TRES LAURELS

UNIT 4A SUBDIVISION

JULY 2024
SAN ANTONIO, TEXAS

BID PACKAGE

PREPARED FOR:

LENNAR HOMES OF TEXAS, LLC

100 NE LOOP 410, SUITE 1150

SAN ANTONIO, TX 78216

CUDE ENGINEERS
SAN ANTONIO | AUSTIN | SAN MARCOS

4122 POND HILL ROAD, STE 101
SAN ANTONIO, TEXAS 78231

PHONE: (210) 681-2951
CUDEENGINEERS.COM

TBPE NO. 455
TBPELS NO. 10048500

TABLE OF CONTENTS

ATTACHMENTS

INVITATION TO BIDDERS

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)

LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.

INVITATION TO BIDDERS
CONSTRUCTION DOCUMENTS AND
TECHNICAL SPECIFICATIONS FOR
Tres Laurels 4A

STREETS, DRAINAGE, WATER & WASTEWATER CONSTRUCTION

BEXAR COUNTY, TEXAS

July 2, 2024

Sealed **bids** addressed to Lennar Homes of Texas LLC will be received at the office of Cude Engineers, 4122 Pond Hill Road, Suite 101, San Antonio Texas 78231 until **10:00 AM**, Local Time, **July 16th, 2024**, for the following project:

Scope of Work in this Contract includes:

- Water, Sewer, and Drainage to serve 167 single-family lots in Tres Laurels Unit 4A
- Approximately 2,842 LF of Onsite Roads
- Approximately 1,477 LF of Onsite Sewer
- Approximately 2,917 LF of Onsite Water

Instruction to bidders and other bid documents will be available for review or to download at www.CivCastUSA.com. Timeline for **Questions** will close at 10:00 AM, local time **Tuesday July 9th, 2024.**

A virtual bid opening will occur at **10:00 AM**, local time **Tuesday July 16th, 2024.**

INSTRUCTIONS TO BIDDERS

IMPORTANT NOTICE: Bidder must read ALL Instructions. Failure to do so may result in a non-responsive Bid. Failure to do so does not release Bidder from the obligation to comply.

1. Submission of Bids

1.1 In accordance with the Plans and Specifications prepared by the ENGINEER, any Proposal received after the published time of the bid opening will be returned unopened.

1.2 The OWNER reserves the right to reject any or all Bids if the OWNER believes that it would not be in the best interest of the Project to make an 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 other criteria established by OWNER.

1.3 Bids shall be submitted at the location and time indicated in the Invitation to Bidders and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation “BID ENCLOSED” on the face of it. Bids which are not received by the time and at the location specified in the Bidding Documents, will be returned unopened to the Bidder.

1.4 By submitting a Bid, each Bidder agrees to fully and forever waive and release any claim (known or unknown) it has or may have against the OWNER, DEVELOPER, ARCHITECT and ENGINEER, and their respective attorneys, employees, consultants, representatives, agents, successors, assigns, officers, directors, and members arising under the statutes of Texas, tort, contract or otherwise; or out of or in connection with the: (i) administration, evaluation, or recommendation (or lack thereof) of any Bid; (ii) waiver of any requirements under the Bid Documents or the CONTRACT DOCUMENTS; (iii) acceptance or rejection of any bids; (iv) award of the Contract; and, (v) provision of references (positive or negative) in connection with any work performed by Bidder, and Bidder’s contractors and subcontractors in connection with the Project and the CONTRACT DOCUMENTS, to which Bidder hereby consents and authorizes.

1.5 All work must conform to Federal, State and local governmental rules and criteria.

1.6 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 CUDE ENGINEERS (Engineer) and reviewed by the CITY OF SAN ANTONIO, and/or other agencies as required, and agrees to commence work within ten (10) days after notification to begin. It is the intent of the owner to start construction as soon as possible.

1.7 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 that may be deemed advisable.

1.8 The most current editions of the City of San Antonio Standard Specifications, Texas Department of Transportation Standard Specifications and San Antonio Water Systems shall be followed for all construction except as amended by the City of San Antonio.

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

1.10 Contractor to complete the material take-off for items bid lump sum to confirm the Engineer Quantities. Quantities shown are plan estimates only.

1.11 Direct all questions concerning this proposal to Matthew Trinkle and Chris Chaffee at mtrinkle@cudeengineers.com and cchaffee@cudeengineers.com with Cude Engineers at (210) 681-2951.

1.12 Contractor is responsible for all Texas Commission on Environmental Quality (TCEQ) Storm Water Pollution Prevention Plan (SW3P) requirements, including but not limited to setting up, installing and maintaining the erosion and sedimentation controls as designed and shall inspect the controls every two weeks 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 maintain erosion control inspection reports as required by the TCEQ and provide Owner with one complete set of all SW3P inspection reports, including updates and modifications, prior to receiving final payment for the project.

1.13 Contractor must keep a copy of the Storm Water Pollution Prevention Plan (SW3P) on site and readily available for authorities.

1.14 Clearing and/or grading for the utility easements as well as removal of on-site deleterious material and trash shall be included in the base bid cost for site clearing and grading. Contractor is to clear entire project of all underbrush and undesirable vegetation. Contact Owner for extent and sequence of lot clearing and coordination with any applicable tree ordinance.

1.15 Excavated material that is free of organic matter and other deleterious substances may be disposed of on-site. No fill shall be placed within the flood plain without a Flood Plain Development Permit as applicable. 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. For fills greater than one (1) foot within building pad area, a 79G Letter will be required with testing complete per eight (8) inch lift. Testing to be paid by the Owner. Contractor shall get owners approval of test lab. Contractor shall pay re-testing due to failure of density requirements. All quantities are “In-place, tight” cubic yards.

1.16 Excavated material placed on lots shall have positive drainage to prevent any ponding of water, and provide a minimum final grade of 1.5% in all areas with the exception of building pads which shall have a minimum final grade of 1.0%.

1.17 Contractor shall submit a letter to Engineer after completion of final grading of utility easements, certifying that the grades on the utility easements are completed as per the grading plan.

1.18 Contractor shall be responsible for disposing of all waste materials off project site including, but not limited to, excess excavation not suitable for use as lot fill, concrete, trees, and any other material which is not part of the completed contract work. No separate pay item.

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

1.20 Contractor will protect existing utilities, structures, curb, fences and sidewalk during construction. Any damage will be repaired by the Contractor at no extra cost.

1.21 The streets are public. The Contractor must coordinate and schedule all testing required by the City of San Antonio and/or Bexar County.

1.22 The Contractor will be required to coordinate work with the Utility companies that will be installing electric, telephone and TV.

1.23 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.

1.24 Contractor to notify City of San Antonio, Bexar County, CPS, AT&T, Time Warner Cable, and/or other appropriate Utility Providers prior to street (subgrade) and/or drain construction.

1.25 The Contractor shall coordinate with the Developer for placement of private conduit.

1.26 The Contractor is responsible for obtaining all final approvals and shall provide Engineer with street and grading "As-builts" at or before the final inspection. Copies of acceptance letters for such shall also be provided to Engineer, as applicable. One year warranty period shall begin at the date of the final acceptance letter as determined and provided by the City. Contractor is responsible for obtaining final approvals prior to the expiration of warranty period for City maintenance.

1.27 The Owner is to provide and pay for construction staking.

1.28 Water Tie-ins are will not be measured and are considered subsidiary to other Water Improvement items.

1.29 All Sanitary Sewer pipe to be SDR-26.

1.30 **Bid is due on or before 10:00 a.m. July 16th, 2024.** Please submit bid to Adrian Todsen, John Bare and Richard Mott of Lennar Homes of Texas Land and Construction, LTD.

2. Copies of the Bidding Documents

2.1 Complete sets of the Bidding Documents in the number and for the deposit sum of $100, if any, stated in the Invitation to Bidders may be obtained from the ENGINEER's Office. Checks for the Plans and Specifications shall be made payable to Cude Engineers.

2.2 Copies of Bidding Documents are made available only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

2.3 Complete sets of Bidding Documents must be used in preparing Bids; neither OWNER nor ENGINEER assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.4 The Bidding Documents may include reports on the geotechnical, subsurface, physical or environmental conditions which contain information used by the ENGINEER and OWNER. Neither the ENGINEER nor OWNER are responsible for accuracy or completeness of any such information or data. Bidder shall have full responsibility for interpretation of the reports and use of the information for bidding and construction purposes.

3. Bid Security

3.1 No bid security required.

4. Contract Documents

Contract Documents include the Agreement, Addenda, all Conditions (General, Supplementary and Special), specifications and plans, the Bid Proposal, and any written modifications.

5. Defined Terms

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions have the meanings assigned to them in the Standard General Conditions unless modified by the Supplementary and Special Conditions.

6. Bid Proposal Form

6.1 The Bid Proposal Form is included with the Bidding Documents; additional copies may be obtained from the ENGINEER.

6.2 All blanks on the Bid Proposal Form must be completed by printing in ink or by typewriter.

6.3 Bids by corporations 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 an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

6.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature. Bids by limited partnerships must be executed by an authorized representative of the general partner on behalf of the general partner.

6.5 All names must be typed or printed in ink below the signature. The address (including County), telephone number, e-mail address (if available), and facsimile number for communications regarding the Bid must be shown.

6.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Proposal Form).

6.7 Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed, shall be provided. State Contractor license number, if any, must also be shown.

7. Interpretations and Addenda

7.1 All questions about the meaning or intent of the Bidding Documents are to be directed to ENGINEER. As necessary, interpretations or clarifications will be issued by Addenda mailed or delivered to all parties having received the Bidding Documents. Questions received less than three days prior to the date for opening of Bids may not be answered. Verbal discussions and answers are not binding.

7.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by OWNER or ENGINEER.

8. Self Performing

As a condition of this Agreement, the CONTRACTOR is required to self perform at least 60 percent of the work (based on total contract price awarded, complete in place) with personnel directly employed by CONTRACTOR.

9. Subcontractors, Suppliers and Others

9.1 If the Special Conditions require the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to OWNER prior to the Effective Date of the Agreement, apparent Successful Bidder, and any other Bidder so requested, shall within five days after the Bid opening, submit to OWNER a list of all such Subcontractors, Suppliers and other persons and organizations.

9.2 OWNER reserves the right to reject a proposed subcontractor or supplier at its sole discretion. OWNER may request apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price.

If apparent Successful Bidder declines to make any such substitution, OWNER may award the contract to another Bidder meeting the Bid requirements that proposes to use acceptable subcontractors, suppliers, and other persons and organizations. By declining to make requested substitutes, the apparent Successful Bidder will not sacrifice their Bid security.

9.3 No CONTRACTOR shall be required to employ any subcontractor, supplier, organization against whom CONTRACTOR has reasonable objection.

10. Examination of Contract Documents and Site

10.1 It is the responsibility of each Bidder before submitting a Bid:

10.1.1 To thoroughly examine the Contract Documents and other reports, tests, and drawings identified in the Bidding Documents and Special Conditions. Bidder is instructed to read all Bidding and Contract Documents before completing the bid form. Bidder is advised that failure to read Contract Documents, including without limitation, the General, Supplementary and Special Conditions, does not relieve Bidder from compliance with these documents.

10.1.1.1 Copies of available reports, tests and drawings will be produced by OWNER for review by Bidder on request. OWNER and ENGINEER disclaim any responsibility for the accuracy, true location and extent of surface and subsurface investigations that have been prepared by others.

10.1.1.2 Bidder is responsible for any interpretation or conclusion drawn from any reports, tests, and drawings, or any such data, interpretations, opinions or information, and OWNER and ENGINEER disclaim any responsibility for such interpretations by Bidders, e.g., without limitation, projecting soil-bearing values, rock profiles, soil stability and the presence, level and extent of underground water or underground facilities.

10.1.1.3 Bidder will be responsible for considering how said reports, tests and drawings may relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs performing the Work in accordance with the Contract Documents.

10.1.2 To visit the site to become familiar with and satisfy Bidder as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work;

10.1.3 To consider Federal, State and local laws and regulations that may affect cost, progress, performance or furnishing of the Work;

10.1.4 To correlate Bidder's knowledge and observations of the site with the Contract Documents and such other related reports, tests and drawings;

10.1.5 To promptly notify ENGINEER of all conflicts, errors, ambiguities or discrepancies which Bidder has discovered in or between the Contract Documents and such other related documents.

10.2 On request, OWNER may provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the site to its former conditions upon completion of such explorations, investigations, tests and studies.

11. Availability of Lands for Work, etc.

The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by the CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Contract Documents.

12. Substitute and "Or-Equal" Items

All Bids shall be based on work, materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Although the Drawings or Specifications may state a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, Bids shall not be based on any substitutions or as equal items. ENGINEER will not consider any application for substitute or as equal until after the Effective Date of the Agreement. The procedure for submission of any such application by CONTRACTOR and consideration by ENGINEER is set forth in the Standard General Conditions and may be supplemented in the Special Conditions.

13. Contract Time

The number of calendar days within which, or the dates by which, the Work is to be substantially completed and the Work is to achieve final completion are set forth in the Agreement and in the Special Conditions.

14. Economic Disincentive for Late Completion of Work

The CONTRACTOR and the OWNER agree that time is of the essence of this Contract. The CONTRACTOR and the OWNER agree that the Agreement is based on completion of the Work by CONTRACTOR in the time specified in the Agreement. CONTRACTOR and the OWNER agree that for each and every calendar day the work or any portion thereof shall remain uncompleted after the expiration of the time limit set in the Contract, or as extended under the provisions for Extension of Time in this Contract, CONTRACTOR shall be liable to OWNER for an economic disincentive in an amount specified in the Special Conditions for such calendar day. The OWNER shall have the option to deduct and withhold said amount from any monies that the OWNER owes the CONTRACTOR or to recover such amount from the CONTRACTOR or the Sureties on the CONTRACTOR's bond.

15. Modification and Withdrawal of Bids

15.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

15.2 If, within twenty-four 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, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

16. Opening of Bids

A virtual bid opening will occur at 10:00 AM, local time Tuesday July 16th, 2024.

17. Bids to Remain Subject to Acceptance

17.1 All Bids will remain subject to acceptance for ninety (90) days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

18. Award of Contract

18.1 If the contract is to be awarded, it will be awarded to the Successful Bidder as evaluated by OWNER. The Bid price shall include such amounts as the Bidder deems proper for overhead and profit.

18.2 Discrepancies between the multiplication of units of Work and unit prices 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. Discrepancies between words or figures will be resolved in favor of the words. In case of any ambiguity or lack of clarity in stating the prices in the Bid, OWNER reserves the right to consider the most advantageous construction thereof or reject the Bid.

18.3 OWNER reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, non-responsive, unbalanced or conditional Bids. OWNER also reserves the right to waive all irregularities and defects in the Bids and the bidding process, except time of submitting a Bid.

18.4 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. OWNER may require Bidders to submit bank references and financial statements in connection with bid evaluation.

18.5 OWNER may also consider Bidder's (or Bidder's officers', partners', directors', affiliates') (i) prior dealings with OWNER or with any entity responsible for payment to Bidder under this Contract and (ii) the amount, size, number, cost and completion-status of any projects that Bidder currently has underway (including, without limitation, projects underway with OWNER or with any entity responsible for payment to Bidder under this Contract), and the amount, nature and quality of the manpower, materials and equipment available to bidder.

18.6 By submitting a Bid, each Bidder agrees to fully and forever waive and release any claim (known or unknown) it has or may have against the OWNER, DEVELOPER, ARCHITECT and ENGINEER, and their respective attorneys, employees, consultants, representatives, agents, successors, assigns, officers, directors, and

members arising under the statutes of Texas, tort, contract or otherwise; or out of or in connection with the: (i) administration, evaluation, or recommendation (or lack thereof) or any BID; (ii) waiver of any requirements under the Bid Documents or the CONTRACT DOCUMENTS; (iii) acceptance or rejection of any bids; (iv) award of the Contract; and (v) provision of references (positive or negative) in connection with any work performed by Bidder, and Bidder's contractors and subcontractors in connection with the Project and the CONTRACT DOCUMENTS, to which Bidder hereby consents and authorizes.

18.7 If the contract is to be awarded, OWNER will give the Successful Bidder Notice of Award within ninety (90) days after the day of the Bid opening.

19. Bonds

Standard General Conditions and the Special Conditions set forth OWNER's requirements, if any, as to Bonds. When the Successful Bidder delivers the executed Agreement to OWNER, it must be accompanied by the required payment and performance bonds.

20. Signing of Agreement

When OWNER gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within seven days thereafter CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER with the required Bonds. Within ten days thereafter OWNER shall deliver one fully signed counterpart to CONTRACTOR.

21. Retainage

The amount of retainage is set forth in the Special Conditions.

22. Sales Tax

22.1 Applicable taxes, licenses, fees and other similar items are part of the cost of the work and it shall be CONTRACTOR's responsibility to familiarize itself with these costs and to observe and comply with the laws and regulations relating to the same. The prices, sums, rates and other charges set forth in the CONTRACTOR's bid shall cover and include all such costs.

22.2 The Special Conditions will indicate if OWNER is exempt from sales tax.

23. Insurance Requirements

CONTRACTOR shall maintain such insurance as specified in the Standard General, Supplementary, and Special Conditions.

24. Estimates of Quantities

Unless otherwise noted in the Special Conditions, the quantities listed in the Bid Proposal shall be considered as approximate and will be used only for comparison of Bids. Payment to the CONTRACTOR will be made only for the actual quantities of work performed or materials furnished in accordance with the contract. The quantities may be increased or decreased as provided in the Standard General Conditions without in any way invalidating the unit Bid prices.

25. Statement of Qualifications

No statement of qualifications required.

26. Prevailing Wage Rate

Minimum wage rates, if applicable to this Contract, shall be specified in the Special Conditions.

27. Civil Engineer Responsibilities:

27.1 The Engineer does not guarantee the performance of, and shall have no responsibility for, the acts or omissions of any Contractor, Subcontractor, Supplier or any other entity furnishing materials or performing any work on the project. Engineer shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by the Contractor(s) or the safety precautions and programs incident to the work of the Contractor(s).

27.2 The engineering design of this project was performed by a representative of the Owner, referred to in these Specifications as the “Engineer” who will exercise the authority and functions of the Owner in the following respects:

- Staking the work for construction and furnishing all necessary cut sheets.
- Checking of shop and working drawings furnished by the Contractor.
- Consultation and advice during construction and rendering those decisions requiring interpretation of the Plans and Specifications.
- Periodic visits to the project for consultation with the Owner.
- Assist in the final inspection.
- Assist in processing of the monthly and final estimate.

27.3 Staking of requested infrastructure within 72 hours of notification by Contractor. Re-staking will be Charged to the Contractor by the Owner.

27.4 Staking Criteria

- General - The Contractor will be provided with construction stakes delineating each phase of the Project as to line and grade, appropriate benchmark information and cut sheets.
  Detailed transfer of elevations, lines and grades to structures and other features of the work shall be done by the Contractor.
- Clearing Staking - CUDE will set staking for clearing of street right-of-ways, drainage right-of-ways, utility easements, drainage easements, and lot grading. Staking will consist of laths defining the centerline of streets and the limits of the non-street ROW or easements.
- Contractor's Responsibility - When horizontal control points, benchmarks, construction stakes and iron lot pins have been set,

the preservation of such stakes/pins as to position, elevation and/or marking shall become the responsibility of the Contractor. Should any of the original construction stakes/pins be destroyed by the Contractor's operation, or by any other parties or means whatsoever, the replacement of such stakes/pins will be at the expense of the Contractor. Prior to beginning each phase of work, the contractor shall check for stakes/pins that have been destroyed and request re-staking before commencing work on that phase. Any re-staking requested after work has started on that phase will be charged to the Contractor. Upon completion of construction, any iron pins that have been destroyed/disturbed by the Contractor will be re-set by the Engineer at the expense of the Contractor.

- Contractor's Work Area - The Contractor shall confine all construction operations to the limits of the street right-of-way or respective easement in which work is occurring. Contractors working in easements within the client's property limits may use an area twenty-five feet (25') wide and immediately adjacent to the easement, however, clearing within the working area shall be limited to brush; no trees shall be removed. The use of any additional area for construction operations, haul road, material storage, equipment and personnel parking and vehicle traffic is expressly prohibited without written approval from the Owner and/or Engineer specifying the locations and permitted use.
- Street Staking - Construction staking shall consist of a single line of hubs at 100-foot common intervals on the water main side of the street and at 50-foot intervals on curves, PC's and PT's, on both sides of the street. All hubs shall be set at five feet (5') outside the street ROW. The line of hubs shall also be used for water main construction. In addition, the location of blow-offs and Fire hydrants will be staked on this line.
- Sanitary Sewer Staking - Construction stakes will consist of a single line of offset hubs spaced at 100-foot common intervals, at manhole locations and at other special features; with guard stakes showing the stationing and the offset.
- Water Staking - See Street Staking. Front property iron pins will be set after street subgrade and parkways have been graded. A wooden stake indicating the adjacent lots shall be placed at each property corner pin. These iron pins shall be used for installation of service lines and meter boxes. The Contractor is responsible for not disturbing these iron pins.
- Drain Staking - Construction stakes will consist of a single line of offset hubs spaced at 50-foot common intervals, at PI's at beginning and end of transitions, at manhole locations and at other special features; set flush with the ground, located along one right-of-way or street line, or offset as necessary, with guard stakes showing the station and the offset. Inlets and other structures will be staked separately.
- Utility Staking - Upon receipt of the CPS's construction design, the designated lot pins shall be set. A wooden stake indicating the adjacent lots shall be placed at each property corner pin. CPS shall utilize these pins for their construction.
- Each of these staking bullets mentioned above are to be staked in one trip to the site. Separate staking dates due to contractor request will result in additional services to be charged to the contractor by

the owner. The contractor is to submit any modifications to the above-noted staking terms in writing along with the bid proposal.

27.5 Unless otherwise provided or ordered, all inspections will be performed by an authorized representative of the authorities having jurisdiction over the work, referred to in these Specifications as the "Inspector" who will exercise authority and function in the following respects:

- Review laboratory, mill and shop tests of materials and equipment for compliance with the Plans and Specifications.
- General supervision and administration of the authorized construction and review of all work performed for compliance with Plans and Specifications.
- Accept the completed work for the authority having jurisdiction over the work.
- The Inspector shall have the authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract. The Inspector shall also have the authority to reject all work and materials which do not conform to the Contract. The Contractor shall give the Inspector timely notice of the readiness for inspection of all work requiring inspection. If any underground work is performed without approval or consent of the Inspector, it shall be uncovered for inspection and properly restored at the Contractor's expense.

27.6 Cude Engineers will not inspect conduit locations and/or depths for CPS, AT&T or Spectrum/Charter infrastructure.

28. Contractor Responsibilities:

28.1 Contractor will be responsible for coordinating and scheduling all required meetings and inspections as needed. A minimum of 72 hours notice must be given to the Engineer for any requested site visits. Any and all costs for re-testing of sewer and water facilities due to failure to meet specifications or lack of preparedness will be paid by the Contractor.

28.2 Re-staking of stakes set by Engineer will be charged to the Contractor by the Owner.

28.3 The location and depths of existing utilities shown on the plans were placed on the plans from the best available information from various sources. The Contractor is required to verify the location and depth, prior to construction, of all utilities shown on the plans. The Contractor's attention is hereby specifically directed to the information regarding the existing utility structures, lines and mains which are known to exist and may be encountered within and adjacent to the limits of the work covered by this contract. The existence and location of the underground utilities indicated on the Plans are taken from the best records available and are not guaranteed but shall be investigated and verified by the Contractor before starting work. The Contractor shall be held responsible for any damage to, and for maintenance and protection of, existing utilities which cross proposed construction. The cost of temporarily relocating utilities for the convenience of the Contractor shall be paid by the Contractor. In instances where gas or water mains are exposed during the course of construction, the purveyor shall be notified prior to backfilling operations in order that protective coatings on mains may be inspected or repaired. It shall be the responsibility of the Contractor to determine the exact location of the existing utilities which cross proposed construction. It is the Contractor's responsibility to excavate bridging, if necessary, during construction, so as to maintain continuous service. It shall be his responsibility to backfill around the utility facility and to complete construction so as to leave the line firmly and securely bedded in its original position. In areas where utilities near the construction area would be damaged by soil movement, slips or cave-ins, the

Contractor shall take all precautions to protect such utilities from damage and the Contractor shall be fully responsible for and shall pay for the repair of such damage without additional cost to the Owner or the purveyor.

28.4 It shall be the Contractor's responsibility to perform a final "site clean" after construction activity has ceased and obtained all final acceptances. The Contractor will be responsible for hauling off and disposing of all infrastructure construction related debris, regardless of origin.

28.5 The responsibility shall be upon the Contractor to provide and maintain at his own expense an adequate supply of water for his use for construction and domestic consumption. Any connections and piping that the Contractor deems necessary shall be installed at his expense and at locations approved by the Water Purveyor. Before final acceptance, all temporary connections and piping installed shall be removed in a manner satisfactory to the Engineer.

28.6 All electric current required by the Contractor shall be furnished at his own expense. All necessary meters, switches, connections and wiring shall be installed at his expense and at locations approved by the Electric Company. Before final acceptance, all meters, switches, connections and wiring installed by the Contractor shall be removed in a manner satisfactory to the Engineer.

28.7 Contractor shall coordinate with Owner for parking and placement of all materials and equipment. Owner will not be responsible for any damaged, stolen or vandalized equipment, vehicles, etc.

28.8 Only those trees designated by the Engineer will be removed by the Contractor during construction operations. The Contractor shall be required to lay out all proposed improvements and notify the Engineer prior to any tree removal necessary for the execution of work. Trees which are intended to remain, and which are damaged beyond repair or removed, shall be replaced by the Contractor at no extra cost. Trees shall be trimmed and when doing so will avoid removal or damage. Trimmed or damaged trees shall be treated and repaired by persons with experience in this specialty and who are approved by the Engineer. This work is incidental to construction. (No separate pay item.) In the area where excavation or construction occurs within two feet of the canopy of a tree to be saved, the Contractor shall saw cut the edge of the excavation. This will allow for a clean cut of the tree roots and enable the Contractor to excavate in the proximity of trees with minimal damage to the root system. Contact the Engineer if in doubt where to saw cut. This work is incidental to construction. (No separate pay item.)

28.9 Contractor shall notify owner/Engineer if any evidence of ground water is present during any phase of the construction process.

28.10 Contractor is responsible for installing and maintaining the erosion and sedimentation controls as designed and shall inspect the controls weekly (7 days) and after every significant rainfall to ensure significant disturbance to the structure has not occurred. Sediment deposited after a significant rainfall shall be removed and placed in 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. Contractor is also responsible for replacing SW3P measures if damaged during construction. Contractor must keep and maintain a copy of the Storm Water Pollution Prevention Plan (SW3P) on site and readily available for authorities.

28.11 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 natural lows unless indicated on grading plan. Fills in lot areas required 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.

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

28.13 The Owner will pay for all geotechnical testing required for verification of conformance with the project specifications as needed for acceptances and future permitting for uses determined by the Owner. Any and all costs for re-testing due to failure to meet specifications or lack of preparedness will be paid by the Contractor.

28.14 Contractor will be required to coordinate work with the utility companies that will be installing electric, telephone and TV. Contractor is responsible for coordinating with utility companies to mark existing buried utilities regardless of construction plan depiction plan, error or omission that may be affected by construction. The Contractor will be responsible to repair damaged utilities due to construction. It is the sole responsibility of the contractor to identify all potential conflicts between existing and proposed facilities.

28.15 Contractor shall coordinate with the Owner for placement of private conduit.

28.16 Contractor shall be responsible for periodic sweeping of existing streets adjacent to the site to insure they are free from silt and debris. It shall be the Contractors responsibility to perform a final "site clean" after construction activity has ceased. The Contractor will be responsible for hauling off and disposing of all infrastructure construction related debris, regardless of origin.

28.17 Contractor agrees that it will, as part of the award of this contract, obtain and provide to Owner all interim and final field inspection approvals, all interim and final completion approvals or certificate by governing utility and governmental authorities in writing. The applicable warranty period shall follow required governmental requirements for the jurisdiction the project is located in. Contractor agrees to provide plan of record documents within 30 days of substantial completion of project.

28.18 Contractor shall submit a letter to the Engineer and Owner prior to acceptance of infrastructure by all jurisdictional entities, that certifies the final grading of the lots is within 0.25' of the surface file provided by the Engineer. In addition, all spot elevations shown on the grading plan must be certified that the grade is within 0.1'. The Owner reserves the right to perform an as-built topographic survey to confirm such certification at or near substantial grading completion of the project. If errors or discrepancies are found, the Contractor shall be responsible for correcting grades at their own expense. The Contractor will also be responsible for additional as-built topographic survey costs incurred by the Owner for corrections to a miss on grades.

28.19 Contractor is responsible for the hydromulch (soil, seeding, or sodding and watering) of all earthen drainage channels, detention ponds, and on-site and off-lot grading. 85% of channel surface must have established vegetation prior to acceptance of the channel by the City of San Antonio and Bexar County. Hydromulch pay item to include soil, seeding, or sodding and watering for the time period needed to achieve 85% vegetation.

28.20 Contractor to haul excess material to a future unit within the Tres Laurels Subdivision. Contractor shall coordinate with owner/Engineer of location of excess material to be placed.

