PAPE–DAWSON

Specifications for

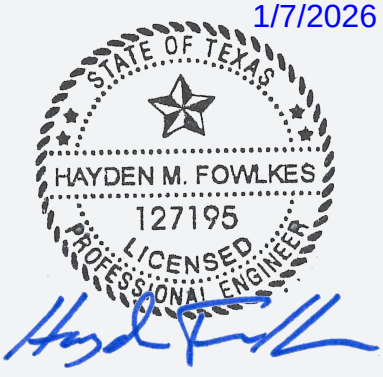
REDBIRD RANCH PHASE 2 UNITS 6M-1, 8M-1 AND GALM ROAD PHASE 4

PAPE–DAWSON

Specifications for

REDBIRD RANCH PHASE 2 UNITS 6M-1, 8M-1 AND GALM ROAD PHASE 4

1/7/2026



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END OF SECTION

LIST OF DRAWING SHEETS

UNIT 6M-1

DESCRIPTION		SHEET NO.
COVER SHEET		C0.00
MASTER DRAINAGE PLAN - EXISTING CONDITIONS		C1.00
MASTER DRAINAGE PLAN - ULTIMATE CONDITIONS (1 OF 3)		C1.01
MASTER DRAINAGE PLAN - ULTIMATE CONDITIONS (2 OF 3)		C1.02
MASTER DRAINAGE PLAN - ULTIMATE CONDITIONS (3 OF 3)		C1.03
DRAIN A - PLAN & PROFILE	STA 0+58.43 TO 11+00.00	C1.04
DRAIN A - PLAN & PROFILE	STA 11+00.00 TO 22+00.00	C1.05
DRAIN A - PLAN & PROFILE	STA 22+00.00 TO 32+50.00	C1.06
DRAIN A - PLAN & PROFILE	STA 32+50.00 TO 42+00.00	C1.07
DRAIN A - PLAN & PROFILE	STA 42+00.00 TO 48+00.00	C1.08
DRAIN A - PLAN & PROFILE	STA 48+00.00 TO 52+10.42	C1.09
DRAIN B1 - PLAN & PROFILE	STA 1+00.00 TO 3+00.00	C1.10
DRAIN B1 - PLAN & PROFILE	STA 3+00.00 TO 4+04.25	C1.11
DRAIN B2 - PLAN & PROFILE	STA 1+02.42 TO 3+80.00	C1.12
DRAIN B2 - PLAN & PROFILE	STA 3+80.00 TO 6+56.12	C1.13
DRAIN B3 - PLAN & PROFILE	STA 1+00.00 TO 1+39.38	C1.14
DRAIN C1 - PLAN & PROFILE	STA 1+30.60 TO 4+20.00	C1.15
DRAIN C1 - PLAN & PROFILE	STA 4+20.00 TO 5+54.24	C1.16
DRAIN C2 - PLAN & PROFILE	STA 1+00.00 TO 1+34.23	C1.17
DRAIN C3 - PLAN & PROFILE	STA 1+00.00 TO 1+78.69	C1.18
DRAIN D - PLAN & PROFILE	STA 0+88.80 TO 11+50.00	C1.19
DRAIN D - PLAN & PROFILE	STA 11+50.00 TO 22+50.00	C1.20
DRAIN D - PLAN & PROFILE	STA 22+50.00 TO 33+50.00	C1.21
DRAIN D - PLAN & PROFILE	STA 33+50.00 TO 41+45.00	C1.22
INTERCEPTOR DRAIN E - PLAN & PROFILE	STA 1+00.00 TO 4+50.00	C1.23
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LILAC ROLLER - PLAN & PROFILE	STA 1+87.42 TO 12+00.00	C2.00
LILAC ROLLER - PLAN & PROFILE	STA 12+00.00 TO 13+13.72	C2.01
MAGPIE STARLING - PLAN & PROFILE	STA 1+45.62 TO 12+00.00	C2.02

MAGPIE STARLING - PLAN & PROFILE	STA 12+00.00 TO 16+07.89	C2.03
GOLDEN ORIOLE - PLAN & PROFILE	STA 1+46.00 TO 7+89.89	C2.04
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TYPICAL STREET DETAILS		C2.10
TYPICAL STREET DETAILS		C2.11
TYPICAL STREET DETAILS		C2.12
OVERALL SIGNAGE PLAN		C3.00
OVERALL SIGNAGE PLAN		C3.01
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OVERALL SIGNAGE - DETAILS		C3.11
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OVERALL WATER DISTRIBUTION PLAN		C4.00
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12 INCH WATER MAIN W-02 AND W-03	SEE SHEET FOR STATIONING	C4.03
OVERALL WATER DISTRIBUTION DETAILS		C4.10
OVERALL WATER DISTRIBUTION DETAILS		C4.11
OVERALL SANITARY SEWER PLAN		C5.00
OVERALL SANITARY SEWER PLAN		C5.01
SANITARY SEWER LINE A - PLAN & PROFILE	STA 2+09.37 TO 12+00.00	C5.02
SANITARY SEWER LINE A - PLAN & PROFILE	STA 12+00.00 TO 23+50.00	C5.03
SANITARY SEWER LINE A - PLAN & PROFILE	STA 23+50.00 TO 34+00.00	C5.04
SANITARY SEWER LINE A - PLAN & PROFILE	STA 34+00.00 TO 45+00.00	C5.05
SANITARY SEWER LINE A - PLAN & PROFILE	STA 45+00.00 TO 55+51.24	C5.06
SANITARY SEWER LINE B - PLAN & PROFILE	STA 1+00.00 TO 8+03.00	C5.07
SANITARY SEWER LINE C - PLAN & PROFILE	STA 1+00.00 TO 7+67.29	C5.08
SANITARY SEWER LINE D - PLAN & PROFILE	STA 1+00.00 TO 10+80.71	C5.09
SANITARY SEWER DETAILS		C5.10
SANITARY SEWER NOTES		C5.20
OVERALL UTILITY PLAN		C6.00
OVERALL UTILITY PLAN		C6.01
OVERALL UTILITY PLAN		C6.02
OVERALL GRADING PLAN		C7.00
STORMWATER POLLUTION PREVENTION PLAN		C8.00
STORMWATER POLLUTION PREVENTION PLAN		C8.01
STORMWATER POLLUTION PREVENTION PLAN DETAILS		C8.10

LIST OF DRAWING SHEETS

UNIT 8M-1

DESCRIPTION		SHEET NO.
COVER SHEET		C0.00
MASTER DRAINAGE PLAN - EXISTING CONDITIONS		C1.00
MASTER DRAINAGE PLAN - ULTIMATE CONDITIONS		C1.01
MASTER DRAINAGE PLAN - ULTIMATE CONDITIONS		C1.02
MASTER DRAINAGE PLAN - ULTIMATE CONDITIONS		C1.03
INTERCEPTOR DRAIN A - PLAN & PROFILE	STA 1+10.00 TO 3+14.00	C1.04
DRAIN B - PLAN & PROFILE	STA 1+00.00 TO 2+00.32	C1.05
DRAIN C3 - PLAN & PROFILE	STA 1+82.19 TO 4+45.00	C1.06
DRAIN C4 - PLAN & PROFILE	STA 1+00.00 TO 3+80.00	C1.07
DRAIN C4 - PLAN & PROFILE	STA 3+80.00 TO 5+92.93	C1.08
DRAIN C5 - PLAN & PROFILE	STA 1+00.00 TO 1+35.16	C1.09
DRAIN C6 - PLAN & PROFILE	STA 1+00.00 TO 1+11.00	C1.10
DRAINAGE DETAILS		C1.20
DRAINAGE DETAILS		C1.21
DRAINAGE DETAILS		C1.22
HAWFINCH - PLAN & PROFILE	STA. 1+50.22 TO 10+50.00	C2.00
HAWFINCH - PLAN & PROFILE	STA. 10+50.00 TO 18+29.57	C2.01
GREAT GREEN MACAW - PLAN & PROFILE	STA 8+86.58 TO 14+96.58	C2.02
AMETHYST STARLING - PLAN & PROFILE	STA. 1+40.00 TO 9+50.00	C2.03
AMETHYST STARLING - PLAN & PROFILE	STA. 9+50.00 TO 13+65.78	C2.04
NORTHERN GANNET - PLAN & PROFILE	STA. 1+40.00 TO 5+35.00	C2.05
REGENT HONEYEATER & GOLDEN PHEASANT - PLAN & PROFILE	SEE SHEET FOR STATIONING	C2.06
TYPICAL STREET DETAILS		C2.10
TYPICAL STREET DETAILS		C2.11
TYPICAL STREET DETAILS		C2.12
OVERALL SIGNAGE PLAN		C3.00
OVERALL SIGNAGE PLAN		C3.01
TXDOT SIGN MOUNTED DETAILS		C3.10
TXDOT SIGN MOUNTED DETAILS		C3.11
OVERALL WATER DISTRIBUTION PLAN		C4.00
OVERALL WATER DISTRIBUTION PLAN		C4.01
12 INCH WATER MAIN-01	STA 1+00.00 TO 3+13.11	C4.02
WATER DISTRIBUTION DETAILS		C4.10
WATER DISTRIBUTION DETAILS		C4.11
OVERALL SANITARY SEWER PLAN		C5.00
OVERALL SANITARY SEWER PLAN		C5.01
SANITARY SEWER LINE A - PLAN & PROFILE	STA 1+05.00 TO 11+50.00	C5.02
SANITARY SEWER LINE A - PLAN & PROFILE	STA 11+50.00 TO 18+00.62	C5.03
SANITARY SEWER LINE B - PLAN & PROFILE	STA 1+00.00 TO 5+86.00	C5.04

SANITARY SEWER LINE C & E - PLAN & PROFILE	STA 1+00.00 TO 2+55.00, STA 1+00.00 TO 2+50.00	C5.05
SANITARY SEWER LINE D - PLAN & PROFILE	STA 1+00.00 TO 10+00.00	C5.06
SANITARY SEWER LINE D - PLAN & PROFILE	STA 10+00.00 TO 13+88.26	C5.07
SANITARY SEWER LINE F - PLAN & PROFILE	STA 1+00.00 TO 3+90.00	C5.08
SANITARY SEWER DETAILS		C5.10
SANITARY SEWER NOTES		C5.20
OVERALL UTILITY PLAN		C6.00
OVERALL UTILITY PLAN		C6.01
OVERALL GRADING PLAN		C7.00
OVERALL GRADING PLAN		C7.01
STORMWATER POLLUTION PREVENTION PLAN		C8.00
STORMWATER POLLUTION PREVENTION PLAN DETAILS		C8.10

LIST OF DRAWING SHEETS

GALM ROAD PHASE 4

DESCRIPTION		SHEET NO.
COVER SHEET		C0.00
OVERALL DRAINAGE PLAN - EXISTING CONDITIONS		C1.00
OVERALL DRAINAGE PLAN - PROPOSED CONDITIONS		C1.01
PROPOSED CONDITIONS DRAINAGE CALCULATIONS		C1.02
OVERALL DRAINAGE PLAN - ULTIMAGE CONDITIONS		C1.03
ULTIMATE CONDITIONS DRAINAGE CALCULATIONS		C1.04
DRAIN A - PLAN & PROFILE	STA. 1+09.62 TO 2+80.00	C1.05
DRAIN A - PLAN & PROFILE	STA. 2+80.00 TO 6+60.00	C1.06
DRAIN A - PLAN & PROFILE	STA 6+60.00 TO 11+20.00	C1.07
DRAIN A - PLAN & PROFILE	STA. 11+20.00 TO 15+77.51	C1.08
DRAIN B - PLAN & PROFILE	STA. 1+04.92 TO 3+80.00	C1.09
DRAIN B - PLAN & PROFILE	STA. 3+80.00 TO 8+40.00	C1.10
DRAIN B - PLAN & PROFILE	STA. 8+40.00 TO 12+06.60	C1.11
DRAIN B2 - PLAN & PROFILE	STA. 1+14.25 TO 3+58.00	C1.12
DRAIN C - PLAN & PROFILE	STA. 1+16.18 TO 2+89.84	C1.13
DRAIN D-1 & D-2 - PLAN & PROFILE	SEE SHEET FOR STATIONING	C1.14
DRAIN E - PLAN & PROFILE	STA. 1+14.17 TO 2+90.49	C1.15
DRAIN F - PLAN & PROFILE	STA. 1+00.00 TO 5+00.00	C1.16
DRAIN F - PLAN & PROFILE	STA. 5+00.00 TO 7+20.00	C1.17
DRAIN F - PLAN & PROFILE	STA. 7+20.00 TO 11+80.00	C1.18
DRAIN F - PLAN & PROFILE	STA. 11+80.00 TO 16+40.00	C1.19
DRAIN F - PLAN & PROFILE	STA. 16+40.00 TO 21+00.00	C1.20
DRAIN F - PLAN & PROFILE	STA. 29+60.00 TO 30+75.54	C1.21
DRAIN G - PLAN & PROFILE	STA 1+55.93 TO STA 2+48.73	C1.22
DRAINAGE DETAILS		C1.30
DRAINAGE DETAILS		C1.31
DRAINAGE DETAILS		C1.32
DRAINAGE DETAILS		C1.33
DRAINAGE DETAILS		C1.34
DRAINAGE DETAILS		C1.35
DRAINAGE DETAILS		C1.36
GALM ROAD - PLAN & PROFILE	STA. 71+06.13 TO 80+50.00	C2.00
GALM ROAD - PLAN & PROFILE	STA. 80+50.00 TO 91+50.00	C2.01
GALM ROAD - PLAN & PROFILE	STA. 91+50.00 TO 101+50.00	C2.02
GALM ROAD - PLAN & PROFILE	STA. 101+50.00 TO 109+19.40	C2.03
ROYAL ALBATROSS - PLAN & PROFILE	STA. 34+89.96 TO 41+23.14	C2.04
TYPICAL STREET DETAILS		C2.10
TYPICAL STREET DETAILS		C2.11
TYPICAL STREET DETAILS		C2.12
OVERALL SIGNAGE PLAN		C3.00

OVERALL SIGNAGE PLAN		C3.01
TxDOT SIGN MOUNTED DETAILS		C3.10
TxDOT SIGN MOUNTED DETAILS		C3.11
TxDOT SIGN MOUNTED DETAILS		C3.12
16 & 12 INCH WATER MAIN - W-01	STA. 1+00.00 TO 11+50.00	C4.00
16 & 12 INCH WATER MAIN - W-01	STA. 11+50.00 TO 21+50.00	C4.01
12 INCH WATER MAIN - W-01	STA. 21+50.00 TO 30+50.00	C4.02
12 INCH WATER MAIN - W-01	STA. 30+50.00 TO 37+84.54	C4.03
12 INCH WATER MAIN - W-02 & W-03	SEE SHEET FOR STATIONING	C4.04
8 INCH & 12 INCH WATER MAIN - W-04, W-05, & W-06	SEE SHEET FOR STATIONING	C4.05
WATER DISTRIBUTION DETAILS		C4.10
WATER DISTRIBUTION DETAILS		C4.11
OVERALL SANITARY SEWER PLAN		C5.00
SANITARY SEWER LINE A - PLAN & PROFILE	STA. 2+79.00 TO 9+51.00	C5.01
SANITARY SEWER LINE B - PLAN & PROFILE	STA. 1+00.00 TO 10+29.28	C5.02
SANITARY SEWER DETAILS		C5.10
SANITARY SEWER NOTES		C5.20
OVERALL UTILITY PLAN		C6.00
OVERALL UTILITY PLAN		C6.01
STORM WATER POLLUTION PREVENTION PLAN		C8.00
STORMWATER POLLUTION PREVENTION PLAN DETAILS		C8.10

END OF SECTION

CONTINENTAL HOMES OF TEXAS, LP FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3

Date: 12/2025

INVITATION TO BIDDERS

Sealed Bids addressed to Continental Homes of Texas, LP, Attn: Catherine Tran, will be received at the office of Pape-Dawson, located at 1672 Independence Drive, Suite 102, New Braunfels, Texas 78132, until **3:30 p.m. Local Time, January 16, 2026**, and then publicly opened and read via video conference for "Construction of **Redbird Ranch Phase 2 Units 6M-1, 8M-1 and Galm Road Phase 4** for Continental Homes of Texas, LP for the benefit of Redbird Ranch Water Control And Improvement District No. 3 of Medina County, Texas."

Scope of Work of the Contract Documents includes the following: site clearing & grading, sedimentation & erosion control, street, drainage, sanitary sewer, and water improvements.

Bids received after the closing time will be returned unopened. **A pre-bid conference** will be held by video conference on **January 5, 2026, at 3:30 p.m. Local Time**.

Each Bid must be accompanied by a Bid bond or a certified or cashier's check, acceptable to the Owner, in an amount not less than two percent (2%) of the total amount Bid, as a guarantee that the successful bidder will enter into the Contract Documents and execute the Bonds on the forms provided and provide the required insurance certificates and Bonds within seven (7) days after the date Contract Documents are received by the successful bidder. If a certified or cashier's check is provided, the successful bidder shall deliver, at the bid opening address, the *original* certified or cashier's check within one (1) business day of receipt of the bid opening.

Copies of the bidding documents are on file at Engineer's office and may be obtained electronically by request to the Engineer via an email to cyett@pape-dawson.com. Bidders must email the Engineer in order to be sent a link to view and/or download specifications, plans, soils report and environmental reports for this project. There is NO charge to view or download documents.

The Owner reserves the right to reject any or all Bids and to waive all defects and irregularities in bidding or bidding process except the time for submitting a Bid. The successful bidder, if any, will be the responsible bidder, which will be most advantageous and result in the best and most economical completion of the Project.

The requirements of Subchapter J, Chapter 552, Government Code, may apply to this Bid and the bidder agrees that the Contract Documents can be terminated if the bidder knowingly or intentionally fails to comply with a requirement of that subchapter.

CONTINENTAL HOMES OF TEXAS, L.P. FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3

INSTRUCTIONS TO BIDDERS

1. PREPARATION OF BIDS. Unless otherwise directed in the Invitation to Bidders, each Bid must be submitted on the bid forms provided or on photocopies of the forms, in conformity with the requirements of the **Invitation to Bidders**, these **Instructions to Bidders** ("Instructions"), and the instructions printed on the bid form. In addition, if submitting a paper Bid, the Bid must be submitted in duplicate.

All blanks on the bid form must be completed and no change shall be made to the bid form or any other of the Contract Documents. All amounts must be in figures, with amounts extended and totaled. If minimum unit prices have been established for certain items, the minimum unit prices will be shown on the bid form. ***See Paragraph 8 of these Instructions*.** If the bidder chooses not to bid on optional items (if any), "No Bid" must be entered in the bid space. Any Bid may be rejected if it contains any omission, erasure, alteration, addition, irregularity of any kind, or items not called for; if it does not submit prices for each of the items in the bid form; if it is not signed by the bidder; if it is unbalanced; or if it in any manner, fails to conform to the conditions of the Invitation to Bidders and these Instructions. An "unbalanced" Bid means a Bid containing unit prices that are significantly less than cost for some items and significantly more than cost for others. This may be evidenced by submission of unit price Bid items where the cost is significantly higher/lower than the cost of the same Bid items submitted by other Bidders on the same Project.

The bidder must sign its Bid. If the Bid is made by a partnership or corporation, the name and address of the partnership or corporation must be shown together with the names and addresses of the partners or officers. If the Bid is made by an individual, it must be executed by that person; if made by a partnership, it must be executed by one of the partners (and if by a limited partnership, then executed by the general partner); or if made by a corporation, it must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or assistant secretary of the corporation. The corporate address and state of incorporation shall be shown below the signature.

When applicable, evidence of authority to conduct business as an out-of-state corporation in the State of Texas must be provided in accordance with the paragraph entitled QUALIFICATION OF BIDDERS. State contractor license number, if any, must also be shown.

The Bid and the Bid Security must be sealed and must identify the contents (i.e., Bid or Bid Security), the bidder's name, and the job name and number, and be addressed to the Owner as prescribed in the **Invitation to Bidders**.

2. CONTRACT DOCUMENTS. The Contract Documents are complementary and must be read together as a whole; what is called for by one is binding as if called for by all.

Bidders desiring further information or further interpretation of any part of the Contract Documents are hereby obligated to submit a written request for such information to Engineer not less than **three (3) calendar days** before the Bid opening. If appropriate, answers to these requests will be given, in writing, to all bidders as addenda to the Contract Documents, and when each addendum is issued it becomes a part of the Contract Documents. No explanation or interpretation of the Contract Documents, other than written addenda, is binding.

Should a bidder find discrepancies or errors in or omissions from the Contract Documents or should the bidder be in doubt as to any meaning, the bidder is hereby obligated to notify Engineer in writing. It is the responsibility of each bidder to determine if it has received all addenda, complete files of which will be maintained at the Engineer's office and the office designated to receive the Bids, if any.

Each bidder must inform itself fully of the construction and labor conditions under which the Work will be performed and will be presumed to have inspected the Site and to have read and to be thoroughly familiar with the Contract Documents. Failure to do so will not relieve the successful bidder of its obligation to furnish all materials and labor necessary to carry out the requirements of the Contract Documents and to complete the Work for the consideration in its Bid.

3. PRE-BID CONFERENCE. A pre-bid conference among Owner, Engineer, prospective bidders, and others will be held to discuss the scope of the Work and to answer questions concerning the Work. No addendum will be issued at this conference, but an addendum will be issued afterwards, if necessary, to answer questions. The pre-bid conference will be held at the place and time stated in the **Invitation to Bidders** or as modified by written addenda.

4. BID SECURITY. Each Bid must be accompanied by a bid bond or a certified or cashier's check, acceptable to the Owner, in an amount not less than five (5) percent of the total amount bid (the "Bid Security"), as a guarantee that the successful bidder will enter into the Contract and execute the required Bonds on the forms provided and provide the required insurance certificates and Bonds within seven (7) days after the date Contract Documents are received by the successful bidder. Bid Securities will be returned to all but the three (3) most qualified, responsible bidders within three (3) days after opening of Bids, and the latter's Bid Securities will be returned after complete execution of the Contract Documents. If the successful bidder does not enter into the Contract after notice of award, then the bidder's Bid Security will be forfeited and will be retained by Owner. If the award of the Contract to the successful bidder is canceled or not executed for any reason, the Owner may accept the next lowest bid and proceed with the next-lowest qualified bidder.

5. BONDS. The successful bidder must furnish a performance bond, a Maintenance Bond and a payment bond each in the sum of 100 percent (100%) of the Contract Price. **The Payment Bond form must comply with the Requirements of Subchapter I of Chapter 53 of the Texas Property Code.** The Bonds must be from a surety company holding a permit from the State of Texas to act as surety. Unless otherwise specified, the cost of proving Bonds must be included in the bidder's total Bid amount. The surety company must have a minimum Best Key Rating of "B+" or better. The surety company, the agency and agent issuing the Bonds must be authorized to issue Bonds in Texas in an amount equal to the total Contract Price and such authorization must be recorded in the files of the Texas Department of Insurance. The person executing the Bonds must be a licensed Texas local recording agent and such licensing must be recorded in the files of the Texas Department of Insurance. All Bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act. The Bonds must be executed by a duly appointed representative of the surety company licensed by the State of Texas as a General Lines Agent and such licensing must be recorded in the files of the Texas Department of Insurance. If the surety company does not have such a rating due to the length of time it has existed, the surety company must be eligible to participate in the surety bond guarantee program of the Small Business Administration and must be an approved surety listed in the current **U.S. Department of Treasury Circular 570**, and must meet all of the rules and regulations of the Treasury Department with respect to performance and payment bonds for federal jobs, including specifically the rules related to underwriting limitation. For contracts over $100,000, the surety must also hold a certificate of authority from the United States Secretary of Treasury to qualify as a surety on obligations permitted or required under federal law, or have obtained reinsurance for any liability in excess of $1,000,000 from a reinsurer that is authorized and admitted as a reinsurer in the State of Texas and is the holder of a certificate of authority from the United States Secretary of Treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law. If bidder's proposed surety company, agency or agents do not meet the requirements herein, then Owner may refrain from considering the bidder for Contract award and Owner may require bidder to forfeit its Bid Security.

It is further agreed that the successful bidder will execute the Bonds required for the satisfactory performance of the Work, the fulfillment of any guarantees required, and the prompt payment to all persons supplying labor and materials in the prosecution of the Work, in accordance with the Contract Documents and on the forms provided for this purpose. It is agreed that this Contract is not in effect until the required Bonds are furnished and approved by Owner. Upon increase of the Contract Price authorized by Change Order, Contractor must immediately provide revised Bonds for such increased Contract Price. Contractor's failure to provide compliant Bonds may be grounds for immediate termination regardless of whether the Contractor has started the Work on the Project.

If the surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements herein Contractor must promptly notify Owner and Engineer and must, within ten (10) calendar days after the event giving rise to such notification, provide another Bond and surety to fulfill the required obligations.

6. DELIVERY OF BIDS. It is each bidder's responsibility to deliver its Bid and Bid Security as stated in the **Invitation to Bidders** before the closing time. The fact that a Bid and a Bid Security were dispatched will not be considered. The Bid and Bid Security must be timely delivered to be considered.

7. "OR EQUAL" SUBMISSIONS. Where materials or equipment are specified by a trade or brand name, it is not the intention of the Owner to discriminate against an equal product of another manufacturer, but to set a definite standard of quality or performance. In preparing its proposal, each bidder is expected to include in its base Bid the cost of the item so specified. However, in certain Technical Specification sections, manufacturers are listed followed by "or equal". In certain other Technical Specification sections, manufacturers are listed with "or equal" not included. In those items where "or equal" is not included, it is hereby added and understood to be included, even though not specifically stated in each Technical Specification. If a bidder chooses to submit a suggested "or equal" product in lieu of a product by one of the named manufacturers, Owner will evaluate the item to determine if it is an "equal". The bidder is responsible for providing all data required to evaluate an item submitted as a suggested "or equal." Owner's decision on whether a suggested manufacturer is an "equal" is final. No claims for additional cost or time delay, etc. will be accepted if a suggested manufacturer is submitted by bidder as an "equal" and Owner decides the item is not "equal".

Bidder must submit its list of suggested "or equal" items at time of Bid submission. No additional suggested "or equal" items will be considered after bid opening.

8. MINIMUM UNIT PRICE ITEMS. If the approximate quantity and a minimum unit price have been established for items in the bid form, the bidder may not bid a unit price less than the minimum value; however, it may bid an amount greater than the minimum unit price. If no entry is made in the spaces provided, the minimum unit prices shown apply.

9. EXTRA UNIT PRICE ITEMS. Extra Unit Price Items are included to facilitate payment for changes and alterations that may be required to complete the Work. The Work, as provided by the Contract Documents, is described in bid items other than Extra Unit Price Items. When additional Work covered by Extra Unit Price Items is performed, payment will be based on the quantity constructed and the unit prices entered in the Bid.

10. TIME FOR COMPLETION. Contractor will **not** be allowed time extensions (i) due to inclement weather except for Force Majeure events as defined under **Section 1.01 of the General Conditions of the Contract**; (ii) due to non-availability of equipment or material, when the principal units of Work and tasks on the critical path are not in progress or are not delayed by the event of delay, interference, disruption, or

hindrance; (iii) when at least seven (7) hours of available working time remain out of the working day; (iv) while materials are drying and it is possible for the Contractor to enclose the area and use drying devices; (v) when an event of delay, interference, disruption, or hindrance occurs on a day other than a working day or other day when the Contractor had not originally planned to work; (vi) when an event of delay, interference, disruption, or hindrance occurs after the expiration of the Contract Time; (vii) to the extent the Contractor could have anticipated or alleviated the impact of the event of delay, interference, disruption, or hindrance through reasonable efforts; (viii) when events of concurrent delay overlap the claimed delay; and/or (ix) when an extension of time is precluded by any provision of the Contract Documents.

11. QUALIFICATION OF BIDDERS. The apparent most qualified, responsible bidder must submit to Owner, within five (5) calendar days of notification of award of the Contract, either (i) a fully completed contractor's statement of qualification or (ii) a written statement that the most recently submitted contractor's statement of qualification is accurate, which statement of qualification must be considered in the award of the Contract. Failure to accurately complete the contractor's statement of qualification or to timely submit the statement of qualification will, at Owner's option, disqualify the bidder from consideration in the award of the Contract. The form of the Contractor's statement of qualification is available from the Engineer. Owner may reject, at Owner's sole discretion, a bidder's statement of qualification if the bidder's statement of qualification is not on the form provided. Evidence of out-of-state incorporation to conduct business in the state in which the Work is to be performed, along with state contractor license number, must also be provided and is a consideration in the award of the Contract.

12. MODIFICATION AND WITHDRAWAL OF BIDS. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered in the same manner as Bids were submitted at any time prior to the opening of Bids. If, within twenty-four (24) hours after Bids are opened, any bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid despite the exercise of ordinary care, that bidder may withdraw its Bid and the Bid Security will be returned.

13. INTENTIONALLY DELETED.

14. AWARD OF CONTRACT. Owner reserves the right to reject any or all Bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced or conditional Bids and to reject the Bid of any bidder if Owner believes that it would not be in the best interest of the Project to make award to that bidder, whether because the Bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria of Owner. Owner also reserves the right to waive all informalities and defects in bidding, except time of submitting a Bid. Discrepancies between the multiplication of units and unit prices in a Bid will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum if the correct sum is evident from the face of the Bid.

In evaluating Bids, Owner will consider, among other things, the qualifications of bidders, whether the Bids comply with the prescribed requirements, and such substitutions, alternates, unit prices and other data, as may be requested in the bid form or prior to the Bid opening. Alternate bid items will not be considered unless requested in the bid form.

Owner may consider the qualifications and experience of subcontractors, suppliers, and other persons and organizations proposed for the Work. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work.

Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of bidders, proposed subcontractors, suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents, to Owner's satisfaction.

BY SUBMITTING A BID, EACH BIDDER AUTHORIZES OWNER TO PERFORM ALL INVESTIGATIONS INTO THE BIDDER'S BACKGROUND, CAPABILITIES, PRIOR EXPERIENCE, AND OTHER FACTORS PERTAINING TO BIDDER'S PERFORMANCE OF THE WORK AS OWNER DEEMS NECESSARY IN ITS SOLE DISCRETION, AND FOR THAT PURPOSE, SUBMISSION OF A BID ACTS AS BIDDER'S SPECIFIC AUTHORIZATION TO PERSONS AND ENTITIES CONTACTED BY OWNER IN CONNECTION WITH SUCH INVESTIGATIONS TO PROVIDE OWNER WITH THE INFORMATION REQUESTED BY OWNER AND TO DISCUSS AND EXPRESS OPINIONS CONCERNING BIDDER. FURTHER, BY SUBMISSION OF A BID, BIDDER AGREES TO FULLY AND FOREVER WAIVE AND RELEASE ANY CLAIM (KNOWN OR UNKNOWN) IT HAS OR MAY HAVE AGAINST THE OWNER AND ENGINEER AND THEIR RESPECTIVE ATTORNEYS, EMPLOYEES, CONSULTANTS, REPRESENTATIVES, AND AGENTS ("THE EVALUATING PARTIES") ARISING OUT OF OR IN CONNECTION WITH THE: (1) ADMINISTRATION, EVALUATION, OR RECOMMENDATION (OR LACK THEREOF) OF ANY BID; (2) WAIVER OF ANY REQUIREMENTS UNDER THE BID DOCUMENTS OR THE CONTRACT DOCUMENTS; AND (3) ACCEPTANCE OR REJECTION OF ANY BIDS AND AWARD OF THE CONTRACT.

Owner reserves the right to award the Bid, at Owner's discretion, based on the amount of the total base bid (without including "Extra Unit Price Items" or "alternate" bid items) or on the amount of the total amount bid (including "Extra Unit Price Items" or "alternate" bid items), or based on any other combination, means or method determined appropriate by Owner.

If the Contract is to be awarded, it will be awarded to the responsible bidder whose evaluation by Owner indicates that the award will be most advantageous to the Owner and result in the best and most economical completion of the Work.

If the Contract is to be awarded, Owner will give the successful bidder a notice of award within ninety (90) days after the day of the Bid opening. All bidders must honor their Contract Price on the bid form, if the Contract is awarded within the timeframe provided herein. A Notice to Proceed will be issued within a reasonable period after the Contract Documents are fully executed.

Within seven (7) calendar days of receipt from the Owner after notice of award, the successful bidder must submit to the Engineer the payment and performance bonds and all information or other items necessary to complete the Contract Documents, including the required insurance, anticipated construction schedule, and Contractor's safety program. ***See SAFETY under Section 5.20 of the General Conditions of the Contract.*** The successful bidder must return the fully executed Contract Documents to Engineer within seven (7) calendar days of receipt, or Owner may at its sole discretion disqualify the Bid and accept another Bid and the bidder must, at Owner's option, forfeit its Bid Security.

15. TAXES, LICENSES AND FEES. Certain taxes, licenses, fees, and other similar items are part of the cost of the Work, and it is bidder's responsibility to familiarize itself with these costs and to observe and comply with the Laws and Regulations relating to same. The prices, sums, rates, and other charges set forth in the bidder's Bid must cover and include all such costs. If this Contract is for construction of a water or wastewater system, certain tax exemptions under **Tax Code 151.355** may apply. If the improvements under this Contract will be owned by a governmental entity that is not the District, **Tax Code 151.309** may apply. Contractor, and all subcontractors to Contractor (i) must not include any provision for Texas sales and use taxes with respect to such exempt items in any Bid or the Contract Price, and (ii) must pass on to

the Owner cost savings due to any exempt status of such exempt items. Contractor's contracts with all subcontractors to Contractor must include the foregoing provisions. Contractor must pay taxes on items that are not exempt.

16. NUMBER OF SIGNED SETS OF DOCUMENTS. The Contract Documents will be prepared in at least five (5) original sets for signature, one (1) for delivery to the successful bidder. Owner will furnish the successful bidder six (6) sets of Plans and Technical Specifications free of charge, and additional sets may be obtained from Engineer at Engineer's reproduction rates.

17. ELECTRONIC COUNTERPARTS; FORM OF BONDS TO BE PROVIDED TO OWNER. The Contract Documents may be executed and delivered in any number of counterparts, each of which so executed and delivered will be deemed to be an original and all of which will constitute one and the same instrument**.**

18. INSURANCE. *See section entitled "INSURANCE REQUIREMENTS" attached to and incorporated into the* ***General Conditions of the Contract as Attachment A to the General Conditions of the Contract****.*

19. SOILS REPORT. If a soils investigation has been made for this Project, the soils report and log of borings is available for bidder's information only. The report is not a warranty of subsurface conditions, nor is it a part of the Contract Documents. Bidders are expected to examine the Site and such reports and then decide for themselves the soils or conditions that may be encountered.

Owner and Engineer disclaim any responsibility for the accuracy, true location and extent of the surface and subsurface investigations that have been prepared by others. Owner and Engineer further disclaim responsibility for interpretation of that data by bidder, *e.g.,* projecting soil-bearing values, rock profiles, soil stability and the presence, level and extent of underground water or other underground facilities or utilities.

20. LABOR CLASSIFICATION AND MINIMUM WAGE SCALE.

(A) General: The public improvements being constructed under this Contract will be owned, operated, and maintained by a governmental entity. Since the public improvements being constructed under this Contract will be owned by a governmental entity, **Chapter 2258 of the Texas Government Code** applies to this Contract. Chapter 2258 of the Texas Government Code provides that any political subdivision of the State of Texas shall determine the general prevailing wage rate received by the classes of workers employed on projects similar to this Project and shall specify in the call for bids and in the Contract Documents the minimum wage rates which must be paid for each type of worker. This statute further provides that the Contractor or subcontractors must pay, as penalty to Owner, Sixty Dollars ($60.00) 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. Owner is authorized to withhold from the Contractor the amount of this penalty from any payment due under the Contract Documents.

The statute likewise requires that the Contractor and subcontractors keep an accurate record of the names and occupations of all persons employed by them on the construction of the Project and to show the actual per diem wages paid to each worker. These records are open to the inspection of Owner.

(B) The minimum wage rates that apply to this Contract are specified in **Attachment B to the General Conditions of the Contract**. Contractor and subcontractors must review and ascertain such wage rates and pay at least such minimum rates.

BID FORM

THE PROJECT AND THE PARTIES

1.01 TO:

A. Owner: Continental Homes of Texas, L.P. for the benefit of Redbird Ranch Water Control and Improvement District No. 3
c/o Pape-Dawson
Attn: Catherine Tran, P.E., Senior Project Manager
1672 Independence Drive, Suite 102
New Braunfels, Texas 78132

1.02 FOR: REDBIRD RANCH PHASE 2 UNITS 6M-1, 8M-1 AND GALM ROAD PHASE 4

1.03 DATE: _____ (BIDDER TO ENTER DATE)

1.04 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

A. Bidder's Full Name _____
   1. Address _____
   2. City, State, Zip_____
   3. The Undersigned proposes to furnish all labor, services, material, tools and necessary equipment for the construction of various improvements and to perform the work required at the locations set out by the Plans and Specifications, in strict accordance with the Contract Documents.
   4. In submitting this Bid, it is understood that this Bid may not be altered or withdrawn for a minimum of ninety (90) calendar days, and that the Owner has reserved the right to reject any and all bids.
   5. The Undersigned certifies that this Bid made in good faith, without collusion or connection with any other person, persons, partnership, company, firm, association, or corporation offering Bids on this work, for the following sum or prices to wit:

1.05 DECLARATION

A. The Undersigned hereby declares that he/she has visited the site and has carefully examined the Drawings, Specifications, Contract Document sand Bidding Documents related to the work covered by his/her bid.

1.06 OFFER

A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared _____ for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Unit Prices listed in this bid form of:

B. _____
_____ dollars
($_____), in lawful money of the United States of America.

C. We have included the required security deposit as required by the Instruction to Bidders.

D. All applicable federal taxes are included and State of TX taxes are included in the Bid Price.

E. All Cash and Contingency Allowances described in Section 01 2100 - Allowances are included in the Bid Sum.

1.07 ACCEPTANCE

A. This offer shall be open to acceptance and is irrevocable for ninety (90) days from the bid closing date.

B. If this bid is accepted by Owner within the time period stated above, we will:
   1. Execute the Agreement within seven days of receipt of Notice of Award or acceptance of this bid.

2. Furnish the required bonds within seven days of receipt of Notice of Award or acceptance of this bid.
3. Commence work within _____ days after written Notice to Proceed of this bid or acceptance of this bid. Completion time includes _____ days for adverse weather conditions.

C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

1.08 CONTRACT TIME

A. If this Bid is accepted, we will:

B. Complete the Work in _____ calendar days from Notice to Proceed or acceptance of this bid.

1.09 UNIT PRICES

A. Unit prices for specific portions of the Work as listed at the end of this section.

1.10 CHANGES TO THE WORK

A. When Owner or Engineer establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
1. _____ percent overhead and profit on the net cost of our own Work;
2. _____ percent on the cost of work done by any Subcontractor.

B. On work deleted from the Contract, our credit to Owner shall be Engineer-approved net cost plus _____ of the overhead and profit percentage noted above.

1.11 ADDENDA

A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Price.
1. Addendum # _____ Dated _____.
2. Addendum # _____ Dated _____.
3. Addendum # _____ Dated _____.
4. Addendum # _____ Dated _____.

1.12 BID FORM SUPPLEMENTS

A. The following information is included with Bid submission:
1. Subcontractors (Section 00 4336): _____, _____, _____.
2. Unit Prices (Section 00 4100 - Bid Form at the end of this section: _____, _____, _____.

B. The following Supplements are attached to this Bid Form and are considered an integral part of this Bid Form:
1. Document 00 4336 - Proposed Subcontractors Form: Include the names of Subcontractors and the portions of the Work they will perform.

C. BONDS:
   1. Payment and performance bonds running to the Owner pursuant to Article 1.02, INSTRUCTION FOR BIDDERS;
      a. Premium:_____
      b. Name and address of surety:
         1) _____
         2) _____

D. INSURANCE:
   1. Insurance pursuant to Article 1.16, INSTRUCTION FOR BIDDERS (show normal coverage).
      a. Workmen's Compensation Insurance complying with the laws of the state:
         1) Carrier: _____
      b. Employer's Liability Insurance:
         1) Carrier: _____
         2) $_____
      c. Comprehensive General Liability and Property Damage Insurance:
         1) Carrier: _____
         2) $_____
      d. Comprehensive Automobile Liability and Property Damage Insurance:
         1) Carrier: _____
         2) $_____

1.13 BID FORM SIGNATURE(S)

The Corporate Seal of

_____

(Bidder - print the full name of your firm)

_____

(Authorized signing officer, Title)

(Seal)

_____

A. (Authorized signing officer, Title)

END OF SECTION

REDBIRD RANCH PHASE 2 UNIT 6M-1
UNIT PRICES

Date _____

BIDDER'S FULL NAME _____

Address _____

City, State, Zip _____

Milestone #1-Substantial Completion (days): _____ **6M-1 Base Bid:** $ -

Milestone #2-Final Completion (days): _____ **8M-1 Base Bid:** $ -

Galm Road Phase 4 Base Bid: $ -

Royal Albatross Base Bid: $ -

6M-1, 8M-1, Galm Road Phase 4, and Royal Albatross - BASE BID AMOUNT: **$ -**

1. The Undersigned proposes to furnish all labor, services, materials, tools and necessary equipment for the construction of various improvements and to perform the work required at the locations set out by the Plans and Specifications, in strict accordance with the Contract Documents.
2. In submitting this Bid, it is understood that this Bid may not be altered or withdrawn for a minimum of 90 calendar days, and that the Owner has reserved the right to reject any and all Bids.
3. The Undersigned certifies that this Bid is made in good faith, without collusion or connection with any other person, persons, partnership, company, firm, association, or corporation offering Bids on this work, for the following sum or prices to wit:

SIGNATURES _____

Authorized Signing Officer, Title

SIGNATURES _____

Authorized Signing Officer, Title

ITEM NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
STREET IMPROVEMENTS					
1.	Local A (50' ROW)				
	a. 2" Type D HMAC (Face of Curb to Face of Curb)	SY	11,190	$ -	$ -
	b. 10" Flexible (Granular) Base (1' Behind Back of Curb)	SY	12,410	$ -	$ -
	c. 6" Treated Subgrade (1' Behind Back of Curb)	SY	12,410	$ -	$ -
2.	Local B (60' ROW)				
	a. 2" Type D HMAC (Face of Curb to Face of Curb)	SY	6,810	$ -	$ -
	b. 2" Type C HMAC (Face of Curb to Face of Curb)	SY	6,810	$ -	$ -
	c. 16" Flexible (Granular) Base (1' Behind Back of Curb)	SY	7,330	$ -	$ -
	d. 8" Treated Subgrade (1' Behind Back of Curb)	SY	7,330	$ -	$ -
3.	Sidewalk	SY	1,528	$ -	$ -
4.	Striping & Signage	LS	1	$ -	$ -
5.	7" Concrete Curb	LF	9,832	$ -	$ -
6.	Rock Rubble	SY	63	$ -	$ -
7.	Barricade Posts	EA	20	$ -	$ -
8.	Remove Header Curb & Barricade Posts	LF	40	$ -	$ -

REDBIRD RANCH PHASE 2 UNIT 6M-1
UNIT PRICES

9.	Revegetation (Hydromulch) Parkways	SY	7,215	$ -	$	-
10.	Header Curb	LF	140	$ -	$	-
				SUBTOTAL	$	-

DRAINAGE IMPROVEMENTS

1.	Rock Rubble	SY	975	$ -	$	-
2.	Curlex Single Net Erosion Control Blanket	SY	45,710	$ -	$	-
3.	Reinforced Concrete Class 'A'					
	a. 10' Curb Inlet Type CI	EA	2	$ -	$	-
	b. 20' Curb Inlet Type CI	EA	7	$ -	$	-
	c. 20' Curb Inlet Type CII	EA	1	$ -	$	-
	d. 30' Curb Inlet Type CI	EA	1	$ -	$	-
	e. 5'x5' Junction Box	EA	1	$ -	$	-
	f. 6'x6' Junction Box	EA	2	$ -	$	-
	g. Baffle Blocks	CY	5.4	$ -	$	-
	h. PW-1 Headwall	CY	104.9	$ -	$	-
	i. FW-0 Headwall	CY	8.6	$ -	$	-
4.	5" Concrete Rip-rap	SY	5,025	$ -	$	-
5.	6" Concrete Rip-rap	SY	6,735	$ -	$	-
6.	24" RCP	LF	477.47	$ -	$	-
7.	30" RCP	LF	223.25	$ -	$	-
8.	36" RCP	LF	172.20	$ -	$	-
9.	48" RCP	LF	75.19	$ -	$	-
10.	5'X3' SBC	LF	129.75	$ -	$	-
11.	5'X4' SBC	LF	167.48	$ -	$	-
12.	5-5'X4' MBC	LF	111.27	$ -	$	-
13.	Landlok 450 Erosion Control Mat	SY	1,730.00	$ -	$	-
14.	Trench Excavation Protection	LF	1,431.80	$ -	$	-
15.	Hydromulch	SY	70,788.00	$ -	$	-
16.	Combination Railing	LF	155.00	$ -	$	-
17.	Pipe Railing	LF	45.00	$ -	$	-
18.	Metal Beam Guardrail Fence	LF	383.27	$ -	$	-
				SUBTOTAL	$	-

DETENTION BASINS

1.	Rock Rubble	SY	230	$ -	$	-
2.	Reinforced Concrete Class 'A'					
	a. Baffle Blocks	CY	8.6	$ -	$	-
3.	5" Concrete Rip-rap	SY	2,086	$ -	$	-
4.	Landlock 450(HP-TRM) Erosion Control Mat	SY	11,915	$ -	$	-

REDBIRD RANCH PHASE 2 UNIT 6M-1
UNIT PRICES

5.	Curlex Single Net Erosion Control Blanket	SY	11,445	$ -	$	-
6.	Chain Link Wire Fence	LF	5,987.00	$ -	$	-
7.	Revegetation (Hydromulch)	SY	75,075	$ -	$	-
				SUBTOTAL	$	-

SANITARY SEWER IMPROVEMENTS

1.	8" Sanitary Sewer Pipe (SDR-26)					
	b. 8'-10' Depth	LF	2,382	$ -	$	-
	c. 10'-12' Depth	LF	1,209	$ -	$	-
	d. 12-14' Depth	LF	325	$ -	$	-
	e. 14'-16' Depth	LF	421	$ -	$	-
	f. 16'-18' Depth	LF	158	$ -	$	-
2.	12" Sanitary Sewer Pipe (SDR-26)					
	b. 8'-10' Depth	LF	2,371	$ -	$	-
	c. 10'-12' Depth	LF	842	$ -	$	-
3.	Standard Manhole	EA	29	$ -	$	-
4.	Drop Manhole	EA	1	$ -	$	-
5.	Manhole Extra Depth	VF	156	$ -	$	-
6.	8"x6" Wye	EA	121	$ -	$	-
7.	6" Lateral (SDR-26)	LF	4,488	$ -	$	-
8.	6" Vertical Stack	VF	134	$ -	$	-
9.	Trench Excavation Protection	LF	7,708	$ -	$	-
10.	Camera Testing	LF	7,708	$ -	$	-
11.	Tie to Existing Manhole	EA	1	$ -	$	-
12.	24" Concrete Encasement	LF	391	$ -	$	-
13.	Cap and End	EA	6	$ -	$	-
				SUBTOTAL	$	-

WATER DISTRIBUTION IMPROVEMENTS

1.	8" PVC C-900 Class 235, DR 18	LF	3,742	$ -	$	-
2.	8" Gate Valve, MJ w/Valve Box	EA	13	$ -	$	-
3.	12" PVC C-900 Class 235, DR-18	LF	1,402	$ -	$	-
4.	12" Gate Valve, MJ w/Valve Box	EA	3	$ -	$	-
5.	2 1/2" Flush Valve	EA	4	$ -	$	-
6.	16" Steel Casing	LF	236	$ -	$	-
7.	24" Steel Casing	LF	202	$ -	$	-
8.	Standard Fire Hydrant Assembly	EA	8	$ -	$	-
9.	Joint Restraints	LS	1	$ -	$	-
10.	Ductile Iron Fittings	TON	7.07	$ -	$	-

REDBIRD RANCH PHASE 2 UNIT 6M-1
UNIT PRICES

11.	1"Irrigation Service	EA	1	$ -	$ -
12.	1" Single Service, Long	EA	68	$ -	$ -
13.	1" Single Service, Short	EA	56	$ -	$ -
14.	Hydrostatic Testing	LS	1	$ -	$ -
15.	Trench Excavation Protection	LF	5,144	$ -	$ -
16.	Meter Box with Lid	EA	125	$ -	$ -
				SUBTOTAL	$ -

GRADING, CLEARING, TPDES & SIGNAGE

1.	Lot Excavation	CY	175	$ -	$ -
2.	Lot Embankment	CY	81,510	$ -	$ -
3.	Street Excavation	CY	6,605	$ -	$ -
4.	Street Embankment	CY	8,785	$ -	$ -
5.	Drain Excavation	CY	90,935	$ -	$ -
6.	Drain Embankment	CY	5,450	$ -	$ -
7.	Basin Excavation	CY	140,160	$ -	$ -
8.	Basin Embankment	CY	4,980	$ -	$ -
9.	Stockpile Excess Material	CY	118,035	$ -	$ -
10.	Export to 8M-1	CY	19,115	$ -	$ -
11.	Vegetation (Stockpile)	SY	16080	$ -	$ -
12.	Clearing (Includes Stockpile)	AC	73.46	$ -	$ -
13.	TPDES (Includes Stockpile)	LS	1	$ -	$ -
				SUBTOTAL	$ -

ELECTRICAL IMPROVEMENTS

1.	2-4" PVC SCH 40 (DR HORTON CONDUIT)	LF	270	$ -	$ -
2.	2-6" PVC SCH 80	LF	205	$ -	$ -
3.	2-4" PVC SCH 40	LF	260	$ -	$ -
4.	1-6" PVC SCH 80	LF	60	$ -	$ -
5.	1-10" PVC SCH 80	LF	120	$ -	$ -
				SUBTOTAL	$ -

REDBIRD RANCH PHASE 2 UNIT 6M-1 - BASE BID:	**$**	**-**

REDBIRD RANCH PHASE 2 UNIT 8M-1
UNIT PRICES

Date _____

BIDDER'S FULL NAME _____

Address _____

City, State, Zip _____

Milestone #1-Substantial Completion (days): _____ **BASE BID:** $ -

Milestone #2-Final Completion (days): _____

1. The Undersigned proposes to furnish all labor, services, materials, tools and necessary equipment for the construction of various improvements and to perform the work required at the locations set out by the Plans and Specifications, in strict accordance with the Contract Documents.
2. In submitting this Bid, it is understood that this Bid may not be altered or withdrawn for a minimum of 90 calendar days, and that the Owner has reserved the right to reject any and all Bids.
3. The Undersigned certifies that this Bid is made in good faith, without collusion or connection with any other person, persons, partnership, company, firm, association, or corporation offering Bids on this work, for the following sum or prices to wit:

SIGNATURES _____

Authorized Signing Officer, Title

SIGNATURES _____

Authorized Signing Officer, Title

ITEM NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
STREET IMPROVEMENTS					
1.	Local A (50' ROW)				
	a. 2" Type D HMAC (Face of Curb to Face of Curb)	SY	11,205	$ -	$ -
	b. 10" Aggregate Base (1' behind back of curb)	SY	12,430	$ -	$ -
	c. 6" Lime Treated Subgrade (1' behind back of curb)	SY	12,430	$ -	$ -
2.	Local B (60' ROW)				
	a. 2" Type D HMAC (Face of Curb to Face of Curb)	SY	4,340	$ -	$ -
	b. 2" Type C HMAC (Face of Curb to Face of Curb)	SY	4,340	$ -	$ -
	c. 16" Aggregate Base (1' behind back of curb)	SY	4,710	$ -	$ -
	d. 8" Lime Treated Subgrade (1' behind back of curb)	SY	4,710	$ -	$ -
3.	Remove Header Curb & Barricade Post	LF	40	$ -	$ -
4.	Hydromulch (Parkways)	SY	5,040	$ -	$ -
5.	7" Concrete Curb	LF	8,262	$ -	$ -
6.	Sidewalk	SY	507	$ -	$ -
7.	Header Curb	LF	180	$ -	$ -
8.	Barricade Posts	EA	30	$ -	$ -
9.	Striping and Signage	LS	1	$ -	$ -
				SUBTOTAL	$ -
DRAINAGE IMPROVEMENTS					
1.	24" RCP	LF	34.16	$ -	$ -

REDBIRD RANCH PHASE 2 UNIT 8M-1
UNIT PRICES

2.	30" RCP	LF	476.09	$ -	$ -
3.	36" RCP	LF	123.93	$ -	$ -
4.	42" RCP	LF	130.88	$ -	$ -
5.	Reinforced Concrete Class 'A'				
	a. 20' Type CI Curb Inlet	EA	1	$ -	$ -
	b. 20' Type CII Curb Inlet	EA	1	$ -	$ -
	c. 25' Type CI Curb Inlet	EA	2	$ -	$ -
	d. 5'X5' Junction Box	EA	1	$ -	$ -
	e. 7'X7' Junction Box	EA	1	$ -	$ -
	f. Sidewalk Box	CY	6.8	$ -	$ -
6.	6" Concrete Rip-Rap	SY	50.2	$ -	$ -
7.	Rock Rubble	SY	18	$ -	$ -
8.	Trench Excavation Protection	LF	765.06	$ -	$ -
9.	Curlex Single Net Erosion Control Blankets	SY	615	$ -	$ -
10.	Hydromulch	SY	615	$ -	$ -
11.	Pipe Railing	LF	35	$ -	$ -
				SUBTOTAL	$ -

SANITARY SEWER IMPROVEMENTS

1.	8" Sanitary Sewer Pipe (SDR-26)				
	a. 6'-8' Depth	LF	80	$ -	$ -
	b. 8'-10' Depth	LF	1,630	$ -	$ -
	c. 10-12' Depth	LF	2,130	$ -	$ -
	d. 12'-14' Depth	LF	421	$ -	$ -
	e. 14'-16' Depth	LF	68	$ -	$ -
2.	Standard Manhole	EA	17	$ -	$ -
3.	Manhole Extra Depth	VF	91.7	$ -	$ -
4.	6" Vertical Stack	VF	67.1	$ -	$ -
5.	Trench Excavation Protection	LF	4,329	$ -	$ -
6.	Camera Testing	LF	4,329	$ -	$ -
7.	8"x6" Wye	EA	98	$ -	$ -
8.	6" Lateral (SDR-26)	LF	3,786	$ -	$ -
9.	Tie to Existing Stub-out	EA	1	$ -	$ -
				SUBTOTAL	$ -

WATER DISTRIBUTION IMPROVEMENTS

1.	8" PVC C-900 Class 235, DR 18	LF	4,360	$ -	$ -
2.	8" Gate Valve, MJ w/Valve Box	EA	19	$ -	$ -
3.	12" PVC C-900 Class 235, DR 18	LF	213	$ -	$ -
4.	2 1/2" Flush Valve	EA	7	$ -	$ -

