A minimum 12-inch void space should be provided below the beams to reduce potential contact between the beam and the expansive soil. When voids spaces are formed using cardboard carton forms, the forms should not be crushed or allowed to become wet before or during concrete placement. A vertical pre-cast panel (permanent retainer form) should be provided along the edges of the void space to prevent the collapse of the surrounding soil into the void space.

The expansive subgrade will subject the shafts to uplift pressures and will create tensile forces within the shafts. Accordingly, each shaft should be steel reinforced to withstand these forces. The actual uplift forces will vary with depth and moisture condition, but steel reinforcement design for the soil uplift pressures may be modeled using 1,000 psf acting over the entire shaft perimeter of the upper 10 feet of the shaft. This reinforcement should not preclude the need for additional reinforcement due to structural design or as required by codes.

Construction Considerations

Drilled shaft construction should be monitored by the Engineer to observe the following: 1) the proper identification of bearing material, 2) adequate penetration of the shaft excavation into the bearing layer is provided, 3) the base and sides of the shaft excavation are clean of loose cuttings, and 4) if seepage is encountered, whether it is of sufficient amount to require the use of temporary steel casing for straight-sided shafts.

Seepage was noted during this study. If seepage occurs during construction, it will likely require the use of temporary casings. If casings are used, then the Engineer must observe that a necessary and continuous head of concrete is maintained within the casing during casing extraction to prevent the caving of the excavation and/or inflow of groundwater.

The concrete placement should occur as soon as possible after completion of the excavation and observation of the shaft, and no longer than 4 hours after completion of the excavation. Prolonged air exposure or inundation of the bearing surface with groundwater could deteriorate the bearing material. Shaft excavations should be deepened if delays occur to provide a suitable bearing surface. Precautions are required during reinforcing steel and concrete placement to prevent loose soil and debris from falling into the excavation. The concrete should not be allowed to strike the reinforcing cage or the sides of the excavation during placement. Mushrooming of the drilled shaft near or at the surface should not be allowed to prevent the formation of a horizontal surface that will be subject to expansive uplift pressures.

Floor Slabs

Although the use of drilled shafts will be suitable for the structure, the floor slab may also be subjected to undesirable movements. The floor slab can either be structurally suspended above the ground, or a portion of the subgrade can be removed and replaced with “non-expansive” select fill to limit potential expansive soil movements to an acceptable level. A structurally suspending floor slab significantly reduces the risk of potential distress, but can cost more than a ground-supported floor. The Owner may elect to construct a ground-supported floor slab instead of a suspended floor slab, but in doing so the Owner should recognize and accept that the slab will experience some movement, and has an increased risk of developing related distress and

cracks. The use of a ground-supported floor slab represents a compromise between construction costs and an acceptable risk of potential structural and cosmetic distress.

If a ground-supported floor system is selected, subgrade modification is recommended to reduce expansive soil movements. The calculated expansive movement can be reduce to about one inch by replacing the upper portion of the subgrade with 7 feet of "non-expansive" select fill. Before placement of the first lift of select fill, the exposed subgrade should be moisture conditioned and recompacted to a depth of 12 inches.

Select fill should not be allowed to extend beyond the building perimeter, but this often occurs during construction. Therefore, the subgrade beyond the building perimeter should be undercut following grade beam construction to remove select fill around the exterior of the building and replaced with on-site clay to reduce surface water infiltration. The undercut should be wide enough to remove the select fill, but no less than 5 feet. Failure to provide this step could result in the formation of the "bath tub effect" beneath the floor system, which could lead to deep-seated swell and resulting structural distress.

Pump Cans

The pumps will be deep enough that expansive soil movement below them should be less than one inch. However, the base of the excavation could weather when exposed. A mudslab is recommended at the base of the excavation to protect the excavation from softening due to seepage and construction foot traffic. The mudslab should be a minimum 4-inch thick layer of lean grout or concrete mixture. The mudslab should be placed within 24 hours after completing the excavation. The Engineer must observe the base of the excavation to confirm that it is free of loose and/or deleterious material. The footing for the support of the can may be designed based on a net allowable bearing pressure of 2,500 psf. Transitional subgrade modification may be required for supply piping and should be evaluated once the pump and building layout is available.

Earth Pressures

The pump cans and other buried portions of the structures will be subjected to lateral earth pressures. Because the configuration of the cans will limit deflection, they should account for at-rest earth pressures. Values are provided in Table 3 for both on-site soil and select backfill in an undrained and drained condition.

Table 3. Lateral Earth Pressures

Material	Earth Pressure Condition	Equivalent Fluid Pressure, psf/ft	
		Drained	Undrained
Select Fill ϕ=30°, γ_t=125 pcf	At-rest, k_o=0.5	65	95
On-Site Soil ϕ=18°, γ_t=125 pcf	At-rest, k_o=0.69	85	105

Equivalent fluid pressure values for the select fill and/or granular material require a triangular wedge of the material behind the wall. The material should slope upward and away from the bottom of the wall at a slope of 1:1 or flatter. The upper 18 inches should consist of plastic clay to reduce surface water infiltration into the fill. To design for a drained condition, a positive drain system must be provided to the base of the structure.

Backfill should be placed and compacted as recommended in the EARTHWORK section of this report. Over-compaction will result in excessive lateral earth pressures. Hand-operated tampers or other lightweight compactors are preferred in the 3-foot area adjacent to the wall. The impact of surcharge loads (if present) should be included in design. Surcharge loads can include construction equipment, vehicular loads, soil and materiel stockpiles, and other items. The additional lateral loads due to these surcharge items can be factored using the earth-pressure coefficients provided in Table 3.

Utility and Service Lines

Utility lines connected to the structure may experience differential movement in response to expansive soil movements. These movements may damage connections. This is of particular importance for a suspended slab system. Flexible connections are recommended to account for differential movement between the building and utilities. Design and construction of the utilities must also consider other expansive soil issues in order to limit damage. Excavations should be sloped so that water within excavations will flow to a low point away from the building where it can be removed from before backfilling. Compaction of bedding material should not be water-jetted. Compacted backfill above the utilities should be on-site clays to limit the percolation of surface water. Utility trenches extending under structures should include fat clay or concrete cut-off collars at the perimeter/edge to prevent the transmission of water along trench lines.

Exterior Flatwork

It must be recognized that the exterior flatwork will move in response to expansive soil movements, while the structure will be essentially static. This will create differential movement between the structure and the surrounding flatwork. Therefore, structure entrances should either be part of the structure or designed to tolerate vertical movement without inhibiting access or creating drainage problems (including vehicular entrances to the building, if present). The moisture content of the subgrade below flatwork must be maintained up to the time of concrete placement. If subgrade soils are allowed to dry below the specified moisture content, scarification and moisture conditioning of the soils will be required. The Engineer should confirm the moisture content of the subgrade before concrete placement.

Concrete flatwork will form cracks due to normal shrinkage during curing and thermal effects. Therefore, concrete should be steel reinforced to reduce the formation and size of cracks. Flatwork should also include frequent and regularly spaced expansion/control joints, and dowels should be used to limit vertical offsets between neighboring flatwork slabs. Joints should be cut as soon as the concrete has cured enough to allow for equipment access and cutting. Delays in joint cutting will increase the risk of the formation of uncontrolled cracks. These recommendations are intended to reduce the appearance of distress in exterior flatwork, but they are not intended to prevent the formation of cracks, or movement/vertical offsets between flatwork slabs.

Site Drainage

Proper drainage is critical to the performance and condition of the foundations and flatwork. Positive surface drainage must be provided that directs surface water away from the foundations and flatwork. If water is collected next to or below the foundations and flatwork, then undesirable soil movements can occur, and these movements can exceed values used in design. It is recommended that a slope of at least 1.5 percent be provided. The slopes should direct water away from the structures, and must be maintained throughout construction and the life of the structures.

The location of gutter downspouts, and other features, should be designed such that these items will not create moisture concentrations at or beneath the structure or flatwork. Downspouts should discharge well away from the structure, and should not be allowed to erode surface soil.

Moisture related issues can be positively addressed by constructing continuous exterior flatwork that extends to the building line. The joints created at the interface of the flatwork and building line must be sealed with a flexible joint sealer to prevent the infiltration of water. Open cracks that may develop in the flatwork should also be sealed. The joint and any cracks that develop must be maintained and resealed as needed, and should be part of a periodic inspection and maintenance program.

Seismic Site Class

This area of Texas has low seismic activity. Seismic designs in Texas are typically based upon the criteria established in the International Building Code (IBC). The seismic design is based upon the Site Class, as defined in Sections 1613.5.2 and 1613.5.5. Based upon the results of the site specific borings and our experience with the local geologic conditions, the average subsurface conditions correspond to Site Class "C."

ROADWAYS AND PARKING

Entrance and Parking Areas

The proposed entrance and parking areas around the pump station will be constructed with concrete. The thickness of the concrete will depend upon the expected traffic over the life of the facility. If traffic will be limited to automobiles and light trucks, then a minimum thickness of 6 inches is recommended. If significant medium to heavy duty truck traffic is expected, then the thickness should be increased to 8 inches. The concrete should be steel reinforced, and include load-transfer dowels across construction joints. Joints should be formed or saw-cut to control the formation of shrinkage cracks.

The pavement subgrade area is composed of expansive plastic clays. We recommend treatment of the clays with hydrated lime to create a suitable subbase for the construction of the concrete pavement. Hydrated lime should be applied at a rate of 6 percent, or 27 pounds per square yard of treated surface area for a 6-inch treatment depth. Construction of the treated subgrade should follow Texas Department of Transportation 2004 Standard Specification Item 260. Confirmation testing should include depth checks, and gradation and moisture-density tests, as recommended in the EARTHWORK section of this report. The moisture content and density must be maintained until construction of the overlying pavement. The treated subgrade should extend at least 12 inches beyond the curb line to improve pavement edge support during dry/warm/windy periods. Only lime treated material should be used for fine grading. Sand, select fill or other porous materials should not be used as leveling course material below pavements.

Moisture changes within the subgrade and subbase must be minimized. The pavement and surrounding grades must have positive drainage that quickly removes surface water. Routine maintenance must be performed on pavement joints and cracks to prevent the infiltration of surface water below the pavement. Even with these precautions, some distress may still occur, which will require periodic maintenance.

Access Drive

The proposed access drive will be an exposed aggregate roadway. These types of roadways can perform suitably for low-volume roadways, but will require periodic maintenance to repair potholes and "bird baths", and also to redress the exposed surface to improve serviceability. A minimum thickness of 12 inches is recommended. If desired, the thickness can be reduced to 9 inches if a layer of Tensar geogrid material (or equivalent) is placed within the middle of the layer.

Before placement of the aggregate, the exposed subgrade should be properly prepared to provide for satisfactory pavement performance. Preparation should include stripping and grubbing of the subgrade and the removal of deleterious material to a minimum of 12 inches beyond the edges of the roadway. The exposed

subgrade should then be proof rolled as detailed in the following EARTHWORK section. The completed roadway should be shaped to drain away from the roadway and shoulders. If necessary, shallow drainage swales can be used to redirect surface drainage.

EARTHWORK

Site Preparation

The project site should be stripped of vegetation, roots, organic material, existing construction materials (if present) and other undesirable debris. Obstructions that could hinder preparation of the site should also be removed, with special attention given to tree stumps and associated root systems. A typical stripping depth is 4 to 6 inches, but the actual depth will vary and should be based on field observations. After stripping, the area should be suitable for the support of construction equipment. Unsuitable areas (such as those wet, soft, yielding, and/or pumping subgrade) should be corrected before construction proceeds.

Proof rolling should be used to detect areas of soft and/or pumping soil. Proof rolling should be based upon TxDOT Standard Specification Item 216, and performed using a heavy tired vehicle weighting at least 20 tons, with the tires inflated to the manufacturer's specified operating pressure. The entire area should be proof rolled, with each succeeding pass offset by not greater than one tire width. Proof rolling should be performed within the building/foundation area, and also within flatwork areas, such as pavement, sidewalks, pads, etc. The Engineer should be present during proof rolling activities to assist with the identification of unsuitable soil. Unsuitable soil should be undercut and reworked, or otherwise improved in a manner that is suitable to the engineer. When fill is planned, proof rolling should occur before the fill is placed.