BID PROPOSAL

Date:_____

Bid of _____
(Legal Name of Bidder – Company)

[ ] an individual proprietorship

[ ] a corporation organized and existing under the laws of _____

[ ] a partnership consisting of _____

_____

[ ] a joint venture

[ ] other _____

FOR:

Tres Laurels 4A

STREETS, DRAINAGE, WATER & WASTEWATER CONSTRUCTION

TO:

LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.
100 NE Loop 410, Suite 1155
San Antonio, TX 78216

PROPOSAL BIDDING SHEET

Tres Laurels 4A

STREETS, DRAINAGE, WATER & WASTEWATER CONSTRUCTION

Gentlemen:

Pursuant to the foregoing Invitation and Instructions to Bidders, the undersigned bidder hereby proposes to do all the work for the unit prices bid to furnish all necessary superintendence, labor, machine, equipment, tools, materials, insurance and miscellaneous items, to complete all work according to the bids, as provided in the construction plan and contract documents for the **CONSTRUCTION OF TRES LAURELS 4A, STREETS, DRAINS, WATER AND WASTEWATER UTILITIES** and clean up the site to the satisfaction of the Owner/Engineer, and bind himself on acceptance of this proposal to execute a contract and bonds for completing said project within the time stated for the following prices, to wit:

Tres Laurels 4A

STREETS, DRAINAGE, WATER & WASTEWATER CONSTRUCTION

ACKNOWLEDGMENT OF RECEIPT OF ADDENDUM

ADDENDUM NO. 1 _____
Signature Date

ADDENDUM NO. 2 _____
Signature Date

ADDENDUM NO. 3 _____
Signature Date

ADDENDUM NO. 4 _____
Signature Date

ADDENDUM NO. 5 _____
Signature Date

ADDENDUM NO. 6 _____
Signature Date

BID FORM – UNIT 4A

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)

7/2/2024
Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A

BIDDER'S NAME: _____

BID SUMMARY

SEDIMENTATION AND EROSION CONTROL	$	-
LOT GRADING IMPROVEMENTS	$	-
DRAINAGE IMPROVEMENTS	$	-
STREET IMPROVEMENTS	$	-
WATER IMPROVEMENTS	$	-
SANITARY SEWER IMPROVEMENTS	$	-
MISCELLANEOUS IMPROVEMENTS	$	-
TOTAL BASE BID:	$	-

No shrinkage or swelling facor is accounted for in the engineering excavation and embankment quantities. Contractor to adjust unit price as he deems necessary to account for shrinkage and swelling.

* Includes Bid Bond, Warranty Assignments or Bonds, Per City of San Antonio, and SAWS Requirements

** Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

*** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____
Date _____

7/2/2024

Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
SEDIMENTATION & EROSION CONTROL

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT PRICES	COST
Phase 4A					
1.	Stabilized Construction Entrance	EA	1	$ -	$ -
2.	Concrete Washout Pit	EA	1	$ -	$ -
3.	Silt Fence (Phase 1)	LF	2440	$ -	$ -
4.	Silt Fence (Phase 2)	LF	9632	$ -	$ -
5.	Inlet Protection	LF	70	$ -	$ -
6.	Rock Berm	LF	60	$ -	$ -
				TOTAL	$ -

* Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

*** Commence of Construction:

1. Initial project clearing will need to be limited to the locations of the proposed temporary SWP3 Best Management Practices (BMP) designed by the engineer. These BMPs may include, but are not limited to:
Stabilized Construction Exit(s), Silt Fence, Discharge Point Rock Berms/Check Dams, Trash containment, Temporary Sediment Basins (if applicable), Demarcation of protected site features for exapmle; Wetlands, Environmental Buffers, Caves or Solution Features, and Habitats,
2. Prior to commencement of additional clearing or earth disturbing activities, the proposed BMPs will need to be installed by the Contractor and inspected by a Lennar Representative. Contractor must provide at minimum, 48-hours of notice to Lennar when the BMPs are scheduled to be installed and completed. The Lennar Representative will coordinate the Land Development Manager to release the project for construction.
3. When a Temporary Sediment Basin is required for the project, limited clearing of the proposed basin location and any material borrow areas to construct the Temporary Sediment Basin may occur during the initial BMP installation period. The Temporary Sediment Basin must be completely constructed to Engineer's design. This may include the following; Construction of the dewatering structure (Riser Pipe or Fair Cloth Skimmer and pump), Construction of the Emergency Overflow Structure, Installation of a sediment depth marker. Note-Once accessible to appropriate equipment, the only the Temporary Sediment Basin berms/slopes shall be temporarily stabilized.
4. General Contractor is to maintain all pollution control measures in effective operating condition throughout the contract period to the extent achievable. To ensure BMPs are operating effectively, and in accordance with the Construction General Permit, Lennar will provide regular and if applicable, post-rain event BMP inspections and inspection reports. The General Contractor will be provided an electronic copy of the BMP inspection report via email. weekly regarding issues with BMPs at the project through the Lennar SWP3 Inspection process. Items noted in the BMP Inspection report must be addressed by the General Contractor as soon as possible, and within 7 calendar days. General Contractor shall provide documentation to the assigned Lennar Land Development Project Manager to include:
a. Actions taken in response to the BMP inspection report and date(s) the actions were completed or,
b. Statement of extenuating circumstance as to why an item could not be completed within the 7-day timeframe and proposed scheduled date of completion.
5. Contractor to maintain Spill Response Supplies/Kit at the project location while actively working onsite.
6. When dewatering activities disccharge into onsite creeks or rivers, or discharge outside the limits of construction, daily dewatering inspections must be documented in accordance with the 03.05.2023 TCEQ Construction General Permit. Daily report must be sent to Lennar within 24-hours.

`

Bidders Initials _____

Date _____

7/2/2024

Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
LOT GRADING

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT PRICES	COST
Phase 4A					
1.	Overall Clearing & Grubbing (Disturbed Area)	AC	31.6	$ -	$ -
2.	Overall Excavation	CY	11,884	$ -	$ -
3.	Overall Embankment*	CY	36,718	$ -	$ -
4.	Import*	CY	15,743	$ -	$ -
				TOTAL	$ -

* The contractor is to field verify and survey the existing site topography. Import quantity is subject to change based on the amount of material brought on-site from Montgomery Road Phase 1D and Tres Laurels CLOMR channel.

** Contractor to field verify and survey the existing site topography and submit information to engineer prior to submitting final bid for verification. No shrinkage or swelling factor is accounted for in the engineering excavation and embankment quantities. Contractor to adjust unit price as he deems necessary to account for shrinkage and swelling.

*** All final lot grading shall be compacted in accordance with notes on the Lot Grading Plan, Sheets C2.00

**** Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

***** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____

Date _____

7/2/2024

Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
STREET IMPROVEMENTS

18292

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT PRICES	COST
Phase 4A					
1	Mobilization	LS	1	$ -	$ -
2	Street Excavation	CY	12,331	$ -	$ -
3	Street Embankment (Final)(Dens. Cont.)(Type B)	CY	2,970	$ -	$ -
4	Contractor to remove existing header curb	LF	40	$ -	$ -
5	Contractor to Remove Existing Guard Posts	EA	8	$ -	$ -
6	2" HMAC Type "D"	SY	12,884	$ -	$ -
7	12.5" Flexible Base (Compacted Depth)	SY	14,343	$ -	$ -
8	3" HMAC Type "D"	SY	5,408	$ -	$ -
9	14.75" Flexible Base (Compacted Depth)	SY	5,903	$ -	$ -
10	6" Lime Stabilized Subgrade (27 LB/SY)	SY	20,246	$ -	$ -
11	Concrete Header Curb	LF	124	$ -	$ -
12	Concrete Curb	LF	9,632	$ -	$ -
13	Timber Guard Post	EA	25	$ -	$ -
14	Concrete Sidewalk	SY	463	$ -	$ -
15	ADA Ramps	SY	22	$ -	$ -
16	R1-1 STOP (30")(High Intensity)	EA	10	$ -	$ -
17	OM-4 End of Road marker (18"X18")	EA	12	$ -	$ -
18	9" [229mm] Street Name, Block Number (VARIES x9")(High Intesity)	EA	22	$ -	$ -
19	W11A-2 Ped Crossing (30"x30")(High Intensity)	EA	2	$ -	$ -
20	Type II Blue Raised Pavement Marker	EA	8	$ -	$ -
				TOTAL	$ -

* Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____

Date _____

7/2/2024

Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
DRAINAGE IMPROVEMENTS

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT PRICES	COST
Phase 4A					
1	Type II Inlet (Complete) (10 FT)	EA	1	$ -	$ -
2	Type II Inlet (Complete) (15 FT)	EA	1	$ -	$ -
3	Type II Inlet (Complete) (20 FT)	EA	1	$ -	$ -
4	Type II Inlet (Complete) (25 FT)	EA	1	$ -	$ -
5	24" H.D.P.E.	LF	282	$ -	$ -
6	36" H.D.P.E.	LF	287	$ -	$ -
7	Concrete Rip-Rap (5" Thick)	SY	123	$ -	$ -
8	Revegetation (Disturbed Open Space)	SY	11,229	$ -	$ -
9	8"-12" Rock Rubble	SY	93	$ -	$ -
10	Concrete Collars	EA	4	$ -	$ -
11	Baffle Blocks	CY	1	$ -	$ -
				TOTAL	$ -

* Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____

Date _____

7/2/2024

Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
WATER IMPROVEMENTS

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT PRICES	COST
Phase 4A					
1	Remove Existing Blowoff & Tie To Existing 8" Main	EA	4	$ -	$ -
2	Remove Existing Blowoff & Tie To Existing 12" Main	EA	1	$ -	$ -
3	Trench Excavation Safety Protection	LF	4514	$ -	$ -
4	2" HDPE Pipe	LF	622	$ -	$ -
5	8" C-900, DR18 Class 235 PVC Pipe	LF	3727	$ -	$ -
6	12" C-900, DR18 Class 235 PVC Pipe	LF	165	$ -	$ -
7	Ductile Iron Fittings	TON	3.66	$ -	$ -
8	8" Gate Valve & Boxes, M.J.	EA	20	$ -	$ -
9	12" Gate Valve & Boxes, M.J.	EA	4	$ -	$ -
10	3/4" Short Single Service with 5/8" meter	EA	123	$ -	$ -
11	3/4" Long Single Service with 5/8" meter	EA	54	$ -	$ -
12	1" Irrigation Service with 1" meter	EA	2	$ -	$ -
13	1.5" Amenity Center Service with 1.5" meter	EA	1	$ -	$ -
14	Meter Boxes	EA	180	$ -	$ -
15	Fire Hydrant Assembly	EA	6	$ -	$ -
16	6" Steel Casing	LF	13	$ -	$ -
17	24" Steel Casing	LF	39	$ -	$ -
18	2" Blowoffs (Perm.)	EA	8	$ -	$ -
19	2" Blowoffs (Temp.)	EA	5	$ -	$ -
20	Hydrostatic Testing	EA	1	$ -	$ -
				TOTAL	$ -

* Cast Iron fittings weights were determined by mechanical joint compact

** Service cost shall include the cost of the 4" PVC Sleeve

*** Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

**** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____

Date _____

7/2/2024
Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
SANITARY SEWER IMPROVEMENTS

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES	UNIT PRICES	COST
Phase 4A					
1	8" SDR Sanitary Sewer Pipe				
	8" SDR 26 (10'-14')	LF	5070	$ -	$ -
	8" SDR 26 (14'-18')	LF	297	$ -	$ -
2	12" SDR Sanitary Sewer Pipe				
	12" SDR 26 (6'-10')	LF	26	$ -	$ -
	12" SDR 26 (10'-14')	LF	325	$ -	$ -
	12" SDR 26 (14'-18')	LF	76	$ -	$ -
3	Standard Manhole	EA	27	$ -	$ -
4	Doghouse Manhole	EA	1	$ -	$ -
5	Extra Depth Manhole	VF	164	$ -	$ -
6	Vertical Stacks	LF	112	$ -	$ -
7	Bypass Pumping	LS	1	$ -	$ -
8	6" Sanitary Sewer Lateral (SDR-26)	LF	6,339	$ -	$ -
9	WYE	EA	178	$ -	$ -
10	Trench Excavation Protection	LF	5,794	$ -	$ -
11	Concrete Encasement	CY	7	$ -	$ -
12	TV / Video Sewer Line	LF	5,794	$ -	$ -
				TOTAL	$ -

* Unit cost of 6" Sanitary Sewer Lateral shall include trench excavation protection.

** Note: Refer quantities to the current San Antonio Water System (SAWS) Standard Specifications for Construction. SAWS approval is required. Contractor shall provide proof of trench compaction test results as tested by a Geotechnical Engineer, to comply with SAWS. Cost of first time testing to be paid by owner. Cost of required retesting shall be paid by Contractor.

*** Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

**** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____
Date _____

7/2/2024

Job No. 3050.015

BID PROPOSAL SCHEDULE
TRES LAURELS SUBDIVISION PHASE 4A
MISCELLANEOUS IMPROVEMENTS

NO.	DESCRIPTION	UNIT OF MEASURE	APPROX. QUANTITIES*	UNIT PRICES	COST
Phase 4A					
1	Revegetation (Disturbed Area Within Lots)	SY	106,460	$ -	$ -
2	PVC Sleeve Bundle (3-3" SCH 80 & 2-4" SCH 80)	LF	180	$ -	$ -
				TOTAL	$ -

* Quantity provided is just to acquire Unit Price. True Quanitites will be provided once final CPS Design is complete.

** Contractor is to perform an independent quantity take-off prior to signing the contract, to verify that the quantities given in the bid proposal are within three percent (3%) of the actual quantities required to complete the construction represented by the plans and specifications. If any quantity is found to be in error of more than three percent (3%), the Contractor shall notify the Engineer forty-eight (48) hours prior to signing the contract.

*** Bids shall include all Unit Price costs as indicated by the Contract Documents and Bid Form. The bid price submitted by the Contractor shall be the sum of the unit prices times the estimated quantity of each item shown in the bid form. However, the Contractor shall guarantee himself of the accuracy of the quantities shown in the bid form. The quantities shown are estimates only and indicate only the magnitude of the project and a basis for bid comparison. Any discrepancies in quantity or work necessary to fulfill the intent of the plans shall be included, whether a bid item is included or not. Any work required for which a bid item is not shown shall be considered subsidiary to other work items.

Bidders Initials _____

Date _____

GEOTECHNICAL REPORT
(Frost Project No. FGS-G 20016)

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)

GEOTECHNICAL ENGINEERING STUDY

TRES LAURELS SUBDIVISION
WEST MONTGOMERY ROAD EXTENSION
SAN ANTONIO, TEXAS
PAVEMENT DESIGN

FROST GEOSCIENCES, INC. PROJECT NO.: FGS-G 20016
(PAVEMENT SUPPLEMENT)
NOVEMBER 2, 2022

Prepared Exclusively for:

Mr. Allen Hoover
Mosiac Land Development
6812 West Avenue, Suite 100
San Antonio, Texas 78213

Frost GeoSciences
Construction Materials ▪ Forensics
Environmental ▪ Geotechnical

Frost GeoSciences

Frost Geosciences, Inc.
13406 Western Oak
Helotes, Texas 78023
Office (210)-372-1315
Fax (210)-372-1318
www.frostgeosciences.com
TBPE Firm Registration # F-9227
TBPG Firm Registration # 50040

July 23, 2020

Mr. Allen Hoover
Mosaic Land Development
6812 West Avenue, Suite # 100
San Antonio, Texas 78213

SUBJECT:
Geotechnical Engineering Services
Tres Laurels Subdivision
San Antonio, Texas
FGS Project No: FGS-G20016, Paving Supplement

Dear Mr. Hoover;

We have addressed the issues and questions that Bexar County submitted in their first review. Attached are paving designs with and without lime stabilization USING A CBR VALUE OF 4.5 multiplied by 1500 as per Bexar County design criteria. The UCS Curves have also been included as per Bexar County request.

FGS appreciates this opportunity to be of service to you in this phase of your project. If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,
Frost GeoSciences, Inc.

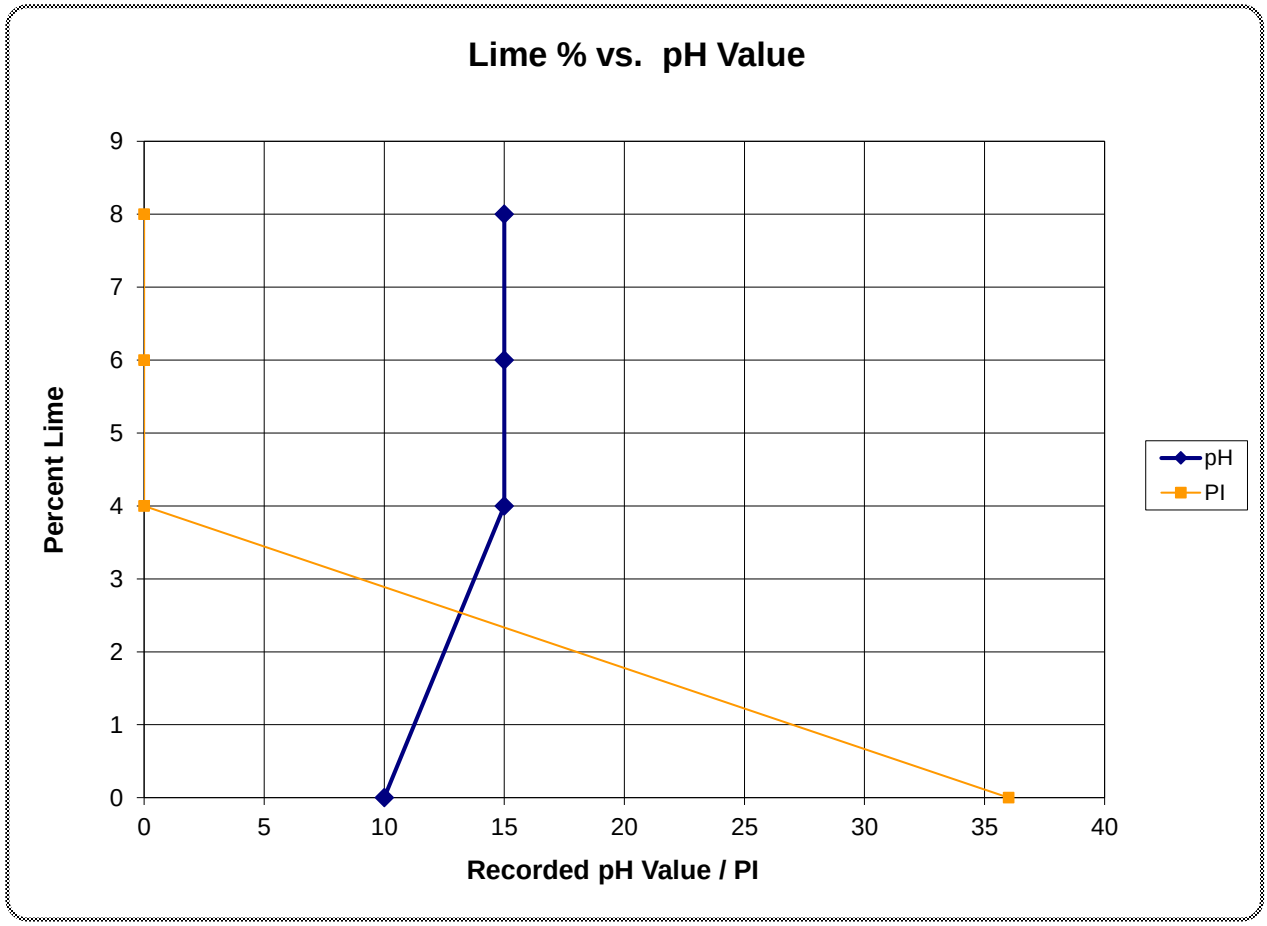
STATE OF TEXAS
F. J. CABALLERO
66952
LICENSED
PROFESSIONAL ENGINEER

F. J. Caballero, P.E.
Project Engineer

Copies Submitted: I: Mr. Allen Hoover, Mosaic Land Development
II: File

LIME CURVE

FGS Project No: FGS-G20116-A



Project Name: Tres Laurels
Project Number: FGS-G20016
Soil Description: Light Brown Clay

%Lime	pH	PI
0	10	36
4	15	0
6	15	0
8	15	0

	6`/.		8`/.
Set #1	160	Set #1	175
Set #2	155	Set #2	180

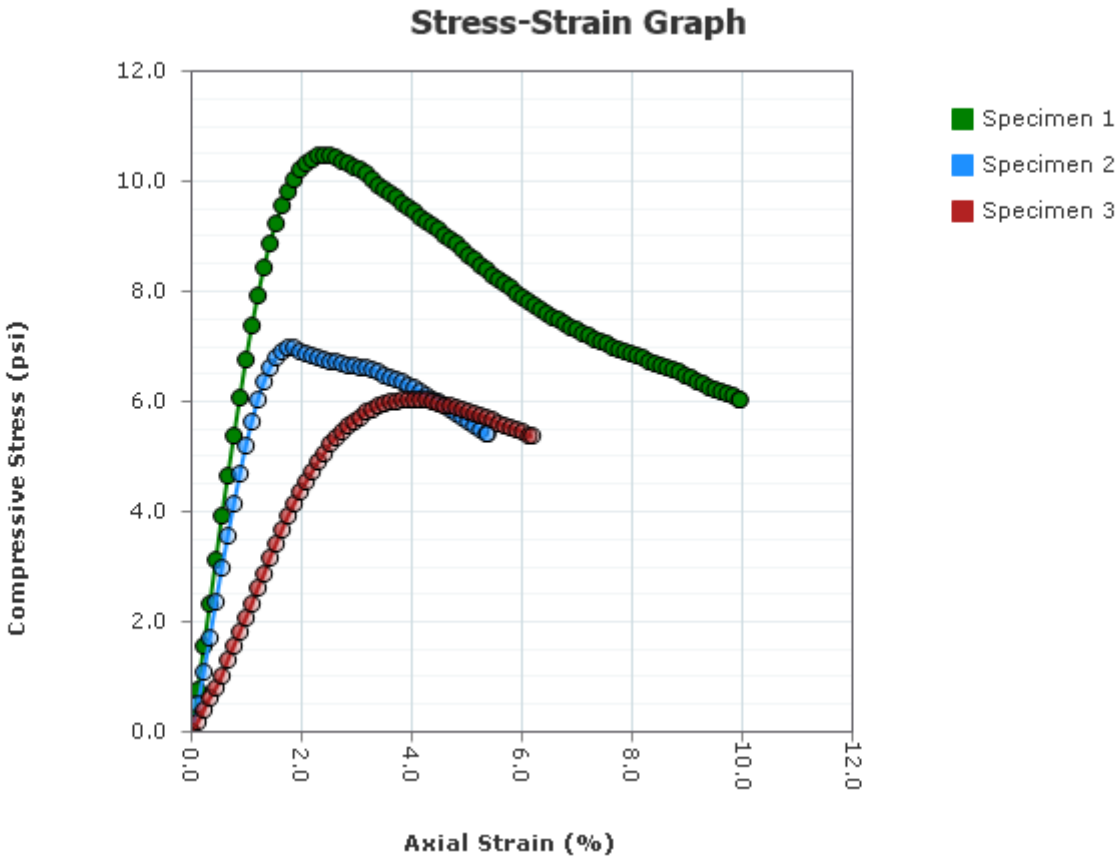
UCS CURVES

FGS Project No: FGS-G20116-A

0 % LIME CURVE

Unconfined Compression Test

D2166



Project:	Tres Laurels Subdivision
Project Number:	FGS-G-20016
Received Date:	10/19/2022
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision /Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	0% Lime

Unconfined Compression Test

D2166

	Specimen Number							
Before Test	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Moisture Content (%):	0.0	0.0	0.0					
Wet Density (pcf)	0.0	0.0	0.0					
Dry Density (pcf)	0.0	0.0	0.0					
Saturation (%):	0.0	0.0	0.0					
Void Ratio:	0.000	0.000	0.000					
Height (in)	4.5763	4.5763	4.5763					
Diameter (in)	3.8307	3.8307	3.8307					
Strain Limit @ 15% (in)	0.7	0.7	0.7					
Height To Diameter Ratio:	1.19	1.19	1.19					
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Failure Angle (°):	0	0	0					
Strain Rate (in/min)	0.09	0.09	0.09					
Strain Rate (%/min):	1.97	1.97	1.97					
Unconfined Compressive Strength (psi)	10.5	7.0	6.0					
Undrained Shear Strength (psi)	5.2	3.5	3.0					
Strain at Failure (%):	2.5	1.9	4.2					

Specific Gravity:	2.72	Plastic Limit:	26	Liquid Limit:	77
Type:	Grab	Soil Classification:	CH		

Project:	Tres Laurels Subdivision
Project Number:	FGS-G-20016
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision /Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	0% Lime

Specimen 1 Failure Sketch	Specimen 2 Failure Sketch	Specimen 3 Failure Sketch	Specimen 4 Failure Sketch	Specimen 5 Failure Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch
							

Unconfined Compression Test

D2166

LIMS Code: [TO COME FROM LIMS]

Specimen 1

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:					

Specimen 2

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	0% Lime				

Specimen 3

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	0% Lime				

Unconfined Compression Test - Specimen 1

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.0036	0.0449	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	34.00588	0.0500	9.0	0.0050	0.1	11.538	0.8	0.8
2	00:00:07	42.90013	0.0550	17.9	0.0100	0.2	11.550	1.6	1.5
3	00:00:10	52.07398	0.0599	27.1	0.0150	0.3	11.563	2.3	2.3
4	00:00:14	61.13785	0.0650	36.1	0.0200	0.4	11.576	3.1	3.1
5	00:00:17	70.3161	0.0700	45.3	0.0250	0.5	11.588	3.9	3.9
6	00:00:21	79.094	0.0750	54.1	0.0300	0.7	11.601	4.7	4.7
7	00:00:24	87.58203	0.0800	62.6	0.0350	0.8	11.614	5.4	5.4
8	00:00:27	95.71223	0.0850	70.7	0.0400	0.9	11.627	6.1	6.1
9	00:00:31	103.579	0.0899	78.6	0.0450	1.0	11.639	6.8	6.8
10	00:00:34	110.8425	0.0949	85.8	0.0500	1.1	11.652	7.4	7.4
11	00:00:38	117.407	0.1000	92.4	0.0550	1.2	11.665	8.0	7.9
12	00:00:41	123.3966	0.1050	98.4	0.0600	1.3	11.678	8.5	8.4
13	00:00:45	128.5415	0.1100	103.5	0.0650	1.4	11.691	9.0	8.9
14	00:00:48	132.9713	0.1149	108.0	0.0700	1.5	11.704	9.4	9.2
15	00:00:51	136.9308	0.1200	111.9	0.0750	1.6	11.717	9.7	9.6
16	00:00:55	140.1634	0.1250	115.2	0.0800	1.7	11.730	10.0	9.8
17	00:00:58	142.8319	0.1300	117.8	0.0850	1.9	11.743	10.2	10.0
18	00:01:02	144.997	0.1350	120.0	0.0900	2.0	11.756	10.4	10.2
19	00:01:05	146.594	0.1400	121.6	0.0950	2.1	11.769	10.6	10.3
20	00:01:08	147.6987	0.1450	122.7	0.1000	2.2	11.782	10.6	10.4
21	00:01:12	148.3782	0.1499	123.4	0.1050	2.3	11.796	10.7	10.5
22	00:01:15	148.6959	0.1550	123.7	0.1100	2.4	11.809	10.7	10.5
23	00:01:18	148.7825	0.1600	123.8	0.1150	2.5	11.822	10.7	10.5
24	00:01:21	148.4515	0.1650	123.4	0.1200	2.6	11.835	10.7	10.4
25	00:01:25	147.9514	0.1700	122.9	0.1250	2.7	11.849	10.7	10.4
26	00:01:28	147.425	0.1750	122.4	0.1300	2.8	11.862	10.6	10.3
27	00:01:31	146.9273	0.1800	121.9	0.1350	3.0	11.875	10.6	10.3
28	00:01:34	146.3021	0.1850	121.3	0.1400	3.1	11.889	10.5	10.2
29	00:01:38	145.5889	0.1899	120.6	0.1450	3.2	11.902	10.5	10.1
30	00:01:41	144.5169	0.1950	119.5	0.1500	3.3	11.916	10.4	10.0
31	00:01:45	143.4782	0.2000	118.5	0.1550	3.4	11.929	10.3	9.9
32	00:01:48	142.7312	0.2050	117.7	0.1600	3.5	11.943	10.2	9.9
33	00:01:51	141.8856	0.2100	116.9	0.1650	3.6	11.956	10.1	9.8

Project Name: Tres Laurels Subdivision Project Number: FGS-G-20016

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 1

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:01:54	141.0115	0.2150	116.0	0.1700	3.7	11.970	10.1	9.7
35	00:01:57	140.2089	0.2200	115.2	0.1750	3.8	11.983	10.0	9.6
36	00:02:00	139.2884	0.2250	114.3	0.1800	3.9	11.997	9.9	9.5
37	00:02:03	138.3523	0.2300	113.3	0.1850	4.0	12.011	9.8	9.4
38	00:02:07	137.5008	0.2350	112.5	0.1900	4.2	12.024	9.8	9.4
39	00:02:10	136.7695	0.2399	111.8	0.1950	4.3	12.038	9.7	9.3
40	00:02:13	135.8353	0.2450	110.8	0.2000	4.4	12.052	9.6	9.2
41	00:02:17	134.9955	0.2500	110.0	0.2050	4.5	12.065	9.5	9.1
42	00:02:20	134.0765	0.2550	109.1	0.2100	4.6	12.079	9.5	9.0
43	00:02:23	133.1546	0.2600	108.2	0.2150	4.7	12.093	9.4	8.9
44	00:02:26	132.2722	0.2650	107.3	0.2200	4.8	12.107	9.3	8.9
45	00:02:30	131.209	0.2700	106.2	0.2250	4.9	12.121	9.2	8.8
46	00:02:33	130.1468	0.2750	105.1	0.2300	5.0	12.135	9.1	8.7
47	00:02:37	129.2029	0.2800	104.2	0.2350	5.1	12.149	9.0	8.6
48	00:02:40	128.2272	0.2850	103.2	0.2400	5.2	12.163	9.0	8.5
49	00:02:43	127.2231	0.2900	102.2	0.2450	5.4	12.177	8.9	8.4
50	00:02:47	126.2289	0.2949	101.2	0.2500	5.5	12.191	8.8	8.3
51	00:02:50	125.347	0.3000	100.3	0.2550	5.6	12.205	8.7	8.2
52	00:02:54	124.429	0.3050	99.4	0.2600	5.7	12.219	8.6	8.1
53	00:02:57	123.5662	0.3100	98.6	0.2650	5.8	12.233	8.6	8.1
54	00:03:00	122.634	0.3150	97.6	0.2700	5.9	12.248	8.5	8.0
55	00:03:04	121.8641	0.3199	96.9	0.2750	6.0	12.262	8.4	7.9
56	00:03:07	121.0306	0.3250	96.0	0.2800	6.1	12.276	8.3	7.8
57	00:03:11	120.2896	0.3300	95.3	0.2850	6.2	12.290	8.3	7.8
58	00:03:14	119.5128	0.3350	94.5	0.2900	6.3	12.305	8.2	7.7
59	00:03:17	118.7996	0.3400	93.8	0.2950	6.4	12.319	8.1	7.6
60	00:03:21	117.9901	0.3450	93.0	0.3000	6.6	12.333	8.1	7.5
61	00:03:24	117.3283	0.3500	92.3	0.3050	6.7	12.348	8.0	7.5
62	00:03:27	116.6923	0.3549	91.7	0.3100	6.8	12.362	8.0	7.4
63	00:03:30	116.1306	0.3600	91.1	0.3150	6.9	12.377	7.9	7.4
64	00:03:33	115.5	0.3650	90.5	0.3200	7.0	12.391	7.9	7.3
65	00:03:37	114.8602	0.3700	89.9	0.3250	7.1	12.406	7.8	7.2
66	00:03:40	114.253	0.3750	89.2	0.3300	7.2	12.421	7.7	7.2
67	00:03:44	113.7877	0.3799	88.8	0.3350	7.3	12.435	7.7	7.1