REDBIRD RANCH PHASE 2 UNIT 8M-1
UNIT PRICES

5.	16" Steel Casing	LF	504	$ -	$	-
6.	24" Steel Casing	LF	64	$ -	$	-
7.	Standard Fire Hydrant Assembly	EA	4	$ -	$	-
8.	Joint Restraints	LS	1	$ -	$	-
9.	Ductile Iron Fittings	TON	4.99	$ -	$	-
10.	1"Irrigation Service	EA	1	$ -	$	-
11.	1" Single Service, Long	EA	54	$ -	$	-
12.	1" Single Service, Short	EA	48	$ -	$	-
13.	Hydrostatic Testing	LS	1	$ -	$	-
14.	Trench Excavation Protection	LF	4,573	$ -	$	-
15.	Meter Box with lid	EA	103	$ -	$	-
				SUBTOTAL	$	-

GRADING, CLEARING, TPDES & SIGNAGE

1.	Lot Excavation	CY	1,685	$ -	$	-
2.	Lot Embankment	CY	29,035	$ -	$	-
3.	Street Excavation	CY	10,260	$ -	$	-
4.	Street Embankment	CY	2,400	$ -	$	-
5.	Drain Excavation	CY	375	$ -	$	-
6.	Clearing	AC	22.24	$ -	$	-
7.	TPDES	LS	1	$ -	$	-
				SUBTOTAL	$	-

ELECTRICAL IMPROVEMENTS

1.	2-6" PVC SCH 80	LF	400	$ -	$	-
2.	2-4" PVC SCH 40	LF	460	$ -	$	-
3.	1-6" PVC SCH 80	LF	65	$ -	$	-
4.	4-6" PVC SCH 80	LF	60	$ -	$	-
				SUBTOTAL	$	-

REDBIRD RANCH PHASE 2 UNIT 8M-1 - BASE BID: $ -

GALM ROAD PHASE 4
UNIT PRICES

Date _____

BIDDER'S FULL NAME _____

Address _____

City, State, Zip _____

Milestone #1-Substantial Completion (days): _____ **BASE BID:** $ -

Milestone #2-Final Completion (days): _____

1. The Undersigned proposes to furnish all labor, services, materials, tools and necessary equipment for the construction of various improvements and to perform the work required at the locations set out by the Plans and Specifications, in strict accordance with the Contract Documents.
2. In submitting this Bid, it is understood that this Bid may not be altered or withdrawn for a minimum of 90 calendar days, and that the Owner has reserved the right to reject any and all Bids.
3. The Undersigned certifies that this Bid is made in good faith, without collusion or connection with any other person, persons, partnership, company, firm, association, or corporation offering Bids on this work, for the following sum or prices to wit:

SIGNATURES _____

Authorized Signing Officer, Title

SIGNATURES _____

Authorized Signing Officer, Title

ITEM NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
STREET IMPROVEMENTS					
1.	Secondary Arterial (120' ROW)				
	a. 2" Type D HMAC (Face of Curb to Face of Curb)	SY	23,812	$ -	$ -
	b. 2" Type C HMAC (Face of Curb to Face of Curb)	SY	23,812	$ -	$ -
	c. 22.5" Flexible (Granular) Base (1' behind back of curb)	SY	27,619	$ -	$ -
	d. 8" Lime Treated Subgrade (1' behind back of curb)	SY	27,619	$ -	$ -
2.	Sidewalk	SY	6,705	$ -	$ -
3.	Striping and Signage	LS	1.0	$ -	$ -
4.	7" Concrete Curb	LF	14,665	$ -	$ -
5.	Barricade Posts	EA	32.0	$ -	$ -
6.	Concrete Median	SY	4,494	$ -	$ -
7.	Revegetation (Hydromulch) Parkways	SY	17,161	$ -	$ -
8.	Header Curb	LF	184.0	$ -	$ -
9.	TPDES	LS	1.0	$ -	$ -
				SUBTOTAL	$ -
DRAINAGE IMPROVEMENTS					
1.	Rock Rubble	SY	219	$ -	$ -
2.	Curlex Single Net Erosion Control Blanket	SY	14,012	$ -	$ -
1.	Reinforced Concrete Class 'A'				
	a. 25' Type CI Curb Inlet	EA	6.0	$ -	$ -

GALM ROAD PHASE 4
UNIT PRICES

	b. 30' Type CI Curb Inlet	EA	1.0	$ -	$ -
	c. 30' Type CII Curb Inlet	EA	1.0	$ -	$ -
	d. 4'X4' Junction Box	EA	1.0	$ -	$ -
	e. Baffle Blocks	CY	3.35	$ -	$ -
	f. PW-2 Headwall	CY	145.70	$ -	$ -
	g. RH-15 Headwall	CY	44.8	$ -	$ -
2.	6" Concrete Rip-rap	SY	957	$ -	$ -
3.	24" RCP	LF	200.81	$ -	$ -
4.	36" RCP	LF	390.63	$ -	$ -
5.	3-6'X4' MBC	LF	112.31	$ -	$ -
6.	Landlok 450 Erosion Control Mat	SY	3,321	$ -	$ -
7.	Trench Excavation Protection	LF	703.75	$ -	$ -
8.	Hydromulch	SY	17,355	$ -	$ -
9.	Combination Railing	LF	131	$ -	$ -
10.	Metal Beam Guardrail Fence	LF	212.50	$ -	$ -
				SUBTOTAL	$ -

SANITARY SEWER IMPROVEMENTS

1.	8" Sanitary Sewer Pipe				
	a. 10'-12' Depth	LF	871	$ -	$ -
	b. 12-14' Depth	LF	58	$ -	$ -
2.	Standard Manhole	EA	5	$ -	$ -
3.	Manhole Extra Depth	VF	26	$ -	$ -
4.	Trench Excavation Protection	LF	929	$ -	$ -
5.	Camera Testing	LF	929	$ -	$ -
6.	24" Steel Encasement	LF	31	$ -	$ -
				SUBTOTAL	$ -

WATER DISTRIBUTION IMPROVEMENTS

1.	8" PVC C-900 Class 235, DR 18	LF	151	$ -	$ -
2.	8" Gate Valve, MJ w/Valve Box	EA	1.0	$ -	$ -
3.	12" PVC C-900 Class 235, DR 18	LF	2,034	$ -	$ -
4.	12" Gate Valve, MJ w/Valve Box	LF	8.0	$ -	$ -
5.	12" D.I. Pipe	LF	194	$ -	$ -
6.	16" PVC C-900 Class 150, CDR-(4)	LF	1,832	$ -	$ -
7.	16" Butterfly Valve, MJ w/Valve Box	EA	4.0	$ -	$ -
8.	2 1/2" Flush Valve	EA	5.0	$ -	$ -
9.	Air Release Valve	EA	3.0	$ -	$ -
10.	16" D.I. Pipe	LF	32.0	$ -	$ -
11.	18" Steel Casing	LF	96.0	$ -	$ -

GALM ROAD PHASE 4
UNIT PRICES

12.	24" Steel Casing	LF	374	$ -	$	-
13.	30" Steel Casing	LF	86.0	$ -	$	-
14.	Standard Fire Hydrant Assembly	EA	4.0	$ -	$	-
15.	Joint Restraints	LS	1.0	$ -	$	-
16.	Ductile Iron Fittings	TON	5.40	$ -	$	-
17.	1"Irrigation Service	EA	3.0	$ -	$	-
18.	Hydrostatic Testing	LS	1.0	$ -	$	-
19.	Trench Excavation Protection	LF	4,243	$ -	$	-
20.	Meter Box with lid	EA	3.0	$ -	$	-
				SUBTOTAL	$	-

GRADING, CLEARING, TPDES & SIGNAGE

1.	Street Excavation	CY	31,550	$ -	$	-
2.	Street Embankment	CY	3,625	$ -	$	-
3.	Drain Excavation	CY	19,310	$ -	$	-
4.	Drain Embankment	CY	2,035	$ -	$	-
5.	Clearing	AC	21.99	$ -	$	-
6.	TPDES	LS	1	$ -	$	-
7.	Stockpile Excess Material	CY	45,200	$ -	$	-
				SUBTOTAL	$	-

ELECTRICAL IMPROVEMENTS

1.	2-4" PVC SCH 40 (DR HORTON CONDUIT)	LF	745	$ -	$	-
2.	1-10" PVC SCH 80	LF	555	$ -	$	-
				SUBTOTAL	$	-

GALM ROAD PHASE 4 - BASE BID: $ -

GALM ROAD PHASE 4 - ROYAL ALBATROSS
UNIT PRICES

Date _____

BIDDER'S FULL NAME _____

Address _____

City, State, Zip _____

Milestone #1-Substantial Completion (days): _____ **BASE BID:** $ -

Milestone #2-Final Completion (days): _____

1. The Undersigned proposes to furnish all labor, services, materials, tools and necessary equipment for the construction of various improvements and to perform the work required at the locations set out by the Plans and Specifications, in strict accordance with the Contract Documents.
2. In submitting this Bid, it is understood that this Bid may not be altered or withdrawn for a minimum of 90 calendar days, and that the Owner has reserved the right to reject any and all Bids.
3. The Undersigned certifies that this Bid is made in good faith, without collusion or connection with any other person, persons, partnership, company, firm, association, or corporation offering Bids on this work, for the following sum or prices to wit:

SIGNATURES _____

Authorized Signing Officer, Title

SIGNATURES _____

Authorized Signing Officer, Title

ITEM NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
STREET IMPROVEMENTS					
1.	Local B (72' ROW)				
	a. 2" Type D HMAC (Face of Curb to Face of Curb)	SY	3,000	$ -	$ -
	b. 2" Type C HMAC (Face of Curb to Face of Curb)	SY	3,000	$ -	$ -
	c. 16" Flexible (Granular) Base (1' behind back of curb)	SY	3,237	$ -	$ -
	d. 8" Lime Treated Subgrade	SY	3,237	$ -	$ -
2.	Sidewalk	SY	829	$ -	$ -
3.	Striping and Signage	LS	1.0	$ -	$ -
4.	7" Concrete Curb	LF	1,255	$ -	$ -
5.	Remove Header Curb & Barricade Posts	LF	48	$ -	$ -
6.	Revegetation (Hydromulch) Parkways	SY	1,185	$ -	$ -
				SUBTOTAL	$ -
DRAINAGE IMPROVEMENTS					
1.	Rock Rubble	SY	118	$ -	$ -
2.	Reinforced Concrete Class 'A'				
	a. 15' Type CI Curb Inlet	EA	2.0	$ -	$ -
	b. Baffle Blocks	CY	4.05	$ -	$ -
	c. PW-1 Headwall	CY	138.1	$ -	$ -
	d. RH-15 Headwall	CY	7.4	$ -	$ -

GALM ROAD PHASE 4 - ROYAL ALBATROSS
UNIT PRICES

3.	24" RCP	LF	41.16	$ -	$	-
4.	30" RCP	LF	106.90	$ -	$	-
5.	3-4'X4' Precast Boxes	LF	55.50	$ -	$	-
6.	Trench Excavation Protection	LF	203.56	$ -	$	-
7.	Combination Railing	LF	104	$ -	$	-
8.	Metal Beam Guardrail Fence	LF	212.50	$ -	$	-
				SUBTOTAL	$	-

SANITARY SEWER IMPROVEMENTS

1.	8" Sanitary Sewer Pipe					
	b. 8'-10' Depth	LF	149	$ -	$	-
	c. 10'-12' Depth	LF	144	$ -	$	-
	d. 12-14' Depth	LF	327	$ -	$	-
	e. 14'-16' Depth	LF	52	$ -	$	-
2.	Standard Manhole	EA	2.0	$ -	$	-
3.	Manhole Extra Depth	VF	12	$ -	$	-
4.	Adjust Existing Manhole Top	EA	1.0	$ -	$	-
5.	Trench Excavation Protection	LF	672	$ -	$	-
6.	Camera Testing	LF	672	$ -	$	-
7.	Tie to Existing Stubout	EA	1.0	$ -	$	-
8.	24" Steel Encasement	LF	19	$ -	$	-
				SUBTOTAL	$	-

WATER DISTRIBUTION IMPROVEMENTS

1.	12" PVC C-900 Class 235, DR 18	LF	653	$ -	$	-
2.	24" Steel Casing	LF	51	$ -	$	-
3.	Joint Restraints	LS	1	$ -	$	-
4.	Ductile Iron Fittings	TON	2.00	$ -	$	-
5.	Hydrostatic Testing	LS	1	$ -	$	-
6.	Trench Excavation Protection	LF	653	$ -	$	-
				SUBTOTAL	$	-

GRADING, CLEARING, TPDES & SIGNAGE

1.	Street Excavation	CY	35	$ -	$	-
2.	Street Embankment	CY	10,735	$ -	$	-
3.	Clearing	AC	2.18	$ -	$	-
4.	TPDES	LS	1	$ -	$	-
				SUBTOTAL	$	-

GALM ROAD PHASE 4 - ROYAL ALBATROSS
UNIT PRICES

ELECTRICAL IMPROVEMENTS						
1.	2-4" PVC SCH 40 (DR HORTON CONDUIT)	LF	95	$ -	$	-
2.	1-10" PVC SCH 80	LF	95	$ -	$	-
				SUBTOTAL	$	-
				GALM ROAD PHASE 4 - ROYAL ALBATROSS- BASE BID:	**$**	**-**

PROPOSED SUBCONTRACTORS FORM

PART 1 PARTICULARS

1.01 PROPOSED SUBCONTRACTORS

A. Herewith is the list of proposed Subcontractors referenced in the bid submitted by:

(Bidder) _____

B. To (Owner): Continental Homes of Texas, L.P. for the benefit of Redbird Ranch Water Control and Improvement District No. 3

C. Dated _____ and which is an integral part of the Bid Form.

1.02 LIST OF SUBCONTRACTORS

A. The following work is proposed to be performed (or provided) by Subcontractors and coordinated by us:

WORK SUBJECT	SUBCONTRACTOR NAME

END OF SECTION

AGREEMENT FORM

PART 1 GENERAL

1.01 FORM OF AGREEMENT

A. The Agreement to be executed is attached following this page.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - General Conditions of the Contract.

B. Document - Special Conditions of the Contract Part A (attached following Contract)

C. Document - Special Conditions of the Contract Part B (attached following Contract)

D. Section 01 4216 - Definitions.

1.03 MODIFICATIONS TO THE AGREEMENT FORM

A. _____

B. _____

C. _____

END OF SECTION

CONTINENTAL HOMES OF TEXAS, L.P FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3

CONTRACT

STATE OF TEXAS }

COUNTY OF _____}

THIS CONTRACT ("Contract") is made and entered into this _____ day of _____, 20__ by and between Continental Homes of Texas, L.P. by CHTEX of Texas, Inc. (the "Owner") and [CONTRACTOR NAME], _____, of the City of _____, County of ___, and State of _____, hereinafter termed "Contractor."

All capitalized terms used herein shall be given the meanings set forth in the General Conditions of the Contract. Pape-Dawson shall be referred to herein as the "Engineer."

For and in consideration of the mutual covenants hereinafter set forth, and under the conditions expressed in the Bonds bearing even date herewith, the Contractor and Owner hereby agree as follows:

Contractor shall commence and complete the Work generally described as follows:

Redbird Ranch Phase 2 Units 6M-1, 8M-1 and Galm Road Phase 4 for CONTINENTAL HOMES OF TEXAS, L.P, FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3
Medina County, Texas,
according to those Plans and Technical Specifications
prepared by Engineer
in the initial Contract Price of $_____

and all Extra Work in connection therewith, under the terms as stated in the Contract Documents, and, at Contractor's own proper cost and expense, to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said Work, in accordance with the conditions and prices stated in the Bid attached hereto and in accordance with the Contract Documents. Contractor represents and warrants to the Owner that it has carefully examined this Contract and all Contract Documents and is thoroughly familiar therewith.

The Contractor hereby agrees to begin work within ten (**10) calendar days** after the written Notice to Proceed has been given by the Engineer. Contractor hereby also agrees to achieve Substantial Completion of the Work within _____ **calendar days** after the date of the written Notice to Proceed and to achieve Final Completion of the Work within 30 **calendar days** after Substantial Completion.

Owner agrees to pay Contractor for completion of the Work in accordance with the Contract Documents for the initial Contract Price of _____ ($_____), plus or minus any increases or decreases to the initial Contract Price as provided by the Contract Documents. Contractor will be paid in current funds for the performance of the Contract in accordance with the Bid submitted therefor, subject to additions and deductions as allowed by the Contract Documents and, if applicable, approved by Change Order under the Contract Documents, and to make payments on account thereof as provided therein.

CONTINENTAL HOMES OF TEXAS, L.P FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in the year and day first above written.

CONTINENTAL HOMES OF TEXAS, L.P.
A Texas limited partnership
Owner

By: CHTEX of Texas, Inc. A Delaware Corporation, its sole general partner

ATTEST: By: _____

Name: Leslie K. Ostrander

_____ Title: Assistant Secretary

[CONTRACTOR]
Contractor

ATTEST: By: _____

Name: _____

_____ Title: _____

(The following to be executed if Contractor is a corporation)

I, _____, certify that I am the secretary of the corporation named as Contractor herein; that _____, who signed this Contract on behalf of Contractor, was then _____ _____ of said corporation; that said Contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

Signed: _____

Corporate Seal

SPECIAL CONDITIONS OF THE CONTRACT
PART A

1. Name and Location of Project.
Work covered by these Technical Specifications is entitled "Redbird Ranch Phase 2 Units 6M-1, 8M-1 and Galm Road Phase 4, San Antonio, Medina County, Texas."

2. Description of Work.
   a. Under this Contract, Contractor shall furnish all materials, appliances, tools, equipment, transportation, services, and all labor and superintendence necessary for the construction of the Work as described in these Technical Specifications and as shown on the Plans. The completed installation shall not lack any part that can be reasonably implied as necessary to its proper functioning or any subsidiary item that is customarily furnished, and Contractor shall deliver the installation to Owner in operating condition.

   b. The Work, in general, under this Contract includes the purchase, installation, and construction of all structures, equipment, and materials, including appurtenances, as indicated on the Plans.

      Major items of construction and services required are designated as follows:

      (1) Install and adjust waterlines, valves, valve boxes, flushing valves, fittings, and appurtenances;
      (2) Construct and adjust sanitary sewer, manholes and appurtenances;
      (3) Repair existing pavement affected;
      (4) Furnish and install all subsidiary items as necessary to complete the project;
      (5) Perform testing as specified on installed lines; and
      (6) Clean-up project area upon completion.

3. Technical Specifications.
   a. Technical Specifications are of the abbreviated, simplified or streamlined type and include incomplete sentences. The omission of words or phrases such as "Contractor shall," "in conformity therewith," "shall be," "as noted on Plans," "according to Plans," "a," "an," "the," and "all," are intentional. Omitted words or phrases shall be supplied by inference in same manner as they are when a "note" occurs on Plans.

   b. The Technical Specifications are interpreted to require that Contractor shall provide all items, articles, materials, operation or methods listed, mentioned, or scheduled either on Plans or specified herein, or both, including all labor, materials, equipment, and incidentals necessary and required for their completion.

   c. Whenever the words "designated," "submitted," "observed," or similar words or phrases are used, it shall be assumed that the word "Engineer" follows the verb as the object of the clause, such as "observed by Engineer."

   d. All references to standard Technical Specifications or manufacturer's installation directions shall mean the latest edition thereof on the date Bids are due unless specifically noted otherwise.

   e. Reference to technical society, organization or body is made in Technical Specifications in accordance with following abbreviations:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
FS	Federal Specifications
PCA	Portland Cement Association
IEEE	Institute of Electrical and Electronic Engineers
NEC	National Electric Code
UL	Underwriters' Laboratories
AISI	American Iron and Steel Institute
API	American Petroleum Institute
IPCEA	Insulated Power Cable Engineers Association
NEMA	National Electrical Manufacturers Association
AWS	American Welding Society
PCI	Prestressed Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute (Formerly ASA)

f. Some Technical Specification items cover construction requirements and materials in comprehensive manner, and only pertinent portions of these items apply.

4. Manufacturer's Representative.
When required by Technical Specifications provide the services of trained, qualified technicians to check final equipment installation, to assist as required in placing same in operation, and to instruct operating personnel in the proper manner of performing routine operation and maintenance of the equipment.

5. Plans.

Sheet No. Title

Reference Section 00 0115 – List of Drawing Sheets

6. Plans/Exhibits/Reports.

Title

CPS Design
Geotechnical Report
CAD dwgs
Stockpile Exhibit

PERFORMANCE BOND AND LABOR AND MATERIALS PAYMENT BOND

PART 1 GENERAL

1.01 PERFORMANCE BOND AND LABOR AND MATERIALS PAYMENT BOND

A. The Contractor shall, prior to the execution of the Contract, furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in the amount of 100% of the Contract Sum covering 100% performance and 100% payment, and with such sureties secured through the Contractor's usual sources as may be agreeable to the parties.

B. The Contractor shall deliver the required bonds to the Owner no later than the date of execution of the Contract, or if the Work is commenced prior thereto in response to a letter of intent, the Contractor shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

C. The Contractor shall require the Attorney-In-Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his Power of Attorney.

D. Surety's Standard Performance Bond and Labor and Material Payment Bond, meeting requirements of the Hardeman Act, will be the forms used as Performance and Labor and Material Payment Bonds for this Project.

END OF SECTION

BOND NO. _____

PAYMENT BOND
(Private)

STATE OF TEXAS Contract Date _____

COUNTY OF _____ Date Bond Executed _____

PRINCIPAL _____

SURETY _____

OWNER _____

PENAL SUM OF BOND (in words and figures) _____

being 100 percent of the Contract Price.

CONTRACT for the construction of _____ on land in _____ County for, _____, _____ County, Texas.

KNOW ALL PERSONS BY THESE PRESENTS, that we, Principal and Surety above named, are held and firmly bound unto Owner, its successors and assigns, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, officers, directors, shareholders, partners, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal entered into the Contract with Owner, which Contract is expressly incorporated herein for all purposes.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in such Contract, and any authorized extensions or modification thereof, including all amounts due for materials, equipment and tools, consumed or used in connection with the construction of such Work, and for all labor cost incurred in such Work including that by a SUBCONTRACTOR, and to any mechanic or materialmen lienholder whether it acquires its lien by operation of State or Federal law, then this obligation shall be void; otherwise, this obligation will remain in full force and effect.

Principal shall promptly pay Claimants for all labor, subcontracts, materials, and specially fabricated material as defined in Chapter 53.001, Texas Property Code, and normal and usual extras not to exceed fifteen (15%) percent of the Contract Price.

PROVIDED 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 and Specifications accompanying the same shall in any way 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 this Contract or to the Work or to the Plans and Specifications.

PROVIDED, FURTHER, that is expressly agreed that this Bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract, so as to bind the Principal and the Surety to the full and faithful performance of the Contract as so amended. The term "Amendment," wherever used in this Bond and whether referring

to this Bond, the Contract or the Contract Documents shall include any alteration, additions, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each of which shall be deemed an original, this ___ day of _____, 20__.

_____
PRINCIPAL

By _____

Name _____

Title _____

Address _____

_____ (SEAL)

STATE OF TEXAS §
COUNTY OF _____ §

This instrument was acknowledged before me on _____, 20__, by _____, the [TITLE]_____ of [PRINCIPAL COMPANY]_____, the corporation that executed the foregoing instrument.

NOTARY PUBLIC, State of _____

_____
(Notary's Printed Name)

My Commission Expires: _____

By: _____

_____

SURETY

By _____

Name _____

Title _____

(SEAL)

Physical Address:

_____

_____

_____

Mailing Address:

_____

_____

_____

Telephone: _____

Local Recording Agent Personal Identification Number:

_____

Agency Name:_____

Agency Address_____

Agency Telephone _____

Surety must attach its original Power of Attorney to this Bond.

Surety must attach Surety Identification/Complaint Notice to this Bond.

STATE OF TEXAS §

COUNTY OF _____ §

This instrument was acknowledged before me on _____, 20__, by _____, the Attorney-in-Fact of [SURETY COMPANY]_____, the corporation that executed the foregoing instrument.

NOTARY PUBLIC, State of _____

_____

(Notary's Printed Name)

My Commission Expires: _____

By: _____

APPROVAL OF OWNER

_____ as the Owner named and referred to in the foregoing bond and the Contract incorporated in the foregoing Bond, hereby endorses and approves the foregoing Bond and approves the filing of same in the office of the County Clerk of _____ County, Texas, this ___ day of _____, 20__.

DEVELOPER

By _____

Name _____

Title _____

NOTE: Approval of Owner is required by statute. See Property Code §53.202 for all requirements.

STATE OF TEXAS §
COUNTY OF _____ §

This instrument was acknowledged before me on _____, 20__, by _____, the [TITLE]_____ of [DEVELOPER COMPANY]_____, the corporation that executed the foregoing instrument.

NOTARY PUBLIC, State of _____

_____
(Notary's Printed Name)

My Commission Expires: _____

By: _____

CERTIFICATE AS TO CORPORATE PRINCIPAL

I,_____, certify that I am the secretary of the corporation named as Principal in the Bond; that _____, who signed the Bond on behalf of Principal, was then _____ of the corporation; that I know his or her signature, and his or her signature is genuine; and that the Bond was duly signed for and on behalf of the corporation by authority of its governing body.

_____ (Corporate Seal)

Signature of Corporate Secretary

ATTACH POWER OF ATTORNEY

MEMORANDUM OF CONTRACT

KNOW ALL MEN BY THESE PRESENTS: _____ ("Obligee") and _____ (the "Principal" and/or "Contractor") entered into a certain construction contract (the "Contract") dated as of _____, for the construction of those certain improvements commonly identified as _____, located in _____ County, Texas, being more particularly described in Exhibit "A" attached hereto and incorporated fully herein.

Under the terms of the Contract, the Contractor shall construct such improvements described therein for the sum of _____ Dollars ($_____) (the "Contract Price"), payable as the Work is performed in accordance with the terms of the Contract.

This Memorandum of Contract does not alter, amend or modify the Contract, but is executed solely for the purpose of serving as the memorandum of contract in compliance with the provisions of Subchapter I, Chapter 53 of the Texas Property Code.

EXECUTED as set forth below.

[SIGNATURES ON FOLLOWING PAGE]

Developer: _____

By: _____

Title: _____

STATE OF TEXAS §

COUNTY OF _____ §

This instrument was acknowledged before me on _____, 20__, by _____, the _____ of _____, a _____ (corporation / limited partnership), on behalf of said _____ (corporation / limited partnership).

_____

NOTARY PUBLIC, State of _____

_____

(Notary's Printed Name)

My Commission Expires: _____

By: _____

Exhibit A

(Legal description of the land and the improvements being constructed under the Contract)

BOND NO. _____

COMMON LAW PERFORMANCE BOND
(Private)

STATE OF TEXAS Contract Date _____

COUNTY OF _____ Date Bond Executed _____

PRINCIPAL _____

SURETY _____

OWNER [DEVELOPER]_____

PENAL SUM OF BOND (in words and figures) _____,

being 100 percent of the Contract Price.

CONTRACT for the construction of _____ in _____ County, Texas (the "Contract").

KNOW ALL PERSONS BY THESE PRESENTS, that we, Principal and Surety above named, are held and firmly bound unto Owner, its successors and assigns, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, officers, directors, shareholders, partners, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has entered into a certain construction contract, hereinafter referred to as the "Contract", with Owner, dated the ___ day of _____, 20__, to construct _____ at _____ (the "Work").

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH, that if Principal well and truly performs the work in accordance with the Plans, Specifications and any other Contract Documents, during the original term of the Contract and any extensions thereof that may be granted by Owner, with or without notice to Surety, and during the life of any guaranty or warranty required under the Contract, then this obligation is void; otherwise it is to remain in full force and effect. Should the Principal fail to faithfully and strictly perform the Work as required by the Contract in all its terms, the Surety will be liable for all damages, losses, expenses and liabilities that the Owner may suffer in consequence thereof.

Surety hereby agrees, for value received, that no change, extension of time, alteration or addition to the terms of the Contract or to Work performed under the Contract, or to the Plans, Specifications or drawings accompanying the Contract, will in any way affect its obligations 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.

The bound parties have executed this instrument pursuant to authority of their respective governing body, to be effective on the same date of the Contract.

_____	ATTEST
PRINCIPAL	
By _____	By _____
Name _____	Name _____
Title _____	Title _____
Address _____	
_____	(SEAL)
_____	ATTEST
SURETY	
By _____	By _____
Name _____	Name _____
Title _____	Title _____
(SEAL)	Physical Address:
	_____
	_____
	_____
	Mailing Address:
	_____
	_____
	_____
	Telephone: _____

Local Recording Agent Personal Identification Number:

_____

Agency Name:_____

Agency Address_____

Agency Telephone _____

Surety must attach its original Power of Attorney to this Bond.

Surety must attach Surety Identification/Complaint Notice to this Bond.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I,_____, certify that I am the secretary of the corporation named as Principal in the Bond; that _____, who signed the Bond on behalf of Principal, was then _____ of the corporation; that I know his or her signature, and his or her signature is genuine; and that the Bond was duly signed for and on behalf of the corporation by authority of its governing body.

_____ (Corporate Seal)

Signature of Corporate Secretary

ATTACH POWER OF ATTORNEY

GENERAL CONDITIONS

PART 1FORM OF GENERAL CONDITIONS OF THE CONTRACT

1.01 THE GENERAL CONDITIONS OF THE CONTRACT

A. The General Conditions applicable to this contract is attached following this page.

PART 2 RELATED REQUIREMENTS

2.01 SECTION 01 4216 - DEFINITIONS.

END OF SECTION

GENERAL CONDITIONS OF THE CONTRACT

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ATTACHMENT A – INSURANCE REQUIREMENTS

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GENERAL CONDITIONS OF THE CONTRACT

ARTICLE I. DEFINITIONS

1.01. DEFINITIONS. The following terms shall be defined as described below unless such definition is expressly modified by the Contract Documents. Any capitalized terms used in the Contract Documents not defined in this Section shall have the meaning assigned to such term under the Contract Documents.

a. Bid. The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

b. Bond(s). Performance bonds, maintenance bonds and payment bonds, or any of them, as required by the Contract Documents.

c. Change Order. A document signed by Contractor, Engineer, and Owner and entered into in accordance with the Contract Documents that authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time.

d. Claim. A "Claim" is a claim, demand, or assertion by the Contractor seeking for itself or on behalf of a subcontractor or supplier: adjustment or interpretation of any Contract term, including without limitation, adjustment of the Contract Price or Contract Time; payment of money; relief from obligations; or other relief or recovery with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question asserted by the Contractor (whether for itself or on behalf of a subcontractor or supplier) arising out of or relating to the Contract.

e. Contract. The entire and integrated written agreement between the Owner and Contractor concerning the Work, including the Contract Documents. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

f. Contract Documents. The Bid, Contract, Instructions to Bidders, General Conditions, Addendum to the General Conditions, Special and Supplemental Conditions, if any, Technical Specifications, Plans, Change Orders, any written amendment to the Contract signed by Contractor, Engineer, and Owner, Written Work Orders, addenda issued by Engineer, and all other documents designated as incorporated by reference. Documents incorporated by reference are Contract Documents, whether attached or not. Approved Shop Drawings and other Contractor's submittals, inspections, and reports, such as testing of subsurface and physical or environmental conditions, are not Contract Documents and are not part of the Contract.

g. Contractor. The entity with whom Owner has entered into this Contract.

h. Contractor Parties. The Contractor, and all its subcontractors, suppliers, and their respective agents, representatives, or employees, or any of them.

i. Contract Price. The amount of money stated in the Contract as payable by Owner to Contractor for timely completion of the Work in accordance with the Contract Documents, plus or minus any increases or decreases to the initial Contract Price agreed to by Owner as provided by the Contract.

j. Contract Time. The number of days or the dates stated in the Contract to achieve Final Completion, expressed as a number of calendar days or as a reference to the date of Final Completion. If the Contract Time is measured by calendar days, each and every calendar day shall be counted against the Contract Time and the Contract Time will be computed to exclude the first day and include the last day of such period.

k. Contracting Information. The following: 1) information in a voucher or contract relating to the receipt or expenditure of public funds by a governmental body; 2) solicitation or bid documents relating to a contract with a governmental body; 3) communications sent between a governmental body and a vendor, contractor, potential vendor, or potential contractor during the solicitation, evaluation, or negotiation of a contract; 4) documents, including bid tabulations, showing the criteria by which a governmental body evaluates each vendor, contractor, potential vendor, or potential contractor responding to a solicitation and, if applicable, an explanation of why the vendor or contractor was selected; and 5) communications and other information sent between a governmental body and a vendor or contractor related to the performance of a final contract with the governmental body or work performed on behalf of the governmental body.

l. Engineer. The design consultant so identified in the Contract, or such other firm that Owner may designate, is herein called Engineer and is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

m. Extra Unit Price Items. All extra unit price items or alternate unit price items so specified in the Bid.

n. Extra Work. All Work that may be required by Engineer or Owner to be done by Contractor to accomplish any change, alteration, or addition to the Work shown upon the Plans, implied by the Technical Specifications, or otherwise within the Contract Documents and not covered by Contractor's Bid. Notwithstanding the foregoing, Extra Unit Price Items or alternate unit price items so specified in the Bid and required by Engineer or Owner as described herein are not included in the definition of Extra Work.

o. Final Acceptance. Action at a formal meeting of the Owner, wherein Owner accepts the completed Project.

p. Final Completion. The date on which the entire Work or an agreed portion thereof is complete in strict conformance with the Contract Documents. If any governmental entity has jurisdiction to approve or accept Contractor's Work on the Project, or any portion thereof, Final Completion is not achieved unless and until written approval or acceptance of the entity is received, including Final Acceptance by Owner.

q. Force Majeure. Fire, flood, or act of God, earthquakes, hurricanes, tornadoes, epidemics, war, riot, civil disturbance, sabotage, terrorism, governmental or judicial restraint but only to the extent such event: (i) is beyond the control of and cannot be reasonably anticipated by, or the effects alleviated by, the Contractor; and (ii) prevents the performance of the Work on the critical path. Events not specifically listed herein shall not constitute events of Force Majeure.

r. Hazardous Environmental Condition. The presence at the Site of asbestos, PCBs, petroleum, hazardous waste, contaminants, or radioactive material in such quantities or circumstances that may present a danger to persons or property exposed thereto in connection with the Work.

s. Indemnified Parties. Owner, Engineer, and the officers, directors, managers, members, employees, agents, and representatives of each such party.

t. Laws and Regulations. Any and all applicable federal, state and local laws, rules, regulations, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction and any and all rules of common law pertaining to the Contractor's services, the Site, Contractor's employees and subcontractor's employees and/or the Work, and those of any other governmental entities with jurisdiction, including, without limitations all applicable laws of the State of Texas, Chapter 411 of the Texas Labor Code, Title VII (Equal Employment Opportunity) of the Civil Rights Act of 1964, The Occupational Safety and Health Act of 1970, The National Environmental Policy Act, The Federal Water Pollution Control Act, The Clean Air Act, The Clean Water Act, The Toxic Substance Control Act, The Resource Conservation and Recovery Act, and all amendments thereof. The agencies charged with the administration and enforcement of the Laws and Regulations include, but are not limited to, the Department of the Interior, the Equal Employment Opportunity Commission, the Occupational Safety and Health Administration, the Environmental Protection Agency, the U.S. Corps of Engineers, the National Fire Protection Association, the U.S. Geological Survey, the Minerals Management Service, the Texas Commission on Environmental Quality, the county in which the Site is located, and the municipality, as applicable, in whose corporate or extraterritorial jurisdiction the Site is located. Certain specific regulations that may be applicable to the Work are the Occupational Safety and Health Construction and General Industry Standards (29 CFR Part 1926 and 1910), and various environmental regulations.

u. Notice to Proceed. A written notice given by or on behalf of Owner to Contractor fixing the date on which the Contract Time will begin to run and on which Contractor shall start to perform the Work.

v. Owner. The entity so specified in the Contract.

w. Plans. That part of the Contract Documents which graphically shows the scope, extent, and character of the Work to be performed by Contractor.

x. Project. The total construction on the Site, which may include work performed by the Owner or other contractors.

y. Regulatory Agencies. Any and all governmental bodies, agencies, authorities, counties, municipalities, and courts having jurisdiction over the Project.

z. Shop Drawing. All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

aa. Site. The land or area furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access.

bb. Substantial Completion. The time at which the Work, or any portion thereof, is sufficiently completed in accordance with the Contract Documents so that Owner can occupy the entirety of the Work and put it to the full and unrestricted use for which it was intended, and all required certificates of occupancy and other permits, approvals, licenses, and documents required to occupy the Project by all entities, agencies and governmental authorities having jurisdiction over the Project and/or the operation and occupancy of the Project, as determined by the Engineer, have been given so that the Project may operate for its intended purpose, although the Project may still require minor miscellaneous Work and adjustment. The Work will not be considered substantially complete if: (i) any project systems included in the Work are not operational as designed and scheduled; (ii) designated instructions of Owner, Engineer, or Owner's other representative in the operation of systems have not been completed; (iii) any final finishes within the Contract Documents are not in place; or (iv) a Certificate of Substantial Completion in the form attached hereto and incorporated by reference herein has not been issued by the Engineer and signed by the Owner, Contractor and Engineer. The terms "substantially completed" or "substantially complete" as applied to all or part of the Work shall have the same meanings as set forth herein.

cc. Technical Specifications. That part of the Contract Documents, including any written addenda thereto, consisting of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

dd. Work. All obligations of the Contractor under the Contract Documents and all equipment, materials, labor, construction, management, supervision, services, punch list, and activities of every kind and nature, whether commenced or not, or completed or partially completed, undertaken by the Contractor, provided or to be provided by the Contractor, required of the Contractor, or inferable from the Contract Documents to perform and fulfill all of the Contractor's obligations pursuant to the Contract Documents.

ee. Written Work Order. A written statement to Contractor signed by Owner or Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions. A Written Work Order will not change the Contract Price or Contract Time but is evidence that the parties expect that the Written Work Order will be incorporated in a subsequently issued Change Order following agreement by the parties as to its effect, if any, on the Contract Price or Contract Time.

ARTICLE II. CONTRACT DOCUMENTS

2.01. INTERPRETATION OF CONTRACT DOCUMENTS AND PHRASES.

a. Whenever the words "required," "permitted," "designated," "considered necessary," "prescribed," or words of like import are used, it shall be understood that the requirement, permission, order, designation, or prescription of Engineer is intended and similarly, the words "approval," "acceptable," or "satisfactory," or words of like import shall mean approved by, or acceptable to, Engineer.

b. Whenever in the Technical Specifications or Plans accompanying this Contract, the terms or descriptions of various qualities relative to finish, workmanship, or other qualities of similar kind which cannot from their nature be specifically and clearly described and specified, are necessarily described in general terms, the fulfillment of which must depend

on individual judgment, then, in all such cases, any question of the fulfillment of said judgment of said Technical Specifications or Plans shall be decided by Engineer, and said Work shall be done in accordance with Engineer's interpretations of the meaning of the words, terms, or clauses defining the character of the Work.

c. The parties hereto agree that these Contract Documents shall not be construed against any party hereto on the basis that such party did or did not draft the Contract Documents.

d. The section headings used herein are for convenience only and shall not affect the construction or terms hereof.

e. If there is an irreconcilable conflict between Contract Documents, the more stringent requirement shall control, but except in such event and to avoid such conflict, every construction of provisions shall be that each is in aid to, or supplementary to or complementary of, each other provision, to control and secure for Owner the completion of the entire Work in an expeditious, orderly, and coordinated manner. The precedence, from highest to lowest, shall be in the following order:

1. Contract between Owner and Contractor;

2. Special Conditions of the Contract Part A Technical Specifications and Plans;

3. Special Conditions of the Contract Part B, if any;

4. Addendum to the General Conditions, if any;

5. General Conditions of the Contract.

The most recently issued document takes precedence over previously issued forms of the same document. Modifications take precedence over applicable previously issued documents. Detailed drawings shall take precedence over general drawings. In the event of any discrepancies between the Plans and Technical Specifications, or likewise, in the event of any doubt as to the meaning and intent of any portion of the Contract Documents, including the Technical Specifications or Plans, Engineer shall define that which is intended to apply to the Work.

f. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period.

2.02. EXHIBITS. All Work shall be done, and all materials furnished in strict conformity with the Contract Documents, all of which are hereto attached (or considered as if attached) and are hereby made a part of this Contract.

2.03. ACCURACY. These Contract Documents, including the Technical Specifications, Plans, and Bid, are intended to show all Work to be done and material to be furnished hereunder. **If the Work under the Contract Documents is for a critical infrastructure facility, as defined by Chapter 59 of the Texas Business and Commerce Code, the following statements in this Section apply: Contractor understands and acknowledges that errors may exist in the Contract Documents and that the Owner does not warrant the accuracy or sufficiency thereof. The Contractor acknowledges that the Contract Documents are sufficiently detailed, accurate and**

comprehensive to enable Contractor to have adequately estimated and established the Contract Price and to perform the Work within the Contract Time.

2.04. CONTRACTING INFORMATION. If the Contract Price is equal to or greater than $1,000,000, Contractor, pursuant to the **Government Code Section 552.372**, shall:

a. preserve all Contracting Information related to the Contract Documents as provided by the records retention requirements applicable to the Owner for the duration of the Contract;
b. promptly provide to the Owner any Contracting Information related to the Contract Documents that is in the custody or possession of the Contractor on request of the Owner; and
c. on Final Completion of the Contract, provide at no cost to Owner all Contracting Information related to the Contract Documents that is in the custody or possession of the Contractor or preserve the Contracting Information related to the Contract Documents as provided by the records retention requirements of the Owner.

ARTICLE III. PRELIMINARY MATTERS

3.01 CONSTRUCTION SCHEDULE. The Contractor shall submit a construction schedule based on critical path method ("CPM") or other method specifically approved by the Engineer and that is sufficiently accurate during the entire Contract Time to determine if the Contractor is performing on schedule.

Within ten (10) days following the end of each month after Notice to Proceed, or at more frequent intervals when requested by Engineer, the Contractor shall submit an updated and revised schedule; the revision must be current as of the immediate past schedule period. Each element shall be updated to reflect the actual start and stop dates, actual duration and actual number of days worked, anticipated changes to future start and stop dates, and changes due to change in amount of Work or Contract Time. When requested by Engineer, the Contractor will submit only that portion of the CPM submittal required.

Failure to meet any schedule submission dates or to comply with any requested submittal or failure to provide an acceptable submittal will be cause to withhold payment of all or portions of the next scheduled monthly payment or any portions of future monthly payment until an acceptable submittal has been made.

As a minimum, the Contractor shall have available at least one individual with authority to maintain and revise the schedule as needed to reflect the actual and planned work schedule. This individual is to cooperate with Engineer's staff and be available to discuss the schedule with Engineer's staff when requested.

3.02 SCHEDULE OF VALUES. If directed by Engineer or the Contract Documents, Contractor shall submit a schedule of values showing the subdivision of the Contract into various items of payment of construction. This schedule of values must state quantities and prices to the smallest common measurement, e.g., cubic yard, pound, linear feet, etc., and will be used as a basis for computing value to the Owner of Work to be paid for in partial payments. Except for Work associated with prices bid as supplemental items listed in the Bid, the schedule of values also will be used to determine the value of like or similar work that may be added to or deleted from the Contract Documents. The above-mentioned schedule of values must be in a format and of such detail to be acceptable to the Engineer. No partial payments will be made unless the schedule of values has been submitted by Contractor and accepted by the Engineer. Engineer may require that the

schedule of values be cross-referenced to CPM with each item on schedule of values to show which CPM activity corresponds to or includes the item.

3.03 KEEPING PLANS AND SPECIFICATIONS ACCESSIBLE. Contractor shall be furnished with five (5) copies of all Plans and Technical Specifications without expense to Contractor and shall keep one (1) copy of each constantly accessible on the Site.

3.04 SHOP DRAWING SUBMITTALS.

a. Shop Drawing Submittal List. Within fifteen (15) days after the date of the Notice to Proceed, Contractor shall submit for the Engineer's review a complete Shop Drawing submittal list. The list is to include Shop Drawings for all equipment and manufactured materials to be furnished under this Contract. The list should include, but not be limited to, the following, with each submittal to be numbered with a consecutive numbering system.

1. Name (description) of submittal.

2. Applicable specification number or drawing number.

3. Scheduled submission date.

4. Latest date acceptable submittal required to prevent delay in purchase.

The Engineer may waive all or portions of the submittal requirements for any Shop Drawing on the submittal list. No payment will be made for the Work until the submittal list is accepted by the Engineer.

b. Contractor's Duties. The Contractor shall review Shop Drawings prior to submittal to verify field measurements, field construction criteria, manufacturer model number, and other pertinent data, to ensure conformance with the Contract Documents, coordination with other submittals, and schedule for submittal and review.

The Contractor shall stamp and sign submittals with stamp which states, "This submittal is certified to be in conformance with Contract Documents unless noted herein." All submittals without this certification will not be reviewed but will be returned to the Contractor for proper submission. The Engineer will rely on this statement when performing the review of the submittal.

The Contractor shall schedule submittals to allow sufficient time for the review process and to coordinate submittals with the schedule to prevent delay to Work.

The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, product data, samples or similar submittals until the respective submittal has been approved by the Engineer.

The Work shall be in accordance with approved submittals. Provided, however, the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's approval of Shop Drawings, product data, samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and (1) the Engineer has given written

approval to the specific deviation as a minor change in the Work, or (2) a Change Order has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, product data, samples or similar submittals by the Engineer's approval thereof.

The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, product data, samples or similar submittals, to revisions other than those requested by the Engineer on previous submittals. In the absence of such written notice, the Engineer's approval of a resubmission shall not apply to such revisions.

No Work may be performed in connection with fabrication, manufacturer, or purchase of materials or equipment until submittals have been reviewed and marked "No Exception Taken" or "Make Corrections Noted." Work performed on submittals marked "Make Corrections Noted" must be in accordance with all corrections noted thereon.

The Contractor shall correct submittals and resubmit or shall prepare new submittals for review by Engineer for all submitted items marked "Submit Specified Item," "Rejected," or "Revise and Resubmit." No Claims for extra time or delays will be considered due to time required for review of submittals or resubmittals unless, due to no fault of the Contractor, Engineer does not review the submittals in a timely fashion pursuant to paragraph c, below.

c. Engineer's Duties. The Engineer shall review submittals as expeditiously as possible, but the amount of time required for review will vary depending on the complexity and quantity of data submitted. All submittal schedules shall allow for at least thirty (30) days for initial review by the Engineer. Failure by the Engineer to timely review a submittal shall not constitute the basis of a Claim except for an adjustment in the Contract Time.

Such review by the Engineer shall be for the sole purpose of determining the general conformity of said Shop Drawings or schedules to the Contract Documents and shall not relieve the Contractor of its duty as an independent contractor as set forth herein, it being expressly understood and agreed that the Engineer does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules or any means or methods reflected thereby, in relation to the safety of either person or property during Contractor's performance hereunder. The Engineer's review of drawings will not constitute an acceptance of all dimensions, quantities, and details of the material, equipment, device, or item shown and does not relieve the Contractor from any responsibility for errors or deviations from the Contract requirements.

The Engineer shall clearly mark four (4) copies of submittals with required corrections and shall stamp drawings noting the appropriate action, signature, and date.

d. Form of Submittal. The Contractor must submit four (4) copies of all submittals. One (1) copy of the appropriately marked submittal will be retained at the Engineer's office, one (1) copy will be retained at the Engineer's field office, and two (2) copies will be returned to the Contractor for Contractor's use. The Engineer will not mark additional copies for the Contractor. If the Contractor desires additional copies, they must be marked by the Contractor.

The Contractor shall submit a complete copy of relevant Contract Document items which have been marked by the manufacturer to certify each point of the Contract Document item noting compliance and each point of deviation.

The Contractor must submit relevant literature, catalog cuts, or written descriptive matter backing up all points of the Contract Documents item compliance.

Contractor must submit comparative life cycle, cost, performance, or other data supporting consideration of all points of the Contract Documents item deviation.

All information supplied must be carefully and completely cross-referenced to the relevant Contract Document item requirement.

When required by an individual Contract Document item, the Contractor shall submit written step-by-step test plan for functional checkout and demonstration test of respective equipment. Submissions that do not conform to the form of submittal as outlined herein will not be considered and will be returned to the Contractor for proper submission.

The Contractor must have acceptable Shop Drawings at the Site. Failure of the Contractor to supply acceptable drawings will be deemed sufficient cause for Owner to delay the Work at Contractor's risk and expense until such drawings are available. This procedure shall not entitle Contractor to an extension of time.

e. Installation Drawings. When required by individual items of the Technical Specifications, the Contractor shall provide, for the Engineer's use, two (2) copies of installation drawings and instructions consisting of all necessary details required for field assembly, erection, and installation of a particular component of Work, including, but not limited to, unloading and storage instructions, layout/placement drawings, erection sequences, assembly drawings, connection details, and wiring diagrams.

3.05 VARIATIONS AND ALTERNATE DESIGNS. Foundations, structural supports, electrical work, and piping when shown on Plans for items of equipment may be changed by Engineer if necessary to accommodate equipment furnished. Effort has been made to design foundations, structural supports, electrical work, and piping so that no changes not usually and normally encountered in work of the type to be performed hereunder will be necessary; however, exact dimensions and size of subject foundations and structural supports and exact electrical and piping installations may not be finally determined until the applicable Shop Drawings are submitted to the Engineer. Changes to the Plans or Technical Specifications will be signed and sealed by the Engineer in accordance with applicable laws. Contractor shall make required changes in the Work, after prior consultation with the Engineer, at no cost to Owner.

If substitute items of equipment are authorized which vary materially from those shown on Plans, Contractor shall prepare equipment data and detailed drawings covering necessary modifications and submit to the Engineer for approval. Contractor shall make drawings the same size as Plans and of comparable quality. Contractor shall pay the charges resulting from modifications including engineering charges for checking modifications.

If alternate design features are proposed for the convenience of the Contractor, the Contractor shall submit design calculations and detailed drawings covering proposed changes and related modifications of the Plans to the Engineer for review. Design calculations and detailed drawings submitted by the Contractor must be signed and sealed by a professional engineer licensed in the

State of Texas. The Contractor shall make drawings the same size as the Plans and of comparable quality. Contractor shall pay the charges resulting from modifications, including engineering charges for checking such designs.

ARTICLE IV. SITE ACCESS/ CONDITIONS/ REFERENCE POINTS

4.01 ACCESS AND AVAILABILITY OF LANDS. Except as provided herein, the Owner shall provide, as indicated on the Plans, land upon which the Work is to be done, rights-of-way for access to same, and such other lands which are designated for use of the Contractor. If required, Contractor shall provide, at its own cost, for additional lands and access for temporary construction facilities or storage of materials and equipment.

Contractor shall propose, for Engineer's review and approval, access roads for moving construction personnel and equipment. The access routes are subject to change by the Engineer, occasioned by the progress of the Work or unforeseen conditions. If routes are changed, Contractor may propose alternate routes. Changes required in haul routes shall not be the basis for extra payment, unless such changes are required by written directive from the Engineer.

Contractor shall, whenever possible, keep all construction traffic out of existing neighborhoods. Contractor shall keep haul routes clean at all times to the satisfaction of the Engineer and the local governing body having jurisdiction over the haul routes.

4.02 SURVEYING; LINES AND GRADES. The Owner will establish reference points for construction only; the Contractor is responsible for staking from benchmarks and horizontal control references established by Engineer. The Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Engineer. The Contractor shall report to the Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.03 SOILS REPORT. If provided, any soils report and log of borings is available for Contractor's information only. The report is not a warranty of subsurface conditions, nor is it a part of the Contract Documents. Contractor is expected to examine the Site and such reports and then decide for itself the character of the materials to be encountered.

Owner and Engineer disclaim any responsibility for the accuracy, true location, and extent of the surface and subsurface investigations that have been prepared by others. Owner and Engineer further disclaim responsibility for interpretation of that data by Contractor, i.e. projecting soil-bearing values, rock profiles, soil stability and the presence, level and extent of underground water or underground facilities.

4.04 SUBSURFACE EXPLORATION. It is not represented that the Plans show all existing storm sewer, sanitary sewer, water, gas, telephone and electrical facilities, and other underground structures. Contractor shall determine the location of these installations in the way of the Work by referring to available records, consulting appropriate municipal departments and utility owners, and by making necessary exploration and excavations.

4.05 DEVIATIONS OCCASIONED BY UTILITY STRUCTURES. Whenever existing utilities, not indicated on the Plans, present obstructions to grade and alignment of pipe, Contractor shall

immediately notify the Engineer who, without delay, will determine whenever existing improvements are to be relocated or grade and alignment of pipe changed. Where necessary to move services, poles, guy wires, pipelines, or other obstructions, the Contractor will make arrangements with owners of utilities. The Owner will not be responsible for or liable for damages for any delays due to changes made by owners of utilities which hinder progress of any Work. The Owner may, at its sole discretion, determine whether to grant any extension of time and/or additional compensation.

4.06 DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS. Contractor shall give prompt written notice to Engineer if any subsurface or physical condition is uncovered or revealed and either: (i) differs materially from that shown or indicated in the Contract Documents or the technical data or related documents; or (ii) is of a highly unusual nature and differs materially from conditions ordinarily encountered and generally recognized as inherent in work performed at the location. After receipt of Contractor's written notice, Engineer will promptly review the condition, determine the necessity of Owner's obtaining additional exploration or tests and advise Owner in writing of Engineer's findings and conclusions. Contractor shall not further disturb such condition or perform any Work in connection therewith until receipt of Written Work Order from Engineer to do so. Absent an emergency, any Work performed by Contractor before receiving Engineer's response will be at the sole expense of the Contractor.

The Contract Price and/or the Contract Time may be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work. Provided, however, Contractor shall not be entitled to any adjustment in the Contract Price or Contract Time if: (i) Contractor knew, or should have known, of the existence of such conditions at the time Contractor entered into the Contract; (ii) the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site required by the Contract Documents to be conducted prior to Contractor's entering into the Contract; or (iii) Contractor failed to give the written notice as required. If Owner and Contractor cannot agree on entitlement to, or the amount or extent of, any adjustment in the Contract Price or Contract Time, or both, a Claim may be made.

4.07 ARCHAEOLOGICAL OR HISTORICAL MATERIALS. On discovery of materials with potential archaeological or historical significance, the Contractor shall stop Work and notify the Engineer. The Contractor shall protect the Site from disturbance until it is cleared by the Engineer to resume Work. If the discovery results in a delay exceeding sixty (60) days or more, the Contractor may receive damages for delay, limited to the actual costs of de-mobilization and re-mobilization, without mark-up, and may make a Claim for an extension to the Contract Time.