Fill Material

Table 4 provides material, moisture, and density requirements for a variety of materials based on FNI Specification 31 05 13 "Soils for Earthwork". Compaction of each lift should be continuous over its entire area. The maximum allowable aggregate size for these materials is 2 inches. Fill should be placed in loose horizontal lifts not exceeding about 8 to 9 inches, with the intent of providing a compacted lift thickness of 6 inches. Fill placed along slopes should be placed in horizontal lifts that are benched into the slope.

Table 4. Material and Compaction Requirements

Material Use	Material Requirements	Proctor Test Method	Density Requirement*	Moisture Requirement*
General Fill	FNI Class 1 or 2 Earth Fill	Standard (ASTM D 698)	95 to 100 %	Opt. to +4 %
"Non-expansive" Select Backfill	FNI Class 4 Earth Fill	Standard (ASTM D 698)	98%+	-2 to +3 %
Crushed Stone Backfill	TxDOT Item 247, Grade 1 or 2, Type A or D	TEX-113E	98%+	-3 to +1%
Flowable Fill	FNI Spec. 31 23 23 34	N/A	N/A	N/A

*Based upon Maximum Dry Density and Optimum Moisture Content

Material should be consistent with regard to type and moisture content. Clods should be processed and mixed, and water should be evenly applied, so that each lift has a uniform moisture and density. Each lift should be tested to confirm it has the specified moisture and compaction. One moisture/density verification test should be performed for every 5,000 square feet of compacted area, or for every 150 linear feet of utility backfill. A

minimum of three verification tests should be provided for every lift. Subsequent lifts should not be placed until the exposed lift has the specified moisture and density. Lifts failing to meet the moisture and density requirements should be reworked to meet the required specifications.

The specified moisture content must be maintained until compaction of the overlying lift, or construction of overlying flatwork. Failure to maintain the moisture content could result in excessive soil movement, and can also have a detrimental effect on overlying plastic concrete. The contractor must provide some means of controlling the moisture content (such as water hoses, water trucks, etc.). Maintaining subgrade moisture is always critical, but will require the most effort during warm, windy and/or sunny conditions. Density and moisture verification testing is recommended to provide some indication that adequate earthwork is being provided. However, the quality of the fill is the sole responsibility of the contractor. Satisfactory verification testing is not a guarantee of the quality of the contractor's earthwork operations.

CLOSING

Continuity

The geotechnical engineer should be requested to review the completed plans and specifications to confirm that the design is consistent with the subsurface conditions indicated by the investigation. The construction should be observed and tested by qualified personnel. The geotechnical engineer should be requested to visit the site periodically to observe subsurface conditions and construction procedures and to review the construction observation reports.

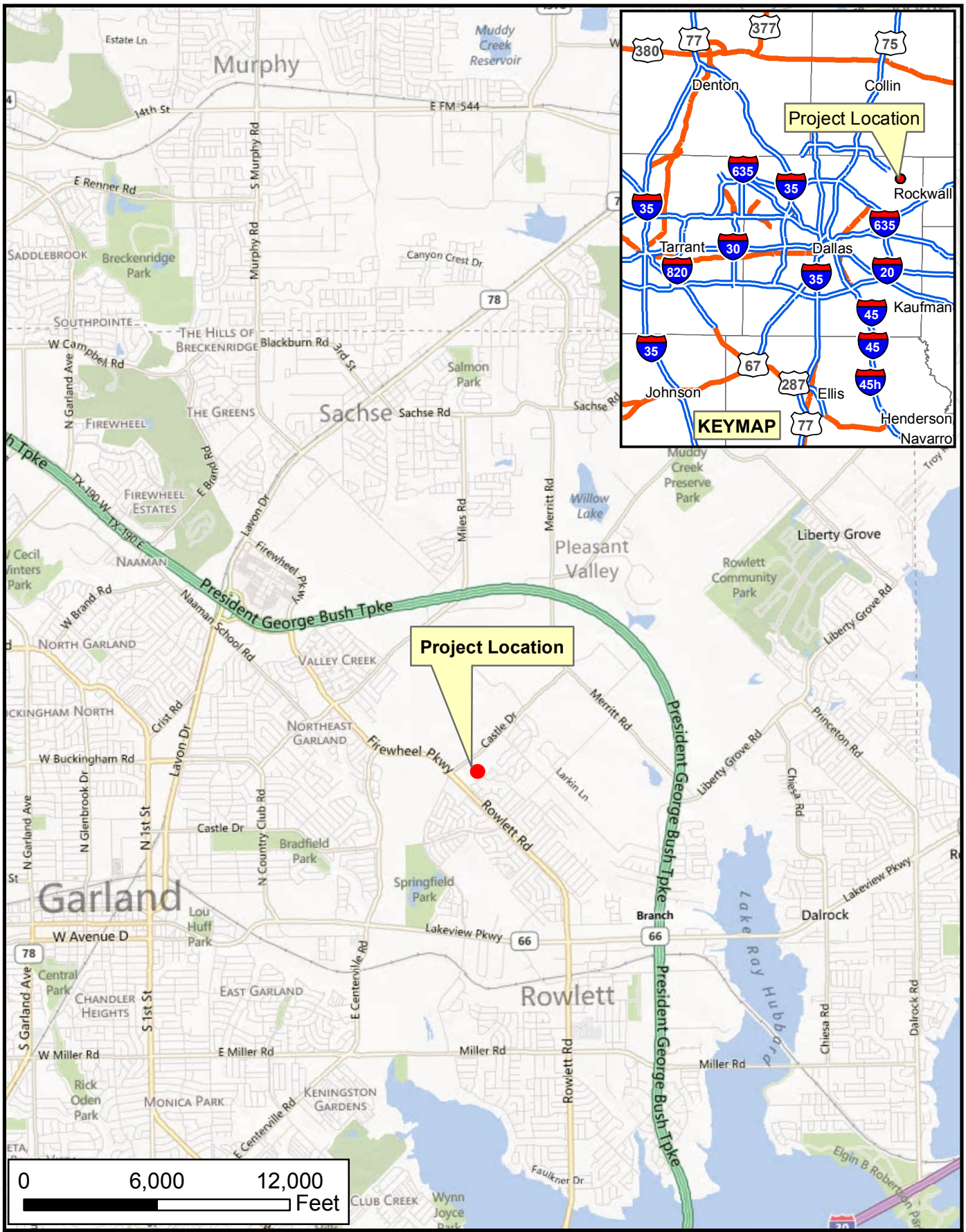
Limitations

This work was performed in a manner consistent with the level of care and skill ordinarily exercised by other members of Freese and Nichols' profession practicing in the same locality, under similar conditions and at the date the services are provided. Freese and Nichols makes no other representation, guarantee or warranty, express or implied regarding he services, communication (oral or written), report, opinion, or instrument of service provided. Recommendations contained in this report are based on our field observations, subsurface explorations, laboratory tests, and present knowledge of the proposed construction. It is possible that soil, rock or groundwater conditions could vary between or beyond the points explored. This report has been prepared for use during design. Paragraphs, statements, test results, boring logs, figures, etc., should not be taken out of context, not utilized without a knowledge and awareness of their intent within the purpose of this report.

This report was prepared specifically for use of Freese and Nichols, Inc. and the City of Rowlett for this project, and shall not be used for other projects or purposes. This report, and any future addenda or reports regarding this site, may be made available to contractors/bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Contractors/bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Verification of the subsurface conditions for purposes of determining difficulty of excavation, trafficability, etc., is the responsibility of the contractors/bidders. Because of the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the Owner so that Freese and Nichols' geotechnical engineer can confirm those conditions.

-- END OF MEMORANDUM –

ATTACHMENT A



FREESE AND NICHOLS

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Fort Worth, TX 76109 - 4895
Phone - (817) 735 - 7300

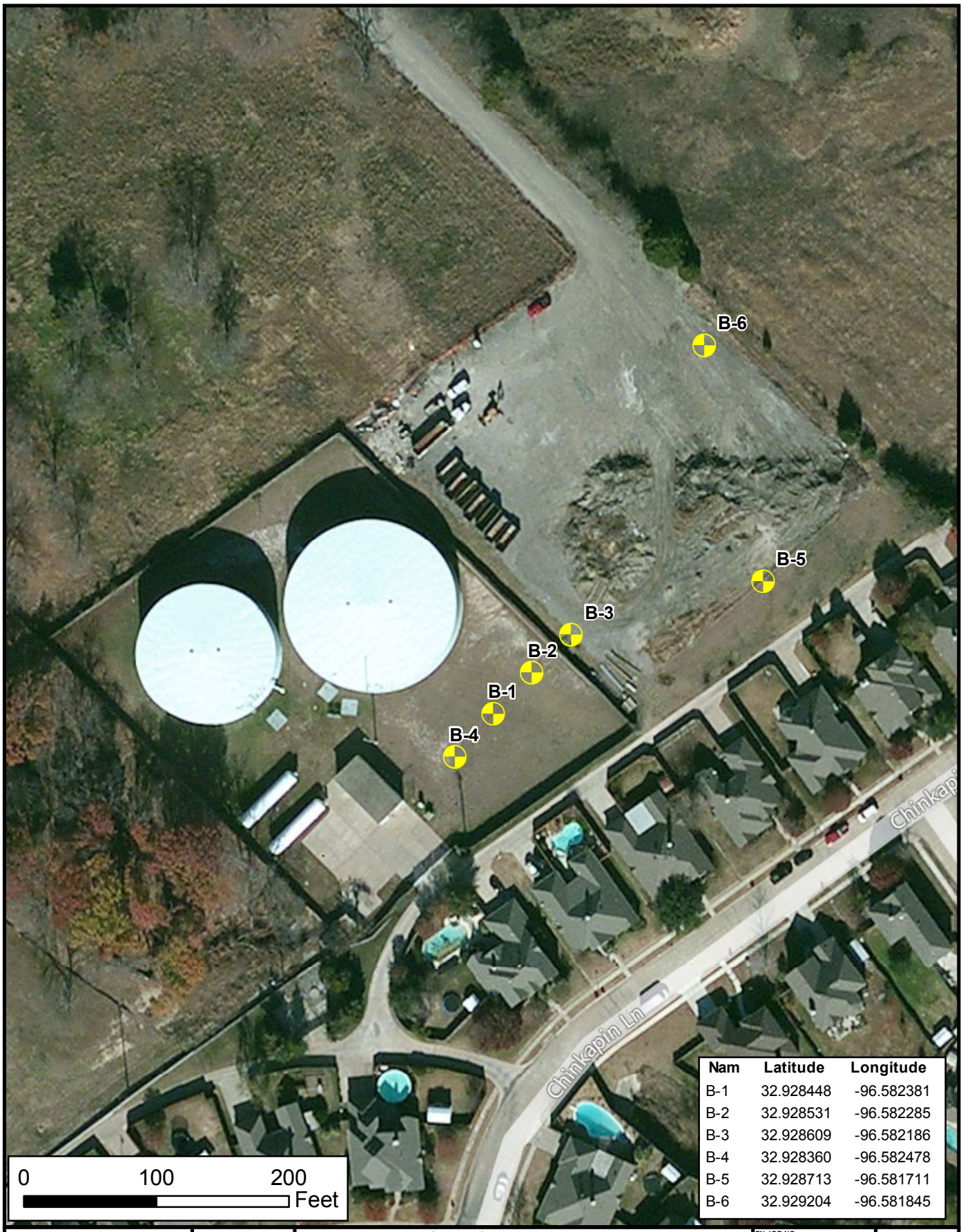
N
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City of Rowlett, Texas
Rowlett Road Lower Pressure Plane Pump Station

Vicinity Location Map

FN JOB NO	ROW13161
FILE	BLM.mxd
DATE	June 2013
SCALE	1:72,000
DESIGNED	MTM
DRAFTED	NBB

1
FIGURE



Nam	Latitude	Longitude
B-1	32.928448	-96.582381
B-2	32.928531	-96.582285
B-3	32.928609	-96.582186
B-4	32.928360	-96.582478
B-5	32.928713	-96.581711
B-6	32.929204	-96.581845