Unconfined Compression Test - Specimen 1

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
68	00:03:47	113.2759	0.3850	88.3	0.3400	7.4	12.450	7.7	7.1
69	00:03:51	112.8154	0.3900	87.8	0.3450	7.5	12.465	7.6	7.0
70	00:03:54	112.3119	0.3950	87.3	0.3500	7.6	12.479	7.6	7.0
71	00:03:57	111.8764	0.4000	86.9	0.3550	7.8	12.494	7.5	7.0
72	00:04:00	111.4134	0.4050	86.4	0.3600	7.9	12.509	7.5	6.9
73	00:04:04	111.0155	0.4100	86.0	0.3650	8.0	12.524	7.5	6.9
74	00:04:07	110.5286	0.4150	85.5	0.3700	8.1	12.539	7.4	6.8
75	00:04:10	110.1493	0.4200	85.1	0.3750	8.2	12.554	7.4	6.8
76	00:04:14	109.7294	0.4250	84.7	0.3800	8.3	12.569	7.4	6.7
77	00:04:17	109.3046	0.4300	84.3	0.3850	8.4	12.584	7.3	6.7
78	00:04:20	108.8559	0.4350	83.9	0.3900	8.5	12.599	7.3	6.7
79	00:04:23	108.4917	0.4400	83.5	0.3950	8.6	12.614	7.2	6.6
80	00:04:27	108.0009	0.4450	83.0	0.4000	8.7	12.629	7.2	6.6
81	00:04:30	107.5365	0.4500	82.5	0.4050	8.9	12.644	7.2	6.5
82	00:04:33	107.0594	0.4550	82.1	0.4100	9.0	12.659	7.1	6.5
83	00:04:37	106.3902	0.4599	81.4	0.4150	9.1	12.674	7.1	6.4
84	00:04:40	105.8452	0.4650	80.8	0.4200	9.2	12.690	7.0	6.4
85	00:04:44	105.3422	0.4700	80.3	0.4250	9.3	12.705	7.0	6.3
86	00:04:47	104.7883	0.4750	79.8	0.4300	9.4	12.720	6.9	6.3
87	00:04:51	104.2306	0.4799	79.2	0.4350	9.5	12.736	6.9	6.2
88	00:04:54	103.8312	0.4850	78.8	0.4400	9.6	12.751	6.8	6.2
89	00:04:57	103.316	0.4899	78.3	0.4450	9.7	12.766	6.8	6.1
90	00:05:01	102.8975	0.4950	77.9	0.4500	9.8	12.782	6.8	6.1
91	00:05:04	102.4287	0.4999	77.4	0.4550	9.9	12.797	6.7	6.1
92	00:05:04	102.3857	0.5005	77.4	0.4555	10.0	12.799	6.7	6.0

Unconfined Compression Test - Specimen 2

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.00801	0.0726	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	30.9639	0.0776	6.0	0.0050	0.1	11.538	0.5	0.5
2	00:00:06	37.45799	0.0826	12.4	0.0100	0.2	11.550	1.1	1.1
3	00:00:10	44.59441	0.0876	19.6	0.0150	0.3	11.563	1.7	1.7
4	00:00:13	52.20156	0.0926	27.2	0.0200	0.4	11.576	2.4	2.3
5	00:00:17	59.40055	0.0976	34.4	0.0250	0.5	11.588	3.0	3.0
6	00:00:20	66.48613	0.1026	41.5	0.0300	0.7	11.601	3.6	3.6
7	00:00:24	73.16744	0.1076	48.2	0.0350	0.8	11.614	4.2	4.1
8	00:00:27	79.54275	0.1126	54.5	0.0400	0.9	11.627	4.7	4.7
9	00:00:31	85.56464	0.1176	60.6	0.0450	1.0	11.639	5.3	5.2
10	00:00:34	90.84644	0.1226	65.8	0.0500	1.1	11.652	5.7	5.7
11	00:00:37	95.54799	0.1276	70.5	0.0550	1.2	11.665	6.1	6.0
12	00:00:41	99.39312	0.1326	74.4	0.0600	1.3	11.678	6.5	6.4
13	00:00:44	102.4732	0.1376	77.5	0.0650	1.4	11.691	6.7	6.6
14	00:00:48	104.7448	0.1426	79.7	0.0700	1.5	11.704	6.9	6.8
15	00:00:51	106.1663	0.1476	81.2	0.0750	1.6	11.717	7.0	6.9
16	00:00:55	106.8566	0.1526	81.8	0.0800	1.7	11.730	7.1	7.0
17	00:00:58	106.9245	0.1576	81.9	0.0850	1.9	11.743	7.1	7.0
18	00:01:01	106.4142	0.1626	81.4	0.0900	2.0	11.756	7.1	6.9
19	00:01:05	105.853	0.1676	80.8	0.0950	2.1	11.769	7.0	6.9
20	00:01:08	105.3852	0.1726	80.4	0.1000	2.2	11.782	7.0	6.8
21	00:01:12	105.1442	0.1776	80.1	0.1050	2.3	11.796	7.0	6.8
22	00:01:15	104.913	0.1826	79.9	0.1100	2.4	11.809	6.9	6.8
23	00:01:18	104.67	0.1876	79.7	0.1150	2.5	11.822	6.9	6.7
24	00:01:21	104.4916	0.1926	79.5	0.1200	2.6	11.835	6.9	6.7
25	00:01:24	104.2311	0.1976	79.2	0.1250	2.7	11.849	6.9	6.7
26	00:01:28	104.0605	0.2026	79.1	0.1300	2.8	11.862	6.9	6.7
27	00:01:31	103.9128	0.2076	78.9	0.1350	3.0	11.875	6.8	6.6
28	00:01:34	103.7945	0.2126	78.8	0.1400	3.1	11.889	6.8	6.6
29	00:01:38	103.5873	0.2176	78.6	0.1450	3.2	11.902	6.8	6.6
30	00:01:41	103.3145	0.2226	78.3	0.1500	3.3	11.916	6.8	6.6
31	00:01:44	102.9171	0.2276	77.9	0.1550	3.4	11.929	6.8	6.5
32	00:01:48	102.462	0.2326	77.5	0.1600	3.5	11.943	6.7	6.5
33	00:01:51	102.025	0.2376	77.0	0.1650	3.6	11.956	6.7	6.4

Project Name: Tres Laurels Subdivision Project Number: FGS-G-20016

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 2

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:01:54	101.5283	0.2426	76.5	0.1700	3.7	11.970	6.6	6.4
35	00:01:57	101.127	0.2476	76.1	0.1750	3.8	11.983	6.6	6.4
36	00:02:01	100.5648	0.2526	75.6	0.1800	3.9	11.997	6.6	6.3
37	00:02:04	99.967	0.2576	75.0	0.1850	4.0	12.010	6.5	6.2
38	00:02:07	99.35646	0.2626	74.3	0.1900	4.2	12.024	6.5	6.2
39	00:02:10	98.69312	0.2676	73.7	0.1950	4.3	12.038	6.4	6.1
40	00:02:14	97.95499	0.2726	72.9	0.2000	4.4	12.052	6.3	6.1
41	00:02:17	97.30191	0.2776	72.3	0.2050	4.5	12.065	6.3	6.0
42	00:02:20	96.53152	0.2826	71.5	0.2100	4.6	12.079	6.2	5.9
43	00:02:23	95.76797	0.2876	70.8	0.2150	4.7	12.093	6.1	5.9
44	00:02:27	95.01321	0.2926	70.0	0.2200	4.8	12.107	6.1	5.8
45	00:02:30	94.24282	0.2976	69.2	0.2250	4.9	12.121	6.0	5.7
46	00:02:33	93.44847	0.3026	68.4	0.2300	5.0	12.135	5.9	5.6
47	00:02:37	92.69518	0.3076	67.7	0.2350	5.1	12.149	5.9	5.6
48	00:02:41	91.80161	0.3126	66.8	0.2400	5.2	12.163	5.8	5.5
49	00:02:44	90.95642	0.3176	65.9	0.2450	5.4	12.177	5.7	5.4
50	00:02:45	90.84644	0.3184	65.8	0.2458	5.4	12.179	5.7	5.4

Unconfined Compression Test - Specimen 3

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.00165	0.1121	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	27.36074	0.1171	2.4	0.0050	0.1	11.538	0.2	0.2
2	00:00:06	29.75454	0.1221	4.8	0.0100	0.2	11.550	0.4	0.4
3	00:00:09	32.23534	0.1271	7.2	0.0150	0.3	11.563	0.6	0.6
4	00:00:13	34.30651	0.1321	9.3	0.0200	0.4	11.576	0.8	0.8
5	00:00:16	36.8318	0.1371	11.8	0.0250	0.5	11.588	1.0	1.0
6	00:00:19	39.99453	0.1421	15.0	0.0300	0.7	11.601	1.3	1.3
7	00:00:22	43.03016	0.1471	18.0	0.0350	0.8	11.614	1.6	1.6
8	00:00:26	46.10831	0.1521	21.1	0.0400	0.9	11.627	1.8	1.8
9	00:00:29	49.20798	0.1571	24.2	0.0450	1.0	11.639	2.1	2.1
10	00:00:32	52.30177	0.1621	27.3	0.0500	1.1	11.652	2.4	2.3
11	00:00:36	55.47232	0.1671	30.5	0.0550	1.2	11.665	2.6	2.6
12	00:00:39	58.70935	0.1721	33.7	0.0600	1.3	11.678	2.9	2.9
13	00:00:43	61.80119	0.1771	36.8	0.0650	1.4	11.691	3.2	3.1
14	00:00:46	64.91894	0.1821	39.9	0.0700	1.5	11.704	3.5	3.4
15	00:00:49	67.92867	0.1871	42.9	0.0750	1.6	11.717	3.7	3.7
16	00:00:53	70.93203	0.1921	45.9	0.0800	1.7	11.730	4.0	3.9
17	00:00:56	73.76088	0.1971	48.8	0.0850	1.9	11.743	4.2	4.2
18	00:01:00	76.3287	0.2021	51.3	0.0900	2.0	11.756	4.5	4.4
19	00:01:03	78.68339	0.2071	53.7	0.0950	2.1	11.769	4.7	4.6
20	00:01:06	80.91196	0.2121	55.9	0.1000	2.2	11.782	4.9	4.7
21	00:01:10	82.94451	0.2171	57.9	0.1050	2.3	11.796	5.0	4.9
22	00:01:13	84.87001	0.2221	59.9	0.1100	2.4	11.809	5.2	5.1
23	00:01:17	86.70165	0.2271	61.7	0.1150	2.5	11.822	5.4	5.2
24	00:01:20	88.30843	0.2321	63.3	0.1200	2.6	11.835	5.5	5.3
25	00:01:23	89.7671	0.2371	64.8	0.1250	2.7	11.849	5.6	5.5
26	00:01:27	91.11578	0.2421	66.1	0.1300	2.8	11.862	5.7	5.6
27	00:01:30	92.0778	0.2471	67.1	0.1350	3.0	11.875	5.8	5.6
28	00:01:34	93.04861	0.2521	68.0	0.1400	3.1	11.889	5.9	5.7
29	00:01:37	94.04142	0.2571	69.0	0.1450	3.2	11.902	6.0	5.8
30	00:01:40	94.88954	0.2621	69.9	0.1500	3.3	11.916	6.1	5.9
31	00:01:44	95.55826	0.2671	70.6	0.1550	3.4	11.929	6.1	5.9
32	00:01:47	96.16489	0.2721	71.2	0.1600	3.5	11.943	6.2	6.0
33	00:01:51	96.67377	0.2771	71.7	0.1650	3.6	11.956	6.2	6.0

Unconfined Compression Test - Specimen 3

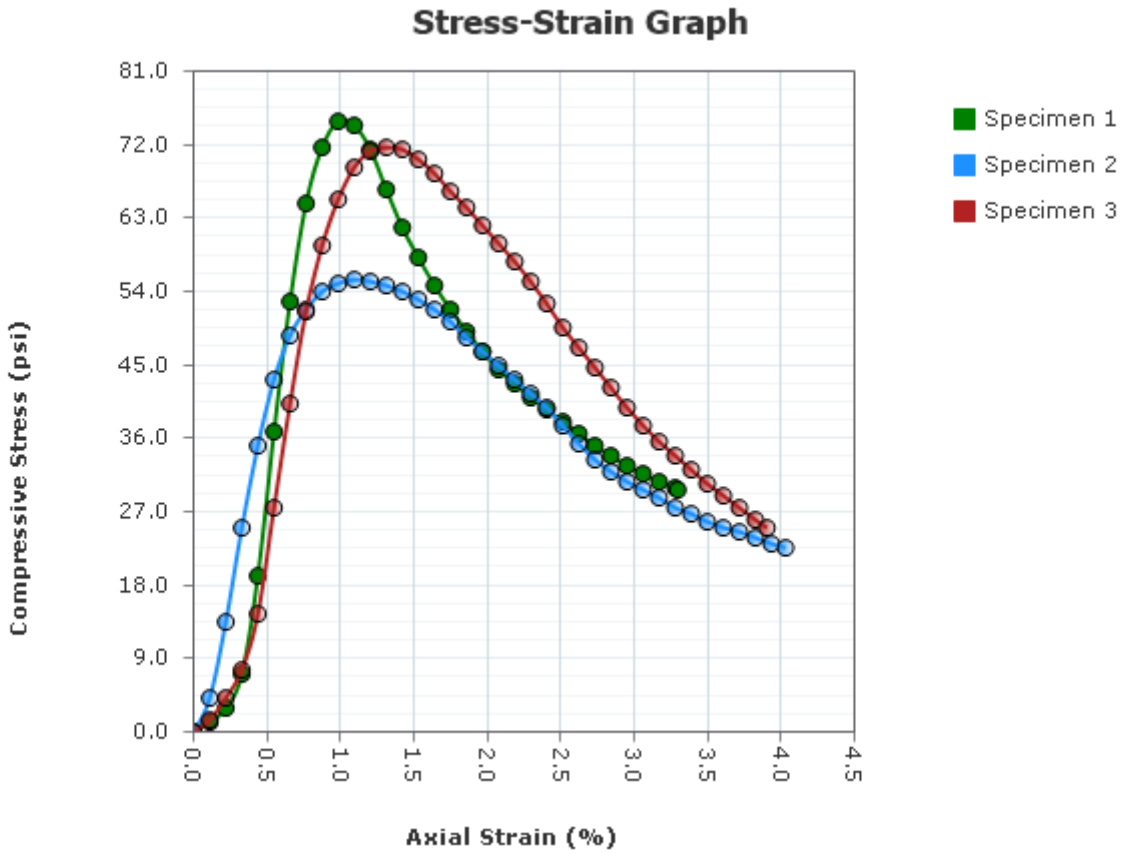
D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:01:54	97.02523	0.2821	72.0	0.1700	3.7	11.970	6.2	6.0
35	00:01:57	97.36008	0.2871	72.4	0.1750	3.8	11.983	6.3	6.0
36	00:02:01	97.54339	0.2921	72.5	0.1800	3.9	11.997	6.3	6.0
37	00:02:04	97.6133	0.2971	72.6	0.1850	4.0	12.011	6.3	6.0
38	00:02:07	97.68026	0.3021	72.7	0.1900	4.2	12.024	6.3	6.0
39	00:02:10	97.56294	0.3071	72.6	0.1950	4.3	12.038	6.3	6.0
40	00:02:14	97.25547	0.3121	72.3	0.2000	4.4	12.052	6.3	6.0
41	00:02:17	97.04967	0.3171	72.0	0.2050	4.5	12.065	6.3	6.0
42	00:02:20	96.80037	0.3221	71.8	0.2100	4.6	12.079	6.2	5.9
43	00:02:23	96.50903	0.3271	71.5	0.2150	4.7	12.093	6.2	5.9
44	00:02:27	96.27293	0.3321	71.3	0.2200	4.8	12.107	6.2	5.9
45	00:02:30	95.98207	0.3371	71.0	0.2250	4.9	12.121	6.2	5.9
46	00:02:33	95.62767	0.3421	70.6	0.2300	5.0	12.135	6.1	5.8
47	00:02:37	95.18919	0.3471	70.2	0.2350	5.1	12.149	6.1	5.8
48	00:02:40	94.80692	0.3521	69.8	0.2400	5.2	12.163	6.1	5.7
49	00:02:43	94.41146	0.3571	69.4	0.2450	5.4	12.177	6.0	5.7
50	00:02:46	93.98521	0.3621	69.0	0.2500	5.5	12.191	6.0	5.7
51	00:02:50	93.52766	0.3671	68.5	0.2550	5.6	12.205	5.9	5.6
52	00:02:53	93.04176	0.3721	68.0	0.2600	5.7	12.219	5.9	5.6
53	00:02:56	92.62772	0.3771	67.6	0.2650	5.8	12.233	5.9	5.5
54	00:03:00	92.16236	0.3821	67.2	0.2700	5.9	12.248	5.8	5.5
55	00:03:03	91.71215	0.3871	66.7	0.2750	6.0	12.262	5.8	5.4
56	00:03:07	91.23994	0.3921	66.2	0.2800	6.1	12.276	5.7	5.4
57	00:03:09	90.94958	0.3951	65.9	0.2830	6.2	12.285	5.7	5.4

2 % LIME CURVE

Unconfined Compression Test

D2166



Project:	Tres Laurels Subdivision
Project Number:	FGS-P-20032
Received Date:	10/19/2022
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	2% Lime

Unconfined Compression Test

D2166

	Specimen Number							
Before Test	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Moisture Content (%):	0.0	0.0	0.0					
Wet Density (pcf)	0.0	0.0	0.0					
Dry Density (pcf)	0.0	0.0	0.0					
Saturation (%):	0.0	0.0	0.0					
Void Ratio:	0.000	0.000	0.000					
Height (in)	4.5763	4.5763	4.5763					
Diameter (in)	3.8307	3.8307	3.8307					
Strain Limit @ 15% (in)	0.7	0.7	0.7					
Height To Diameter Ratio:	1.19	1.19	1.19					
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Failure Angle (°):	0	0	0					
Strain Rate (in/min)	0.09	0.09	0.09					
Strain Rate (%/min):	1.97	1.97	1.97					
Unconfined Compressive Strength (psi)	74.9	55.4	71.8					
Undrained Shear Strength (psi)	37.4	27.7	35.9					
Strain at Failure (%):	1.0	1.1	1.3					

Specific Gravity:	2.72	Plastic Limit:	26	Liquid Limit:	77
Type:	Grab	Soil Classification:	CH		

Project:	Tres Laurels Subdivision
Project Number:	FGS-P-20032
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	2% Lime

Specimen 1 Failure Sketch

Specimen 2 Failure Sketch

Specimen 3 Failure Sketch

Specimen 4 Failure Sketch

Specimen 5 Failure Sketch

Specimen 6 Failure Sketch

Specimen 7 Failure Sketch

Specimen 8 Failure Sketch

Unconfined Compression Test

D2166

LIMS Code: [TO COME FROM LIMS]

Specimen 1

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	2% Lime				

Specimen 2

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	2% Lime				

Specimen 3

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	2% Lime				

Unconfined Compression Test - Specimen 1

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.00458	0.0008	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	39.6411	0.0059	14.6	0.0050	0.1	11.538	1.3	1.3
2	00:00:06	58.93518	0.0108	33.9	0.0100	0.2	11.550	2.9	2.9
3	00:00:10	106.7417	0.0159	81.7	0.0150	0.3	11.563	7.1	7.1
4	00:00:15	247.6618	0.0208	222.7	0.0200	0.4	11.576	19.3	19.2
5	00:00:19	451.5666	0.0259	426.6	0.0250	0.5	11.588	37.0	36.8
6	00:00:24	637.7181	0.0309	612.7	0.0300	0.7	11.601	53.2	52.8
7	00:00:29	776.8422	0.0359	751.8	0.0350	0.8	11.614	65.2	64.7
8	00:00:32	859.1449	0.0408	834.1	0.0400	0.9	11.627	72.4	71.7
9	00:00:36	896.6542	0.0458	871.6	0.0450	1.0	11.639	75.6	74.9
10	00:00:40	892.6087	0.0509	867.6	0.0500	1.1	11.652	75.3	74.5
11	00:00:43	857.8309	0.0558	832.8	0.0550	1.2	11.665	72.3	71.4
12	00:00:47	801.9348	0.0609	776.9	0.0600	1.3	11.678	67.4	66.5
13	00:00:50	749.2107	0.0658	724.2	0.0650	1.4	11.691	62.8	61.9
14	00:00:53	705.8217	0.0708	680.8	0.0700	1.5	11.704	59.1	58.2
15	00:00:56	666.6709	0.0759	641.7	0.0750	1.6	11.717	55.7	54.8
16	00:00:59	632.1527	0.0809	607.1	0.0800	1.7	11.730	52.7	51.8
17	00:01:03	602.1318	0.0858	577.1	0.0850	1.9	11.743	50.1	49.1
18	00:01:06	574.2436	0.0908	549.2	0.0900	2.0	11.756	47.7	46.7
19	00:01:10	548.062	0.0958	523.1	0.0950	2.1	11.769	45.4	44.4
20	00:01:13	526.9249	0.1009	501.9	0.1000	2.2	11.782	43.6	42.6
21	00:01:17	509.3569	0.1058	484.4	0.1050	2.3	11.796	42.0	41.1
22	00:01:20	491.6315	0.1108	466.6	0.1100	2.4	11.809	40.5	39.5
23	00:01:23	473.9501	0.1159	448.9	0.1150	2.5	11.822	39.0	38.0
24	00:01:26	456.8376	0.1208	431.8	0.1200	2.6	11.835	37.5	36.5
25	00:01:29	441.0001	0.1258	416.0	0.1250	2.7	11.849	36.1	35.1
26	00:01:32	425.7354	0.1308	400.7	0.1300	2.8	11.862	34.8	33.8
27	00:01:35	412.1826	0.1359	387.2	0.1350	3.0	11.875	33.6	32.6
28	00:01:38	400.3828	0.1408	375.4	0.1400	3.1	11.889	32.6	31.6
29	00:01:41	390.2479	0.1459	365.2	0.1450	3.2	11.902	31.7	30.7
30	00:01:45	381.4402	0.1509	356.4	0.1500	3.3	11.916	30.9	29.9
31	00:01:45	379.9331	0.1517	354.9	0.1509	3.3	11.918	30.8	29.8

Unconfined Compression Test - Specimen 2

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.05493	0.0345	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	73.75746	0.0396	48.7	0.0050	0.1	11.538	4.2	4.2
2	00:00:08	180.8139	0.0445	155.8	0.0100	0.2	11.550	13.5	13.5
3	00:00:13	314.5942	0.0495	289.5	0.0150	0.3	11.563	25.1	25.0
4	00:00:17	432.25	0.0545	407.2	0.0200	0.4	11.576	35.3	35.2
5	00:00:21	524.3337	0.0595	499.3	0.0250	0.5	11.588	43.3	43.1
6	00:00:24	588.6519	0.0645	563.6	0.0300	0.7	11.601	48.9	48.6
7	00:00:28	627.1711	0.0695	602.1	0.0350	0.8	11.614	52.2	51.8
8	00:00:31	651.9929	0.0746	626.9	0.0400	0.9	11.627	54.4	53.9
9	00:00:35	665.5222	0.0795	640.5	0.0450	1.0	11.639	55.6	55.0
10	00:00:38	671.1495	0.0845	646.1	0.0500	1.1	11.652	56.1	55.4
11	00:00:42	669.994	0.0896	644.9	0.0550	1.2	11.665	56.0	55.3
12	00:00:45	665.6292	0.0946	640.6	0.0600	1.3	11.678	55.6	54.9
13	00:00:48	657.106	0.0996	632.1	0.0650	1.4	11.691	54.8	54.1
14	00:00:52	646.3459	0.1045	621.3	0.0700	1.5	11.704	53.9	53.1
15	00:00:55	632.0652	0.1096	607.0	0.0750	1.6	11.717	52.7	51.8
16	00:00:59	614.3872	0.1146	589.3	0.0800	1.7	11.730	51.1	50.2
17	00:01:02	594.2191	0.1196	569.2	0.0850	1.9	11.743	49.4	48.5
18	00:01:05	574.5931	0.1246	549.5	0.0900	2.0	11.756	47.7	46.7
19	00:01:08	554.2344	0.1295	529.2	0.0950	2.1	11.769	45.9	45.0
20	00:01:12	534.2882	0.1345	509.2	0.1000	2.2	11.782	44.2	43.2
21	00:01:15	515.1735	0.1396	490.1	0.1050	2.3	11.796	42.5	41.6
22	00:01:18	495.0733	0.1446	470.0	0.1100	2.4	11.809	40.8	39.8
23	00:01:21	470.4119	0.1496	445.4	0.1150	2.5	11.822	38.6	37.7
24	00:01:24	443.7336	0.1546	418.7	0.1200	2.6	11.835	36.3	35.4
25	00:01:27	421.5911	0.1596	396.5	0.1250	2.7	11.849	34.4	33.5
26	00:01:30	404.4836	0.1646	379.4	0.1300	2.8	11.862	32.9	32.0
27	00:01:33	389.5967	0.1695	364.5	0.1350	3.0	11.875	31.6	30.7
28	00:01:36	377.4626	0.1745	352.4	0.1400	3.1	11.889	30.6	29.6
29	00:01:39	366.0464	0.1795	341.0	0.1450	3.2	11.902	29.6	28.6
30	00:01:42	353.812	0.1845	328.8	0.1500	3.3	11.916	28.5	27.6
31	00:01:46	343.3731	0.1896	318.3	0.1550	3.4	11.929	27.6	26.7
32	00:01:49	334.1323	0.1945	309.1	0.1600	3.5	11.942	26.8	25.9
33	00:01:52	325.6031	0.1995	300.5	0.1650	3.6	11.956	26.1	25.1

Project Name: Tres Laurels Subdivision Project Number: FGS-P-20032

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 2

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:01:55	317.5194	0.2046	292.5	0.1700	3.7	11.970	25.4	24.4
35	00:01:59	309.4645	0.2096	284.4	0.1750	3.8	11.983	24.7	23.7
36	00:02:02	302.3471	0.2145	277.3	0.1800	3.9	11.997	24.1	23.1
37	00:02:04	296.2734	0.2190	271.2	0.1844	4.0	12.009	23.5	22.6

Unconfined Compression Test - Specimen 3

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.04858	0.0239	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	42.46996	0.0289	17.4	0.0050	0.1	11.538	1.5	1.5
2	00:00:07	71.86373	0.0339	46.8	0.0100	0.2	11.550	4.1	4.1
3	00:00:10	111.9458	0.0389	86.9	0.0150	0.3	11.563	7.5	7.5
4	00:00:15	192.8743	0.0439	167.8	0.0200	0.4	11.576	14.6	14.5
5	00:00:21	343.4792	0.0489	318.4	0.0250	0.5	11.588	27.6	27.5
6	00:00:25	491.4203	0.0539	466.4	0.0300	0.7	11.601	40.5	40.2
7	00:00:30	623.9262	0.0590	598.9	0.0350	0.8	11.614	52.0	51.6
8	00:00:33	717.2941	0.0639	692.2	0.0400	0.9	11.627	60.1	59.5
9	00:00:37	785.5977	0.0689	760.5	0.0450	1.0	11.639	66.0	65.3
10	00:00:41	830.7625	0.0739	805.7	0.0500	1.1	11.652	69.9	69.1
11	00:00:44	855.2851	0.0789	830.2	0.0550	1.2	11.665	72.0	71.2
12	00:00:47	863.4021	0.0839	838.4	0.0600	1.3	11.678	72.7	71.8
13	00:00:51	859.5931	0.0889	834.5	0.0650	1.4	11.691	72.4	71.4
14	00:00:54	846.648	0.0939	821.6	0.0700	1.5	11.704	71.3	70.2
15	00:00:58	826.407	0.0989	801.4	0.0750	1.6	11.717	69.5	68.4
16	00:01:01	803.6252	0.1039	778.6	0.0800	1.7	11.730	67.6	66.4
17	00:01:04	779.0161	0.1090	754.0	0.0850	1.9	11.743	65.4	64.2
18	00:01:07	755.083	0.1139	730.0	0.0900	2.0	11.756	63.3	62.1
19	00:01:10	730.0759	0.1190	705.0	0.0950	2.1	11.769	61.2	59.9
20	00:01:13	705.2615	0.1239	680.2	0.1000	2.2	11.782	59.0	57.7
21	00:01:17	676.6186	0.1290	651.6	0.1050	2.3	11.796	56.5	55.2
22	00:01:20	644.7596	0.1339	619.7	0.1100	2.4	11.809	53.8	52.5
23	00:01:23	612.3659	0.1389	587.3	0.1150	2.5	11.822	51.0	49.7
24	00:01:26	582.937	0.1439	557.9	0.1200	2.6	11.835	48.4	47.1
25	00:01:30	553.5031	0.1490	528.5	0.1250	2.7	11.849	45.9	44.6
26	00:01:33	525.6667	0.1539	500.6	0.1300	2.8	11.862	43.4	42.2
27	00:01:36	498.2742	0.1589	473.2	0.1350	3.0	11.875	41.1	39.8
28	00:01:39	472.8346	0.1640	447.8	0.1400	3.1	11.889	38.9	37.7
29	00:01:43	449.446	0.1690	424.4	0.1450	3.2	11.902	36.8	35.7
30	00:01:46	427.8833	0.1739	402.8	0.1500	3.3	11.916	35.0	33.8
31	00:01:49	408.093	0.1789	383.0	0.1550	3.4	11.929	33.2	32.1
32	00:01:52	389.0424	0.1840	364.0	0.1600	3.5	11.943	31.6	30.5
33	00:01:55	370.4107	0.1890	345.4	0.1650	3.6	11.956	30.0	28.9