4.08 HAZARDOUS ENVIRONMENTAL CONDITIONS. Reports identifying Hazardous Environmental Condition are not Contract Documents. **Owner and Engineer do not warrant the accuracy or completeness of such documents and disclaim all responsibility and liability for accuracy of investigations and reports prepared by third parties.** Owner and Engineer also disclaim any responsibility for Contractor's interpretation of such reports and tests. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby; and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Contractor shall not be required to resume Work in connection with such condition or in any

affected area until the affected area is or has been rendered safe for the resumption of Work. Except as provided in this Section, it will not be the Contractor's duty to provide any required governmental notifications relative to the discovery of Hazardous Environmental Conditions.

4.09 LOSSES FROM UNFORESEEN CIRCUMSTANCES AND CONDITIONS OR NATURAL CAUSES. Except as specifically provided in the Contract Documents, all loss or damage arising out of the nature of the Work to be done, or from the action of the elements, or from any unforeseen circumstances or natural causes in the prosecution of the same, or from the soil, subsurface, and other conditions, whether naturally occurring or manmade, or from concealed conditions or unusual obstructions or difficulties which may be encountered in the prosecution of the Work, shall be sustained and borne by Contractor at its own cost and expense. Contractor accepts such risk even for circumstances and conditions that differ materially from those indicated in the Contract Documents, geotechnical report, a review of the Site and surrounding areas or other information furnished by or on behalf of Owner. Accordingly, Contractor shall not be entitled to any additional compensation or time associated with unforeseen circumstances or conditions or natural causes except as specifically allowed by the Contract Documents.

ARTICLE V. CONTRACTOR'S RESPONSIBILITIES/ INDEMNITIES

5.01. INDEPENDENT CONTRACTOR. It is understood and agreed that all Work done by Contractor shall meet with the approval of Owner's representative but that the detailed manner and method of doing the Work shall be under the control of Contractor as set forth more fully in these General Conditions, Owner being interested only in the result obtained, and that Contractor is an independent contractor as to all Work performed hereunder.

5.02. TIME AND ORDER OF COMPLETION. Time is of the essence of this Contract. It is the meaning and intent of this Contract, unless otherwise herein specifically provided, that Contractor shall be allowed to prosecute its Work at such times, in such order of precedence, and in such manner as shall be most conducive to economy of construction; provided, however, that:

a. In all instances Contractor shall comply with the Contract Documents and the order, time, techniques, sequences, procedures, manner, means and methods of prosecution of the Work shall be such that the Work shall comply with and shall be completed as a whole and in part, in strict accordance with the Contract Documents, including the Plans and Technical Specifications, and within the required time of completion, and Contractor shall have no right to perform any portion of the Work or utilize means, methods, techniques, sequences, procedures or individuals in violation of the Contract Documents or that may damage the Work or decrease the life expectancy of the Project.

b. The exercise of any of the rights and authority granted the Owner in the Contract Documents (including, without limitation, ordering changes in the Work, rejecting proposed means, methods, techniques, sequences or procedures, and directing suspension, rescheduling, re-execution or correction of the Work) shall not be construed as or deemed to be control of, charge of, responsibility for, or an assumption of Contractor's obligations with respect to, such construction means, methods, techniques, sequences, procedures, safety precautions, and programs.

When Owner is having other work done, either by contract or by its own forces, Engineer may prescribe the time and sequence of constructing the Work done under this Contract so that conflict will be avoided, and the various construction being done for Owner shall be harmonized.

With regard only to items (a) and (b), above, any additional schedules or charts furnished; acquisition of any necessary additional equipment; work hours in excess of those encompassed within Contractor's normal workday; or performance of certain tasks whether similar or dissimilar to the foregoing shall be done without additional cost to Owner.

5.03. CONTRACTOR'S DUTY AND STANDARD OF CARE. Contractor is an independent contractor and shall give personal attention to the faithful prosecution and completion of the Work and shall be present either in person or by duly authorized representatives on the Site continuously during its progress. Contractor shall exercise the highest degree of skill, care, attention, effort, judgment, and diligence that a professional Contractor would use in the performance of the Work. Contractor warrants that Contractor will: (i) perform, supervise and direct the Work, using the Contractor's best skill and attention, in a good and workmanlike manner and in the best and most expeditious and economical manner consistent with the interests of the Owner; (ii) utilize its best skill, efforts and judgment in furthering the interests of the Owner; (iii) perform the Work in strict compliance with applicable Laws and Regulations, such that the Work, no later than the time for completion, will comply with applicable Laws and Regulations; (iv) furnish efficient business administration and supervision (all of the foregoing collectively, the "Standard of Care"); and (v) perform the Work in strict accordance with the Contract Documents. If directed by the Engineer, Contractor shall maintain an office on or adjacent to the Site. Regardless of what authority and rights may be assigned by the Owner to the Engineer, Contractor remains fully and solely responsible and liable for its obligations to perform the Work in strict accordance with the requirements of the Contract Documents; to insure against failures in safety precautions; to carry out the Work pursuant to safe methods of construction; to select and fulfill the proper manner, means, and methods in performing the Work in order to fully comply with the Plans, Technical Specifications and other Contract Documents; and to otherwise complete the Work in accordance with the Contract Documents.

5.04. CONTRACTOR'S AGENT. Contractor, during Contractor's absence from the Site, shall keep a competent English-speaking superintendent or foreman upon the Site, fully authorized to act for Contractor in Contractor's absence. Contractor shall provide Engineer and Owner with written notification of such individual's position, name, and contact information. Any notice given by Engineer, when given to any superintendent, foreman, or agent of Contractor in charge of any operation of the Work in the absence of Contractor, shall be considered as notice to Contractor, provided any notice given under this paragraph shall be in writing.

5.05. CHARACTER OF WORKERS. Contractor agrees to employ only orderly, competent, and skillful people to do the Work; and agrees that whenever Owner shall inform the Contractor in writing that any person(s) or subcontractors on the Work are, in Owner's opinion, incompetent, unfaithful, or disorderly, such person(s) or subcontractor shall be discharged from the Work and shall not again be employed on the Work without Owner's written consent.

5.06. CONSTRUCTION MATERIALS. Contractor shall provide all labor, tools, equipment, machinery, and material necessary in the prosecution and completion of this Contract, unless otherwise specifically provided. It is understood that Owner shall not be held responsible for the care, preservation, conservation, or protection of any material, tools, or machinery of Contractor. **Owner shall not be responsible for any part of the Work until the risk of loss has transferred to the Owner upon Final Completion**. The Contractor shall incorporate into the Work only new materials and equipment and shall store these materials and equipment in a manner to protect them from damage. The manner of protection is subject to specific approval of the Engineer. Pipe, fittings, equipment, and other serviceable materials found on the Site or dismantled by reason of construction shall remain property of the Owner unless otherwise designated. The Contractor shall

remove and deliver materials to Owner at designated points and shall pay, at prevailing market price, for usable materials that are damaged through negligence or otherwise.

5.07. OTHER CONTRACTS. Other construction may be underway concurrently in this area. The Contractor shall afford utility companies and other contractors' reasonable opportunity for introduction and storage of their materials and execution of their work. All Work under this Contract must be properly connected and coordinated with that constructed by others and Contractor has the duty and obligation to connect and coordinate the Work with work constructed by others related to the Project so the Work and Project function as intended.

5.08. DAMAGES. Notwithstanding any liquidated damages/economic disincentives provisions contained in the Contract Documents, in the event Owner is damaged in the course of the Work by the act of negligence, omission, mistake, or default of the Contractor Parties or intentional acts or omissions of the Contractor Parties or should the Contractor Parties delay the progress of work by others on the Project or the projects of Owner so as to cause loss or liability to Owner, then Contractor shall reimburse Owner for such loss, including attorney's fees, and Owner's damages shall not be capped by any liquidated damages/economic disincentives provisions in the Contract Documents.

NOTWITHSTANDING ANY OTHER PROVISION OF THE CONTRACT DOCUMENTS, IN NO EVENT (INCLUDING, WITHOUT LIMITATION, DEFAULT BY OWNER), SHALL OWNER'S LIABILITIES, IF ANY, TO CONTRACTOR EVER EXCEED THE TOTAL CONTRACT PRICE, LESS ALL SUMS FOR WORK, MATERIALS AND/OR LABOR PREVIOUSLY PAID TO CONTRACTOR BY OWNER AND CONTRACTOR RELEASES OWNER FOR ANY LIABILITIES IN EXCESS OF SUCH TOTAL CONTRACT PRICE, INCLUDING WITHOUT LIMITATION LIABILITIES ARISING FROM OWNER'S NEGLIGENCE, BREACH OF CONTRACT, OR ANY OTHER CAUSES OF ACTION OR CLAIMS.

5.09. TITLE AND RISK OF LOSS. Although Contractor has custody and possession of the Work, as between Owner and Contractor, ownership, and title to (as opposed to risk of loss of) all of the Work completed and in the course of construction at the Site and of all materials furnished irrespective of the location thereof, shall be in the name of the Owner. The vesting of such title in the Owner shall not impose any obligations on the Owner or relieve Contractor of any of its obligations hereunder. The Contractor warrants that it shall acquire no Work or equipment and materials, whether directly or through a subcontractor, subject to an agreement under which a security interest is retained by the seller or otherwise imposed by the Contractor, any subcontractor, or any other person or entity. **Notwithstanding the passage of title, risk of loss or damage shall remain with Contractor until Final Completion approved by the Owner.**

5.10. PROTECTION OF PERSONS AND PROPERTY. Contractor shall at all times take reasonable precautions for the safety of its employees and of all other persons at the Site, and for the protection of property of the Owner and of others, including property adjacent to the Site. Contractor shall comply with all applicable federal, state, and municipal safety laws and regulations and building and construction codes. All machinery and equipment and other physical hazards shall be guarded in accordance with the Manual of Accident Prevention in Construction published by the Associated General Contractors of America unless such instructions are incompatible with Laws and Regulations. Where damage occurs to property of others due to Contractor's or its subcontractors' or suppliers' acts or omissions, or where necessary to take down fences, signs, or other obstructions, Contractor shall repair, renew or replace in their original condition and restore damaged property or make satisfactory restitution to a condition equal to or better than that which existed before

Contractor caused the damage or removal, at no cost to Owner. Contractor shall promptly report to Engineer all accidents involving Contractor's employees or any other parties or property. Where livestock are present, Contractor shall take all necessary precautions to assure that no construction or construction related activity will allow livestock to leave their confine. Where existing fences are being crossed, Contractor shall maintain the integrity of the fence during construction through placement of guards, temporary fences, or other adequate measures as approved by the Engineer. All construction activities, including ingress and egress, shall occur within the boundaries and constraints of the temporary and permanent construction limits. Additionally, no staging, parking, loading, and/or unloading shall occur outside of the designated construction limits.

5.11. INSURANCE AND BONDS. Contractor shall procure and maintain in full force and effect during the Work the insurance described in **Attachment A to the General Conditions** and, if applicable, the **Special Conditions of the Contract Part B**. In addition, Contractor agrees to insure the Work under an appropriate builder's risk or other insurance policy until the risk of loss transfers to Owner pursuant to **Section 5.09**. It is further agreed by the parties to this Contract that Contractor will execute a performance bond, maintenance bond and/or payment bond, each as further specified in the Contract Documents.

5.12. INDEMNIFICATION.

Indemnity. TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL PROTECT, DEFEND, INDEMNIFY AND HOLD HARMLESS THE INDEMNIFIED PARTIES, FROM AND AGAINST EVERY LOSS, ITEM OF DAMAGE, INJURY, EXPENSE, DEMAND, CLAIM, CAUSE OF ACTION, JUDGMENT OR LIABILITY, OF WHATSOEVER KIND OR CHARACTER, WHETHER ARISING IN CONTRACT OR TORT OR UNDER ANY STATUTE, FOR EVERY ELEMENT OF RECOVERY, WHETHER DIRECT OR INDIRECT, INCLUDING SPECIAL AND CONSEQUENTIAL DAMAGES, AND INCLUDING ALL RELATED FINES, FEES, AND COSTS, TO INCLUDE ALL FEES AND CHARGES OF ENGINEERS, ARCHITECTS, ATTORNEYS AND OTHER PROFESSIONALS AND ALL COURT OR ARBITRATION OR OTHER DISPUTE RESOLUTION COSTS, FOR:

BODILY INJURY TO OR DEATH OF ANY PERSON, PROPERTY DAMAGE OR ECONOMIC LOSS (INCLUDING LOSS OF USE) EVEN IF SUCH BODILY INJURY, DEATH, PROPERTY DAMAGE OR ECONOMIC LOSS IS CAUSED BY OR ARISES OUT OF ANY NEGLIGENCE OR FAULT, BREACH OF CONTRACT, BREACH OR VIOLATION OF ANY STATUTE, ORDINANCE, GOVERNMENTAL REGULATION, STANDARD, OR RULE, OR BREACH OF CONTRACT BY THE INDEMNIFIED PARTIES. EXCEPT TO THE EXTENT CHAPTER 151 OF THE TEXAS INSURANCE CODE APPLIES, IT IS THE EXPRESS INTENTION OF THE PARTIES THAT THE INDEMNITY PROVIDED FOR IN THIS SECTION IS AN INDEMNITY BY THE CONTRACTOR, ITS AGENTS, EMPLOYEES AND SUBCONTRACTOR OF ANY TIER TO INDEMNIFY THE INDEMNIFIED PARTIES FROM THE CONSEQUENCES OF THE INDEMNIFIED PARTIES' OWN NEGLIGENCE, FAULT OR STRICT LIABILITY, WHETHER SUCH NEGLIGENCE, FAULT OR STRICT LIABILITY IS THE SOLE, JOINT OR CONCURRING CAUSE OF THE BODILY INJURY, DEATH, PROPERTY DAMAGE AND/OR ECONOMIC LOSS.

TO THE EXTENT THAT CHAPTER 151 OF THE TEXAS INSURANCE CODE APPLIES TO THIS CONTRACT, HOWEVER, AND EXCEPT FOR A CLAIM

FOR THE BODILY INJURY OR DEATH OF AN EMPLOYEE OF SUPPLIER, ITS AGENT, OR ITS SUBCONTRACTOR OF ANY TIER, THEN THE ABOVE INDEMNITY OBLIGATIONS OF CONTRACTOR, ITS AGENTS, EMPLOYEES AND SUBCONTRACTOR OF ANY TIER DO NOT EXTEND TO DEFENDING, INDEMNIFYING AND HOLDING HARMLESS THE INDEMNIFIED PARTIES FROM AND AGAINST EVERY LOSS, ITEM OF DAMAGE, INJURY, EXPENSE, DEMAND, CLAIM, CAUSE OF ACTION, JUDGMENT OR LIABILITY, OF WHATSOEVER KIND OR CHARACTER, WHETHER ARISING IN CONTRACT OR TORT OR UNDER ANY STATUTE, FOR EVERY ELEMENT OF RECOVERY, WHETHER DIRECT OR INDIRECT, INCLUDING SPECIAL AND CONSEQUENTIAL DAMAGES, AND INCLUDING ALL RELATED FINES, FEES, AND COSTS, TO INCLUDE ALL FEES AND CHARGES OF ENGINEERS, ARCHITECTS, ATTORNEYS AND OTHER PROFESSIONALS AND ALL COURT OR ARBITRATION OR OTHER DISPUTE RESOLUTION COSTS CAUSED BY THE NEGLIGENCE OR FAULT, THE BREACH OR VIOLATION OF A STATUTE, ORDINANCE, GOVERNMENTAL REGULATION, STANDARD, OR RULE, OR THE BREACH OF CONTRACT OF THE INDEMNIFIED PARTIES, THEIR AGENTS, EMPLOYEES OR ANY THIRD PARTY UNDER THE CONTROL OR SUPERVISION OF THE INDEMNIFIED PARTY, OTHER THAN THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR SUBCONTRACTORS OF ANY TIER.

CONTRACTOR'S INDEMNITY OBLIGATIONS ABOVE SHALL NOT EXTEND TO ENGINEER, ARCHITECT, OR LANDSCAPE ARCHITECT OR THEIR AGENTS, SERVANTS, OR EMPLOYEES (THE "PROFESSIONAL PARTIES") FOR DAMAGE THAT:

IS CAUSED BY OR RESULTING FROM DEFECTS IN PLANS, DESIGNS, OR SPECIFICATIONS PREPARED, APPROVED, OR USED BY THE PROFESSIONAL PARTIES, OR NEGLIGENCE OF THE PROFESSIONAL PARTIES IN THE RENDITION OR CONDUCT OF PROFESSIONAL DUTIES CALLED FOR OR ARISING OUT OF THE CONTRACT DOCUMENTS AND THE PLANS, DESIGNS, OR SPECIFICATIONS THAT ARE A PART OF THE CONTRACT DOCUMENTS; AND

ARISES FROM PERSONAL INJURY OR DEATH, PROPERTY INJURY, OR ANY OTHER EXPENSE THAT ARISES FROM PERSONAL INJURY, DEATH, OR PROPERTY INJURY.

THE INDEMNITY OBLIGATIONS IN THIS SECTION ARE IN ADDITION TO ALL OTHER LEGAL, EQUITABLE, OR INDEMNIFICATION REMEDIES AVAILABLE TO THE INDEMNIFIED PARTIES. THESE INDEMNIFICATION OBLIGATIONS SURVIVE THE TERMINATION OR EXPIRATION OF THIS CONTRACT.

CONTRACTOR DOES HEREBY WAIVE, RELEASE AND FOREVER RELINQUISH AND DISCHARGE THE INDEMNIFIED PARTIES FROM ALL OF CONTRACTOR'S CAUSES OF ACTION ARISING FROM BODILY INJURY OR DEATH OR DAMAGE TO ANY PROPERTY ARISING OUT OF THE WORK, REGARDLESS OF WHETHER THE INJURY OR DAMAGE IS CAUSED IN

FULL OR IN PART BY THE NEGLIGENCE OR OTHER FAULT OF THE INDEMNIFIED PARTIES.

THE INDEMNITY OBLIGATIONS IN THIS SECTION ARE INDEPENDENT OF THE INSURANCE REQUIRED HEREIN.

THE INDEMNITY OBLIGATIONS IN THIS SECTION ARE INTENDED TO COMPLY WITH CHAPTER 130 OF THE CIVIL PRACTICE AND REMEDIES CODE AND ANY OTHER APPLICABLE LAW. IT IS AGREED THAT WITH RESPECT TO ANY LEGAL LIMITATIONS NOW OR HEREAFTER IN EFFECT AND AFFECTING THE ENFORCEABILITY OF THESE INDEMNITY OBLIGATIONS, SUCH LEGAL LIMITATIONS ARE MADE A PART OF THESE INDEMNITY OBLIGATIONS TO THE MINIMUM EXTENT NECESSARY TO BRING THESE INDEMNITY OBLIGATIONS INTO CONFORMITY WITH THE REQUIREMENTS OF SUCH LIMITATIONS, AND AS SO MODIFIED, THESE INDEMNITY OBLIGATIONS SHALL CONTINUE IN FULL FORCE AND EFFECT.

Each party hereto agrees and covenants that it will not contest the validity or enforceability of any indemnity or exculpatory provision of this Contract on the basis that the party has no notice or knowledge of such provision or that the provision is not "conspicuous."

Contractor shall include in each of its subcontracts with its subcontractors of every tier the provisions of this Section in the same form as in all material respects to those contained herein. Such provisions shall be for the benefit of and in favor of the Indemnified Parties and such other parties on whom Contractor and such subcontractors may agree.

5.13. INTELLECTUAL PROPERTY RIGHTS, COPYRIGHT AND INDEMNIFICATION.

a. Contractor shall not furnish or provide to Owner any materials or Work that infringe a third party's intellectual property rights (whether it be claims of improper use of confidential information, patent infringement, copyright infringement, or the like). Contractor shall not disclose or provide to Owner any information, ideas, concepts, improvements, discoveries, inventions, or forms of expression of ideas which Contractor does not own or otherwise have the right to disclose or provide to Owner.

b. Contractor represents and warrants that the materials and the Work shall be free from third party claims of ownership and that Owner's right to own, use, or otherwise disclose such materials and Work shall be free from third party claims of infringement of intellectual property rights (whether it be claims of improper use of confidential information, patent infringement, copyright infringement, trademark infringement or the like).

c. Contractor represents and warrants to Owner that all information, ideas, concepts, improvements, discoveries, inventions, or forms of expression of ideas disclosed or provided to Owner shall be free from third party claims of ownership and that Owner's right to own, use, or otherwise disclose such information, ideas, concepts, improvements, discoveries, inventions, or forms of expression of ideas shall be free from third party claims of infringement of intellectual property rights (whether it be claims of improper use of confidential information, patent infringement, copyright infringement, trademark infringement or the like).

d. Contractor represents and warrants that all processes or methods utilized by Contractor to provide its services to Owner are free from infringement of third party intellectual property rights (whether it be claims of improper use of confidential information, patent infringement, copyright infringement, or the like) and that all products provided by Contractor to Owner are free from third party claims of infringement of intellectual property rights, including allegations that the product infringes the claims of the United States process patent in violation of the Process Patents Amendment Act of 1988. Contractor shall cooperate fully and promptly with Owner with respect to any notice of infringement or request for disclosure or response to a request for disclosure generated or received by Owner in connection with Contractor's Work pursuant to the Process Patents Amendment Act of 1988. To the extent that Contractor obtains products from third parties which it intends to provide to Owner, Contractor shall obtain agreements from Contractor's vendors to cooperate in connection with requests for disclosure generated or received by Owner pursuant to the Process Patents Amendment Act of 1988.

e. THE INDEMNITY AGREEMENT PROVIDED IN CONTRACTOR'S INDEMNITY OBLIGATION PROVIDED IN **SECTION 5.12** ABOVE, INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: (I) CONTRACTOR'S BREACH OF ANY COVENANT, REPRESENTATION OR WARRANTY, WHETHER EXPRESS OR IMPLIED, REGARDING INTELLECTUAL PROPERTY RIGHTS; (II) ALLEGATIONS THAT OWNER, BY USE OF THE MATERIALS OR THE WORK, INFRINGES ANY THIRD PARTY'S INTELLECTUAL PROPERTY RIGHTS (WHETHER IT BE CLAIMS OF IMPROPER USE OF CONFIDENTIAL INFORMATION, PATENT INFRINGEMENT, COPYRIGHT INFRINGEMENT, TRADEMARK INFRINGEMENT OR THE LIKE); (III) ALLEGATIONS THAT A THIRD PARTY OWNS INFORMATION, IDEAS, CONCEPTS, IMPROVEMENTS, DISCOVERIES, INVENTIONS, OR FORMS OF EXPRESSION OF IDEAS, DESCRIBED OR PROVIDED BY CONTRACTOR TO OWNER; (IV) ALLEGATIONS THAT OWNER'S OWNERSHIP OR USE OF INFORMATION, IDEAS, CONCEPTS, IMPROVEMENTS, DISCOVERIES, INVENTIONS, OR FORMS OF EXPRESSION OF IDEAS DISCLOSED OR PROVIDED BY CONTRACTOR TO OWNER INFRINGE A THIRD PARTY'S INTELLECTUAL PROPERTY RIGHTS; (V) ALLEGATIONS THAT THE PROCESSES UTILIZED BY CONTRACTOR IN PROVIDING ITS SERVICES TO OWNER INFRINGE THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (INCLUDING A VIOLATION OF THE PROCESS PATENTS AMENDMENT ACT OF 1988); OR (VI) THE COSTS, AND EXPENSES, INCLUDING ATTORNEY'S FEES INCURRED BY OWNER, IN ENFORCING THE INTELLECTUAL PROPERTY INDEMNITY INCLUDED IN THIS PARAGRAPH.

IN ADDITION TO CONTRACTOR'S INDEMNITY OBLIGATION PROVIDED IN SECTION 5.12 ABOVE, TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL PROTECT, DEFEND, INDEMNIFY AND HOLD HARMLESS THE INDEMNIFIED PARTIES FROM AND AGAINST EVERY LOSS, ITEM OF DAMAGE, INJURY, EXPENSE, DEMAND, CLAIM, CAUSE OF ACTION, JUDGMENT OR LIABILITY, OF WHATSOEVER KIND OR CHARACTER, WHETHER ARISING IN CONTRACT OR TORT OR UNDER ANY STATUTE, FOR EVERY ELEMENT OF RECOVERY, WHETHER DIRECT OR INDIRECT, INCLUDING SPECIAL AND CONSEQUENTIAL DAMAGES, AND INCLUDING ALL RELATED FEES AND COSTS, TO INCLUDE ALL FEES AND CHARGES OF ENGINEERS, ARCHITECTS, ATTORNEYS AND OTHER PROFESSIONALS AND ALL COURT OR ARBITRATION OR OTHER DISPUTE

RESOLUTION COSTS, BASED UPON, ARISING OUT OF, OR RELATING TO ANY ALLEGATION OF VIOLATION OF COPYRIGHT LAWS AS A RESULT OF CONTRACTOR'S PERFORMANCE (OR NON-PERFORMANCE) OF THE WORK.

f. Contractor confirms and agrees that the Owner has and shall retain all rights, title, and interest in and to the drawings, documents, designs and information, including, without limitation, any copyright or other intellectual property rights, provided to Contractor by or on behalf of Owner, and that by use of such drawings, documents, designs and information, the Contractor shall not acquire any right, title, or interest in such drawings, documents, designs and information, including, without limitation, any copyright or other intellectual property rights. ***The Owner makes no representation or warranty, and hereby disclaims any such representation or warranty, that any information provided to the Contractor by or on behalf of the Owner in connection with the Work IS ACCURATE, CORRECT, SUFFICIENT, COMPLETE OR can be used without infringing any intellectual property rights of third parties under any intellectual property rights of the world.***

5.14. SUBCONTRACTOR'S ASSIGNMENT AND SUBLETTING. Contractor shall be fully responsible to Owner for all acts and omissions of any subcontractor, supplier, or other person or organization performing or furnishing any of the Work under a direct or indirect contract with Contractor. All Work performed for Contractor by such subcontractor, supplier, persons or organization shall be pursuant to an appropriate agreement between Contractor and each such party that specifically binds such party to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer and, if attached, the parties identified in **Special Conditions of the Contract Part B**.

Contractor shall timely pay its subcontractors and material suppliers, as required by law and any agreements between or among Contractor and its subcontractors/material suppliers or other persons or organizations performing the Work, and such payments are a condition precedent to final payment.

5.15. CONTRACTOR'S SETTLEMENT OF THIRD-PARTY CLAIMS. Contractor shall promptly settle or cause the settlement of all claims for which it is responsible, in whole or in part, pursuant to the Contract Documents. Upon receipt of any claim, Contractor shall immediately notify the Owner of the full particulars thereof, and the Owner may elect, by notice to Contractor, to have its representative accompany Contractor's representative in making settlement of the same.

5.16. SETTLING THIRD PARTY SMALL CLAIMS. Owner shall provide Contractor written notice of any claims made arising out of or relating to the Contract or the Contractor's performance of the Work. Contractor shall, within ten (10) calendar days following such notice, appoint in writing and thereafter, until Final Completion, unless earlier allowed by Owner, maintain on the Site a special agent who shall have full duty and authority on behalf of Contractor to settle and pay any claims payable by Contractor described herein, to request or confirm payment by Owner of such claims for the account of Contractor, and to do all other things necessary or convenient in connection with the foregoing authority. In addition, Contractor shall cause said special agent to accompany the representative of Owner to solicit the settlement of such claims as Owner's representative may request. Contractor, through its special agent, shall settle and pay claims payable by Contractor hereunder, but only in the presence and with the cooperation of the representative of the Owner, and in such settlement, Contractor shall take receipts and releases in favor of and releasing the Indemnified Parties as well as Contractor.

Understanding that Owner has a special interest in preserving the good will of persons whose property may be injured in the course of the Work, should Contractor fail to settle and pay claims, including providing written receipts and releases in favor of and releasing the Indemnified Parties, within thirty (30) calendar days of Owner's initial written notice, Owner shall thereafter have the rights and authority (in Owner's discretion) to itself settle and pay, on Contractor's behalf, such claims as described in this paragraph. Contractor expressly acknowledges, acquiesces, and confirms that a representative of Owner may, in good faith, determine whether claims are payable in whole or in part by Contractor under the provisions herein (the hazard and expense of litigation and the special interest of Owner in liquidating all claims being considered), and if found so payable in part, the portion thereof payable by Contractor. To minimize the expense of employing agents in settling claims, Contractor hereby further authorizes Owner to settle and pay any claims payable by Contractor hereunder which may be settled at Owner's sole election for up to $10,000 per claim (or such greater amount per claim as Contractor may fix by written notice to Owner). The amount of any such claims and associated costs and expenses related to same may be withheld from Contractor's progress or final payment.

Contractor shall reimburse Owner for all costs and expenses incurred by Owner in the settlement of any claims payable by Contractor.

5.17. CONTRACTOR'S USE OF OWNER'S PROPERTY. In the event that any arrangement is made whereby Contractor or any of its subcontractors of any tier use any employees of Owner, any tools, equipment, apparatus, improvements or other personal property of Owner or any utilities (such as electricity, gas, water, compressed air and toilet facilities) furnished by or through Owner, irrespective of who pays the employees and regardless of whether any consideration is paid for the use of the tools or the utilities, then the employees while engaged in the use of the tools or the utilities shall be conclusively considered the agents, servants, and employees of Contractor, and the acceptance and/or use of the tools or the utilities by Contractor or its subcontractors of every tier shall mean the Contractor has inspected and determined the tools and utilities satisfactory for Contractor's intended purposes and uses, and accepted full responsibility for the tools and utilities. **Owner makes no representation or warranty regarding the condition or suitability of any such tools, equipment, apparatus, improvements, other property or utilities and Contractor releases Owner from all such claims of representation and/or warranty with regards to the conditions of suitability of such tools, equipment, apparatus, improvements, other property, or utilities.** Contractor shall return the tools at the conclusion of Contractor's use thereof in the same condition as when received, ordinary wear and tear excepted.

5.18. LAWS AND REGULATIONS.

a. Prior to beginning the Work, Contractor shall become familiar with all of the Laws and Regulations relating to the Work or which in any manner might affect the Work and shall thereafter comply with all such Laws and Regulations. Contractor shall, at its expense, obtain all permits, licenses, certificates, and other authorizations required by or reasonably necessary in connection with the Work and shall at all times observe and comply with the Laws and Regulations.

b. Contractor agrees that all financial settlements, billings, and reports rendered to Owner as provided for in the Contract Documents will, to the best of its knowledge and belief, reflect properly the facts about all activities and transactions handled for the account of Owner, which data may be relied upon by Owner and Engineer as being complete and accurate in any further recording and reporting made by Owner for whatever purpose.

c. Contractor agrees to notify Owner promptly upon discovery of any instance where the Contractor fails to comply with provision (a), above, or where Contractor has reason to believe data covered by (b), above, is no longer accurate and complete.

5.19. BUSINESS STANDARDS. Contractor, in performing its obligations under this Contract, shall establish and maintain appropriate business standards, procedures, and controls, including those necessary to avoid any real or apparent impropriety or adverse impact on the interests of the Owner. Contractor shall review with the Owner at reasonable frequency during the performance of the Work hereunder, such business standards and procedures including, without limitation, those related to the activities of Contractor's employees and agents in their relations with the Owner's employees, agents, and representatives, vendors, subcontractors and other third parties, and those relating to the placement and administration of purchase orders and subcontracts.

In connection with this Contract and the Work, neither Contractor, its subcontractors of every tier, nor the employees, representatives, and agents of Contractor or any such subcontractor shall at any time solicit, accept, offer, or bestow gratuities of more than nominal value from or to one or more of the Indemnified Parties, any of Owner's other contractors associated with the Work, the employees, agents, or representatives of such other contractors, or anyone else associated with the Work. Violation of this policy by Contractor or any subcontractor shall constitute a material breach of Contractor's obligations under the Contract Documents that may result, at the Owner's election, in a declaration of default.

5.20. SAFETY.

a. Contractor shall develop a safety program applicable to each job site and to the Work to be done and enforce such program at all times. Further, Contractor shall comply with all applicable Laws and Regulations including, but not limited to, the standards and regulations promulgated by the Secretary of Labor under the Occupational Safety and Health Act of 1970 (OSHA) and any other legislation enacted for the safety and health of Contractor employees. Contractor shall have complete control of the Work and Site and responsibility for protecting the safety and health of its employees, subcontractors, and all other persons.

b. Contractor shall notify Owner immediately by telephone, with prompt confirmation in writing, of injuries and fatalities that occur on the Site in connection with any Work being performed under this Contract and shall provide Owner with such reports of injuries and fatalities as Owner shall deem necessary, including but not limited to, copies of all reports or other documents filed or provided to Contractor's insurers or the State of Texas in connection with such injury or fatality.

c. Nothing contained herein shall be interpreted as enlarging Owner's legal duty to Contractor or to Contractor's agents, employees, subcontractors, or third parties, or altering the status of Contractor as an independent contractor.

5.21. ALCOHOL, DRUGS, WEAPONS, ETC. The use of alcohol or controlled substances by any Contractor Parties on Owner's property or the Site or any Contractor Parties remaining on Owner's property or the Site under the influence of such substances is strictly prohibited. In addition, possession of alcohol, controlled substances, firearms, explosives, weapons, and hazardous substances or articles without proper authorization is not permitted on Owner's property or the Site. Entry onto Owner's property is deemed to be consent to and recognition of the right of Owner or a

representative of the Owner who has been specifically authorized to search the person, motor vehicles, and other property of each individual while entering, on, or departing the Site.

5.22. UTILITY SERVICES FOR CONSTRUCTION. The Contractor shall provide all utilities necessary for construction at no additional cost to Owner unless otherwise specified in the Contract Documents.

5.23. OPERATION AND MAINTENANCE MANUALS. Operation and maintenance manuals are to be provided where required by an item in the Technical Specifications. The Contractor is responsible for obtaining installation, operation, and maintenance manuals from manufacturers and suppliers for equipment furnished under the Contract and shall submit three copies of each complete manual and one CD to the Engineer within ninety (90) days after approval of Shop Drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the Site or storage location. Operations and maintenance manuals specified hereinafter are in addition to any operation, maintenance, or installation instructions required by the Contractor and/or Engineer to install, test, and start up equipment. Contractor shall comply with all such manuals in installing and operating such equipment.

Each manual must be bound in a folder and labeled to identify the contents and project to which it applies. The Engineer may additionally request electronic copies of each manual, stored on electronic media suitable to the Engineer. The manual should contain the following:

a. An 8-1/2-inch x 11-inch typewritten sheet listing the manufacturer's identification, including order number, model, and serial number and location of parts and service centers.

b. A separate 8-1/2-inch x 11-inch typewritten list of recommended stock of parts, including part number and quantity.

c. Complete replacement parts list.

d. Performance data and rating tables.

e. Specific instructions for installation, operation, adjustment, and maintenance.

5.24. INTERRUPTION OF UTILITY SERVICES. The Contractor shall not operate any valve or other control on existing systems. The Contractor shall exercise care in performing Work so as not to interrupt service, including, but not limited to, locating and uncovering existing utilities ahead of heavy excavation equipment and at house connections, either lifting trenching machine over lines or cutting and reconnecting with minimum interruption of service, as approved.

5.25. TRAFFIC AND OTHER SAFETY MEASURES. If the Work occurs on, near, or adjacent to any street, alley, or public place or where construction creates hazard to property, traffic, or public safety, the Contractor shall furnish and maintain suitable barricades, warning signs, lights and other safety items or mechanisms and remove same when no longer necessary. The Contractor shall be responsible for all phases of traffic control according to the guidelines as set forth in Manual on Uniform Traffic Control Devices and per all Laws and Regulations.

5.26. USE OF STREETS. Except where approved otherwise, the Contractor may not hinder or inconvenience travel on streets or intersecting alleys for more than two blocks at any one time. Whenever streets are closed the Contractor shall comply with all Laws and Regulations and place properly worded signs announcing such fact to the public, with proper barricades at the nearest

street corners, on both sides of obstruction. The Contractor shall leave no street or driveway blocked at night. When streets are closed, Contractor shall also notify the Engineer, the Fire Department and the Police Department and any other parties required by Laws and Regulations. The Contractor shall not block ditches, inlets, fire hydrants, etc., and, where necessary, shall provide temporary drainage.

The Contractor shall remove as soon as practicable, accumulated rubbish and open each block for public use. Use of any portion of a street shall not constitute acceptance of any portion of Work. The Contractor shall backfill and shape trenches across street intersections or driveways for safe traffic at night or, where permitted, span open trenches with steel plates or bridges to permit traffic flow. When driveways are cut, the immediate placement of mats for ingress or egress of vehicles may be directed if undue hardship to property owner would otherwise result or the Laws and Regulations require.

5.27. CONSTRUCTION STORMWATER DISCHARGES. The Contractor shall, without any additional expense to the Owner, be responsible for obtaining any necessary licenses and permits and for complying with all applicable Laws and Regulations, including, but not limited to, any Laws and Regulations concerning storm water permitting and management. Specifically, without limitation, the Contractor will comply with all aspects of the Texas Pollutant Discharge Elimination System ("TPDES") General Permit for Storm Water Discharges from Construction Activities in Texas and with the Storm Water Pollution Prevention Plan (SWPPP) that has been developed for the Project. At Owner's expense, the baseline SWPPP for the Project will be provided by the Engineer to Contractor. The Contractor will implement the baseline SWPPP and advise the Engineer in writing prior to implementing any changes required to the SWPPP due to changes in construction activities. The Engineer may update SWPPP due to changes in construction activities. The Contractor will file the Notice of Intent ("NOI") for permit coverage with the Texas Commission on Environmental Quality and will maintain a copy thereof, file stamped by such governmental authority, at the Site. Weekly inspection to ensure compliance with the SWPPP and other permit requirements will be performed by the Contractor. Upon Final Completion, the Contractor shall file the Notice of Termination ("NOT") with the Texas Commission on Environmental Quality.

The Contractor, and not the Owner, shall be responsible for, and the Contractor shall indemnify Owner from and against, any and all monetary fines or damages assessed by any governing agency resulting from the failure to comply with the requirements of the SWPPP.

5.28. SITE MAINTENANCE AND CLEAN-UP. Contractor shall maintain the Site during construction to keep it reasonably neat and free of trash, rubbish, and other debris. In clean-up operations, Contractor shall remove from the Site and from public and private property temporary structures, rubbish, and waste materials and dispose of excavated materials beyond that needed to bring the Site to elevations shown. During final clean-up, any road constructed by Contractor for access to the Site must be leveled and ruts filled so that surface drainage is not hindered.

5.29. AS-BUILT DIMENSIONS/RECORD DRAWINGS. The Contractor shall make daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities. Upon Final Completion of Work, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and location of all Work constructed.

5.30. SANITATION. Necessary sanitary conveniences for the use of laborers on the Work, properly secluded from public observation, shall be constructed and maintained by Contractor, in accordance

with all Laws and Regulations and in such manner and at such point as shall be approved by Owner, and their use shall be strictly enforced.

5.31. CONTRACTOR'S BUILDINGS. The building of structures for housing men, or the erection of tents or other forms of protection will be permitted only at such places as Owner shall prescribe, and the sanitary conditions of the grounds in or about such structures shall at all times be maintained in a manner satisfactory to Owner in accordance with all Laws and Regulations.

ARTICLE VI. ENGINEER'S STATUS DURING CONSTRUCTION

6.01. ENGINEER'S AUTHORITY AND DUTY. It is mutually agreed between the parties to this Contract that: Engineer will act as Owner's representative during the construction of the Project, and that no act or omission on the part of Engineer, or its subordinates or representatives, will excuse Contractor from full and proper performance of this Contract according to its terms, or give rise to any liability or obligation from Engineer to Contractor. All authority and rights assigned by the Owner to the Engineer with respect to the Work are solely and exclusively for the benefit of the Owner and not for the Contractor. The Engineer shall have no liability to Contractor under these Contract Documents.

As a contractual adjudication procedure pursuant to **Local Government Code 271.154** and in order to prevent delays, it is further agreed by and between the parties to the Contract that, if it cannot be otherwise agreed, Engineer shall in all cases: (i) determine the amounts and quantities of the several kinds of Work which are to be paid for under this Contract; (ii) determine all questions in relation to said Work and the construction thereof; and (iii) decide every question in writing which may arise relative to the performance of this Contract on the part of Contractor. Provided, however, that should Engineer render any decision or make any requirement which, in the opinion of Contractor, is not in accordance with the meaning and intent of this Contract, Contractor must file with Engineer, as part of the contractual adjudication procedure, within thirty (30) calendar days of Engineer's written decision Contractor's written notice of objection(s) to the decision or requirement so rendered. Contractor's failure to object to Engineer's decision or requirement within such contractual adjudication period of thirty (30) calendar days shall be deemed Contractor's agreement with such decision or requirement. It is the intent of this Contract that there shall be no delay in the performance of the Work. To this end, the decision or requirement of Engineer shall be promptly carried out. Engineer shall, within a reasonable time or as otherwise required in the Contract Documents, render and deliver to both Owner and Contractor a written decision on all Claims of the parties hereto and on all questions that may arise relative to the execution of the Work or the interpretation of the Contract, Technical Specifications, or Plans. **See Section 7.06 for additional notice and contractual adjudication procedures.**

6.02. EXAMINATION, OBSERVATION, AND TESTING. It is agreed by Contractor that Engineer shall be and is hereby authorized to appoint from time to time such subordinate engineers or Project representatives as Owner may deem proper to examine the material furnished and observe the Work done and to ascertain whether the said material is furnished and said Work is done in accordance with the Contract Documents. Contractor shall furnish all reasonable aid and assistance required by the subordinate engineers or Project representatives for the proper examination and testing of the Work and materials. The authority of subordinate engineers and Project representatives shall be limited to examination, observation, and testing of Work and materials, and reporting same to Engineer.

6.03. PRELIMINARY APPROVAL. Neither Engineer nor its subordinates shall have any power to waive the obligations of this Contract for the furnishing by Contractor of good, new material, or

for Contractor's obligations to perform the Work in a good and workmanlike manner as herein described and in full accordance with the Plans, Technical Specifications, and other Contract Documents. No action taken or thing done, written or oral, including, but not limited to, inspections made, payments made, or Final Completion of the Work, and no failure or omission of Engineer or its subordinates to discover, object to, or condemn any defective Work or material, shall release Contractor from the obligation to fully and properly perform the Contract, including, without limitation, the obligation to at once tear out, remove, and properly replace the same.

Any questioned Work may be ordered by Engineer to be taken up or removed for re-examination prior to Final Acceptance, and if found not in accordance with the Contract Documents for said Work, all expense of removing, reexamination, and replacement shall be borne by Contractor; cost of uncovering any Work will be borne by Owner only when the Work is found acceptable and the Work was originally performed with the knowledge of the Engineer.

6.04. RIGHT OF ENGINEER TO MODIFY MATERIALS AND EQUIPMENT. The Contractor shall provide and use accepted equipment and materials in sufficient qualities and quantities to facilitate diligent prosecution of the Work to the end that the Work will be completed within the Contract Time and otherwise in accordance with the Contract Documents. If at any time Engineer shall find that the materials or equipment used by Contractor are faulty or inadequate to secure the quality of Work or the rate of progress necessary for Contractor to complete the Work (or any portion thereof) within the time period required by this Contract or otherwise will prevent the Work from being completed in accordance with the Contract Documents, Engineer may, in writing, require Contractor to improve the materials and/or equipment, and/or replace and/or supplement them, and Contractor shall comply with such requirements.

6.05. WORK FORCE AND EQUIPMENT. If at any time the work force of Contractor is inadequate for securing the progress herein specified, Contractor shall, if so notified in writing, increase its work force or equipment, or both, to such an extent as to ensure compliance with the schedule of progress (and timely completion of the Work) all in accordance with the Contract Documents.

ARTICLE VII. EXTRA WORK/ CHANGE ORDERS/ CLAIMS

7.01. CHANGES AND ALTERATIONS. Contractor further agrees that Owner may make such changes and alterations as Owner may see fit in the line, grade, form, dimensions, Plans, Technical Specifications, or materials for or scope of the Work herein contemplated, or any part thereof, either before or after the beginning of the construction, without affecting the validity of this Contract and the accompanying Bonds.

If such changes or alterations diminish the quantity of the Work to be done, such changes may reduce the Contract Price according to the quantity of Work actually done and the unit price established for such Work under this Contract and shall not constitute the basis for a Claim. If such changes or alterations increase the amount of Work and the increased Work can fairly be classified under the Plans, Technical Specifications, or other Contract Documents, such increase shall be paid for according to the quantity of Work actually done and at the unit prices established for such Work under this Contract, otherwise Extra Work shall be paid for as provided in this Article. If Owner makes such changes or alterations as makes useless any Work already done or materials already furnished or used in accordance with the Contract Documents in connection with said Work, then Owner shall recompense Contractor for such Work, labor and materials, in accordance with the prices therefore in the Contract Documents, made useless by such change.

7.02. EXTRA WORK. It is agreed that Contractor shall perform all Extra Work when presented with a Written Work Order or Change Order. **The Contract Price for Extra Work may be changed only by a Change Order signed by Owner, Engineer, and Contractor**. It is agreed that pricing in any Change Order for performing Extra Work shall be determined by one (1) or more of the following methods:

Method (A) - By agreed unit prices; or

Method (B) - By agreed lump sum; or

Method (C) - If neither Method (A) nor Method (B) be agreed upon before the Extra Work is commenced, then Contractor shall be paid the "actual field cost" of the Extra Work, less any savings attributable to the change, alteration or addition, plus fifteen percent (15%) of the net amount.

In the event said Extra Work be performed and paid for under Method (C), then the provisions of this paragraph shall apply and the "actual field cost" is hereby defined to include the cost of all workmen, such as foremen, timekeepers, mechanics, and laborers, and all materials, supplies, teams, trucks, and rentals on machinery and equipment for the time actually employed or used on such Extra Work, plus actual transportation charges necessarily incurred if such equipment or machinery be not already on the job together with all power, fuel, lubricants, water, and similar operating expenses; also all necessary incidental expenses, incurred directly on account of such Extra Work, including Social Security, Old Age Benefits, and other payroll taxes, and a ratable proportion of premiums on all Bonds and all insurance as may be required by any law or ordinance, or required by Engineer or Owner, or by them agreed to. Engineer may prescribe the form in which accounts of the "actual field cost" shall be kept and may also specify, in writing, before the Work commences, the type and kind of machinery and equipment to be used, otherwise these matters shall be determined by Contractor. Where practicable, the terms and prices for the use of machinery and equipment shall be incorporated in the Written Work Order or Change Order. The fifteen percent (15%) of the "actual field cost" to be paid Contractor shall cover and compensate Contractor for its profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the "actual field cost" as herein defined, save that where Contractor's camp or field office must be maintained primarily on account of such Extra Work, then the cost to maintain and operate this office shall be included in the "actual field cost." When Extra Work is performed by a subcontractor, the fifteen percent (15%) will apply to the subcontractor only. The Contractor will be allowed five percent (5%) for overhead and profit.

No Claim for Extra Work of any kind will be allowed unless ordered in writing by Engineer. In case any requirements, response to request for information, response to a submittal or other communication made by Engineer or any other event appear to Contractor to involve Extra Work for which Contractor should receive compensation, Contractor shall immediately, and in any event within thirty (30) calendar days after being notified of any such requirement, response, or communication or after such event, make written request to Engineer for written authorization therefor. Such written request for written authorization shall set forth Contractor's belief of, basis for and amount of expected compensation. IN NO EVENT SHALL CONTRACTOR BEGIN PERFORMING THAT PORTION OF THE WORK AFFECTED BY SUCH REQUIREMENT, RESPONSE, OR COMMUNICATION PRIOR TO GIVING SUCH WRITTEN REQUEST FOR WRITTEN AUTHORIZATION TO THE ENGINEER. Any written request for written authorization not timely made by the Contractor shall be deemed a waiver by the Contractor of its right to assert and recover any additional compensation or otherwise on a Claim in respect of such request, response, or communication. Should a difference of opinion arise as to what does or does

not constitute Extra Work, or as to the payment therefor, and Engineer insists upon its performance, Contractor shall proceed with the Work after making its written request for written authorization to Engineer and shall keep an accurate account of the "actual field cost" thereof, as provided under Method (C). Engineer shall, within a reasonable time, render and deliver to both Owner and Contractor a written decision on all Claims as provided under **Section 6.01** in these General Conditions.

7.03 ESTIMATED QUANTITIES. The estimated quantities of the various classes of Work to be done and material to be furnished under this Contract are approximate and are to be used only as a basis for estimating the probable cost of the Work and for comparing the Bids offered for the Work. It is understood and agreed that the actual amount of Work to be done and material to be furnished under this Contract may differ somewhat from these estimates, and that the basis for determining quantities for payment under this Contract shall be the actual amount of such Work done and the material incorporated**.**

CONTRACTOR AGREES THAT IT WILL MAKE NO CLAIM AND RELEASES OWNER FOR DAMAGES, ANTICIPATED PROFITS, OR OTHERWISE ON ACCOUNT OF ANY DIFFERENCES WHICH MAY BE FOUND BETWEEN THE QUANTITIES OF WORK ACTUALLY DONE OR THE MATERIAL ACTUALLY INCORPORATED UNDER THIS CONTRACT AND THE ESTIMATED QUANTITIES CONTEMPLATED AND CONTAINED IN THE BID.

Where the final quantity of Work performed by Contractor on "Major Unit Price Work" item differs by more than twenty-five percent (25%) from quantity of the item stated in the Contract, a party may request (subject to Owner's approval) an adjustment in the unit price, for the portion that differs by more than twenty-five percent (25%), by a Change Order. Major Unit Price Work is defined as an individual unit price line item whose original total value: (i) is greater than five percent (5%) of original Contract Price; (ii) becomes greater than five percent (5%) of original Contract Price as the result of an increase in quantity; or (iii) is greater than or equal to $100,000, whichever is least.

7.04. EXTENSION OF TIME. Subject to the remainder of this paragraph, should Contractor be delayed in the completion of the Work by any act or negligence of Owner or Engineer, or by any employee of either, or by other contractors employed by Owner, or by changes ordered in the Work, then, if the other requirements for an extension of time are met, an extension of time shall be allowed for completing the Work sufficient to compensate for the delay, the amount of the extension to be the amount approved by Owner, based on the recommendation by Engineer; provided, however, that Contractor shall give Engineer notice in writing of the cause of such delay and the impact to the critical path of the schedule prior to the tenth day of the month following the month in which the delay occurred. Failure to file requests for extension of time within the time set forth herein and otherwise as required by this paragraph shall constitute a waiver of any rights the Contractor may have had to such extensions of time. Contractor shall support its request for time extension with such information as required by Engineer. Approved extensions of time must be made in writing, signed by the Owner, Engineer, and Contractor.

Contractor will not be allowed time extensions: (i) due to inclement weather except for Force Majeure events as defined under Section 1.01 of these General Conditions; (ii) due to non-availability of equipment or material, when the principal units of Work and tasks on the critical path are not in progress or are not delayed by the event of delay, interference, disruption, or hindrance; (iii) when at least seven (7) hours of available working time remain out of the working day; (iv) while materials are drying and it is possible for the Contractor

to enclose the area and use drying devices; (v) when an event of delay, interference, disruption, or hindrance occurs on a day other than a working day or other day when the Contractor had not originally planned to work; (vi) when an event of delay, interference, disruption, or hindrance occurs after the expiration of the Contract Time; (vii) to the extent the Contractor could have anticipated or alleviated the impact of the event of delay, interference, disruption, or hindrance through reasonable efforts; (viii) when events of concurrent delay overlap the claimed delay; and/or (ix) when an extension of time is precluded by any provision of the Contract Documents.

7.05 HINDRANCES, INTERFERENCES, DISRUPTIONS, AND DELAYS. Excluding Owner's fraud, bad faith, or intentional interference, the Contractor shall receive no financial compensation for delay, interference, disruption, or hindrance at any time in the commencement or progress of the Work for any reason and for any period of time, by an act, omission or neglect, or otherwise, of the Owner, Engineer or any other consultant or contractor of the Owner, or of an employee of any of them; or by changes ordered in the Work; or by fire, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation; or by other causes that may justify delay. To the fullest extent allowed by applicable Laws and Regulations, in no event shall the Owner be liable to the Contractor or any subcontractor or supplier, any other person or any surety for or any employee or agent of any of them, and Contractor releases Owner for any damages arising out of or associated with any delay, interference, disruption, or hindrance to the Work, regardless of the source of the delay, interference, disruption, or hindrance, AND EVEN IF SUCH DELAY, HINDRANCE, DISRUPTION OR INTERFERENCE RESULTS FROM, ARISES OUT OF OR IS DUE, IN WHOLE OR IN PART, TO THE NEGLIGENCE, BREACH OF CONTRACT OR OTHER FAULT, HOWEVER CHARACTERIZED, OF THE OWNER OR THE ENGINEER OR THE EMPLOYEES, REPRESENTATIVES OR AGENTS OF THE OWNER OR ENGINEER. The Contractor's sole remedy in any such case shall be an extension of time in such amount as allowed by **Section 7.04** of these General Conditions.

7.06 NOTICE/CONTRACTUAL ADJUDICATION PROCEDURES. It is agreed that, unless specifically waived in the Contract Documents, all Claims shall be referred to Engineer for a decision. All Claims shall be in writing and filed with Engineer within thirty (30) calendar days of the event giving rise to such Claim, unless a specific provision of the Contract Documents provides a shorter period of time for such filing, in which case it shall occur within such shorter time. Written notice stating the general nature of each Claim and the amount or extent of the Claim, with supporting data, must be provided so the Owner and Contractor can investigate and settle disputes, if any, while construction continues. The Claim shall also be accompanied by Contractor's written statement that the adjustment claimed is the entire adjustment to which the Contractor believes it is entitled as a result of said event. Engineer shall reply to such written Claims by Contractor and render its final decision in writing within thirty (30) days of receipt of the Contractor's last submittal. In the event Engineer shall take no action, the Claim shall be deemed denied. Contractor must provide notice of its intent to appeal Engineer's decision within ninety (90) days of Engineer's final decision or within ninety (90) days from the end of the thirty (30) day timeframe for Engineer to reply to Contractor's written Claim, whichever is earlier.

Contractor hereby confirms its willingness and ability to comply with the contractual adjudication procedures of the Contract Documents for seeking an adjustment in price or time, or other relief and hereby agrees that the time periods, notice requirements and procedures set forth in the Contract Documents are reasonable time periods, notice requirements and procedures and that Owner will be prejudiced if Contractor fails to comply with such time periods, notice requirements and procedures. ACCORDINGLY, CONTRACTOR'S FAILURE TO COMPLY WITH THE TIME PERIODS, NOTICE REQUIREMENTS AND CONTRACTUAL ADJUDICATION

PROCEDURES OF THE CONTRACT DOCUMENTS WITH RESPECT TO A CLAIM FOR ADJUSTMENT IN PRICE OR TIME, DAMAGES OR OTHER RELIEF SHALL CONSTITUTE A WAIVER OF THE CLAIM, INCLUDING CLAIMS ARISING OUT OF OWNER'S NEGLIGENCE, BREACH OF CONTRACT OR OTHER FAULT OR STRICT LIABILITY WITHOUT REGARD TO FAULT.