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4055 International Plaza, Suite 200
Fort Worth, TX 76109 - 4895
Phone - (817) 735 - 7300

N
W E
S

City of Rowlett, Texas
Rowlett Road Lower Pressure
Plane Pump Station

Boring Location Map

FN JOB NO	ROW13161
FILE	BLM.mxd
DATE	June 2013
SCALE	1:2,400
DESIGNED	MTM
DRAFTED	NBB

2
FIGURE

BORING LOG LEGEND AND NOMENCLATURE

Abbreviations		
U – Undisturbed Sample (tube)	SPT – Standard Penetration Test	TV – Torvane
A – Auger Sample	TCP – Texas Cone Penetration	NP – Non Plastic
CS – Continuous Sample	CFA – Continuous Flight Auger	ATD – At Time of Drilling
C – Rock Core	HSA – Hollow Stem Auger	AD – After Drilling

General Terms	
Term	Description
Blow Counts	Results from either the Standard Penetration Test (SPT) or the Texas Cone Penetration (TCP) test.
Recovery	Length of sample or core recovered divided by the total length pushed, driven, or cored (expressed as a %)
Rock Quality Designation (RQD)	Cumulative length of unfractured pieces of core material more than 4 inches in length divided by the total length of material cored (expressed as a percentage)

Consistency of Cohesive Soil				
Description	Comp. Strength, tsf	SPT Blows	TCP Blows	Criteria
Very Soft	< 0.25	0 – 2	0 – 8	Sample sags under its own weight and is easily deformed
Soft	≥ 0.25 – < 0.5	> 2 – 4	> 8 – 20	Easily pinched between fingers and remolded with light finger pressure
Medium Stiff	≥ 0.5 – < 1.0	> 4 – 8	N/A for TxDOT	Imprinted easily with fingers and remolded with firm finger pressure
Stiff	≥ 1.0 – < 2.0	> 8 – 15	>20 – 40	Imprinted with strong finger pressure or indented easily with fingernail
Very Stiff	≥ 2.0 – < 4.0	> 15 – 30	> 40 to 80	Light imprint from finger or light indent with fingernail
Hard	≥ 4.0	> 30	>80	Difficult to indent with fingernail

Apparent Density of Cohesionless Soil		
Description	SPT Blow Count	Texas Cone Blow Count
Very Loose	0 – 4	0 – 8
Loose	> 4 – 10	> 8 – 20
Medium Dense	> 10 – 30	> 20 to 80
Dense	> 30 – 50	80 to ≥ 5”
Very Dense	> 50	0” to < 5”

Soil Structure	
Description	Criteria
Stratified	Alternating layers of varying material/color with layers ≥ 1/4-inch thick
Laminated	Alternating layers of varying material/color with layers < 1/4-inch thick
Fissured	Breaks along definite planes with little resistance
Slickensided	Fracture planes appear polished or glossy; shows movement direction
Blocky	Cohesive soil that can be broken into small, angular lumps
Lensed	Inclusion of small pockets of soil that is different from dominate type
Homogenous	Same color and appearance throughout

Moisture Condition	
Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

Textural Adjectives	
Textural Item	Description
Pit	Pinhole sized openings
Vug	Small openings up to 4 inches in size
Cavity	Opening larger than 4 inches
Honeycomb	Numerous and grouped pits and vugs
Vesicle	Small openings in volcanic rocks

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BORING LOG LEGEND AND NOMENCLATURE

Rock Hardness Descriptors			
Grade	Approx. Comp. Strength, tsf	Approx. TCP Range	Field Test
Very Soft	< 10 - 100	>6”	Can be peeled with pocket knife, crumbles under firm blows of geological hammer
Soft	100 - 500	4” - 6”	Can be peeled with pocket knife with difficulty, indented by firm blows of geological hammer
Hard	500 - 1000	1” - 5”	Cannot be peeled with pocket knife, can be fractured by single firm blow of hammer
Very Hard	1000 - 2000	0” - 2”	Specimen requires more than one blow of geological hammer to fracture it
Extremely Hard	> 2000	0”	Specimen requires many blows of geological hammer to fracture it

Degree of Rock Weathering	
Description	Criteria
Unweathered	No evidence of chemical or mechanical alteration
Slightly Weathered	Slight discoloration of surface or discontinuities; < 10% volume altered
Weathered	Discoloring evident; 10 to 50% of volume altered
Highly Weathered	Entire mass discolored; alteration through majority of rock
Decomposed	Rock reduced to soil consistency with some rock-like texture

Rock Bedding Structure	
Description	Criteria
Laminated	< 3/8 inch
Very Thinly Bedded	3/8—1 inch
Thinly Bedded	1 inch—4 inches
Moderately Bedded	4 inches—1 foot
Thickly Bedded	1 foot—3 feet
Very Thickly Bedded	3– 10 feet
Massive	> 10 feet

Soil Column Graphic Symbols*			
Graphic	Represented Soil Types	Graphic	Represented Soil Types
	Fat Clay, Fat Clay with sand, Sandy Fat Clay		Well-Graded Sand or Poorly-Graded Sand; little to no fines
	Lean Clay, Lean Clay with sand, Sandy Lean Clay, Silty Clay		Clayey Gravel, Gravel-Sand-Clay Mixtures
	Inorganic Silt and Organic Silt		Silty Gravel, Gravel-Sand-Silt Mixtures
	Clayey Sand, Clay-Sand Mixtures		Well-Graded Gravel or Poorly-Graded Gravel; little to no fines
	Silty Sands, Sand-Silt Mixtures		Fill with Significant Debris or Deleterious Material

Rock Column Graphic Symbols*			
Graphic	Represented Rock Types	Graphic	Represented Rock Types
	Limestone, Shaly/Marly Limestone, Limestone with Shale		Marl, Marl with Limestone, Marl with Shale
	Shale, Shale with Limestone		Sandstone, Shaly Sandstone, Sandstone with Shale
	Mudstone		Generic Bedrock Symbol

* Combined graphics may be used for dual classifications. Not all graphics represented. Refer to lithology description for soil classification or rock type.

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LOG OF BORING NO. B-1

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928448
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582381
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	BLOW COUNTS	HAND PENE-TROMETER (P) / TORVANE (T), tsf	RECOVERY, %	RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
	U-1		4.0 (P)	100			FAT CLAY (CH), brown, hard, moist, with gravel, trace sand, calcareous									
	U-2		4.5+ (P)	100												
	U-3		4.5+ (P)	100						75	51	15	36			
	U-4		4.5+ (P)	100			FAT CLAY (CH), yellow-brown, brown and gray, hard, moist, calcareous, with orange iron stains, residuum, trace sand 3/									
5	U-5		4.5+ (P)	92				16		92	52	19	33			
	U-6		4.5+ (P)	92			-with calcareous inclusions from 3 to 6.5 feet									
	U-7		4.5+ (P)	83												
	U-8		4.5+ (P)	100				17	115					3.3		
	U-9		4.5+ (P)	100				17		93	52	17	35			
10	U-10		4.5+ (P)	92												
	U-11		4.5+ (P)	92			-with sandy seam at 14.5 feet									
15																
	U-12		4.5+ (P)	100			-with a 1 inch calcareous seam at 19 feet	17		93	79	28	51			
20																
	U-13		4.5+ (P)	100			MARL, dark gray, soft to hard, shaly 24.5/	24	100					3.3		
25																
	U-14		4.5+ (P)	100												

Water Observations:

None After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-1

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928448
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582381
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	SAMPLE BLOW COUNTS	SAMPLE HAND PENE-TROMETER (P) / TORVANE (T), tsf	SAMPLE RECOVERY, %	SAMPLE RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
							MARL, dark gray, soft to hard, shaly *(continued)*									
35	U-15		4.5+ (P)	125												
40	TCP	50/3" 50/1.5"														
45	SPT-16	21-32-45 (77)														
50	TCP	50/2.75" 50/1.5"					Total boring depth 50.0 ft.									
55																

Water Observations:
None After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-2

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928531
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582285
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	BLOW COUNTS	HAND PENE-TROMETER (P) / TORVANE (T), tsf	RECOVERY, %	RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
	U-1		4.5+ (P)	83			FAT CLAY (CH), dark brown, hard, moist									
	U-2		2.5 (P)	100			FAT CLAY (CH), yellow-brown, brown and gray, hard to stiff, moist, calcareous, with orange iron-stains, trace sand, residuum 1/									
	U-3		4.5+ (P)	92			-calcareous inclusions from 1 to 4.5 feet									
	U-4		4.5+ (P)	100			-gravel from 2.5 to 3.5 feet	15		79	53	18	35			
	U-5		4.5+ (P)	92												
5	U-6		4.5+ (P)	92												
	U-7		4.5+ (P)	83			-with marl fragments at 6 feet									
	U-8		4.5+ (P)	100												
	U-9		4.5+ (P)	100				18	114					3.9		
10																
15	U-10		4.5+ (P)	83				18		94	44	18	26			
	U-11		4.5+ (P)	100				17	112					1.3		
20																
	U-12		3.0 (P)	100							50	20	30			
25																
	U-13		4.5+ (P)	92			29.5/									

Water Observations:
38 ft After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-2

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928531
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582285
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	SAMPLE BLOW COUNTS	SAMPLE HAND PENE-TROMETER (P) / TORVANE (T), tsf	SAMPLE RECOVERY, %	SAMPLE RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
							MARL, dark gray, soft to hard, shaly *(continued)* -weathered in upper 5 feet									
35	U-14		4.5+ (P)	100				22	98					2.9		
40	U-15	50/2"	4.5+ (P)	67				17	103					1.4		
	TCP	50/1"					Total boring depth 41.0 ft.									
45																
50																
55																

Water Observations:
38 ft After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-3

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928609
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582186
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	BLOW COUNTS	HAND PENE-TROMETER (P) / TORVANE (T), tsf	RECOVERY, %	RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
	U-1		4.5+ (P)	75			3 inches Asphalt 0.25/									
	U-2		2.5 (P)	83			FAT CLAY (CH), dark brown, hard to stiff, moist									
	U-3		2.0 (P)	83												
	U-4		2.25 (P)	58			FAT CLAY (CH), light brown and yellow-brown and gray, stiff to hard, moist, calcareous, with root filaments, trace sand, residuum, with orange iron-stains 3/	25		87	74	25	49			
	U-5		3.0 (P)	100			-dark brown and gray from 4.5 to 5 feet									
5	U-6		3.25 (P)	92			-calcareous inclusions below 5 feet									
	U-7		3.75 (P)	92												
	U-8		2.75 (P)	100												
	U-9		4.0 (P)	100												
	U-10		4.5+ (P)	100				16		88	42	18	24			
10																
	U-11		4.5+ (P)	100			-with sand at 14.5 feet	17	116					1.9		
15																
	U-12		4.0 (P)	100						93	46	14	32			
20																
	U-13		4.0 (P)	100			-dry seam at 24.5 feet									
25																
	U-14		2.25 (P)	100			MARL, dark gray, soft, with clay, shaly 29/	22	101					1.3		

Water Observations:
28 ft After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-3

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928609
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582186
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	SAMPLE BLOW COUNTS	SAMPLE HAND PENE-TROMETER (P) / TORVANE (T), tsf	SAMPLE RECOVERY, %	SAMPLE RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
							-fissile and weathered in upper 6 feet MARL, dark gray, soft, with clay, shaly *(continued)*									
35	U-15		2.75 (P)	100												
40	U-16		4.0 (P)	100			Total boring depth 40.0 ft.									
45																
50																
55																

Water Observations:
28 ft After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-4