Unconfined Compression Test - Specimen 3

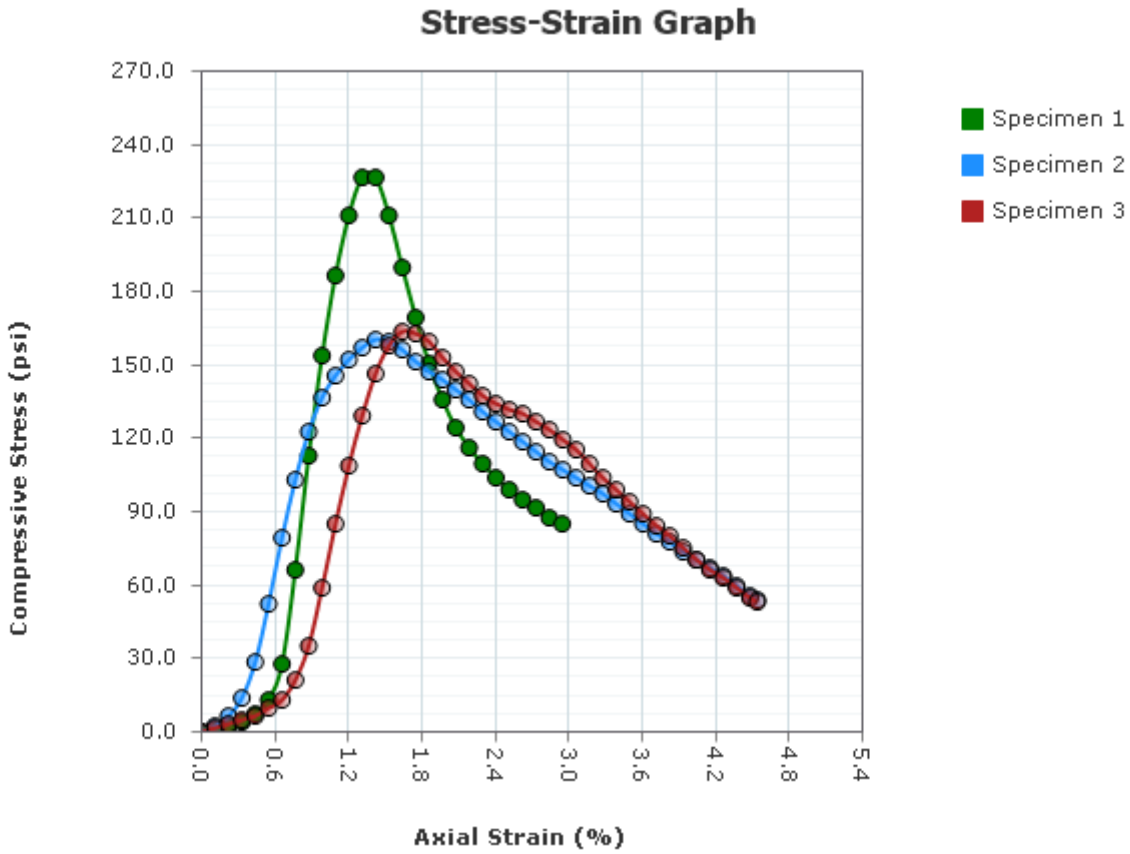
D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:01:58	352.939	0.1940	327.9	0.1700	3.7	11.970	28.5	27.4
35	00:02:01	337.0075	0.1989	312.0	0.1750	3.8	11.983	27.1	26.0
36	00:02:03	325.6384	0.2025	300.6	0.1786	3.9	11.993	26.1	25.1

4 % LIME CURVE

Unconfined Compression Test

D2166



Project:	Tres Laurels Subdivision
Project Number:	FGS-P-20032
Received Date:	10/19/2022
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Lurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	4% Lime

Unconfined Compression Test

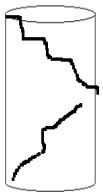
D2166

Before Test	Specimen Number 1	2	3	4	5	6	7	8
Moisture Content (%):	0.0	0.0	0.0					
Wet Density (pcf)	0.0	0.0	0.0					
Dry Density (pcf)	0.0	0.0	0.0					
Saturation (%):	0.0	0.0	0.0					
Void Ratio:	0.000	0.000	0.000					
Height (in)	4.5763	4.5763	4.5763					
Diameter (in)	3.8307	3.8307	3.8307					
Strain Limit @ 15% (in)	0.7	0.7	0.7					
Height To Diameter Ratio:	1.19	1.19	1.19					
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Failure Angle (°):	0	0	0					
Strain Rate (in/min)	0.09	0.09	0.09					
Strain Rate (%/min):	1.97	1.97	1.97					
Unconfined Compressive Strength (psi)	226.7	159.9	163.7					
Undrained Shear Strength (psi)	113.3	79.9	81.9					
Strain at Failure (%):	1.4	1.5	1.6					

Specific Gravity:	2.72	Plastic Limit:	26	Liquid Limit:	77
Type:		Soil Classification:	CH		

Project:	Tres Laurels Subdivision
Project Number:	FGS-P-20032
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Lurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	4% Lime

Specimen 1 Failure Sketch



Specimen 2 Failure Sketch

Specimen 3 Failure Sketch

Specimen 4 Failure Sketch

Specimen 5 Failure Sketch

Specimen 6 Failure Sketch

Specimen 7 Failure Sketch

Specimen 8 Failure Sketch

Unconfined Compression Test

D2166

LIMS Code: [TO COME FROM LIMS]

Specimen 1

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	4% Lime				

Specimen 2

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	4% Lime				

Specimen 3

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	4% Lime				

Unconfined Compression Test - Specimen 1

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.0256	0.0277	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	38.54319	0.0327	13.5	0.0050	0.1	11.538	1.2	1.2
2	00:00:06	49.84052	0.0377	24.8	0.0100	0.2	11.550	2.2	2.1
3	00:00:10	73.82883	0.0427	48.8	0.0150	0.3	11.563	4.2	4.2
4	00:00:14	109.9171	0.0477	84.9	0.0200	0.4	11.576	7.4	7.3
5	00:00:18	177.8697	0.0527	152.8	0.0250	0.5	11.588	13.3	13.2
6	00:00:23	349.3822	0.0577	324.4	0.0300	0.7	11.601	28.1	28.0
7	00:00:30	798.8948	0.0627	773.9	0.0350	0.8	11.614	67.1	66.6
8	00:00:37	1338.997	0.0677	1,314.0	0.0400	0.9	11.627	114.0	113.0
9	00:00:42	1818.424	0.0727	1,793.4	0.0450	1.0	11.639	155.6	154.1
10	00:00:47	2201.366	0.0777	2,176.3	0.0500	1.1	11.652	188.8	186.8
11	00:00:52	2491.631	0.0827	2,466.6	0.0550	1.2	11.665	214.0	211.5
12	00:00:56	2670.252	0.0877	2,645.2	0.0600	1.3	11.678	229.5	226.5
13	00:01:00	2675.345	0.0927	2,650.3	0.0650	1.4	11.691	230.0	226.7
14	00:01:03	2492.896	0.0977	2,467.9	0.0700	1.5	11.704	214.1	210.9
15	00:01:06	2250.788	0.1027	2,225.8	0.0750	1.6	11.717	193.1	190.0
16	00:01:09	2008.693	0.1077	1,983.7	0.0800	1.7	11.730	172.1	169.1
17	00:01:12	1788.843	0.1127	1,763.8	0.0850	1.9	11.743	153.0	150.2
18	00:01:15	1621.852	0.1177	1,596.8	0.0900	2.0	11.756	138.6	135.8
19	00:01:18	1492.684	0.1227	1,467.7	0.0950	2.1	11.769	127.3	124.7
20	00:01:21	1395.436	0.1277	1,370.4	0.1000	2.2	11.782	118.9	116.3
21	00:01:24	1316.705	0.1327	1,291.7	0.1050	2.3	11.796	112.1	109.5
22	00:01:27	1250.3	0.1377	1,225.3	0.1100	2.4	11.809	106.3	103.8
23	00:01:30	1196.217	0.1427	1,171.2	0.1150	2.5	11.822	101.6	99.1
24	00:01:33	1152.586	0.1477	1,127.6	0.1200	2.6	11.835	97.8	95.3
25	00:01:36	1110.133	0.1527	1,085.1	0.1250	2.7	11.849	94.2	91.6
26	00:01:40	1067.046	0.1577	1,042.0	0.1300	2.8	11.862	90.4	87.8
27	00:01:42	1030.889	0.1625	1,005.9	0.1348	2.9	11.875	87.3	84.7

Unconfined Compression Test - Specimen 2

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.10479	0.0255	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	55.00402	0.0305	29.9	0.0050	0.1	11.538	2.6	2.6
2	00:00:08	100.2305	0.0355	75.1	0.0100	0.2	11.550	6.5	6.5
3	00:00:12	187.1062	0.0405	162.0	0.0150	0.3	11.563	14.1	14.0
4	00:00:16	356.2454	0.0455	331.1	0.0200	0.4	11.576	28.7	28.6
5	00:00:22	635.9485	0.0505	610.8	0.0250	0.5	11.588	53.0	52.7
6	00:00:27	949.1804	0.0555	924.1	0.0300	0.7	11.601	80.2	79.7
7	00:00:31	1226.328	0.0605	1,201.2	0.0350	0.8	11.614	104.2	103.4
8	00:00:35	1456.064	0.0655	1,431.0	0.0400	0.9	11.627	124.2	123.1
9	00:00:39	1619.358	0.0705	1,594.3	0.0450	1.0	11.639	138.3	137.0
10	00:00:43	1722.11	0.0755	1,697.0	0.0500	1.1	11.652	147.2	145.6
11	00:00:47	1802.738	0.0805	1,777.6	0.0550	1.2	11.665	154.2	152.4
12	00:00:51	1863.539	0.0855	1,838.4	0.0600	1.3	11.678	159.5	157.4
13	00:00:55	1895.714	0.0905	1,870.6	0.0650	1.4	11.691	162.3	160.0
14	00:00:58	1896.233	0.0955	1,871.1	0.0700	1.5	11.704	162.4	159.9
15	00:01:02	1853.849	0.1006	1,828.7	0.0750	1.6	11.717	158.7	156.1
16	00:01:05	1799.047	0.1055	1,773.9	0.0800	1.7	11.730	153.9	151.2
17	00:01:09	1755.174	0.1105	1,730.1	0.0850	1.9	11.743	150.1	147.3
18	00:01:12	1715.153	0.1156	1,690.0	0.0900	2.0	11.756	146.6	143.8
19	00:01:15	1674.201	0.1205	1,649.1	0.0950	2.1	11.769	143.1	140.1
20	00:01:19	1627.388	0.1255	1,602.3	0.1000	2.2	11.782	139.0	136.0
21	00:01:22	1571.271	0.1305	1,546.2	0.1050	2.3	11.796	134.2	131.1
22	00:01:25	1520.954	0.1356	1,495.8	0.1100	2.4	11.809	129.8	126.7
23	00:01:28	1472.146	0.1405	1,447.0	0.1150	2.5	11.822	125.6	122.4
24	00:01:31	1427.156	0.1456	1,402.1	0.1200	2.6	11.835	121.7	118.5
25	00:01:34	1381.899	0.1506	1,356.8	0.1250	2.7	11.849	117.7	114.5
26	00:01:37	1338.051	0.1555	1,312.9	0.1300	2.8	11.862	113.9	110.7
27	00:01:40	1300.549	0.1605	1,275.4	0.1350	3.0	11.875	110.7	107.4
28	00:01:43	1259.901	0.1655	1,234.8	0.1400	3.1	11.889	107.1	103.9
29	00:01:46	1222.588	0.1705	1,197.5	0.1450	3.2	11.902	103.9	100.6
30	00:01:48	1186.825	0.1755	1,161.7	0.1500	3.3	11.916	100.8	97.5
31	00:01:51	1141.284	0.1805	1,116.2	0.1550	3.4	11.929	96.8	93.6
32	00:01:54	1092.569	0.1855	1,067.5	0.1600	3.5	11.943	92.6	89.4
33	00:01:57	1042.995	0.1905	1,017.9	0.1650	3.6	11.956	88.3	85.1

Project Name: Tres Laurels Subdivision Project Number: FGS-P-20032

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 2

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:02:00	996.7518	0.1956	971.6	0.1700	3.7	11.970	84.3	81.2
35	00:02:03	951.9281	0.2005	926.8	0.1750	3.8	11.983	80.4	77.3
36	00:02:06	912.002	0.2055	886.9	0.1800	3.9	11.997	77.0	73.9
37	00:02:09	873.2222	0.2105	848.1	0.1850	4.0	12.010	73.6	70.6
38	00:02:12	833.2047	0.2155	808.1	0.1900	4.2	12.024	70.1	67.2
39	00:02:15	792.8915	0.2206	767.8	0.1950	4.3	12.038	66.6	63.8
40	00:02:18	747.554	0.2255	722.4	0.2000	4.4	12.052	62.7	59.9
41	00:02:21	698.7327	0.2306	673.6	0.2050	4.5	12.065	58.4	55.8
42	00:02:23	672.4899	0.2333	647.4	0.2078	4.5	12.073	56.2	53.6

Unconfined Compression Test - Specimen 3

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.0041	0.0126	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	41.11297	0.0176	16.1	0.0050	0.1	11.538	1.4	1.4
2	00:00:06	59.85956	0.0226	34.9	0.0100	0.2	11.550	3.0	3.0
3	00:00:10	81.53962	0.0276	56.5	0.0150	0.3	11.563	4.9	4.9
4	00:00:13	105.4375	0.0326	80.4	0.0200	0.4	11.576	7.0	6.9
5	00:00:17	134.5644	0.0376	109.6	0.0250	0.5	11.588	9.5	9.5
6	00:00:20	180.1198	0.0426	155.1	0.0300	0.7	11.601	13.5	13.4
7	00:00:25	274.6305	0.0476	249.6	0.0350	0.8	11.614	21.7	21.5
8	00:00:30	434.0338	0.0526	409.0	0.0400	0.9	11.627	35.5	35.2
9	00:00:35	706.5276	0.0576	681.5	0.0450	1.0	11.639	59.1	58.6
10	00:00:40	1014.202	0.0626	989.2	0.0500	1.1	11.652	85.8	84.9
11	00:00:44	1295.406	0.0676	1,270.4	0.0550	1.2	11.665	110.2	108.9
12	00:00:48	1535.376	0.0726	1,510.4	0.0600	1.3	11.678	131.1	129.3
13	00:00:52	1733.77	0.0776	1,708.8	0.0650	1.4	11.691	148.3	146.2
14	00:00:56	1869.054	0.0826	1,844.1	0.0700	1.5	11.704	160.0	157.6
15	00:01:00	1943.121	0.0876	1,918.1	0.0750	1.6	11.717	166.4	163.7
16	00:01:03	1936.54	0.0926	1,911.5	0.0800	1.7	11.730	165.9	163.0
17	00:01:06	1894.707	0.0976	1,869.7	0.0850	1.9	11.743	162.2	159.2
18	00:01:09	1822.571	0.1026	1,797.6	0.0900	2.0	11.756	156.0	152.9
19	00:01:12	1755.602	0.1076	1,730.6	0.0950	2.1	11.769	150.2	147.0
20	00:01:15	1697.741	0.1126	1,672.7	0.1000	2.2	11.782	145.1	142.0
21	00:01:18	1646.116	0.1176	1,621.1	0.1050	2.3	11.796	140.7	137.4
22	00:01:22	1608.535	0.1226	1,583.5	0.1100	2.4	11.809	137.4	134.1
23	00:01:25	1582.829	0.1276	1,557.8	0.1150	2.5	11.822	135.2	131.8
24	00:01:28	1560.355	0.1326	1,535.4	0.1200	2.6	11.835	133.2	129.7
25	00:01:32	1529.134	0.1376	1,504.1	0.1250	2.7	11.849	130.5	126.9
26	00:01:35	1488.317	0.1426	1,463.3	0.1300	2.8	11.862	127.0	123.4
27	00:01:38	1445.673	0.1476	1,420.7	0.1350	3.0	11.875	123.3	119.6
28	00:01:41	1395.171	0.1526	1,370.2	0.1400	3.1	11.889	118.9	115.2
29	00:01:45	1333.89	0.1576	1,308.9	0.1450	3.2	11.902	113.6	110.0
30	00:01:48	1267.339	0.1626	1,242.3	0.1500	3.3	11.916	107.8	104.3
31	00:01:51	1205.803	0.1676	1,180.8	0.1550	3.4	11.929	102.5	99.0
32	00:01:54	1147.806	0.1726	1,122.8	0.1600	3.5	11.943	97.4	94.0
33	00:01:58	1089.872	0.1776	1,064.9	0.1650	3.6	11.956	92.4	89.1

Project Name: Tres Laurels Subdivision Project Number: FGS-P-20032

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 3

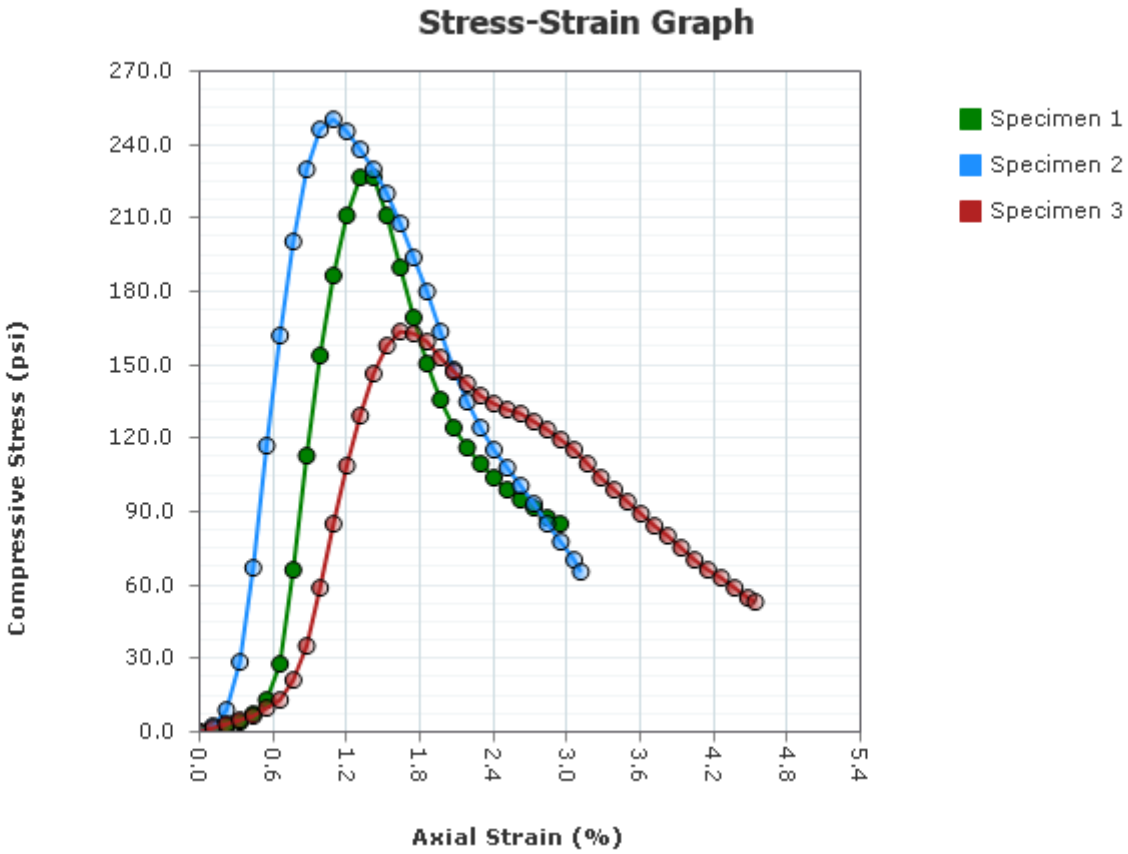
D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:02:01	1035.248	0.1826	1,010.2	0.1700	3.7	11.970	87.7	84.4
35	00:02:04	981.2324	0.1876	956.2	0.1750	3.8	11.983	83.0	79.8
36	00:02:07	927.1176	0.1926	902.1	0.1800	3.9	11.997	78.3	75.2
37	00:02:10	874.8759	0.1976	849.9	0.1850	4.0	12.011	73.7	70.8
38	00:02:13	825.4622	0.2026	800.5	0.1900	4.2	12.024	69.5	66.6
39	00:02:16	779.8153	0.2076	754.8	0.1950	4.3	12.038	65.5	62.7
40	00:02:19	734.9026	0.2126	709.9	0.2000	4.4	12.052	61.6	58.9
41	00:02:22	689.224	0.2176	664.2	0.2050	4.5	12.065	57.6	55.1
42	00:02:24	666.4597	0.2203	641.5	0.2077	4.5	12.073	55.7	53.1

6 % LIME CURVE

Unconfined Compression Test

D2166



Project:	Tres Laurels Subdivision
Project Number:	FGS-P-20032
Received Date:	10/19/2022
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	6% Lime

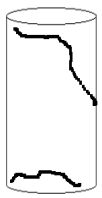
Unconfined Compression Test

D2166

	Specimen Number							
Before Test	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Moisture Content (%):	0.0	0.0	0.0					
Wet Density (pcf)	0.0	0.0	0.0					
Dry Density (pcf)	0.0	0.0	0.0					
Saturation (%):	0.0	0.0	0.0					
Void Ratio:	0.000	0.000	0.000					
Height (in)	4.5763	4.5763	4.5763					
Diameter (in)	3.8307	3.8307	3.8307					
Strain Limit @ 15% (in)	0.7	0.7	0.7					
Height To Diameter Ratio:	1.19	1.19	1.19					
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Failure Angle (°):	0	0	0					
Strain Rate (in/min)	0.09	0.09	0.09					
Strain Rate (%/min):	1.97	1.97	1.97					
Unconfined Compressive Strength (psi)	226.7	250.0	163.7					
Undrained Shear Strength (psi)	113.3	125.0	81.9					
Strain at Failure (%):	1.4	1.1	1.6					

Specific Gravity:	2.72	Plastic Limit:	26	Liquid Limit:	77
Type:	Grab	Soil Classification:	CH		

Project:	Tres Laurels Subdivision
Project Number:	FGS-P-20032
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	6% Lime

Specimen 1 Failure Sketch	Specimen 2 Failure Sketch	Specimen 3 Failure Sketch	Specimen 4 Failure Sketch	Specimen 5 Failure Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch
							

Unconfined Compression Test

D2166

LIMS Code: [TO COME FROM LIMS]

Specimen 1

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	6% Lime				

Specimen 2

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	6% Lime				

Specimen 3

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	6% Lime				

Unconfined Compression Test - Specimen 1

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.0256	0.0277	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	38.54319	0.0327	13.5	0.0050	0.1	11.538	1.2	1.2
2	00:00:06	49.84052	0.0377	24.8	0.0100	0.2	11.550	2.2	2.1
3	00:00:10	73.82883	0.0427	48.8	0.0150	0.3	11.563	4.2	4.2
4	00:00:14	109.9171	0.0477	84.9	0.0200	0.4	11.576	7.4	7.3
5	00:00:18	177.8697	0.0527	152.8	0.0250	0.5	11.588	13.3	13.2
6	00:00:23	349.3822	0.0577	324.4	0.0300	0.7	11.601	28.1	28.0
7	00:00:30	798.8948	0.0627	773.9	0.0350	0.8	11.614	67.1	66.6
8	00:00:37	1338.997	0.0677	1,314.0	0.0400	0.9	11.627	114.0	113.0
9	00:00:42	1818.424	0.0727	1,793.4	0.0450	1.0	11.639	155.6	154.1
10	00:00:47	2201.366	0.0777	2,176.3	0.0500	1.1	11.652	188.8	186.8
11	00:00:52	2491.631	0.0827	2,466.6	0.0550	1.2	11.665	214.0	211.5
12	00:00:56	2670.252	0.0877	2,645.2	0.0600	1.3	11.678	229.5	226.5
13	00:01:00	2675.345	0.0927	2,650.3	0.0650	1.4	11.691	230.0	226.7
14	00:01:03	2492.896	0.0977	2,467.9	0.0700	1.5	11.704	214.1	210.9
15	00:01:06	2250.788	0.1027	2,225.8	0.0750	1.6	11.717	193.1	190.0
16	00:01:09	2008.693	0.1077	1,983.7	0.0800	1.7	11.730	172.1	169.1
17	00:01:12	1788.843	0.1127	1,763.8	0.0850	1.9	11.743	153.0	150.2
18	00:01:15	1621.852	0.1177	1,596.8	0.0900	2.0	11.756	138.6	135.8
19	00:01:18	1492.684	0.1227	1,467.7	0.0950	2.1	11.769	127.3	124.7
20	00:01:21	1395.436	0.1277	1,370.4	0.1000	2.2	11.782	118.9	116.3
21	00:01:24	1316.705	0.1327	1,291.7	0.1050	2.3	11.796	112.1	109.5
22	00:01:27	1250.3	0.1377	1,225.3	0.1100	2.4	11.809	106.3	103.8
23	00:01:30	1196.217	0.1427	1,171.2	0.1150	2.5	11.822	101.6	99.1
24	00:01:33	1152.586	0.1477	1,127.6	0.1200	2.6	11.835	97.8	95.3
25	00:01:36	1110.133	0.1527	1,085.1	0.1250	2.7	11.849	94.2	91.6
26	00:01:40	1067.046	0.1577	1,042.0	0.1300	2.8	11.862	90.4	87.8
27	00:01:42	1030.889	0.1625	1,005.9	0.1348	2.9	11.875	87.3	84.7

Unconfined Compression Test - Specimen 2

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.03685	0.0283	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	54.54061	0.0333	29.5	0.0050	0.1	11.538	2.6	2.6
2	00:00:07	132.4267	0.0383	107.4	0.0100	0.2	11.550	9.3	9.3
3	00:00:13	357.5061	0.0433	332.5	0.0150	0.3	11.563	28.8	28.8
4	00:00:19	797.4752	0.0483	772.4	0.0200	0.4	11.576	67.0	66.7
5	00:00:25	1381.984	0.0533	1,356.9	0.0250	0.5	11.588	117.7	117.1
6	00:00:30	1899.881	0.0583	1,874.8	0.0300	0.7	11.601	162.7	161.6
7	00:00:35	2348.93	0.0633	2,323.9	0.0350	0.8	11.614	201.6	200.1
8	00:00:39	2694.961	0.0683	2,669.9	0.0400	0.9	11.627	231.7	229.6
9	00:00:44	2893.245	0.0733	2,868.2	0.0450	1.0	11.639	248.9	246.4
10	00:00:47	2938.298	0.0783	2,913.3	0.0500	1.1	11.652	252.8	250.0
11	00:00:51	2890.936	0.0833	2,865.9	0.0550	1.2	11.665	248.7	245.7
12	00:00:54	2808.938	0.0883	2,783.9	0.0600	1.3	11.678	241.6	238.4
13	00:00:57	2713.959	0.0933	2,688.9	0.0650	1.4	11.691	233.3	230.0
14	00:01:01	2596.605	0.0983	2,571.6	0.0700	1.5	11.704	223.1	219.7
15	00:01:04	2457.561	0.1033	2,432.5	0.0750	1.6	11.717	211.1	207.6
16	00:01:07	2302.312	0.1083	2,277.3	0.0800	1.7	11.730	197.6	194.1
17	00:01:10	2138.877	0.1133	2,113.8	0.0850	1.9	11.743	183.4	180.0
18	00:01:14	1952.672	0.1183	1,927.6	0.0900	2.0	11.756	167.3	164.0
19	00:01:17	1771.303	0.1233	1,746.3	0.0950	2.1	11.769	151.5	148.4
20	00:01:19	1619.142	0.1283	1,594.1	0.1000	2.2	11.782	138.3	135.3
21	00:01:22	1491.734	0.1333	1,466.7	0.1050	2.3	11.796	127.3	124.3
22	00:01:26	1389.346	0.1383	1,364.3	0.1100	2.4	11.809	118.4	115.5
23	00:01:28	1304.44	0.1433	1,279.4	0.1150	2.5	11.822	111.0	108.2
24	00:01:31	1217.885	0.1483	1,192.8	0.1200	2.6	11.835	103.5	100.8
25	00:01:33	1130.508	0.1533	1,105.5	0.1250	2.7	11.849	95.9	93.3
26	00:01:36	1035.937	0.1583	1,010.9	0.1300	2.8	11.862	87.7	85.2
27	00:01:39	949.9493	0.1633	924.9	0.1350	3.0	11.875	80.3	77.9
28	00:01:42	861.962	0.1683	836.9	0.1400	3.1	11.889	72.6	70.4
29	00:01:43	806.0429	0.1707	781.0	0.1425	3.1	11.895	67.8	65.7

Unconfined Compression Test - Specimen 3

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.0041	0.0126	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	41.11297	0.0176	16.1	0.0050	0.1	11.538	1.4	1.4
2	00:00:06	59.85956	0.0226	34.9	0.0100	0.2	11.550	3.0	3.0
3	00:00:10	81.53962	0.0276	56.5	0.0150	0.3	11.563	4.9	4.9
4	00:00:13	105.4375	0.0326	80.4	0.0200	0.4	11.576	7.0	6.9
5	00:00:17	134.5644	0.0376	109.6	0.0250	0.5	11.588	9.5	9.5
6	00:00:20	180.1198	0.0426	155.1	0.0300	0.7	11.601	13.5	13.4
7	00:00:25	274.6305	0.0476	249.6	0.0350	0.8	11.614	21.7	21.5
8	00:00:30	434.0338	0.0526	409.0	0.0400	0.9	11.627	35.5	35.2
9	00:00:35	706.5276	0.0576	681.5	0.0450	1.0	11.639	59.1	58.6
10	00:00:40	1014.202	0.0626	989.2	0.0500	1.1	11.652	85.8	84.9
11	00:00:44	1295.406	0.0676	1,270.4	0.0550	1.2	11.665	110.2	108.9
12	00:00:48	1535.376	0.0726	1,510.4	0.0600	1.3	11.678	131.1	129.3
13	00:00:52	1733.77	0.0776	1,708.8	0.0650	1.4	11.691	148.3	146.2
14	00:00:56	1869.054	0.0826	1,844.1	0.0700	1.5	11.704	160.0	157.6
15	00:01:00	1943.121	0.0876	1,918.1	0.0750	1.6	11.717	166.4	163.7
16	00:01:03	1936.54	0.0926	1,911.5	0.0800	1.7	11.730	165.9	163.0
17	00:01:06	1894.707	0.0976	1,869.7	0.0850	1.9	11.743	162.2	159.2
18	00:01:09	1822.571	0.1026	1,797.6	0.0900	2.0	11.756	156.0	152.9
19	00:01:12	1755.602	0.1076	1,730.6	0.0950	2.1	11.769	150.2	147.0
20	00:01:15	1697.741	0.1126	1,672.7	0.1000	2.2	11.782	145.1	142.0
21	00:01:18	1646.116	0.1176	1,621.1	0.1050	2.3	11.796	140.7	137.4
22	00:01:22	1608.535	0.1226	1,583.5	0.1100	2.4	11.809	137.4	134.1
23	00:01:25	1582.829	0.1276	1,557.8	0.1150	2.5	11.822	135.2	131.8
24	00:01:28	1560.355	0.1326	1,535.4	0.1200	2.6	11.835	133.2	129.7
25	00:01:32	1529.134	0.1376	1,504.1	0.1250	2.7	11.849	130.5	126.9
26	00:01:35	1488.317	0.1426	1,463.3	0.1300	2.8	11.862	127.0	123.4
27	00:01:38	1445.673	0.1476	1,420.7	0.1350	3.0	11.875	123.3	119.6
28	00:01:41	1395.171	0.1526	1,370.2	0.1400	3.1	11.889	118.9	115.2
29	00:01:45	1333.89	0.1576	1,308.9	0.1450	3.2	11.902	113.6	110.0
30	00:01:48	1267.339	0.1626	1,242.3	0.1500	3.3	11.916	107.8	104.3
31	00:01:51	1205.803	0.1676	1,180.8	0.1550	3.4	11.929	102.5	99.0
32	00:01:54	1147.806	0.1726	1,122.8	0.1600	3.5	11.943	97.4	94.0
33	00:01:58	1089.872	0.1776	1,064.9	0.1650	3.6	11.956	92.4	89.1