IT IS FURTHER AGREED THAT ACCEPTANCE BY CONTRACTOR OF THE FINAL PAYMENT SHALL BE A BAR TO ANY CLAIMS OR SUITS BY CONTRACTOR AGAINST OWNER FOR ANY MATTERS RELATED TO THIS CONTRACT, INCLUDING MATTERS ARISING OUT OF OWNER'S NEGLIGENCE, BREACH OF CONTRACT OR OTHER FAULT OR STRICT LIABILITY WITHOUT REGARD TO FAULT.

7.07 **WAIVER OF CHAPTER 2251 REMEDY FOR NONPAYMENT. Owner and Contractor mutually agree that Chapter 2251 of Subchapter F, Title 10, of the Government Code ("Chapter 2251"), shall not apply to the Work. Owner and Contractor waive the application of Chapter 2251, if any, to the Contract. Instead, Owner and Contractor agree to follow the claims procedures in the General Conditions of the Contract.**

ARTICLE VIII. TESTS AND INSPECTIONS/ DEFECTIVE WORK/ WARRANTY

8.01. TESTING AND INSPECTION. The Owner shall arrange and obtain all inspections and tests required by the Contract Documents; provided, however, that if initial testing fails, all retests will be at Contractor's sole expense. Such testing and inspection is for the sole benefit of Owner, and Owner makes no representation or warranty as to the accuracy of the results of any test or inspection. Contractor at its own expense shall provide such laboratory with all test specimens required by the Contract Documents. The Contractor shall notify the Engineer prior to manufacture or fabrication of items so that observation may be accomplished and furnish field samples of materials to Engineer for testing.

8.02. DEFECTS AND THEIR REMEDIES; WARRANTY PERIOD. It is agreed that if the Work or any part thereof, or any material delivered to the Site for use in the Work or selected for the Work, shall be deemed by Engineer as unsuitable or not in conformity with the Contract Documents, Contractor shall, after receipt of written notice thereof from Engineer, forthwith remove such material and rebuild or otherwise remedy such Work so that it shall be in full accordance with this Contract.

It further is agreed that all Work or any part thereof, including equipment installed, shall be free from defects due to faulty workmanship or materials during the warranty period of eighteen months (18 mos) from the date of Final Completion. Contractor shall notify Engineer in writing thirty (30) days in advance of the expiration of such warranty period, and Engineer shall thereafter schedule a final inspection of the Work prior to the expiration of the warranty period. Contractor's failure to notify the Owner of the expiration of the warranty period, as provided herein, shall extend the warranty period for successive thirty (30) day periods until such written notice is received. Upon notice from Owner, Contractor shall repair defects in all construction that develop during the warranty period, or as noted on the final inspection report, at no cost to Owner. Neither Final Acceptance nor final payment nor any provision in the Contract Documents relieves Contractor of the above guarantee.

If observed by Owner, notice of the defects will be given by Owner to Contractor with reasonable promptness. Failure to repair or replace defect upon notice entitles Owner to repair or replace same and recover reasonable cost thereof from Contractor and/or its surety.

8.03. RIGHT OF ENTRY. Owner reserves the right to enter the property or location on which the Work herein contracted for is to be constructed or installed, by Engineer and such agent or agents as Owner may elect, for the purpose of examining, observing, or testing the Work, or for the purpose of constructing or installing such collateral Work as Owner may desire.

ARTICLE IX. MINIMUM WAGE RATE SCALE/PRICE FOR WORK/ PAYMENTS TO CONTRACTOR

9.01. LABOR CLASSIFICATION AND MINIMUM WAGE RATE SCALE.

Chapter 2258 of the Texas Government Code provides that any political subdivision of the State of Texas shall ascertain the general prevailing wage rate received by the classes of workers employed on projects similar to this Project and shall specify in the call for Bids and in the Contract Documents the minimum wage rates which shall be paid for each type of worker. This statute further provides that the Contractor or subcontractors shall pay, as penalty to Owner, Sixty Dollars ($60.00) 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. Owner is authorized to withhold from the Contractor the amount of this penalty from any payment due under the Contract Documents. The statute likewise requires that the Contractor and subcontractors keep an accurate record of the names and occupations of all persons employed by them on the construction of the Project and to show the accrual per diem wages paid to each worker. These records are open to the inspection of Owner. The minimum wage rates that apply to this Contract are specified in **Attachment B to these General Conditions**. Contractor and subcontractors shall review and ascertain such wage rates and pay at least such minimum rates.

9.02. PRICE FOR WORK. In consideration of the furnishing of all the necessary labor, equipment, and material and the completion of all Work by Contractor, and on the Final Completion of all Work and the delivery of all materials embraced in this Contract in full conformity with the Contract Documents, Owner agrees to pay Contractor the final Contract Price. Contractor hereby agrees to pay such prices as are necessary for furnishing all materials and all labor required for the aforesaid Work, including all expenses incurred by Contractor, and for well and truly performing the same and the whole thereof in the manner prescribed by and in accordance with the Contract Documents, including the Plans and the attached Technical Specifications, and requirements of Engineer.

9.03. PROGRESS PAYMENTS. On or before 25th day of each month, the Contractor shall submit an application for progress payment to the Engineer showing the total value of the Work completed. Payment, less any retainage, shall be made within thirty (30) days after the Owner receives and approves at a meeting of the Board of Directors of the Owner the pay estimate submitted by Contractor that has been approved by the Engineer for payment. Progress payments for unit price work will be based on the number of units completed. No payment shall be requested nor made for materials purchased and stored on-site that are not yet incorporated into the Work unless specifically authorized by the Owner and Engineer and Contractor furnishes satisfactory evidence that Contractor has acquired title to the material and that it will be utilized in the Work. If requested, Contractor shall meet with the Engineer at the Site to verify the quantity of Work completed.

Beginning with the second application for progress payment, each application shall include: 1) an affidavit and lien release of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations with respect to the prior application for payment; and 2) a lien waiver from each subcontractor stating that the subcontractor has been paid for its Work through the date of the previous progress payment.

Engineer shall promptly review each application for payment, including required submittals. Engineer shall provide to Owner a statement showing, as complete as practicable and based upon Engineer's observations, the total value of the Work completed by the Contractor together with Engineer's recommendation as to payment. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, such payments are not due and payable under the Contract Documents. Payments based on such interim statements are subject to adjustment and correction as set forth in the Contract Documents.

In making progress payments, ten (10) percent of the estimated amount shall be retained until Final Completion. However, if the Owner at any time after fifty (50) percent of the Work has been completed finds that satisfactory progress is being made, Owner may authorize any of the remaining progress payments to be made in full. Also, if the Work has reached Substantial Completion, the Owner, if Owner finds the amount retained to be in excess of the amount adequate for the protection of the Owner, at its discretion, may release to the Contractor all or a portion of the excess amount retained. The Owner is not obligated to pay interest on amounts retained except as provided herein. The Owner shall not be obligated to pay any interest on the ten (10) percent retainage held on the first fifty (50) percent of Work completed. If the Owner holds any retainage on the remaining fifty (50) percent of the Work completed, the Owner must pay interest on such retainage from the date the retainage is withheld to the date of payment to the Contractor. The interest rate to be paid on such retainage shall be the rate of interest paid by the Owner's depository bank on interest bearing accounts of similar amounts during the period of time interest accrues.

Owner may, at Owner's option, withhold part or all of any payment due the Contractor if: (i) any Work progress falls behind schedule or any requirement of the Contractor as provided in the Contract is not performed timely or as scheduled, including submission of any submittals, reports, Shop Drawings, samples, test reports; (ii) any Work is defective or not in strict compliance with this Contract or should Contractor otherwise fail to perform Work in accordance with the provisions of this Contract; (iii) Owner has incurred damages, including, without limitation, any additional costs associated with design professionals, attorneys or other consultants, as a result of any action or inaction by Contractor not in accordance with the Contract; (iv) claims have been made against Owner on account of Contractor's performance (or non-performance) or furnishing of the Work; (v) Contractor is in breach of the Contract Documents; (vi) there is evidence that the Work cannot be completed for the unpaid balance of the Contract Price; (vii) Contractor has failed to submit proper statements for payment with all required attachments and supporting documentation, which documentation shall expressly include consent of Contractor's surety as to payment without obligation to the surety to do so, if, in Owner's sole discretion, any cause for such consent exists; (viii) Contractor has failed or allegedly failed to make payment to any tier of subcontractor or supplier; and (ix) any other items entitling Owner to an offset against the amount recommended for payment. It is understood, however, that in case the whole Work is near completion and some unexpected and unusual delay occurs due to no fault or neglect on the part of the Contractor, the Owner may, at Owner's option and upon written recommendation of the Engineer, pay a reasonable and equitable portion of the retained percentage to the Contractor; or the Contractor, at the Owner's option, may be relieved of the obligation to fully complete the Work and, thereupon, the Contractor shall receive payment of the balance due him under the Contract, subject to the conditions stated in **Article X.**

Partial payment shall not be construed as an acceptance of defective or non-conforming Work.

9.04. PAYMENT OF SUBCONTRACTOR/MATERIAL CLAIMS. Should Owner receive notice of any claim(s) of unpaid labor or materials (or damages) from subcontractors, material suppliers, or

any other person or entity, Owner may, at its option, withhold part or all of any payment due the Contractor until Owner, in its discretion, is satisfied that such claim(s) have been fully resolved and paid by Contractor, or Owner may, at its option, pay such claim(s) using the withheld funds.

9.05. RIGHT OF SET-OFF. If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, or if the Contractor owes the Owner money for any other reason, then, for all purposes and at all times, without waiver or limitation of any of its other rights or remedies under this Contract and applicable Laws and Regulations, Owner shall have the right, but not the obligation, to deduct and withhold the amount of money, if any, that may ever be due from Contractor (or its surety) to Owner from any monies that Owner owes Contractor (or its surety), or to issue a written notice to the Contractor reducing the Contract Price by an amount equal to that which the Owner is entitled.

ARTICLE X. SUBSTANTIAL COMPLETION, PARTIAL USE, FINAL COMPLETION, AND ACCEPTANCE

10.01. SUBSTANTIAL COMPLETION. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify Engineer and request a determination as to whether the Work or designated portion thereof is substantially complete. If Owner, or Owner's Engineer does not consider the Work substantially complete, Engineer will notify Contractor giving reasons for the position. After performing any required Work, Contractor shall then submit another request for Engineer to determine Substantial Completion. If Owner considers the Work substantially complete, Engineer will prepare and deliver a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall include a punch list of items to be completed or corrected before Final Acceptance and final payment, and may establish responsibilities of the Owner and Contractor for security, maintenance, utilities, or damage to the Work and insurance until the time of Final Acceptance. If the Certificate of Substantial Completion omits responsibilities as to security, maintenance, utilities, or damage to the Work or insurance, the responsibility for the omitted item(s) shall remain with the Party assigned the responsibility in the Contract Documents. Failure to include an item on the punch list does not alter the responsibility of Contractor to complete the Work in accordance with the Contract Documents. Contractor, Engineer, and Owner shall sign the Certificate of Substantial Completion confirming the matter is set forth in such Certificate. Once Contractor reaches Substantial Completion, Owner may, in its sole discretion, release to Contractor all or a portion of the retainage in excess of the amount adequate for the protection of Owner.

10.02. PARTIAL USE. Use by Owner, at Owner's option, of any substantially completed part of the Work which: (i) has specifically been identified in the Contract Documents; or ii) Owner and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work in accordance with the following: Owner at any time may request Contractor to permit Owner to use any such part of the Work which Owner believes to be ready for its intended use and is substantially complete. If Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Engineer that such part of the Work is substantially complete and request Engineer to issue a notice specifying what portion of the Work is substantially complete for the purpose of payment and what Work remains to be done on the portion being accepted. Contractor at any time may notify Engineer that Contractor considers any such part of the Work ready for its

intended use and substantially complete and request Engineer to issue a notice specifying what portion of the Work is substantially complete for the purpose of payment and what Work remains to be done in the portion being accepted. The notice for the portion of the Work that is substantially complete may establish responsibilities of the Owner and Contractor for security, maintenance, utilities, damage to the Work and insurance for the portion of the Work which is substantially complete and being utilized by Owner. If the notice for the portion of the Work that is substantially complete omits responsibilities of the Owner and Contractor for security, maintenance, utilities, damages to the Work or insurance for the portion of the Work which is substantially complete and being utilized by Owner, the responsibility for the omitted item(s) remains with the party assigned the responsibility in the Contract Documents.

10.03. FINAL COMPLETION, INCLUDING FINAL ACCEPTANCE, AND PAYMENT. Upon Final Completion of the Work, Contractor shall give the Engineer written notice that the Work has been fully and finally completed and must certify that the Work is complete and was built in conformance with the Plans, Technical Specifications, and other Contract Documents. Such written notice must be accompanied by all documentation called for in the Contract Documents, including but not limited to: (i) maintenance bonds if required by the Contract Documents; (ii) the consent of surety to final payment; (iii) Contractor Affidavit for final payment and Bills Paid; (iv) affidavits of final payment and lien waivers and releases from all subcontractors who performed Work on the Project; and (v) as-built drawings, as described in **Section 5.29** of these General Conditions. Drawings will be reviewed by Engineer and returned to Contractor so that any adjustment required may be made. Production of these documents is a condition precedent to final payment

Within ten (10) calendar days after Engineer receives Contractor's written notice, certification(s), and required documentation, Engineer will schedule inspection by Engineer, Owner, and Regulatory Agencies; provided, however, that additional time shall be allowed for scheduling such inspections if required due to the Regulatory Agencies' availability or responsiveness. If the Work is found to be completed in accordance with the Contract Documents, including the Plans and Technical Specifications, and acceptable to the Engineer, Owner, and Regulatory Agencies, Engineer shall proceed to make final measurements and prepare a final statement of the value of all Work performed and materials furnished under the terms of the Contract Documents and shall submit the final statement to Contractor for approval. Upon receipt from the Contractor of the executed approved final statement and all other documents required by the Contract Documents for final payment, the Engineer shall issue to the Owner a certificate of completion and Contractor approved final statement of the value of the Work performed. The Owner shall thereafter make Final Acceptance of the Work and shall pay to the Contractor on or before the 31st day after the date of the certificate of completion the balance due Contractor under the terms of this Contract, provided Contractor has fully performed its contractual obligations under the terms of this Contract.

The Owner shall be entitled to withhold from such final payment for any circumstance for which Owner is entitled to withhold pursuant to General Conditions. For example, but not by limitation, should Owner receive notice of any claim(s) of unpaid labor or materials (or damages) from subcontractors, material suppliers, or any other person or entity, Owner may, at its option, withhold part or all of any of the final payments due the Contractor until Owner, in its discretion, is satisfied that such claim(s) have been fully resolved and paid by Contractor, or Owner may, at its option pay for such claims(s) using the withheld funds.

Neither Final Acceptance by Owner, nor the final payment, nor any provision in the Contract Documents, shall relieve Contractor of: (i) the obligation for fulfillment of any warranty or guarantee that may be required in the Contract Documents, including the Technical Specifications;

(ii) the obligation to repair defective Work or materials; (iii) Contractor's indemnification obligations under this Contract; or (iv) any of Contractor's continuing obligations.

10.04. OPERATION OF FACILITIES. The Owner reserves the right to operate new facilities during the construction period. Use of new facilities by the Owner during construction will not constitute Final Acceptance of the Work and will not constitute the date for start of any required warranty periods or guarantees. The Contractor will provide all necessary maintenance, including normal lubrication and adjustment, to new facilities operated by the Owner until Final Acceptance of the Work.

ARTICLE XI. SUSPENSION OF WORK/ TERMINATION/ DEFAULT

11.01. SUSPENSION OF WORK. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than sixty (60) consecutive calendar days by written notice to Contractor.

11.02. OWNER'S RIGHT TO CARRY OUT THE WORK. If the Contractor defaults or neglects to carry out the Work in accordance with the Contract and fails within a ten (10) day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case the Owner may offset from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Engineer's or other consultant's additional services made necessary by such default, neglect or failure (the "Cost to Cure"). Such action by the Owner and Cost to Cure are both subject to prior approval of the Engineer. If payments then or thereafter due the Contractor are less than the Cost to Cure, the Contractor shall pay the difference to the Owner.

11.03. TERMINATION FOR CONVENIENCE OF OWNER. Owner may terminate Contractor's performance under the Contract for Owner's convenience at any time upon written notice to Contractor, whether or not Contractor is in default, and, in such event, Owner's only liability will be to pay Contractor the following amounts:

a. The unpaid balance due Contractor for the Work performed and accepted, based on the schedules and tables, unit prices and lump sums enumerated in the Contract Documents; and

b. Reasonable expenditures made and costs incurred by Contractor for the materials ordered by Contractor for the Work prior to the date of termination and not incorporated in the Work, less reasonable salvage, or resale value, provided such materials conform to the Technical Specifications, and for labor performed on any such materials prior to the date of termination and associated labor insurance and labor payroll taxes.

From the total of the items enumerated in items (a) and (b), above inclusive, there shall be deducted the total dollar amount of all claims of Owner against Contractor, including the total dollar amount of claims on account of delay or defects in materials and/or workmanship.

The amount payable under the provisions of this Section, plus the sum of all amounts previously paid under the Contract, shall in no event exceed the Contract Price. Notwithstanding anything to the contrary contained herein or in the other Contract Documents, neither the Owner nor any other party shall be responsible for damages for loss of anticipated profits on Work not performed on account of any termination of the Contract.

Contractor shall transfer and assign to Owner in accordance with Owner's instructions, all materials, supplies, Work in process, and other things for which Contractor is entitled to receive reimbursement hereunder, and all plans, drawings, working drawings, sketches, specifications, and information in connection with the Work, and shall take such action as may be necessary to secure to Owner, at Owner's election, the rights of Contractor under any or all orders and subcontracts made in connection with the Work.

If and as Owner so directs or authorizes, Contractor shall sell at a price approved by Owner, or retain at a price mutually agreeable, any such materials, supplies, Work in progress or other things as referred to above. The proceeds of any such sale or the agreed price shall be paid or credited to Owner in such manner as Owner may direct to reduce the amount payable by Owner.

If requested by Owner, Contractor shall endeavor to cancel any or all of its outstanding orders or subcontracts upon such terms as may be approved by Owner.

Upon the performance of the obligations described in this Section by the respective parties, all obligations of the respective parties under the Contract shall be discharged, except such obligations as by their terms, express or implied, contemplate continued obligations after acceptance of the Work.

Nothing herein shall affect the right of Owner to terminate Contractor's performance as provided elsewhere in the Contract Documents.

11.04. TERMINATION FOR CAUSE AND EVENTS OF DEFAULT. An event of default includes, without limitation, any one (1) or more of the following:

a. A petition in bankruptcy is filed by or against Contractor, or Contractor makes a general assignment for the benefit of creditors, or a receiver is appointed on account of the insolvency of Contractor or to take charge of the Work or any part thereof.

b. Contractor fails or refuses to supply enough properly skilled workers or proper equipment or fails to make prompt payment when due to subcontractors for materials, equipment or labor.

c. Contractor disregards the Laws and Regulations or the instructions of Owner or of Engineer.

d. Contractor breaches any of the provisions of the Contract Documents, or breaches any of its representations or warranties in the Contract Documents, or otherwise fails or refuses to perform or fulfill all or any part of its obligations under the Contract Documents.

If one (1) or more of the identified events occur, Owner or Engineer, in Owner's sole discretion without waiving any rights, may provide written notice to Contractor and Contractor's surety of its intent to terminate for cause. Owner will allow a minimum of ten (10) calendar days for Contractor or surety to cure deficiencies in performance, then in any such case, Owner may, by written notice to Contractor and its surety, declare Contractor (and surety) in default under the Contract Documents and terminate Contractor's performance under the Contract and may at its option employ any remedies provided for in the Contract Documents or otherwise available at law or in equity.

Nothing contained herein shall be interpreted as enlarging Owner's legal duty to Contractor or to Contractor's agents, employees, subcontractors, or third parties, or altering the status of Contractor as an independent contractor. Should Owner elect to terminate the performance of Contractor hereunder, then such termination shall not waive, extinguish or diminish the obligations and liabilities of the Contractor or its surety existing as of the termination date. Contractor shall submit and does hereby submit to the personal jurisdiction of the state or federal courts having subject matter jurisdiction and sitting in the county in which the Site is located, for the adjudication of any suit brought to enforce Owner's rights and remedies under the Contract.

If for any reason, the Owner's termination for cause is deemed to be invalid, improper, or not enforceable, the Owner's termination for cause is automatically converted to a termination for convenience under **Section 11.03**.

11.05. REMEDIES FOR DEFAULT OF CONTRACTOR. In the event the Owner elects to terminate Contractor for cause, Owner shall have the right, but not the obligation, at its sole election and discretion, and without prejudice to any other right or remedy available to it, to take possession of the Work and the Site and use all or any part of Contractor's equipment, tools and materials to itself finish, or cause to be finished by another contractor, the Work by whatever method Owner may deem expedient. Further, Contractor shall not be entitled to receive further payment until the Work achieves Final Completion. If the unpaid balance of the Contract Price exceeds the costs and expenses of terminating the Contract and finishing the Work, (including, without limitation, attorney's, engineering, surveying and other professionals' fees and costs, together with the costs of completing the Work), such excess shall be paid to Contractor. If such costs and expenses exceed the unpaid balance of the Contract Price, Contractor shall pay the difference to Owner. The amount to be paid to the Contractor or Owner, as applicable, shall be certified by the Engineer, upon application, and this obligation for payment shall survive termination of the Contract.

In the event Owner elects to make demand on Contractor's performance Bond, the Contractor's surety shall be obligated to complete or cause completion of the Work in strict conformity with the Contract, including Contract Times. If the Owner reasonably determines that the surety is not proceeding diligently and with promptness to complete its obligation hereunder, the Owner may take possession of the Work and the Site and use all or any part of Contractor's equipment and materials to itself finish, or cause to be finished by another contractor, the Work by whatever method Owner may deem expedient as provided in the preceding paragraph.

ARTICLE XII. MISCELLANEOUS

12.01. NO THIRD-PARTY BENEFICIARIES. Except as provided herein, the Contract Documents shall not create any rights in third parties and no provision of the Contract Documents shall be construed as creating any obligations for the benefit of, or rights in favor of, any person or entity other than the Owner, the Indemnified Parties, and the Contractor. If **Special Conditions of the Contract Part B** is made a part of the Contract Documents, Developer(s) named in the **Special Conditions of the Contract Part B** of the Contract are third-party beneficiaries of the Contract. Without limiting the foregoing, the Owner shall have no obligation to pay or to see to the payment of any monies due to any of Contractor's subcontractors or material suppliers of every tier or to any other person or entity.

12.02. SEVERABILITY. Except as otherwise provided under **Section 5.12** of these General Conditions, if any term, condition or provision of the Contract Documents, or the application thereof to any person or circumstance, shall ever be held to be void, voidable or unenforceable, then in each such

event the remainder of the Contract Documents or the application of such term, condition or provision to any other person or any other circumstance (other than those as to which it shall have been held void, voidable or unenforceable) shall not be affected thereby, and each term, condition or provision of the Contract Documents shall remain valid and enforceable to the fullest extent permitted by Laws and Regulations.

12.03. NON-WAIVER OF RIGHTS. Any failure by the Owner at any time, or from time to time, to enforce or require the strict keeping and performance of any of the terms or conditions of the Contract Documents shall not constitute a waiver of the right to enforce or require the strict keeping of such terms or conditions and shall not affect or impair such terms or conditions in any way or the right of Owner at any time to avail itself of such remedies as it may have for any subsequent breach or breaches of any such term or condition or of any other term or condition of the Contract Documents, including, without limitation, the right to terminate. Notwithstanding any provision hereof, neither Owner's receipt of non-compliant Bonds or non-compliant insurance certificates nor Owner's allowance of Contractor to proceed with the Work, shall be construed to relieve Contractor of its obligation to provide Bonds and insurance in favor of Owner according to the requirements of these Contract Documents.

Contractor agrees that Owner shall not be precluded or estopped by any action taken or thing done, written or oral, including, but not limited to, inspections made, payments made, or Final Completion of the Work, from showing that the actual amount and character of the Work done and equipment and materials furnished by Contractor do not in fact conform to the Plans, Technical Specifications or other Contract Documents. Contractor also agrees that Owner shall not be precluded or estopped because of any action taken or not taken, from demanding and recovering from Contractor any damages resulting therefrom or from the Contractor's other failure to comply with the Contract Documents.

In the event of termination by Owner of Contractor's performance under the Contract for convenience, on account of Force Majeure, or by reason of Contractor's default, no rights or remedies of Owner shall thereby be waived, nor shall any breach by Contractor of the provisions in the Contract Documents which has occurred or is continuing at the time of such termination be waived, regardless of whether or not default has been declared.

12.04. OWNER'S AUDIT RIGHTS. Owner's duly authorized representatives shall have access at all reasonable times to all Contractor's and subcontractor's personnel, job description, employment and qualification records, books, records, correspondence, instructions, plans, drawings, receipts, vouchers, data stored in computers, and memoranda of every description pertaining to Work for the purpose of auditing and verifying costs of Work or for any other reasonable purpose. Owner's representatives shall have the right to reproduce any of the aforesaid documents.

If audit by Owner reveals charges or costs charged to or paid by Owner as costs or fees which are not proper or exceed the rates or amounts permitted under the Contract Documents for any such matters, the Owner shall be entitled upon demand for a refund from Contractor of all such amounts, plus interest thereon from the date of payment by Owner until the date of refund by Contractor at the rate of the lesser of: (i) eighteen percent (18%) per annum; or (ii) the maximum rate allowed by law.

12.05. NO ASSIGNMENT. Contractor shall not be allowed to assign or otherwise convey all or any portion of this Contract without the express written consent of Owner.

12.06. CUMULATIVE RIGHTS AND REMEDIES. The rights and remedies of Owner provided in the Contract Documents shall be cumulative of and not in lieu of all other rights and remedies available to Owner at law or in equity. It is expressly agreed that exercise of a right or pursuit by Owner of any one or more of the remedies provided in the Contract Documents or otherwise available at law or in equity shall not constitute an election of remedies by Owner or forfeiture of any other right of Owner.

12.07. BINDING EFFECT. This Contract shall be binding upon and inure to the benefit of the parties hereto and their respective assigns and successors.

12.08. PREVAILING PARTY RECOVERS ATTORNEYS' FEES. Subject to **Local Government Code 271.153**, the prevailing party of any dispute, as set forth herein, shall be entitled to recover reasonable and necessary attorney's fees. If a party claiming the right to payment of an amount in dispute is awarded all or substantially all of such disputed amount, then such claiming party shall be the prevailing party. If the party defending against such claim is found to be not liable to pay all or substantially all of the disputed amounts claimed by the other party, then the party so defending against such claim shall be the prevailing party. If both parties prevail with respect to different claims, then the party who is prevailing with respect to the greater monetary sum shall be deemed the prevailing party. Notwithstanding anything to the contrary, nothing herein waives any immunities from suit or damages to which the Owner is entitled.

12.09. ANTI-BOYCOTT OF ISRAEL VERIFICATION**.** By signing and entering into the Contract, Contractor verifies, pursuant to **Chapter 2271 of the Texas Government Code**, it is not a Company that boycotts Israel and agrees it will not boycott Israel during the term of this Contract. The terms "boycotts Israel" and "boycott Israel" have the meaning assigned to the term "boycott Israel" in **Section 808.001**, **Texas Government Code**. For purposes of this paragraph, "Company" means a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations that exists to make a profit, but does not mean a sole proprietorship.

12.10. ANTI-TERRORISM VERIFICATION. Contractor hereby represents and warrants that at the time of this Contract neither Contractor, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of Contractor: (i) engages in business with Iran, Sudan, or any foreign terrorist organization pursuant to **Subchapter F of Chapter 2252 of the Texas Government Code**; or (ii) is a Company listed by the Texas Comptroller pursuant to **Section 2252.**153 of the Texas Government Code. The term "foreign terrorist organization" has the meaning assigned to such term pursuant to **Section 2252.151 of the Texas Government Code**. For purposes of this paragraph, "Company" means a sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, limited liability company, or other entity or business association whose securities are publicly traded, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations, that exists to make a profit.

12.11. ANTI-BOYCOTT OF ENERGY COMPANIES VERIFICATION**.** By signing and entering into the Contract, Contractor verifies, pursuant to **Chapter 2276 of the Texas Government Code** (as added by Senate Bill 13, 87th Texas Legislature, Regular Session), it is not a Company that boycotts energy companies and agrees it will not boycott energy companies during the term of this Contract. The terms "boycotts energy companies" and "boycott energy companies" have the meaning assigned to the term "boycott energy company" in **Section 809.001**, **Texas Government Code**. For purposes of this paragraph, "Company" means a for-profit sole proprietorship, organization,

association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations, that exists to make a profit, but does not include a sole proprietorship.

12.12. ANTI-DISCRIMINATION OF FIREARM ENTITY OR FIREARM TRADE ASSOCIATION VERIFICATION**.** By signing and entering into the Contract, Contractor verifies, pursuant to **Chapter 2274 of the Texas Government Code** (as added by Senate Bill 19, 87th Texas Legislature, Regular Session, "SB 19"), that it is not a Company that has a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and agrees it will not discriminate against a firearm entity or firearm trade association during the term of this Contract. The terms "discriminates against a firearm entity or firearm trade association" and "discriminate against a firearm entity or firearm trade association" have the meaning assigned to the term "discriminate against a firearm entity or firearm trade association" in **Section 2274.001(3)**, **Texas Government Code** (as added by SB 19). For purposes of this paragraph, "Company" means a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations, that exists to make a profit, but does not mean a sole proprietorship.

12.13. LONE STAR INFRASTRUCTION PROTECTION ACT VERIFICATION. If under this Contract, Contractor is granted direct or remote access to the control of critical infrastructure, excluding access specifically allowed for product warranty and support, Contractor verifies, pursuant to **Chapter 2275 of the Texas Government Code** (as added by Senate Bill 2116, 87th Legislature Regular Session), that neither Contractor, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of Contractor, nor any of its sub-contractors (i) is owned or controlled by (a) individuals who are citizens of China, Iran, North Korea, Russia or any designated country; or (b) 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 China, Iran, North Korea, Russia, of any designated country; or (ii) is headquartered in China, Iran, North Korea, Russia or a designated country. The term "designated country" means a country designated by the Governor as a threat to critical infrastructure under **Section 113.003 of the Texas Business & Commerce Code**. The term "critical infrastructure" means a communication infrastructure system, cybersecurity system, electric grid, hazardous waste treatment system, or water treatment facility.

CONTINENTAL HOMES OF TEXAS, L.P. FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3

ATTACHMENT A

ATTACHMENT A TO THE GENERAL CONDITIONS OF THE CONTRACT INSURANCE REQUIREMENTS

I. BUILDER'S RISK INSURANCE OR INSTALLATION FLOATER INSURANCE

A. Builder's Risk. Unless otherwise provided in the Contract and before beginning the Work, Contractor shall purchase and maintain builder's risk insurance, if generally available in the insurance marketplace, upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof from an insurer rated by Best's A- and VII or better. This insurance shall:

i. include the Owner, Contractor, all subcontractors to be insured under such builder's risk policy, as insureds. For purposes of the remainder of this **Section I.A. through I.O.** the parties required to be insured shall collectively be referred to as "insureds."

ii. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood). If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

iii. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

iv. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

v. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or supplier).

vi. extend to cover damage or loss to insured property while in transit.

vii. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

viii. allow for the waiver of the insurer's subrogation rights, as set forth below.

ix. not include a co-insurance clause.

x. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

xi. include performance/hot testing and start-up.

xii. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work reaches Final Completion.

B. **Installation Floater.** If builder's risk insurance is not generally available in the insurance marketplace for the Work, the Contractor shall obtain an installation floater insurance policy acceptable to Owner, or other acceptable equivalent policy as follows:

X No Installation Floater is required.

□ The Installation Floater shall be in the amount of all installed, fabricated, or erected property being incorporated into the Work under the Contract.

Such policy shall cover all risks of physical loss or damage, including flood and earthquake, to the Work. Such coverage shall continue in full force and effect pursuant to **Subparagraph I.A.xii**. The installation floater or equivalent policy shall name the Owner and Contractor to be insured under such installation floater, as insureds.

C. Contract with No Property. Neither builder's risk insurance nor an installation floater is required under the Contract when the Engineer determines the Work does NOT involve installation, fabrication, or erection of any property, including but not limited to any fixtures, materials, or equipment, which could be covered under such policies. The risk of loss, however, remains with the Contractor pursuant to the Contract Documents.

D. Insurance Certificates. Before beginning the Work under this Contract, Contractor shall furnish certificates of insurance to Owner with endorsements evidencing that the insurance required under this **Section I** is in full force and effect. Contractor shall provide new, replacement certificates, evidencing the procurement of successor policies, prior to the expiration of each required policy for so long as this Contract is in effect. Owner may require Contractor to provide certification of insurance on an ACORD form.

E. Accuracy of Information. Contractor warrants the accuracy of all information shown on each certificate furnished to Owner by Contractor or on Contractor's behalf by Contractor's broker or other representative.

F. Notice of Cancellation or Change. The Builder's risk, installation floater and all the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this **Section I** will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least seven (7) days prior written notice has been given to the purchasing policyholder. Within three (3) days of receipt of

any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

G. Deductibles. The purchaser of any required builder's risk, installation floater, or other property insurance shall pay all premiums and costs not covered because of the application of a policy deductible or self-insured retentions.

H. Partial Occupancy or Use by Owner. If Owner will occupy or use a portion or portions of the Work prior to Final Completion of all the Work, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the insurer. The builder's risk, installation floater, or equivalent policy of insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may be removed from coverage under the builder's risk policy, installation floater or equivalent policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance, installation floater, or equivalent policy.

I. Additional Insurance. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk, installation floater, or other property insurance policies provided under this **Section I**, it may do so at Contractor's expense.

J. Insurance of Other Property. If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a subcontractor, or an employee of Contractor or a subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount. The entity or individual procuring the insurance is responsible for payment of premiums.

K. Non-Waiver - No Limitation of Owner's Rights. Contractor unilaterally agrees to comply with the provisions of this Section. Accordingly, Owner's knowledge concerning deficiencies in Contractor's insurance, including non-compliance with this Section shown by any insurance certificate or other information furnished to Owner, shall not affect Owner's rights and shall not result in a waiver or otherwise limit or impair Owner's remedies for Contractor's failure to comply with the requirements of this Section.

L. No Impairment or Waiver of Rights. Nothing contained in this Section shall restrict, limit, impair or waive Owner's rights or Contractor's duties under the other terms of this Contract or under applicable law. The cancellation, expiration, or exhaustion of any of the insurance required above shall not preclude Owner from recovery against Contractor for any liability arising under this Contract or under law.

M. Automatic Reformation to Conform to Law. The parties intend this Contract to comply with Texas law. Accordingly, the parties agree that any legal limitations now or hereafter in effect and affecting the validity or enforceability of any provision of this Contract are made a part hereof and shall operate to amend this Contract to the minimum extent necessary to bring all provisions into conformity with the requirements of such limitations and, as so modified, this Contract shall continue in full force and effect.

N. Waiver of Rights.

i. All policies purchased in accordance with this Section**,** expressly including the builder's risk policy and installation floater policy or equivalent policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies to the extent of actual coverage under such policies.

ii. Contractor shall be responsible for assuring that the agreement under which a subcontractor performs a portion of the Work contains provisions whereby the subcontractor waives all rights against Owner and Contractor as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance, installation floater and any other property insurance applicable to the Work.

O. Receipt and Application of Property Insurance Proceeds.

i. Any insured loss under the builder's risk, installation floater or other policies of insurance required by this **Section I** will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within fifteen (15) days after notice of such claim.

ii. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause.

II. LIABILITY INSURANCE

A. Insurance Certificates. In addition to the coverages described and required in **Section I** above and before beginning the Work under this Contract, Contractor shall furnish certificates of insurance to Owner evidencing that the insurance required below is in force and effect. Contractor shall provide new, replacement certificates, evidencing the procurement of successor policies, prior to the expiration of each required policy for so long as this Contract is in effect. Owner may require Contractor to provide certification of insurance on an ACORD form.

B. Accuracy of Information. Contractor warrants the accuracy of all information shown on each certificate furnished to Owner by Contractor or on Contractor's behalf by Contractor's broker or other representative.

C. Minimum Required Insurance and Minimum Limits of Liability. Before beginning the Work, and throughout performance of the Work and the term of this Contract, Contractor shall obtain and

maintain in force and effect, at Contractor's sole expense, insurance of the following types and amounts from insurance rated by Best's A- and VII or better:

i. **Workers' Compensation Insurance** affording statutory benefits in accordance with all requirements of the Texas Workers' Compensation Act and covering Contractor's employees.

ii. **Employer's Liability Insurance** with limits of not less than $1,000,000 per accident or disease.

iii. **Commercial General Liability Insurance**, including coverage for bodily injury and property damage, personal and advertising injury, the products-completed operations hazard, and insured contracts, applicable in Texas, on a form no less broad than the Insurance Services Office ("ISO") CG 00 01 form dated 2004 or thereafter, and with limits of not less than:

(1) Each Occurrence - $1,000,000
(2) General Aggregate - $2,000,000
(3) Products-Completed Operations Aggregate - $2,000,000
(4) Personal & Advertising Injury -$1,000,000

iv. **Business Automobile Liability Insurance**, including coverage for bodily injury and property damage, on a form no less broad than the ISO CA 00 01 form dated 2010 or thereafter, with limits of not less than $1,000,000 combined single limit for each accident and covering owned, hired or leased, and non-owned autos.

v. **Excess or Umbrella Liability Insurance**, affording coverage no less broad than, and applying excess of the limits of liability, of the policies required by II.C.ii., II.C.iii., and II.C.iv., above, with limits of not less than $2,000,000 per occurrence and in the aggregate.

D. Additional Insurance or Limits. Paragraphs II.C, above, states the minimum types of liability insurance and limits of liability required by this Contract in connection with the Work. Contractor may, in its sole discretion, procure additional insurance or higher limits of liability at Contractor's sole expense.

E. Additional Insureds. To the extent allowed by law, the Commercial General Liability Insurance, Business Automobile Liability Insurance, and Excess or Umbrella Insurance, required by II.C.iii. through II.C.v., above, shall be endorsed to provide that the Indemnified Parties (collectively, "the Additional Insureds"), are added as additional insureds for liability arising out of the Work, to include liability based on either alleged fault or vicarious liability. Such additional insured coverage shall not be limited to liability caused by Contractor or Contractor's fault. The Additional Insureds shall be afforded additional insured status on the policies required by paragraphs II.C.iii and II.C.v, above, under a combination of the ISO CG 20 10 10 01 and ISO CG 20 37 10 01 endorsements.

F. Primary/Non-Contributing. The insurance policies required by II.C.iii. through II.C.v., above, shall provide that the Additional Insureds are covered on a primary basis. Also, the insurance policies required by II.C.iii., through II.C.v., above shall be endorsed to provide that Contractor's insurers will not seek contribution or recovery from such other insurance as may be available to the Additional Insureds.

G. Insurance Required of Contractor's Subcontractors. Contractor shall require all subcontractors who will perform any of the Work to obtain the same insurance and limits of liability as required by II.C.iii. through II.C.v., above. Contractor shall also require all such subcontractors to cause their insurers to waive subrogation to the same extent as required of Contractor's insurers by the following provision, II.H. Contractor shall obtain certificates of insurance from its subcontractors before they begin any of the Work and, upon request, shall provide copies thereof to Owner.

H. Waiver of Subrogation in Favor of Indemnified Parties. The parties intend that none of Contractor's insurers shall subrogate against the Indemnified Parties. Accordingly, Contractor agrees to cause all of its insurers—not limited to insurers underwriting the policies required above—to waive subrogation against the Indemnified Parties and its directors. **For the avoidance of doubt, Contractor also agrees that it presently waives and releases all rights of recovery, claims, or causes of action that might hereafter arise in favor of Contractor against Indemnified Parties for any loss, damage or liability that is covered by Contractor's insurance, regardless of whether the loss, damage or liability is caused by the negligence, breach of any legal duty, or other fault of the Indemnified Parties.** The foregoing waiver and release is effective even if Contractor fails to obtain the required insurance.

I. Notice of Cancellation, Modification or Impairment of Limits. The policies required above shall be endorsed to provide that they will not be canceled, or the coverage or limits of liability thereunder materially changed, without at least seven (7) days' prior written notice to Owner.

J. Notice of Impairment of Limits. Contractor shall give written notice to Owner no later than seven (7) days after the date on which an impairment of a required aggregate limit, due to the payment of a claim or defense expense, reduces the available aggregate limit to an amount 50% or less than the aggregate limit required above. If Contractor's available excess insurance will not drop down and comply with paragraph II.C.iii., through II.C.v. of these insurance requirements, Owner may require reinstatement of an impaired aggregate limit up to the amount required.

K. Information Concerning Contractor's Insurance Program. If Owner has questions concerning Contractor's casualty insurance program, Contractor agrees to promptly answer them. Complete, true and correct copies of each policy required above shall be furnished to Owner promptly upon Owner's request, but Contractor may redact payroll and premium information. Contractor agrees to cooperate with Owner, and with Owner's insurance broker, in the event Owner elects to seek or obtain additional insurance benefiting Owner. Contractor also provides Owner permission to communicate with Contractor's insurance broker regarding coverages required under the Contract Documents.

L. Contractor's Compliance with Policy Conditions. Contractor shall comply with and not violate, or knowingly permit to be violated, any condition of the insurance policies required in this **Attachment A**. Contractor agrees to give its insurers timely written notice of all occurrences, accidents or claims arising out of the Work, with a copy to Owner.

M. Contractor's Payment of Premiums, Deductibles and SIRs. Contractor, not Owner, shall be responsible for any and all policy premiums, deductibles, or self-insured retentions payable in connection with Contractor's insurance, including the insurance required above.

N. Non-Waiver - No Limitation of Owner's Rights. Contractor unilaterally agrees to comply with the provisions of this **Attachment A**. Accordingly, Owner's knowledge concerning deficiencies in Contractor's insurance, including non-compliance with this Article shown by any insurance certificate or other information furnished to Owner, shall not affect Owner's rights, and shall not result in a waiver or otherwise limit or impair Owner's remedies for Contractor's failure to comply with the requirements of this Article.

O. No Impairment or Waiver of Rights. Nothing contained in this **Attachment A** shall restrict, limit, impair or waive Owner's rights or Contractor's duties under the other terms of this Contract or under applicable law. The cancellation, expiration, or exhaustion of any of the insurance required above shall not preclude Owner from recovery against Contractor for any liability arising under this Contract or under law.

P. Automatic Reformation to Conform to Law. The parties intend this Contract to comply with Texas law. Accordingly, the parties agree that any legal limitations now or hereafter in effect and affecting the validity or enforceability of any provision of this Contract are made a part hereof and shall operate to amend this Contract to the minimum extent necessary to bring all provisions into conformity with the requirements of such limitations and, as so modified, this Contract shall continue in full force and effect.

Q. Term of Insurance Requirements. All the foregoing insurance requirements shall survive termination of this Contract. All required insurance shall continue for at least thirty (30) days after Final Completion of the Work, to include performance of all warranty work.

III. WORKERS' COMPENSATION INSURANCE COVERAGE

A. Definitions.

i. **Certificate of Coverage ("Certificate")** - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Workers' Compensation Commission, or a coverage agreement DWC-81, DWC-82, DWC-83, or DWC-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.

ii. **Duration of the Project** - Includes the time from the beginning of the Work on the Project until the Contractor's/person's Work on the Project has been completed and accepted by the governmental entity and the warranty period has expired.

iii. **Persons Providing Services on the Project ("Subcontractor" in §406.096 of the Texas Labor Code)** - 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, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the Project.

iv. **"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.

B. 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.

C. The Contractor must provide a Certificate of Coverage to the governmental entity prior to being awarded the Contract.

D. 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.

E. The Contractor shall obtain from each person providing Services on a Project, and provide to the governmental entity:

i. 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

ii. 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.

F. The Contractor shall retain all required Certificates of Coverage for the duration of the Project and for one (1) year thereafter.

G. The Contractor shall notify the governmental entity in writing by certified mail or personal delivery, within ten (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.

H. The Contractor shall post on each Project site a notice, in the text, form, and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing Services on the Project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The Contractor shall contractually require each person with whom it contracts to provide services on a Project, to:

i. 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;

ii. provide to 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;

iii. 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;

iv. obtain from each other person with whom it contracts, and provide to the Contractor:

(1) a Certificate of Coverage, prior to the other person beginning work on the Project; and

(2) a new Certificate of Coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current Certificate of Coverage ends during the duration of the Project;

v. retain all required Certificates of Coverage on file for the duration of the Project and for one (1) year thereafter;

vi. notify the governmental entity in writing by certified mail or personal delivery, within ten (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

vii. contractually require each person with whom it contracts, to perform as required by Paragraphs **III.I.i** through **III.I.vi**., with the Certificates of Coverage to be provided to the person for whom they are providing services.

J. 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.

K. The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor which entitles 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.

CONTINENTAL HOMES OF TEXAS, L.P. FOR THE BENEFIT OF REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3

ATTACHMENT B

ATTACHMENT B TO THE GENERAL CONDITIONS OF THE CONTRACT MINIMUM WAGE RATE SCALE

RESOLUTION ADOPTING PREVAILING WAGE RATE SCALE FOR CONSTRUCTION

WHEREAS, Redbird Ranch Fresh Water Supply District No. 3 of Medina County (the "District"), has been legally created and operates pursuant to the general laws of the State of Texas applicable to conservation and reclamation districts; and

WHEREAS, Chapter 2258, Texas Government Code, Prevailing Wage Rates ("Chapter 2258"), requires a public body to determine the general prevailing wage rate for classes of workers in the locality in which a public work project is to be performed; and

WHEREAS, Chapter 2258 authorizes the Board of Supervisors (the "Board") of the District to adopt prevailing wage rates establishing minimum rates to be paid by all contractors and subcontractors in connection with all District construction projects; and

WHEREAS, because the District is located in Bexar County and Medina County, Texas Water Code § 49.279 allows the District to determine the District's prevailing wage rates by adopting the prevailing wage rates of Bexar County; and

WHEREAS, the Board concurs that it is in the best interests of the District to adopt the prevailing wage rates of Bexar County; Now, Therefore,

BE IT RESOLVED BY THE BOARD OF SUPERVISORS OF REDBIRD RANCH FRESH WATER SUPPLY DISTRICT NO. 3 THAT:

Section 1: The Board hereby adopts the prevailing wage rates previously adopted and utilized by Bexar County for Bexar County public work projects. When, and to the extent, Bexar County amends its prevailing wage rates, such amended rates shall be considered the prevailing wage rates of the District effective upon such amendment by Bexar County. Nothing in this Resolution Adopting Prevailing Wage Rates in any way prohibits the payment to workers of amounts greater than the prevailing wage rates adopted by the District.

Section 2: Contractors and subcontractors on District construction projects shall be responsible to ascertain the then-current prevailing wage rages adopted and utilized by Williamson County, obtain a copy of same from Williamson County, and to pay at least such minimum wage rates for the classes of workers described therein.

Section 3: The District's engineer is hereby directed and authorized to include this Resolution Adopting Prevailing Wage Rates in: 1) the call for the bids for District construction contracts, and 2) in the District construction contracts themselves.

PASSED AND APPROVED this 13th day of August, 2020.

/s/ Payton Rion

President, Board of Supervisors

ATTEST:

/s/ Truitt Priddy

Secretary, Board of Supervisors

(SEAL)

879588

CERTIFICATE FOR RESOLUTION

THE STATE OF TEXAS §
§
COUNTY OF MEDINA §

I, the undersigned officer of the Board of Supervisors of Redbird Ranch Fresh Water Supply District No. 3 of Medina County, hereby certify as follows:

1. The Board of Supervisors of Redbird Ranch Fresh Water Supply District No. 3 of Medina County convened in regular session on August 13, 2020, and the roll was called of the members of the Board:

Payton Rion	President
Trent Rush	Vice President
Truitt Priddy	Secretary
Johnny Bernal	Assistant Secretary
Vacant	Assistant Vice President

and all of said persons were present, thus constituting a quorum. Whereupon, among other business, the following was transacted at the meeting: a written

RESOLUTION ADOPTING PREVAILING WAGE RATE SCALE FOR CONSTRUCTION

was introduced for the consideration of the Board. It was then duly moved and seconded that the resolution be adopted, and, after due discussion, the motion, carrying with it the adoption of the resolution, prevailed and carried unanimously.

2. A true, full, and correct copy of the aforesaid resolution adopted at the meeting described in the above and foregoing paragraph is attached to and follows this certificate; the action approving the resolution has been duly recorded in the Board's minutes of the meeting; the persons named in the above and foregoing paragraph are the duly chosen, qualified, and acting officers and members of the Board as indicated therein; each of the officers and members of the Board was duly and sufficiently notified officially and personally, in advance, of the time, place, and purpose of the aforesaid meeting, and that the resolution would be introduced and considered for adoption at the meeting, and each of the officers and members consented, in advance, to the holding of the meeting for such purpose; the meeting was open to the public as required by law; and public notice of the time, place, and subject of the meeting was given as required by Chapter 551, Texas Government Code, and Section 49.063, Texas Water Code, as suspended by the Governor of the State of Texas.

SIGNED AND SEALED on August 13, 2020.

/s/ Truitt Priddy
Secretary, Board of Supervisors

(SEAL)

879588

"General Decision Number: TX20250007 09/19/2025

Superseded General Decision Number: TX20240007

State: Texas

Construction Type: Heavy

Counties: Atascosa, Bandera, Bastrop, Bell, Bexar, Brazos, Burleson, Caldwell, Comal, Coryell, Guadalupe, Hays, Kendall, Lampasas, McLennan, Medina, Robertson, Travis, Williamson and Wilson Counties in Texas.

HEAVY (excluding tunnels and dams, not to be used for work on Sewage or Water Treatment Plants or Lift / Pump Stations in Bell, Coryell, McClennon and Williamson Counties) Construction Projects

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

|_____|_____|

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number Publication Date
0 01/03/2025
1 09/19/2025

* SUTX2011-006 08/03/2011

Rates Fringes

CEMENT MASON/CONCRETE FINISHER (Paving and Structures).....$ 12.56 **

ELECTRICIAN.....$ 26.35

FORM BUILDER/FORM SETTER
Paving & Curb.....$ 12.94 **
Structures.....$ 12.87 **

LABORER
Asphalt Raker.....$ 12.12 **
Flagger.....$ 9.45 **
Laborer, Common.....$ 10.50 **
Laborer, Utility.....$ 12.27 **
Pipelayer.....$ 12.79 **
Work Zone Barricade Servicer.....$ 11.85 **

PAINTER (Structures).....$ 18.34

POWER EQUIPMENT OPERATOR:
Agricultural Tractor.....$ 12.69 **
Asphalt Distributor.....$ 15.55 **
Asphalt Paving Machine.....$ 14.36 **
Boom Truck.....$ 18.36
Broom or Sweeper.....$ 11.04 **
Concrete Pavement Finishing Machine.....$ 15.48 **
Crane, Hydraulic 80 tons or less.....$ 18.36
Crane, Lattice Boom 80

tons or less.....$ 15.87 **
Crane, Lattice Boom over
80 tons.....$ 19.38
Crawler Tractor.....$ 15.67 **
Directional Drilling
Locator.....$ 11.67 **
Directional Drilling
Operator.....$ 17.24 **
Excavator 50,000 lbs or
Less.....$ 12.88 **
Excavator over 50,000 lbs...$ 17.71 **
Foundation Drill, Truck
Mounted.....$ 16.93 **
Front End Loader, 3 CY or
Less.....$ 13.04 **
Front End Loader, Over 3 CY.$ 13.21 **
Loader/Backhoe.....$ 14.12 **
Mechanic.....$ 17.10 **
Milling Machine.....$ 14.18 **
Motor Grader, Fine Grade....$ 18.51
Motor Grader, Rough.....$ 14.63 **
Pavement Marking Machine....$ 19.17
Reclaimer/Pulverizer.....$ 12.88 **
Roller, Asphalt.....$ 12.78 **
Roller, Other.....$ 10.50 **
Scraper.....$ 12.27 **
Spreader Box.....$ 14.04 **
Trenching Machine, Heavy....$ 18.48

Servicer.....$ 14.51 **

Steel Worker
Reinforcing.....$ 14.00 **
Structural.....$ 19.29

TRAFFIC SIGNALIZATION:
Traffic Signal Installation
Traffic Signal/Light Pole
Worker.....$ 16.00 **

TRUCK DRIVER
Lowboy-Float.....$ 15.66 **
Off Road Hauler.....$ 11.88 **
Single Axle.....$ 11.79 **
Single or Tandem Axle Dump
Truck.....$ 11.68 **
Tandem Axle Tractor w/Semi
Trailer.....$ 12.81 **

WELDER.....$ 15.97 **

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.75) or 13658 ($13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union

whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7).

Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

PROHIBITION ON BOYCOTTING ISRAEL AND CONTRACTING WITH TERRORIST ORGANIZATIONS VERIFICATION

This verification is hereby incorporated into the terms of the contract by and between CONTINENTAL HOMES OF TEXAS, L.P. and _____ entered into this the _____ day of _____, 2024.

1.01 _____, in conjunction with the execution of the above referenced contract and in accordance with Chapter 2270 of the Texas Government Code, effective Sept. 1 2017, does hereby agree, confirm, and verify that it:

A. Does not Boycott Israel; and

B. Will not Boycott Israel during the term of the contract

"Boycott Israel" has the meaning given to it in Chapter 808 of Subtitle A, Title 8 of the Texas Government Code. As of the effective date of the statute, the term 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 make for ordinary business purposes."

1.02 Contractor hereby certifies that it is not a entity that contracts with or provides supplies or services to a foreign terrorist organization, as defined by Section 2252.151(2), Texas Government Code, and has not been identified as a company known to have contracts with or provide supplies or services to a foreign terrorist organization as identified on a list prepared and maintained under Section 806.051, 807.051, or 2252.153, Texas Government Code.

1.03 Contractor hereby acknowledges and agrees that this verification is a material term of the contract and Owner is expressly relying on this verification in agreeing to enter into the contract with Contractor.

1.04 TO THE MAXIMUM EXTENT PERMITTED BY LAW, CONTRACTOR AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS OWNER FROM ALL CLAIMS, CAUSES OF ACTION, LEGAL PROCEEDINGS, DAMAGES, COSTS, FEES AND EXPENSES ARISING OUT OF OR RELATED TO AN ACTUAL OR ALLEGED MISREPRESENTATION BY CONTRACTOR PROVIDED HEREUNDER.

Prohibition on Boycotting Israel and Contracting with Terrorist Organizations [Continued]

_____

Contractor Signature

State of Texas

County of _____

Before me, a notary public, on this day personally appeared _____, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained in Paragraph 1A and B and Paragraph 2 are true and correct.