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.92836
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582478
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	BLOW COUNTS	HAND PENE-TROMETER (P) / TORVANE (T), tsf	RECOVERY, %	RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
	U-1		3.0 (P)	67			FAT CLAY (CH), yellow-brown, brown and gray, medium stiff to hard, moist, trace sand, calcareous, with orange iron-stains, residuum									
	U-2		1.0 (P)	100												
	U-3		4.25 (P)	100			-calcareous inclusions from 1 to 6 feet -sand seam from 1.5 to 1.7 feet	18	115							
	U-4		2.75 (P)	100												
	U-5		3.0 (P)	83			-with gravel at 4 feet									
5	U-6		4.5+ (P)	92				19		85	52	15	37			
	U-7		4.0 (P)	92												
	U-8		4.5 (P)	100												
	U-9		4.0 (P)	100												
	U-10		2.75 (P)	100												
10																
	U-11		2.25 (P)	100			-with sand from 14.5 to 15 feet	20	105					1.5		
15																
	U-12		4.5+ (P)	100												
20																
	U-13		4.5+ (P)	100			-with calcareous nodules at 24 feet			88						
25																
	U-14		4.5+ (P)	100			MARL, dark gray, soft to hard, shaly [29/]	27	99					2.6		

Water Observations:
None After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-4

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.92836
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.582478
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	SAMPLE BLOW COUNTS	SAMPLE HAND PENE-TROMETER (P) / TORVANE (T), tsf	SAMPLE RECOVERY, %	SAMPLE RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
							MARL, dark gray, soft to hard, shaly *(continued)*									
35	U-15		4.5+ (P)	100												
	U-16		4.5+ (P)	100				24	104					4.6		
40							Total boring depth 40.0 ft.									
45																
50																
55																

Water Observations: None After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-5

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.928713
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.581711
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	BLOW COUNTS	HAND PENE-TROMETER (P) / TORVANE (T), tsf	RECOVERY, %	RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
	U-1		4.5+ (P)	92			FAT CLAY (CH), dark brown, hard, moist to dry, calcareous, with occasional roots, trace sand									
	U-2		4.5+ (P)	75												
	U-3		4.5+ (P)	100				17		81	62	24	38			
	U-4		4.5+ (P)	83			-gravel and sand from 3 to 3.2 feet -calcareous inclusions increase below 4 feet									
	U-5		4.5+ (P)	100			-large root at 4 feet									
5							4.5/ FAT CLAY (CH), yellow-brown, hard, moist, calcareous, residuum									
							Total boring depth 5.0 ft.									
10																
15																
20																
25																

Water Observations:
None After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

LOG OF BORING NO. B-6

Project Description: Rowlett Rd Lower Pressure Plane Pump Station and Castle Water Lline
Project Location: Rowlett, Texas
Date Drilling Started: 5/8/2013
Logged By: HM
Rig Type: CME 75
Northing/Latitude: 32.929204
Drilling Co.: W.E.S.T. Drilling
Hammer Type: Automatic
Easting/Longitude: -96.581845
Project No.: ROW13161
Phase No.: 0001
Date Drilling Completed: 5/8/2013
Drill Method: HSA
Hammer Wt. & Drop: 170 lb.; 24 in.
Elevation:

DEPTH, ft	SAMPLE TYPE	SAMPLE BLOW COUNTS	SAMPLE HAND PENE-TROMETER (P) / TORVANE (T), tsf	SAMPLE RECOVERY, %	SAMPLE RQD, %	SYMBOL	MATERIAL DESCRIPTION	WATER CONTENT, %	UNIT DRY WEIGHT, pcf	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNC. COMPRESSIVE STRENGTH, tsf	STRAIN AT FAILURE, %	ELEVATION, ft
	U-1		2.5 (P)	83			2 inches Asphalt / Gravel 0.166/									
	U-2		2.5 (P)	83			FAT CLAY (CH), dark brown, medium stiff, moist, with gravel and sand, calcareous 1/									
	U-3		2.2 (P)	75			FAT CLAY (CH), light brown, yellow-brown and gray, medium stiff to stiff, moist, trace sand and gravel, residuum	24	104					1.8		
	U-4		2.5 (P)	92			-gravel at 4 feet									
	U-5		3.75 (P)	96												
5							Total boring depth 5.0 ft.									
10																
15																
20																
25																

Water Observations:
None After Drilling

Remarks: Boring backfilled with soil cuttings upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. These logs are subject to the limitations, conclusions, and recommendations in the associated report.

ATTACHMENT B

SUMMARY OF LABORATORY RESULTS

FREESE AND NICHOLS

PROJECT NAME Rowlett Rd LPP PS and Castle WL **PROJECT NUMBER** ROW13161 **PROJECT PHASE** 0001

PROJECT LOCATION Rowlett, Texas **TESTING PERFOMED BY:** Gorrondona & Associates, Inc.

Borehole	Depth, ft	Water Content, %	Unit Dry Weight lb/ft^3	% Passing No. 200 Sieve	Liquid Limit	Plastic Limit	Plasticity Index	Unconfined Compressive Strength, tsf	Strain at Failure, %
B-1	2.0			75	51	15	36		
B-1	4.0	16.1		92	52	19	33		
B-1	7.0	16.8	115.2					3.3	
B-1	8.0	16.9		93	52	17	35		
B-1	19.0	17.1		93	79	28	51		
B-1	24.0	23.7	99.7					3.3	
B-2	3.0	15.5		79	53	18	35		
B-2	8.0	17.5	113.7					3.9	
B-2	14.0	17.5		94	44	18	26		
B-2	19.0	17.4	112.5					1.3	
B-2	24.0				50	20	30		
B-2	34.0	22.3	98.5					2.9	
B-2	39.0	16.7	102.9					1.4	
B-3	3.0	24.9		87	74	25	49		
B-3	9.0	15.9		88	42	18	24		
B-3	14.0	17.4	116.0					1.9	
B-3	19.0			93	46	14	32		
B-3	29.0	22.1	101.4					1.3	
B-4	2.0	17.8	114.9						
B-4	5.0	18.6		85	52	15	37		
B-4	14.0	20.1	105.4					1.5	
B-4	24.0			88					
B-4	29.0	26.7	99.4					2.6	
B-4	39.0	24.0	103.5					4.6	
B-5	2.0	16.8		81	62	24	38		
B-6	2.0	23.5	103.8					1.8	

LAB SUMMARY - GINT STD US LAB.GDT - 5/30/13 08:34 - T:\2.30 TECHNICAL DATA\BORING LOGS\ROW13161.GPJ

Absorption Swell Test - ASTM (D4546)

Project Name Rowlett Rd LPP PS and Castle WL **Project No.** ROW13161 **Date** 5/22/2013

Boring No. B-1 **Sample No.** U-5 **Sample Depth (ft.)** 4-5

Sample Description Light Brown/ Gray w/ calc nods

Initial Sample Parameters

Diameter (in.)		Height (in)		
Sample Diameter	2.5 in.	Res Dev. Height	0.2 in.	(A_o) Initial Area (in^2)
		Ring Height	1 in.	4.908
		Sample Height	0.8	(V) Volume (in^3)
				3.927

Water Content/ Unit Weight Determination

Tare Designation	15	(WC) Water Content % (C/E x 100)	16.1%
(A) Wet Weight + Tare (g)	72.45	Sample Weight + ring (g)	243.12
(B) Dry Weight + Tare (g)	62.47	Weight of Ring (g)	108.6
(C) Water Weight (g), (A-B)	9.98	(WUW) Wet Unit Weight (pcf)	130.24
(D) Tare Weight (g)	0.42	(DUW) Dry Unit Weight (pcf)	112.20
(E) Dry Soil Weight (g), (B-D)	62.05		

Final Sample Parameters

Tare Designation	3		
(A) Wet Weight + Tare (g)	52.22	(WC) Water Content % (C/E x 100)	23.5%
(B) Dry Weight + Tare (g)	42.37		
(C) Water Weight (g), (A-B)	9.85		
(D) Tare Weight (g)	0.41		
(E) Dry Soil Weight (g), (B-D)	41.96		

Applied Load to Restrain Swell: 60 lbs.

Applied Pressure: 12.22 psi.

Test Data after Releasing Load

Date	Time (hr, min)	Elapsed Time (min.)	Dial Reading (in.)	% Swell
22-May	9:55 AM	0	0.0504	0.00%
22-May	9:55 AM	0.5	0.0546	0.53%
22-May	9:56 AM	1	0.0550	0.58%
22-May	9:57 AM	2	0.0555	0.64%
22-May	9:59 AM	4	0.0562	0.73%
22-May	10:03 AM	8	0.0575	0.89%
		15		
22-May	10:25 AM	30	0.0590	1.08%
22-May	10:55 AM	60 (1hr)	0.0612	1.35%
22-May	11:55 AM	120 (2hrs)	0.0660	1.95%
22-May	1:55 PM	240 (4hrs)	0.0680	2.20%
		480 (8hrs)		
23-May	9:55 AM	1440 (24hrs)	0.0739	2.94%

Apparatus #: *6*

Tested By: S. Ellis

Absorption Swell Test - ASTM (D4546)

Project Name Rowlett Rd LPP PS and Castle WL **Project No.** ROW13161 **Date** 5/22/2013

Boring No. B-2 **Sample No.** U-10 **Sample Depth (ft.)** 14-15

Sample Description Light Brown/ Gray Sandy CL

Initial Sample Parameters

Diameter (in.)		Height (in)		
Sample Diameter	2.5 in.	Res Dev. Height	0.2 in.	(A_o) Initial Area (in²)
		Ring Height	1 in.	4.908
		Sample Height	0.8	(V) Volume (in³)
				3.927

Water Content/ Unit Weight Determination

Tare Designation	14	(WC) Water Content % (C/E x 100)	17.5%
(A) Wet Weight + Tare (g)	54.19	Sample Weight + ring (g)	245.88
(B) Dry Weight + Tare (g)	46.18	Weight of Ring (g)	109.16
(C) Water Weight (g), (A-B)	8.01	(WUW) Wet Unit Weight (pcf)	132.37
(D) Tare Weight (g)	0.41	(DUW) Dry Unit Weight (pcf)	112.66
(E) Dry Soil Weight (g), (B-D)	45.77		

Final Sample Parameters

Tare Designation	2		
(A) Wet Weight + Tare (g)	63.20	(WC) Water Content % (C/E x 100)	20.0%
(B) Dry Weight + Tare (g)	52.74		
(C) Water Weight (g), (A-B)	10.46		
(D) Tare Weight (g)	0.41		
(E) Dry Soil Weight (g), (B-D)	52.33		

Applied Load to Restrain Swell: 50 lbs.

Applied Pressure: 10.19 psi.

Test Data after Releasing Load

Date	Time (hr, min)	Elapsed Time (min.)	Dial Reading (in.)	% Swell
22-May	9:55 AM	0	0.0641	0.00%
22-May	9:55 AM	0.5	0.0745	1.30%
22-May	9:56 AM	1	0.0753	1.40%
22-May	9:57 AM	2	0.0764	1.54%
22-May	9:59 AM	4	0.0769	1.60%
22-May	10:03 AM	8	0.0786	1.81%
		15		
22-May	10:25 AM	30	0.0804	2.04%
22-May	10:55 AM	60 (1hr)	0.0828	2.34%
22-May	11:55 AM	120 (2hrs)	0.0845	2.55%
22-May	1:55 PM	240 (4hrs)	0.0853	2.65%
		480 (8hrs)		
23-May	9:55 AM	1440 (24hrs)	0.0877	2.95%

Apparatus #: #7

Tested By: S. Ellis

Absorption Swell Test - ASTM (D4546)

Project Name Rowlett Rd LPP PS and Castle WL **Project No.** ROW13161 **Date** 5/22/2013

Boring No. B-3 **Sample No.** U-10 **Sample Depth (ft.)** 9-10

Sample Description Light Brown Sandy w/ trace Dark Brown

Initial Sample Parameters

Diameter (in.)		Height (in)		
Sample Diameter	2.5 in.	Res Dev. Height	0.2 in.	(A_o) Initial Area (in^2)
		Ring Height	1 in.	4.908
		Sample Height	0.8	(V) Volume (in^3)
				3.927

Water Content/ Unit Weight Determination

Tare Designation	16	(WC) Water Content % (C/E x 100)	15.9%
(A) Wet Weight + Tare (g)	71.41	Sample Weight + ring (g)	242.29
(B) Dry Weight + Tare (g)	61.66	Weight of Ring (g)	109.12
(C) Water Weight (g), (A-B)	9.75	(WUW) Wet Unit Weight (pcf)	128.93
(D) Tare Weight (g)	0.39	(DUW) Dry Unit Weight (pcf)	111.23
(E) Dry Soil Weight (g), (B-D)	61.27		

Final Sample Parameters

Tare Designation	4		
(A) Wet Weight + Tare (g)	49.27	(WC) Water Content % (C/E x 100)	19.4%
(B) Dry Weight + Tare (g)	41.32		
(C) Water Weight (g), (A-B)	7.95		
(D) Tare Weight (g)	0.41		
(E) Dry Soil Weight (g), (B-D)	40.91		

Applied Load to Restrain Swell:	50	lbs.
Applied Pressure:	10.19	psi.