Project Name: Tres Laurels Subdivision Project Number: FGS-P-20032

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 3

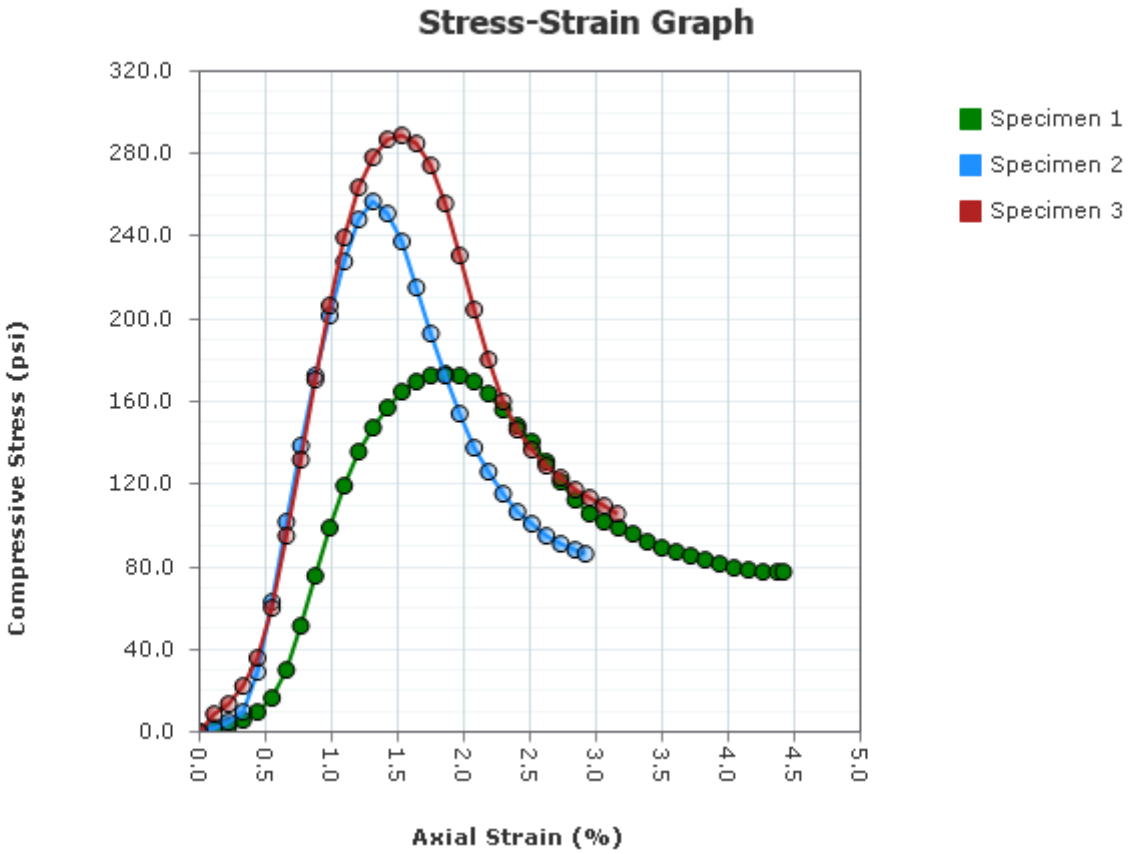
D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:02:01	1035.248	0.1826	1,010.2	0.1700	3.7	11.970	87.7	84.4
35	00:02:04	981.2324	0.1876	956.2	0.1750	3.8	11.983	83.0	79.8
36	00:02:07	927.1176	0.1926	902.1	0.1800	3.9	11.997	78.3	75.2
37	00:02:10	874.8759	0.1976	849.9	0.1850	4.0	12.011	73.7	70.8
38	00:02:13	825.4622	0.2026	800.5	0.1900	4.2	12.024	69.5	66.6
39	00:02:16	779.8153	0.2076	754.8	0.1950	4.3	12.038	65.5	62.7
40	00:02:19	734.9026	0.2126	709.9	0.2000	4.4	12.052	61.6	58.9
41	00:02:22	689.224	0.2176	664.2	0.2050	4.5	12.065	57.6	55.1
42	00:02:24	666.4597	0.2203	641.5	0.2077	4.5	12.073	55.7	53.1

8 % LIME CURVE

Unconfined Compression Test

D2166



Project:	Tres Laurels Subdivision
Project Number:	FGS-G-20016
Received Date:	10/19/2022
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	8% Lime

Unconfined Compression Test

D2166

	Specimen Number							
Before Test	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Moisture Content (%):	0.0	0.0	0.0					
Wet Density (pcf)	0.0	0.0	0.0					
Dry Density (pcf)	0.0	0.0	0.0					
Saturation (%):	0.0	0.0	0.0					
Void Ratio:	0.000	0.000	0.000					
Height (in)	4.5763	4.5763	4.5763					
Diameter (in)	3.8307	3.8307	3.8307					
Strain Limit @ 15% (in)	0.7	0.7	0.7					
Height To Diameter Ratio:	1.19	1.19	1.19					
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Failure Angle (°):	0	0	0					
Strain Rate (in/min)	0.09	0.09	0.09					
Strain Rate (%/min):	1.97	1.97	1.97					
Unconfined Compressive Strength (psi)	173.3	257.0	288.6					
Undrained Shear Strength (psi)	86.6	128.5	144.3					
Strain at Failure (%):	1.9	1.3	1.5					

Specific Gravity:	2.72	Plastic Limit:	26	Liquid Limit:	77
Type:	Grab	Soil Classification:	CH		

Project:	Tres Laurels Subdivision
Project Number:	FGS-G-20016
Sampling Date:	10/27/2022
Sample Number:	1
Sample Depth:	
Boring Number:	
Location:	Tres Laurels Subdivision/Montgomery Rd
Client Name:	Mosiac Land Development
Remarks:	8% Lime

Specimen 1 Failure Sketch

Specimen 2 Failure Sketch

Specimen 3 Failure Sketch

Specimen 4 Failure Sketch

Specimen 5 Failure Sketch

Specimen 6 Failure Sketch

Specimen 7 Failure Sketch

Specimen 8 Failure Sketch

Unconfined Compression Test

D2166

LIMS Code: [TO COME FROM LIMS]

Specimen 1

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	8% Lime				

Specimen 2

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	8% Lime				

Specimen 3

Other Associated Tests:

Sampling Method:	Reconstituted	Material Moisture:	Trimmings	Source Moisture:	Before Shear
Molding Date:	10/19/2022	Test Date:	10/27/2022		
Large Particle:	NO	Sensitivity:	0		
Technician:	Miguel Gonzalez Jr	Test Time:	10/27/2022		
Specimen Description:	Dark Brown Clay				
Test Remarks:	8% Lime				

Unconfined Compression Test - Specimen 1

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.06422	0.0300	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	40.56255	0.0350	15.5	0.0050	0.1	11.538	1.3	1.3
2	00:00:07	62.46257	0.0401	37.4	0.0100	0.2	11.550	3.2	3.2
3	00:00:10	93.99889	0.0451	68.9	0.0150	0.3	11.563	6.0	6.0
4	00:00:14	137.9583	0.0500	112.9	0.0200	0.4	11.576	9.8	9.8
5	00:00:18	221.6634	0.0551	196.6	0.0250	0.5	11.588	17.1	17.0
6	00:00:22	370.5036	0.0600	345.4	0.0300	0.7	11.601	30.0	29.8
7	00:00:27	620.1104	0.0650	595.0	0.0350	0.8	11.614	51.6	51.2
8	00:00:32	905.4693	0.0700	880.4	0.0400	0.9	11.627	76.4	75.7
9	00:00:36	1173.885	0.0750	1,148.8	0.0450	1.0	11.639	99.7	98.7
10	00:00:41	1409.586	0.0801	1,384.5	0.0500	1.1	11.652	120.1	118.8
11	00:00:45	1605.634	0.0850	1,580.6	0.0550	1.2	11.665	137.1	135.5
12	00:00:49	1745.402	0.0900	1,720.3	0.0600	1.3	11.678	149.3	147.3
13	00:00:52	1857.92	0.0950	1,832.9	0.0650	1.4	11.691	159.0	156.8
14	00:00:56	1950.82	0.1001	1,925.8	0.0700	1.5	11.704	167.1	164.5
15	00:01:00	2017.291	0.1051	1,992.2	0.0750	1.6	11.717	172.9	170.0
16	00:01:04	2044.463	0.1100	2,019.4	0.0800	1.7	11.730	175.2	172.2
17	00:01:07	2059.873	0.1150	2,034.8	0.0850	1.9	11.743	176.6	173.3
18	00:01:11	2055.117	0.1200	2,030.1	0.0900	2.0	11.756	176.1	172.7
19	00:01:14	2022.57	0.1250	1,997.5	0.0950	2.1	11.769	173.3	169.7
20	00:01:18	1955.55	0.1300	1,930.5	0.1000	2.2	11.782	167.5	163.8
21	00:01:20	1866.974	0.1350	1,841.9	0.1050	2.3	11.796	159.8	156.2
22	00:01:23	1771.952	0.1401	1,746.9	0.1100	2.4	11.809	151.6	147.9
23	00:01:26	1685.856	0.1450	1,660.8	0.1150	2.5	11.822	144.1	140.5
24	00:01:29	1571.022	0.1501	1,546.0	0.1200	2.6	11.835	134.1	130.6
25	00:01:32	1463.488	0.1550	1,438.4	0.1250	2.7	11.849	124.8	121.4
26	00:01:35	1358.138	0.1601	1,333.1	0.1300	2.8	11.862	115.7	112.4
27	00:01:38	1283.64	0.1650	1,258.6	0.1350	3.0	11.875	109.2	106.0
28	00:01:41	1238.14	0.1700	1,213.1	0.1400	3.1	11.889	105.3	102.0
29	00:01:45	1199.202	0.1751	1,174.1	0.1450	3.2	11.902	101.9	98.6
30	00:01:48	1164.608	0.1800	1,139.5	0.1500	3.3	11.916	98.9	95.6
31	00:01:51	1128.162	0.1850	1,103.1	0.1550	3.4	11.929	95.7	92.5
32	00:01:54	1092.618	0.1900	1,067.6	0.1600	3.5	11.943	92.6	89.4
33	00:01:57	1064.78	0.1950	1,039.7	0.1650	3.6	11.956	90.2	87.0

Project Name: Tres Laurels Subdivision Project Number: FGS-G-20016

Test Date: 10/27/2022 Technician: Miguel Gonzalez Jr Checked By: _____ Date: _____

Unconfined Compression Test - Specimen 1

D2166 LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
34	00:02:00	1044.067	0.2000	1,019.0	0.1700	3.7	11.970	88.4	85.1
35	00:02:03	1023.407	0.2051	998.3	0.1750	3.8	11.983	86.6	83.3
36	00:02:06	998.4113	0.2100	973.3	0.1800	3.9	11.997	84.5	81.1
37	00:02:09	981.36	0.2151	956.3	0.1850	4.0	12.011	83.0	79.6
38	00:02:13	968.5033	0.2200	943.4	0.1900	4.2	12.024	81.9	78.5
39	00:02:16	964.3214	0.2250	939.3	0.1950	4.3	12.038	81.5	78.0
40	00:02:19	961.6132	0.2300	936.5	0.2000	4.4	12.052	81.3	77.7
41	00:02:21	958.1871	0.2321	933.1	0.2021	4.4	12.057	81.0	77.4

Unconfined Compression Test - Specimen 2

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	25.01387	0.0244	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:03	48.64533	0.0294	23.6	0.0050	0.1	11.538	2.1	2.0
2	00:00:07	80.04527	0.0344	55.0	0.0100	0.2	11.550	4.8	4.8
3	00:00:10	137.6391	0.0394	112.6	0.0150	0.3	11.563	9.8	9.7
4	00:00:17	361.8757	0.0444	336.9	0.0200	0.4	11.576	29.2	29.1
5	00:00:23	760.5417	0.0494	735.5	0.0250	0.5	11.588	63.8	63.5
6	00:00:28	1209.663	0.0544	1,184.7	0.0300	0.7	11.601	102.8	102.1
7	00:00:34	1640.936	0.0594	1,615.9	0.0350	0.8	11.614	140.2	139.1
8	00:00:39	2034.487	0.0644	2,009.5	0.0400	0.9	11.627	174.4	172.8
9	00:00:43	2378.043	0.0694	2,353.0	0.0450	1.0	11.639	204.2	202.2
10	00:00:48	2678.458	0.0744	2,653.4	0.0500	1.1	11.652	230.2	227.7
11	00:00:52	2920.91	0.0794	2,895.9	0.0550	1.2	11.665	251.3	248.3
12	00:00:56	3026.497	0.0844	3,001.5	0.0600	1.3	11.678	260.4	257.0
13	00:01:00	2963.875	0.0894	2,938.9	0.0650	1.4	11.691	255.0	251.4
14	00:01:03	2801.422	0.0944	2,776.4	0.0700	1.5	11.704	240.9	237.2
15	00:01:06	2552.681	0.0994	2,527.7	0.0750	1.6	11.717	219.3	215.7
16	00:01:10	2293.859	0.1044	2,268.8	0.0800	1.7	11.730	196.9	193.4
17	00:01:13	2055.416	0.1094	2,030.4	0.0850	1.9	11.743	176.2	172.9
18	00:01:16	1836.606	0.1144	1,811.6	0.0900	2.0	11.756	157.2	154.1
19	00:01:18	1649.137	0.1194	1,624.1	0.0950	2.1	11.769	140.9	138.0
20	00:01:21	1506.727	0.1244	1,481.7	0.1000	2.2	11.782	128.6	125.8
21	00:01:24	1384.857	0.1294	1,359.8	0.1050	2.3	11.796	118.0	115.3
22	00:01:27	1285.574	0.1344	1,260.6	0.1100	2.4	11.809	109.4	106.7
23	00:01:30	1212.324	0.1394	1,187.3	0.1150	2.5	11.822	103.0	100.4
24	00:01:33	1147.753	0.1444	1,122.7	0.1200	2.6	11.835	97.4	94.9
25	00:01:36	1103.827	0.1494	1,078.8	0.1250	2.7	11.849	93.6	91.0
26	00:01:39	1069.495	0.1544	1,044.5	0.1300	2.8	11.862	90.6	88.1
27	00:01:41	1051.124	0.1579	1,026.1	0.1335	2.9	11.871	89.0	86.4

Unconfined Compression Test - Specimen 3

D2166

LIMS Specimen Code: [TO COME FROM LIMS]

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Displacement (in)	Corrected Load (Lbf)	Corrected Displacement (in)	Axial Strain (%)	Cross Sectional Area (in²)	Stress (psi)	Compressive Stress (psi)
0	00:00:00	61.06453	0.0002	0.0	0.0000	0.0	0.000	0.0	0.0
1	00:00:04	156.6717	0.0052	95.6	0.0050	0.1	11.538	8.3	8.3
2	00:00:07	221.0221	0.0102	160.0	0.0100	0.2	11.550	13.9	13.8
3	00:00:11	316.5413	0.0152	255.5	0.0150	0.3	11.563	22.2	22.1
4	00:00:15	476.12	0.0202	415.1	0.0200	0.4	11.576	36.0	35.9
5	00:00:20	763.0944	0.0252	702.0	0.0250	0.5	11.588	60.9	60.6
6	00:00:25	1160.553	0.0302	1,099.5	0.0300	0.7	11.601	95.4	94.8
7	00:00:30	1598.029	0.0352	1,537.0	0.0350	0.8	11.614	133.4	132.3
8	00:00:35	2049.299	0.0402	1,988.2	0.0400	0.9	11.627	172.5	171.0
9	00:00:40	2469.513	0.0452	2,408.4	0.0450	1.0	11.639	209.0	206.9
10	00:00:44	2847.203	0.0502	2,786.1	0.0500	1.1	11.652	241.7	239.1
11	00:00:49	3133.305	0.0552	3,072.2	0.0550	1.2	11.665	266.6	263.4
12	00:00:53	3314.68	0.0602	3,253.6	0.0600	1.3	11.678	282.3	278.6
13	00:00:56	3412.614	0.0652	3,351.6	0.0650	1.4	11.691	290.8	286.7
14	00:01:00	3439.125	0.0702	3,378.1	0.0700	1.5	11.704	293.1	288.6
15	00:01:03	3400.601	0.0752	3,339.5	0.0750	1.6	11.717	289.8	285.0
16	00:01:07	3276.53	0.0802	3,215.5	0.0800	1.7	11.730	279.0	274.1
17	00:01:10	3069.709	0.0852	3,008.6	0.0850	1.9	11.743	261.1	256.2
18	00:01:13	2772.362	0.0902	2,711.3	0.0900	2.0	11.756	235.3	230.6
19	00:01:16	2473.708	0.0952	2,412.6	0.0950	2.1	11.769	209.3	205.0
20	00:01:19	2182.839	0.1002	2,121.8	0.1000	2.2	11.782	184.1	180.1
21	00:01:21	1951.769	0.1052	1,890.7	0.1050	2.3	11.796	164.1	160.3
22	00:01:24	1792.906	0.1102	1,731.8	0.1100	2.4	11.809	150.3	146.7
23	00:01:27	1677.509	0.1152	1,616.4	0.1150	2.5	11.822	140.3	136.7
24	00:01:31	1591.911	0.1202	1,530.8	0.1200	2.6	11.835	132.8	129.3
25	00:01:34	1518.083	0.1252	1,457.0	0.1250	2.7	11.849	126.4	123.0
26	00:01:37	1455.403	0.1302	1,394.3	0.1300	2.8	11.862	121.0	117.5
27	00:01:40	1407.156	0.1352	1,346.1	0.1350	3.0	11.875	116.8	113.4
28	00:01:43	1362.136	0.1402	1,301.1	0.1400	3.1	11.889	112.9	109.4
29	00:01:46	1320.765	0.1448	1,259.7	0.1446	3.2	11.901	109.3	105.8

NO STABILIZATION PAVEMENT DESIGNS

FGS Project No.: FGS-G20116-A

Pavement Optimization
Design Analysis

Tensar

Design	LOCAL - A	**Reference**	
Project	TRES LAURELS, SUB'D.	**Location**	San Antonio, TX, USA
Customer		**Designer**	FLORENTINO CABALLERO, P. E.
Company	FROST GEOSCIENCES, Inc.	**Date**	October 19, 2022

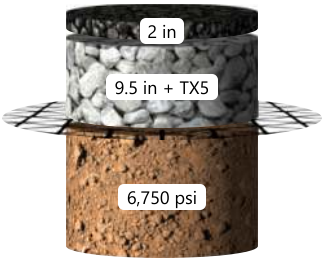
Results

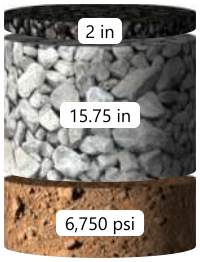
TriAx Stabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	2 in	0.440	0.880
Mechanically stabilized layer	9.5 in	0.232	2.204
Structural number (SN)			3.084
Calculated traffic (ESALs)			1,046,000

Unstabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	2 in	0.440	0.880
Aggregate base	15.75 in	0.140	2.205
Structural number (SN)			3.085
Calculated traffic (ESALs)			1,048,200





Parameters

Project Information

Subgrade resilient modulus	Target ESALs	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
6,750 psi	1,000,000	70%	0.45	4.2	2

Pavement Optimization
Design Analysis

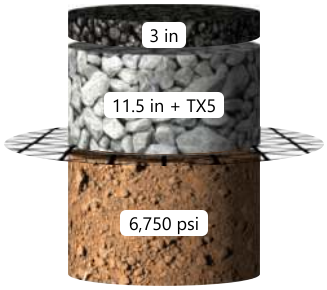
Tensar

Design	LOCAL - B	**Reference**	
Project	TRES LAURELS, SUB'D.	**Location**	San Antonio, TX, USA
Customer		**Designer**	FLORENTINO CABALLERO, P. E.
Company	FROST GEOSCIENCES, Inc.	**Date**	October 19, 2022

Results

TriAx Stabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
Mechanically stabilized layer	11.5 in	0.217	2.495
Structural number (SN)			3.815
Calculated traffic (ESALs)			2,005,100



Unstabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
Aggregate base	18 in	0.140	2.520
Structural number (SN)			3.840
Calculated traffic (ESALs)			2,095,600

Parameters

Project Information

Subgrade resilient modulus	Target ESALs	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
6,750 psi	2,000,000	90%	0.45	4.2	2

Pavement Optimization
Design Analysis

Tensar

Design	ARTERIAL	**Reference**	
Project	TRES LAURELS, SUB'D.	**Location**	San Antonio, TX, USA
Customer		**Designer**	FLORENTINO CABALLERO, P. E.
Company	FROST GEOSCIENCES, Inc.	**Date**	October 19, 2022

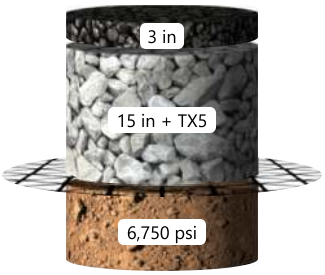
Results

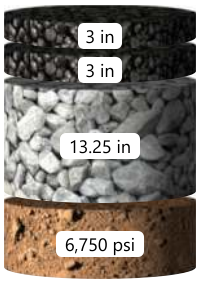
TriAx Stabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
Mechanically stabilized layer	15 in	0.199	2.985
Structural number (SN)			4.305
Calculated traffic (ESALs)			2,070,600

Unstabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
HMA layer 2	3 in	0.380	1.140
Aggregate base	13.25 in	0.140	1.855
Structural number (SN)			4.315
Calculated traffic (ESALs)			2,102,200





Parameters

Project Information

Subgrade resilient modulus	Target ESALs	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
6,750 psi	2,000,000	95%	0.45	4.2	2.5

LIME STABILIZATION PAVEMENT DESIGN

FGS Project No.: FGS-G22127-A

Pavement Optimization
Design Analysis

Design	LOCAL - A, LIME STABILIZATION	**Reference**	
Project	TRES LAURELS, SUB'D.	**Location**	San Antonio, TX, USA
Customer		**Designer**	FLORENTINO CABALLERO, P. E.
Company	FROST GEOSCIENCES, Inc.	**Date**	November 2, 2022

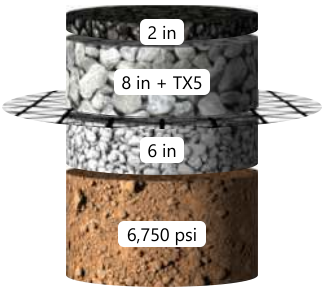
Results

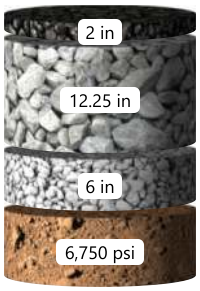
TriAx Stabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	2 in	0.440	0.880
Mechanically stabilized layer	8 in	0.238	1.904
Subbase	6 in	0.080	0.480
Structural number (SN)			3.264
Calculated traffic (ESALs)			1,524,600

Unstabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	2 in	0.440	0.880
Aggregate base	12.25 in	0.140	1.715
Subbase	6 in	0.080	0.480
Structural number (SN)			3.075
Calculated traffic (ESALs)			1,026,000





Parameters

Project Information

Subgrade resilient modulus	Target ESALs	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
6,750 psi	1,000,000	70%	0.45	4.2	2

Pavement Optimization
Design Analysis

Design	LOCAL - B, LIME STABILIZATION	**Reference**	
Project	TRES LAURELS, SUB'D.	**Location**	San Antonio, TX, USA
Customer		**Designer**	FLORENTINO CABALLERO, P. E.
Company	FROST GEOSCIENCES, Inc.	**Date**	November 2, 2022

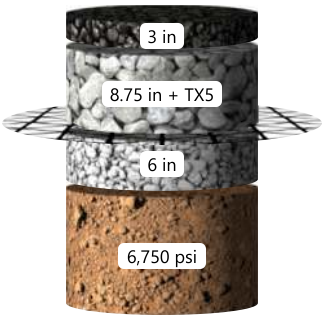
Results

TriAx Stabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
Mechanically stabilized layer	8.75 in	0.232	2.030
Subbase	6 in	0.080	0.480
Structural number (SN)			3.830
Calculated traffic (ESALs)			2,058,200

Unstabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
Aggregate base	14.5 in	0.140	2.030
Subbase	6 in	0.080	0.480
Structural number (SN)			3.830
Calculated traffic (ESALs)			2,058,200



Parameters

Project Information

Subgrade resilient modulus	Target ESALs	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
6,750 psi	2,000,000	90%	0.45	4.2	2

Pavement Optimization
Design Analysis

Design	ATERIAL, LIME STABILIZATION	**Reference**	
Project	TRES LAURELS, SUB'D.	**Location**	San Antonio, TX, USA
Customer		**Designer**	FLORENTINO CABALLERO, P. E.
Company	FROST GEOSCIENCES, Inc.	**Date**	November 2, 2022

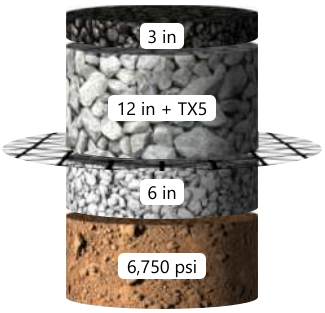
Results

TriAx Stabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
Mechanically stabilized layer	12 in	0.209	2.508
Subbase	6 in	0.080	0.480
Structural number (SN)			4.308
Calculated traffic (ESALs)			2,080,000

Unstabilized Pavement Section

	Thickness	Coeff.	SN
HMA layer 1	3 in	0.440	1.320
HMA layer 2	3 in	0.330	0.990
Aggregate base	10.75 in	0.140	1.505
Subbase	6 in	0.080	0.480
Structural number (SN)			4.295
Calculated traffic (ESALs)			2,039,400



Parameters

Project Information

Subgrade resilient modulus	Target ESALs	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
6,750 psi	2,000,000	95%	0.45	4.2	2.5

GEOTECHNICAL ENGINEERING STUDY

TRES LAURELS SUBDIVISION
WEST MONTGOMERY ROAD EXTENSION
SAN ANTONIO, TEXAS
PAVEMENT DESIGN

FROST GEOSCIENCES, INC. PROJECT NO.: FGS-G 20016
JULY 23, 2020

Prepared Exclusively for:

Mr. Allen Hoover
Mosiac Land Development
6812 West Avenue, Suite 100
San Antonio, Texas 78213

Frost GeoSciences
Construction Materials ▪ Forensics
Environmental ▪ Geotechnical

Frost GeoSciences
Construction Materials ▪ Forensics
Environmental ▪ Geotechnical

Frost GeoSciences

Frost Geosciences, Inc.
13406 Western Oak
Helotes, Texas 78023
Office (210)-372-1315
Fax (210)-372-1318
www.frostgeosciences.com
TBPE Firm Registration # F-9227
TBPG Firm Registration # 50040

July 23, 2020

Mr. Allen Hoover
Mosiac Land Development
6812 West Avenue, Suite # 100
San Antonio, Texas 78213

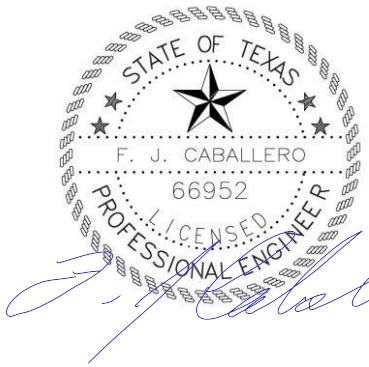
SUBJECT:
Geotechnical Engineering Services
Tres Laurels Subdivision
San Antonio, Texas
FGS Project No: FGS-G20016

Dear Mr. Hoover;

Frost GeoSciences, Inc. (FGS) is a geotechnical engineering company registered with the Texas Board of Professional Engineers, with registration No. F-9227, and is pleased to submit the results of our Geotechnical Engineering Study for the above referenced project. This report includes the results of field and laboratory testing along with recommendations for use in preparation of the appropriate design and construction documents for this project.

FGS appreciates this opportunity to be of service to you in this phase of your project. If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,
Frost GeoSciences, Inc.



F. J. Caballero, P.E.
Project Engineer

JOT – FGS-G20016

Copies Submitted:
i. One (1) Electronic: Mr. Allen Hoover, Mosiac Land Development, San Antonio, Texas
ii. One (1) File

TABLE OF CONTENTS

PROJECT INFORMATION

Project Authorization:

Frost GeoSciences, Inc. (FGS) has completed a geotechnical engineering study for new pavements to be constructed in **Tres Laurels Subdivision, (along West Montgomery Road Extension)** in San Antonio, Texas. This project was authorized by Mr. Allen Hoover of Mosiac Land Development, through acceptance of Frost GeoSciences **Proposal No.: FGS-P-G20032 dated June 5, 2020.** Our scope of services for this project is as outlined in that proposal.