(Personalized Seal)

_____

Notary Public's Signature

Receipt and incorporation into the above referenced contract hereby agreed to and acknowledged by:

_____

Owner Signature

END OF SECTION

SPECIAL CONDITIONS

PART 1 GENERAL

1.01 SPECIAL CONDITIONS

A. Pape-Dawson will be serving as the representative for the Redbird Ranch Water Control and Improvements District No. 3. Contractor shall coordinate construction with Pape-Dawson and respective County inspectors.

B. There is existing tree canopy within the limits of Redbird Ranch Phase 2 Units 6M-1, 8M-1 and Galm Road Phase 4 that must remain and be protected throughout all phases of construction. Please refer to limits of clearing shown on SWPPP.

C. The Owner is expecting the Contractor to deliver a complete construction project (in accordance with the plans). Any bid containing exclusions that are in conflict with these specifications or are considered to be unreasonable by the Engineer will result in a disqualification of the bid.

D. Contractor is responsible for haul off or on-site embankment of trench spoils.

E. This job may require rock excavation. Any bid excluding rock excavation will be disqualified.

F. Project is export. Stockpile material should be located in the future unit, Redbird Ranch Phase 2 Unit 6M-4, to the northwest. Please refer to the stockpile exhibit for location.

G. The project specifications and TPDES plan shall be considered part of the construction documents and Contractor shall include in their bid all compliance with these documents.

H. Contractor shall be expected to revegetate all disturbed areas in accordance with the TPDES Plan for this project. Hydromulch should be placed in a manner consistent with manufacturer's specifications. Contractor shall irrigate all such areas until vegetation is established.

I. Hydromulch shall be Texas Native Blend or as approved by the landscape architect or Owner and will include 2” Topsoil.

J. Contractor shall install tree protection around all protected trees in accordance with plans.

K. Contractor shall coordinate fine grading around all protected trees with the Owner.

L. Reference Geotechnical Engineering Report for this project. Contractor shall include in their bid all compliance with this document.

M. It is the Developer's intent to have all dry utilities installed prior to laying base. Contractor shall coordinate, including scheduling, with CPS, Spectrum and AT&T.

N. All unsuitable material shall be removed from the site by the Contractor, at his expense.

O. Time is of the essence for construction of this project. Contractor to obtain field acceptances from all utility agencies, Medina County, and the District Engineer within the calendar days allowed for this project.

P. The Contractor shall provide all construction staking. Contractor shall locate and protect control points prior to starting work and preserve all points during construction. Contractor shall reimburse Engineer for all stakes, benchmarks, control points, etc. required to be replaced for any reason during the course of construction.

Q. All on-site testing shall be paid for by Owner. The Contractor will coordinate and schedule all testing as required. Any retesting shall be paid for by Contractor.

R. All excavation is unclassified.

S. The Contractor shall prepare a well-coordinated bid, which includes all related work between subcontractors and incorporates all coordination of work. The Contractor shall assure all subcontractors have had access to the total bid package (drawings, specs, special conditions, etc.) to assure the bid and construction is fully coordinated.

T. Any modification to existing ranch fencing or gates shall be coordinated with Continental Homes of Texas, L.P.

U. By submitting a bid, Contractor will hold unit prices for ninety (90) days from the date of bid submittal.

V. Attached to this section are the Continental Homes of Texas, L.P. "Instructions to Bidders." If there are any discrepancies between the specifications and aforementioned "Instruction to Bidders," the "Instructions to Bidders" will prevail.

W. Bids shall remain open to acceptance and shall be irrevocable for a period of ninety (90) days. The bid may not be altered or withdrawn for a minimum of ninety (90) days.

X. Existing Ground Topography has been obtained by Pape-Dawson either by field LiDAR or on the ground topography. The specifications and standards used by Pape-Dawson are as follows:

<u>LiDAR</u>

All points will be shot twice as two (2) different points (not averaged). First occupation will be 180 epochs and described as GT (ground truthing), second occupation will be done immediately after the first, losing and re-acquiring signal lock between each and will be 15 epochs and described as CHK (previous Pt. No.).

For example: "531 AT S60D", "532 CHK 531" or "551 GT S60D", "552 CHK 551". THE ELEVATIONS FOR THESE 2 POINTS MUST BE WITHIN 0.10' OF EACH OTHER. IF NOT, SHOOT ALTERNATING 180 EPOCH SHOTS AND 15 EPOCH CHECK SHOTS UNTIL 2 POINTS' ELEVATIONS ARE WITHIN 0.10' OF EACH OTHER (ANY TWO OF ALL OF THE POINTS SHOT WITH AT LEAST ONE BEING 180 EPOCH)

<u>ON THE GROUND TOPOGRAPHY</u>

1. All survey control is observed three (3) times, accumulating an average X,Y, and Z coordinate. First and second round observations will be 180 epochs back-to-back. (Losing and re-acquiring signal lock between the first and second observations.) Third observation will be for 180 epochs with at least two (2) hours of separation between the first and second observations.
2. All control is then leveled using a conventional survey level.
3. All natural ground observations are individually walked and occupied for 15 epochs.
4. Control checks are taken in the morning, before and after lunch and at the end of days, each occupied for 15 epochs. This is done every day the survey crew is on site.
5. PDOP's have to be under 4.0, the tolerances set at 0.10' for vertical and horizontal shots. Anything above this is disregarded and reobserved.
6. Pape-Dawson will not consider or review contractors topo unless it has been obtained by the same specifications and standards. Topo collected by a GPS unit attached to a moving vehicle is not considered accurate enough for quantity disputes.

Any requests to compare topo collected not to the above specifications will need to be paid for by the requesting contractor or will require an additional service request from the clients/owner.

Y. Contractor to process all material in accordance with Geotech report for lot fills.

Z. The Engineer's grading plan and street profiles included in the construction documents shall represent finished grades of the proposed project. The Engineer shall provide topographic digital surfaces of both existing and proposed grades. The existing ground surface was produced using on-the-ground field shots or field LiDAR. The Contractor is ultimately responsible for verifying the existing ground using methods listed above. In addition, the contractor is solely responsible for the accuracy of the earthwork quantities (embankment, excavation, material import, and material export) in the contractor's submitted bid that are necessary to produce the finished grades. It shall be the intent of the contractor to finish the project to the finished grades included in the construction documents based on the earthwork quantities set forth in the contractor's submitted bid, and without importing additional material and without producing stockpiles of extra material except as directed by owner or engineer. Contractor shall not stockpile any material on owner's property without owner's approval. Any material handling outside of the contracted amount needed to produce the finished grade for the project (including, without limitation, material importing and material exporting) shall be deemed as non-pay items, and shall be performed by the contractor at the contractor's sole cost and expense.

END OF SECTION

CONTINENTAL HOMES OF TEXAS, L.P.

SPECIAL CONDITIONS

The following language is added to the Instructions to Bidders:

1. These are Instructions to Bidders to provide **REDBIRD RANCH WATER CONTROL AND IMPROVEMENT DISTRICT NO. 3**, (OWNER), a proposal for the construction of **Redbird Ranch Phase 2 Units 6M-1, 8M-1 and Galm Road Phase 4** consisting of site clearing & grading, sedimentation & erosion control, street, drainage, sanitary sewer, and water improvements. This is a "public" bid. Sealed bids will be received in the office of **Pape-Dawson,** located at 1672 Independence Drive, Suite 102, New Braunfels, Texas 78132 on or before **3:30 p.m. on the 16th day of January 2026**. Bid documents may be obtained in electronic format. Please contact **Connie Yett with Pape-Dawson at cyett@pape-dawson.com.**

2. Bidders shall submit a unit price for each item for which a bid is requested. Proposals must be submitted in sealed envelopes in accordance with the bid specifications. All bids must be accompanied by a Construction Schedule. Any bids received without a Construction Schedule will not be accepted. Winning bidder will be required to provide monthly Construction Schedule updates to Owner.

3. The successful bidder will be required to enter into a Contract with the Owner, requiring full compliance and performance of the conditions of the proposal, plans and specifications as designed by Pape- Dawson Engineers. (ENGINEER) and reviewed by Medina County, and/or other agency as required and agrees to commence work within five (5) days after notification to begin, unless otherwise directed by Owner.

4. Bidders are required to inspect the Site and inform themselves of all conditions affecting the execution of the Work to be performed. The filing of the proposal shall constitute an admission by the bidder that he has carried out the foregoing stipulations to his entire satisfaction. Quantities included in the plans and proposals are estimated and are to be regarded as approximate only. The Owner reserves the right to vary the quantities, to construct all, or any part, or to delete any part or item of Work, which may be deemed advisable. Variations will be adjusted at the unit price provided. No profit, overhead or other reimbursement will be paid by the Owner in the event of a deletion of Work. ***It is the bidder's responsibility to verify all quantities against the plans. Bidder shall notify Engineer immediately, and prior to bid submittal, of any variances in excess of 3% of quantities given in the bid documents provided. Once bid sheets are received it will be understood that the Contractor agrees with the quantities and/or specifications of the plans. Any and all variances in quantities experienced during the construction process and submitted as a change order shall be paid at the applicable unit price provided in bidder's proposal.***

5. Portions of this proposal may be deleted. Prices for all items must stand on their own.

6. No rock clauses shall be noted on bids, nor will they be accepted by Owner. All bidders are expected to thoroughly review and inform themselves of all existing site and sub-surface conditions prior to submittal of proposals.
7. Contractor to complete the material take-off for items bid lump sum. Quantities shown on the plans

are estimates only.

8. Direct all technical questions concerning this proposal to **Catherine Tran, P.E., Senior Project Manager** with **Pape-Dawson** at **catherine.tran@pape-dawson.com.**

The following language is added to the Special Conditions of the Contract Part A:

Construction will conform to the following current specifications as applicable.

a. City of San Antonio "Standard Specifications for Public Works Construction" plus current amendments together with any special specifications issued by City of San Antonio.
b. Medina County “Specifications for Subdivision and Public Works Construction,” if located outside City of San Antonio city limits inside Medina County.
c. Per service area, San Antonio Water System (SAWS) “Standard Specifications for Construction,” Medina Metropolitan Water District (BMWD) specifications, Yancey Water Supply Corporation specifications, or San Antonio River Authority (SARA) specifications.
d. Texas Commission on Environmental Quality "Rules and Regulations for Public Water Systems."
e. Texas Commission on Environmental Quality “Design Criteria For Sewerage systems” Chapter 317 and “Edwards Aquifer” Chapter 213.

The following language is added to the General Conditions of the Contract:

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

1. Contractor is responsible for installing and maintaining the erosion and sedimentation controls as designed and shall inspect the controls Bi-weekly (14 days) and after every significant rainfall (1/2 inch or greater) to ensure significant disturbance to the structure has not occurred. Sediment deposited after a significant rainfall shall be removed and placed in a designated soil disposal area. Contractor to provide Owner with one complete set of all SW3P inspection reports, including updates and modifications, prior to receiving final payment for project.

CLEARING AND GRADING

1. **The Engineer’s street profiles included in the Construction Documents shall represent finished grades of the proposed Project. The Engineer shall provide topographic digital surfaces of both existing and proposed grades. The existing ground surface was produced using LIDAR topography and on-the-ground field shots. The Contractor is ultimately responsible for verifying the existing ground using whatever field surveying methods necessary. In addition, the Contractor is solely responsible for the accuracy of the earthwork quantities (embankment, excavation, material import, and material export) in the contractor’s submitted bid that are necessary to produce the finished grades. It shall be the intent of the Contractor to finish the project to the finished grades included in the Contract Documents based on the earthwork quantities set forth in the Contractor’s submitted bid, and without importing additional material and without producing stockpiles of extra material except as directed by Owner or Engineer. Contractor shall not stockpile any material on Owner’s property without Owner’s approval. Any material handling outside of the contracted amount needed to produce the finished grades for the Project (including, without limitation,**

material importing and material exporting) shall be deemed as non-pay items and shall be performed by the Contractor at the Contractor's sole cost and expense.

2. Clearing and or grading for street rights-of-way and utility easements shall be included in the base bid cost for site clearing and grading. Contractor is to clear entire project site of all underbrush and undesirable vegetation unless directed otherwise. Contact Owner for extent and sequence of lot clearing and coordination with any applicable tree ordinance.

3. Excavated material that is free of organic matter and other deleterious substances may be disposed on-site, as approved by Owner. Said material will be utilized as fill material for lots and easements as per the Grading Plan and compacted to meet 79G requirements with 95% Standard Density using ASTM 698 or TEX-114E. No fill shall be placed within flood plain areas until a "Flood Plain Development Permit" has first been obtained. Fills in flood plain areas require compaction testing for every twelve (12) inch lift and fills greater than one foot deep within building pad areas require compaction testing for every six (6") inch lift.

   Contractor shall coordinate with the Owner's choice of geotechnical testing lab to schedule all geotechnical and compaction testing.

   The Owner will pay for all geotechnical testing required for verification of conformance with Project specifications, unless otherwise specified. Any and all costs for re-testing due to failure to meet specifications or lack of preparedness will be paid by the contractor.

4. Excavated material placed on lots shall have positive drainage to prevent any ponding of water and provide a minimum final grade as specified on grading plans.

5. Contractor shall submit a letter to Engineer and Owner after completion of final grading of utility easements, certifying that the grades on the utility easements are completed as per the grading plan. Owner may, at its discretion, verify that all final utility grades conform to proposed grading plan.

6. Contractor shall submit a letter to Engineer and Owner after completion of final grading of lots, certifying that the grades on the lots are completed as per the grading plan. Owner may, at its discretion, verify that all final lots' grades conform to proposed grading plan within 0.1,' but in no circumstances shall grades be less than 1.0%.

7. Contractor shall be responsible for disposing of all waste materials including, but not limited to, excess excavation, concrete, trees, and any other material which is not part of the completed contract work. No separate pay item.

8. Prior to any lot grading, Contractor shall contact Owner to determine if any trees in areas of fill/excavation can be saved.

9. Any and all fill materials imported to the site by Contractor for the purpose of satisfying the proposed grading plan shall be reasonably homogeneous to existing site conditions, acceptable by Engineer and/or Owner, and shall conform to all specifications listed in Section 3 above.

STREETS AND DRAINS

1. Street excavation includes cut in the parkways, as per design plans.

2. Contractor will protect existing fences, concrete curbs, and sidewalks during construction. Any damage will be repaired by the contractor at no extra cost to Owner.

3. If driveway locations are known prior to installation of curb, Contractor shall depress curb at driveway location for each lot. Contractor to coordinate with Engineer for driveway locations prior to laying any curb. No separate pay item.

4. The Contractor must coordinate and schedule all testing required by Medina.

5. Street geotechnical material testing will be paid for by the Owner. Any retesting required due to the failure of the initial tests to meet specifications will be at the contractor's expense.

WATER AND SEWER

1. Water is located within Yancey Water Supply Corporation jurisdiction and sewer is located in the San Antonio Water System (SAWS) jurisdiction for Redbird Ranch Phase 2 Units 6M-1, 8M-1 and Galm Road Phase 4. A General Construction Permit is required for water and sewer improvements. Warranty Assignment, Payment and Receipt Affidavit will be required. Cost of a one-year warranty for said contract shall be included in unit prices bid for those items.

2. Contractor shall provide Engineer with as–built plans at or before the final walk through inspection.

3. Contractor will be responsible for coordinating and scheduling all required meetings and inspections with Yancey Water Supply Corporation (water), SAWS (sewer) and the Engineer.

4. Water system to be restrained. Restraints are not individually measured and are considered subsidiary to bid item.

UTILITIES

1. The Contractor will be required to coordinate work with the utility companies that will be installing electric, gas, telephone, and TV.

2. The Contractor is responsible for coordinating with utility companies to mark existing buried utilities that may be affected by construction. The Contractor will be responsible to repair damaged utilities due to construction.

3. Placement of sleeves for utility street crossings is located on the Utility Plat. Bid item will include all materials and installation and coordination with CPS Energy, AT&T, and Cable TV or appropriate Utility provider. Contractor shall notify Utility provider prior to street (subgrade) and/or drain construction. Sleeve placements for utility street and drain crossings are required when street and/or drain construction precedes utility installation. Quantity will be measured using horizontal length

and cost is to include 90° sweeps, caps, and additional vertical PVC length so that caps are exposed 6" above finished ground.

4. The Contractor shall coordinate with the Owner for placement of private conduits.

DISPOSAL OF DEBRIS

1. The contractor will be required to maintain a clean Site at all times. Any and all "consumed product" waste (i.e. lunch bags, beverage containers, etc.) must be promptly disposed of in a proper manner. The Site must be left clear of all excess trash and debris at all times. Failure to comply will result in a fine to be assessed per day by the Owner.

ACCESS TO ADJOINING PROPERTIES

1. Access to adjoining properties, including those in the possession of Owner, shall be strictly forbidden unless direct and explicit written permission is given by Owner.

PARKING AND MATERIAL PLACEMENT

1. The Contractor shall coordinate with Owner for parking and placement of all materials and equipment.

2. Owner will not be responsible for any damaged, stolen, or vandalized equipment, vehicles, materials, supplies, etc.

INVOICING

1. Any and all changes to the original Construction Contract shall be acknowledged and approved by Owner, Engineer, and Contractor prior to commencement of pertinent work. Any unapproved work performed which is outside of the scope and arrangement of the original Contract shall be solely at Contractor's expense.

2. All monthly contract pay draws shall be submitted to Engineer for approval and verification (that all current Work has been completed and is in accordance with the Plans and Specifications) prior to payment processing by Owner. Monthly draws shall be submitted on or following the last day of each month and shall not include Work estimated to be completed but not actually completed. Contractor shall not invoice for materials on hand.

3. Contractor retainage will not be released until all applicable field acceptances are received from the respective agencies. In addition, all as-built plans, warranty assignments, payment and receipt affidavits, and acceptance checklists must also be received by the Engineer prior to release of retainage.

PERMITS

1. All required Permits/Tree Affidavit must be obtained prior to construction of any kind taking place.

2. Any construction without necessary Permits/Tree Affidavit is at Contractor's risk.

FIELD ACCEPTANCES AND APPROVALS

1. Contractor agrees that it will, as part of the award of Contract, obtain and provide to Owner all interim and final field inspection approvals, all interim and final completion approvals or certificates by governing utility and governmental authorities in writing, including Preliminary Field Acceptance upon Substantial Completion as well as Final Acceptance following the applicable warranty period. **The applicable warranty period for this Contract shall be 18 months from field acceptance for water, streets, and drainage**. Contractor agrees to timely provide plan of record construction documents within 30 calendar days of Substantial Completion of the project.

SCHEDULE

1. Contractor is to begin mobilization and erosion control on or before **TBD**.

2. Contractor to provide construction schedule with anticipated Final Acceptance date with their bid.

MISCELLANEOUS

1. Water GCPs will be available within ninety (90) days after bid is awarded.

2. Medina County approved plans will be available within 150 days.

3. Project is import. There is an existing stockpile located in the future unit, Redbird Ranch Phase 2 Unit 6M-1, to the northwest. Please refer to the stockpile exhibit for location. The remaining material is to balance Redbird Ranch Phase 2 Unit 3M-5. Contractor is responsible for all geotechnical testing for material prior to placement.

4. SCHEDULE is critical to this Project.

5. Coordination with other on-site contractor(s) will be required.

6. Construction access location will be determined by Engineer and Owner.

BID SUBMITTAL

The following must be submitted. Any item from this list not included in the bid will cause the bid to be disqualified.

1. Completed bid tab
2. Signed Instructions to Bidders form
3. Construction Schedule
4. Applicable addenda

LIQUIDATED DAMAGES

1. **Owner shall be entitled to recover from Contractor as liquidated damages and not as a penalty, the sum of $1,000.00 per day for each calendar day beyond the Substantial Completion Deadline that Contractor fails to achieve Substantial Completion of the Work (subject only to permissible delays properly documented as set forth in Section 2.11 of the construction contract).**

Contractor's signature shall indicate an understanding and acceptance of all conditions set forth in these Special Conditions.

By: _____ Date: _____

Bidder's Name & Address:

_____

_____

_____

END (CHT)

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 5200 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.

B. Section 00 7200 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.

C. Section 01 2100 - Allowances: Payment procedures relating to allowances.

D. Section 01 2200 - Unit Prices: Monetary values of unit prices; Payment and modification procedures relating to unit prices.

E. Section 01 7800 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Engineer for approval.

B. Forms filled out by hand will not be accepted.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.

D. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

E. Include within each line item, a direct proportional amount of Contractor's overhead and profit.

F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Engineer for approval.

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

H. Submit one hard-copies or digital copy of each Application for Payment.

I. Include the following with the application:
   1. Construction progress schedule, revised and current as specified in Section 01 3000.
   2. Current construction photographs specified in Section 01 3000.
   3. Partial release of liens from major subcontractors and vendors.
   4. Project record documents as specified in Section 01 7800, for review by Owner which will be returned to the Contractor.

J. When Engineer requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. For required changes, Engineer will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

B. For changes for which advance pricing is desired, Engineer will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.

C. Contractor may propose a change by submitting a request for change to Engineer, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Engineer for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Engineer.
   3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
   4. For change ordered by Engineer without a quotation from Contractor, the amount will be determined by Engineer based on the Contractor's substantiation of costs as specified for Time and Material work.

E. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

F. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

H. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
1. All closeout procedures specified in Section 01 7000.
2. Owner's punch list.

END OF SECTION

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contingency allowance.

B. Inspecting and testing allowances.

C. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CONTINGENCY ALLOWANCE

A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.

B. Funds will be drawn from the Contingency Allowance only by Change Order.

C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 INSPECTING AND TESTING ALLOWANCES

A. Costs Included in Inspecting and Testing Allowances: Cost of engaging an inspecting or testing agency; execution of inspecting and tests; and reporting results.

B. Costs Not Included in the Inspecting and Testing Allowances:
   1. Costs of incidental labor and facilities required to assist inspecting or testing agency.
   2. Costs of testing services used by Contractor separate from Contract Document requirements.
   3. Costs of retesting upon failure of previous tests as determined by Engineer.

C. Payment Procedures:
   1. Submit one copy of the inspecting or testing firm's invoice with next application for payment.
   2. Pay invoice on approval by Architect or Engineer.

D. Differences in cost will be adjusted by Change Order.

1.05 ALLOWANCES SCHEDULE

A. Section _____-_____: Include the stipulated sum of $_____ for purchase and delivery of _____.

B. Section _____-_____: Include the stipulated sum of $_____ for purchase and delivery of _____.

C. Section _____-_____: Include the stipulated sum of $_____ for purchase and delivery of _____.

D. Section _____-_____: Include the stipulated sum of $_____ for purchase and delivery of _____.

E. Section _____-_____: Include the stipulated sum of $_____ for installation of _____.

F. Section _____-_____: Include the stipulated sum of $_____ for installation of _____.

G. Section _____-_____: Include the stipulated sum of $_____ for installation of _____.

H. Section _____-_____: Include the stipulated sum of $_____ for installation of _____.

I. Contingency Allowance: Include the stipulated sum/price of $_____ for use upon Owner's instructions.

J. Inspecting and Testing Allowance: Include the sum of $_____ for payment of inspecting services specified in Section 01 4000 - Quality Requirements.

K. Soils Testing Allowance: Include the sum of $_____ for testing compacted soils specified in Section 31 2200.

L. Concrete Testing Allowance: Include the sum of $_____ for testing concrete specified in Section 03 3000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

C. Defect assessment and non-payment for rejected work.

1.02 RELATED REQUIREMENTS

A. Document 00 2113 - Instructions to Bidders: Instructions for preparation of pricing for Unit Prices.

B. Document 00 4322 - Unit Prices Form: List of Unit Prices as supplement to Bid Form

C. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.05 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. Measurements and quantities will be verified by Engineer.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

D. Measurement Devices:

E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

G. Measurement by Area: Measured by square dimension using mean length and width or radius.

H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

J. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Engineer prior to starting work.

K. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes , calculate and certify quantities for payment purposes.

1.06 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Engineer, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected Products.

1.07 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not complying with specified requirements.

B. If, in the opinion of Engineer, it is not practical to remove and replace the Work, Engineer will direct one of the following remedies:
   1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Engineer.
   2. The defective Work will be partially repaired to the instructions of the Engineer, and the unit price will be adjusted to a new unit price at the discretion of Engineer.

C. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct one of the following remedies:
   1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Owner.
   2. The defective Work will be partially repaired to the instructions of the Owner, and the unit price will be adjusted to a new unit price at the discretion of Owner.

D. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.

E. The authority of Owner to assess the defect and identify payment adjustment is final.

1.08 SCHEDULE OF UNIT PRICES

A. Item: _____; Section _____.

B. Item: _____; Section _____.

C. Item: _____; Section _____.

D. Item: _____; Section _____.

E. Item: _____; Section _____.

F. Item: _____; Section _____.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meetings.

F. Construction progress schedule.

G. Contractor's daily reports.

H. Progress photographs.

I. Coordination drawings.

J. Submittals for review, information, and project closeout.

K. Number of copies of submittals.

L. Requests for Interpretation (RFI) procedures.

M. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - General Conditions: Dates for applications for payment.

B. Section 01 3216 - Construction Progress Schedule: Form, content, and administration of schedules.

C. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.

D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Engineer:

1. Requests for Interpretation (RFI).
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

1.04 PROJECT COORDINATOR

A. Cooperate with the Project Manager in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.

B. During construction, coordinate use of site and facilities through the Project Manager.

C. Comply with Project Manager's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

D. Comply with instructions of the Project Manager for use of temporary utilities and construction facilities.

E. Coordinate field engineering and layout work under instructions of the Project Manager.

F. Make the following types of submittals to Engineer through the Project Manager:
   1. Requests for Interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.
   12. Plan of record drawings.
   13. As-built utility drawings.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENTS

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document.
   1. It is Contractor's responsibility to submit documents in allowable format.

3.02 PRECONSTRUCTION MEETING

A. Owner will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Engineer.
   3. Contractor.
   4. Geotechnical Engineer, if needed.
   5. Subcontractors, if needed.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Submission of initial Submittal schedule.
   6. Designation of personnel representing the parties to Contract and Engineer.
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Scheduling.
   9. Scheduling activities of a Geotechnical Engineer.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Engineer.
   4. Special consultants.
   5. Contractor's superintendent.
   6. Major subcontractors.
   7. Architect.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   6. Security and housekeeping procedures.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   10. Procedures for maintaining record documents.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Engineer.
   4. Special consultants.
   5. Contractor's superintendent.
   6. Major subcontractors.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of RFIs log and status of responses.
   7. Review of off-site fabrication and delivery schedules.
   8. Maintenance of progress schedule.
   9. Corrective measures to regain projected schedules.
   10. Planned progress during succeeding work period.
   11. Coordination of projected progress.
   12. Maintenance of quality and work standards.

13. Effect of proposed changes on progress schedule and coordination.
14. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.06 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
   1. Date.
   2. High and low temperatures, and general weather conditions.
   3. List of subcontractors at Project site.
   4. List of separate contractors at Project site.
   5. Approximate count of personnel at Project site.
      a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
   6. Major equipment at Project site.
   7. Material deliveries.
   8. Safety, environmental, or industrial relations incidents.
   9. Meetings and significant decisions.
   10. Unusual events (submit a separate special report).
   11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
   12. Emergency procedures.
   13. Directives and requests of authority having jurisdiction (AHJ).
   14. Change Orders received and implemented.
   15. Testing and/or inspections performed.
   16. List of verbal instruction given by Owner and/or Engineer.
   17. Signature of Contractor's authorized representative.

3.07 PROGRESS PHOTOGRAPHS

A. Submit new photographs at least once a month, within 3 days after being taken.

B. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.

C. Photography Type: Digital; electronic files.

D. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Engineer.

E. In addition to periodic, recurring views, take photographs of each of the following events:

1. Completion of site clearing.
2. Excavations in progress.
3. Foundations in progress and upon completion.
4. Structural framing in progress and upon completion.
5. Enclosure of building, upon completion.
6. Final completion, minimum of ten (10) photos.

F. Views:
1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
2. Consult with Engineer for instructions on views required.
3. Provide factual presentation.
4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

G. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
1. Delivery Medium: Via email.
2. File Naming: Include project identification, date and time of view, and view identification.
3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.08 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to Engineer.

3.09 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
1. Prepare a separate RFI for each specific item.
a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
b. Do not forward requests which solely require internal coordination between subcontractors.
2. Prepare in a format and with content acceptable to Owner.
3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
1. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
a. Approval of submittals (use procedures specified elsewhere in this section).
b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).

2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
    a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Engineer, and any of its consultants, due to processing of such RFIs.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. Owner's, Engineer's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
2. Note dates of when each request is made, and when a response is received.
3. Highlight items requiring priority or expedited response.
4. Highlight items for which a timely response has not been received to date.

H. Review Time: Engineer will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Engineer within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.10 SUBMITTAL SCHEDULE

A. Submit to Engineer for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule specified in Section - 01 3216 - Construction Progress Schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.
   4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.11 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Engineer for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.12 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Engineer's knowledge as contract administrator or for Owner.

3.13 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.14 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Engineer.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.15 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. Transmit using approved form.
      a. Use Contractor's form, subject to prior approval by Engineer.
   4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Deliver submittals to Engineer at business address.
   8. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Engineer's consultants, Owner, or another affected party, allow an additional 7 days.
   9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   10. Provide space for Contractor and Engineer review stamps.
   11. When revised for resubmission, identify all changes made since previous submission.
   12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
   14. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Do not reproduce Contract Documents to create shop drawings.
   3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:

1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.16 SUBMITTAL REVIEW

A. Submittals for Review: Engineer will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Engineer will acknowledge receipt and review. See below for actions to be taken.

C. Engineer's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Engineer's and consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "Approved", or language with same legal meaning.
      b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
      c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
         1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
         2) Non-responsive resubmittals may be rejected.
   2. Not Authorizing fabrication, delivery, and installation:
      a. "Revise and Resubmit".
         1) Resubmit revised item, with review notations acknowledged and incorporated.
      b. "Rejected".
         1) Submit item complying with requirements of Contract Documents.

E. Engineer's and consultants' actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1-GENERAL

1.01 SUBMITTALS

A. Submit two prints of all Shop Drawings until final acceptance. One print will be returned to the General Contractor after Engineer's review.

B. Submit a minimum of four copies of all Product Data until final acceptance. Three copies of the Product Data will be returned to the General Contractor after Engineer's review.

C. Submit a minimum of duplicates of all Samples. Additional samples may be required for specific items for coordination of finishes.

D. Submit additional copies of Samples and Product Data as necessary for distribution to subcontractors. Contractor shall obtain and distribute required prints of Shop Drawings made from reviewed and stamped reproducible. Exact number of copies of Product Data, Samples and Shop Drawings to be submitted shall be established in the pre-construction conference.

E. Contractor shall review and stamp with his approval all submittals. Any submittals which do not bear the Contractor's approval stamp shall be returned without review.

F. Where printed materials describe more than one product or model, clearly identify which is to be furnished.

G. Shop Drawings shall not be reproductions of Contract Documents.

H. Contractor shall make any corrections noted on Engineer's reviewed copies of submittals and shall resubmit the required number of corrected copies of Shop Drawings and Product Data or new Samples.

I. Each Shop Drawing, Sample and Product Data submittal shall be properly identified bearing the name and quality of the material, the manufacturer's name, the Contractor's name, the Subcontractor's name, the name of the Project and the date of submission, and referenced to the applicable Specification Section.

J. Engineer's checking of Shop Drawings, Samples or Product Data which deviates from the Contract Documents does not authorize changes to the Contract Sum. Submit in writing at the time of submission any changes to the Contract Sum affected by such Shop Drawings, Samples or Product Data, otherwise, claim for extras will not be considered.

K. Submit schedule of Shop Drawing and Sample Submittals within 15 days after notice to proceed.

END OF SECTION

PROJECT MEETINGS

PART 1 - GENERAL

1.01 PRE-CONSTRUCTION MEETING

A. Contractor will schedule and administer a pre-construction meeting within 15 days after date of Notice to Proceed.

B. Location: A central site, convenient for all parties, provided by Contractor.

C. Attendance
   1. Owner's Representative.
   2. Engineer's Representative.
   3. Contractor's Superintendent.
   4. Others as appropriate.

D. Agenda
   1. Contractor's progress and schedule chart.
   2. Review of required submittals.
   3. Processing of applications for payment.
   4. Critical work sequencing.
   5. Equipment and supply deliveries.
   6. Storage areas, security housekeeping and Owner's needs.
   7. Record minutes and distribute copies within three days after meeting to participants, with one copy each to Engineer, Owner, participants, and those affected by decisions made.

1.02 PROGRESS MEETINGS

A. Contractor shall schedule regular periodic meetings, as required.

B. Hold called meetings as required by progress of the work.

C. Attendance:
   1. Contractor's Project Manager and Superintendent.
   2. Engineer's Representative.
   3. Suppliers as appropriate to the agenda.
   4. Others as appropriate.

END OF SECTION

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

A. Section 01 1000 - Summary: Work sequence.

1.03 REFERENCE STANDARDS

A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

1.04 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit in PDF format.

G. Submit under transmittal letter form specified in Section 01 3000 - Administrative Requirements.

1.05 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with two years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.06 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches (560 x 432 mm).

C. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules to define critical portions of the entire schedule.

E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

F. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Engineer. Indicate decision dates for selection of finishes.

G. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Engineer at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Engineer, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECURITY PROGRAM

A. Protect Work , existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

B. Initiate program in coordination with Owner's existing security system at project mobilization.

C. Maintain program throughout construction period until Owner occupancy.

1.02 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls.

1.03 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification.

C. Allow entrance only to authorized persons with proper identification.

D. Maintain log of workers and visitors, make available to Owner on request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Contractor's construction-related professional design services.

F. Control of installation.

G. Tolerances.

H. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 - Allowances: Allowance for payment of testing services.

B. Section 01 3000 - Administrative Requirements: Submittal procedures.

C. Section 01 4216 - Definitions.

1.03 REFERENCE STANDARDS

A. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

1.04 DEFINITIONS

A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

B. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.05 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
   1. Temporary sheeting, shoring, or supports.
   2. Temporary scaffolding.
   3. Temporary bracing.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Engineer and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.

j. Compliance with Contract Documents.
k. When requested by Engineer, provide interpretation of results.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Engineer, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.07 QUALITY ASSURANCE

A. Testing Agency Qualifications:
1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

C. Contractor's Quality Control (CQC) Plan:
1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
1) Include qualifications (in resume form), duties, responsibilities of each person assigned to CQC function.
b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
1) Management and control of documents and records relating to quality.
2) Communications.
3) Coordination procedures.
4) Resource management.
5) Process control.
6) Inspection and testing procedures and scheduling.
7) Control of noncomplying work.
8) Tracking deficiencies from identification, through acceptable corrective action, and verification.
9) Control of testing and measuring equipment.
10) Project materials certification.
11) Managerial continuity and flexibility.
c. Owner will not make a separate payment for providing and maintaining a Quality Control Plan. Include associated costs in Bid price.
d. Acceptance of the plan is required prior to start of construction activities not including mobilization work. Owner's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. Owner reserves the right to require

Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.

D. Quality-Control Personnel Qualifications. Engage a person with requisite training and experience to implement and manage quality assurance (QA) and quality control (QC) for the project.

1.08 REFERENCES AND STANDARDS

1.09 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ services of an independent testing agency to perform certain specified testing; payment for cost of services will be derived from allowance specified in Section 01 2100; see Section 01 2100 and applicable sections for description of services included in allowance.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 3 EXECUTION

2.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2.02 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

2.03 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Engineer and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Engineer.
   6. Attend preconstruction meetings and progress meetings.
   7. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Engineer.

F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

2.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

A. Furnish: To supply, deliver, unload, and inspect for damage.

B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

D. Provide: To furnish and install.

E. Supply: Same as Furnish.

1.03 ABBREVIATIONS AND NAMES

A. The following acronyms or abbreviations as referenced in contract documents are defined to mean the associated names. Names are subject to change, and are believed to be, but are not assured to be, accurate and up-do-date as of date of contract documents:

1. AA Aluminum Association
2. AAMA American Architectural Manufacturers Association
3. AAN American Association of Nurserymen
4. AASHTO American Association of State Highway and Transportation Officials
5. AATCC American Association of Textile Chemists and Colorists
6. ACI American Concrete Institute
7. ACIL American Council of Independent Laboratories
8. ACPA American Concrete Pipe Association
9. ADC Air Diffusion Council
10. AFBMA Anti-Friction Bearing Manufacturers Association, Inc.
11. AGA American Gas Association
12. AHAM Association of Home Appliance Manufacturers
13. AI Asphalt Institute
14. AIA American Institute of Architects
15. AIA American Insurance Association
16. AISC American Institute of Steel Construction
17. AISI American Iron and Steel Institute
18. AITC American Institute of Timber Construction
19. ALSC American Lumber Standards Committee
20. AMCA Air Movement and Control Association
21. ANSI American National Standards Institute
22. APA American Plywood Association
23. APA American Parquet Association
24. ARI Air Conditioning and Refrigeration Institute
25. ASC Adhesive and Sealant Council
26. ASCE American Society of Civil Engineers
27. ASHREA Architectural Society of Heating, Refrigerating and Air-Conditioning Engineers
28. ASME American Society of Mechanical Engineers
29. ASPE American Society of Plumbing Engineers
30. ASSE American Society of Sanitary Engineers

31. ASTM American Society for Testing and Materials
32. AWI Architectural Woodwork Institute
33. AWPA American Wood-Preservers' Association
34. AWPB American Wood-Preservers Bureau
35. AWS American Welding Society
36. AWWA American Water Works Association
37. BHMA Builders Hardware Manufacturers Association
38. BIA Brick Institute of America
39. BIFMA Business and Institutional Furniture Manufacturer's Association
40. CBM Certified Ballast Manufacturers
41. CDA Copper Development Association
42. CE Corps of Engineers (U.S. Dept. of the Army)
43. CFFA Chemical Fabrics and Film Association, Inc.
44. CFR Code of Federal Regulations
45. CGA Compressed Gas Association
46. CISPI Cast Iron Soil Pipe Institute
47. CLFMI Chain Link Fence Manufacturer's Institute
48. CPSC Consumer Product Safety Commission
49. CRA California Redwood Association
50. CRI Carpet and Rug Institute
51. CRSI Concrete Reinforcing Steel Institute
52. CS Commercial Standard of NBS (U.S. Dept. of Commerce)
53. CTI Ceramic Tile Institute
54. DHI Door and Hardware Institute
55. DLPA Decorative Laminate Products Association
56. DOC Department of Commerce
57. DOT Department of Transportation
58. EIA Electronic Industries Association
59. EPA Environmental Protection Agency
60. FAA Federal Aviation Administration (U.S. Dept of Transportation)
61. FCC Federal Communications Commission
62. FCI Fluid Controls Institute
63. FGMA Flat Glass Marketing Association
64. FHA Federal Housing Administration (U.S. Dept. of HUD)
65. FM Factory Mutual System
66. FS Federal Specification (General Services Admin.)
67. FTI Facing Tile Institute
68. GA Gypsum Association
69. GSA General Services Administration
70. HPMA Hardwood Plywood Manufacturers Association
71. IEEE Institute of Electrical and Electronic Engineers, Inc.
72. IESNA Illuminating Engineering Society of North America
73. IGCC Insulating Glass Certification Council
74. ILI Indiana Limestone Institute of America
75. IMIAC International Masonry Industry All-Weather Council
76. IRI Industrial Risk Insurance
77. ISA Instrument Society of America
78. MBMA Metal Building Manufacturer's Association
79. MCAA Mechanical Contractors Association of America
80. MIA Marble Institute of America
81. MIL Military Standardization Documents (U.S. Dept. of Defense)
82. ML/SFA Metal Lath/Steel Framing Association
83. MSS Manufacturers Standardization Society of the Valve and Fittings Industry

84. NAAMM National Association of Architectural Metal Manufacturers
85. NBGQA National Building Granite Quarries Association
86. NBS National Bureau of Standards (U.S. Dept. of Commerce)
87. NCMA National Concrete Masonry Association
88. NCRPM National Council on Radiation Protection and Measurement
89. NEC National Electrical Code (by NFPA)
90. NECA National Electrical Contractors Association
91. NEII National Elevator Industry, Inc.
92. NEMA National Electrical Manufacturers Association
93. NFPA National Fire Protection Association
94. NFPA National Forest Products Association
95. NHLA National Hardwood Lumber Association
96. NKCA National Kitchen Cabinet Association
97. NOFMA National Oak Flooring Manufacturers Association
98. NPA National Particleboard Association
99. NPCA National Paint and Coatings Association
100. NRCA National Roofing Contractors Association
101. NRMCA National Ready-Mix Concrete Association
102. NSF National Sanitation Foundation
103. NSSEA National School Supply and Equipment Association
104. NTMA National Terrazzo and Mosaic Association
105. NWMA National Woodwork Manufacturers Association
106. OSHA Occupational Safety Health Administration (U.S. Dept. of Labor)
107. PCA Portland Cement Association
108. PCI Prestressed Concrete Institute
109. PDI Plumbing and Drainage Institute
110. PEI Porcelain Enamel Institute
111. PS Product Standard of NBS (U.S. Dept. of Commerce)
112. RFCI Resilient Floor Covering Institute
113. RIS Redwood Inspection Service (Grading Rules)
114. SAMA Scientific Apparatus Makers Association
115. SDI Steel Deck Institute
116. SGCC Safety Glazing Certification Council
117. SHLMA Southern Hardwood Lumber Manufacturers Association
118. SIGMA Sealed Insulating Glass Manufacturers Association
119. SJI Steel Joist Institute
120. SMACNA Sheet Metal and Air Conditioning Contractors' National Association
121. SPIB Southern Pine Inspection Bureau (Grading Rules)
122. SPIB Southern Pine Inspection Bureau
123. SSPC Steel Structures Painting Council
124. SWI Steel Window Institute
125. TCA Tile Council of America
126. TIMA Thermal Insulation Manufacturers Association
127. TPI Truss Plate Institute
128. TxDOT Texas Department of Transportation
129. UBC Uniform Building Code
130. UL Underwriters Laboratories
131. USDA United States Department of Agriculture
132. USPS United States Postal Service
133. WCLIB West Coast Lumber Inspection Bureau (Grading Rules)
134. WRI Wire Reinforcement Institute
135. WSC Water Systems Council
136. WSFI Wood and Synthetic Flooring Institute

137. WWPA Western Wood Products Association (Grading Rules)
138. WWPA Woven Wire Products Association

1.04 GENERAL SPECIFICATION ABBREVIATIONS

A. Cubic Foot - cu. ft.
B. Degree - deg.
C. Diameter - dia.
D. Feet or Foot - ft.
E. Inch - in.
F. Inside Diameter - i.d.
G. Kips (1000 pounds) - K
H. Millimeter mm
I. Ounce - oz.
J. Outside Diameter - o.d.
K. Pound - lb.
L. Pounds per Cubic Foot - pcf
M. Pounds per Square Foot - psf
N. Pounds per Square Inch - psi
O. Square Foot - sq. ft.
P. Square Inch - sq. in.

1.05 REFERENCE STANDARDS - GENERAL

A. Publications of organizations and societies listed in individual Specification Sections shall be considered integral with Contract Documents to extent referenced.
B. Publications are referred to in text by basic designation only with organizations and societies referenced by abbreviations.
C. When standard is referenced to in individual Specification Section but is not listed in this Section by title and date, it shall be considered to be latest revision at date of Project Manual issuance.
D. Make available at site, copies of referenced documents as Engineer or Owner may request.
E. Following listings include full title and applicable revision date.

1.06 REFERENCE STANDARDS

A. American Concrete Institute (ACI):
   1. 211.1-81 (Revised 1985), Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
   2. 211.2-81, Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
   3. 211.3-75 (Revised 1987), Standard Practice for Selecting Proportions for No-Slump Concrete.
   4. 301-84 (Revised 1987), Specification for Structural Concrete for Buildings.
   5. 304R-85, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
   6. 306R-77 (Revised 1982), Hot Weather Concreting.
   7. 306R-78 (Revised 1983), Cold Weather Concreting.
   8. 308-81 (Revised 1986), Standard Practice for Curing Concrete.
   9. 309-72 (Revised 1982), Standard Practice for Consolidation of Concrete.
   10. 315-80, Details and Detailing of Reinforced Concrete (included in SP-66).
   11. 318-83 (Revised 1986), Building Code Requirements for Reinforced Concrete.
   12. 347-78 (Reapproved 1984), Recommended Practice for Concrete Formwork.
   13. SP-66, ACI Detailing Manual (1980 Edition).

B. American Institute of Steel Construction (AISC):
   1. Code of Standard Practice for Steel Buildings and Bridges (with Commentary), September 1, 1976.
   2. Manual of Steel Construction, Eighth Edition.
   3. Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings (with Commentary), November 1, 1978.
   4. Specification for Structural Joints Using ASTM A325 or A490 Bolts, April 26, 1978.

C. American Society for Testing and Materials (ASTM)
   1. A 36-84a, Specification for Structural Steel.
   2. A 47-84, Specification for Ferritic Malleable Iron Castings.
   3. A 53-84a, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
   4. A 82-85, Specification for Steel Wire, Plain, for Concrete Reinforcement.
   5. A 108-81, Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
   6. A 116-81, Specification for Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric.
   7. A 123-84, Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
   8. A 153-84, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   9. A 185-85, Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
   10. A 242-87, Specification for High-Strength Low-Alloy Structural Steel.
   11. A 307-86, Specification for Carbon Steel Bolts and Studs, 6000 psi Tensile Strength.
   12. A 325-86a, Specification for High-Strength Bolts for Structural Steel Joints.
   13. A 370-86a, Methods and Definitions for Mechanical Testing of Steel Products.
   14. A 416-86, Specification for Steel Strand, Uncoated Seven-Wire Stress-Relieved for Prestressed Concrete.
   15. A 421-80 (1985), Specification for Uncoated Stress-Relieved Wire for Prestressed Concrete.
   16. A 446-85, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
   17. A 475-85, Specification for Zinc-Coated Steel Wire Strand.
   18. A 490-85, Specification for Heat-Treated, Steel Structural Bolts 150 KSI Tensile Strength.
   19. A 500-84, Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
   20. A 501-84, Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
   21. A 514-87a, Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding.
   22. A 525-83, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
   23. A 572-84, Specification for High-Strength Low-Alloy Columbium-Vanadium Steel of Structural Quality.
   24. A 576-81, Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality.
   25. A 588-87, Specification for High-Strength Low-Alloy Structural Steel with 50,000 psi Minimum Yield Point to 4 in. Thick.
   26. A 611-85, Specification for Steel, Sheet, Carbon, Cold-Rolled Structural Quality.
   27. A 615-87, Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   28. A 706-84a, Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
   29. A 775-85, Specification for Epoxy-Coated Reinforcing Steel Bars.
   30. A 633-85, Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
   31. C 31-85, Method for Making and Curing Concrete Test Specimens in the Field.
   32. C 33-86, Specification for Concrete Aggregates.
   33. C 39-86, Test for Compressive Strength of Cylindrical Concrete Specimens.

34. C 42-84a, Methods for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
35. C 90-85, Specification for Hollow Load-Bearing Concrete Masonry Units.
36. C 91-86, Specification for Masonry Cement.
37. C 94-86, Specification for Ready-Mixed Concrete.
38. C 109-86, Test Method for Compressive Strength of Hydraulic Cement Mortars.
39. C 138-81, Test Method for Unit Weight, Yield and Air Content (Gravimetric) of Concrete.
40. C 140-75 (1980), Method of Sampling and Testing Concrete Masonry Units.
41. C 143-78, Test Method for Slump of Portland Cement Concrete.
42. C 144-87, Specification for Aggregate for Masonry Mortar.
43. C 150-85a, Specification for Portland Cement.
44. C 171-69 (1986), Specification for Sheet Materials for Curing Concrete.
45. C 172-82, Method of Sampling Freshly Mixed Concrete.
46. C 173-78, Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
47. C 190-85, Test Method for Tensile Strength of Hydraulic Cement Mortars.
48. C 207-79 (1984), Specification for Hydrated Lime for Masonry Purposes.
49. C 231-82, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
50. C 260-85, Specification for Air-Entraining Admixtures for Concrete.
51. C 270-86b, Specification for Mortar for Unit Masonry.
52. C 309-81, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
53. C 311-85, Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.
54. C 330-87, Specification for Lightweight Aggregates for Structural Concrete.
55. C 404-87, Specification for Aggregates for Masonry Grout.
56. C 476-83, Specification for Grout for Reinforced and Non-reinforced Masonry.
57. C 494-86, Specification for Chemical Admixtures for Concrete.
58. C 567-85, Test Method for Unit Weight of Structural Lightweight Concrete.
59. C 595-86, Specification for Blended Hydraulic Cements.
60. C 618-85, Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement.
61. C 780-80 (1985), Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
62. C 827-82, Test Method for Early Volume Change of Cementitious Mixtures.
63. C 938-80 (1985), Practice for Proportioning Grout Mixtures for Preplaced-Aggregate Concrete.
64. C 942-86, Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory.
65. C 989-85a, Specification for Ground Iron Blast-Furnace Slag for Use in Concrete and Mortars.
66. D 98-80, Specification for Calcium Chloride.
67. D 994-71 (Reaffirmed 1982), Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
68. D 1751-83, Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
69. D 1752-84, Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
70. D 2092-86, Recommended Practices for Preparation of Zinc-Coated Galvanized Steel Surfaces for Painting.
71. D 2240-86, Test for Rubber Property - Durometer Hardness.
72. D 3034, Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
73. E 164-81, Practice for Ultrasonic Contact Examination of Weldments.

74. E 329-77 (1983), Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.
75. E 447-84, Test Methods for Compressive Strength of Masonry Prisms.

D. American Welding Society (AWS):
1. A5.1-81, Specification for Carbon Steel Covered Arc-Welding Electrodes.
2. A5.5-81, Specification for Low-Alloy Steel Covered Arc-Welding Electrodes.
3. A5.17-80, Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc-Welding.
4. A5.20-79, Specification for Carbon Steel Electrodes for Flux Cored Arc-Welding.
5. B2.1-84, Welding Procedure and Performance Qualification.
6. D1.1-86, Structural Welding Code - Steel.
7. D1.3-81, Specification for Welding of Sheet Metal in Structures.
8. D1.4-79, Structural Welding Code - Reinforcing Steel.
9. QC-1-86, Standard for Qualification and Certification of Welding Inspectors.

E. Prestressed Concrete Institute (PCI):
1. MNL 116-77, Manual for Quality Control for Plants and Production of Precast Prestressed Concrete Products.
2. MNL 117-77, Manual for Quality Control of Plants and Production of Architectural Precast Concrete Products

F. Steel Deck Institute (SDI):
1. Specification for Composite Steel Floor Deck, 1987.
2. Specification for Non-Composite Steel Form Deck, 1987.
3. Specification for Steel Roof Deck, 1987.

G. Steel Joist Institute (SJI):
1. Recommended Code of Standard Practice for Steel Joists, November 4, 1985.
2. Standard Specification for Joist Girders, November 4, 1985.
3. Standard Specification for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series, November 4, 1985.
4. Standard Specification for Open Web Steel Joists, K-Series, November 1, 1985.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering
B. Temporary utilities.
C. Temporary telecommunications services.
D. Temporary sanitary facilities.
E. Temporary Controls: Barriers, enclosures, and fencing.
F. Security requirements.
G. Vehicular access and parking.
H. Waste removal facilities and services.
I. Project identification sign.
J. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 01 5100 - Temporary Utilities.
B. Section 01 5213 - Field Offices and Sheds.
C. Section 01 5500 - Vehicular Access and Parking.
D. Section 01 5813 - Temporary Project Signage.

1.03 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.
B. Maintain temporary facilities in operable condition.

1.04 TEMPORARY UTILITIES - SEE SECTION 01 5100

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

1.05 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:

1.06 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.

1.07 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide protection for plants designated to remain. Replace damaged plants.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.08 FENCING

A. Construction: Commercial grade chain link fence.
B. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.09 SECURITY - SEE SECTION 01 3553

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING - SEE SECTION 01 5500

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

F. Do not allow vehicle parking on existing pavement.

1.11 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PROJECT SIGNS - SEE SECTION 01 5813

1.13 PROJECT IDENTIFICATION

A. Provide project identification sign of design, construction, and location approved by Owner.

B. No other signs are allowed without Owner permission except those required by law.

1.14 FIELD OFFICES - SEE SECTION 01 5213

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

1.15 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Provision of electricity, lighting, heat, ventilation, water, and sanitation.

1.02 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls:
   1. Temporary telecommunications services for administrative purposes.
   2. Temporary sanitary facilities required by law.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.04 TEMPORARY ELECTRICITY

A. Cost: By Contractor.

B. Provide power service required from utility source.

C. Complement existing power service capacity and characteristics as required.

D. Permanent convenience receptacles may be utilized during construction.

E. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.05 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain LED, compact fluorescent, or high-intensity discharge lighting as suitable for the application for construction operations in accordance with requirements of 29 CFR 1926 and authorities having jurisdiction.

B. Maintain lighting and provide routine repairs.

1.06 TEMPORARY HEATING

A. Cost of Energy: By Contractor.

B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

C. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.07 TEMPORARY COOLING

A. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.

B. Maintain maximum ambient temperature of 80 degrees F (26 degrees C) in areas where construction is in progress, unless indicated otherwise in specifications.

1.08 TEMPORARY VENTILATION

1.09 TEMPORARY WATER SERVICE

A. Cost of Water Used: By Contractor.

B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

C. Connect to existing water source.
   1. Exercise measures to conserve water.
   2. Provide separate metering and reimburse Owner for cost of water used.

D. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

FIELD OFFICES AND SHEDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary field offices for use of Contractor.

B. Maintenance and removal.

1.02 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls:
   1. Temporary telecommunications services for administrative purposes.
   2. Temporary sanitary facilities required by law.

B. Section 01 5000: Parking and access to field offices.

1.03 USE OF EXISTING FACILITIES

A. Existing facilities shall not be used for field offices.

1.04 USE OF PERMANENT FACILITIES

A. Permanent facilities shall not be used for field offices.

PART 2 PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS

A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

2.02 CONSTRUCTION

A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.

B. Exterior Materials: Weather resistant, finished in one color.

C. Interior Materials in Offices: Sheet type materials for walls and ceilings, prefinished or painted; resilient floors and bases.

D. Fire Extinguishers: Appropriate type fire extinguisher at each office.

2.03 ENVIRONMENTAL CONTROL

A. Heating, Cooling, and Ventilating: Automatic equipment to maintain comfort conditions.

2.04 CONTRACTOR OFFICE AND FACILITIES

A. Size: For Contractor's needs and to provide space for project meetings.

B. Furnishings in Meeting Area: Conference table and chairs to seat at least eight persons; racks and files for Contract Documents, submittals, and project record documents.

C. Other Furnishings: Contractor's option.

2.05 OWNER AND ARCHITECT/ENGINEER OFFICE

PART 3 EXECUTION

3.01 PREPARATION

A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.02 MAINTENANCE AND CLEANING

A. Weekly janitorial services for offices; periodic cleaning and maintenance for offices.

B. Maintain approach walks free of mud, water, and snow.

3.03 REMOVAL

A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

END OF SECTION

VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access roads.