Test Data after Releasing Load

Date	Time (hr, min)	Elapsed Time (min.)	Dial Reading (in.)	% Swell
22-May	9:55 AM	0	0.0254	0.00%
22-May	9:55 AM	0.5	0.0281	0.34%
22-May	9:56 AM	1	0.0284	0.38%
22-May	9:57 AM	2	0.0288	0.43%
22-May	9:59 AM	4	0.0292	0.48%
22-May	10:03 AM	8	0.0292	0.48%
		15		
22-May	10:25 AM	30	0.0299	0.56%
22-May	10:55 AM	60 (1hr)	0.0300	0.58%
22-May	11:55 AM	120 (2hrs)	0.0307	0.66%
22-May	1:55 PM	240 (4hrs)	0.0307	0.66%
		480 (8hrs)		
23-May	9:55 AM	1440 (24hrs)	0.0322	0.85%

Apparatus #: #5

Tested By: S. Ellis

Absorption Swell Test - ASTM (D4546)

Project Name Rowlett Rd LPP PS and Castle WL **Project No.** ROW13161 **Date** 5/22/2013

Boring No. B-4 **Sample No.** U-6 **Sample Depth (ft.)** 5-6

Sample Description Light Brown/ Gray

Initial Sample Parameters

Diameter (in.)		Height (in)		
Sample Diameter	2.5 in.	Res Dev. Height	0.2 in.	(A_o) Initial Area (in²)
		Ring Height	1 in.	4.908
		Sample Height	0.8	(V) Volume (in³)
				3.927

Water Content/ Unit Weight Determination

Tare Designation	13	(WC) Water Content % (C/E x 100)	18.6%
(A) Wet Weight + Tare (g)	70.65	Sample Weight + ring (g)	241.23
(B) Dry Weight + Tare (g)	59.62	Weight of Ring (g)	109.07
(C) Water Weight (g), (A-B)	11.03	(WUW) Wet Unit Weight (pcf)	127.96
(D) Tare Weight (g)	0.40	(DUW) Dry Unit Weight (pcf)	107.87
(E) Dry Soil Weight (g), (B-D)	59.22		

Final Sample Parameters

Tare Designation	1		
(A) Wet Weight + Tare (g)	49.22	(WC) Water Content % (C/E x 100)	22.0%
(B) Dry Weight + Tare (g)	40.42		
(C) Water Weight (g), (A-B)	8.80		
(D) Tare Weight (g)	0.40		
(E) Dry Soil Weight (g), (B-D)	40.02		

Applied Load to Restrain Swell:	55	lbs.
Applied Pressure:	11.21	psi.

Test Data after Releasing Load

Date	Time (hr, min)	Elapsed Time (min.)	Dial Reading (in.)	% Swell
22-May	9:55 AM	0	0.0335	0.00%
22-May	9:55 AM	0.5	0.0347	0.15%
22-May	9:56 AM	1	0.0359	0.30%
22-May	9:57 AM	2	0.0369	0.43%
22-May	9:59 AM	4	0.0371	0.45%
22-May	10:03 AM	8	0.0393	0.73%
		15		
22-May	10:25 AM	30	0.0419	1.05%
22-May	10:55 AM	60 (1hr)	0.0439	1.30%
22-May	11:55 AM	120 (2hrs)	0.0459	1.55%
22-May	1:55 PM	240 (4hrs)	0.0468	1.66%
		480 (8hrs)		
23-May	9:55 AM	1440 (24hrs)	0.0476	1.76%

Apparatus #: #8

Tested By: S. Ellis

APPENDIX C
EXISTING PUMP STATION PHOTOS



Figure C-1: Existing Barrel Can for Pump Addition

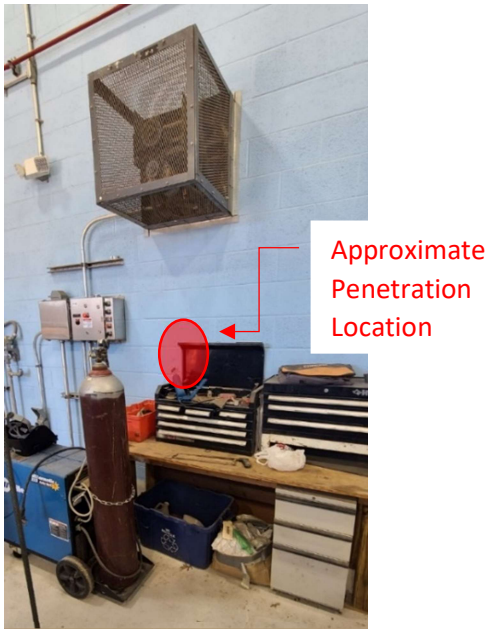


Figure C-2: Interior View of Proposed Pipe Penetration



Figure C-3: Exterior View of Proposed Pipe Penetration

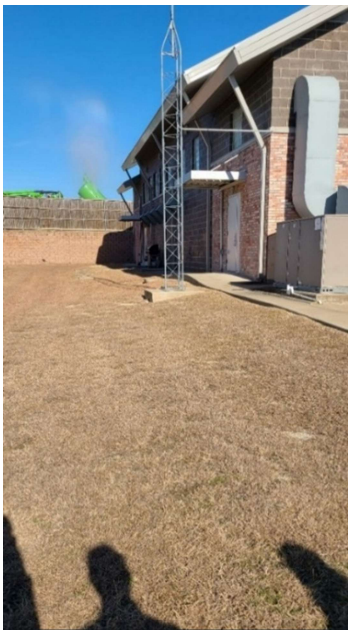


Figure C-4: Existing Antenna



Figure C-5: Existing Conduits for Pump RRLPP-6



Figure C-6: Existing Conduits for Pump Control Valve for RRLPP-6



Figure C-7: Existing Equipment Pad for VFD



Figure C-8: Existing Switchboard



Figure C-9: Existing LPP Pump Station RTU

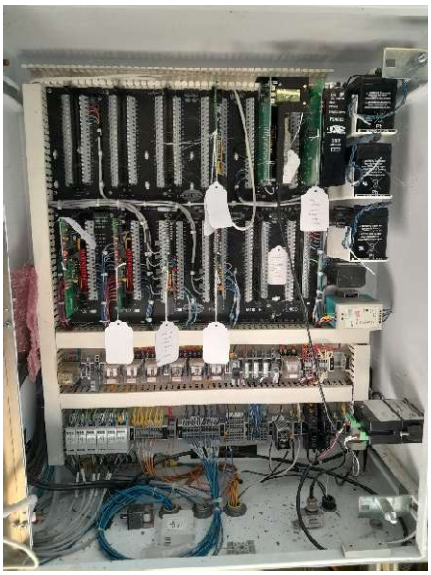
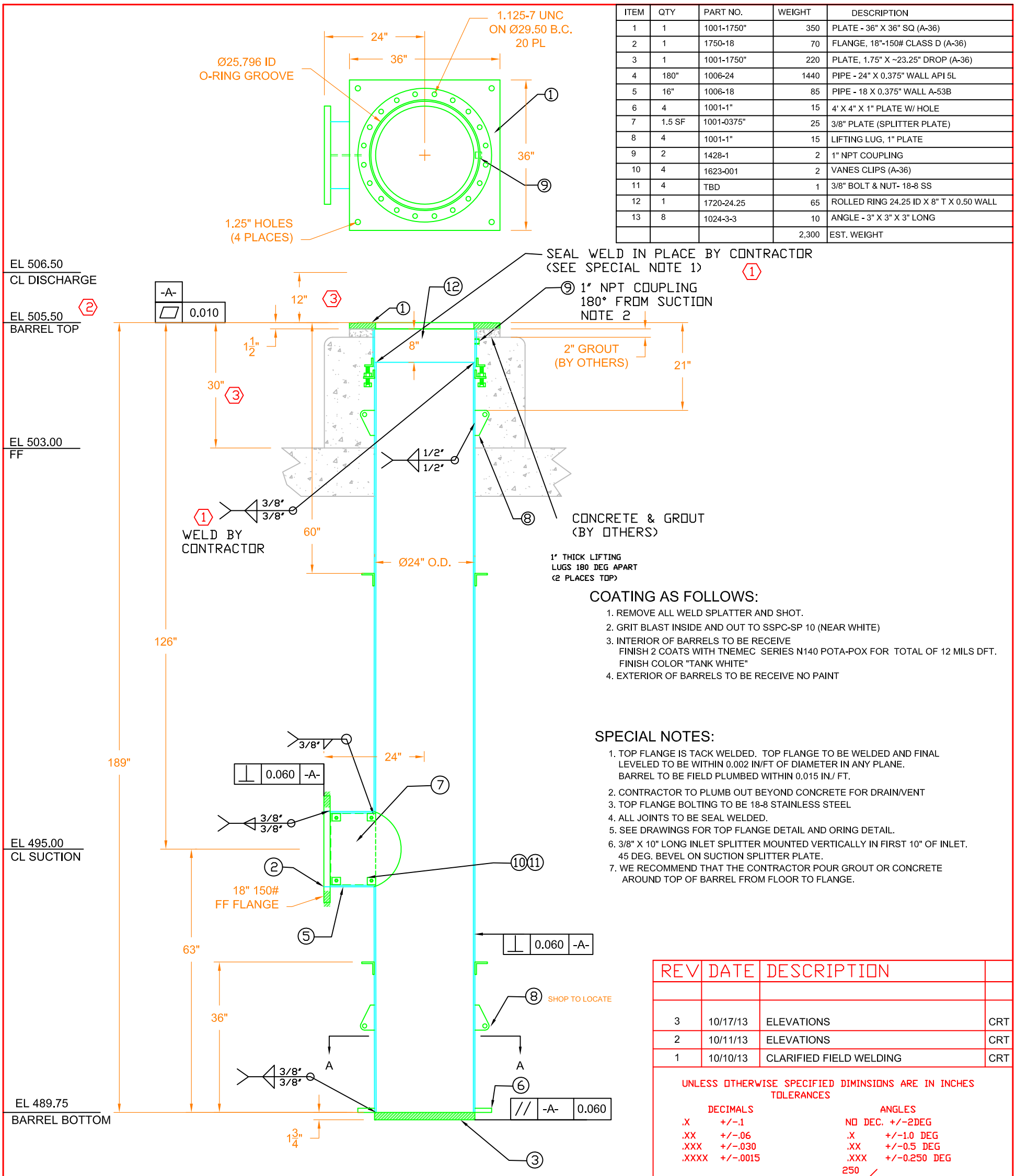


Figure C-10: Existing UPP Pump Station RTU

APPENDIX D
EXISTING BARREL SHOP DRAWINGS



ITEM	QTY	PART NO.	WEIGHT	DESCRIPTION
1	1	1001-1750"	350	PLATE - 36" X 36" SQ (A-36)
2	1	1750-18	70	FLANGE, 18"-150# CLASS D (A-36)
3	1	1001-1750"	220	PLATE, 1.75" X ~23.25" DROP (A-36)
4	180"	1006-24	1440	PIPE - 24" X 0.375" WALL API 5L
5	16"	1006-18	85	PIPE - 18 X 0.375" WALL A-53B
6	4	1001-1"	15	4' X 4" X 1" PLATE W/ HOLE
7	1.5 SF	1001-0375"	25	3/8" PLATE (SPLITTER PLATE)
8	4	1001-1"	15	LIFTING LUG, 1" PLATE
9	2	1428-1	2	1" NPT COUPLING
10	4	1623-001	2	VANES CLIPS (A-36)
11	4	TBD	1	3/8" BOLT & NUT- 18-8 SS
12	1	1720-24.25	65	ROLLED RING 24.25 ID X 8" T X 0.50 WALL
13	8	1024-3-3	10	ANGLE - 3" X 3" X 3" LONG
			2,300	EST. WEIGHT