Project Description:

We understand that **The Tres Laurels Subdivision** involves the design and construction of both
Type "A" and Type "B" residential streets and ARTERIAL streets. The design will be designed in general accordance with the Bexar County Flexible Pavement Design Criteria. A Vicinity Map showing the location of the project is included in the section of this report entitled Illustrations.

Purpose and Scope of Services:

The study is to evaluate the subsurface conditions at the project site and develop geotechnical engineering recommendations and guidelines for use in preparing the appropriate design and other related construction documents for this project. Therefore, our scope of services for this project include the following:

- Drill borings and excavate test pits at selected locations within the project limits to evaluate subsurface conditions and to observe the potential presence of subsurface water;
- Perform geotechnical engineering laboratory tests on selected samples recovered during our field activities to evaluate their physical and engineering properties;
- Perform Engineering analyses to develop the appropriate geotechnical engineering recommendations and guidelines, to include:
    - Appropriate pavement section thickness recommendations;
    - Pavement section material requirements and specifications;
    - General site and subgrade preparation within the construction limits; and

- General comments regarding construction methods, sequences and potential difficulties that may arise during overall construction as it relates to the geotechnical engineering aspects of this project.

- Prepare a written report that includes a boring location plan, boring log at each bore site, and results of the laboratory testing program, descriptions of the subsurface conditions encountered and our geotechnical engineering recommendations and guidelines developed for this project.

Our scope of services for this project did not include the assessment of any potential environmental concerns at this site. Therefore, such concerns are not addressed in this report.

SITE AND SUBSURFACE CONDITIONS

Site Description:

The site conditions were assessed using a combination of aerial photography and observations made by the FGS personnel during our field operations. The following site conditions were noted:

- The site is the **Tres Laurels Subdivision**, located along the West Montgomery Road Extension is San Antonio, Texas.

Site Geology:

According to the Bureau of Economic Geology, Geologic Atlas of Texas – San Antonio Sheet (1984), the Site is located on the following Geological Groups:

- **The Anacacho Limestone (Kac)** consists of limestone and marl. The limestone is light yellow to yellow brown and light gray. This limestone is thick bedded, fossiliferous, and cross bedded alternating with marl. The marl is light gray to yellow. Some volcanic rock fragments and rusty bentonite beds with sandy seams in some parts. Marine mega fossils are abundant. Overall thickness is up to 500 feet.

- **The Navarro Group and Marlbrook Marl ("upper Taylor marl") undivided (Kknm)** formation is made up of two parts. The upper part consists of marl, clay, sandstone, and siltstone. The marl and clay are typically glauconitic and contain concretions of limonite and siderite. The sandstone portion is fine-grained and the siltstone portion is yellow-brown, with concretions of hard bluish-gray siliceous limestone 2-10' in diameter. Sandstone beds have little lateral continuity, becoming more abundant in the western portions. This formation's thickness can be up to 580'. The lower part consists of clay. It is usually montmorillonitic, unctuous, greenish-gray to brownish-gray in color. It typically weathers to a very thick, black, clayey soil that can reach a thickness of +/- 400 feet. Total thickness for this portion reaches +/- 980'.

- **The Quaternary Alluvium (Qal)** is floodplain and channel deposits. Most of the sediment is sand, silt, clay and gravel. This includes lowest terrace deposits near floodplain level and locally bedrock in stream channels. Thickness is about 30 feet, moderately brown, very fine grained, well sorted, in part argillaceous, locally burrowed, cross-bedded, and range from a few inches to 10 feet thick. Lignite is brownish black and occurs near the middle with seams 1 to 20 feet thick. Overall thickness of the Wilcox Group ranges from 440 to 1200 feet.

Soil Description:

According to the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Bexar County (1966), the Site is located on the following soils:

- **The Brackett clay loam, 1-5% slopes (BpC)** consists of very shallow and shallow, light colored soils that developed over soft limestone interbedded with hard limestone. These soils occur as moderately sloping to steep, convex, cone shaped hills. They are mainly in the western and northwestern parts of the county but occur in a few places in the northeastern part. The surface layer is grayish brown gravelly clay loam and is about 6" thick. This layer has weak, granular structure and is friable when moist. It is very strongly calcareous and consists of limestone fragments that range from about a quarter of an inch to as much as 6 inches in diameter. The subsurface layer is light brownish gray silty clay and is about 9" thick. The structure is weak to moderate, fine, and granular. This layer is hard when dry but friable when moist. The underlying material is white chalk that can be penetrated by roots. The Brackett Soils are well drained. Internal drainage is medium or slow. Erosion is active in most areas, even where there is a natural cover of vegetation.

- **The Brackett-Austin Complex, 1-5% slopes (BsC):** consists of very shallow and shallow, light colored soils that developed over soft limestone interbedded with hard limestone. These soils occur as moderately sloping to steep, convex, cone shaped hills. They are mainly in the northern and northwestern parts of the county. The alternate layers of hard and soft limestone give the slopes a "stair step" appearance. The surface layer is grayish brown gravelly clay loam and is about 4 inches thick. This layer has weak, granular structure and is friable when moist. It is very strongly calcareous. About 20 percent of this layer consists of limestone fragments that range from about a quarter of an inch to as much as 6 inches in diameter. The subsurface layer is light brownish gray clay loam to silty clay and is about 8 inches thick. The structure is weak to moderate, fine, granular. This layer is hard when dry but friable when moist. The underlying material is a thick bed of soft limestone that is interbedded with hard limestone and contains lenses of chalky marl or calcareous clay. The Brackett-Austin Complex is well drained. Internal drainage is medium or slow. Erosion is active in most areas, even where there is a natural cover of vegetation. Natural fertility is low to moderate.

- **The Lewisville silty clay, 1-3% slopes (LvB)** consists of moderately deep, dark colored, nearly level alluvial soils. These soils occur mainly on terraces bordering the San Antonio and Medina Rivers and their main tributaries. The surface layer is dark grayish

brown and is about 20" thick. It has fine sub angular blocky or blocky structure, and is firm and crumbly when moist. This layer contains a few fine concretions of lime carbonate. The subsurface layer is limey brown clay and is about 17" thick. It has fine, sub angular blocky or blocky structure and is very firm but crumbly when moist. Lewisville soils have slow or medium surface drainage and medium internal drainage. Permeability is slow to moderate. The capacity to hold water is good. Natural fertility is high. The hazard of water erosion is serious on the more sloping parts but is very slight on the nearly level areas.

- **The Trinity and Frio Soils, Frequently Flooded (Tf)** occur as narrow, long and irregularly shaped areas on the flood plains of small streams and the larger field drainage ways. They are mostly in the northern and central parts of the county. These soils are flooded at least once a year, generally after a heavy rain. Some areas are subject to a thin deposition of sediments, and others to scouring or shifting. Channels in these areas are poorly defined and of small capacity. The surface layer ranges from clay loam to gravelly clay in texture. The subsurface layer is clay, but in places it contains thin loamy strata. These soils are typically 3-5' deep.

- **The Tarrant Association, gently undulating (1-5% slopes) (TaB)** consists of stony soils that are very shallow, dark colored, and gently undulating to steep. The Tarrant Association occurs on the limestone prairies in the northern third of the county. The surface layer is very dark grayish brown, calcareous clay loam and is about 10" thick. It has moderate, fine, sub angular blocky structure. This layer is crumbly and friable when moist. Limestone fragments that range from a ¼" to 24" in diameter cover about 35 percent of the surface. The subsurface layer, about 8" thick, is hard fractured limestone. The cracks and spaces are filled with dark grayish brown clay loam. The bedrock is hard limestone. Tarrant soils have rapid surface drainage and good internal drainage. Water erosion is a hazard. The capacity to hold water is low. Natural fertility is high.

- **The Tarrant Association, rolling 5-15% slopes (TaC)** consists of stony soils that are very shallow, dark colored, and gently undulating to steep. The Tarrant Association occurs on the limestone prairies in the northern third of the county. The surface layer is very dark grayish brown, calcareous clay loam and is about 10" thick. It has moderate, fine, sub angular blocky structure. This layer is crumbly and friable when moist. Limestone fragments that range from a quarter of an inch to 24" in diameter cover about 35 percent of the surface. The subsurface layer, about 8" thick, is hard fractured limestone. The cracks and spaces are filled with dark grayish brown clay loam. The bedrock is hard limestone. Tarrant soils have rapid surface drainage and good internal drainage. The capacity to hold water is low. Natural fertility is high. Water erosion is a hazard.

- **The Houston Black gravelly clay, 3-5% slopes (HuC)** consists of clayey soils that are deep, dark gray to black and calcareous with some gravel. The surface layer is black and about 36" thick. Gravel ordinarily makes up 10-18% of this layer by volume. On a few minor ridge tops, gravel may compose of 60% of the soil. The subsurface layer is about 12" thick. Water intake is slow and erosion due to water is a hazard. The formation of plow pans is common.

- **The Hilly Gravelly Land (HgD)** consists of bed of caliche or of gravelly, very strongly calcareous, loamy alluvium that is approximately 10-20' or more in thickness. The upper 3-12" of the caliche layer is generally hard and scaly. There are a few nearly level areas approximately 100' wide, and on these has formed a 4-8" thick mantle of limy, dark grayish brown loam or clay loam. On the slopes, there is very little soil; it is estimated that only approximately 15% of this land is actually soil. In some places, there is a 2-3' bed of weak conglomerate consisting of sediments cemented with calcium carbonate.

- **The Houston Black Clay, 1-3% slopes (HsB)** consists of clayey soils that are deep, dark gray to black and calcareous. The surface layer is very dark gray to black, mildly alkaline, and about 38 inches thick. This layer has weak, very fine, blocky structure in the uppermost 8 inches. Below that depth, it has moderate, fine, and very fine, blocky structure and is extremely firm but crumbly when moist. This layer cracks when dry and swells when wet. The subsurface layer is about 12 inches thick. It is gray or dark gray clay and has some grayish brown or olive brown streaks. It has moderate, medium blocky structure and is extremely firm when moist. Like the surface layer, this layer cracks when dry and swells when wet. The underlying material is very pale brown, calcareous clay or marl and has mottles of olive brown and gray. There are some shale fragments and gypsum crystals. The Houston Black Clay has slow to rapid surface drainage. Internal drainage is slow to none. Rainfall is very rapidly absorbed when the soil is dry and cracked, but practically all of it runs off after the water content of the soil has reached field capacity. Most areas lack a permanent water table. The capacity to hold water is good. Water erosion is a hazard.

- **Venus clay loam, 1 to 3 percent slopes (VcB).—**this soil occurs as gentle slopes, either between the terraces and the upland soils or between the terraces and the flood plains. It has a thinner surface layer, stronger slopes, and more rapid runoff than Venus clay loam, 0 to 1 percent slopes. Included in the areas mapped are small tracts of Patrick soils, 1 to 3 percent slopes, of Venus clay loam, 0 to 1 percent slopes, and of Lewisville silty clay, 1 to 3 percent slopes. The surface layer is about 14 inches thick. The subsurface layer, about 20 inches thick, is clay loam in texture but is less clayey than the surface layer. This is a fairly productive soil. Most of it is cultivated, and part of it is irrigated. Small grain, Sudan grass, grain sorghum, corn, and cotton are well suited, and track crops can be grown under irrigation. A crust readily forms on the surface. The hazard of sheet and gully erosion is moderate. Terracing, fertilization, contour tillage, and proper use of plant residues are needed to help control runoff and erosion, conserve moisture, and maintain tilth and fertility. (Capability unit IIe-3, dryland; IIe-3, irrigated; Clay Loam range site)

- **The Lewisville silty clay, 1-3% slopes (LvB)** consists of moderately deep, dark colored, nearly level alluvial soils. These soils occur mainly on terraces bordering the San Antonio and Medina Rivers and their main tributaries. The surface layer is dark grayish brown and is about 20" thick. It has fine sub angular blocky or blocky structure, and is firm and crumbly when moist. This layer contains a few fine concretions of lime carbonate. The subsurface layer is limey brown clay and is about 17" thick. It has fine, sub angular blocky or blocky structure and is very firm but crumbly when moist. Lewisville soils have slow or medium surface drainage and medium internal drainage. Permeability is slow to moderate. The capacity to hold water is good. Natural fertility is high. The hazard of water erosion is serious on the more sloping parts but is very slight on the nearly level areas.

- **The Houston clay, 3-5% slopes, eroded (HnC2)** consists of deep, moderately well drained clay soils. These soils have developed in calcareous marls, alluvial clays, and chalk, under a prairie of tall grasses. The surface layer is grayish brown clay about 25" thick. Some scattered pebbles are present; some as much as 3" thick. The next layer is dark gray clay that reaches to a depth of about 38 inches. The next lower layer, to a depth of about 80 inches, is grayish brown clay. The underlying material, to a depth of 104 inches is gray clay with mottles of olive and yellow. The hazard of erosion is moderate

Subsurface Conditions:

Subsurface conditions at the site were evaluated by drilling a total of **NINE** (9) soil borings to a depth of FIFTEEN (15) feet and Two (2) test pits to approximately two (2) feet depth were excavated to obtain soil samples to determine the California Bearing Ratio (CBR) of the soil samples. The number of borings and test pits, their locations and their depths were selected by FGS. The borings and test pits were located in the field by FGS personnel using Global Positioning System (GPS) technology. The borings were advanced using solid flight auger drilling methods and soil samples were routinely obtained during the drilling process; the test pits are routinely excavated to the appropriate depth. Drilling and sampling techniques were accomplished in general accordance with ASTM procedures. Logs of the borings are presented in the Appendix section at the end of the report. A Borehole Location Plan with the location of each boring is presented in the Illustrations section of this report.

The soil samples obtained during our field exploration were transported to our laboratory where they were reviewed by qualified geotechnical engineering personnel. Representative samples were selected and tested to determine pertinent engineering properties and characteristics for use in evaluating the project site. Laboratory testing and soil classification were accomplished in general accordance with ASTM procedures.

Based on the field and laboratory data, it is determined that the stratigraphy of the site is generally as follows:

Stratum	Range of Depth, ft.	Stratum Description and Classification
I	0.0 to 3.0	Fat Clay (CH), Dark Brown
II	3.0 to 15.0	Fat Clay (CH), Light Tan

The subsurface descriptions shown above are general in nature and highlight major subsurface stratification features and material types. The boring logs included in Appendix A should be reviewed for specific information such as soil or rock material descriptions, stratifications, sampling depths and intervals, field test data and laboratory test data. The stratifications shown on each boring log only represent the conditions and approximate boundaries between strata at that actual boring location. The actual transitions between strata may be gradual. Variations will occur and should be expected at locations away from each boring location. Subsurface water level observations made during field operations are also shown on the boring logs. The indicated stratum depths and any subsurface water levels are measured from the ground surface and are estimated to the nearest one-half (½) foot. Portions of any samples that are not altered or consumed by laboratory testing will be retained for 30 days from the date of issuance of this report. Unless otherwise requested by the client and/or depending upon project requirements, all soil samples will be discarded after that retention period.

The P.I. values obtained from the soil samples taken near the surface ranged from 36 to 51 in the CLAY subgrade soil. Due to the characteristics of the materials found in the area, FGS is of the opinion that the sulfate contents of the materials would pose a problem if not treated with lime. The P.I. value of the material near the surface is greater than 20 and could be reduced if lime is applied to the subgrade material or the native Clay material is replaced with a more suitable material.

Subsurface Water Information:

The borings were advanced using dry drilling techniques to their full depths in an attempt to detect the potential presence of subsurface water in the material. Subsurface water was not encountered either during or upon completion of drilling or sampling operations. The boreholes were backfilled with soil cuttings upon completion of drilling and sampling operations.

Short-term field observations generally do not provide accurate subsurface water levels for evaluation at most sites. Subsurface water levels are generally influenced by seasonal and climatic conditions that result in fluctuations of subsurface water levels over time. The earthwork contractor should check for subsurface water during excavation activities especially when sand and/or gravel are encountered. No specific notations concerning subsurface water are indicated on the boring logs in Appendix A since no subsurface water was observed.

Pavement Design:

Flexible pavements should be designed and constructed in accordance with the requirements established by local municipalities and the American Association of State Highway and Transportation Officials (AASHTO) "Guide for Design of Pavement Structures", for this project, the Bexar County Flexible Pavement Design Criteria was used.

Below is a table which outlines the Bexar County Flexible Pavement Design Criteria, which was used in the design of the proposed street sections for this project:

Input Parameters used in Asphalt Pavement Section Calculation

San Antonio Pavement Specifications								
	Primary and Secondary Arterials		Local Type "B" Streets		Local Type "A" Streets with **Bus Traffic**		Local Type "A" Streets with **NO Bus Traffic**	
W18	ESAL = 3,000,000		ESAL = 2,000,000		ESAL = 1,000,000		ESAL = 100,000	
R	95%		90%		70%		70%	
So	Flexible	Rigid	Flexible	Rigid	Flexible	Rigid	Flexible	Rigid
	0.45	0.35	0.45	0.35	0.45	0.35	0.45	0.35
Po	4.2	4.5	4.2	4.5	4.2	4.5	4.2	4.5
Pt	2.5	2.5	2.0	2.5	2.0	2.5	2.0	2.0
ΔPSI	1.7	2.0	2.2	2.0	2.2	2.0	2.2	2.5
T	20		20		20		20	
SN	Min.	Max	Min.	Max.	Min.	Max.	Min.	Max.
	3.80	5.76	2.92	5.05	2.58	4.20	2.02	3.18

In addition to the parameters shown above, the soil resilient modulus, M_R, of the subgrade soil, must be determined. Typically, this value is obtained through California Bearing Ratio (CBR) testing. Field investigations show that both soil samples obtained within the subgrade at the site are very similar with very similar (CBR) values. These soils are Dark Brown Fat Clay (CH) with CBR values ranging between 4.3 and 4.5. We will use the 4.5 CBR value to design our pavement sections.

Information regarding the moisture density relationships of the bulk samples of subgrade soil collected at this site and the CBR test results are presented in the Appendix section of this report.

The Pavement Sections for Clay soils with a CBR value of 4.5 are presented in the tables below.

It should be noted, the P.I. value of the Clay subgrade at this site varies between 36 and 51 where tested. The Clay soils may have areas with a P.I. value of 20 or less. While the Chalk soils will generally have a P.I. value of 20 or less. The subgrade soils with a P.I. value greater than 20 should be treated with lime to reduce their P.I. value or be replaced with better material approved by the Project Engineer. It will be important that once the field work starts, personnel from FGS be present to identify the areas where lime should be applied to reduce the P.I. value of the subgrade soil.

For the purposes of developing layer thicknesses for the pavement sections shown below, we have used the following structural coefficients in the calculation of pavement structural numbers:

Material Type	Structural Coefficient	Drainage Coefficient
TXDOT Item 340, Hot Mixed Asphaltic Concrete	0.44	1.00
TXDOT Items 292 or 340, Asphalt Treated Base	0.38	1.00
TXDOT Item 247, Flexible Base - Crushed Limestone	0.14	1.00
TXDOT Item 247, Flexible Base	0.08	1.00

Based on the design parameters and the structural coefficients discussed above, the minimum required Structural Number, SN, for the existing soil conditions may be determined using equation found in Appendix CC-1 of the Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures prepared for the National Cooperative Highway Research Program

$$MR = 2555\ (CBR)^{0.64}$$

Where: MR = the DESIGN Resilient Modulus

$$MR = 2555\ (4.5)^{0.64}$$

MR = 6,690.32 psi

WE WILL USE MR=6,650 PSI FOR OUR PAVEMENT DESIGNS

In accordance with Bexar County design parameters we have developed the following flexible pavement recommendations for Local A Type Streets with bus Traffic on a Clay subgrade.

COMPONENT	FLEXIBLE DESIGN SECTION (inches)		
	Local Type "A" Streets with Bus Traffic		
	Option # 1	Option # 2	Option # 3
Type D HMAC Surface	2.0 inches	2.0 inches	2.0 inches
Type B HMAC Base	N/A	N/A	N/A
Flexible Base, (Type B, Grade 2), Pit Run	12.5 inches	12.5 inches	7.0 inches
Lime Treated Subgrade (6 inch Min.)	Yes	No	YES
3 X 5 Rock Wrapped in Mirafi 180N Filter Fabric	No	Yes	NO
TENSAR GEOGRID (TX-5)	No	No	Yes
Design ESAL Value	1,000,000	1,000,000	1,000,000
Actual ESAL Value	1,068,000	1,068,000	1,068,000

In accordance with Bexar County design parameters we have developed the following flexible pavement recommendations for Local "B" Type Streets on a Clay subgrade.

COMPONENT	FLEXIBLE DESIGN SECTION (inches)		
	Local Type "B" Streets		
	Option # 1	Option # 2	Option # 3
Type D HMAC Surface	3.0 inches	3.0 inches	3.0 inches
Type B HMAC Base	N/A	N/A	N/A
Flexible Base, (Type B, Grade 2), Pit Run	14.75 inches	14.75 inches	9.0 inches
Lime Treated Subgrade (6 inch Min.)	Yes	No	YES
3 X 5 Rock Wrapped in Mirafi 180N Filter Fabric	No	Yes	NO
TENSAR GEOGRID (TX-5)	No	No	Yes
Design ESAL Value	2,000,000	2,000,000	2,000,000
Actual ESAL Value	2,117,000	2,117,000	2,136,000

COMPONENT	FLEXIBLE DESIGN SECTION (inches)		
	Arterial Streets		
	Option # 1	Option # 2	Option # 3
Type D HMAC Surface	3.0 inches	3.75 inches	3.0 inches
Type B HMAC Base	3.0 inches	N/A	N/A
Flexible Base, (Type B, Grade 2), Pit Run	11.75 inches	17.50 inches	14.0 inches
Lime Treated Subgrade (6 inch Min.)	Yes	Yes	YES
3 X 5 Rock Wrapped in Mirafi 180N Filter Fabric	No	No	No[
TENSAR GEOGRID (TX-5)	No	No	Yes
Design ESAL Value	3,000,000	3,000,000	3,000,000
Actual ESAL Value	3,037,000	3,014,000	3,041,000

Note: Asterisk (*) If the P.I. value of the Clay Subgrade is 20 or less, than Moisture Conditioning may be substituted for Lime Treatment, see Pavement Analysis section for additional details.
Double Asterisk (**) the design was calculated using Tensar Spectra Pave4 PRO software.

Pavement Analysis:

The pavement designs presented in the previous paragraphs include designs for lime stabilized subgrade and lime treated subgrade, to be used on pavement sections with a Clay subgrade and a P.I. value greater than 20. The Bexar County pavement design criteria requires that a minimum of six (6) inches of subgrade soil below the pavement structure be treated or stabilized if the subgrade has a P.I. value greater than 20. If a Geogrid fabric is used to reduce the base course thickness, treatment or stabilization of the underlying high P.I. soil is still required, although The City of San Antonio will allow 3 X 5 Rock wrapped in a Filter Fiber.

In the case that subgrade fill is required to bring the subgrade elevation up to final grade, fills should be made with flexible base, on-site Chalk millings or other material approved by the Project Engineer. Fill material compaction shall be in accordance with subgrade compaction requirement for Bexar County.

Pavement Material Specifications:

The following guidelines have been prepared for use in the selection and preparation of various materials that may be used to construct the pavement sections. Submittals should be made for each pavement material and should be reviewed by the Geotechnical Engineer and other appropriate members of the

design team. The submittals should provide the test information necessary to verify full compliance of the materials with the recommended or specified material properties.

Fill Material - If fill is used to raise the grade, approved fill material underneath the pavement should be used. The fill should be free of deleterious material with a minimum CBR value of 4.5 and preferably a Plastic Index below 20. If the material has a PI greater than 20 the lime application rates should be re-evaluated and sulfate content tested for the fill material. The material should be placed as per applicable city or county guidelines.

Hot-Mix Asphaltic Surface Course – Asphaltic concrete should be plant mixed, hot laid, Type D meeting the 2014 TX DOT Standard Specification Item 340. Mix should be compacted to between 92 and 97 percent of the maximum theoretical density as determined by TEX-227-F.

Asphalt Treated Base – Asphalt treated base should be placed in **maximum six (6) inch compacted lifts**. These materials should conform to the requirements of the 2014 TX DOT Standard Specification Item 292, Grade 1 or Item 340, Type A or B.

Flexible Base Course – Flexible base materials should be placed in maximum eight (8) inch **compacted lifts.** The base materials should be compacted to at least 95 percent of the maximum dry density as determined by ASTM D 1557. Flexible base materials should be moisture conditioned to between plus or minus two (+-2) percentage points of the optimum moisture content. Flexible base materials should meet all requirements specified in 2014 TX DOT Standard Specification Item 247, Type A or B, Grade 1 or 2.

Lime Treated Subgrade – Clay subgrade (with P.I. values greater than 20) should be treated with hydrated lime to reduce its plasticity and improve its strength and load carrying ability. Hydrated lime should be mixed with the subgrade soils in accordance with Bexar County Specifications for Lime Treatment to reduce the P.I. value to 20 or less.

Lime Stabilized Subgrade – Clay subgrade (with P.I. values greater than 20) should be stabilized with hydrated lime to reduce its plasticity and improve its strength and load carrying ability. Hydrated lime should be mixed with the subgrade soils in accordance with Bexar County Specifications for Lime Stabilization. We estimate that approximately six (6) percent (by weight) hydrated lime will be required to properly stabilize these soils. This is equivalent to about 27 pounds of hydrated lime per square yard for a six (6) inch depth. The optimum lime content should result in a soil-lime mixture with

a pH of at least 12.4 when tested in accordance with ASTM C 977, Appendix XI and should reduce the P.I. to 20 or less.

3 X 5 Rock Wrapped in Filter Fabric – The City of Converse allows 3 X 5 rock wrapped in Filter Fabric instead of lime stabilization. However the **wrapping fabric must be Mirafi 180N Filter Fabric or equal.**

Geogrid – Tensar TX5 geogrid may be used to provide additional structural support to flexible base materials. The geogrid should be placed as per manufacturer's recommendations at the interface between the flexible base and subgrade.

Moisture Conditioned Subgrade – Exposed subgrade soils that do not need to be stabilized or treated should be scarified and moisture conditioned to between plus or minus three (+-3) percentage points of optimum to a depth of at least six (6) inches. The soils should then be compacted to at least 95 percent of the maximum dry density as determined by ASTM D 698.

Lime Series Curve and Unconfined Compressive Strength:

A Lime Series Curve was developed for the project to determine the optimum amount of hydrated lime required to stabilize the subgrade in accordance with Bexar County criteria. The optimum lime content should result in a soil-lime mixture with a pH of at least 12.4 when tested in accordance with ASTM C 977 and should reduce the Plasticity Index to 20 or less. The lime series curve depicts the percent lime added to the subgrade and the resulting pH/P.I. A strength verification test was performed on the lime stabilized subgrade to determine the Unconfined Compressive Strength (UCS) of the soil-lime mixture. **Bexar County requires an UCS of 160 psi, a pH of 12.4 or greater and a P.I. of 20 or less. Results of the**

Lime Series Curve and the Unconfined Compressive Strength test are presented in the Appendix section of this report. Additional field verification testing will be required during the subgrade stabilization process once the project has started.

Subgrade Preparation:

The pavement alignment should be stripped of topsoil, vegetation, roots, loose or soft soils and any other deleterious materials. The stripped materials should be removed from the site and properly disposed of or used elsewhere on site. Upon completion of stripping operations, the alignment may be either excavated or filled as necessary to achieve the desired pavement elevation. Prior to the placement of any fill for grade adjustments or the construction of the pavement section, the exposed subgrade should be proof rolled with appropriate construction equipment

weighing at least 20 tons. Unstable or non-uniform areas should be removed to expose stable soils and may be replaced with clean, properly compacted flexible base material or other more suitable material approved by the Project Engineer. All fill placed within the paved areas should be free of any deleterious materials and should not contain stones larger than the maximum lift thickness. The fill materials should be placed on prepared surfaces in lifts not to exceed eight (8) inches compacted measure. All fill materials placed in paved areas should be moisture conditioned to between plus or minus three (+-3) percentage points of the optimum moisture content and compacted to at least 95 percent of the maximum dry density as determined by ASTM D 698.

Drainage:

Proper pavement perimeter drainage should be provided and maintained to minimize the infiltration of surface water into the pavement section from surrounding unpaved areas. The infiltration of water into the pavement section typically results in the accelerated degradation of the section with time as vehicular traffic traverses the infiltrated area. Curbs used in paved areas should extend at least three (3) inches into the base materials to help reduce the potential for water infiltration into the pavement section. Prefabricated strip drains or small "French" drains may also be installed behind curbs to intercept and remove water from the pavement perimeter before water infiltrates the pavement section. Furthermore, all concrete and asphalt interfaces should be sealed using a sealant that is compatible with both asphalt and concrete.

Proper pavement drainage is a critical component in the long-term performance of a pavement section. The pavement section recommendations shown above are based on generally recognized structural coefficients. These coefficients reflect the relative strength of each pavement material type and their contribution to the structural integrity of the pavement. The infiltration of water into these pavement materials will generally weaken the materials and result in the degradation of the pavement's performance. Therefore, proper drainage of the pavement should be carefully considered by the project design team to ensure that water rapidly drains from the pavement and does not pond on or around the pavement.

Utilities:

Care should be exercised to make sure that utility lines do not serve as conduits that transmit water beneath foundations or pavements at this site. Secondary backfill for utility lines that are located beneath pavement, sidewalk and building areas should consist of lean clay (CL), flowable fill or other material in accordance with local municipality or utility provider specifications. Proper compaction of trench backfill is essential in pavement areas where settlement of the trench backfill can

cause significant distress to the overlaying pavement. Flowable fill materials should be as described in the American Concrete Institute ACI 229R. Granular materials such as sand or gravel are not recommended as secondary backfill in utility trenches located in building pad or pavement areas.

Excavations:

As was discussed previously, these materials that are penetrated by geotechnical augers can generally be excavated with conventional earthmoving equipment. It should be noted that excavation equipment varies and field conditions may vary. Generally, geologic processes (such as faulting, weathering, etc.) are erratic and large variations can occur in small lateral distances. Details regarding "means and methods" to accomplish the work (such as excavation equipment and technique selection) are the sole responsibility of the project contractor.

The Occupational Safety and Health Administration (OSHA) Safety and Health Standards (29 CFR Part 1926, Revised October 1989), require that excavations be constructed in accordance with the current OSHA guidelines. Furthermore, the State of Texas requires that detailed plans and specifications meeting OSHA standards be prepared for trench and excavation retention systems used during construction. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavation as part of the contractor's safety procedures.