B. Parking.

C. Existing pavements and parking areas.

D. Permanent pavements and parking facilities.

E. Construction parking controls.

F. Flag persons.

G. Haul routes.

H. Traffic signs and signals.

I. Maintenance.

J. Removal, repair.

K. Mud from site vehicles.

1.02 RELATED REQUIREMENTS

A. Section 01 5813 - Temporary Project Signage: Post Mounted and Wall Mounted Traffic Control and Informational Signs.

B. Section 31 2200 - Grading: Specifications for earthwork and paving bases.

PART 3 EXECUTION

2.01 PREPARATION

A. Clear areas, provide surface and storm drainage of road, parking, area premises, and adjacent areas.

2.02 ACCESS ROADS

A. Use of existing on-site streets for construction traffic is not permitted.

B. Tracked vehicles not allowed on paved areas.

C. Construct new temporary all-weather access roads from public thoroughfares to serve construction area, of a width and load bearing capacity to provide unimpeded traffic for construction purposes.

D. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.

E. Extend and relocate as work progress requires, provide detours as necessary for unimpeded traffic flow.

F. Location as indicated.

G. Provide unimpeded access for emergency vehicles. Maintain 20 foot (6 m) width driveways with turning space between and around combustible materials.

H. Provide and maintain access to fire hydrants free of obstructions.

2.03 PARKING

A. Use of existing parking facilities by construction personnel is not permitted.

B. Use of new parking facilities by construction personnel is not permitted.

C. Arrange for temporary parking areas to accommodate use of construction personnel.

D. When site space is not adequate, provide additional off-site parking.

2.04 PERMANENT PAVEMENTS AND PARKING FACILITIES

A. Prior to Substantial Completion the base for permanent roads and parking areas may be used for construction traffic.

B. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.

2.05 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.

C. Prevent parking on or adjacent to access roads or in non-designated areas.

2.06 FLAG PERSONS

A. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

2.07 HAUL ROUTES

A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.

B. Confine construction traffic to designated haul routes.

C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

2.08 TRAFFIC SIGNS AND SIGNALS

A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

B. Relocate as work progresses, to maintain effective traffic control.

2.09 MAINTENANCE

A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.

B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

2.10 REMOVAL, REPAIR

A. Remove temporary roads when permanent paving is usable.

B. Remove underground work and compacted materials to a depth of 2 feet (600 mm); fill and grade site as specified.

C. Repair existing facilities damaged by use, to original condition.

D. Remove equipment and devices when no longer required.

E. Repair damage caused by installation.

2.11 MUD FROM SITE VEHICLES

A. Provide means of removing mud from vehicle wheels before entering streets.

END OF SECTION

SPILL RESPONSE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Guideline for Contractors for handing petroleum hydrocarbon spills and leaks on the project site.

1.02 RELATED SECTIONS -- NOT USED

1.03 REFERENCES

A. Texas Commission on Environmental Quality Regulations, TAC Ch. 327.

B. Edwards Aquifer Authority, Ch. 713, Subchapter E.

1.04 SUBMITTALS

A. Summary report of procedures and operational sequence for review and approval by Pape-Dawson Engineers (Engineer) as Owner's Representative.

B. Manifest and disposal records.

C. Testing and laboratory sampling results.

PART 2 PRODUCTS

2.01 MATERIALS

A. Contractor to pay for any and all testing, excavation, disposal, and consultants/contractors required for the execution of the work.

PART 3 EXECUTION

3.01 CONDITIONS

A. Texas Commission on Environmental Quality (TCEQ) and Edwards Aquifer Authority (EAA) regulations require reporting of fuel spills or leaks of 25 gallons or more to the land surface, or any quantity sufficient to create a sheen on surface water. For oils, the reporting requirements are a spill of 210-gallons to the land surface or a quantity sufficient to create a sheen on surface water.

B. Spills of quantities to the land in excess of 1-gallon, or spills that affect more than 10-square feet of ground surface, although not large enough to require reporting to TCEQ, must be reported by the Contractor to the Engineer and appropriate emergency response actions should be implemented.

C. Cleanup of any spills related to the project shall be completed to non-detect conditions, unless the constituent is naturally occurring in which case TCEQ State specific background concentrations may be used as cleanup goals, as determined by the Engineer.

3.02 SPILL RESPONSE ACTIONS

A. Appropriate response actions may vary, depending on the volume spilled or leaked and the location of the spill.
   1. In all cases, attempts to minimize the volume lost and the size of the area affected should be made.
   2. Spills/leaks on asphalt, concrete or other impervious surface, may be cleaned using absorbent materials, i.e., oil absorbent pads or socks, or granular material.
   3. Spills/leaks to soil or bedrock will likely require excavation.

B. Contractor to take immediate action to contain the spill. Implement emergency response measures to stop and contain leak/spill. Appropriate emergency response measures include, but are not limited to, placement of absorbent materials on top of and downstream of leak/spill or construction of berm downstream of leak/spill to prevent further spread of material.

C. Contact Fire Department or other appropriate Emergency Management Agency as necessary to minimize loss of property or life.

D. Notify Engineer within 24 hours of the leak/spill.

E. Notify TCEQ and EAA if the project is within the Edwards Aquifer Recharge Zone or 5 miles upgrade within 24 hours if quantity of material leaked/spilled meets Section 3.01, A. above.

F. Follow protocol as shown on attached flow chart that describes some possible scenarios.

3.03 CLEANUP

A. Impacted material should be segregated from material not impacted by the leak/spill. Impacted materials may include loose material, absorbent material, or excavated material.

B. Excavated and segregated materials should be stored on plastic and covered with plastic, or stored within a drum, roll-off box, or other covered container, pending characterization and disposal at an approved disposal facility.

C. The volume of material segregated and disposed should be recorded, and copies of disposal manifests should be provided to the Engineer.

D. After excavation of impacted soil, the Engineer will evaluate the area excavated and determine if sampling of remaining subgrade will be necessary.

E. The determination will be made on a site-specific basis and will be a function of volume spilled/leaked, size of area affected, soil type, type of product spilled/leaked, location of spill/leak, etc.

F. If sampling and analysis indicate constituents of concern are detected in the soil or rock subgrade, then additional excavation will be necessary. The Contractor shall continue to excavate at the direction of the Engineer until further sample and analysis results indicate that constituents of concern are no longer detected.

G. After Engineers approval, the excavated area may be backfilled.

H. The Contractor may hire their own environmental consultant/contractor to perform sampling, analysis, and cleanup oversight. In this case the Contractor's consultant must coordinate all their activities with the Engineer prior to each step, phase, or course of action.

I. The Engineer may collect additional confirmation samples if warranted, and will provide approval that corrective actions are complete before the excavation is backfilled.

J. Contractor must notify Engineer 48-hours in advance of sample collection and disposal. Contractor must provide Engineer or designated construction observer with opportunity to observe Contractor's implementation of approved cleanup method and to collect and split samples, is so desired by Engineer.

END OF SECTION

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED REQUIREMENTS

A. Section 31 1000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.

B. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.

C. Section 31 3700 - Riprap: Temporary and permanent stabilization using riprap.

1.03 REFERENCE STANDARDS

A. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).

B. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.

C. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; 1995.

1.04 PERFORMANCE REQUIREMENTS

A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP).

B. Comply with requirements of State of TX Erosion and Sedimentation Control Manual.

C. Comply with all requirements of TPDES for erosion and sedimentation control.

D. Best Management Practices Standard: FHWA FLP-94-005.

E. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

F. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
   1. Obtain and pay for permits and provide security required by authority having jurisdiction.
   2. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.

G. Timing: Put preventive measures in place before disturbance of surface cover and before precipitation occurs.

H. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

I. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.

2. Prevent development of ruts due to equipment and vehicular traffic.
3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

J. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
1. Prevent windblown soil from leaving the project site.
2. Prevent tracking of mud onto public roads outside site.
3. Prevent mud and sediment from flowing onto sidewalks and pavements.
4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

K. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

L. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

M. Open Water: Prevent standing water that could become stagnant.

N. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. Erosion and Sedimentation Control Plan:
1. Submit not less than 30 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
2. Include:
a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
e. Other information required by law.
f. Format required by law is acceptable, provided any additional information specified is also included.
3. Obtain the approval of the Plan by authorities having jurisdiction.

B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

D. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams.
   1. Color: Manufacturer's standard.

D. Silt Fence Posts: One of the following, minimum 5 feet (1500 mm) long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot (1.98 kg per linear m).

E. Gravel: See Section 31 2323 for aggregate.

F. Riprap: See Section 31 3700.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet (7 m), minimum.
   2. Length: 50 feet (16 m), minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences or rock berms.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
      b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
      c. Along the toe of cut slopes and fill slopes.
      d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space as indicated on drawings.
      e. Across the entrances to culverts and catch basins that receive runoff from disturbed areas.
   2. Space sediment barriers with the following maximum slope length upslope from barrier:
      a. Slope of Less Than 2 Percent: 100 feet (30 m)..
      b. Slope Between 2 and 5 Percent: 75 feet (23 m).
      c. Slope Between 5 and 10 Percent: 50 feet (15 m).
      d. Slope Between 10 and 20 Percent: 25 feet (7.5 m).
      e. Slope Over 20 Percent: 15 feet (4.5 m).

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
   1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
   2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
   1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.

H. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches (150 mm).
   2. Place geotextile fabric full width and length, with minimum 12 inch (300 mm) overlap at joints.
   3. Place and compact at least 6 inches (150 mm) of 1 1/2 to 3 1/2 inch (40 to 90 mm) diameter stone.

B. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873/D4873M.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch (405 mm) high barriers with minimum 36 inch (905 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 4 inches (100 mm) in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch (710 mm) high barriers, minimum 48 inch (1220 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet (6 m), use nominal 32 inch (810 mm) high barriers with woven wire reinforcement and steel posts spaced at 4 feet (1220 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches (50 mm) of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
   7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches (460 mm), with extra post.
   8. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
   9. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches (300 mm) high with post spacing not more than 4 feet (1220 mm).

C. Mulching Over Large Areas:
   1. Dry Straw and Hay: Apply 2-1/2 tons per acre (6350 kg per hectare); anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
   2. Wood Waste: Apply 6 to 9 tons per acre (15,200 to 20,800 kg per hectare).
   3. Erosion Control Matting: Comply with manufacturer's instructions.

D. Mulching Over Small and Medium Areas:
   1. Dry Straw and Hay: Apply 4 to 6 inches (100 to 150 mm) depth.
   2. Wood Waste: Apply 2 to 3 inches (50 to 75 mm) depth.

3. Erosion Control Matting: Comply with manufacturer's instructions.

E. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch (12 to 25 mm) deep.
4. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
5. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches (13 mm) or more rainfall at the project site, and daily during prolonged rainfall. Follow the requirements of the SWPPP.

B. Repair deficiencies immediately.

C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Clean out temporary sediment control structures weekly and relocate soil on site.

E. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Engineer.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project identification sign.

B. Project informational signs.

1.02 QUALITY ASSURANCE

A. Design sign and structure to withstand 50 miles/hr (80 km/hr) wind velocity.

B. Sign Painter: Experienced as a professional sign painter for minimum three years.

C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.03 SUBMITTALS

A. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.

B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch (19 mm) thick, standard large sizes to minimize joints.

C. Rough Hardware: Galvanized.

D. Paint and Primers: Exterior quality, two coats; sign background of color as selected.

E. Lettering: Exterior quality paint, contrasting colors.

2.02 PROJECT IDENTIFICATION SIGN

A. One painted sign of construction, design, and content indicated on drawings, location designated.

B. Content:

1. Project number, title, logo and name of Owner as indicated on Contract Documents.
2. Name of Prime Contractor and major Subcontractors.

2.03 PROJECT INFORMATIONAL SIGNS

A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot (30 m) distance.

B. Provide at each field office, storage shed , and directional signs to direct traffic into and within site. Relocate as Work progress requires.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install project identification sign within 30 days after date fixed by Notice to Proceed.

B. Erect at designated location.

C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

D. Install sign surface plumb and level, with butt joints. Anchor securely.

E. Paint exposed surfaces of sign, supports, and framing.

3.02 MAINTENANCE

A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, and removal.

C. Cutting and patching.

D. Surveying for laying out the work.

E. Cleaning and protection.

F. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 5100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.

B. Section 01 5713 - Temporary Erosion and Sediment Control: Additional erosion and sedimentation control requirements.

C. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.03 SUBMITTALS

A. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.
   1. Minimum of 3 years of documented experience.

B. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Engineer. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.05 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Perform dewatering activities, as required, for the duration of the project.

E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

G. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

H. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.

I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Engineer of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Control datum for survey is that established by Owner provided survey.

E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

F. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

H. Utilize recognized engineering survey practices.

I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.
   4. Controlling lines and levels required for mechanical and electrical trades.

K. Periodically verify layouts by same means.

L. Maintain a complete and accurate log of control and survey work as it progresses.

M. On completion of major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction .

3.03 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Engineer before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.

C. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

D. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Engineer.

E. Clean existing systems and equipment.

F. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

G. Do not begin new construction in alterations areas before demolition is complete.

H. Comply with all other applicable requirements of this section.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

B. Prohibit traffic from landscaped areas.

C. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and detention basins.

C. Clean site; sweep paved areas, rake clean landscaped surfaces.

D. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.09 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Engineer when work is considered ready for Engineer's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Engineer's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Engineer's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Engineer.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Engineer when work is considered finally complete and ready for Engineer's Substantial Completion final inspection.

H. Complete items of work determined by Engineer listed in executed Certificate of Substantial Completion.

END OF SECTION

FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Field engineering services by Contractor.

B. Land surveying services by Contractor.

C. Boundary demarcations.

D. Construction surveying by Contractor.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 - Allowances: Cash, testing, and contingency allowances for field engineering services.

1.03 DESCRIPTION OF SERVICES

A. Specific services listed in this section are in addition to, and do not supersede, general Execution and Closeout Requirements.

B. Sole responsibility for establishing all locations, dimensions and levels of items of work.

C. Sole responsibility for provision of all materials required to establish and maintain benchmarks and control points, including batter boards, grade stakes, structure elevation stakes, and other items.

D. Having a skilled instrument person(s) available on short notice when necessary for laying out the work.

E. Preparation and maintenance of daily reports of activity on the work. Submission of reports containing key progress indicators and job conditions to Engineer.
   1. Major equipment and materials installed as part of the work.
   2. Major construction equipment utilized.
   3. Location of areas in which construction was performed.
   4. Materials and equipment received.
   5. Work performed, including field quality control measures and testing.
   6. Weather conditions.
   7. Safety.
   8. Delays encountered, amount of delay incurred, and the reasons for the delay.
   9. Instructions received from Engineer or Owner, if any.

F. Preparation and maintenance of professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the work.

G. Prior to backfilling operations, surveying - locating, and recording on a copy of Contract Documents - an accurate representation of buried work and Underground Facilities encountered.

H. Setting up and executing time-lapse photography of construction activities.

1.04 REFERENCE STANDARDS

A. FGDC-STD-007.1 - Geospatial Positioning Accuracy Standards - Part 1: Reporting Methodology; 1998.

B. FGDC-STD-007.2 - Geospatial Positioning Accuracy Standards - Part 2: Standards for Geodetic Networks; 1998.

C. FGDC-STD-007.4 - Geospatial Positioning Accuracy Standards - Part 4: Architecture, Engineering, Construction, and Facilities Measurement; 2002.

D. State Plane Coordinate System for the State in which the Project is located.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.06 QUALITY ASSURANCE

A. Land Surveyor's Qualifications: As established in Section 01 7000 - Execution and Closeout Requirements.

B. Use adequate number of skilled and thoroughly-trained workers to perform the work of this section in a timely and comprehensive manner.

C. Minimum accuracy for required work is as follows:
   1. Grade: Horizontal Tolerance: Plus or minus 0.1 feet (30.5 mm), Vertical Tolerance: Plus or minus 0.1 feet (30.5 mm).
   2. Culverts and ditches: Horizontal Tolerance: Plus or minus 0.1 feet (30.5 mm), Vertical Tolerance: Plus or minus .05 feet (15.5 mm).
   3. Structures: Horizontal Tolerance: Plus or minus .01 feet (3 mm) (location), Vertical Tolerance: Plus or minus .01 feet (3 mm).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify layout information shown on drawings in relation to property survey and existing benchmarks.

B. Notify Owner’s representative and Engineer of discrepancies immediately in writing before proceeding to lay out work.

C. Locate and protect existing benchmarks, base lines, and demarcations. Preserve permanent reference points during construction.

D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify existing conditions.

3.02 FIELD ENGINEERING

A. Maintain field office files, drawings, specifications, and record documents.

B. Coordinate field engineering services with Contractor's subcontractors, installers, and suppliers as appropriate.

C. Prepare layout and coordination drawings for construction operations.

D. Check and coordinate the work for conflicts and interferences, and immediately advise Engineer and Owner of all discrepancies of which Contractor is aware.

E. Cooperate as required with Engineer and Owner in observing the work and performing field inspections.

F. Review and coordinate work on a regular basis with shop drawings and Contractor's other submittals.

G. In general, match existing adjacent grades and maintain existing flow lines.

H. Check the location, line and grade of every major element as the work progresses. Notify the Engineer when deviations from required lines or grades exceed allowable tolerances. Include in such notifications a thorough explanation of the problem, and a proposed plan and schedule for remedying the deviation. Do not proceed with remedial work without Owner’s concurrence of the remediation plan.

I. Check all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials and equipment for compliance with shop drawings and Contract Documents requirements.

J. Check all bracing and shoring for structural integrity and compliance with designs prepared by the Contractor.

3.03 LAND SURVEYING

A. General: Follow standards for geospatial positioning accuracy.
   1. FGDC-STD-007.1 as amended by Authority Having Jurisdiction.
   2. FGDC-STD-007.2 as amended by Authority Having Jurisdiction.
   3. FGDC-STD-007.4 as amended by Authority Having Jurisdiction.

B. Coordinate survey data with the State Plane Coordinate System of the State in which the Project is located.

C. Contractor is responsible for the restoration of all property corners and control monuments damaged or destroyed by construction-related activities. Any disturbed monuments must be replaced at Contractor's expense by a surveyor licensed in the State in which the Project is located, and approved by the Engineer.
   1. Temporarily suspend work at such points and for such reasonable times as the Owner may require for resetting monuments. The Contractor will not be entitled to any additional compensation or extension of time.

3.04 BOUNDARY DEMARCATIONS

A. Wetlands: Protect demarcations and areas from disturbance as indicated on drawings.

B. Species Habitat: Protect demarcations and areas from disturbance as indicated on drawings.

C. Historic Archaeology: Protect demarcations and areas from disturbance as indicated on drawings.

D. Undisturbed: Protect demarcations and areas from disturbance as indicated on drawings.

3.05 CONSTRUCTION SURVEYING

A. General: Perform surveying as applicable to specific items necessary for proper execution of work.
   1. Alignment Staking: Provide alignment stakes at 50 foot (15.24 m) intervals on tangent, and at 25 foot (7.62 m) intervals on curves.
   2. Slope Staking: Provide slope staking at 50 foot (15.24 m) intervals on tangent, and at 25 foot (7.62 m) intervals on curves. Re-stake at every ten-foot difference in elevation.
   3. Structure: Stake out structures, including elevations, and check prior to and during construction.
   4. Pipelines: Stake out pipelines including elevations, and check prior to and during construction.
   5. Site Utilities: Stake out utility lines including elevations, and check prior to and during construction.
   6. Road: Stake out roadway elevations at 50 foot (15.24 m)50-foot intervals on tangent, and at 25 foot (7.62 m) intervals on curves.
   7. Cross-sections: Provide original, intermediate, and final staking as required, for site work and other locations as necessary for quantity surveys.
   8. Easement Staking: Provide easement staking at 50 foot (15.24 m) intervals on tangent, and at 25 foot (7.62 m) intervals on curves. If required by project conditions, provide wooden laths with flagging at 100 foot (30.48 m) intervals.

B. Surveying to Determine Quantities for Payment.
   1. For each application for progress payment, perform such surveys and computations necessary to determine quantities of work performed or placed. Perform surveys necessary for Engineer to determine final quantities of work in place.

C. Record Log: Maintain a log of layout control work. Record any deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used.

D. Use by the Engineer: The Engineer may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the work and may be checked by the Engineer at any time.

E. Accuracy:
   1. Establish Contractor's temporary survey references points for Contractors use to at least second-order accuracy (e.g., 1:10000). Set construction staking used as a guide for the work to at least third-order accuracy (e.g., 1:5000). Provide the absolute margin for error specified below on the basis established by such orders.
      a. Horizontal Accuracy of Easement Staking: Plus/minus 0.1 foot (30.5 mm).
      b. Accuracy of Other Staking: Plus/minus 0.04 foot (12.2 mm) horizontally and plus/minus 0.02 foot (6.1 mm) vertically.
      c. Include an error analysis sufficient to demonstrate required accuracy in survey calculations.
   2. Owner reserves the right to check the Contractor's survey, measurements, and calculations. The requirement for accuracy will not be waived, whether this right is exercised or not.

3.06 SUPPORT AND BRACING

A. General requirements: Design all support and bracing systems, if required. Provide for attachment to portions of the building structure capable of bearing the loads imposed. Design systems to not overstress the building structure.

3.07 RECORDS

A. Maintain at the Site a complete and accurate log of control and survey work as it progresses.
   1. Organize and record survey data in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in the State in which the Project is located. Record Contractor's surveyor's original field notes, computations, and other surveying data in Contractor-furnished hard-bound field books. Contractor is solely responsible for completeness and accuracy of survey work, and completeness and accuracy of survey records, including field books. Survey records,(including field books) may be rejected by Owner due to failure to organize and maintain survey records in a manner that allows reasonable and independent verification of calculations, and/or allows identification of elevations, dimensions, and grades of the work.
   2. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require re-surveying the data questioned by Engineer.

END OF SECTION

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project record documents.

B. Operation and maintenance data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Engineer with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
   2. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.

3. Changes made by Addenda and modifications.

F. Record Drawingsand Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   2. Field changes of dimension and detail.
   3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

B. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

C. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bonds and services and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Review submittals to verify compliance with Contract Documents. Submit to Engineer for review and transmittal to Owner.

1.02 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during progress of construction submit within 10 days after acceptance.

B. Otherwise make submittals within ten days after Date of Substantial Completion, prior to final request for payment.

C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing the date of acceptance as the start of the warranty period.

END OF SECTION

BOND NO. _____

MAINTENANCE BOND

STATE OF TEXAS Contract Date _____

COUNTY OF _____ Date Bond Executed _____

PRINCIPAL _____

SURETY _____

OWNER _____

PENAL SUM OF BOND (in words and figures) _____,

being 100 percent of the Contract Price.

CONTRACT for _____for [OWNER], _____ County, Texas (the "Contract").

KNOW ALL PERSONS BY THESE PRESENTS, that we, Principal and Surety above named, are held and firmly bound unto Owner, its successors and assigns, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, officers, directors, shareholders, partners, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal entered into that certain Contract with Owner, which Contract is expressly incorporated herein for all purposes.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH, that if Principal well and truly repair any and all defects in the work occasioned by or resulting from defects in materials furnished by, or workmanship of, the Principal in performing the work covered by the Contract, including any guaranty or warranty required under the Contract, then this obligation is void; otherwise it is to remain in full force and effect. Should the Principal fail to well and truly repair any and all defects in the work occasioned by or resulting from defects in materials furnished by, or workmanship of, the Principal in performing the work as required by the Contract in all its terms, the Surety will be liable for all damages, losses, expenses and liabilities that the Owner may suffer in consequence thereof.

The parties intend this maintenance bond to be a common law bond to be constructed in accordance with Texas law.

Surety hereby agrees, for value received, that no change, extension of time, alteration or addition to the terms of the Contract or to work performed under the Contract, or to the plans, specifications or drawings accompanying the Contract, will in any way affect its obligations 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.

The bound parties have executed this instrument pursuant to authority of their respective governing body, to be effective on the same date of the Contract.

_____	ATTEST
PRINCIPAL	
By _____	By _____
Name _____	Name _____
Title _____	Title _____
Address _____	
_____	(SEAL)

_____	ATTEST
SURETY	
By _____	By _____
Name _____	Name _____
Title _____	Title _____

(SEAL)

Physical Address:

_____

_____

_____

Mailing Address:

_____

_____

_____

Telephone: _____

Local Recording Agent Personal Identification Number:

_____

Agency Name:_____

Agency Address_____

Agency Telephone _____

Surety must attach its original Power of Attorney to this Bond.

Surety must attach Surety Identification/Complaint Notice to this Bond.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the secretary of the corporation named as Principal in the Bond; that _____, who signed the Bond on behalf of Principal, was then _____ of the corporation; that I know his or her signature, and his or her signature is genuine; and that the Bond was duly signed for and on behalf of the corporation by authority of its governing body.

_____ (Corporate Seal)

Signature of Corporate Secretary

ATTACH POWER OF ATTORNEY

SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.01 SUMMARY

A. If procured by the owner, a Geotechnical Report was used in preparing the design and can be provided by the engineer.

B. The Geotechnical Report is not a conclusive indication of the soil conditions other than where the borings were taken.

C. The accuracy of the Geotechnical Report is not guaranteed in any respect by the Owner, and the Owner accepts no responsibility for interpretation of conclusions drawn therefrom.

D. The information contained in the Geotechnical Report is made available in order that the Contractor may have ready access to the same information available to the Owner as of this date.

E. Contractor is invited and encouraged to make his own interpretation and evaluation of the information and by starting work shall be assumed to have fully accepted responsibility for the subsurface conditions that may hereafter be encountered in performing the excavation work.

F. Contractor is to examine the project site and the record of investigation and make, to whatever extent they deem appropriate, his own investigation of existing subsurface conditions to determine the nature, kind and character of materials to be encountered.

G. Extra payment will not be authorized for work which should have been anticipated or could have been anticipated upon careful examination of the site, or upon soil investigation, or upon consideration of factors generally recognized as being inherent in excavation work of the nature indicated by the Contract Documents.

H. The Contractor shall advise Engineer of discovery of any unknown or undetermined items.

I. The Contractor shall make their own investigation into the location and size of existing site utilities whether represented on the drawings or not.

END OF SECTION

CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.

B. Form stripping.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 03 3000 - Cast-in-Place Concrete.

C. Section 31 2316 - Excavation: Shoring and underpinning for excavation.

1.03 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment of forming work will be by the unit price method.

B. Formwork (Horizontal Structures): Measure by the square foot (meter). Includes form materials, placement, placing accessories, stripping.

1.04 REFERENCE STANDARDS

A. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).

B. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

C. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

1.05 SUBMITTALS

A. Product Data: Provide data on void form materials and installation requirements.

B. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

C. Design Data: As required by authorities having jurisdiction.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with Highways standards of the State of TX.

B. Maintain one copy of each installation standard on site throughout the duration of concrete work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.

B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

C. Protect plastic foam products from damage and exposure to sunlight.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.

C. Chamfer outside corners of beams, joists, columns, and walls.

D. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

E. Comply with Highways standards of the State of TX.

2.02 WOOD FORM MATERIALS

A. Form Materials: At the discretion of the Contractor.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 EARTH FORMS

A. Earth forms are not permitted.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Install stay in place mesh steel formwork in accordance with manufacturer's recommendations.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Coordinate this section with other sections of work that require attachment of components to formwork.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

3.05 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

3.06 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI SPEC-117, unless otherwise indicated.

3.07 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

3.08 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION

CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories.

B. Section 03 3000 - Cast-in-Place Concrete.

1.03 PRICE AND PAYMENT PROCEDURES

A. Bar Reinforcement: By the ton (metric ton). Includes reinforcement, placement, and accessories.

B. Welded Wire Reinforcement: By the square foot (square m). Includes welded wire reinforcement, placement, and accessories.

1.04 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ACI MNL-66 - ACI Detailing Manual; 2020.

C. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

D. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2024.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2025.

F. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).

G. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement; 2024.

H. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2025.

I. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2024.

J. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement; 2024.

K. ASTM A1035/A1035M - Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement; 2023a.

L. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.

M. CRSI (P1) - Placing Reinforcing Bars, 10th Edition; 2019.

1.05 SUBMITTALS

A. Shop Drawings: Comply with requirements of ACI MNL-66 Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.

B. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

C. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301.
   1. Maintain one copy of each document on project site.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Plain billet-steel bars.
   2. Unfinished.

B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
   1. Unfinished.

C. Reinforcing Steel: Deformed bars, ASTM A996/A996M Grade 40 (280), Type A.

D. Reinforcing Steel: Plain or deformed bars; ASTM A1035/A1035M, Grade 100 (100,000 psi) (690 MPa), Type CL.

E. Reinforcing Steel Mat: ASTM A704/A704M, using ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa) steel bars or rods, unfinished.

F. Stirrup Steel: ASTM A1064/A1064M steel wire, unfinished.

G. Steel Welded Wire Reinforcement (WWR): Galvanized, deformed type; ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: 4 x 8-W6 x W10 (102 x 203-MW39 x MW65).

H. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel components for placement within 1-1/2 inches (38 mm) of weathering surfaces.

2.02 RE-BAR SPLICING:

A. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for splicing reinforcing bars.
   1. Comply with ACI CODE-318 steel reinforcing design strength requirements for splices in tension and compression.

B. Grout: Cementitious, non-metallic, non-shrink grout for use with manufacturer's grout sleeve reinforcing bar coupler system.

2.03 FABRICATION

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Accommodate placement of formed openings.

C. Comply with applicable code for concrete cover over reinforcement.

3.02 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

END OF SECTION

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Floors and slabs on grade.

C. Concrete reinforcement.

D. Joint devices associated with concrete work.

E. Miscellaneous concrete elements, including equipment pads, flagpole bases, thrust blocks, and manholes.

F. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.

B. Section 03 2000 - Concrete Reinforcing.

C. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

D. Section 32 1313 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 PRICE AND PAYMENT PROCEDURES

A. Cast-in-place concrete work will be paid for by the unit price method.

B. Concrete - Slab-on-Fill or Slab-on-Grade: Includes formwork as specified in Section 03 1000, reinforcement as specified in Section 03 2000, concrete, placement accessories, consolidating and leveling, troweling, and curing. Measurement by:
   1. Cubic yard (meter).

C. Concrete - Miscellaneous Locations: Includes formwork as specified in Section 03 1000, reinforcement as specified in Section 03 2000, concrete, placement accessories, consolidating, and curing. Measurement by:
   1. Cubic yard (meter).

D. Concrete - Grouting: Includes preparation of substrate, grout, placement, consolidating, troweling, and curing. Measurement by the cubic yard (meter).

E. Construction Joint Devices: Includes component, accessories, and installation. Measurement by the linear foot (meter).

1.04 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.

C. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

D. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.

E. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.

F. ACI PRC-308 - Guide to External Curing of Concrete; 2016.

G. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).

H. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2025.

J. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.

K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.

L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.

M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.

N. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

O. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

P. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2024a.

Q. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.

R. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

S. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2023.

T. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.

U. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.

V. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2025.

W. ASTM C845/C845M - Standard Specification for Expansive Hydraulic Cement; 2024.

X. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

Y. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.

Z. COE CRD-C 48 - Handbook for Concrete and Cement Standard Test Method for Water Permeability of Concrete; 1992.

AA. COE CRD-C 513 - Handbook for Concrete and Cement Corps of Engineers Specifications for Rubber Waterstops; 1974.

BB. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.05 SUBMITTALS

A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

B. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with expansive component manufacturer's written recommendations.

C. Test Reports: Submit report for each test or series of tests specified.

D. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

E. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
   1. Maintain one copy of each document on site.

B. Follow recommendations of ACI PRC-305 when concreting during hot weather.

C. Follow recommendations of ACI PRC-306 when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

A. Comply with requirements of Section 03 1000.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
   3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches (38 mm) of concrete surface.

2.02 REINFORCEMENT MATERIALS

A. Comply with requirements of Section 03 2000.

B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Type: Deformed billet-steel bars.
   2. Finish: Unfinished, unless otherwise indicated.

C. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
   1. Form: Coiled Rolls.
   2. WWR Style: 4 x 8-W6 x W10 (102 x 203-MW39 x MW65).

D. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches (38 mm) of weathering surfaces.
   4. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing full steel reinforcing design strength in tension and compression.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type II - Moderate Portland type.
   1. Acquire cement for entire project from same source.

B. Blended, Expansive Hydraulic Cement: ASTM C845/C845M, Type K.

C. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

D. Lightweight Aggregate: ASTM C330/C330M.

E. Fly Ash: ASTM C618, Class C or F.

F. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

2.05 BONDING AND JOINTING PRODUCTS

A. Slab Isolation Joint Filler: 1/2-inch (13 mm) thick, height equal to slab thickness, with removable top section forming 1/2-inch (13 mm) deep sealant pocket after removal.

B. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.

C. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.

D. Dowel Sleeves: Plastic sleeve for smooth, round, steel load-transfer dowels.

2.06 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.

B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.

C. Curing Agent, Water-Cure Equivalent Type: Clear, water-based, non-film-forming, liquid-water cure replacement agent.
   1. Comply with ASTM C309 standards for water retention.
   2. Compressive Strength of Treated Concrete: Equal to or greater than strength after 14-day water cure when tested in accordance with ASTM C39/C39M.
   3. VOC Content: Zero.

D. Curing Compound, Non-Dissipating: Liquid, membrane-forming, clear, nonyellowing acrylic; complying with ASTM C309.

E. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.

2.07 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.

C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

D. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch (27.6 MPa) unless otherwise indicated in the design drawings.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Water-Cement Ratio: Maximum 40 percent by weight.
   4. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
   5. Maximum Slump: 4 inches (100 mm).
   6. Maximum Aggregate Size: 5/8 inch (16 mm).

E. Structural Lightweight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 pounds per square inch (20.7 MPa) unless otherwise indicated in the design drawings.

2. Maximum Slump: 4 inches (100 mm).
3. Maximum Aggregate Size: 5/8 inch (16 mm).

2.08 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
   1. Colored Concrete: Add pigments in strict accordance with manufacturer's instructions to achieve consistent color from batch to batch.

B. Transit Mixers: Comply with ASTM C94/C94M.

C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R.

E. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.

F. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.

G. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI PRC-304.

B. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

C. Ensure reinforcement, inserts, and formed construction joint devices will not be disturbed during concrete placement.

D. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

3.04 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch (5 mm) thick blade and cut at least 1 inch (25 mm) deep but not less than one quarter (1/4) the depth of the slab.

E. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.05 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

3.06 CURING AND PROTECTION

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than seven days.
   2. High early strength concrete: Not less than four days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

3.07 FIELD QUALITY CONTROL

A. Provide free access to concrete operations at project site and cooperate with appointed firm.

B. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

C. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

D. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards (76 cu m) or less of each class of concrete placed.

E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.08 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

3.09 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stair railings and guardrails.

B. Free-standing railings at steps.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 09 9113 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

E. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2024.

F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
2. Include the design engineer's seal and signature on each sheet of shop drawings.

C. Designer's Qualification Statement.

D. Fabricator's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

B. Comply with ASTM E985.

C. Allow for expansion and contraction of members and building movement without damage to connections or members.

D. Dimensions: See drawings for configurations and heights.

E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.

F. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

G. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
1. Ease exposed edges to a small uniform radius.

2.02 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, black finish.

C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

E. Exposed Fasteners: No exposed bolts or screws.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 32 1723 - Pavement Markings: Painted pavement markings.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.

B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.

C. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2024.

D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

E. SSPC V1 (PM1) - Good Painting Practice: Painting Manual Volume 1; 2024.

F. SSPC V2 (PM2) - Systems and Specifications: Steel Structures Painting Manual Volume 2; 2021.

G. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.
   5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
   1. If a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Engineer is obtained using the specified procedures for substitutions.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each paint material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

B. Flammability: Comply with applicable code for surface burning characteristics.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Engineer from the manufacturer's full line.

D. Colors: As indicated on drawings.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including concrete, concrete masonry units, brick, fiber cement siding, primed wood, and primed metal.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Exterior Light Industrial Coating, Water Based; MPI #161, 163, or 164.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
   1. Alkali-Resistant Water-Based Primer; MPI #3.
   2. Anti-Corrosive Alkyd Primer for Metal; MPI #79.
   3. Alkyd Primer for Galvanized Metal.
   4. Water Based Primer for Galvanized Metal; MPI #134.
   5. Rust-Inhibitive Water Based Primer; MPI #107.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing paints or finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Clean surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi (10,350 to 27,580 kPa) at 6 to 12 inches (150 to 300 mm). Allow to dry.
   3. Clean concrete according to ASTM D4258. Allow to dry.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance.

D. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 FIELD QUALITY CONTROL

A. Owner will provide field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and grubbing.

B. Selective removal and trimming.

C. Earth stripping and stockpiling.

D. Repair and restoration.

E. Debris removal.

1.02 RELATED REQUIREMENTS

A. Section 02 4100 - Demolition: Removal of built elements and utilities.

B. Section 31 10 00.10 - Tree Protection

C. Section 31 2323 - Fill: Material for filling holes, pits, and excavations generated as result of removal operations.

D. Section 01 57 13 - Temporary Erosion and Sediment Control

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:

1. Basis of Measurement for Clearing and Grubbing and Earth Stripping and Stockpiling: By sq yard (sq meter).
2. Basis of Measurement for Selective Removal and Trimming and Restoration of Damaged Vegetation: Per unit.

1.04 REFERENCE STANDARDS

A. Project Geotechnical Report

B. Storm Water Pollution Prevention Plan

C. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.

D. ANSI A300 Part 5 - American National Standard for Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction); 2019.

E. ANSI A300 Part 6 - Tree, Shrub, and Other Woody Plant Management--Standard Practices (Planting and Transplanting); 2012 (Reapproved 2018).

F. ANSI Z133 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene prework meeting one week prior to start of work of this section; require attendance by affected personnel.

B. Coordinate pre-construction meeting with local jurisdictional authority.

C. Sequencing: Ensure utility disconnections are in orderly and expeditious manner.

1.06 QUALITY ASSURANCE

A. Clearing Firm Qualifications: Company specializing in performing work of type specified and with at least three years of experience.

B. Trimming or Pruning Qualifications: Tree Care Industry Association (TCIA) Certified Treecare Safety Professional.

1.07 FIELD CONDITIONS

A. Ambient Conditions: Terminate work during hazardous environmental conditions according to 29 CFR 1910.266.

B. Existing Conditions: See site and utility survey, geotechnical report, hazardous material survey, existing conditions survey, and site drawing.

C. Temporary Erosion and Sediment Control: Comply with other requirements specified in Section 01 5713 - Temporary Erosion and Sediment Control.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sedimentation Barrier: See Section 01 5713 - Temporary Erosion and Sediment Control.

B. Tree Wound Compound: Application capable of sealing vegetation wounds and grafts.

PART 3 EXECUTION

3.01 EXAMINATION

A. Locate property boundaries and benchmarks and protect monumentation.

B. Identify potential runoff areas.

C. Construction Fencing: Make sure construction fencing is installed and maintained.

D. Erosion and Sediment: Make sure SWPPP Best Management Practices are implemented and maintained.

E. Identify potential dust sources.

F. Identify preexisting debris, junk, and trash on-site.

3.02 PREPARATION

A. Coordinate work with utility companies; notify before starting work and comply with local requirements; obtain required permits.

B. Contact Texas Excavation Safety System at 811 and have all utilities field located. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are to remain.

E. Protect existing vegetation to remain from damage and monitor according to ANSI A300 Part 5.
   1. Photograph vegetation with documentation indicating data, time, weather, and brief description of health condition.

F. Install sedimentation barriers according to Section 01 5713 - Temporary Erosion and Sediment Control.

G. Protect benchmarks, survey control points, and existing structures from damage or displacement.

H. Develop dust remediation controls and methods. Do not use water if that results in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

I. Remove preexisting debris, junk, and trash on-site.

J. Contractor is responsible for complying with State and local requirements related to permitting, storm water control, statutory notification periods, keeping roadways clear of debris, and dust control during operations.

K. Any existing water wells and septic systems found on the site shall be abandoned or removed as required by the Health Department. The Contractor shall obtain permits for such work from the Health Department.

3.03 CLEARING AND GRUBBING

A. Clearing: Cut trees, stumps, shrubs, downed timber, and other vegetation for removal within identified area as indicated on drawings according to 29 CFR 1910.266. Follow recommendations of ANSI Z133 and best local practices for species involved.

B. Clear site after relocating vegetation in accordance with ANSI A300 Part 6.

C. Do not remove or damage vegetation beyond limits indicated on drawings.
   1. Building Perimeter: 20 feet (12 m) outside.
   2. Paving: 10 feet (3.1 m) each side of surface walkways, patios, surface parking, and utility lines less than 12 inches (305 mm) in diameter.
   3. Minor Utility Trenches: 10 feet (3.1 m) each side of utility lines less than 12 inches (305 mm) in diameter.
   4. Roadways and Main Utility Trenches: 15 feet (4.6 m) each side.
   5. Pervious Paving: 15 feet (4.6 m) outside perimeter.

D. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum subsoil disturbance.

E. Grubbing: Remove stumps, roots, buried timber, and other vegetation minimum depth 12 inches (30 cm) from ground. Remove rocks minimum depth 6 inches (15 cm) from ground.

3.04 SELECTIVE REMOVAL AND TRIMMING

A. Selective Removal: Individual tree and shrub identified for removal as indicated on drawings according to 29 CFR 1910.266.
   1. Includes trees, stumps, shrubs, downed timber, and other vegetation identified for removal as indicated on drawings.
   2. Fell trees away from vegetation identified to remain.
   3. Pull stumps, remove roots, buried timber, and other vegetation identified for removal 12 inches (30 cm), minimum depth, from ground. Remove rocks 6 inches (15 cm), minimum depth, from ground.
   4. Cut stump neatly and close to ground.
   5. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and matching existing grade.

B. Selective Trimming: Individual limbs and branches cut back according to ANSI A300 Part 1 identified for removal as indicated on drawings. Follow recommendations of ANSI Z133 and best local practices for species involved.

3.05 EARTH STRIPPING AND STOCKPILING

A. Stripping:
   1. Remove topsoil within identified area:
      a. 4 inches (10 cm) deep.
      b. According to soil report.
   2. Remove topsoil within identified area as indicated on drawings.

B. Stockpiling:
   1. Place topsoil in identified areasif indicated for reuse:
      a. Pile depth not to exceed 8 feet (2.5 m).
      b. Protect piles from erosion.
   2. Place rock in identified areasif indicated for reuse.

3.06 REMOVED VEGETATION PROCESSING

A. Do not burn, bury, landfill, or leave on-site.

B. Trees: Sell if marketable.

C. Sod: Reuse on-site if possible; otherwise dispose of off-site.

D. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; give preference to on-site uses.

3.07 REPAIR AND RESTORATION

A. Remaining Existing Facilities, Utilities, and Site Features: If damaged due to this work, repair or replace to original condition.

B. Vegetation: Replace damaged or destroyed vegetation identified to remain as indicated on drawings at no cost to Owner:
   1. Outside removal limits.
   2. Inside protection limits.

C. Apply tree wound compound according to manufacturer's recommendations.

3.08 DEBRIS REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and windblown debris from public and private lands.

D. Remove paving, curbs, and other surface improvements as indicated on the Design drawings.

E. Remove abandoned utilities unless otherwise noted to remain. Indicate removal termination point for underground utilities on Record Documents.

3.09 CLEANING

A. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.

B. Do not burn or bury materials on site.

C. Leave site clean and ready to receive work.

END OF SECTION

TREE PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Protection of Existing Trees.

1.02 RELATED REQUIREMENTS

A. Section 02 4100 - Demolition

B. Section 31 1000 - Site Clearing

C. Section 31 2200 - Grading

1.03 PRICE AND PAYMENT PROCEDURES

A. Tree Protection Fence: By the linear foot. Includes chain link or plastic mesh fence, posts, tie wire, and installation.

1.04 REFERENCE STANDARDS

A. ANSI A300-2008 Pruning.

B. Local Municipal Code.

1.05 QUALITY ASSURANCE

A. Employ certified arborist or landscape architect to supervise or perform tree protection work as required.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tree Protection Fence: 4 feet high galvanized chain link.
   1. Posts: 1-1/2 inch at 6 feet on center, 2 feet deep.
   2. Tension Wire: Not less than 12 gauge at top and 6 inches above existing grade.

B. Tree Protection Fence: 4 feet high heavy gauge orange plastic mesh with 2" openings.
   1. Posts: "T" posts at 6 feet on center, 2 feet deep.

PART 3 EXECUTION

3.01 TREE PROTECTION FENCE

A. Install at Root Protection Zone of all existing trees to be protected per local jurisdictional requirements; otherwise, as shown on drawing.

B. Root Protection Zone as defined by the local jurisdiction; otherwise, shall be located 1 foot radius from trunk for every 1 inch diameter of trunk at 4 feet from ground. The diameter of a multi-trunk tree is calculated as the sum of the largest trunk plus half of the sum of additional trunks at 4.5 feet from ground.

C. Fence may be located a minimum of half of the root protection radius if approved by the regulatory authority, Engineer, or Owner.

D. Fence Location Detail: See detail as shown on drawings.

3.02 TREE PROTECTION REQUIREMENTS

A. Install tree protection fence prior to any clearing, excavation, or grading and maintain in good repair for the duration of all construction work unless otherwise directed**.**

B. No construction operations are allowed within the Root Protection Zone.

C. Root Protection Zone shall be sustained in a natural state and shall be free from vehicular or mechanical traffic; no fill, equipment, liquids, or construction debris shall be placed inside the protective barrier.

D. Root Protection Zone shall be covered with 6" of mulch to reduce moisture stress.

E. The proposed finished grade and elevation of land within the Root Protection Zone of any trees to be preserved shall not be raised or lowered more than 3 inches. Welling and retaining methods are allowed outside the Root Protection Zone.

F. Root Protection Zone shall remain pervious, i.e. ground cover or turf at completion of landscape design.

G. No roots may be cut closer than 6 feet from the base of any tree. Roots cut within the Root Protection Zone will only be allowed on one side of the tree. Any roots that need to be cut within the Root Protection Zone will be cut using a saw-type trencher, and all cut roots will be painted.

H. All trees impacted by construction shall be fertilized with an organic tree fertilizer prior to construction and again at the end of construction. The area within the protective fencing shall be mulched with about 6 inches of mulch. Water barrels shall be placed within the Root Protection Zone to irrigate these trees if necessary.

I. No trash or warming fires shall be placed within 50 feet of any tree.

J. No pedestrian traffic shall occur within dripline of any tree.

3.03 DAMAGE TO PROTECTED TREES

A. Trim trees and shrubs when doing so will prevent removal or damage. Trimmed or damaged trees shall be treated or repaired under supervision of a certified arborist or landscape architect.

B. Any damage done to existing tree crowns or root systems shall be repaired immediately under supervision of a certified arborist. All wounds to oaks shall be painted with pruning paint within 20 minutes after damage. Roots exposed during construction operations will be cut cleanly. Cut surfaces shall be painted and topsoil and mulch placed over exposed root area immediately.

C. Branch Pruning Detail: See detail as shown on drawings.

D. Contractor shall compensate owner for damage to existing trees designated to remain in the amount of $200 per caliper inch measured 4 feet from ground. This amount will be deducted from final payment.

END OF SECTION

GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rough grading.

B. Fine grading.

1.02 RELATED REQUIREMENTS

A. Section 31 1000 - Site Clearing.

B. Section 31 2316 - Excavation.

C. Section 31 2316.26 - Rock Removal.

D. Section 31 2323 - Fill.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:
   1. Basis of Measurement for Rough Grading: By square yard (yard).
   2. Basis of Measurement for Fine Grading: By square yard (yard).

1.04 REFERENCE STANDARDS

A. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017 (Reapproved 2025).

1.05 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.06 QUALITY ASSURANCE

A. Perform in accordance with State of TX, Highway Department standards.

1.07 FIELD CONDITIONS

A. Ambient Conditions: Terminate work during hazardous environmental conditions in accordance with 29 CFR 1910.266.

B. Existing Conditions: See site and utility survey, geotechnical report, hazardous material survey, existing conditions survey, and site drawing.

PART 2 PRODUCTS

2.01 MATERIALS

A. Gravel: Excavated on-site.
   1. Graded according to ASTM D2487 Group Symbol GW, GP, or SP.

B. Other Fill Materials: See Section 31 2323.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify survey bench mark and intended elevations for grading areas are as indicated.

B. Verify the absence of standing or ponding water.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect above- and below-grade utilities to remain.

D. Notify utility company to remove and relocate utilities.

E. Provide temporary means and methods to remove standing or ponding water from areas prior to grading.

F. Protect site features to remain, including but not limited to bench marks, survey control points, and fences.

G. Remove topsoil in accordance with Section 31 1000.

H. Excavate materials in accordance with Section 31 2316.

I. Remove rock in accordance with Section 31 2316.26.

J. Fill and backfill in accordance with Section 31 2323.

3.03 ROUGH GRADING

A. Excavate and fill subgrade material to elevations indicated on plans.

B. Horizontally bench existing slopes greater than 1:4.

C. Replace displaced subgrade in accordance with Section 31 2323.

D. Remove and replace unsuitable materials as specified fill.

E. See Section 31 2316 for stockpiling procedures.

3.04 FINE GRADING

A. Scrape and spread subgrade material uniformly smooth and without disruptions.

B. Slopes: Transition smoothly to adjacent areas.

C. See Section 31 2323 and the Geotechnical Report for final compaction.

3.05 TOLERANCES

A. Top Surface: Plus or minus 1/2 inch (13 mm).

3.06 CLEANING

A. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive work.

END OF SECTION

EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Support and protection.

B. Dewatering.

C. Excavation.

D. Excavation repairs.

1.02 RELATED REQUIREMENTS

A. Project Geotechnical Report

B. Section 02 4100 - Demolition.

C. Section 31 1000 - Site Clearing.

D. Section 31 2200 - Grading.

E. Section 31 2316.13 - Trenching.

F. Section 31 2316.26 - Rock Removal.

G. Section 31 2319 - Dewatering.

H. Section 31 2323 - Fill.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:

1. Basis of Measurement for Unclassified Excavation: By cubic yard (cubic meter).
2. Basis of Measurement for Excavation Classified as Earth: By cubic yard (cubic meter).

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in materials testing.

1.06 FIELD CONDITIONS

A. Ambient Conditions: Do not perform excavation during periods of heavy rain as directed by Engineer.

B. Existing Conditions: See site and utility survey, geotechnical report, hazardous material survey, existing conditions survey, and site drawing.

C. Utility Location: Notify Call Before You Dig (811) before excavation to request approximate underground utility marking.

D. Stormwater: Comply with requirements, see Section 01 5713 - Temporary Erosion and Sediment Control.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify survey bench mark elevations are as indicated on drawings.

B. Survey existing adjacent structures and exterior improvements to establish exact elevations at fixed points for bench marking.

C. Assess adjacent structures and exterior improvements to establish existing conditions. Notify Engineer of existing cracks, sags, or other damages prior to starting work.

D. Verify prevailing groundwater level is as indicated on drawings.

3.02 PREPARATION

A. See Section 31 1000 for site clearing and topsoil removal.

B. Identify required lines, levels, contours, and datum locations.

C. Protect survey bench marks, control points, and monuments from excavating equipment and vehicular traffic.

D. Protect existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Protect plants and other features to remain.

F. Locate and identify known utilities to remain and protect from damage.

G. Notify utility company to remove and relocate utilities.

3.03 SUPPORT AND PROTECTION

A. Excavation Safety: Comply with OSHA's Excavation Standard, 29 CFR 1926, Subpart P.

B. Permanently leave in place excavation support and protection systems used as formwork or within 10 feet (3.03 m) of existing foundations unless otherwise noted on drawings.

3.04 DEWATERING

A. Prevent surface water and groundwater from entering excavations and surrounding areas.

B. Dispose of water without causing surface erosion, sediment buildup, or endangering public health or property.

C. See Section 31 2319 for additional dewatering requirements.

3.05 EXCAVATION

A. Grade top perimeter of excavation to prevent surface water collection.

B. General Excavation:
   1. Excavate to indicated contours, elevations, and grades.
   2. Unclassified Excavation: Excavate material as indicated on drawings.
   3. Classified Excavation: Classify excavated material as rock and earth.
      a. Earth Excavation: Excavate material as indicated on drawings.
      b. Rock Excavation: See Section 31 2316.26.

C. Excavation for Exterior Improvements:
   1. Excavate to subgrade; do not disturb subsoils.
   2. Compact subgrade as indicated on the Geotechnical Report.

D. Excavation to accommodate foundations, underground tanks, and underground utilities.
   1. Excavate to specified elevations.
   2. Over-excavate to safely install, adjust, and remove forms, bracing, or supports necessary for installation of work.
   3. Hand trim excavations. Remove loose matter.

E. See Section 31 2316.13 for trenching.

F. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

G. Do not interfere with 45-degree bearing splay of foundations.

3.06 EXCAVATION REPAIRS

A. Notify Engineer of over-excavations.

B. Correct areas over-excavated with native compacted soil.

C. See Section 31 2323 for additional requirements.

3.07 FIELD QUALITY CONTROL

A. Resurvey existing adjacent structure and exterior improvement bench marks. Notify Engineer of changes in elevations, positions, or slopes.

B. Notify Engineer of additional cracks, sags, or other damages to adjacent structures or exterior improvements occurring during work.

3.08 CLEANING

A. Stockpile excavated material for re-use in area designated on-site; see Section 31 2200.

B. Remove excavated material unsuitable for re-use from site.

C. Remove excess excavated material from site.

3.09 PROTECTION

A. Divert surface water away from excavations.

B. Keep excavations free of standing water.

C. Maintain stability of banks and loose soils; prevent from falling into excavations.

D. Maintain excavations in satisfactory, undisturbed condition.

E. Protect bottom of excavations from freezing.

END OF SECTION

TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Trench excavation.

B. Utility bedding and cover.

C. Backfill and compaction.

D. Dewatering.

1.02 RELATED REQUIREMENTS

A. Section 31 0519 - Geosynthetics for Earthwork.

B. Section 31 1000 - Site Clearing.

C. Section 31 2200 - Grading.

D. Section 31 2316 - Excavation.

E. Section 31 2316.26 - Rock Removal.

F. Section 31 2319 - Dewatering.

G. Section 31 2323 - Fill.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:

1. Basis of Measurement for Trenching: By linear foot (linear meter).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate trenching with utility installation.

1.05 SUBMITTALS

A. Samples: 10 lb (4.5 kg) sample of each type of fill; submit in air-tight containers to testing laboratory.

B. Source Quality Control Submittals: Submit name of imported materials source.

1. Results of gradation tests on proposed and actual materials used.

C. Field Quality Control Submittals:

1. Results of compaction density tests.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

F. Testing agency's qualification statement.

G. Compaction Density Test Reports.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of experience.

B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

D. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions, erection drawings, and shop drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver fill to project site in advance of need.