COATING AS FOLLOWS:

1. REMOVE ALL WELD SPLATTER AND SHOT.
2. GRIT BLAST INSIDE AND OUT TO SSPC-SP 10 (NEAR WHITE)
3. INTERIOR OF BARRELS TO BE RECEIVE
   FINISH 2 COATS WITH TNEMEC SERIES N140 POTA-POX FOR TOTAL OF 12 MILS DFT.
   FINISH COLOR "TANK WHITE"
4. EXTERIOR OF BARRELS TO BE RECEIVE NO PAINT

SPECIAL NOTES:

1. TOP FLANGE IS TACK WELDED. TOP FLANGE TO BE WELDED AND FINAL LEVELED TO BE WITHIN 0.002 IN/FT OF DIAMETER IN ANY PLANE. BARREL TO BE FIELD PLUMBED WITHIN 0.015 IN./ FT.
2. CONTRACTOR TO PLUMB OUT BEYOND CONCRETE FOR DRAIN/VENT
3. TOP FLANGE BOLTING TO BE 18-8 STAINLESS STEEL
4. ALL JOINTS TO BE SEAL WELDED.
5. SEE DRAWINGS FOR TOP FLANGE DETAIL AND ORING DETAIL.
6. 3/8" X 10" LONG INLET SPLITTER MOUNTED VERTICALLY IN FIRST 10" OF INLET. 45 DEG. BEVEL ON SUCTION SPLITTER PLATE.
7. WE RECOMMEND THAT THE CONTRACTOR POUR GROUT OR CONCRETE AROUND TOP OF BARREL FROM FLOOR TO FLANGE.

REV	DATE	DESCRIPTION	
3	10/17/13	ELEVATIONS	CRT
2	10/11/13	ELEVATIONS	CRT
1	10/10/13	CLARIFIED FIELD WELDING	CRT

UNLESS OTHERWISE SPECIFIED DIMINSIONS ARE IN INCHES

TOLERANCES

DECIMALS		ANGLES	
.X	+/-.1	NO DEC.	+/-2DEG
.XX	+/-.06	.X	+/-1.0 DEG
.XXX	+/-.030	.XX	+/-0.5 DEG
.XXXX	+/-.0015	.XXX	+/-0.250 DEG

250

FINISH ALL MACHINED SURFACES

BREAK ALL CORNERS AND SHARP EDGES .010/.030

RADIUS ALL FILLETS .015/.040 R

CHAMFER ALL THREADED HOLES 90/120 DEG

TO A DEPTH OF ONE THREAD +/- .030

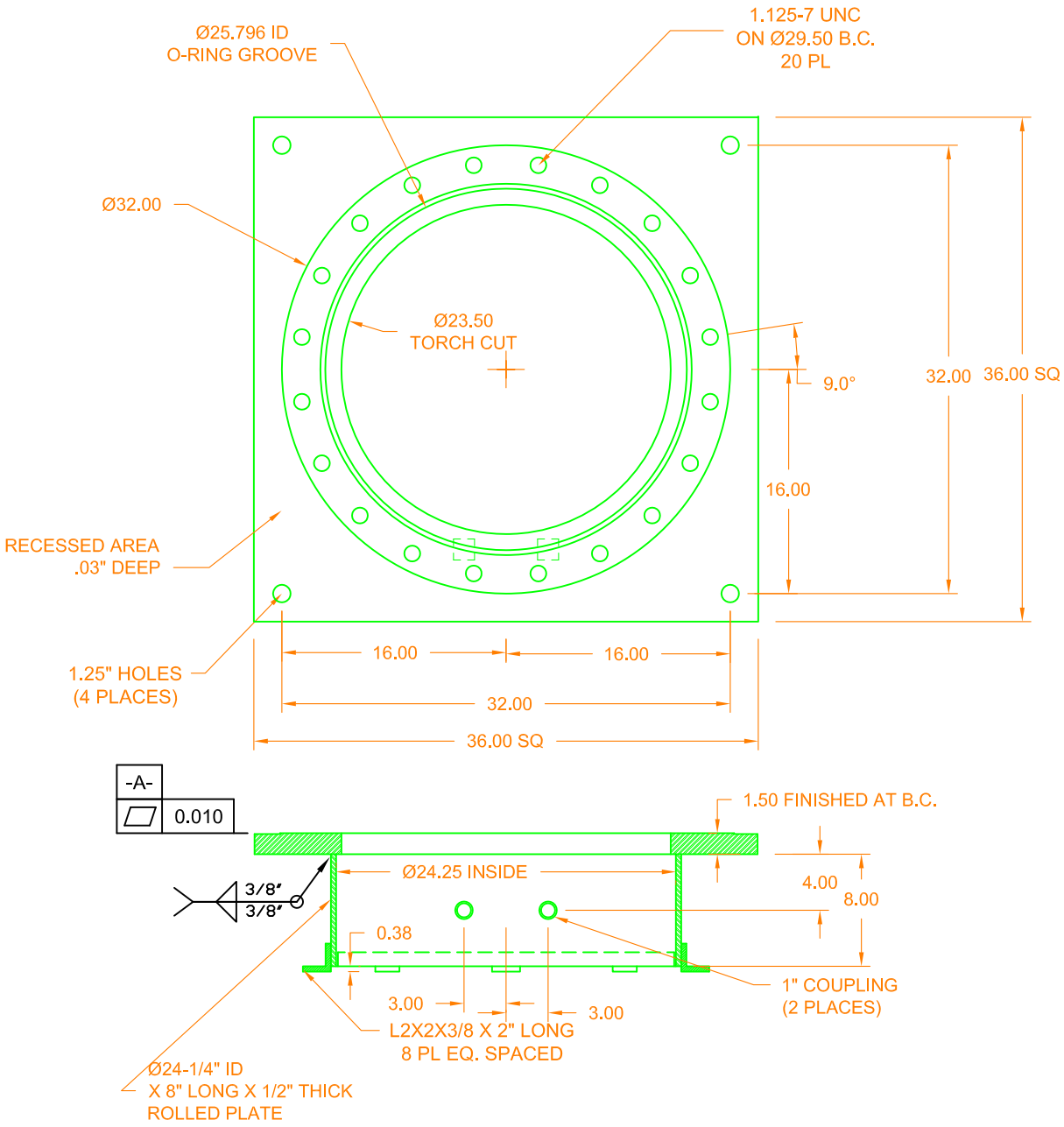
SCREW THREAD STANDARDS PER FED-STD-H2B

SMITH PUMP COMPANY

PRODUCT	SUCTION BARREL - FABRICATION
PROJECT	ROWLETT ROAD LOWER PLANE P.S.
OWNER	CITY OF ROWLETT, TX
CONTRACTOR	CRESCENT CONTRACTORS
ENG.	FREESE - NICHOLS
SALES ORDER:	169496 QTY: 5
DWG. NO.	T:\CAD\5601..\5601-050-24X189-18.DWG

DATE	SCALE	BY	CK	REV
10/04/13	NONE	CRT	SPCO	3

THIS DRAWING IS INTENDED TO DEFINE THE PRODUCTS AND MATERIALS TO BE PROVIDED BY SMITH PUMP COMPANY.
THIS DRAWING IS NOT INTENDED TO DEFINE OR SUPERCEDE THE ENGINEER'S REQUIREMENTS FOR INSTALLATION.



REV	DATE	DESCRIPTION	
-	-	-	-

UNLESS OTHERWISE SPECIFIED DIMINSIONS ARE IN INCHES
TOLERANCES

DECIMALS		ANGLES	
.X	+/-.1	NO DEC.	+/-2DEG
.XX	+/-.06	.X	+/-1.0 DEG
.XXX	+/-.030	.XX	+/-0.5 DEG
.XXXX	+/-.0015	.XXX	+/-0.250 DEG

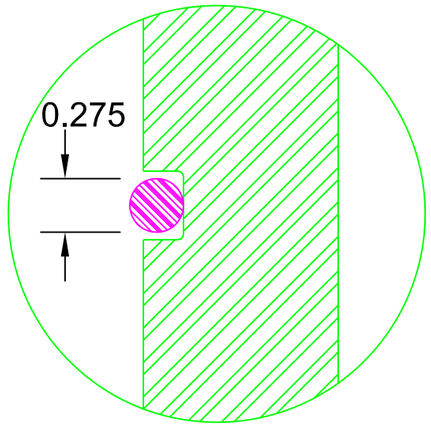
250

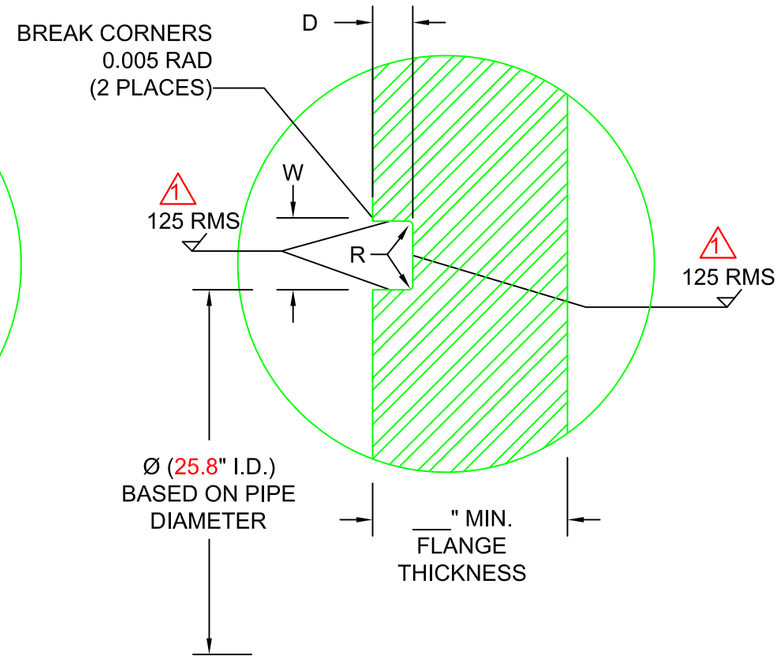
FINISH ALL MACHINED SURFACES
BREAK ALL CORNERS AND SHARP EDGES .010/.030
RADIUS ALL FILLETS .015/.040 R
CHAMFER ALL THREADED HOLES 90/120 DEG
TO A DEPTH OF ONE THREAD +/- .030
SCREW THREAD STANDARDS PER FED-STD-H2B

SMITH PUMP COMPANY

PRODUCT	SUCTION BARREL - FABRICATION
PROJECT	ROWLETT ROAD LOWER PLANE P.S.
OWNER	CITY OF ROWLETT, TX
CONTRACTOR	CRESCENT CONTRACTORS
ENG.	FREESE - NICHOLS
SALES ORDER:	169496 QTY: 5
DWG. NO.	T:\CAD\5601..\5601-050-24X189-18.DWG

DATE	SCALE	BY	CK	REV
10/04/13	NONE	CRT	SPCO	-





NOM. O.D.	1/4
ACTUAL O.D.	0.275 +/-.006
W	0.352 +/-.010
D	0.206 +/-.005
R	0.030 +/-.010

1. MATING FLANGE FINISH - 125 RMS (1)
2. TYPICAL FOR 12" PIPE FLANGES AND UP.
3. BASED ON PARKER DESIGN CHART 4-2 PG 4-14 (5700 HANDBOOK)
4. GROOVE WALL TAPER - 0/+5 DEG