In no case should slope height, slope inclination or excavation depth exceed those specified in local, state and Federal safety regulations. OSHA addresses the construction of slopes in large excavations that are less than 20 feet deep on OSHA Table B-1. We have provided this information solely as a service to our client. The OSHA regulations and OSHA Table B-1 should be consulted prior to any excavations that would be subject to OSHA regulations. FGS does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state and Federal safety or other regulations.

QUALITY CONTROL

Document Review:

Due to the uniqueness of each project and construction site, it is important that all engineering reports, drawings, specifications, change orders and other related documents accurately reflect the recommendations intended by the respective

design professionals involved in the project. The performance of the pavements planned for this project will depend on the correct interpretation and implementation of our geotechnical engineering report and guidelines. We should be provided the opportunity to review the final design and construction documents to check that our geotechnical recommendations are properly interpreted and implemented in these documents. This review is not a part of our scope of services for this project and would be an additional service. We cannot be responsible for misinterpretation of our geotechnical recommendations if we have not had an opportunity to review these documents.

Construction Materials Testing:

As the Geotechnical Engineer of Record, we recommend that Frost GeoSciences be retained to monitor the pavement installation and earthwork related activities for this project. Due to our familiarity with this project, it is important that FGS provide these services to make certain that our geotechnical recommendations are interpreted properly and to make certain that actual field conditions are those described in our geotechnical report. We believe this technical overview and on-site surveillance during these activities is essential to provide well-constructed pavements and to check that the intent of these geotechnical recommendations is met.

REPORT LIMITATIONS

The recommendations and guidelines submitted in this report are based on the available subsurface information developed by FGS and project information provided by the client. If there are any changes in the nature, design or location of the project, the opinions, conclusions, recommendations and guidelines submitted in this report should not be used until we are able to review the changes and respond in writing as to whether the information contained within this report remains applicable.

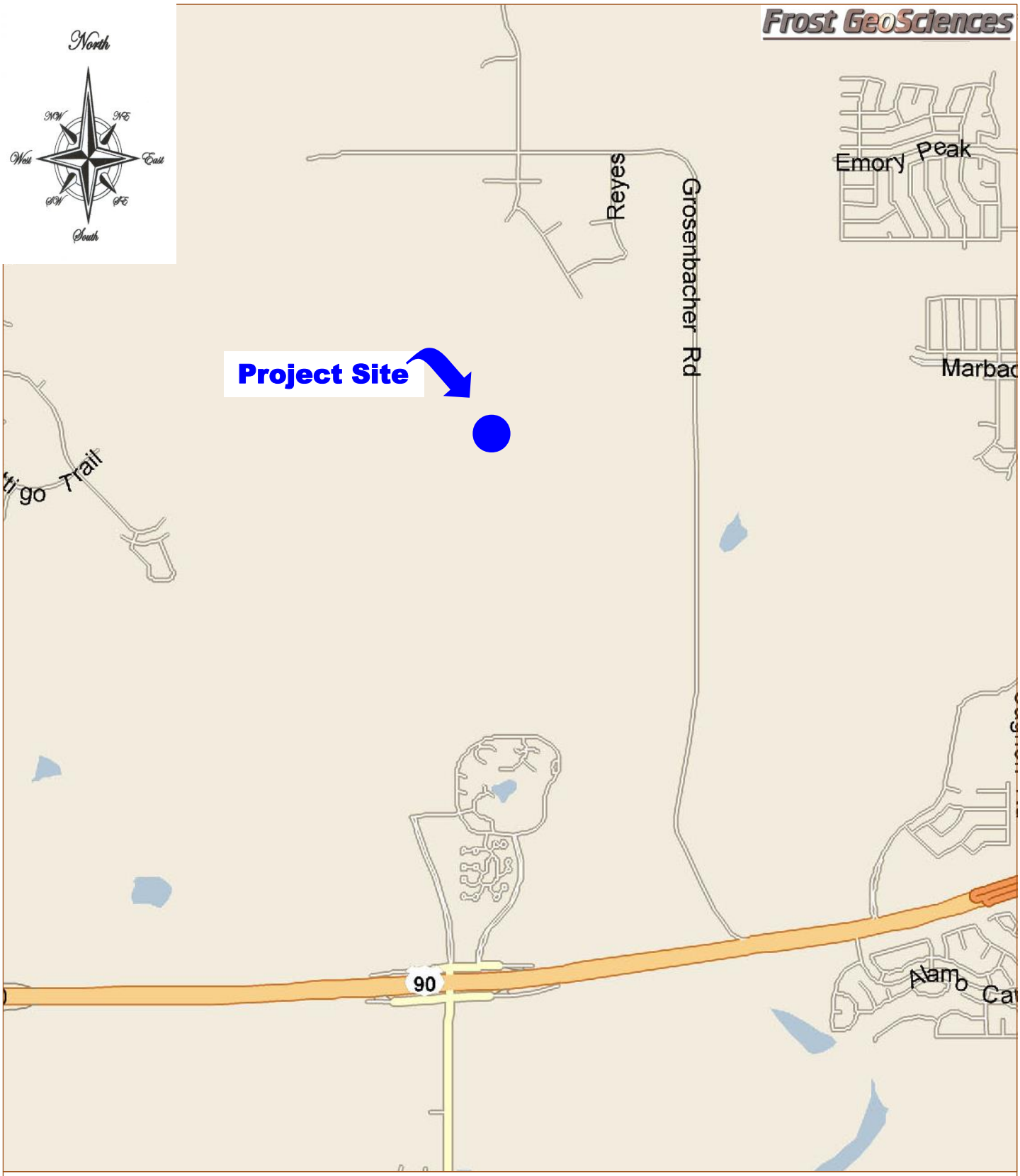
Subsurface conditions at this site have been observed and interpreted at the boring locations only. Substantial variations in subsurface materials resulting from local geologic conditions or previous site use may occur away from the boring locations. These variations may not become evident until construction begins. Therefore, any conditions that vary significantly from those described in our report should be reported to FGS immediately. FGS will then determine whether our conclusions, opinions and recommendations remain valid or whether additional investigation and/or engineering analysis is required.

This study has been performed in accordance with accepted geotechnical engineering practice using the standard of care and skill currently exercised by geotechnical engineers practicing in this area. No warranty, expressed or implied, is made or intended. This report has been prepared exclusively for the specified client; project and client's authorized project team for use in preparing the appropriate design and construction documents for this project. This report may be included in the construction documents for this project provided the report is reproduced in its entirety. This report shall not be reproduced or used for any other purpose without the express written consent of Frost GeoSciences, Inc.

ILLUSTRATIONS

Vicinity Map
Boring Location Plan

VICINITY MAP



PROJECT NAME:	Vicinity Map Microsoft Streets and Trips (2013)	
Geotech Engineering Study TRES LAURELS SUBDIVISION San Antonio, Texas	PROJECT NO.: FGS-G-20016	DATE CREATED: July 22, 2013

BORING PLAN

Frost GeoSciences

PROJECT NAME:

Geotechnical Engineering Study
TRES LAURELS SUBDIVISION
San Antonio, Texas

Boring Location Plan
(Google Earth)

PROJECT NO.: FGS-G-20016

DATE: June 10, 2024

APPENDIX A

Boring Logs
Boring PVR Values
Symbol Key Sheet

BORING LOGS

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

PROJECT NO.: FGS-G20016
BORING NO.: B-01
DRILLING DATE:
SURFACE ELEVATION:

CLIENT: Mosiac Land Development

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (LL)	ATTERBERG LIMITS: PLASTIC LIMIT (PL)	ATTERBERG LIMITS: PLASTICITY INDEX (PI)	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
				7	63	24	39						Dark Brown Clay
	5			8	56	19	37						Light Brown Clay at 2'
	10			8	75	28	47						Light Tan Clay at 7'
	15												Boring Terminated at 15 feet of Depth
	20												

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

This log is not valid if separated from the report.

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

CLIENT: Mosiac Land Development

PROJECT NO.: FGS-G20016
BORING NO.: B-02
DRILLING DATE:
SURFACE ELEVATION:

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													Light Brown Clay
				6	77	26	51						Light Tan Clay at 2'
	5												
				8	73	27	46						
	10												
	15												Boring Terminated at 15 feet of Depth
	20												

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

PROJECT NO.: FGS-G20016
BORING NO.: B-03
DRILLING DATE:
SURFACE ELEVATION:

CLIENT: Mosiac Land Development

FIELD DATA | LABORATORY DATA

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (LL)	ATTERBERG LIMITS: PLASTIC LIMIT (PL)	ATTERBERG LIMITS: PLASTICITY INDEX (PI)	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	0			9	77	26	51						Dark Black Clay
	5												
	10			7	72	33	39						Light Tan Clay at 6'
	15												Boring Terminated at 15 feet of Depth
	20												

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

PROJECT NO.: FGS-G20016
BORING NO.: B-04
DRILLING DATE:
SURFACE ELEVATION:

CLIENT: Mosiac Land Development

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													Dark Brown Clay
	5			8	65	25	40						
													Light Tan Clay at 7'
	10			9	72	30	42						
	15												Boring Terminated at 15 feet of Depth
	20												

DRILLING METHOD(S):

Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:

Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

This log is not valid if separated from the report.

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

CLIENT: Mosiac Land Development

PROJECT NO.: FGS-G20016
BORING NO.: B-05
DRILLING DATE:
SURFACE ELEVATION:

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	0			7	64	28	36						Lght Brown Clay
	5												
	10			5	47	18	29						Light Tan Weathered Limestone at 7'
	15												Boring Terminated at 15 feet of Depth
	20												

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

PROJECT NO.: FGS-G20016
BORING NO.: B-06
DRILLING DATE:
SURFACE ELEVATION:

CLIENT: Mosiac Land Development

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	0			10	58	24	34						Dark Brown Clay
	5			8	71	30	41						Light Tan Clay at 6'
	10												
	15												Boring Terminated at 15 feet of Depth
	20												

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

PROJECT NO.: FGS-G20016
BORING NO.: B-07
DRILLING DATE:
SURFACE ELEVATION:

CLIENT: Mosiac Land Development

PAGE 1 of 1

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	0			3	56	19	37						Light Brown Clay
	5												Light Brown Clay with small Gravel at 6'
	10			2	58	20	38						Light Brown Clay at 6.5'
	15												Boring Terminated at 15 feet of Depth
	20												

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

This log is not valid if separated from the report.

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

PROJECT NO.: FGS-G20016
BORING NO.: B-08
DRILLING DATE:
SURFACE ELEVATION:

CLIENT: Mosiac Land Development

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	0			8	61	22	39						Dark Brown Clay
	5			6	76	28	48						Light Tan Clay at 6'
	10												
	15												Boring Terminated at 15 feet of Depth
	20												

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

LOG OF BORING

Frost GeoSciences
Geologic • Environmental
Geotechnical

PROJECT: Tres Laurels Subdivision
Montgomery Rd
San Antonio, Tx

CLIENT: Mosiac Land Development

PROJECT NO.: FGS-G20016
BORING NO.: B-09
DRILLING DATE:
SURFACE ELEVATION:

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
				4	55	18	37						Light Tan Silty Clay
	5			5	77	28	49						Light Tan Marly Clay at 4'
	10												
	15												Boring Terminated at 15 feet of Depth
	20												

DRILLING METHOD(S):
Dry auger drilling techniques were used to the termination depth of the boring.

SUBSURFACE WATER INFORMATION:
Subsurface water was not encountered either during or upon completion of drilling operations and subsurface water observations.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

FROST LOG FGS-G20016.GPJ FROST.GDT 7/8/20

PVR VALUES

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-01

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	39	1.5	x		
II	37	7.0		x	
III	47	14.5			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **2.14** inches

Effective Plasticity Index

BRAB	PCI
40	40

Soil Support Index

BRAB	PCI
0.72	0.72

Soil/Climatic Rating Factor

$1 - C_w$ = **0.28**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-02

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	51	4.0	x		
II	46	10.0		x	
III	45	14.5			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **3.48** inches

Effective Plasticity Index

BRAB	PCI
51	47

Soil Support Index

BRAB	PCI
0.61	0.65

Soil/Climatic Rating Factor

$1 - C_w$ = **0.35**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-03

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	51	2.0	x		
II	39	10.0		x	
III	38	14.5			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **2.56** inches

Effective Plasticity Index

BRAB	PCI
51	41

Soil Support Index

BRAB	PCI
0.61	0.72

Soil/Climatic Rating Factor

$1 - C_w$ = **0.28**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-04

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	40	4.0	x		
II	42	10.0		x	
III	40	14.5			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **2.61** inches

Effective Plasticity Index

BRAB	PCI
40	40

Soil Support Index

BRAB	PCI
0.72	0.72

Soil/Climatic Rating Factor

$1 - C_w$ = **0.28**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-05

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	36	4.0	x		
II	33	7.0		x	
III	29	14.5			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **1.68** inches

Effective Plasticity Index

BRAB	PCI
36	33

Soil Support Index

BRAB	PCI
0.77	0.81

Soil/Climatic Rating Factor

$1 - C_w$ = **0.19**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-06

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	34	1.5	x		
II	33	3.5		x	
III	41	7.0			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **1.26** inches

Effective Plasticity Index

BRAB	PCI
29	29

Soil Support Index

BRAB	PCI
0.86	0.86

Soil/Climatic Rating Factor

$1 - C_w$ = **0.14**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-07

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	35	1.5	x		
II	37	3.5		x	
III	38	10.0			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **1.45** inches

Effective Plasticity Index

BRAB	PCI
34	34

Soil Support Index

BRAB	PCI
0.80	0.80

Soil/Climatic Rating Factor

$1 - C_w$ = **0.20**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-08

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	39	1.5	x		
II	48	7.0		x	
III	45	14.5			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **2.61** inches

Effective Plasticity Index

BRAB	PCI
45	45

Soil Support Index

BRAB	PCI
0.67	0.67

Soil/Climatic Rating Factor

$1 - C_w$ = **0.33**

RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

PVR Calculator

Frost GeoSciences, Inc.
13402 Western Oak
Helotes, Texas 78023

Project Name:	Tres Laurels Subdivision
Project Location:	Montgomery Rd
Project City:	San Antonio Tx
Project Number:	FGS-G20016
Boring Number:	B-09

Surcharge Pressure: 1.00 **psi** **Climatic Rating, C_w:** 16

Stratum	Plasticity Index	Bottom Depth (feet)	Moisture Condition		
			Dry	Average	Optimum
I	37	1.5	x		
II	49	7.0		x	
III	48	10.0			x
IV					
V					
VI					
VII					
VIII					

PVR Results

PVR = **2.45** inches

Effective Plasticity Index

BRAB	PCI
41	41

Soil Support Index

BRAB	PCI
0.71	0.71

Soil/Climatic Rating Factor

$1 - C_w$ = **0.29**

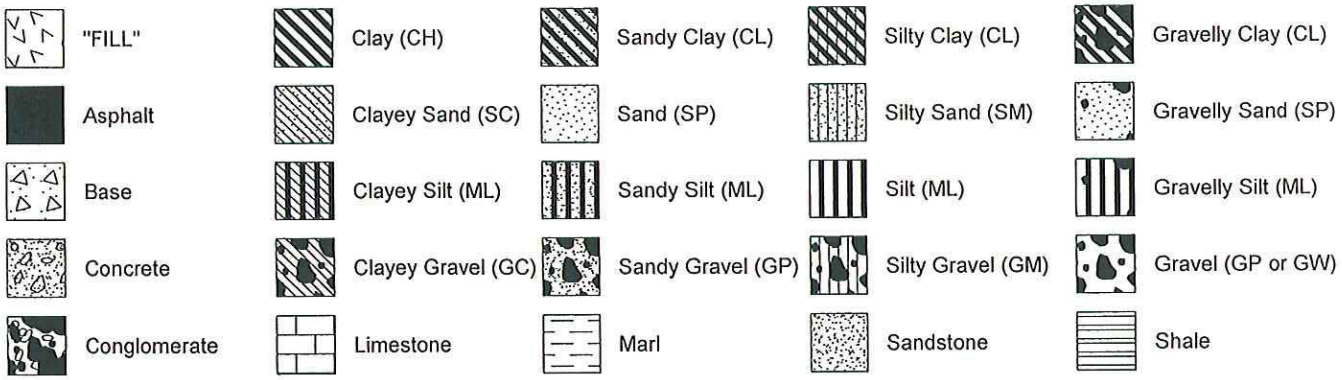
RULES

1.) Depths should not extend greater than 15 feet.
2.) Use only one moisture condition per stratum.
3.) Moisture conditions must be selected using an "x".
4.) Integers or one-half foot intervals must be used.
5.) Use PI = 8 for none expansive layers.
6.) DO NOT USE PI = 0 FOR NON-EXPANSIVE LAYERS.
7.) **Error checking is limited.**

SYMBOL KEY

Symbol Key Sheet

Material Symbols



Strength of Cohesive Soils

Consistency	Undrained Shear Strength, KSF
Very Soft	less than 0.25
Soft	0.25 to 0.50
Firm	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	greater than 4.00

Soil Plasticity

Degree of Plasticity	Plasticity Index (PI)
None	0 to 5
Low	5 to 10
Moderate	10 to 20
Plastic	20 to 40
Highly Plastic	more than 40

Density of Granular Soils

Descriptive Term	SPT Blow Count (blows/ft)
Very Loose	less than 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	more than 50

Standard Penetration Test (ASTM D 1586) Driving Record

Note: Driving is limited to 50 blows per interval, or 25 blows for 0.25 inch advancement, whichever controls. This is done to avoid damaging sampling tools.

Blows Per Foot	Description
25	Sampler was seated 6 inches, then 25 blows were required to advance the sampler 12 inches.
75/8"	Sampler was seated 6 inches, 25 blows were required for the second 6 inch increment and the 50 blow limit was reached at 2 inches of the last increment.
Ref/2"	Sampler could only be driven 2 inches of the 6 inch seating penetration before the 50 blow limit was reached.

Terms Characterizing Structure

Soil Terms	Description
Blocky	Contains cracks or failure planes resulting in rough cubes of material.
Calcareous	Contains appreciable quantities of calcium carbonate.
Fissured	Contains shrinkage cracks, which are frequently filled with fine sand or silt. The fissures are usually near vertical in orientation.
Interbedded	Composed of alternating layers of different soil types.
Laminated	Composed of thin layers of varying color and texture.
Nodules	Secondary inclusions that appear as small lumps about 0.1 to 0.3 inch in diameter.
Partings	Inclusion of different material less than 1/8 inch thick extending through the sample.
Pockets	Inclusion of different material that is smaller than the diameter of the sample.
Seams	Inclusion of different material between 1/8 and 3 inches thick, and extends through the sample.
Slickensided	Has inclined planes of weakness that are slick and glossy in appearance. Slickensides are commonly thought to be randomly oriented.
Streaks or Stains	Stains of limited extent that appear as short stripes, spots or blotches.

Rock Terms	
Bedding Plane	A surface parallel to the surface of deposition, generally marked by changes in color or grain size.
Fracture	A natural break in rock along which no displacement has occurred.
Joint	A natural break along which no displacement has occurred, and which generally intersects primary surfaces.
% Recovery	The ratio of total length of recovery to the total length of core run, expressed as a percentage.
RQD - Rock Quality Designation	The ratio of total recovered length of fragments longer than 4 inches to the total run length, expressed as a percentage.
Weathering	The process by which rock is broken down and decomposed.

Sampler Symbols

APPENDIX B

Moisture Density Relationship
CBR Test Results
Lime Series Curve and Unconfined Compressive Strength Chart
Spectra Pave Design Analysis

MOISTURE DENSITY

13406 Western Oak
Helotes, TX 78023
(210) 372-1315 phone (210) 372-1318 fax

Frost GeoSciences
Construction Materials ▪ Forensics
Environmental ▪ Geotechnical

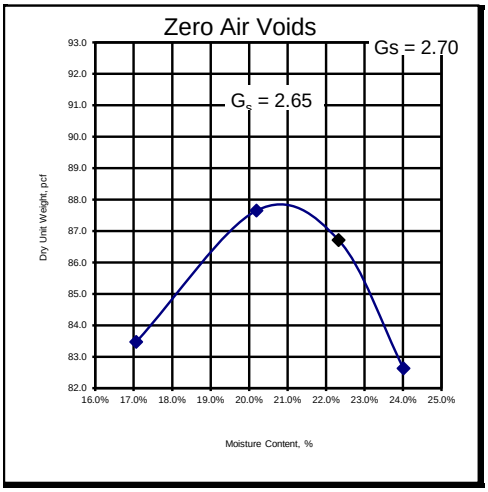
Project #: **FGS-G20016**

Project: **Tres Laurels**

Report Date: 6/30/2020
Sample Date: 6/25/2020

Client:	Mosiac Land Development		
Report:	ASTM - Standard Proctor	LAB NO:	4102
Material:	Subgrade	Report #:	S1

Moisture-Density Relationship - Subgrade Soil



Test Results

% Moisture	Dry Density Lbs./ft^3
17.1%	83.5
20.2%	87.6
22.3%	86.7
24.0%	82.6

Optimum = 21.0%

Maximum = 87.6

Sieve	% Passing
3 inch	100.0%
3/4 inch	100.0%
3/8 inch	100.0%
No. 4	100.0%
No.10	45.5%
No. 40	24.3%
No.100	5.2%
No.200	1.6%

Color: Light Brown
Description: Clay

Liquid Limit: 57
Plastic Limit: 21
Plasticity Index: 36

Location: Project Site

Desc of Rammer: Mechanical
Preparation Method: Dry
Remarks: No comments at this time.

Test Method (As Applicable): ASTM D-698 A
ASTM D-4318

Respectfully Submitted,
Frost GeoSciences, Inc.

F.J.Caballero, P. E. , Project Manager

13406 Western Oak
Helotes, TX 78023
(210) 372-1315 phone (210) 372-1318 fax

Frost GeoSciences
Construction Materials ▪ Forensics
Environmental ▪ Geotechnical

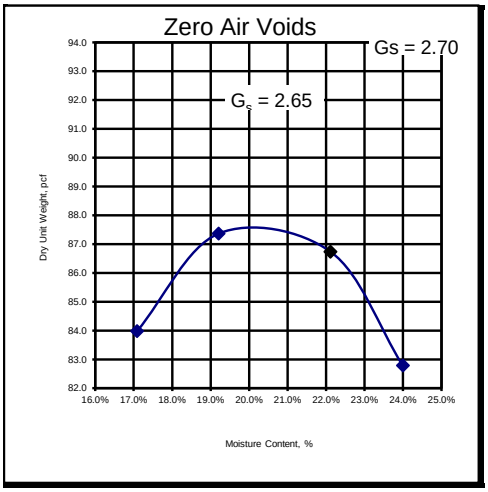
Project #: **FGS-G20016**

Project: **Tres Laurels**

Report Date: 6/30/2020
Sample Date: 6/25/2020

Client:	Mosiac Land Development		
Report:	ASTM - Standard Proctor	LAB NO:	4102
Material:	Subgrade	Report #:	S2

Moisture-Density Relationship - Subgrade Soil



Test Results

% Moisture	Dry Density Lbs./ft^3
17.1%	84.0
19.2%	87.4
22.1%	86.7
24.0%	82.8

Optimum = 20.5% Maximum = 87.4

Sieve	% Passing
3 inch	100.0%
3/4 inch	100.0%
3/8 inch	100.0%
No. 4	100.0%
No.10	44.9%
No. 40	23.8%
No.100	5.3%
No.200	1.7%

Color: Light Brown
Description: Clay

Liquid Limit: 56
Plastic Limit: 22
Plasticity Index: 34

Location: Project Site

Desc of Rammer: Mechanical
Preparation Method: Dry
Remarks: No comments at this time.

Test Method (As Applicable): ASTM D-698 A
ASTM D-4318

Respectfully Submitted,
Frost GeoSciences, Inc.

F.J.Caballero, P. E. , Project Manager

CBR RESULTS

Frost GeoSciences, Inc.
13406 Western Oak
Helotes, Texas 78023

CBR (California Bearing Ratio)
ASTM D1883

Project Name: Tres Laurels Project #: FGS-G20016
Soil Desc. Light Brown Clay CBR # 1
Tested By: Miguel Gonzalez Jr Test Date: 07/06/20

Compaction Energy: Rammer: 5.5 lbs. # layers: 3 Blows: 56
w at compaction: 21.00% Mold Dia. 6 in. Soil Ht. 4.584 in.
Volume 0.075 $ft.^3$ Opt. M.C. 21.0
Opt. Dry Unit wt. 87.6

	Initial	Final	%S
Date/Time	7/01/20 9:00am	7/06/20 9:00am	
Swell Data	0.000	0.039	0.85

Mold #	2
Surcharge, lbs.	10
Initial mass of wet soil + mold, lbs.	26.531
Final mass of wet soil + mold, lbs.	26.632
Mass of Mold, lbs.	18.104
Initial mass of wet soil, lbs.	8.427

Dry density = 87.7 Comp. 1.00114
Moisture = 21.6 Points Opt. 0.61992

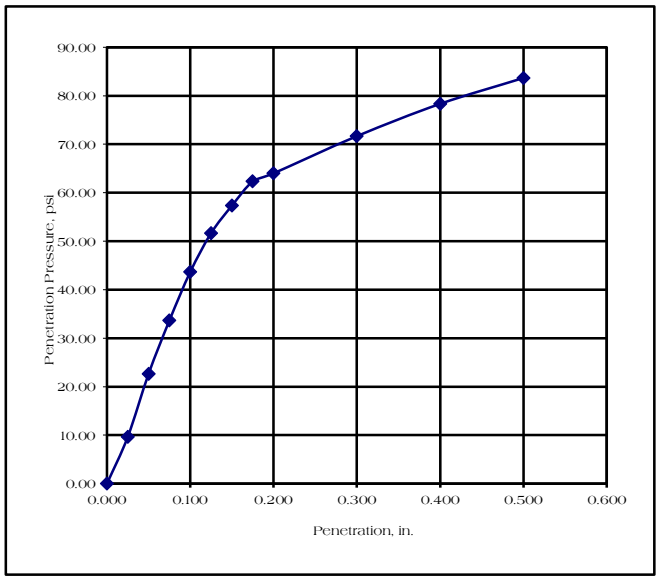
ASTM D2216 Moisture Content

Compaction	Project #	Can No.	Wet Wt. (1)	Dry Wt. (2)	Tare Wt. (3)	(1) - (2) = A	(2) - (3) = B	%MC = A/B*100
Before	GS-G20016		642.69	551.21	127.69	91.48	423.52	21.59992
After	GS-G20016		667.41	571.45	128.01	95.96	443.44	21.63991

ASTM D1883 Date: 7/6/2020
Time: 9:15am

Strain, in.	Load, lbs	Stress, psi	CBR
0.000	0.00	0.00	
0.025	29.00	9.67	
0.050	68.00	22.67	
0.075	101.00	33.67	
0.100	131.00	43.67	4.4
0.125	155.00	51.67	
0.150	172.00	57.33	
0.175	187.00	62.33	
0.200	192.00	64.00	4.3
0.300	215.00	71.67	
0.400	235.00	78.33	
0.500	251.00	83.67	

Used=TexDot Sieves



Frost GeoSciences, Inc.
13406 Western Oak
Helotes, Texas 78023

CBR (California Bearing Ratio)
ASTM D1883

Project Name: Tres Laurels Project #: FGS-G20016
Soil Desc. Light Brown Clay CBR # 2
Tested By: Miguel Gonzalez Jr Test Date: 07/06/20

Compaction Energy: Rammer: 5.5 lbs. # layers: 3 Blows: 56
w at compaction: 20.50% Mold Dia. 6 in. Soil Ht. 4.584 in.
Volume 0.075 $ft.^3$ Opt. M.C. 20.5
Opt. Dry Unit wt. 87.4

	Initial	Final	%S
Date/Time	7/01/20 9:00am	7/06/20 9:00am	
Swell Data	0.000	0.042	0.92

Mold #	3
Surcharge, lbs.	10
Initial mass of wet soil + mold, lbs.	26.542
Final mass of wet soil + mold, lbs.	26.641
Mass of Mold, lbs.	18.096
Initial mass of wet soil, lbs.	8.446

Dry density = 87.3 Comp. 0.99886
Moisture = 20.8 Points Opt. 0.33143

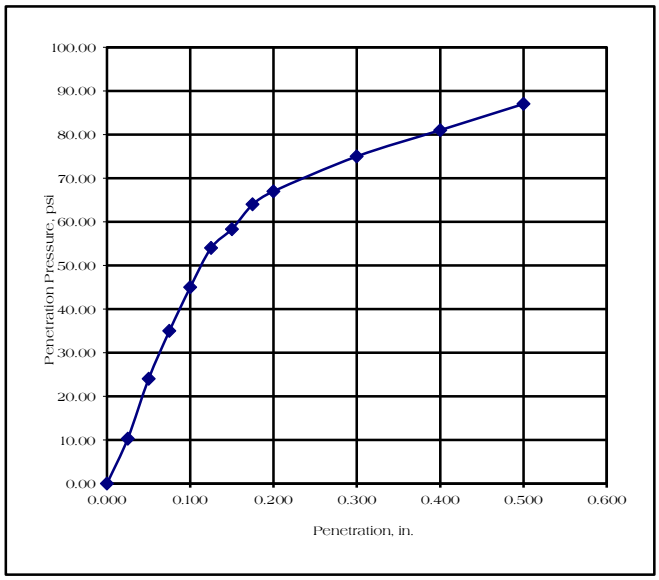
ASTM D2216 Moisture Content

Compaction	Project #	Can No.	Wet Wt. (1)	Dry Wt. (2)	Tare Wt. (3)	(1) - (2) = A	(2) - (3) = B	%MC = A/B*100
Before	GS-G20016		635.65	505.33	128.41	130.32	376.92	34.57498
After	GS-G20016		657.31	622.22	127.15	35.09	495.07	7.087887