B. When fill materials need on-site storage, locate stockpiles where indicated on drawings.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
2. Prevent contamination.
3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Comprised of sand and gravel; free of shale, clay, friable materials, and debris.
   1. Fill Type General: Complying with State of TX Highway Department standard.
   2. Fill Type General: Subsoil excavated on-site.
      a. Free of lumps larger than 3 inches (75 mm), rocks larger than 2 inches (50 mm), and debris.
      b. Complying with ASTM D2487 Group Symbol CL.

B. Granular Fill: Pit-run washed stone; free of shale, clay, friable materials, and debris.
   1. Fill Type Aggregate: Coarse aggregate, complying with State of TX Highway Department standard.

C. Crushed Stone: Crusher-run, mineral aggregate, free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Type Aggregate: Complying with State of TX Highway Department standard.
   2. Grade in accordance with ASTM D2487 Group Symbol GM.

D. Filter Fabric: Geotextile, capable of material separation.
   1. Geotextile: Nonbiodegradable, woven.
   2. Geotextile: See Section 31 0519.

E. Sand: Natural river or bank, washed free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Type Sand: Complying with State of TX Highway Department standard.
   2. Grade in accordance with ASTM D2487 Group Symbol SW.
   3. Sand Equivalent: In accordance with ASTM D2419.

F. Concrete: Ready mix.
   1. Ready for placement in accordance with ASTM C94/C94M.

G. Flowable Fill: Controlled low-strength material in accordance with ASTM D6103/D6103M.

H. General Fill: Subsoil excavated on-site.

I. Structural Fill: Subsoil excavated on-site.

J. Granular Fill - Gravel: Pit run washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM C136/C136M.

K. Granular Fill - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
   1. Graded in accordance with ASTM C136/C136M.

L. Sand: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Graded in accordance with ASTM C136/C136M.

2.02 ACCESSORIES

A. Underground Warning Tape: Suitable for direct burial.
   1. Bright-colored, continuously printed plastic ribbon tape, minimum 6 inches (150 mm) wide by 4 mils, 0.004 inch (0.10 mm) thick.

B. Buried Detection Wire: Copper, single strand, continuously insulated, 12 AWG, suitable for direct burial.

2.03 SOURCE QUALITY CONTROL

A. Test fill materials in accordance with specified standard before delivery to site.

B. Nonconforming Materials: Change and retest.

C. Provide materials of each type from same source or as directed by Engineer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify survey benchmarks and intended elevations for work are as indicated on drawings.

B. Verify prevailing groundwater level is as indicated on drawings.

C. Perform assessment of adjacent structures and exterior improvements to establish existing conditions. Notify Engineer of existing cracks, sags, or other damages prior to starting work.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 31 1000 for site clearing and topsoil removal.

C. Protect survey benchmarks, control points, and monuments from excavating equipment and vehicular traffic.

D. Protect existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Protect plants and other features to remain.

F. Locate and identify existing utilities to remain as indicated on drawings and protect from damage.

G. Notify utility company to remove and relocate utilities as indicated on drawings.

3.03 SUPPORT AND PROTECTION

A. Excavation Safety: Provide Trench Safety Protection. Comply with OSHA's Excavation Standard, 29 CFR 1926, Subpart P.

B. Contractor is responsible for providing trench box, sheeting, shoring and bracing, as required to maintain stability of excavation. Design of sheeting, shoring and bracing is by the Contractor based on soil profiles per the geotechnical report.

C. Abandon support and protection systems used as formwork or within 10 feet (3.03 m) of existing foundations, unless otherwise noted on drawings.
   1. Remove top 4 feet (1.22 m) below grade.

3.04 DEWATERING

A. Prevent surface water and groundwater from entering excavations and surrounding areas.

B. Dispose of water without causing surface erosion, sediment buildup, or endangering public health or property.

C. See Section 31 2319 for additional dewatering requirements.

3.05 TRENCH EXCAVATION

A. Grade top perimeter of excavation to prevent surface water collection.

B. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume.

C. General: Cut trenches neat and clean.
   1. Slope banks of excavations deeper than 4 feet (1.2 m) to angle of repose or less until shored.
   2. Do not interfere with 45-degree bearing splay of foundations.
   3. Cut trenches wide enough to allow inspection of installed utilities.
   4. Hand trim excavations and remove loose matter.
   5. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.
   6. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd (0.25 cu m) measured by volume.

7. See Section 31 2316.26 for rock removal.

D. Utility Preparation: Rake trench bottom to uniform grade.
   1. Remove unsuitable subgrade and backfill.
   2. Compact subgrade to density equal to or greater than subsequent fill material requirements.

E. Maintain trenches and prevent loose soil or rocks from entering.

F. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

G. Slope banks of excavations deeper than 4 feet (1.2 meters) to angle of repose or less until shored.

H. Do not interfere with 45 degree bearing splay of foundations.

I. Cut trenches wide enough to allow inspection of installed utilities.

J. Hand trim excavations. Remove loose matter.

K. Remove excavated material that is unsuitable for re-use from site.

L. Remove excess excavated material from site.

M. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

N. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot (305 mm) into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Engineer.

3.06 UTILITY BEDDING AND COVER

A. Maintain trenches and prevent loose soil or rocks from entering.

B. Crushed Stone: Compact to 95 percent of maximum dry density.
   1. Bedding: Fill to subgrade elevation; rake smooth.
   2. Cover: Completely cover utility.

C. Sand: Compact in maximum 8-inch (200 mm) lifts to 95 percent of maximum dry density.
   1. Bedding: Fill to subgrade elevation; rake smooth.

D. Filter Fabric: Position geosynthetic smooth and wrinkle-free on prepared surface; unroll or unfold carefully; avoid stretching.
   1. Wrap around crushed stone and utility assembly; overlap seams.
   2. See Section 31 0519 for additional requirements.

E. Concrete: Place in accordance with ACI PRC-304.

F. Inspect utility for damage from falling rock. Repair or replace damaged utility.

3.07 FLOWABLE FILL

A. Completely cover utilities in accordance with NRMCA CLSM.
   1. Fill trench to indicated elevation.

3.08 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.09 BACKFILL AND COMPACTION

A. Backfill to contours and elevations indicated on drawings using unfrozen materials.

B. Fill to subgrade elevations unless otherwise indicated on drawings.

C. Employ placement method that does not disturb or damage other work.

D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen, or spongy subgrade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. General Fill: Place and compact materials in equal continuous layers not exceeding 8 inches (200 mm) compacted depth.

G. Granular Fill: Place and compact material in equal continuous layers not exceeding 6 inches (150 mm) compacted depth.

H. Slope grade away from building minimum 2 inches in 10 feet (50 mm in 3 m), unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

I. Correct areas that are over-excavated.
   1. Thrust-Bearing Surfaces: Fill with concrete.
   2. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

J. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.
   2. At Other Locations: 95 percent of maximum dry density.

K. Reshape and re-compact fills subjected to vehicular traffic.

L. Underground Warning Tape:
   1. Install 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried pipe if required by the owner.

M. Buried Detection Wire: Install 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried pipe, if required by the owner.

3.10 BEDDING AND FILL AT SPECIFIC LOCATIONS

A. Utility Piping, Conduits, and Duct Bank:

B. At Pipe Culverts:

C. Over Subdrainage Piping at Foundation Perimeter:

D. At French Drains:

3.11 TOLERANCES

A. Maximum Variation from Top Surface of General Backfilling: Plus or minus 1 inch (25 mm) from required elevations.

B. Maximum Variation from Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch (25 mm) from required elevations.

3.12 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D1557 modified proctor, AASHTO T 180, or ASTM D698 standard proctor.

D. Nonconforming Work: For failed tests, remove work, replace, and retest.

E. Frequency of Tests: As directed by the Geotechnical Engineer.

3.13 CLEANING

A. Stockpile excavated material re-used in area designated on-site; see Section 31 2200.

B. Remove excavated material that is not required or unsuitable for re-use from site.

C. Remove excess excavated material from site.

3.14 PROTECTION

A. Divert surface water away from excavations.

B. Keep excavations free of standing water.

C. Maintain stability of banks and loose soils; prevent from falling into excavations.

D. Maintain excavations in neat and square, undisturbed condition.

END OF SECTION

TRENCH EXCAVATION PROTECTION

PART I - GENERAL

1.01 SECTION INCLUDES:

A. Trench Excavation Protection required for the construction of all trench excavation protection systems to be utilized in the project and including all additional excavation and backfill necessitated by the protection and backfill necessitated by the protection system.

1.02 MEASUREMENT AND PAYMENT

A. Trench Excavation Protection is to be included in the cost of installation of trenched underground utilities.

1.03 RELATED SECTIONS

A. Trench Excavation Protection shall be accomplished as required by the provisions of Part 1926, Subpart P - Excavations, Trenching, and Shoring of the Occupational Safety and Health Administration Standards and Interpretations.

B. A copy of the Document is available for review at the office of the Engineer. It shall be construed that this document is included in this Project Manual and shall apply to every Section as if written in full therein.

PART 2 - PRODUCTS -- NOT USED

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. Trench Excavation Protection shall be accomplished as required by the provisions of, Part 1926, Subpart P - Excavations, Trenching, and Shoring of the Occupational Safety and Health Administration Standards and Interpretations.

END OF SECTION

ROCK REMOVAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of identified rock during excavation.

1.02 RELATED REQUIREMENTS

A. Section 31 2323 - Fill: Fill materials.

1.03 PRICE AND PAYMENT PROCEDURES

A. Site Rock Removal: By the cubic yard (cubic meter) measured before disintegration. Includes preparation of rock for removal, mechanical disintegration of rock, removal from position, loading and removing from site. For over excavation, payment will not be made for over excavated work nor for replacement materials.

B. Trench Rock Removal: By the cubic yard (cubic meter) measured before disintegration. Includes preparation of rock for removal, mechanical disintegration of rock, removal from position, loading and removing from site. For over excavation, payment will not be made for over excavated work nor for replacement materials.

1.04 DEFINITIONS

A. Site Rock: Solid mineral material with a volume in excess of 1/3 cubic yard (0.25 cubic meter) or solid material that cannot be removed with a 3/4 cubic yard (0.57 cubic meter) capacity power shovel without drilling or blasting.

B. Trench Rock: Solid mineral material with a volume in excess of 1/6 cubic yard (0.13 cubic meter) or solid material that cannot be removed with a 3/4 cubic yard (0.57 cubic meter) capacity power shovel without drilling or blasting.

C. Rock: Solid mineral material of a size that cannot be removed with a 3/4 cubic yard (0.57 cubic meter) capacity power shovel.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions and note subsurface irregularities affecting work of this section.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

3.03 ROCK REMOVAL

A. Excavate and remove rock by mechanical methods only; use of explosives is prohibited.

B. Mechanical Methods: Drill holes and utilize expansive tools to fracture rock.

C. Form level bearing at bottom of excavations.

D. Remove shaled layers to provide sound and unshattered base for footings.

E. In utility trenches, excavate to 6 inches (150 mm) below invert elevation of pipe and 24 inches (600 mm) wider than pipe diameter.

F. Remove excavated materials from site.

G. Correct unauthorized rock removal in accordance with backfilling and compacting requirements of Section 31 2323.

3.04 FIELD QUALITY CONTROL

A. Provide for visual inspection of foundation bearing surfaces and cavities formed by removed rock.

END OF SECTION

FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade, footings, slabs-on-grade, paving, and site structures.

B. Backfilling and compacting for utilities outside the building to utility main connections.

C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

D. Lightweight concrete fill.

1.02 RELATED REQUIREMENTS

A. Geotechnical report; bore hole locations and findings of subsurface materials.

B. Section 01 5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.

C. Section 31 0519 - Geosynthetics for Earthwork.

D. Section 31 1000 - Site Clearing.

E. Section 31 2200 - Grading: Site grading.

F. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.

G. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

H. Section 31 2316.26 - Rock Removal: Removal of rock during excavating.

I. Section 31 3700 - Riprap.

J. Section 32 1120 - Subbase and Aggregate Base Courses.

K. Section 33 4100 - Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

1.03 PRICE AND PAYMENT PROCEDURES

A. General Fill:
   1. Measurement Method: By the cubic yard (cubic meter).
   2. Includes: Excavating existing soil, stockpiling, scarifying substrate surface, placing where required, compacting, and dewatering.

B. Structural Fill:
   1. Measurement Method: By the cubic yard (cubic meter).
   2. Includes: Excavating existing soil, stockpiling, scarifying substrate surface, placing where required, compacting, and dewatering.

C. Granular Fill:
   1. Measurement Method: By the cubic yard (cubic meter).
   2. Includes: Excavating existing material, stockpiling, scarifying substrate surface, placing where required, compacting, and dewatering.

D. Aggregates:
   1. Measurement Method: By the cubic yard (cubic meter).
   2. Includes: Excavating existing material, stockpiling, scarifying substrate surface, placing where required, compacting, and dewatering.

E. Lightweight Concrete Fill:
   1. Measure completed lightweight concrete fill work in place. Do not count wasted material towards total.
   2. Measurement Method: By the cubic yard (cubic meter).

3. Includes: Excavating existing material, supplying lightweight concrete fill, scarifying substrate surface, placing lightweight concrete fill where required, compacting other fill adjacent to lightweight concrete, and dewatering.

1.04 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Subgrade Elevations: 4 inches (100 mm) below finish grade elevations indicated on drawings, unless otherwise indicated.

1.05 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil–Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).

B. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; 2025.

C. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2025.

D. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

E. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

F. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012 (Reapproved 2021).

G. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2024.

H. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

I. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2015.

J. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017 (Reapproved 2025).

K. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).

L. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2023.

1.06 SUBMITTALS

A. Product Data for Manufactured Fill.

B. Soil Samples: 10 pounds (4.5 kg) sample of each type of fill; submit in air-tight containers to testing laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

E. Compaction Density Test Reports.

F. Lightweight Concrete Test Reports.

G. Manufacturer's Instructions.

H. Testing Agency Qualification Statement.

1.07 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.08 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Complying with State of TX Highway Department standard.

B. General Fill: Subsoil excavated on-site.
   1. Graded.
   2. Free of lumps larger than 3 inches (75 mm), rocks larger than 2 inches (50 mm), and debris.
   3. Complying with ASTM D2487 Group Symbol CL.

C. Structural Fill: Complying with State of TX Highway Department standard.

D. Structural Fill: Subsoil excavated on-site.
   1. Graded.
   2. Free of lumps larger than 3 inches (75 mm), rocks larger than 2 inches (50 mm), and debris.
   3. Complying with ASTM D2487 Group Symbol CL.

E. Concrete for Fill: Lean concrete, compressive strength of 2,500 psi.

F. Granular Fill: Coarse aggregate, complying with State of TX Highway Department standard.

G. Granular Fill - Gravel : Pit run washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM D2487 Group Symbol GW.

H. Granular Fill - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
   1. Grade in accordance with ASTM D2487 Group Symbol GM.

I. Sand: Complying with State of TX Highway Department standard.

J. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Grade in accordance with ASTM D2487 Group Symbol SW.

K. Engineered Fill - Lightweight Concrete:
   1. Materials:
      a. Cement: ASTM C150/C150M.
      b. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
      c. Expansion Material: Manufacturer's recommended expansion material.
      d. Mix Design: By manufacturer.

2.02 ACCESSORIES

A. Geotextile: See Section 31 0519.

2.03 SOURCE QUALITY CONTROL

A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the Work are as indicated.

B. Identify required lines, levels, contours, and datum locations.

C. See Section 31 2200 for additional requirements.

D. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

E. Verify structural ability of unsupported walls to support imposed loads by the fill.

F. Verify underground tanks are anchored to their own foundations to avoid flotation after backfilling.

G. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches (150 mm) to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Place fill in compacted lifts in accordance to the Geotechnical Report

B. Fill to contours and elevations indicated using unfrozen materials.

C. Fill up to subgrade elevations unless otherwise indicated.

D. Employ a placement method that does not disturb or damage other work.

E. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

F. Maintain optimum moisture content of fill materials to attain required compaction density.

G. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches (150 mm) compacted depth.

H. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches (200 mm) compacted depth.

I. Slope grade away from building minimum 2 inches in 10 feet (50 mm in 3 m), unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

J. Correct areas that are over-excavated.
   1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 97 percent of maximum dry density.
   2. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

K. Compaction Density Unless Otherwise Specified or Indicated in the Geotechnical Report:
   1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.
   2. At other locations: 95 percent of maximum dry density.

L. Reshape and re-compact fills subjected to vehicular traffic.

M. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.04 ENGINEERED FILL - LIGHTWEIGHT CONCRETE

A. Install lightweight concrete fill according to manufacturer's written instructions.

B. Use batching, mixing, and placing equipment approved by the manufacturer.

C. Prevent segregation of material.

D. Tolerance: Finished surface within 2 inches (50 mm) of elevation indicated on drawings.

3.05 FILL AT SPECIFIC LOCATIONS

A. Comply with the Geotechnical Report. If not otherwise indicated in the Geotechnical Report use general fill.

B. Structural Fill at buildings:
   1. Use structural fill.
   2. Fill up to subgrade elevations.
   3. Maximum depth per lift: 6 inches (150 mm), compacted.
   4. Compact to minimum 97 percent of maximum dry density.

C. Over Subdrainage Piping at Foundation Perimeter:
   1. Drainage fill and geotextile: Section 31 0519.
   2. Cover drainage fill with general fill.
   3. Fill up to subgrade elevation.
   4. Compact to 95 percent of maximum dry density.

D. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches:
   1. Bedding: Use granular fill.
   2. Cover with general fill.
   3. Fill up to subgrade elevation.
   4. Compact in maximum 8 inch (200 mm) lifts to 95 percent of maximum dry density.

E. At Landscape Areas:
   1. Use general fill.
   2. Fill up to 4 inches (100 mm) below finish grade elevations.
   3. Fill up to subgrade elevations.
   4. Compact to 95 percent of maximum dry density.

F. At French Drains:
   1. Use granular fill.
   2. Compact to 95 percent of maximum dry density.

3.06 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch (25 mm) from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch (12 mm) from required elevations.

3.07 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.

B. Soil Fill Materials:
   1. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.
   2. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180.
   3. If tests indicate work does not meet specified requirements, remove work, replace and retest.
   4. Frequency of Tests: As recommended by the Geotechnical Engineer.
   5. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers, and paving.

C. Engineered Fill - Lightweight Concrete:

1. Testing: Provide third-party testing of samples in accordance with ASTM C796/C796M except do not oven-dry load-test specimens.

3.08 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

LIME SOIL STABILIZATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating, treatment, and placement of lime treated subsoil mix.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: General site and building excavation.

B. Section 31 2316.13 - Trenching: Backfilling of utility trenches.

C. Section 31 2316.26 - Rock Removal.

D. Section 31 2323 - Fill: General site and building backfilling.

E. Section 31 2323 - Fill: Soil and aggregate materials.

1.03 PRICE AND PAYMENT PROCEDURES

A. Measurement Method: By the square yard (square meter) of lime/subsoil mix, based on a lime/soil mix ratio determined by the geotchnical engineer. Includes supplying ingredient materials, scarifying substrate surface, mixing and placing where required, compacting and curing.

1.04 REFERENCE STANDARDS

A. AASHTO M 216 - Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization; 2022.

B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012 (Reapproved 2021).

C. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2024.

D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

E. NLA Bull 326 - Lime-Treated Soil Construction Manual: Lime Stabilization & Lime Modification; 2004.

1.05 SUBMITTALS

A. Submit mix design and materials mix ratio that will achieve specified requirements.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with State of TX Highways standards.

1.07 FIELD CONDITIONS

A. Do not install mixed materials in wind in excess of 10 mph (16 k/h) or when temperature is below 40 degrees F (5 degrees C).

PART 2 PRODUCTS

2.01 MIX MATERIALS

A. Subsoil: General fill specified in Section 31 2323.

B. Lime: AASHTO M 216 hydrated lime.

2.02 EQUIPMENT

A. Equipment: Capable of excavating subsoil, mixing and placing materials, wetting, consolidation, and compaction of material.

2.03 LIME/SOIL MIX

A. Mix subsoil, lime, sand and aggregate in accordance with Geotechnical Report. Quantity of lime is not to exceed 10 percent of dry mixed materials by volume.

B. Carefully add water to the mix to achieve a consistent mixture without lumping yet not create a wet plastic consistency.

C. Obtain approval of the mixby the Geotechnical Engineer before proceeding with placement.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not place fill over frozen or spongy subgrade surfaces.

3.02 EXCAVATION

A. Protect adjacent structures from damage by this work.

B. Excavate subsoil to depth indicated.

C. Proof roll subgrade to identify soft areas; excavate those areas.

D. Do not excavate within normal 45 degree bearing splay of any foundation.

E. Notify Geotechnical Engineer of unexpected subsurface conditions. Discontinue affected Work in area until notified to resume work.

F. Stockpile excavated material in area designated on site; remove excess material not being reused from site.

3.03 SOIL TREATMENT AND BACKFILLING

A. Site mix subsoil, backfill and compact. Blend treated subsoil mix to achieve mix formulation and required stabilization.

B. Place mix material in continuous layers not exceeding 12 inches (300 mm) depth.

C. Maintain optimum moisture content of mix materials to attain required stabilization.

D. Do not exceed 60 minutes in placing adjacent mixed material.

E. Commence compaction of mix no later than 60 minutes after placement.

F. Compact to 95 percent of maximum density determined in accordance with ASTM D698; test in-place density in accordance with ASTM D1556/D1556M.

G. Slope grade away from building minimum 2 inches in 10 ft (150 mm in 3 m), unless noted otherwise.

H. Shape to required line, grade, and cross section.

I. Make grade changes gradual. Blend slope into level areas.

J. At end of day, terminate completed Work by forming a straight and vertical construction joint.

K. Replace damaged fill with new mix to full depth of original mix.

L. Remove surplus mix materials from site.

3.04 TOLERANCES

A. Top Surface of Fill: Plus or minus one inch (25 mm) from required elevations.

3.05 FIELD QUALITY CONTROL

A. Compression test and analysis of hardened fill material will be performed in accordance with ASTM D698.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION

RIPRAP

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General riprap.

B. Nonmachined riprap.

C. Riprap bedding.

D. Geotextile filter fabric.

1.02 RELATED REQUIREMENTS

A. Section 31 0519 - Geosynthetics for Earthwork.

B. Section 31 2316 - Excavation.

C. Section 31 2323 - Fill.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:
   1. See Section 01 2200 - Unit Prices for additional requirements.
   2. Basis of Measurement for Riprap: By square yard (meter) of riprap lift areas, of riprap blocks. Includes supply and placing riprap mix in sacks, moist-cured.
   3. Basis of Payment for Riprap: Include purchase, delivery, and installation.

1.04 REFERENCE STANDARDS

A. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.

B. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).

C. ASTM D4833/D4833M - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products; 2007 (Reapproved 2020).

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Manufacturer's data for weight, bag type, and approximate dimensions.
   2. Manufacturer's data on each geosynthetic product used, including physical properties and seaming materials.

PART 2 PRODUCTS

2.01 GENERAL RIPRAP

A. Riprap: Limestone type; broken stone; solid and nonfriable; 6 inch (150 mm) minimum, 12 inch (300 mm) maximum.

2.02 NONMACHINED RIPRAP

A. Solid and nonfriable; broken stone; limestone type.

B. Mean Particle Size: 6 inches (152 mm):
   1. Percent Smaller by Weight:
      a. 12 inch (305 mm): 70 to 100 percent.
      b. 9 inch (230 mm): 50 to 70 percent.
      c. 6 inch (152 mm): 35 to 50 percent.
      d. 2 inch (51 mm): 2 to 10 percent.

2.03 GEOTEXTILE FILTER FABRIC

A. See Section 31 0519.

B. Woven polyester material, capable of passing surface water and providing material separation.
   1. Grab Strength: 300 pound (1.3 kN) minimum, when tested in accordance with ASTM D4632/D4632M.
   2. Puncture Strength: 450 pound (2.0 kN) minimum, when tested in accordance with ASTM D4833/D4833M.
   3. Permittivity: 0.12 per second minimum, when tested in accordance with ASTM D4491/D4491M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify survey benchmarks and intended elevations for work are as indicated on plans.

B. Identify required lines, levels, contours, and datum locations.

C. Verify riprap areas are uncompromised with surface or groundwater.

D. Do not place riprap over frozen or spongy subgrade surfaces.

3.02 PREPARATION

A. Grade riprap areas to indicated elevations, allowing for riprap thickness. Remove organic materials and compact.

B. See Section 31 2323 for subgrade fill.

C. See Section 31 2316 for excavation.

3.03 PLACEMENT

A. Perform work in accordance with State of TX Highway standard.

B. Place in full course lifts starting at slope base and working uphill.

C. Installed Thickness: 12 inches (300 mm), average.

3.04 BEDDING OR SUBSTRATE CONTACT INSTALLATION

A. Geotextile Filter Fabric Placement:
   1. See Section 31 0519.
   2. Install in accordance with manufacturer's recommendations.
   3. Place over substrate in direction of water flow.
   4. Edges:
      a. Overlapped 2 feet (610 mm), minimum.
      b. Field sewn at 80 percent fabric strength, minimum.
   5. Secure fabric to prevent movement.
   6. Repair or replace fabric damaged during installation.

B. Riprap Bedding Placement:
   1. See Section 31 2323.
   2. Spread uniformly to 12-inch (31 cm) depth.
   3. Smooth surface and remove mounds, dips, and windrows.
   4. Place bedding in manner to prevent damage to geotextile. Repair damages created by bedding placement.

C. Nonmachine Riprap Placement:
   1. Place in full course lifts starting at slope base and working uphill.
   2. Place with homogeneous sizing; interlock larger stones and fill with smaller ones.
   3. Prevent clusters of smaller stones.
   4. Lay flat stones on edges.
   5. Installed Thickness: 12 inches (300 mm), average.
   6. Place riprap without causing bedding disturbances. Correct bedding complying with drawings.

3.05 GEOTEXTILE OR BEDDING CONTACT INSTALLATION

A. Geotextile Filter Fabric Placement:
   1. See Section 31 0519.
   2. Install in accordance with manufacturer's recommendations.
   3. Place over substrate in direction of water flow.
   4. Edges:
      a. Overlapped 2 feet (610 mm), minimum.
      b. Field sewn at 80 percent fabric strength, minimum.
   5. Secure fabric to prevent movement.
   6. Place geotextile in manner to prevent disruptions to bedding. Correct disruptions created by geotextile placement.
   7. Repair or replace fabric damaged during installation.

END OF SECTION

SUBBASE AND AGGREGATE BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Subbase course.

B. Geosynthetic reinforcement.

C. Aggregate base course.

1.02 RELATED REQUIREMENTS

A. Project Geotechnical Report

B. Section 31 0519 - Geosynthetics for Earthwork.

C. Section 31 2200 - Grading.

D. Section 31 2316.13 - Trenching.

E. Section 31 2323 - Fill.

F. Section 32 1313 - Concrete Paving.

G. Section 32 1623 - Sidewalks.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:

1. Basis of Measurement for Subbase Course: By cubic yard (cubic meter).
2. Basis of Measurement for Geosynthetic Reinforcement: By square foot (square meter).
3. Basis of Measurement for Aggregate Base Course: By cubic yard (cubic meter).

1.04 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil–Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).

B. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; 2025.

C. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2025.

D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012 (Reapproved 2021).

E. ASTM D1241 - Standard Specification for Materials for Soil-Aggregate Subbase, Base, and Surface Courses; 2015.

F. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2024.

G. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

H. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2015.

I. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017 (Reapproved 2025).

J. ASTM D3665 - Standard Practice for Random Sampling of Construction Materials; 2024.

K. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).

L. ASTM D5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test; 2020.

M. ASTM D6693/D6693M - Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes; 2020.

N. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2023.

1.05 SUBMITTALS

A. Product Data: Geogrid indicating tensile strength.

B. Test Reports:
   1. Aggregate Composition: Results of laboratory tests on proposed and actual materials used.
   2. Compaction Density: Results of laboratory tests on compacted course.

C. Manufacturer's Instructions: Indicate geosynthetic installation procedure.

D. Source Quality Control Submittals: Submit name of imported materials source.

E. Field Quality Control Submittals: Submit compaction density testing results.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver geosynthetic to project site wrapped in protective covering, maintain prior to use.

B. Aggregate Storage: Prevent material intermixing, contamination, and deterioration.

PART 2 PRODUCTS

2.01 MATERIALS

A. Subbase Course: As indicated in the Geotechnical Report

B. Geosynthetic:
   1. Geotextile: See Section 31 0519.
   2. Geotextile: Nonbiodegradable, woven.

C. Aggregate Base Course: As indicated in the Geotechnical Report and Design Drawings.
   1. If not otherwise indicated, then: Type A, Grade 1 or 2, Item 247:Comply with State of TX Highway Department standard.

2.02 SOURCE QUALITY CONTROL

A. If tests indicate materials do not meet specified requirements, change material and retest.

B. Provide materials of each type from same source throughout the Work.

C. For aggregate materials using classification complying with ASTM D2487, provide testing before delivery to site.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

B. Verify substrate has been inspected, and gradients and elevations are correct and dry.

3.02 PREPARATION

A. Prepare the site as indicated in the Geotechnical Report.

B. If not otherwise indicated then, proof roll subgrade to identify soft spots.

C. Correct irregularities in subgrade gradient and elevation by scarifying, reshaping, and recompacting.

D. Moisture condition subgrade by scarifying a minimum of 6 inches and recompacting to a minimum 95% of the maximum density, +-3%, determined by TxDOT Compaction Test, TxDOT Tex-114-E.

E. Do not place aggregate on soft, muddy, or frozen surfaces.

F. Grade excavated and filled substrate; see Section 31 2200.

G. Backfill and compact trench excavations; see Section 31 2316.13.

H. Backfill and compact subgrade fill; see Section 31 2323.

I. Verify subgrade has been inspected, gradients and elevations are correct.

3.03 PLACEMENT

A. Under Bituminous Concrete Paving:
   1. Subbase Compacted Thickness: According to design drawings and Geotechnical Report.
   2. If required, install geosynthetic reinforcement on substrate in accordance with manufacturer's instructions.
   3. Aggregate Base Compacted Thickness: According to design drawings and Geotechnical Report; otherwise, a maximum of 8 inches.
   4. Compaction as indicated in the Geotechnical Report; otherwise, to 95 percent of maximum dry density in accordance with ASTM D 1557 at a moisture content ranging from -2 to +3 percent of the optimum moisture content..

B. Under Portland Cement Concrete Paving:
   1. Subbase Compacted Thickness: According to design drawings and Geotechnical Report.
   2. If required, install geosynthetic reinforcement on substrate in accordance with manufacturer's instructions.
   3. Aggregate Base Compacted Thickness: According to design drawings and Geotechnical Report; otherwise, a maximum of 8 inches.
   4. Compaction as indicated in the Geotechnical Report; otherwise, to 95 percent of maximum dry density in accordance with ASTM D 1557 at a moisture content ranging from -2 to +3 percent of the optimum moisture content.

C. Under Unit Pavers:
   1. Subbase Compacted Thickness: According to design drawings.
   2. Install geosynthetic reinforcement on substrate in accordance with manufacturers instructions.
   3. Aggregate Base Compacted Thickness: According to design drawings.
   4. Compact to 95 percent of maximum dry density.

D. Place course in maximum 8 inch (203 mm) layers and roller compact to specified density.

E. Level and contour surfaces to elevations and gradients indicated.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Variation From Design Elevation: Within 1/4 inch (6.4 mm).

B. Flatness: Maximum variation of 1/4 inch (6.4 mm) measured with 10 foot (3 m) straight edge.

C. Scheduled Compacted Thickness: Within 1/4 inch (6.4 mm).

3.05 FIELD QUALITY CONTROL

A. Subbase Compaction Density Testing: In accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.

B. Aggregate Base Compaction Density Testing: In accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with AASHTO T 180, ASTM D698 ("standard Proctor"), or ASTM D1557 ("modified Proctor").

D. Frequency of Tests: In accordance with ASTM D3665.

E. Remove, replace, and retest work that does not meet specified requirements.

F. Proof roll compacted aggregate at surfaces going underneath flexible paving.

3.06 CLEANING

A. Stockpile unused materials neat and compact.

B. Remove unused materials and grade areas to prevent standing surface water.

END OF SECTION

ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Single course bituminous concrete paving.

C. Double course bituminous concrete paving.

D. Surface sealer.

1.02 RELATED REQUIREMENTS

A. Project Geotechnical Report

B. Section 31 2200 - Grading: Preparation of site for paving and base.

C. Section 31 2323 - Fill: Compacted subgrade for paving.

D. Section 32 1120 - Subbase and Aggregate Base Courses.

E. Section 32 1713 - Parking Bumpers: Concrete bumpers.

F. Section 32 1723 - Pavement Markings.

G. Section 33 0561 - Concrete Manholes: Manholes, including frames; gutter drainage grilles, covers, and frames for placement by this section.

1.03 PRICE AND PAYMENT PROCEDURES

A. Asphalt Pavement Mix (Base Course): By the ton (metric ton). Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.

B. Asphalt Pavement Mix (Binder Course): By the ton (metric ton). Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.

C. Asphalt Pavement Mix (Wearing Course): By the ton (metric ton). Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.

D. Seal Coat: By the square yard (meter). Includes preparing surfaces and applying.

1.04 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil–Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).

B. AI MS-2 - Asphalt Mix Design Methods; 2015.

C. AI MS-19 - Basic Asphalt Emulsion Manual; 2008.

D. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2025.

E. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.

F. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017 (Reapproved 2025).

G. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with State of TX Highways standard.

B. Mixing Plant: Complying with State of TX Highways standard.

C. Obtain materials from same source throughout.

1.06 FIELD CONDITIONS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F (4 degrees C), or surface is wet or frozen.

B. Place bitumen mixture when temperature is not more than 15 F degrees (8 C degrees) below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with applicable code for paving work on public property.

2.02 MATERIALS

A. Asphalt Cement: ASTM D946.

B. Aggregate for Base Course: In accordance with State of TX Highways standards.

C. Aggregate for Binder Course: In accordance with State of TX Highways standards.

D. Aggregate for Wearing Course: In accordance with State of TX Highways standards.

E. Fine Aggregate: In accordance with State of TX Highways standards.

F. Tack Coat: Homogeneous, medium curing, liquid asphalt.

2.03 ASPHALT PAVING MIXES AND MIX DESIGN

A. Use dry material to avoid foaming. Mix uniformly.

B. Asphalt Base Course: 3.0 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

C. Asphalt Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

D. Asphalt Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

E. Submit proposed mix design of each class of mix for review prior to beginning of work.

2.04 SOURCE QUALITY CONTROL

A. Test mix design and samples in accordance with AI MS-2.

PART 3 EXECUTION

3.01 EXAMINATION

A. Proof roll the base coarse and remove and replace any soft materials.

B. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

C. Verify gradients and elevations of base are correct.

D. Verify manhole frames, clean outs, and other utility access covers are installed in correct position and elevation.

3.02 AGGREGATE BASE COURSE

A. Place and compact aggregate base course.

B. See Section 32 1120.

3.03 PREPARATION - PRIMER

A. Apply primer in accordance with manufacturer's instructions.

B. Apply primer on aggregate base or subbase at uniform rate of 1/3 gal/sq yd (1.5 L/sq m).

C. Use clean sand to blot excess primer.

3.04 PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions.

B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd (1.5 L/sq m).

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.05 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with State of TX Highways standards.

B. Place asphalt within 24 hours of applying primer or tack coat.

C. Install gutter drainage grilles and frames in correct position and elevation.

D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.06 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.

B. Place asphalt wearing course within two hours of placing and compacting binder course.

C. Install gutter drainage grilles and frames in correct position and elevation.

D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

E. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.07 SEAL COAT

A. Apply seal coat to asphalt surface course in accordance with AI MS-19.

3.08 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch (6 mm) measured with 10 foot (3 m) straight edge.

B. Compacted Thickness: Within 1/4 inch (6 mm) of specified or indicated thickness.

C. Variation from True Elevation: Within 1/4 inch (6 mm).

3.09 FIELD QUALITY CONTROL

A. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.

3.10 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for 2 days or until surface temperature is less than 140 degrees F (60 degrees C).

3.11 SCHEDULE

A. Pavement at Parking Areas: In accordance with the Geotechnical Report and design drawings; otherwise, two courses; binder course of 2-1/2 inch (63 mm) compacted thickness and wearing course of 1-1/2 inch compacted thickness..

END OF SECTION

CONCRETE CURBS AND GUTTERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete curbs and gutters.

1.02 RELATED SECTIONS

A. Section 31 23 23 - Fill.

B. Section 32 11 20- Subbase and Aggregate Base Courses.

C. Section 32 13 13 - Concrete Paving

1.03 PRICE AND PAYMENT PROCEDURES

A. Concrete Curbs and Gutters: By the linear foot. Includes trenching, steel reinforcement, concrete curb installation, and cleaning.

1.04 REFERENCES

A. ASTM D 1190, Concrete Joint Sealer Hot Poured Elastic Type.

B. ASTM D 994-71 (R1977), Preformed Expansion Joint Filler For Concrete (Bituminous Type).

C. ASTM D 1751-73 (R1978) Preformed Expansion Joint Fillers for concrete Paving Structural Construction.

D. TxDOT, Item 529. "Concrete Curb, Gutter and Combined Curb and Gutter".

1.05 SUBMITTALS

A. Samples: Submit for review samples, applicable manufacturer's product data, test reports and material certifications.

B. Shop Drawings:
   1. Detailed Reinforcing Steel Layout.
   2. Detailed Construction And Control Joint Layout.

1.06 QUALITY ASSURANCE

A. The testing laboratory shall sample and test concrete in accordance with Section 32 13 13 - Concrete Paving.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified in this Section, all concrete and concrete materials shall conform to TxDOT, Item 529, "Concrete Curb, Gutter and Combined Curb and Gutter".

B. Bituminous Joint Filler: Bituminous type conforming to ASTM D 994 or D 1751 unless otherwise indicated on drawings.
   1. Reinforcing steel shall be ASTM A 615 grade 60, deformed and conform to the provisions of TxDOT Standard Specifications, Item No. 529, "Concrete Curb, Gutter and Combined Curb and Gutter".
   2. All reinforcing steel to be new billet steel.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION

A. Preparation of the subgrade including compaction shall be completed two feet (2') beyond the limits of the work:
   1. Where the subgrade is constructed by excavation of existing grade, the top six inches (6") of the subgrade shall be compacted to at least 95 percent of maximum density as determined by TxDOT TEX-113-E at a moisture content between optimum and optimum +4 percent unless otherwise indicated.
   2. The subgrade shall be brought to the final lines and grades utilizing select backfill.

3. Pit Run Sand or Granular Embedment:
   a. Pit run sand or granular embedment shall be provided as shown on drawings.
   b. The material shall be as specified in Section 31 23 23 and compacted as specified.

3.02 FORM CONSTRUCTION

A. Forms shall be in conformance with TxDOT Standard Specification, Item 529, "Concrete Curb, Gutter and Combined Curb and Gutter".

B. Set forms to line and grade. Install forms over full length of curbs, gutters and sidewalks.

3.03 REINFORCEMENT

A. Locate, place, and support reinforcement as specified in TxDOT Standard Specifications, Item 529, "Concrete Curb, Gutter and Combined Curb and Gutter" unless otherwise shown on drawings.

3.04 CONCRETE PLACEMENT

A. General: Comply with the requirements of TxDOT Standard Specifications, Item 529, "Concrete Curb, Gutter and Combined Curb and Gutter".

B. Machine Formed/Hand Formed:
   1. Automatic curb and gutter machine may be used in lieu of hand formed methods for forming and placing.
   2. Concrete shall have properties as previously specified, except that maximum slump shall be 2-1/2 inches (2 1/2") and air content shall be two percent (2%).
   3. Machine forming shall produce curbs, gutters and sidewalks to the required cross-section, lines, and grades, finish and jointing, as specified for conventionally formed concrete.
   4. Unacceptable work will be removed and replaced at Contractor's expense.

3.05 JOINTS

A. General:
   1. Construct expansion, contraction, and construction joints with faces perpendicular to surface of the curb, gutter and sidewalk.
   2. Construct transverse joints at right angles to the work centerline and as shown.

B. Control Joints:
   1. Provide these joints at ten feet (10') on centers for curbs and gutters.

C. Construction Joints
   1. Place joints at locations where placement operations are stopped for a period of more than 1/2 hour, except where such pours terminate at expansion joints.

D. Expansion Joints
   1. Provide 1/2 inch expansion joint filler where work abuts structures; at returns; and at 50-foot spacing for straight runs.
   2. Where gutter and sidewalk are not poured monolithically, provide expansion joints where each abuts the other.
   3. Place top of expansion joint filler not less than 1/2 inch or more than one inch (1") below concrete surface.
   4. Apply joint sealer on top of expansion joint material flush with concrete surface, and in accordance with manufacturer's instructions.

3.06 CONCRETE FINISHING

A. Smooth the exposed surface by screeding and floating.

B. Work edges of gutter and sidewalks, back top edge of curb, and transverse joints; and round to 1/4-inch radius.

C. Complete surface finishing by drawing a fine-hair broom across surface, perpendicular to line of traffic unless alternative finish is indicated on drawings.

3.07 CURING

A. Protect and cure finished concrete curbs, gutters and sidewalks, complying with applicable requirements of TxDOT Standard Specifications, Item 529, "Concrete Curb, Gutter and Combined Curb and Gutter".

3.08 REPAIR AND CLEANING

A. Broken or defective curb, gutters and sidewalks shall be repaired or replaced as directed by the Engineer at the Contractor's expense.

B. Sweep work and wash free of stains, discolorations, dirt or other foreign material.

END OF SECTION

ASPHALT UNIT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphaltic block pavers.

B. Adhesive.

C. Surface Conditioner.

D. Joint Filler.

1.02 RELATED REQUIREMENTS

A. Section 32 1120 - Subbase and Aggregate Base Courses.

B. Section 32 1313 - Concrete Paving: Concrete substrate.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices, for additional unit price requirements.

B. Asphalt Block Pavers: By the square foot (meter). Includes preparation of substrate, priming, placing pavers, finishing.

1.04 SUBMITTALS

A. Product Data: Provide characteristics of paver unit, dimensions, special shapes, and adhesive.

B. Manufacturer's Installation Instructions: Indicate substrate requirements, installation methods.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Pavers: Fibrous asphaltic block; 8 min by 8 min inch (200 min by 200 min mm) size, 3 1/2 inch (89 mm) thick; natural finish of terracota color.

B. Adhesive: Neoprene modified asphaltic type, recommended by paver manufacturer.

C. Joint Filler: Portland cement and clean sand.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate is level, smooth, capable of supporting pavers and imposed loads, and ready to receive work of this section.

B. Verify gradients and elevations of substrate are correct.

C. Verify dry weather forecast without rain for a minimum of 24 hours with temperatures above 55 degrees Fahrenheit (13 degrees Celsius).

D. Verify that pavers are completely dry prior to polymeric sand installation.

3.02 PREPARATION

A. Apply surface conditioner to surface of substrate in accordance with manufacturer's instructions.

B. See Section 32 1120 for aggregate subbase.

C. See Section 32 1313 for concrete subbase.

3.03 INSTALLATION

A. Apply adhesive and pavers in accordance with manufacturer's instructions.

B. Place paver units in herringbone pattern, from straight reference edge.

C. Place half units or special shaped units at edges and interruptions. Maintain tight joints.

D. Machine roll units to level surface.

E. Sweep a dry mixture of one part Portland cement and three parts sand into paver joints.

F. Using a sprayer set to shower, apply water on specific areas between 100 square feet (10 m) and 500 square feet (50 m) to a depth of 1 1/2 inches (4 cm). Complete one section at a time and avoid flooding the pavers.

G. Fog spray surfaces with water to ensure wetting of joint filler.

H. Sweep excess filler from surface of pavers.

3.04 CLEANING

A. Do not clean pavers until pavers and mortar are dry.

B. Clean soiled surfaces using cleaning solution. Do not harm pavers, joint materials, or adjacent surfaces.

C. Use non-metallic tools in cleaning operations.

D. Rinse surfaces with clean water.

E. Broom clean paving surfaces. Dispose of excess sand.

3.05 PROTECTION

A. Do not permit traffic over unprotected paver surface.

B. Do not permit traffic for 48 hours after pavement placement.

END OF SECTION

PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painted pavement markings.

B. Raised pavement markings.

C. Plastic pavement markings.

1.02 RELATED REQUIREMENTS

A. Section 32 1216 - Asphalt Paving.

B. Section 32 1313 - Concrete Paving.

C. Section 32 1623 - Sidewalks.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices:

1. Basis of Measurement for Linear Painted or Plastic Pavement Markings: By linear foot (linear meter).
2. Basis of Measurement for Painted or Plastic Pavement Markings Symbols or Text: Per unit.
3. Basis of Measurement for Raised Pavement Markings: Per unit.

1.04 REFERENCE STANDARDS

A. AASHTO M 237 - Standard Specification for Epoxy Resin Adhesives for Bonding Traffic Markers to Hardened Portland Cement and Asphalt Concrete; 2005 (Reapproved 2019).

B. AASHTO M 247 - Standard Specification for Glass Beads Used in Pavement Markings; 2013 (Reapproved 2018).

C. AASHTO M 249 - Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form); 2012 (Reapproved 2020).

D. AASHTO MP 24 - Standard Specification for Waterborne White and Yellow Traffic Paints; 2015 (Reapproved 2020).

E. ASTM D4505 - Standard Specification for Preformed Retroreflective Pavement Marking Tape for Extended Service Life; 2012 (Reapproved 2017).

F. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester; 2022.

G. DMS 8220 - Hot Applied Thermoplastic

H. DMS 8200 - Traffic Paint

I. DMS 8290 - Glass Traffic Beads

J. FHWA MUTCD - Manual on Uniform Traffic Control Devices; 2023.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with adjoining work.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

1.06 SUBMITTALS

A. Shop Drawings: Indicate survey control points and pavement markings.

B. Shop Drawings: Indicate traffic management plan with barricades, cones, and temporary markings.

C. Product Data: Manufacturer's data sheets on each product to be used.

D. Manufacturer's Instructions:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint in containers of at least 5 gallons (18 L) accompanied by batch certificate.

B. Deliver glass beads in containers suitable for handling and strong enough to prevent loss during shipment, accompanied by batch certificate.

C. Store products in manufacturer's unopened packaging until ready for installation.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.09 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F (10 degrees C) or more than 95 degrees F (35 degrees C).

1.10 SEQUENCING

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of markings.

PART 2 PRODUCTS

2.01 PAINTED PAVEMENT MARKINGS

A. Comply with State of TX Highway Department standards.

B. Comply with FHWA MUTCD.

C. Painted Pavement Markings: As indicated on drawings.
   1. Marking Paint: In accordance with AASHTO MP 24.
      a. Parking Lots: Yellow unless otherwise indicated on the design drawings.
      b. Symbols and Text: White.
      c. Wheelchair Symbols: Provide blue and white.
   2. Reflective Glass Beads: Type 1, in accordance with AASHTO M 247.
   3. Obliterating Paint: Type I, in accordance with AASHTO MP 24.
      a. Bituminous Pavement: Black.
      b. Concrete Pavement: Gray.

2.02 RAISED PAVEMENT MARKINGS

A. Comply with State of TX Highway Department standards.

B. Comply with FHWA MUTCD.

C. Surface Reflectors: Bidirectional, visible to approaching traffic; capable of withstanding pavement-rated loading.
   1. Housing: Plastic, yellow.
   2. Lens: Prismatic, acrylic, yellow.
   3. Dimensions: 4 inches by 4 inches (102 mm by 102 mm).
   4. Mounting Adhesive: Type I, in accordance with AASHTO M 237.
   5. Pavement Projection: 1/2 inch (12 mm).

D. Delineator Posts: All-direction visibility, reboundable.

1. Upright:
   a. Material: Polypropylene.
   b. Height: 24 inches (610 mm).
   c. Width: 3 inches (76 mm).
   d. Color: Yellow.
   e. Reflective Bands: Two bands.
   f. Shape: Round.
2. Base:
   a. Material: Acrylonitrile butadiene styrene.
   b. Mounting Holes: 1/4 inch (6 mm).
3. Mounting Hardware: Stainless steel.
4. Mounting Adhesive: Type I, in accordance with AASHTO M 237.

2.03 PLASTIC PAVEMENT MARKINGS

A. Comply with State of TX Highway Department standards.

B. Comply with FHWA MUTCD.

C. Plastic Pavement Markings: Preformed, uniform, smooth edges.
   1. Marking Tape: Vinyl, with retroreflective beads, in accordance with ASTM D4505.
      a. Class: Class 1, in accordance with ASTM D4505.
      b. Color: As indicated on the design drawings, otherwise Yellow.
      c. Retroreflectivity: Retroreflectivity II, in accordance with ASTM D4505.
      d. Skid Resistance: Level B, in accordance with ASTM E303.
      e. Thickness: 60 mils, 0.06 inch (1.5 mm).
      f. Width: 4 inches (102 mm).
      g. Primer: As recommended by manufacturer.
   2. Thermoplastic Markings: Alkyd, in accordance with AASHTO M 249.
      a. Color: As indicated on the design drawings, otherwise Yellow.
      b. Reflective Glass Beads: Type 1, in accordance with AASHTO M 247.
      c. Existing-Pavement Primer: Asphalt, thermosetting adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify existing markings for removal.

B. Verification of Conditions: Verify that pavement is dry and ready for installation.

C. Notify Engineer of unsatisfactory conditions before proceeding.

3.02 PREPARATION

A. Establish survey control points for locating and dimensioning of markings.

B. Place barricades, warning signs, and flags as necessary to alert approaching traffic per the traffic control plan.

C. Clean surfaces prior to installation.
   1. Remove dust, dirt, and other debris.
   2. Remove rubber deposits, existing paint markings, and other coatings.

D. Apply paint stencils by type and color at necessary intervals.

3.03 INSTALLATION

A. General:
   1. Position pavement markings as indicated on drawings.
   2. Field location adjustments require approval of Engineer.
   3. Allow traffic movement without hindrance.

B. Painted Pavement Markings:
   1. Apply in accordance with manufacturer's instructions.

2. Apply in accordance with State of TX Highway Department standards.
3. Apply in accordance with FHWA MUTCD standards.
4. Obliterating Paint: Apply as necessary to cover existing markings completely.
5. Marking Paint: Apply uniformly, with sharp edges.
    a. Applications: Two coat.
    b. Wet Film Thickness: 0.015 inch (0.4 mm), minimum.
    c. Stencils: Lay flat against pavement, align with striping, remove after application.
    d. Glass Beads: Apply directly to paint, 10 second lag time, 6 lbs/gal (720 g/L) of paint, uniform thickness and coverage.
    e. Length Tolerance: Plus or minus 3 inches (75 mm).
    f. Width Tolerance: Plus or minus 1/8 inch (3 mm).

C. Raised Pavement Markings:
1. Install in accordance with manufacturer's instructions in manner necessary to maintain manufacturer's warranty.
2. Install in accordance with State of TX Highway Department standards.
3. Install in accordance with FHWA MUTCD standards.
4. Surface Reflectors:
    a. Cut pavement and remove depth equal to height of reflector.
    b. Partially fill area with road marker epoxy adhesive.
    c. Press reflector into adhesive and apply pressure.
5. Delineator Posts:
    a. Base: Drill anchor holes into pavement. Place anchor sleeves into anchor holes flush with pavement surface. Screw anchor bolts through base holes into anchor sleeves.
        1) Apply mounting adhesive to base underside before anchoring.
    b. Upright: Attach post to base before anchoring in place.

D. Plastic Pavement Markings:
1. Install in accordance with manufacturer's instructions in manner necessary to maintain manufacturer's warranty.
2. Install in accordance with State of TX Highway Department standards.
3. Install in accordance with FHWA MUTCD standards.
4. Marking Tape: Place tape on pavement smooth and without wrinkles. 1/4 inch (6 mm) maximum gap between adjacent pieces. Immediately apply uniform pressure until firmly adhered.
    a. Apply primer to pavement at a rate of 1 oz/sq ft (3 L/sq m) and allow to set for 10 minutes prior to taping.
5. Thermoplastic Markings: Preheat pavement surface to 275 degrees F (135 degrees C). Place markings on pavement smooth and without wrinkles. 1/4 inch (6 mm) maximum gap between adjacent markings. Uniformly heat markings between 400 degrees F (204 degrees C) to 440 degrees F (227 degrees C). Do not overheat, scorch, or disperse embedded glass beads.
    a. Apply primer according to manufacturer's recommendations.

E. Apply Markings:
1. Using widths and colors and locations shown on the design drawings.
2. In proper alignment and without abrupt deviation.
3. Free of blisters.
4. Apply in unform cross-section with uniform density, width, and thickness.
5. Ends that are reasonably square and clean.
6. If required, with retroreflectorized drop on glass beads.

3.04 TOLERANCES

A. Maximum Variation From True Position: 1 inches (25 mm).

B. Maximum Offset From True Alignment: 1 inches (25 mm).

3.05 FIELD QUALITY CONTROL

A. Perform field inspection for deviations from true alignment or material irregularities.

B. If inspections indicate work does not meet specified requirements, rework and reinspect at no cost to Owner.

C. Allow the pavement marking to set at least the minimum time recommended by manufacturer.

3.06 CLOSEOUT ACTIVITIES

A. Temporary Markings: Remove without damaging surfaces.

3.07 PROTECTION

A. Prevent approaching traffic from crossing newly applied pavement markings.

B. Replace damaged or removed markings at no additional cost to Owner.

C. Preserve survey control points until pavement marking acceptance.

END OF SECTION

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Posts, rails, and frames.

B. Barbed wire.

C. Concrete.

D. Manual gates with related hardware.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete anchorage for posts.

1.03 PRICE AND PAYMENT PROCEDURES

A. Provide the work under the unit price method.

1. Fencing: Measurement and payment by the linear foot (linear meter), to the fence height specified, based on the specified post spacing. Includes posts, rails, tension wire, fabric, accessories, attachments.
2. Post Footings: Measurement and payment by each unit of footing, to the depth specified. Includes excavation, concrete placed, finishing.
3. Gates: Measurement and payment by square foot (by square meter). Includes frame posts, fabric, accessories, and hardware.

1.04 REFERENCE STANDARDS

A. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire; 2022.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

D. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2022).

E. ASTM A491 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric; 2011 (Reapproved 2022).

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.

G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.

H. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2023.

I. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric; 2017 (Reapproved 2022).

J. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2018 (Reapproved 2022).

K. ASTM F1665 - Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence; 2008 (Reapproved 2022).

L. CLFMI CLF-FIG0111 - Field Inspection Guide; 2014.

M. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.

N. FS RR-F-191/1D - Fencing, Wire and Post Metal (Chain-Link Fence Fabric); 1990.

O. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 SUBMITTALS

A. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

B. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.

C. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation anchor bolt templates,and gate hardware.