REV	DATE	DESCRIPTION
1	03/26/02	CHANGE FINISH TO 125 CRT (1)

UNLESS OTHERWISE SPECIFIED DIMINSIONS ARE IN INCHES
TOLERANCES

DECIMALS		ANGLES	
.X	+/-.1	NO DEC.	+/-2DEG
.XX	+/-.06	.X	+/-1.0 DEG
.XXX	+/-.030	.XX	+/-0.5 DEG
.XXXX	+/-.0015	.XXX	+/-0.250 DEG

250

FINISH ALL MACHINED SURFACES
BREAK ALL CORNERS AND SHARP EDGES .010/.030
RADIUS ALL FILLETS .015/.040 R
CHAMFER ALL THREADED HOLES 90/120 DEG
TO A DEPTH OF ONE THREAD +/- .030
SCREW THREAD STANDARDS PER FED-STD-H2B

SMITH PUMP COMPANY

PRODUCT O-RING GROOVE - 0.25 IN

PROJECT

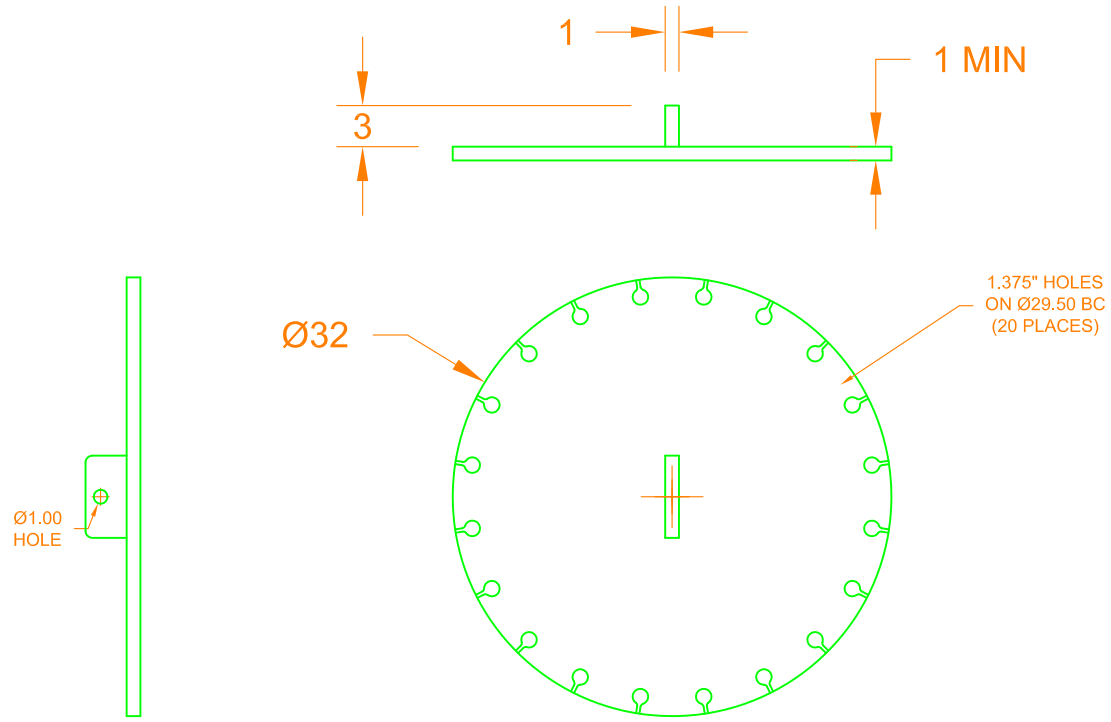
OWNER

CONTRACTOR

ENG.

DWG. NO.

DATE	SCALE	BY	CK	REV
03/11/2002	1"=1"	CRT	SPCO	1



NOTES:

1. MATERIAL - A-36 STEEL
2. BLAST AND PRIME WITH TNEMEC N140 (4-6 MILS DFT).
3. FINISH COAT ON TOP SIDE WITH TNEMEC 1075 (3-4 MILS DFT)

one (1) cover plate

COVER PLATE

REV	DATE	DESCRIPTION
-	-	-

UNLESS OTHERWISE SPECIFIED DIMINSIONS ARE IN INCHES
TOLERANCES

DECIMALS		ANGLES	
.X	+/-.1	NO DEC.	+/-2DEG
.XX	+/-.06	.X	+/-1.0 DEG
.XXX	+/-.030	.XX	+/-0.5 DEG
.XXXX	+/-.0015	.XXX	+/-0.250 DEG

250

FINISH ALL MACHINED SURFACES
BREAK ALL CORNERS AND SHARP EDGES .010/.030
RADIUS ALL FILLETS .015/.040 R
CHAMFER ALL THREADED HOLES 90/120 DEG
TO A DEPTH OF ONE THREAD +/- .030
SCREW THREAD STANDARDS PER FED-STD-H2B

SMITH PUMP COMPANY

PRODUCT	SUCTION BARREL - FABRICATION
PROJECT	ROWLETT ROAD LOWER PLANE P.S.
OWNER	CITY OF ROWLETT, TX
CONTRACTOR	CRESCENT CONTRACTORS
ENG.	FREESE - NICHOLS
SALES ORDER:	169496 QTY: 5
DWG. NO.	T:\CAD\5601..\5601-050-24X189-18.DWG

DATE	SCALE	BY	CK	REV
10/04/13	NONE	CRT	SPCO	-

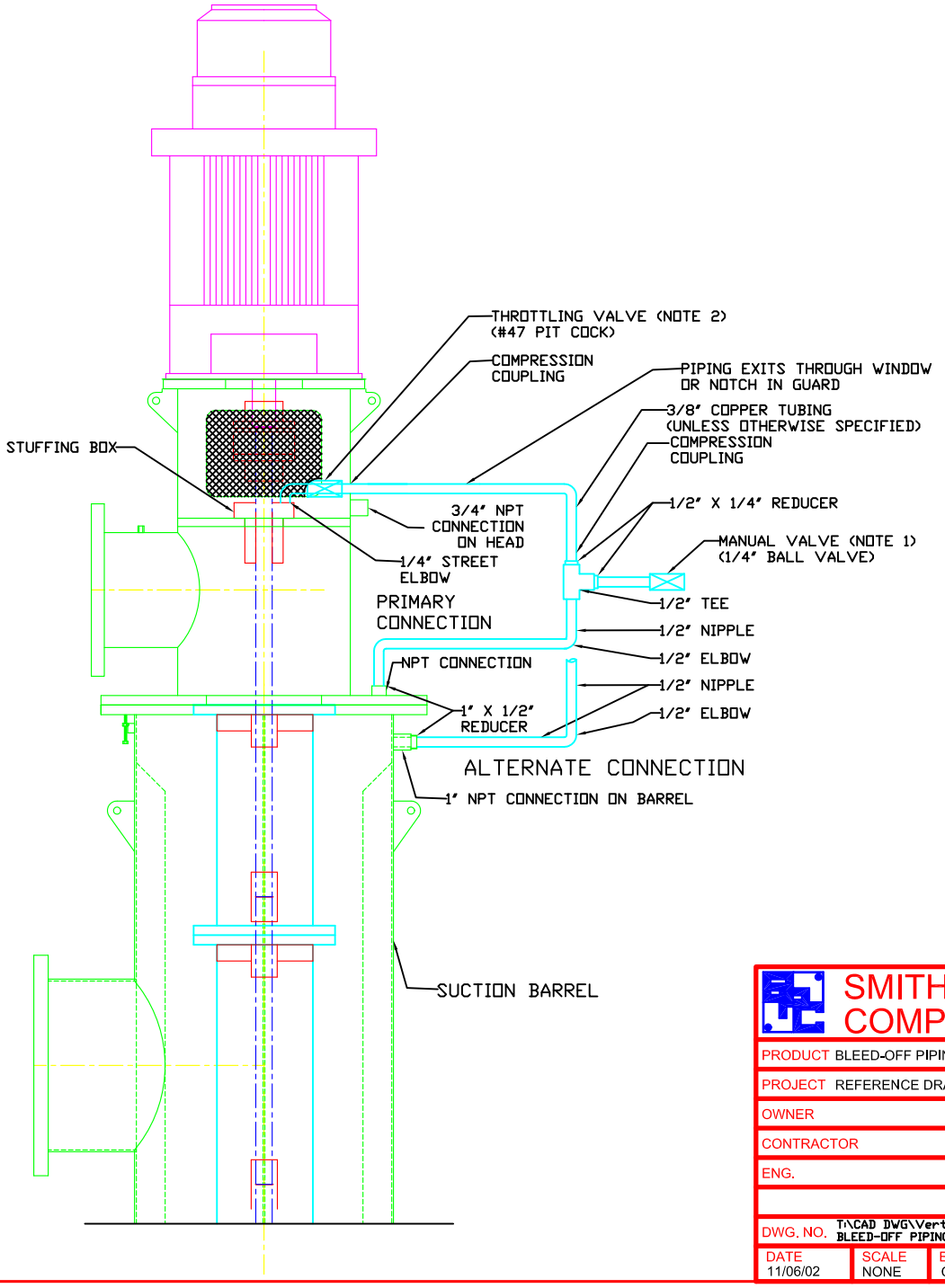
COMPANY CONFIDENTIAL: INFORMATION CONTAINED HEREIN IS CONFIDENTIAL. IT IS THE PROPERTY OF SMITH PUMP CO. IT IS TO BE USED SOLELY FOR THE PURPOSES PROVIDED, AND IT IS NOT TO BE DISCLOSED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF SMITH PUMP COMPANY.

TYPICAL

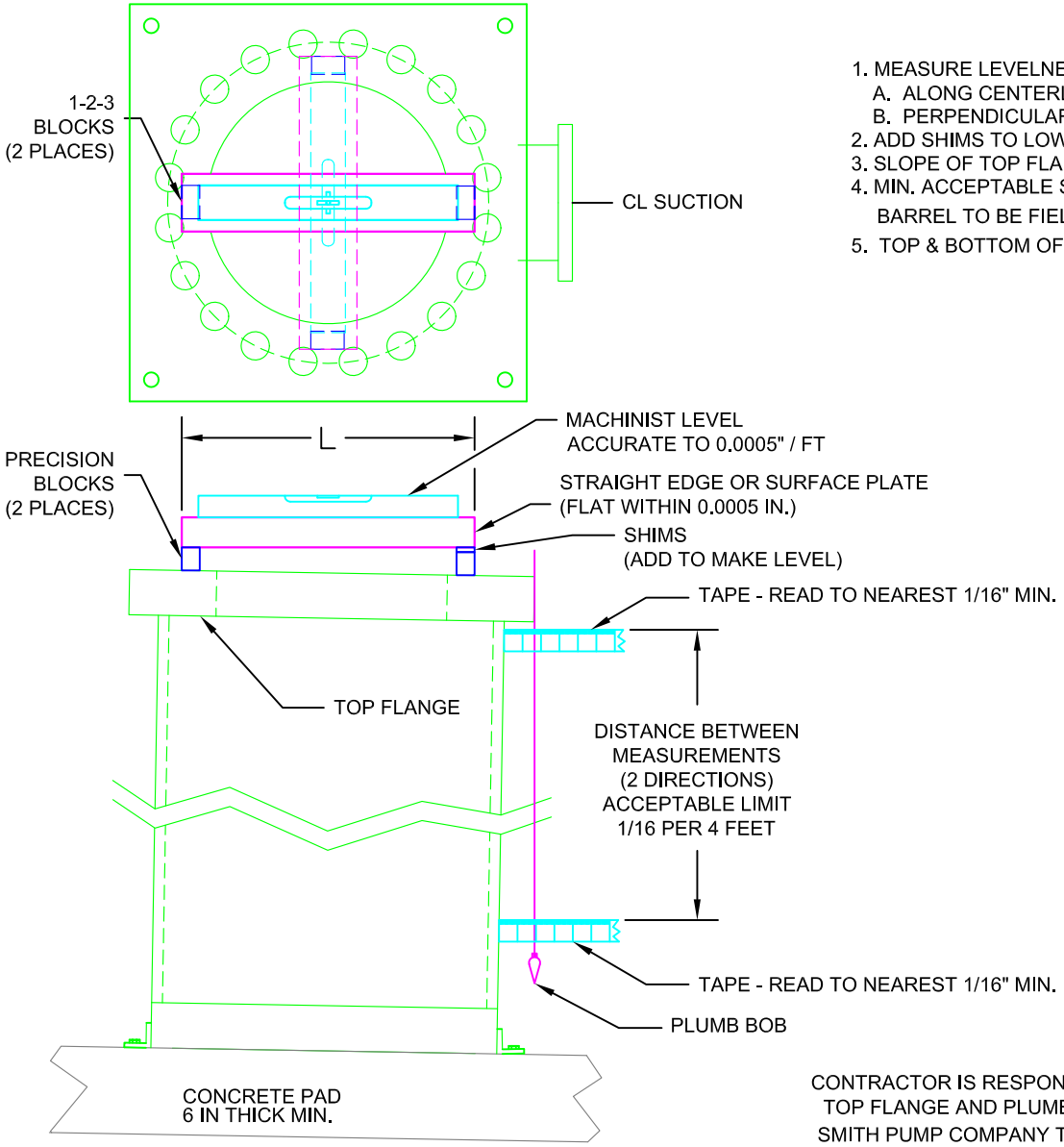
BLEED-OFF PIPING FROM THE PUMP STUFFING BOX OR MECH SEAL TO NPT CONNECTION ON BARREL OR HEAD

SPECIAL NOTES:

1. THE MANUAL VALVE SHOULD REMAIN CLOSED EXCEPT AT INITIAL START-UP TO BLEED THE AIR OUT OF THE SUCTION BARREL.
2. THE THROTTLING VALVE SHOULD ALWAYS REMAIN OPEN OR PARTIALLY OPEN, SO THAT WHEN THE PUMP IS OPERATING, EXCESSIVE PRESSURE WILL BE BLED OFF OF THE STUFFING BOX BACK TO THE SUCTION BARREL.



SMITH PUMP COMPANY				
PRODUCT BLEED-OFF PIPING				
PROJECT REFERENCE DRAWING				
OWNER				
CONTRACTOR				
ENG.				
DWG. NO. T:\CAD DWG\Vertical Turbine\ BLEED-OFF PIPING-W-MECH-SEAL.dwg				
DATE 11/06/02	SCALE NONE	BY CRT	CK SPCO	REV -



1. MEASURE LEVELNESS OF TOP FLANGE IN TWO (2) DIRECTIONS
   A. ALONG CENTERLINE OF SUCTION
   B. PERPENDICULAR TO CL OF SUCTION.
2. ADD SHIMS TO LOW SIDE TO CENTER BUBBLE.
3. SLOPE OF TOP FLANGE = SHIM THICKNESS (IN) / L (FT)
4. MIN. ACCEPTABLE SLOPE = 0.002 IN / FT (ANY DIRECTION)
   BARREL TO BE FIELD PLUMBED WITHIN 0.015 IN./ FT. (ANY DIRECTION)
5. TOP & BOTTOM OF BARREL TO BE SUPPORTED DURING BACKFILLING.

CONTRACTOR IS RESPONSIBLE FOR LEVELNESS OF TOP FLANGE AND PLUMBNESS OF BARREL.
SMITH PUMP COMPANY TO VERIFY LEVELNESS PRIOR TO BACKFILLING AND PRIOR TO PUMP INSTALLATION.
FAILURE TO COMPLY WILL VOID WARRANTY.

REV	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED DIMINSIONS ARE IN INCHES
TOLERANCES

DECIMALS		ANGLES	
.X	+/-.1	NO DEC.	+/-2DEG
.XX	+/-.06	.X	+/-1.0 DEG
.XXX	+/-.030	.XX	+/-0.5 DEG
.XXXX	+/-.0015	.XXX	+/-0.250 DEG

250
FINISH ALL MACHINED SURFACES
BREAK ALL CORNERS AND SHARP EDGES .010/.030
RADIUS ALL FILLETS .015/.040 R
CHAMFER ALL THREADED HOLES 90/120 DEG
TO A DEPTH OF ONE THREAD +/- .030
SCREW THREAD STANDARDS PER FED-STD-H2B

SMITH PUMP COMPANY

PRODUCT	LEVELING BARREL FLANGE
PROJECT	TYPICAL BARREL INSTALLATION
OWNER	
CONTRACTOR	
ENG.	
DWG. NO.	T:\CAD DWG\BARRELS\LEVEL1.dwg

DATE	SCALE	BY	CK	REV
03/11/2002	NONE	CRT	SPCO	—

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8/21/2025

Mrs. Beena Jacob
CIP Manager
City of Rowlett, Texas
5072 Rowlett Road
Rowlett, TX 75089

Re: Recommendation of Award for Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid)
Bid No. 2025-167-B

Mrs. Jacob:

A total of one (1) bidder submitted bid packages for the above referenced project on Wednesday, August 13, 2025. All received bids were read aloud. Bids were for the improvements at the Rowlett Road Pump Station Upper Pressure Plane including 84 LF 12-inch water line by open cut and 1 vertical turbine pump (1850 GPM, 125 HP) with associated mechanical and electrical equipment. The pump will be installed utilizing the existing pump can and connected to the proposed water line. The water line will connect to an existing 12-inch water line on the pump station site.

The bids received are listed below. A detailed bid tabulation is attached to this letter showing line-item costs for each bid received.

BID SUMMARY

Bidders	Total Bid
Felix Construction Company	**$1,427,770.00**

Felix Construction Company is a general contractor based in Richardson, Texas. Felix Construction Company has completed a history of similar projects including the City of Grand Prairie's Southwest Sector Pump Station and City of Keller's Alta Vista Pump Station. Felix Construction Company has a successful history of providing quality work on schedule during similar construction projects, based on feedback from the references provided.

FNI recommends the award of the project to Felix Construction Company for the amount of $1,427,770.00.

Please contact me with any questions or concerns you may have regarding this letter.

Sincerely,

Devan Ruiz

08/21/2025

Devan Ruiz, PMP, PE, Assoc. DBIA
Project Manager
Freese and Nichols, Inc.

Attachments:
Project Bid Tab
Felix Construction Company Project Experience and Reference

File: ROW23118: T:\3.0 DESIGN \3.06 Bid Phase\2025-08-13 ReBid Opening

				FNI IFB Estimate		FELIX CONSTRUCTION COMPANY	
				Total Price	$ 751,500.00	Total Price	$1,427,770.00
Line #	Description	QTY	UOM	Estimated Unit	Estimated Extended	Unit	Extended
1	Mobilization (5% Maximum)	1	LS	$ 44,200.00	$ 44,200.00	$45,000.00	$45,000.00
2	Trench Safety Program	84	LF	$ 10.00	$ 840.00	$18.00	$1,512.00
3	Sodding and Topsoil	200	SY	$ 35.00	$ 7,000.00	$25.00	$5,000.00
4	Erosion Control	1	LS	$ 4,350.00	$ 4,350.00	$5,000.00	$5,000.00
5	Construction of the Rowlett Road Pump Station Upper Pressure Plane Addition Improvements with VFD complete and in place as shown in the plans and described in the specifications	1	LS	$ 582,810.00	$ 582,810.00	$1,292,668.00	$1,292,668.00
6	Matching to reset/level existing RRUPP P-6 pump can flange as shown in the plans and described in the specifications	1	LS	$ 57,750.00	$ 57,750.00	$25,000.00	$25,000.00
7	12-Inch Gate Valve	1	EA	$ 8,750.00	$ 8,750.00	$5,150.00	$5,150.00
8	12-Inch AWWA C151 Ductile Iron Pipe (Yard Piping)	84	LF	$ 340.00	$ 28,560.00	$510.00	$42,840.00
9	12-Inch X 12-Inch Tapping Sleeve	1	EA	$ 17,190.00	$ 17,190.00	$5,600.00	$5,600.00

References Worksheet

Please provide at least five (5) verifiable references for same or similar services as the City has specified in the solicitation, in the spaces provided below.

Name and Address of Similar Project: DCRWS Rehab Phase 1 - 1687 North Highway 377, Roanoke, TX 76262
Owner Name: Trinity River Authority
Owner Representative: Carlos Ramos
Owner Representative Email Address and Phone Number: ramosc@trinityra.org 817.312.6085
Architect/Engineer Name: Plummer Associates
Architect/Engineering Representative: Josh Wheeler
Architect/Engineering Representative Email Address and Phone Number: jwheeler@apaienv.com 972.996.5722

Name and Address of Similar Project: Alta Vista Pump Station - 1100 Bear Creek Parkway Keller, TX 76244
Owner Name: City of Keller
Owner Representative: Alonzo Liñán
Owner Representative Email Address and Phone Number: alinan@cityofkeller.com 817.743.4000
Architect/Engineer Name: Freese and Nichols
Architect/Engineering Representative: Kelly Wood
Architect/Engineering Representative Email Address and Phone Number: kww@freese.com 682.561.6178

Name and Address of Similar Project: Southwest Sector Pump Station - 4055 International Plaza, Suite 200, Fort Worth, TX 76109
Owner Name: City of Grand Prairie
Owner Representative: George Fanous
Owner Representative Email Address and Phone Number: gfanous@gptx.com 972.237.7317
Architect/Engineer Name: Freese and Nichols
Architect/Engineering Representative: Kelly Wood
Architect/Engineering Representative Email Address and Phone Number: kww@freese.com 682.561.6178

Name and Address of Similar Project: Bud Ervin TWTP Clearwell No. 4 and HSPS Improvements - 707 Pleasant Ridge CT., Mansfield, TX 76063
Owner Name: City of Mansfield
Owner Representative: Junior Zavala
Owner Representative Email Address and Phone Number: fernando.zavala@mansfieldtexas.com 214.975.0471
Architect/Engineer Name: Plummer Associates
Architect/Engineering Representative: Matt Kuykendoll
Architect/Engineering Representative Email Address and Phone Number: mkuykendall@plummer.com 817.806.1719

Name and Address of Similar Project: Ard Road Pump Station Upgrades Contract 2 - 702 N Hwy 175, Seagoville, TX 75159
Owner Name: City of Seagoville
Owner Representative: Chris Ryan
Owner Representative Email Address and Phone Number: cryan@seagoville.us 469.396.8892
Architect/Engineer Name: Halff Associates
Architect/Engineering Representative: Ron King
Architect/Engineering Representative Email Address and Phone Number: rking@halff.com 817.813.5715

Bid No. 2025-167-B

Rowlett Road Pump Station Upper Pressure Plane Additions (Rebid)

Bid Tabulation

				Felix Construction Company 403 International Pkwy Ste 500, Richardson, TX	
Item No	**Description**	**UOM**	**Quantity**	**Unit Price**	**Extended Cost**
1	Mobilization (5% Maximum)	Lump-Sum	1	$ 45,000.00	$ 45,000.00
2	Trench Safety Program	Linear Foot/Feet	84	$ 18.00	$ 1,512.00
3	Sodding and Topsoil	Square Yard	200	$ 25.00	$ 5,000.00
4	Erosion Control	Lump-Sum	1	$ 5,000.00	$ 5,000.00
5	Construction of the Rowlett Road Pump Station Upper Pressure Plane Addition Improvements with VFD Complete and in Place as Shown in the Plans and Described in the Specifications	Lump-Sum	1	$ 1,292,668.00	$ 1,292,668.00
6	Matching to Reset/Level Existing RRUPP P-6 Pump Can Flange as Shown in the Plans and Described in the Specifications	Lump-Sum	1	$ 25,000.00	$ 25,000.00
7	12-inch Gate Valve	Each	1	$ 5,150.00	$ 5,150.00
8	12-inch AWWA C151 Ductile Iron Pipe (Yard Piping)	Linear Foot/Feet	84	$ 510.00	$ 42,840.00
9	12-inch X 12-inch Tapping Sleeve	Each	1	$ 5,600.00	$ 5,600.00
Total Bid					**$ 1,427,770.00**