D. Manufacturer's Qualification Statement.

E. Fence Installer Qualification Statement.

F. Field Inspection Records: Provide installation inspection records that include post settings, framework, fabric, barbed wire, fittings and accessories, gates, and workmanship.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of experience.

B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than three years of experience.

1.07 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Line Posts: 1.9 inch (48 mm) diameter.

B. Corner and Terminal Posts: 2.38 inch (60 mm) diameter.

C. Gate Posts: 3-1/2 inch (89 mm) diameter.

D. Bottom Rail: 1.66 inch (42 mm) diameter, plain end, sleeve coupled.

E. Gate Frame: 1.66 inch (42 mm) diameter for welded fabrication.

F. Fabric: 2 inch (51 mm) diamond mesh interwoven wire, 6 gauge, 0.1920 inch (4.9 mm) thick, top selvage knuckle end closed, bottom selvage twisted tight.

G. Tension Wire: 6 gauge, 0.1920 inch (4.9 mm) thick steel, single strand.

H. Tie Wire: Aluminum alloy steel wire.

2.02 MATERIALS

A. Posts, Rails, and Frames:
   1. Formed from hot-dipped galvanized steel sheet, ASTM A653/A653M, HSLAS, Grade 50, with G90 (Z275) zinc coating.
   2. Line Posts: Type I round in accordance with FS RR-F-191/1D.
   3. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round in accordance with FS RR-F-191/1D.

B. Barbed Wire:
   1. Zinc-coated steel, complying with ASTM A121 Type Z Coating Class 1; 2 strands of 0.099 inch (2.51 mm) diameter wire, with 2-pointed barbs at 4 inches (102 mm) on center.

C. Concrete:
   1. Type specified in Section 03 3000.

2.03 MANUAL GATES AND RELATED HARDWARE

A. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches (1,525 mm) high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.

B. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches (1,525 mm) high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.

C. Hinges: Finished to match fence components.
   1. Brackets: Round.
   2. Mounting: Center.
   3. Closing: Manual.

D. Latches: Finished to match fence components.
   1. Brackets: Round.
   2. Locking: Mechanical.

E. Cantilever Gates:
   1. Length: 20 feet (6.1 m).
   2. Height: 60 inches (1525 mm).
   3. Weight Rating: 1,000 lb (454 kg).
   4. Shaft: 1-inch (25.4 mm) diameter.
   5. Roller: Polymer casting, secured to shaft with nylon locknut.
   6. Mounting to Round Fence Post: U-bolts.
   7. Material: Aluminum.
   8. Finish: Galvanized.

2.04 ACCESSORIES

A. Caps: Aluminum alloy; sized to post diameter, set screw retainer.

B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.

C. Extension Arms: Cast steel galvanized, to accommodate 3 strands of barbed wire, single arm, vertical.

2.05 FINISHES

A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 ounces per square foot (530 g/sq m).

B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.

C. Accessories: Same finish as framing.

D. Color(s): Determined by the owner.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that areas are clear of obstructions or debris.

3.02 PREPARATION

A. Removal: Obstructions or debris.

B. Ground Preparation:
   1. Verify Grading is complete.

3.03 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567.

B. Set intermediate posts plumb , in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.

C. Line Post Footing Depth Below Finish Grade: ASTM F567.

D. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567.

E. Brace each gate and corner post to adjacent line post with horizontal center brace rail. Install brace rail one bay from end and gate posts.

F. Provide top rail through line post tops and splice with 6 inch (150 mm) long rail sleeves.

G. Install center brace rail on corner gate leaves.

H. Install bottom tension wire stretched taut between terminal posts.

I. Install support arms sloped inward and attach barbed wire; tension and secure.

J. Do not attach the hinged side of gate to building wall; provide gate posts.

K. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.

L. Peen all bolts upon installation.

M. Install operator in accordance with manufacturer's instructions and in accordance with NFPA 70.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm).

B. Maximum Offset From True Position: 1 inch (25 mm).

C. Do not infringe on adjacent property lines.

3.05 FIELD QUALITY CONTROL

A. Layout: Verify that fence installation markings are accurate to design, paying attention to gate locations, underground utilities, and property lines.

B. Post Settings: Randomly inspect three locations against design for:
   1. Hole diameter.
   2. Hole depth.
   3. Hole spacing.

C. Fence Height: Randomly measure fence height at three locations or at areas that appear out of compliance with design.

D. Barbed Wire: Randomly inspect three locations against design for:
   1. Spacing of barb wire.

E. Gates: Inspect for level, plumb, and alignment.

F. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

3.06 CLEANING

A. Leave immediate work area neat at end of each work day.

B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.

C. Clean fence with mild household detergent and clean water rinse well.

D. Remove mortar from exposed posts and other fencing material using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.

E. Touch up scratched surfaces using materials recommended by manufacturer. Match touched-up paint color to factory-applied finish.

END OF SECTION

SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil.

B. Placing topsoil.

C. Seeding, mulching and fertilizer.

D. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading.

1.03 PRICE AND PAYMENT PROCEDURES

A. Topsoil:
   1. Basis of Measurement: By the cubic yard.
   2. Basis of Payment: Includes topsoil, placing topsoil.

B. Grassed Areas:
   1. Basis of Measurement: By the square yard.
   2. Basis of Payment: Includes preparation of subsoil, preparation of topsoil, placing topsoil, seeding, watering and maintenance for 90 days or until established.

1.04 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.05 SUBMITTALS

A. Topsoil samples.

B. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

C. Maintenance Contract.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 PRODUCTS

2.01 SEED MIXTURE

A. Seed Mixture: As determined by the Landscape Architect or Owner.

2.02 SOIL MATERIALS

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.

2.03 ACCESSORIES

A. Mulching Material: Hay, oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry.

B. Fertilizer: Recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated by analysis.

C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

D. Erosion Fabric: Jute matting, open weave.

E. Herbicide.

F. Stakes: Softwood lumber, chisel pointed.

G. String: Inorganic fiber.

H. Edging: Galvanized steel.

2.04 TESTS

A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.

C. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION

A. Prepare subgrade in accordance with Section 31 2200.

B. Place topsoil in accordance with Section 32 9119.

C. Install edging at periphery of seeded areas in straight lines to consistent depth.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil and prior to roller compaction.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.04 SEEDING

A. Apply seed per seed providers recommendation.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Planting Season: Dependent upon seed species.

D. Do not sow immediately following rain, when ground is too dry, or during windy periods.

E. Roll seeded area with roller not exceeding 112 lbs.

F. Immediately following seeding , apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

G. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

H. Following germination, immediately re-seed areas without germinated seeds that are larger than 24 by 24 inches.

3.05 HYDROSEEDING

A. Apply seeded slurry per seed providers recommendations.

B. Do not hydroseed area in excess of that which can be mulched on same day.

C. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

E. Following germination, immediately re-seed areas without germinated seeds that are larger than 24 by 24 inches.

3.06 PROTECTION

A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.

B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.

C. Secure outside edges and overlaps at 36 inch intervals with stakes.

D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.07 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Provide a separate maintenance contract for specified maintenance service.

C. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.

D. Mow grass at regular intervals to maintain at a maximum height of 3 inches. Do not cut more than 1/3 of grass blade at any one mowing.

E. Neatly trim edges and hand clip where necessary.

F. Immediately remove clippings after mowing and trimming.

G. Water to prevent grass and soil from drying out.

H. Roll surface to remove minor depressions or irregularities.

I. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

J. Immediately reseed areas that show bare spots.

K. Protect seeded areas with warning signs during maintenance period.

END OF SECTION

SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil.

B. Placing topsoil.

C. Fertilizing.

D. Sod installation.

E. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading.

B. Section 31 2323 - Fill.

1.03 PRICE AND PAYMENT PROCEDURES

A. Topsoil:
   1. Basis of Measurement: By the cubic yard.
   2. Basis of Payment: Includes topsoil, placing topsoil.

B. Sodded Areas:
   1. Basis of Measurement: By the square yard.
   2. Basis of Payment: Includes preparation of subsoil, preparation of topsoil, placing topsoil, sodding, watering and maintenance.

1.04 DEFINITIONS

A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

B. Grass: Bermuda, St. Augustine, Buffalo; other acceptable grasses suitable for the region and climate.

1.05 REFERENCE STANDARDS

A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

1.06 SUBMITTALS

A. Certificate: Certify grass species and location of sod source.

B. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

1.07 QUALITY ASSURANCE

A. Sod Producer: Company specializing in sod production and harvesting, and certified by the State of Texas.

B. Installer Qualifications: Company approved by the sod producer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver sod on pallets or in rolls. Protect exposed roots from dehydration.

B. Do not deliver more sod than can be laid within 48 hours.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indicated in plant schedule on Drawings; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root

development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.

1. Thickness: "Thick" sod, minimum 1 inch and maximum 1-3/8 inch topsoil base.
2. Machine cut sod and load on pallets in accordance with TPI (SPEC) Guidelines.

B. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.

C. Fertilizer: Recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions unless otherwise indicated:

1. Nitrogen: 16 percent.
2. Phosphoric Acid: 8 percent.
3. Soluble Potash: 8 percent.

D. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

2.02 ACCESSORIES

A. Wood Pegs: Softwood, sufficient size and length to ensure anchorage of sod on slope.

B. Wire Mesh: Interwoven hexagonal plastic mesh of 2 inch size.

C. Edging: Galvanized steel, painted steel.

D. Herbicide.

2.03 SOURCE QUALITY CONTROL

A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.

C. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this section.

3.02 PREPARATION

A. Prepare subgrade in accordance with Section 31 2200.

B. Place topsoil in accordance with Section 32 9119.

C. Install edging at periphery of seeded areas in straight lines to consistent depth.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil and prior to installation of sod.

C. Apply fertilizer no more than 48 hours before laying sod.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.04 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Lay sod immediately after delivery to site to prevent deterioration.

C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

D. Where new sod adjoins existing grass areas, align top surfaces.

E. Where sod is placed adjacent to hard surfaces, such as curbs, pavements, etc., place top elevation of sod 1/2 inch below top of hard surface.

F. On slopes 4 inches per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. Drive pegs flush with soil portion of sod.

G. Prior to placing sod, on slopes exceeding 4 inches per foot or where indicated, place wire mesh over topsoil. Securely anchor in place with wood pegs sunk firmly into the ground.

H. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.

I. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities.

3.05 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Provide a separate maintenance contract for specified maintenance service.

C. Provide maintenance of sodded areas for one month from Date of Substantial Completion.

D. Maintain sodded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.

E. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

F. Neatly trim edges and hand clip where necessary.

G. Immediately remove clippings after mowing and trimming.

H. Water to prevent grass and soil from drying out.

I. Roll surface to remove irregularities.

J. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

K. Immediately replace sod to areas that show deterioration or bare spots.

L. Protect sodded areas with warning signs during maintenance period.

END OF SECTION

DISINFECTION OF WATER UTILITY PIPING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Disinfection of site domestic water lines and site fire water lines specified in Section 33 1416.

B. Testing and reporting results.

1.02 RELATED REQUIREMENTS

A. Section 33 1416 - Site Water Utility Distribution Piping.

1.03 PRICE AND PAYMENT PROCEDURES

A. Disinfection: By the linear foot (meter). Includes preparing, disinfecting, testing, and reporting.

1.04 REFERENCE STANDARDS

A. AWWA B300 - Hypochlorites; 2024.

B. AWWA B301 - Liquid Chlorine; 2024.

C. AWWA B302 - Ammonium Sulfate; 2023.

D. AWWA B303 - Sodium Chlorite; 2024.

E. AWWA C651 - Disinfecting Water Mains; 2023.

1.05 SUBMITTALS

A. Test Reports: Indicate results comparative to specified requirements.

B. Certificate: From authority having jurisdiction indicating approval of water system.

C. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

D. Disinfection report:
   1. Type and form of disinfectant used.
   2. Date and time of disinfectant injection start and time of completion.
   3. Test locations.
   4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
   5. Date and time of flushing start and completion.
   6. Disinfectant residual after flushing in ppm for each outlet tested.

E. Bacteriological report:
   1. Date issued, project name, and testing laboratory name, address, and telephone number.
   2. Time and date of water sample collection.
   3. Name of person collecting samples.
   4. Test locations.
   5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
   6. Coliform bacteria test results for each outlet tested.
   7. Certification that water complies, or fails to comply, with bacterial standards of Texas Department Health Resources.

1.06 QUALITY ASSURANCE

A. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three years experience.

B. Testing Firm: Company specializing in testing potable water systems, certified by governing authorities of the State in which the Project is located.

C. Submit bacteriologist's signature and authority associated with testing.

PART 2 PRODUCTS

2.01 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300 Hypochlorite, AWWA B301 Liquid Chlorine, AWWA B302 Ammonium Sulfate, and AWWA B303 Sodium Chlorite.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that piping system has been cleaned, inspected, and pressure tested.

B. Schedule disinfecting activity to coordinate with start-up, testing, adjusting and balancing, demonstration procedures, including related systems.

3.02 DISINFECTION

A. Use method prescribed by the applicable state or local codes, or health authority or water purveyor having jurisdiction, or in the absence of any of these follow AWWA C651.

B. Provide and attach equipment required to perform the work.

C. Inject treatment disinfectant into piping system.

D. Maintain disinfectant in system for 24 hours.

E. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.

F. Replace permanent system devices removed for disinfection.

G. Pressure test system to 200 psi (1241 kPa). Repair leaks and re-test.

3.03 FIELD QUALITY CONTROL

A. Test samples in accordance with AWWA C651.

END OF SECTION

SITE CONCRETE ENCASEMENT, CRADLES, SADDLES AND COLLARS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All work required to install and complete all concrete encasements, cradles, saddles and collars.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation

B. Section 31 2316.13 - Trenching

C. Section 33 0561 - Concrete Manholes

D. Section 33 3113 - Site Sanitary Sewerage Gravity Piping

1.03 PRICE AND PAYMENT PROCEDURES

A. Encasement, Cradles, Saddles, and Collars: By the cubic yard. Includes formwork, concrete, placement accessories, consolidating and curing.

1.04 REFERENCES

A. Texas Department of Transportation Standard Specification, Item 420 – Concrete for Structures.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer’s data on manufactured products showing compliance with specified requirements.

B. Manufacturer’s Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.

1.06 QUALITY ASSURANCE

A. The testing laboratory shall sample and test concrete in accordance with geotechnical report unless otherwise indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete: Shall conform to Class B in accordance with Item 420, "Concrete for Structures", TxDOT Standard Specifications.

B. Reinforcement: If required, shall be Grade 60, deformed bars, new billet steel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Concrete Encasement
   1. The trench shall be excavated and fine graded to a depth conforming with details and sections shown on the plans.
   2. The pipe shall be securely tied down to prevent flotation and supported by precast concrete blocks of the same strength as the concrete for encasement.
   3. Encasement shall then be placed to a depth and width conforming with details and sections shown on the plans.

B. Concrete Cradles
   1. The trench shall be prepared and the pipe supported in the same manner as described in this Section.
   2. Concrete cradles shall be constructed in accordance with details and sections shown on the plans.

C. Concrete Saddles

1. Pipe to receive concrete saddle shall be backfilled in accordance with Section 31 2316.13 – Trenching to the spring line.
2. Concrete placed to a depth and width conforming with details and sections shown on the plans.

D. Concrete Collars
1. Concrete collars shall be constructed in accordance with details and sections shown on the plans.

3.02 CLEANING

A. Properly dispose of all debris, trash containers, residue, remnants and scraps which result from the work of this Section.

END OF SECTION

SITE CASTINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Castings shall include labor, materials, equipment and incidentals to construct manhole frames and covers, catch basin inlet frames and grates, trench drain frames and grates, and area drains.

B. Castings include metal items which are not a part of the miscellaneous metal fabrications or metal systems in other sections of these specifications.

1.02 RELATED SECTIONS

A. Section 33 0561 - Concrete Manholes

1.03 SUBMITTALS

A. Shop Drawings:
   1. Submit Shop Drawings to the Engineer for the fabrication and erection of all casting assemblies. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items.
   2. Include setting drawings for location and installation of castings and anchorage devices.
   3. Copies of manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions.

1.04 QUALITY ASSURANCE

A. Shop Assembly
   1. Preassemble items in the shop to the greatest extent possible, so to minimize field splicing and assembly of units at the site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

PART 2 PRODUCTS

2.01 MANHOLE FRAMES AND COVERS

A. Drainage Manholes
   1. Material:
      a. Cast iron conforming to ASTM A 48, Class 30A.
   2. Size:
      a. As shown on the Drawings.
   3. Construction:
      a. Heavy duty suitable for HS-20 loading, with bearing surfaces between frames and covers machined, fitted together, and match marked to prevent rocking.

B. Sanitary Sewer Manholes
   1. Material:
      a. Cast iron conforming to ASTM A 48, Class 30.
   2. Size:
      a. As shown on the Drawings.
   3. Construction:
      a. Heavy duty suitable for HS-20 loading, with bearing surfaces between frames and covers machined, fitted together, and match marked to prevent rocking.
   4. Product and Manufacturer:
      a. Manhole frames and covers shall be as shown on the Plans, or as manufactured by an approved vendor authorized by the local jurisdictional authority.

2.02 CATCH BASIN INLET FRAMES AND GRATES

A. Catch Basin Inlets
   1. Material:

a. Ductile iron conforming to ASTM A 536.

2. Size:
   a. As shown on the Drawings.
3. Construction:
   a. Heavy duty suitable for HS-20 loading, with machine bearing surfaces.
   b. Inlet covers shall be bolted down.

2.03 TRENCH DRAIN FRAMES AND GRATES

A. Trench Drain Frames and Grates
   1. Material:
      a. Ductile iron conforming to ASTM A536.
   2. Size:
      a. As shown on the Drawings.
   3. Construction:
      a. Heavy duty suitable for HS-20 loading, with machine bearing surfaces.
      b. Trench grate covers shall be secured.

B. Trench Drain: As shown on the Plans, or as manufactured by an approved vendor authorized by the local jurisdictional authority.

2.04 AREA DRAINS

A. Area Drains
   1. Material:
      a. Ductile iron conforming to ASTM A536.
   2. Size:
      a. As shown on the Drawings.
   3. Construction:
      a. Heavy duty suitable for HS-20 loading, with machine bearing surfaces.

2.05 DESIGN AND FABRICATION

A. Design all frames, covers, and grates to prevent rocking and rattling under traffic.

B. Fabricate castings true to pattern so that component parts fit together.

2.06 FINISH

A. Shall be in accordance with manufacturer's recommendation, unless shown or specified otherwise.

PART 3 EXECUTION

3.01 INSTALLATION

A. Follow manufacturer's printed instructions and Shop Drawings.

B. Set castings accurately to required locations, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Brace temporarily or anchor temporarily in formwork.

C. Area and planting drains shall be installed in accordance with the manufacturer's recommendations.

END OF SECTION

CONCRETE MANHOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Precast concrete manholes.

B. Concrete masonry unit manholes.

C. Cast-in-place concrete manholes.

D. Cast-in-place concrete base pad.

E. Polymer concrete manhole inserts.

F. Grade adjustments.

G. Frames and covers.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation.

B. Section 31 2323 - Fill.

C. Section 33 3113 - Site Sanitary Sewerage Gravity Piping.

D. Section 33 4211 - Stormwater Gravity Piping.

E. Section 33 4230 - Stormwater Drains.

F. Section 33 4600 - Stormwater Management.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices: Concrete Manholes

1. Basis of Measurement: By the unit for a nominal depth of 10 feet (3 m).
2. Basis of Payment: Includes excavation, hand trimming, bedding and backfilling, base pad, frame and grate, accessories.

1.04 REFERENCE STANDARDS

A. AASHTO HB - Standard Specifications for Highway Bridges; 2005, with Errata.

B. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

C. ACI PRC-440.1 - Guide for the Design and Construction of Structural Concrete Reinforced with Fiber-Reinforced Polymer Bars; 2015.

D. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

E. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

F. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.

G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.

H. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

I. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.

J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025a.

K. ASTM C478/C478M - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections; 2020.

L. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.

M. ASTM C923/C923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals; 2020.

N. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants; 2009 (Reapproved 2019).

O. ASTM D6783 - Standard Specification for Polymer Concrete Pipe; 2005a (Reapproved 2017).

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Installation of concrete manholes with piping and other structures.
   1. See Section 33 3113 for site sanitary sewerage gravity piping.
   2. See Section 33 4211 for stormwater gravity piping.
   3. See Section 33 4230 for stormwater drains.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.06 SUBMITTALS

A. Product Data: Provide manhole covers, component construction,structural rating, features, configuration, and dimensions.

B. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of penetrations.

C. Manufacturer's Installation Instructions: Indicate special procedures for assembly.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Field Quality Control Submittals: Document results of field quality control testing.

F. Project Record Documents:
   1. Record invert elevations of concrete manholes.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of experience.

1.08 FIELD CONDITIONS

A. Maintain materials and surrounding air temperature to minimum 50 degrees F (10 degrees C) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 CONCRETE MANHOLES

A. Weight Rating: HS20 according to AASHTO HB.

B. Precast Concrete Manholes: Comply with ASTM C478/C478M, reinforced.
   1. Wall Thickness: 6 inches (152 mm).
   2. Base Thickness: 12 inches (305 mm).
   3. Cone Thickness: 6 inches (152 mm).
   4. Lid Thickness: 10 inches (254 mm).
   5. Reinforcement: Formed steel wire, galvanized finish, wire diameter as indicated on drawings.
   6. Joint Sealant: Comply with ASTM C990.

C. Cast-In-Place Concrete Manholes: Comply with ASTM C94/C94M, reinforced.
   1. Wall Thickness: 6 inches (152 mm).

D. Cast-In-Place Concrete Base Pads: Comply with ASTM C94/C94M, reinforced.
   1. Thickness: 12 inches (305 mm).
   2. Reinforcement: Formed steel wire, galvanized finish, wire diameter as indicated on drawings.
   3. Width: Match outside catch basin diameter.

4. Length: Match outside catch basin diameter.

E. Cast-In-Place Concrete Materials:
1. Cement: ASTM C150/C150M, Type II.
2. Sand: ASTM C33/C33M, fine aggregate.
3. Crushed Gravel: ASTM C33/C33M, coarse aggregate.
4. Reinforcement: Formed steel wire, galvanized finish, wire diameter as indicated on drawings.
5. Water: Potable.
6. Admixtures, General: Chemical type complying with ASTM C494/C494M, wet mix only.
7. Air-Entraining Admixture: In accordance with ASTM C260/C260M, wet mix only.
8. Form Materials: Wood, profiled to suit conditions.

F. Polymer Concrete Manhole Inserts: Comply with ASTM D6783, reinforced.
1. Wall Thickness: 7 inches (178 mm).
2. Base Thickness: 6 inches (152 mm).
3. Cone Thickness: 5 inches (127 mm).
4. Lid Thickness: 10 inches (254 mm).
5. Reinforcement: Fiber-reinforced polymer bars, in accordance with ACI PRC-440.1.
6. Joint Sealant: Comply with ASTM C990.

G. Polymer Mortar: Provided by the manufacturer.

H. Grade Adjustments:
1. Adjustment Ring: Concrete, 6 inches (152 mm) wide, diameter matching frame dimensions, in accordance with ASTM C478/C478M.

I. Mortar Mixing:
1. Thoroughly mix mortar ingredients in accordance with ASTM C270 and in quantities needed for immediate use.
2. Maintain sand uniformly damp immediately before the mixing process.
3. Do not use antifreeze compounds to lower the freezing point of mortar.

J. Frame and Cover: Cast iron construction, ASTM A48/A48M Class 30B, machined flat bearing surface; hinged; sealing gasket.

2.02 ACCESSORIES

A. Steps: If required, formed galvanized steel rungs; 3/4 inch (19 mm) diameter. Formed integral with manhole sections.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of work are properly sized and located.

B. Verify that built-in items are in proper location, and ready for roughing into Work.

C. Verify excavation for manholes is correct.

3.02 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.03 EXCAVATION AND FILL

A. Hand trim excavation for accurate placement to indicated elevations.

B. Backfill with cover fill, tamp in place and compact, then complete backfilling.

C. See Section 31 2316 for additional excavation requirements.

D. See Section 31 2323 for additional fill requirements.

3.04 INSTALLATION

A. Establish elevations and pipe inverts for inlets and outlets as indicated in drawings.

B. Precast Concrete Manholes:
   1. Place base section plumb and level.
   2. Install joint sealant uniformly around section lip.
   3. Overlay additional sections on joint sealant.
   4. Install cone or lid plumb and level on joint sealant.

C. Cast-In-Place Concrete Base Pad:
   1. Form bottom of excavation walls clean and smooth to correct limits.
   2. Install reinforcement in maximum lengths. Offset end laps in both directions. Splice laps with tie wire.
   3. Place concrete in accordance with ACI PRC-304.
   4. Float base pad top surface level.

D. Cast-In-Place Concrete Manholes:
   1. Form catch basin on concrete base pad plumb and level.
   2. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
   3. Install reinforcement in maximum lengths. Offset end laps in both directions. Splice laps with tie wire.
   4. Place concrete in accordance with ACI PRC-304.
   5. Float catch basin top surface level.

E. Polymer Concrete Manhole Inserts: Install according to manufacturer's instructions.
   1. Protect manhole from foreign material entrance.

F. Grade Adjustments:
   1. Lay concrete ring on mortar bed, plumb and level. Top with mortar, plumb and level.
   2. Place adjacent materials tight, and smooth following design grades.

G. Frames and Covers:
   1. Place frame plumb and level.
   2. Mount frame on mortar bed at indicated elevation.
   3. Mount frame on expanded polypropylene ring according to manufacturer's instructions.
   4. Place grate in frame securely.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection for pipe invert elevations.

B. If inspections indicate work does not meet specified requirements, adjust work and reinspect at no cost to Owner.

END OF SECTION

SITE WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water pipe for site conveyance lines.

B. Pipe valves.

C. Fire hydrants.

D. Backflow preventers - reduced pressure principle assemblies.

E. Backflow preventers - double check-valve assemblies.

1.02 RELATED REQUIREMENTS

A. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

B. Section 33 0110.58 - Disinfection of Water Utility Piping Systems: Disinfection of site service utility water piping.

1.03 PRICE AND PAYMENT PROCEDURES

A. Pipe: By the linear foot (linear meter). Includes hand trimming excavation, pipe and fittings, bedding, concrete thrust restraints, connection to building service piping, and to municipal utility water source.

B. Fittings: By the ton. Includes tees and bends.

C. Valves: By the unit. Includes valve, fittings and accessories.

D. Hydrant: By the unit. Includes hand trimming excavation, gravel sump, hydrant, valve, connection, and accessories.

1.04 REFERENCE STANDARDS

A. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.

B. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2021.

C. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.

D. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.

E. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies; 2021.

F. ASSE 1015 - Performance Requirements for Double Check Backflow Prevention Assemblies; 2021.

G. ASSE 1047 - Performance Requirements for Reduced Pressure Detector Backflow Prevention Assemblies; 2021.

H. ASSE 1048 - Performance Requirements for Double Check Detector Backflow Prevention Assemblies; 2021e.

I. ASSE 1060 - Performance Requirements for Outdoor Enclosures for Fluid Conveying Components; 2017 (Reaffirmed 2025).

J. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

K. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.

L. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.

M. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

N. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2024.

O. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80; 2024.

P. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).

Q. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals; 2019 (Reapproved 2025).

R. ASTM F1267 - Standard Specification for Metal, Expanded, Steel; 2018 (Reapproved 2023).

S. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.

T. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2018.

U. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2023.

V. AWWA C115/A21.15 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges; 2020.

W. AWWA C200 - Steel Water Pipe, 6 in. (150 mm) and Larger; 2023.

X. AWWA C205 - Cement–Mortar Protective Lining and Coating for Steel Water Pipe—4 in. (100 mm) and Larger—Shop Applied; 2024.

Y. AWWA C206 - Field Welding of Steel Water Pipe; 2023.

Z. AWWA C207 - Steel Pipe Flanges for Waterworks Service, Sizes 4 in. through 144 in. (100 mm through 3600 mm); 2023.

AA. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings; 2022.

BB. AWWA C209 - Hand-Applied Tape Coatings for Steel Water Pipe and Fittings; 2025.

CC. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service; 2019.

DD. AWWA C502 - Dry-Barrel Fire Hydrants; 2024.

EE. AWWA C504 - Rubber-Seated Butterfly Valves; 2023.

FF. AWWA C508 - Swing-Check Valves for Waterworks Service, 2-In. Through 48-In. (50-mm Through 1,200-mm) NPS; 2025.

GG. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; 2023.

HH. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances; 2023.

II. AWWA C602 - Cement-Mortar Lining of Water Pipelines in Place - 4 In. (100 mm) and Larger; 2023.

JJ. AWWA C606 - Grooved and Shouldered Joints; 2022.

KK. AWWA C800 - Underground Service Line Valves and Fittings; 2021.

LL. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. through 60 In. (100 mm through 1500 mm); 2022.

MM. AWWA C901 - Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, 3/4 In. (19 mm) Through 3 In. (76 mm), for Water Service; 2025.

NN. AWWA C904 - Cross-Linked Polyethylene (PEX) Pressure Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service; 2016.

OO. AWWA M11 - Steel Pipe - A Guide for Design and Installation; 2017, with Addendum (2019).

PP. NSF 61 - Drinking Water System Components - Health Effects; 2024.

QQ. UL 246 - Hydrants for Fire-Protection Service; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.06 SUBMITTALS

A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.07 QUALITY ASSURANCE

A. Perform Work in accordance with municipality and utility provider requirements.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store valves in shipping containers with labeling in place.

B. Protect crosslinked polyethylene tubing from direct and indirect UV exposure.

PART 2 PRODUCTS

2.01 WATER PIPE

A. Comply with material requirements of the local jurisdiction.

B. Steel Pipe: Welded or Seamless complying with AWWA C200.
   1. Fittings: AWWA C208.
      a. Construct of same material as pipe with standard tube turns or segmentally welded sections to accommodate the type of couplings or joints provided.
      b. Thickness Rating: Comply with not less than specified pipe thickness and calculated pipe pressure rating.
      c. Mechanically or manually wrap, line, and coat all fittings with same protective materials and applications used for pipe.
   2. Joints:
      a. Welded: Provide electrodes complying with AWWA C206.
      b. Sleeve Type Mechanical Coupled:
         1) Designed to couple plain-end piping by compression of a ring gasket at each end of the adjoining pipe sections and provide for confinement and compression of gaskets.
         2) Coupling Assembly:
            (a) One steel middle ring, flared or beveled at each end, providing a gasket seat and two steel or malleable iron follower rings, providing for confinement and compression of the gaskets.
            (b) Provide middle ring and follower rings consisting of true, circular sections, free from irregularities, flat spots, and surface defects.
            (c) Two resilient and tapered rubber gaskets, designed for resistance to set after installation.
            (d) Bolts and nuts to draw the follower rings toward each other to compress the gaskets.
         3) Bolts: Track head complying with ASTM A307 Grade A, with nuts complying with ASTM A563/A563M Grade A.
         4) Coupling Strength: Not less than adjoining pipeline.
      c. Flanged:
         1) Steel Flanges: AWWA C207, Class D.
         2) Bolts, Nuts, and Rubber Gaskets: AWWA C207.
         3) Asbestos gaskets not allowed.
      d. Insulating Joints:
         1) Provide flanged type with insulating gasket, bolt sleeves, and washers to prevent metal-to-metal contact with adjacent piping.

2) Gaskets: Dielectric type, full face, as recommended in Appendix to AWWA C115/A21.15.
3) Bolts and Nuts: As recommended in Appendix to AWWA C115/A21.15.

C. Ductile Iron Pipe: AWWA C151/A21.51:
1. Fittings: Ductile iron, standard thickness.
2. Joints: AWWA C111/A21.11, Styrene butadiene rubber (SBR) or vulcanized SBR gasket with rods.
3. Jackets: AWWA C105/A21.5 polyethylene jacket.

D. Copper Tubing: ASTM B88, Type K, Annealed:
1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
2. Joints: Compression connection or AWS A5.8M/A5.8, BCuP silver braze.

E. PVC Pipe: ASTM D1785 Schedule 80.
1. Fittings: ASTM D2466, PVC.
2. Joints: ASTM D2855, solvent weld.

F. PVC Pipe: AWWA C900 Class 165:
1. Fittings: AWWA C111/A21.11, Schedule 40 per ASTM D2466 or schedule 80 per ASTM D2467.
2. Joints: ASTM D3139 compression gasket ring.

G. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Service" in large letters.

2.02 VALVES

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Gate Valves Up To 3 Inches (75 mm):
1. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, valve key, and extension box.

C. Gate Valves 3 Inches (75 mm) and Over:
1. AWWA C500, iron body, bronze trim, non-rising stem with square nut, single wedge, flanged ends, control rod, valve key, and extension box.

D. Ball Valves Up To 2 Inches (50 mm):
1. Brass body, Teflon coated brass ball, rubber seats and stem seals, Tee stem pre-drilled for control rod, AWWA inlet end, compression outlet, with control rod, valve key, and extension box.

E. Swing Check Valves From 2 Inches to 24 Inches (50 mm to 600 mm):
1. AWWA C508, iron body, bronze trim, 45 degree swing disc, renewable disc and seat, flanged ends.

F. Butterfly Valves From 2 Inches to 24 Inches (50 mm to 600 mm):
1. AWWA C504, iron body, bronze disc, resilient replaceable seat, water or lug ends, infinite position lever handle.

2.03 HYDRANTS

A. Hydrants: Type as required by utility company.

B. Hydrant Extensions: Fabricate in multiples of 6 inches (150 mm) with rod and coupling to increase barrel length.

C. Hose and Streamer Connection: Match sizes with utility company, two hose nozzles , one pumper nozzle.

D. Pressure Rating: According to utility company.

E. Finish: Primer and two coats of enamel in color required by utility company.

2.04 BACKFLOW PREVENTERS - REDUCED PRESSURE PRINCIPLE ASSEMBLIES

A. Reduced Pressure Backflow Preventer Assemblies up to 2 Inches NPS (50 mm DN):
   1. ASSE 1013; NSF 61; bronze body; two independently operating, spring-loaded check valves with stainless steel springs; differential pressure relief valve located between check valves; integral test fittings.
   2. Size: 3/4- to 2-inch NPS (20 to 50 mm DN) assembly with full port ball valves.
   3. Maximum Working Parameters: 175 psi (1207 kPa) at 180 degrees F (82.2 degrees C).
   4. Accessories: Provide Y-strainer, outdoor-mounted protective enclosure, and test cocks.

B. Reduced Pressure Backflow Preventer Assemblies 2-1/2 Inches NPS (65 mm DN) and Larger:
   1. ASSE 1013; NSF 61; epoxy-coated cast iron body; two independently operating, spring-loaded check valves with stainless steel springs; differential pressure relief valve located between check valves; integral test fittings.
   2. Size: 2-1/2- to 10-inch NPS (65 to 250 mm DN) assembly with flanged OS&Y gate valves.
   3. Maximum Working Parameters: 175 psi (1207 kPa) at 140 degrees F (60 degrees C).
   4. Accessories: Provide Y-strainer, outdoor-mounted protective enclosure, and test cocks.

C. Reduced Pressure Backflow Detector Assembly:
   1. ASSE 1047; NSF 61; epoxy-coated cast iron body; metered bypass; two independently operating, spring-loaded check valves with stainless steel springs; differential pressure relief valve located between check valves; integral test fittings.
   2. Size: 2-1/2- to 10-inch NPS (65 to 250 mm DN) assembly with flanged OS&Y gate valves.
   3. Maximum Working Parameters: 175 psi (1207 kPa) at 140 degrees F (60 degrees C).
   4. Accessories: Provide Y-strainer, outdoor-mounted protective enclosure, and test cocks.

2.05 BACKFLOW PREVENTERS - DOUBLE CHECK-VALVE ASSEMBLIES

A. Double Check-Valve Assemblies up to 2 Inches NPS (50 mm DN):
   1. ASSE 1015; NSF 61; bronze body; two independently operating, spring-loaded check valves with stainless steel springs; integral test fittings.
   2. Size: 3/4- to 2-inch NPS (20 to 50 mm DN) assembly with full port ball valves.
   3. Maximum Working Parameters: 175 psi (1207 kPa) at 180 degrees F (82.2 degrees C).
   4. Accessories: Provide Y-strainer, test cocks, and pit-mounted protective enclosure.

B. Double Check-Valve Assemblies 2-1/2 Inches NPS (65 mm DN) and Larger:
   1. ASSE 1015; NSF 61; epoxy-coated cast iron body; two independently operating, spring-loaded check valves with stainless steel springs; integral test fittings.
   2. Size: 2-1/2- to 10-inch NPS (65 to 250 mm DN) assembly with flanged OS&Y gate valves.
   3. Maximum Working Parameters: 175 psi (1207 kPa) at 140 degrees F (60 degrees C).
   4. Accessories: Provide Y-strainer, test cocks, and pit-mounted protective enclosure.

C. Double Check-Detector Assemblies:
   1. ASSE 1048; NSF 61; epoxy-coated cast iron body; metered bypass, two independently operating, spring-loaded check valves with stainless steel springs; integral test fittings.
   2. Size: 2-1/2- to 10-inch NPS (65 to 250 mm DN) assembly with flanged OS&Y gate valves.
   3. Maximum Working Parameters: 175 psi (1207 kPa) at 140 degrees F (60 degrees C).
   4. Accessories: Provide Y-strainer, test cocks, and pit-mounted protective enclosure.

2.06 BEDDING AND COVER MATERIALS

A. Bedding: As specified in Section 31 2316.13.

B. Cover: As specified in Section 31 2316.13.

2.07 ACCESSORIES

A. Meter: Per local jurisdictional requirements and size indicated on the design drawings.

B. Casing Spacer: Stainless steel spacer designed to maintain pipe casing integrity.

C. Outdoor Backflow Enclosures:
   1. Vandal and Damage Resistant, Caged:

a. Description: Expanded metal enclosure to protect aboveground piping, specialties, and equipment from vandalism and damage.
b. Construction:
1) Side and Top Panels: ASTM F1267, expanded metal, rigid construction throughout entire assembly, powder-coated finish.
2) Provide locking device and devices for attachment of enclosure to base.
3) Precast Concrete Base:
(a) Overall size to extend base 6 inches (150 mm) beyond perimeter of enclosure.
(b) Minimum Thickness: 4 inches (100 mm).
(c) Provide piping openings.

2. Insulated Enclosure without Heat Source:
a. Description: Insulated enclosure to protect aboveground piping, specialties, and equipment from vandalism, damage, and weather.
b. Comply with ASSE 1060, Class II.
c. Construction:
1) Enclosure Envelope: Insulated, reinforced fiberglass or aluminum.
2) Access doors with locking devices.
3) Anchors for attaching enclosure to concrete base.
4) Drain opening for enclosures with drain connection.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building service connection and municipal utility water main size, location, and invert are as indicated.

3.02 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.03 TRENCHING

A. See the sections on excavation and fill for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Form and place concrete for pipe thrust restraints at each change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide 2 square feet (0.185 sq m) thrust restraint bearing on subsoil.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.04 INSTALLATION - PIPE

A. Maintain separation of water main from sewer piping in accordance with local code.

B. Group piping with other site piping work whenever practical.

C. Establish elevations of buried piping to ensure not less than 4 feet (1.2 m) of cover.

D. Install pipe to indicated elevation to within tolerance of 5/8 inches (16 mm).

E. Install ductile iron piping and fittings to AWWA C600.

F. Route pipe in straight line.

G. Install pipe to allow for expansion and contraction without stressing pipe or joints.

H. Install access fittings to permit disinfection of water system performed under Section 33 0110.58.

I. Slope water pipe and position drains at low points.

J. Install trace wire 6 inches (150 mm) above top of pipe; coordinate with Section 31 2316.13.

3.05 INSTALLATION - STEEL PIPE

A. Make and assemble rubber-gasketed, bell-and-spigot joints in accordance with manufacturer's recommendations.

B. Make welded joints in accordance with AWWA C206 and install in accordance with AWWA M11, Chapter 12, Transportation, Installation, and Testing.

C. Assemble sleeve-type mechanical coupling joints in accordance with manufacturer's recommendations.

D. Make flanged joints water-tight without undue strain on other material and equipment, using right-sized bolts, and parallel to adjoining flanges.

E. Make grooved joints with equipment designed and produced by the manufacturer of grooved joint couplings and assemble in accordance with the coupling manufacturer's recommendations.

F. Make shouldered type joints with the specified coupling, connect with shouldered ends, and assemble in accordance with the couplings manufacturer's recommendations.

G. Make insulating joints with specified materials and assemble for flanged joints with bolts, with full size insulating sleeves for bolt holes, and no metal-to-metal contact with dissimilar metals after assembly.

H. After installation, line piping in-place with cement mortar in accordance with AWWA C602.

I. Finish joints on piping with cement-mortar lining in accordance with AWWA C205.

J. Maximum, allowable offsets for bell-and-spigot rubber-gasket joints, from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall be five degrees or less in accordance with manufacturer's recommendations.

K. Form short-radius curves and closures with short pipe lengths or specified, fabricated specials.

3.06 INSTALLATION - VALVES, HYDRANTS, BACKFLOW PREVENTERS

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway in accordance with Section 21 1100.

D. Set hydrants to grade, with nozzles at least 20 inches (500 mm) above ground in accordance with Section 21 1100.

E. Locate control valve 24 inches (610 mm) away from hydrant.

F. Provide a drainage pit 36 inches (900 mm) square by 24 inches (600 mm) deep filled with 2 inches (50 mm) washed gravel. Encase elbow of hydrant in gravel to 6 inches (150 mm) above drain opening. Do not connect drain opening to sewer.

G. Paint hydrants per local code.

H. Install backflow preventers in accordance with requirements of local water utility and local authority having jurisdiction.

I. Support backflow preventer independently of surrounding pipe using pipe stanchions.

J. Outdoor Enclosures:
   1. Caged or Insulated without Heat Source:
      a. Install in accordance with manufacturer's recommendations.
      b. Anchor enclosure to flat, concrete base.
      c. Concrete Base Height: 2 inches (50 mm).
      d. Connect drain connection where required and route to suitable termination point.

3.07 SERVICE CONNECTIONS

A. Provide water service to utility company requirements with reduced pressure backflow preventer and water meter with bypass valves.

B. Provide sleeve in retaining wall for service main. Support with reinforced concrete bridge. Calk enlarged sleeve watertight.

C. Anchor service main to interior surface of foundation wall.

3.08 FIELD QUALITY CONTROL

A. Pressure test water piping to 180 pounds per square inch (1241 kPa).

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

END OF SECTION

SITE SANITARY SEWERAGE GRAVITY PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sanitary sewerage drainage piping, fittings, and accessories.

B. Connection of building sanitary drainage system to public sewer.

C. Cleanout access.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: Excavating of trenches.

B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

C. Section 31 2323 - Fill: Bedding and backfilling.

D. Section 33 0561 - Concrete Manholes.

1.03 PRICE AND PAYMENT PROCEDURES

A. Pipe and Fittings:
   1. Basis of Measurement: By the linear foot (meter).
   2. Basis of Payment: Includes hand trimming excavation, bedding, pipe and fittings, connection to building service piping and to public sewer.

B. Cleanout:
   1. Basis of Measurement: By the unit for a nominal depth of 10 feet (3 m).
   2. Basis of Payment: Includes hand trimming excavating, foundation pad, unit installation with accessories, connection to sewer piping.

1.04 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.05 REFERENCE STANDARDS

A. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2025.

B. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe; 2018 (Reapproved 2022).

C. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2020 (Reapproved 2025).

D. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric); 2020 (Reapproved 2025).

E. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2025.

F. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric); 2022a.

G. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2021.

H. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2021.

I. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.

J. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

K. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2025.

L. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2021.

M. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).

N. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials; 2024.

O. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2023.

1.06 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of sanitary sewer with size, location and installation of service utilities.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.07 SUBMITTALS

A. Product Data: Provide data indicating pipe, pipe accessories, and clean outs.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Field Quality Control Submittals: Document results of field quality control testing.

E. Project Record Documents:
   1. Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.01 SEWER PIPE MATERIALS

A. Provide products that comply with applicable code(s).

B. Cast Iron Soil Pipe: ASTM A74, service type, inside nominal diameter of 6 inches (152 mm), hub and spigot end.

C. Joint Seals for Cast Iron Pipe: ASTM C564 rubber gaskets.

D. Ductile Iron Pipe: ASTM A746, Pressure Class 350, with cement-mortar lining, inside nominal diameter of 6 inches (152 mm), bell and spigot end.

E. Joint Seals for Ductile Iron Pipe: AWWA C111/A21.11; styrene butadiene rubber (SBR) or vulcanized SBR gaskets.

F. Concrete Pipe: Nonreinforced, ASTM C14 or ASTM C14M, Class 1; inside nominal diameter of 6 inches (152 mm), bell and spigot end joints.

G. Joint Seals for Concrete Pipe: ASTM C443 (ASTM C443M) rubber compression gaskets.

H. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class II with Wall type A; mesh reinforcement; inside nominal diameter of 6 inches (152 mm), bell and spigot end joints.

I. Plastic Pipe: ASTM D2729, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 6 inches (152 mm), bell and spigot style solvent sealed joint end.

J. Plastic Pipe: ASTM D1785, Schedule 40, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 6 inches (152 mm), bell and spigot style solvent sealed joint end.

K. Plastic Pipe: ASTM D3350, SDR 25 or 26, High Density Polyethylene (HDPE) material; inside nominal diameter of 6 inches (152 mm), with cell classification of 335434C or better, thermal

butt fusion joints and fittings in accordance with manufacturer's recommendations; pipe and fittings same material utilizing transition fittings when connecting to existing piping.

L. Joint Seals: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.

M. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

2.02 PIPE ACCESSORIES

A. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Sewer Service" in large letters.

B. Casing Spacer: Polyethylene spacer designed to maintain pipe casing integrity.

2.03 CLEANOUT MANHOLE

A. Lid and Frame: Cast iron construction, hinged lid.
   1. Lid Design: meet local requirements.
   2. Nominal Lid and Frame Size: 24 inches (600 mm).

B. Shaft Construction and Concentric Cone Top Section: Reinforced precast Concrete pipe sections, lipped male/female dry joints, cast steel ladder rungs into shaft sections at 12 inches (300 mm); nominal shaft diameter of 48 inches (1,200 mm).

C. Base Pad: Cast-in-place concrete levelled top surface to receive concrete shaft sections, sleeved to receive sanitary sewer pipe sections.

2.04 BEDDING AND COVER MATERIALS

A. Pipe Bedding Material: As specified in Section 31 2323.

B. Pipe Cover Material: As specified in Section 31 2323.

PART 3 EXECUTION

3.01 GENERAL

A. Perform work in accordance with applicable code(s).

B. Verify that excavations, dimensions, and elevations are as indicated on Drawings.

C. Notify Architect/Engineer if crossing conflicts occur.

3.02 TRENCHING

A. See Section 31 2316.13 for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

D. Protect and support existing sewer lines, utilities, and appurtenances.

E. Place bedding material per the design drawings.

3.03 INSTALLATION - PIPE

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D2321.

C. Lay pipe to slope gradients as indicated on Drawings.

D. Begin at downstream end of system and progress upstream.

E. Lay bell-and-spigot pipe with bells upstream.

F. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 100 feet (30.5 m).

G. Connect to building sanitary sewer outlet and municipal sewer system , through installed sleeves.

H. Install trace wire 6 inches (150 mm) above top of pipe; coordinate with Section 31 2316.13.

3.04 INSTALLATION - CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place cast-in-place concrete base pad, with provision for sanitary sewer pipe end sections.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.05 FIELD QUALITY CONTROL

A. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

B. Pressure Test: Test in accordance with local requirements.

C. Infiltration Test: Test in accordance with local requirements.

D. Deflection Test: Test in accordance with local requirements.

3.06 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

STORMWATER GRAVITY PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stormwater drainage piping.

B. Stormwater pipe accessories.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: Excavating of trenches.

B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

C. Section 31 2323 - Fill: Bedding and backfilling.

D. Section 33 0561 - Concrete Manholes.

E. Section 33 4230 - Stormwater Drains.

F. Section 33 4600 - Stormwater Management.

1.03 PRICE AND PAYMENT PROCEDURES

A. Pipe and Fittings:
   1. Basis of Measurement: By the linear foot (meter).
   2. Basis of Payment: Includes hand trimming excavation, bedding and backfilling, pipe and fittings, connection to building service piping and to outfall structure.

1.04 REFERENCE STANDARDS

A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Pipe, 75- to 250-mm (3- to 10-in.) Diameter; 2025.

B. AASHTO M 294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter; 2025.

C. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2020 (Reapproved 2025).

D. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2025.

E. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric); 2022a.

F. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2021.

G. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2021.

H. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

I. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2025.

J. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2021.

K. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).

L. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials; 2024.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of stormwater gravity piping with size, location and installation of stormwater drains according to Section 33 4230.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.06 SUBMITTALS

A. Product Data: Provide data indicating pipe, pipe accessories.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Field Quality Control Submittals: Document results of field quality control testing.

E. Project Record Documents:
   1. Record location of pipe runs, connections, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.01 STORMWATER PIPE MATERIALS

A. Provide products that comply with applicable code(s).

B. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class II with Wall type A; mesh reinforcement; inside nominal diameter of 18 inches (457 mm), bell and spigot end joints.

C. Reinforced Concrete Pipe Joint Device: ASTM C443 (ASTM C443M) rubber compression gasket joint.

D. Plastic Pipe: ASTM D1785, Schedule 80, Poly Vinyl Chloride (PVC) material; inside nominal diameter of 6 inches (150 mm), bell and spigot style solvent sealed joint end.

E. Plastic Pipe: ASTM D3350, High Density Polyethylene (HDPE) corrugated wall pipe with integrally formed smooth liner; inside nominal diameter of 6 inch (150 mm), meeting the requirements of AASHTO M 252, Type S, for diameters between 3 inches (75 mm) and 10 inches (250 mm) and AASHTO M 294, Type S, for diameters between 12 inches (300 mm) and 60 inches (1500 mm), water tight, bell and spigot joints with rubber gaskets, with pipe and fittings manufactured from virgin PE compounds with cell classification 3254420C.

F. Corrugated Steel Pipe: AASHTO M 36 Type I; nominal diameter of 12 inches (300 mm), rolled end joints; helical lock seam; coated inside and out with 0.050 inch (1.3 mm) thick bituminous coating.

G. Coupling Bands: Galvanized steel, 0.052 inches (1.3 mm) thick x 10 inches (250 mm) wide; connected with two neoprene "O" ring gaskets and two galvanized steel bolts.

2.02 PIPE ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

B. Downspout Boots: Smooth interior without boxed corners or choke points; include integral lug slots and on-body cleanout and cover with neoprene gaskets.
   1. Configuration: Angular.
   2. Finish: Manufacturer's standard factory applied powder coat finish.
   3. Color: Coordinate with the architect.
   4. Accessories: Manufacturer's standard stainless steel fasteners, stainless steel building wall anchors, and rubber coupling.

2.03 BEDDING AND COVER MATERIALS

A. Bedding: As specified in .

B. Cover: As specified in Section 31 2316.13.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 31 2316.13 - Trenching for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

D. Place bedding material as indicated in the design drawings.

3.02 INSTALLATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D2321.

C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 100 feet (30.5 m).

D. Connect to building storm drainage system, foundation drainage system, and utility/municipal system.

E. Make connections through walls through sleeved openings, where provided.

3.03 FIELD QUALITY CONTROL

A. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.04 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

STORMWATER CULVERTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe culvert, joints and accessories.

B. Bedding and slope protection at pipe end.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: Excavating of trenches.

B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

C. Section 31 2323 - Fill: Bedding and backfilling.

D. Section 31 3700 - Riprap.

1.03 PRICE AND PAYMENT PROCEDURES

A. Pipe Culvert: By the total linear foot (meter) invert length of pipe including tapered ends and the diameter in inches (mm). Includes hand trimming, excavating; removing soft subsoil, bedding fill, compacting; pipe, fittings and accessories assembled; repair of damaged coating.

B. Slope protection: By the unit.

1.04 REFERENCE STANDARDS

A. ASTM A929/A929M - Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe; 2024.

B. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2025.

C. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric); 2022a.

D. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2021.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.06 SUBMITTALS

A. Product Data: Provide data on pipe, fittings and accessories.

B. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

C. Accurately record actual locations of pipe runs, connections, and invert elevations.

D. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.01 CULVERT PIPE, GENERAL

A. Regulatory Requirements: Comply with applicable local code for materials and installation of the work of this section.

2.02 STEEL CULVERT PIPE

A. Corrugated Steel Pipe: Fabricated of ASTM A929/A929M galvanized steel sheet:
   1. rolled end joints.
   2. Helical lock seam.
   3. Coated inside and out with 0.050 inch (1.3 mm) thick bituminous coating.
   4. Shape: Circular, with nominal diameter of 12 inches.

B. Tapered Ends: Same material as pipe, machine cut, for joining to pipe end.

C. Coupling Bands: Galvanized steel, 0.052 inches (1.3 mm) thick x 10 inches (250 mm) wide; connected with two neoprene "O" ring gaskets and two galvanized steel bolts.

2.03 CONCRETE CULVERT PIPE

A. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class III with Wall Type A; mesh reinforcement; bell and spigot end joints:
   1. Shape: Circular with a nominal diameter of 12 inches (Circular with a nominal diameter of 305 mm).

B. Reinforced Concrete Pipe Joint Device: ASTM C443 (ASTM C443M) rubber compression gasket joint.

2.04 BEDDING AND COVER MATERIALS

A. Bedding: As specified in Section 31 2316.13.

B. Cover: As specified in Section 31 2316.13.

2.05 ACCESSORIES

A. Fill at Pipe Ends: Riprap as specified in Section 31 3700.

PART 3 EXECUTION

3.01 EXCAVATING

A. See Section 31 2316.13 - Trenching for additional requirements.

B. Excavate culvert trench to 6 inches (150 mm) below pipe invert. Hand trim excavation for accurate placement of pipe to elevations indicated.

3.02 INSTALLATION - PIPE

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

B. Install pipe and accessories in accordance with manufacturer's instructions

C. Lift or roll pipe into position. Do not drop or drag pipe over prepared bedding.

D. Shore pipe to required position; retain in place until after compaction of adjacent fills. Ensure pipe remains in correct position and to required slope.

E. Repair surface damage to pipe protective coating with two coats of compatible bituminous paint coating.

F. Install culvert end gratings.

3.03 PIPE ENDS

A. Place fill at pipe ends, at embankment slopes, at concrete aprons, to adjacent construction, and as indicated.

3.04 TOLERANCES

A. Lay pipe to alignment and slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 100 feet (30.5 m).

B. Maximum Variation From Intended Elevation of Culvert Invert: 1/8 inch (3 mm).

C. Maximum Offset of Pipe From True Alignment: 1/2 inch (6 mm).

D. Maximum Variation in Profile of Structure From Intended Position: 1 percent.

3.05 PROTECTION

A. Protect pipe and bedding from damage or displacement until backfilling operation is in progress.

END OF SECTION