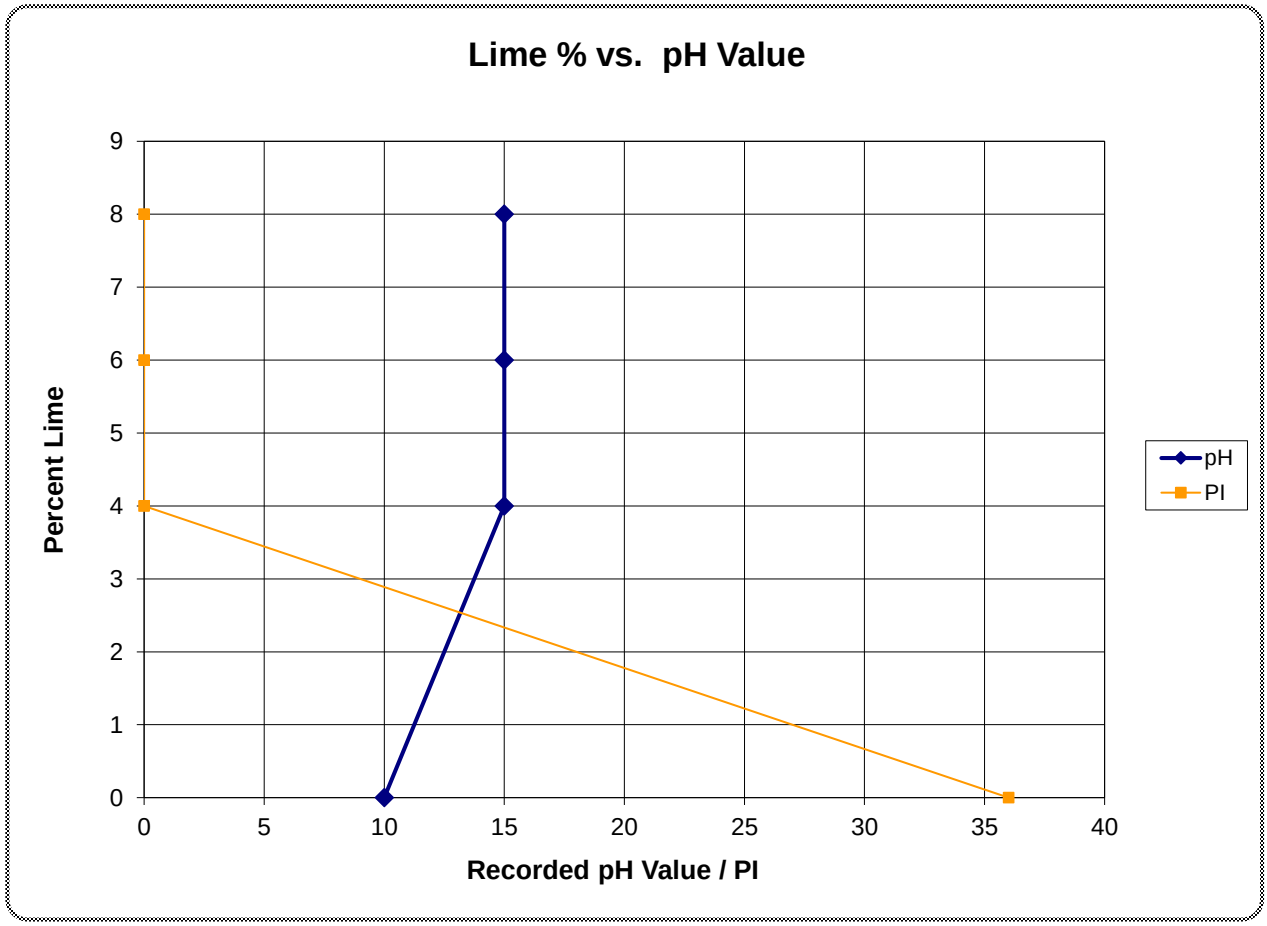
ASTM D1883 Date: 7/6/2020
Time: 9:15am

Strain, in.	Load, lbs	Stress, psi	CBR
0.000	0.00	0.00	
0.025	31.00	10.33	
0.050	72.00	24.00	
0.075	105.00	35.00	
0.100	135.00	45.00	4.5
0.125	162.00	54.00	
0.150	175.00	58.33	
0.175	192.00	64.00	
0.200	201.00	67.00	4.5
0.300	225.00	75.00	
0.400	243.00	81.00	
0.500	261.00	87.00	

Used=TexDot Sieves



LIME SERIES CURVE



Project Name: Tres Laurels
Project Number: FGS-G20016
Soil Description: Light Brown Clay

%Lime	pH	PI
0	10	36
4	15	0
6	15	0
8	15	0

	6`/.		8`/.
Set #1	160	Set #1	175
Set #2	155	Set #2	180

SPECTRA PAVE

SpectraPave™
Pavement Optimization Design Analysis

Design Parameters for AASHTO (1993) Equation

Reliability (%)	= 70	Initial Serviceability	= 4.2
Standard Normal Deviate	= -.524	Terminal Serviceability	= 2.0
Standard Deviation	= 0.45	Change in Serviceability	= 2.2

Aggregate fill shall conform to following requirement:

D50 <= 27mm (Base course)

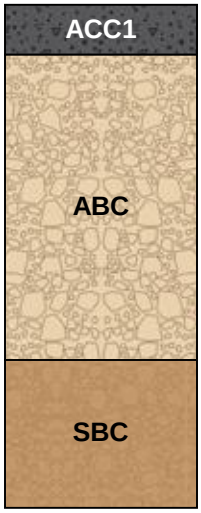
Unstabilized Section Material Properties

Layer	Description	Cost ($/ton)	Layer coefficient	Drainage factor
ACC1	Asphalt Wearing Course	70.00	0.440	N/A
ABC	Aggregate Base Course	20.00	0.140	1.0
SBC	Subbase Course	16.00	0.080	1.0

Stabilized Section Material Properties

Layer	Description	Cost ($/ton)	Layer coefficient	Drainage factor
ACC1	Asphalt Wearing Course	70.00	0.440	N/A
MSL	Mechanically Stabilized Base Course	20.00	0.250	1.0
SBC	Subbase Course	16.00	0.080	1.0

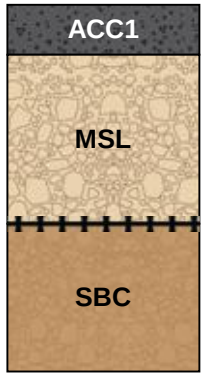
Unstabilized Pavement



2.00 (in)
12.50 (in)
6.00 (in)

Subgrade Modulus = 6,650 (psi)
Structural Number = 3.110
Calculated Traffic (ESALs) = 1,068,000

Stabilized Pavement



Tensar TX5
(Overlap=1.0ft)

2.00 (in)
7.00 (in)
6.00 (in)

Subgrade Modulus = 6,650 (psi)
Structural Number = 3.110
Calculated Traffic (ESALs) = 1,068,000

LIMITATIONS OF THE REPORT

The designs, illustrations, information and other content included in this report are necessarily general and conceptual in nature, and do not constitute engineering advice or any design intended for actual construction. Specific design recommendations can be provided as the project develops.

Project Name	TRES LAURELS SUB'D., LOCAL "A" STREET		
Company Name	MOSIAC LAND DEVELOPMENT		
Designer	F. J. CABALLERO, P. E.	Date	July 23, 2020

SpectraPave™
Pavement Optimization Design Analysis

Design Parameters for AASHTO (1993) Equation

Reliability (%)	= 90	Initial Serviceability	= 4.2
Standard Normal Deviate	= -1.282	Terminal Serviceability	= 2.0
Standard Deviation	= 0.45	Change in Serviceability	= 2.2

Aggregate fill shall conform to following requirement:

D50 <= 27mm (Base course)

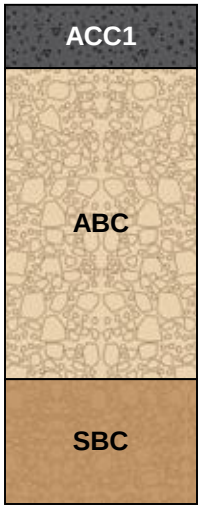
Unstabilized Section Material Properties

Layer	Description	Cost ($/ton)	Layer coefficient	Drainage factor
ACC1	Asphalt Wearing Course	70.00	0.440	N/A
ABC	Aggregate Base Course	20.00	0.140	1.0
SBC	Subbase Course	16.00	0.080	1.0

Stabilized Section Material Properties

Layer	Description	Cost ($/ton)	Layer coefficient	Drainage factor
ACC1	Asphalt Wearing Course	70.00	0.440	N/A
MSL	Mechanically Stabilized Base Course	20.00	0.230	1.0
SBC	Subbase Course	16.00	0.080	1.0

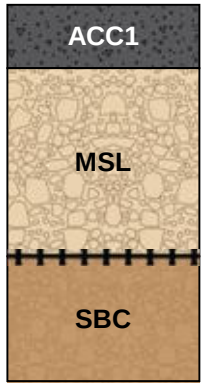
Unstabilized Pavement



3.00 (in)
14.75 (in)
6.00 (in)

Subgrade Modulus = 6,650 (psi)
Structural Number = 3.865
Calculated Traffic (ESALs) = 2,117,000

Stabilized Pavement



Tensar TX5
(Overlap=1.0ft)

3.00 (in)
9.00 (in)
6.00 (in)

Subgrade Modulus = 6,650 (psi)
Structural Number = 3.870
Calculated Traffic (ESALs) = 2,136,000

LIMITATIONS OF THE REPORT

The designs, illustrations, information and other content included in this report are necessarily general and conceptual in nature, and do not constitute engineering advice or any design intended for actual construction. Specific design recommendations can be provided as the project develops.

Project Name	TRES LAURELS SUB'D., LOCAL "B" STREET		
Company Name	MOSIAC LAND DEVELOPMENT		
Designer	F. J. CABALLERO, P. E.	Date	July 23, 2020

SpectraPave™
Pavement Optimization Design Analysis

Design Parameters for AASHTO (1993) Equation

Reliability (%)	= 95	Initial Serviceability	= 4.2
Standard Normal Deviate	= -1.645	Terminal Serviceability	= 2.5
Standard Deviation	= 0.45	Change in Serviceability	= 1.7

Aggregate fill shall conform to following requirement:

D50 <= 27mm (Base course)

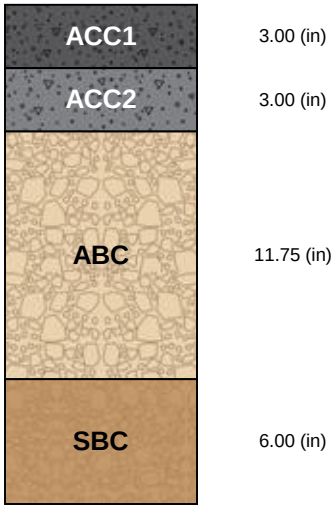
Unstabilized Section Material Properties

Layer	Description	Cost ($/ton)	Layer coefficient	Drainage factor
ACC1	Asphalt Wearing Course	70.00	0.440	N/A
ACC2	Dense-graded Asphalt Course	70.00	0.380	N/A
ABC	Aggregate Base Course	20.00	0.140	1.0
SBC	Subbase Course	16.00	0.080	1.0

Stabilized Section Material Properties

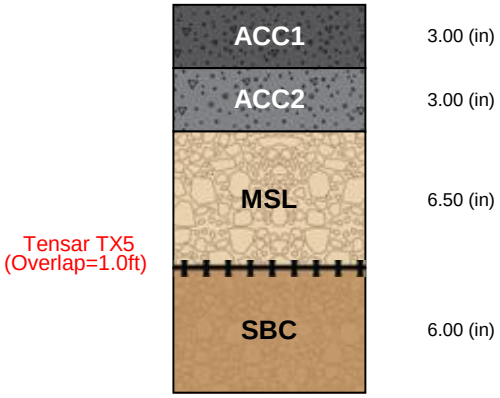
Layer	Description	Cost ($/ton)	Layer coefficient	Drainage factor
ACC1	Asphalt Wearing Course	70.00	0.440	N/A
ACC2	Dense-graded Asphalt Course	70.00	0.380	N/A
MSL	Mechanically Stabilized Base Course	20.00	0.257	1.0
SBC	Subbase Course	16.00	0.080	1.0

Unstabilized Pavement



Subgrade Modulus = 6,650 (psi)
Structural Number = 4.585
Calculated Traffic (ESALs) = 3,037,000

Stabilized Pavement



Subgrade Modulus = 6,650 (psi)
Structural Number = 4.610
Calculated Traffic (ESALs) = 3,152,000

LIMITATIONS OF THE REPORT

The designs, illustrations, information and other content included in this report are necessarily general and conceptual in nature, and do not constitute engineering advice or any design intended for actual construction. Specific design recommendations can be provided as the project develops.

Project Name	TRES LAURELS SUB'D., (ARTERIAL STREET)		
Company Name	MOSIAC LAND DEVELOPMENT		
Designer	F. J. CABALLERO, P. E.	Date	July 23, 2020

ATTACHMENTS

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)

TRES LAURELS, UNIT 4A
CONSTRUCTION PLANS

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)

CIVIL PLANS

CUDEENGINEERS.COM

SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

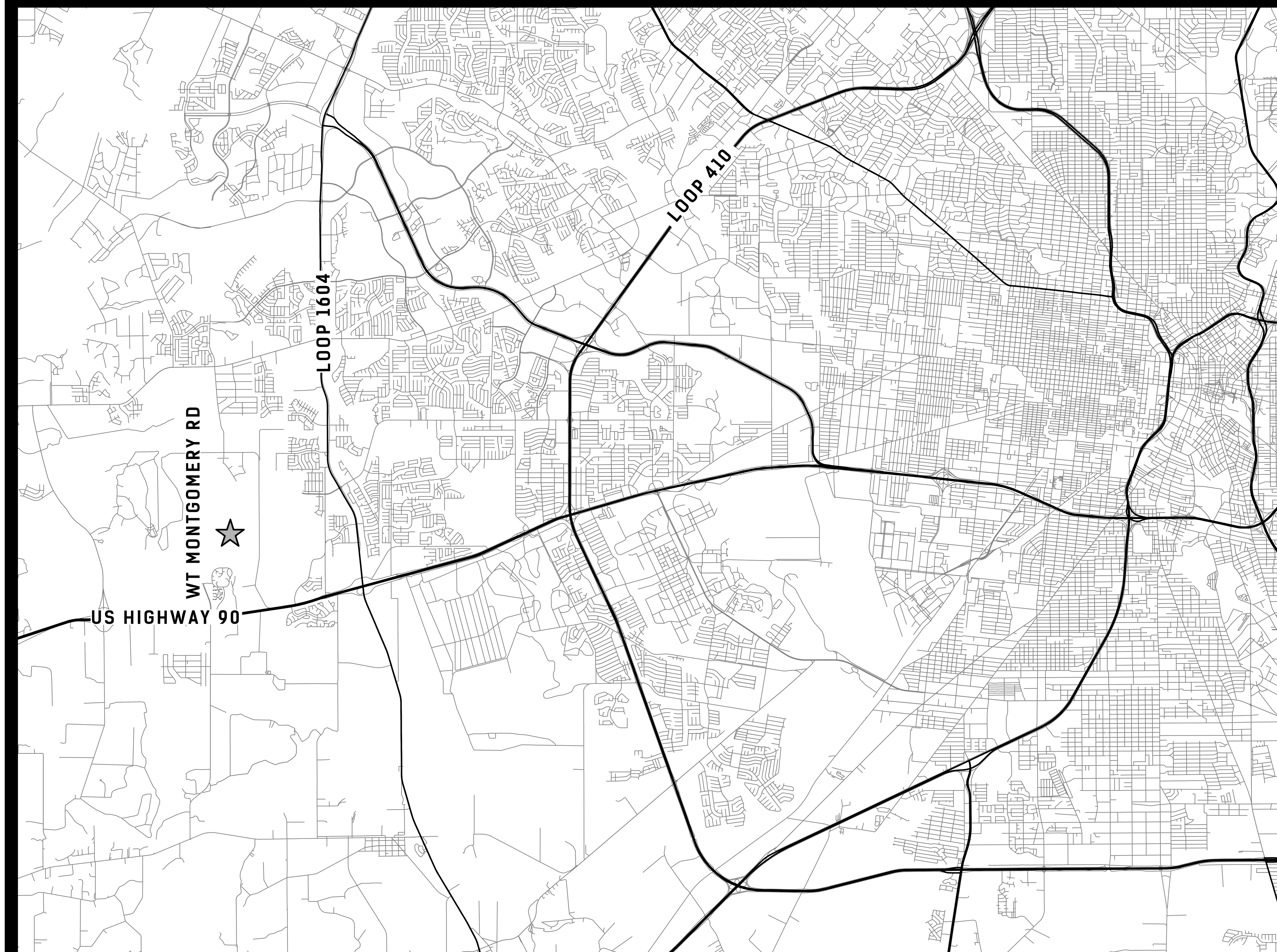
Developer's Name	LENNAR HOMES				
Developer's Address	100 NE LOOP 410 SUITE 1155				
City	SAN ANTONIO	State	TX	Zip	78216
Phone #	(210) 403-6200	Fax #	–		
SAWS Block Map #		Total EDU's	178	Total Acreage	31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS – SDR 26 427 L.F. OF 12" SS – SDR 26	Plat No.	24-11800118		
Number of Lots	178	SAWS Job No.	24-1545		

SAWS PRESSURE ZONE 950W

Developer's Name	LENNAR HOMES				
Developer's Address	100 NE LOOP 410 SUITE 1155				
City	SAN ANTONIO	State	TX	Zip	78216
Phone #	(210) 403-6200	Fax #	–		
SAWS Block Map #		Total EDU's	185	Total Acreage	31.33
Total Linear Footage of Pipe	12" – 165 L.F. ; 8" – 3,727 L.F. ; 2" H.D.P.E. – 622 L.F.	Plat No.	24-11800118		
Number of Lots	178	SAWS Job No.	24-1050		

CONSTRUCTION DOCUMENTS FOR

TRES LAURELS UNIT 4A

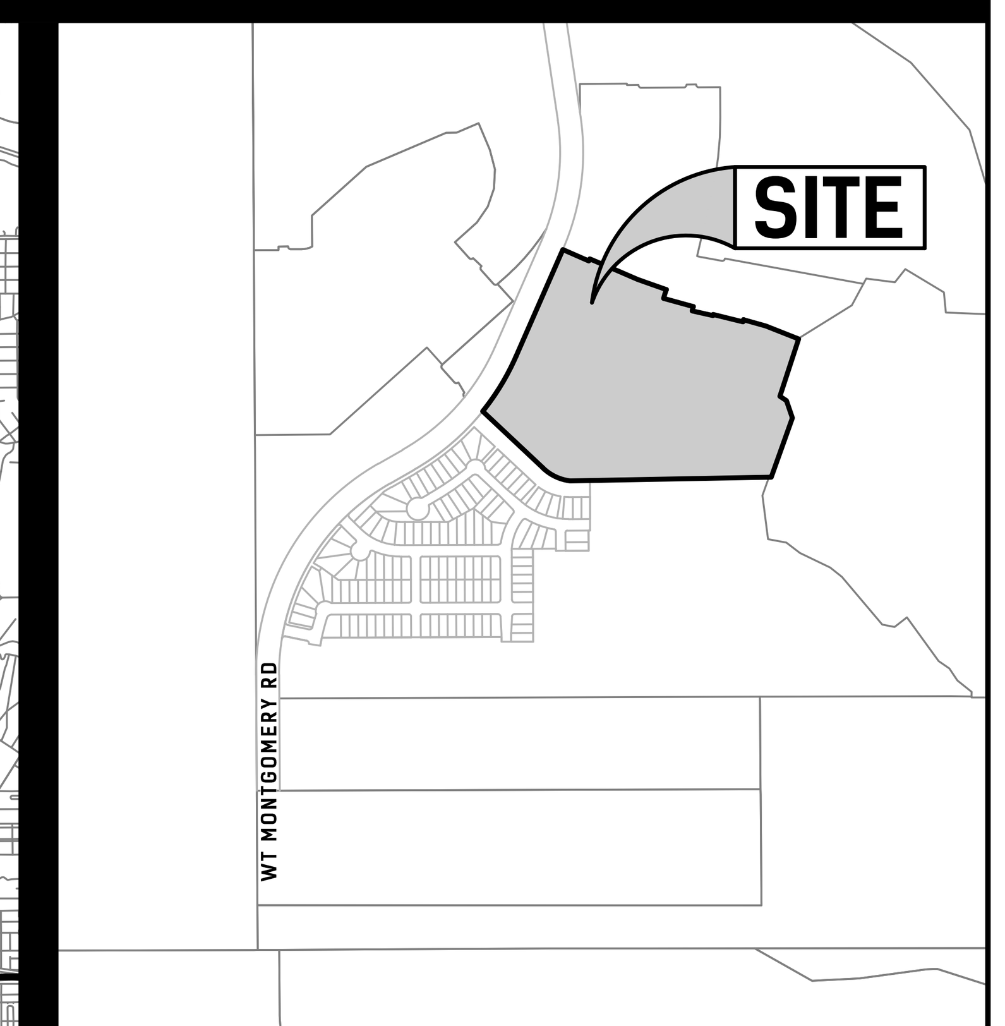


VICINITY MAP
N.T.S.

EST. 1980
CUDE
ENGINEERS

SAN ANTONIO | AUSTIN | SAN MARCOS

4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TEXAS 78231
P:(210) 681.2951
TBPE FIRM NO. 455
TBPLS FIRM NO. 10048500
SBE CERTIFIED FIRM



LOCATION MAP
SCALE: 1" = 1000'

DEVELOPER:
LENNAR HOMES OF TEXAS LAND
AND CONSTRUCTION, LTD.
CONTACT PERSON: RICHARD MOTT
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
TEL: (210) 403-6200

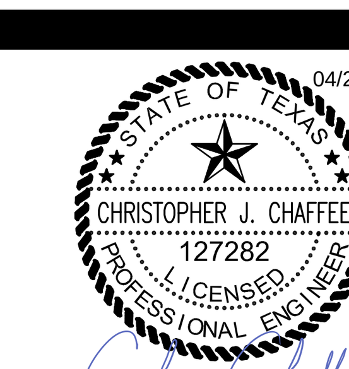
N W E S

MDP NUMBER:
24-11100004

PLAT NUMBER:
24-11800118

PROJECT NUMBER:
03050.015

04/25/2024

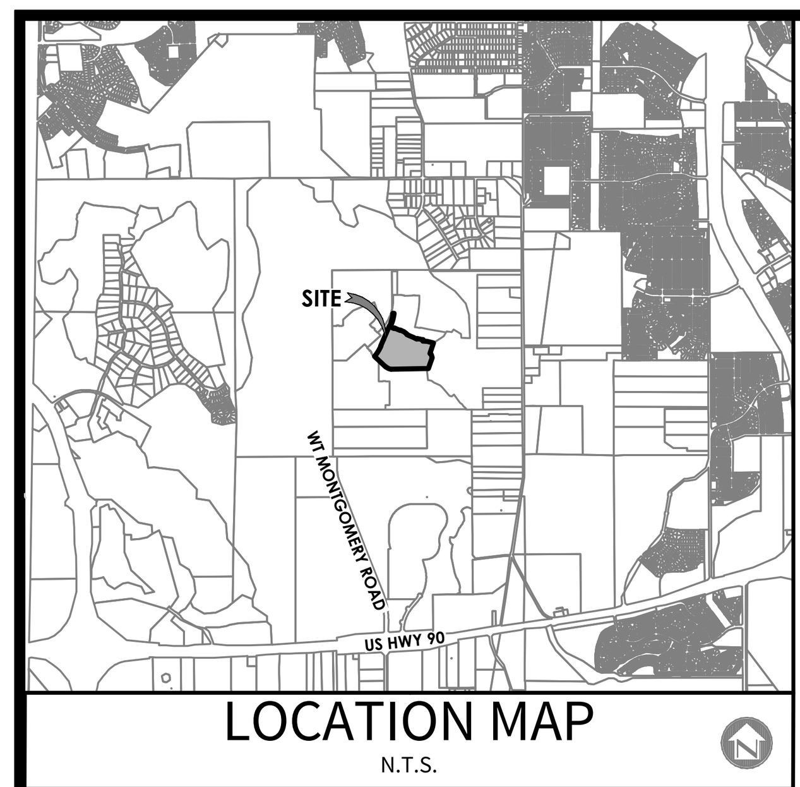


I HAVE REVIEWED THIS PLAN SET FOR QUALITY ASSURANCE AND QUALITY CONTROL PURPOSES.

04/22/2024

THIS PLAN SET HAS BEEN PREPARED, DESIGNED AND REVIEWED UNDER MY DIRECT SUPERVISION.

P:\03050\015\2-DWG\4-Plans\00_cvrall.dwg 2024/04/18 4:09pm rmata

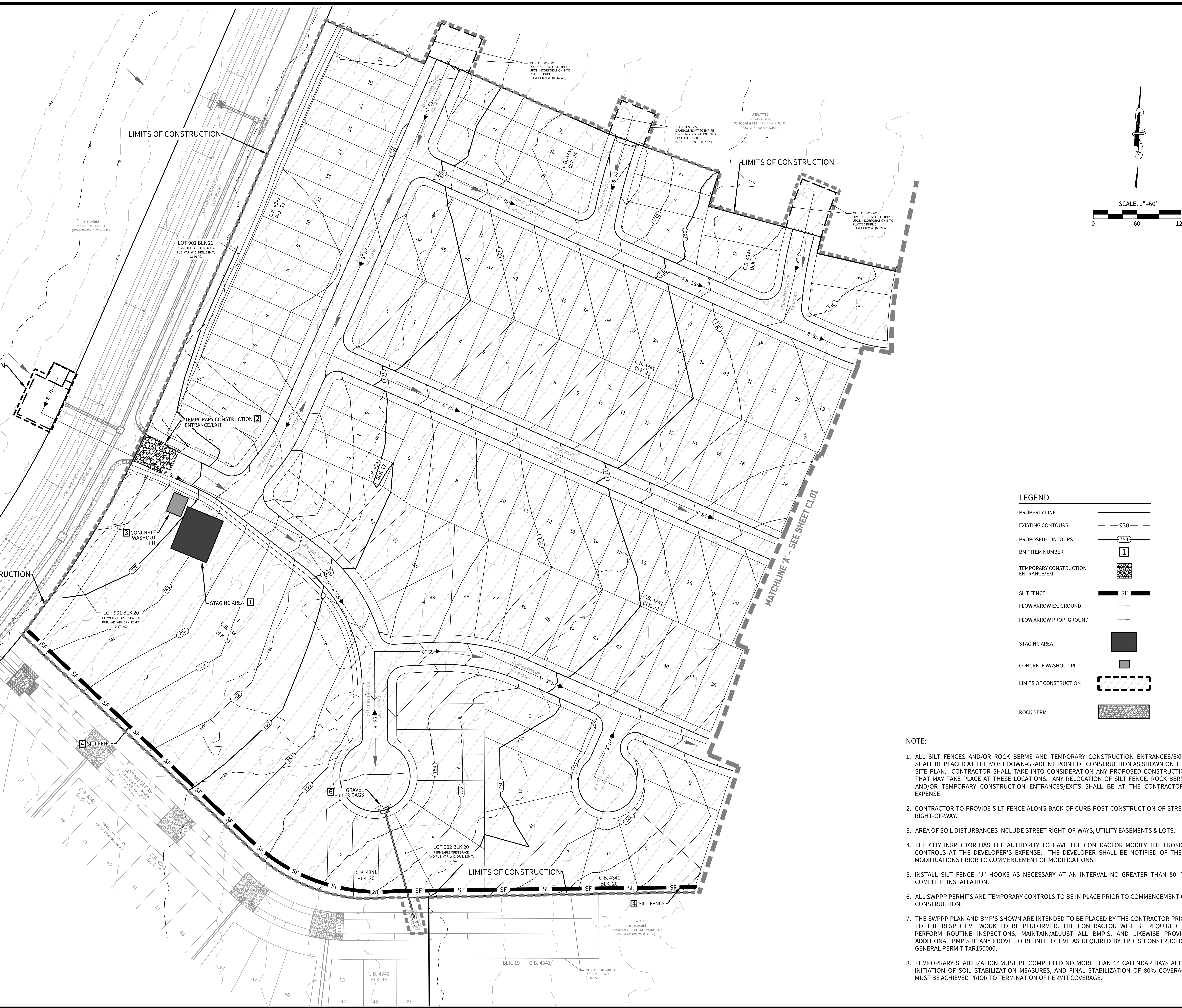


OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



NOTE:

1. ALL SILT FENCES AND/OR ROCK BERMS AND TEMPORARY CONSTRUCTION ENTRANCES/EXITS SHALL BE PLACED AT THE MOST DOWN-GRADIENT POINT OF CONSTRUCTION AS SHOWN ON THIS SITE PLAN. CONTRACTOR SHALL TAKE INTO CONSIDERATION ANY PROPOSED CONSTRUCTION THAT MAY TAKE PLACE AT THESE LOCATIONS. ANY RELOCATION OF SILT FENCE, ROCK BERMS AND/OR TEMPORARY CONSTRUCTION ENTRANCES/EXITS SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. CONTRACTOR TO PROVIDE SILT FENCE ALONG BACK OF CURB POST-CONSTRUCTION OF STREET RIGHT-OF-WAY.
3. AREA OF SOIL DISTURBANCES INCLUDE STREET RIGHT-OF-WAYS, UTILITY EASEMENTS & LOTS.
4. THE CITY INSPECTOR HAS THE AUTHORITY TO HAVE THE CONTRACTOR MODIFY THE EROSION CONTROLS AT THE DEVELOPER'S EXPENSE. THE DEVELOPER SHALL BE NOTIFIED OF THESE MODIFICATIONS PRIOR TO COMMENCEMENT OF MODIFICATIONS.
5. INSTALL SILT FENCE "J" HOOKS AS NECESSARY AT AN INTERVAL NO GREATER THAN 50' TO COMPLETE INSTALLATION.
6. ALL SWPPP PERMITS AND TEMPORARY CONTROLS TO BE IN PLACE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. THE SWPPP PLAN AND BMP'S SHOWN ARE INTENDED TO BE PLACED BY THE CONTRACTOR PRIOR TO THE RESPECTIVE WORK TO BE PERFORMED. THE CONTRACTOR WILL BE REQUIRED TO PERFORM ROUTINE INSPECTIONS, MAINTAIN/ADJUST ALL BMP'S, AND LIKEWISE PROVIDE ADDITIONAL BMP'S IF ANY PROVE TO BE INEFFECTIVE AS REQUIRED BY TPDES CONSTRUCTION GENERAL PERMIT TXR150000.
8. TEMPOPRARY STABILIZATION MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION OF SOIL STABILIZATION MEASURES, AND FINAL STABILIZATION OF 80% COVERAGE MUST BE ACHIEVED PRIOR TO TERMINATION OF PERMIT COVERAGE.

CUDEENGINEERS.COM
CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STORMWATER POLLUTION PREVENTION PLAN

DATE
06/24/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

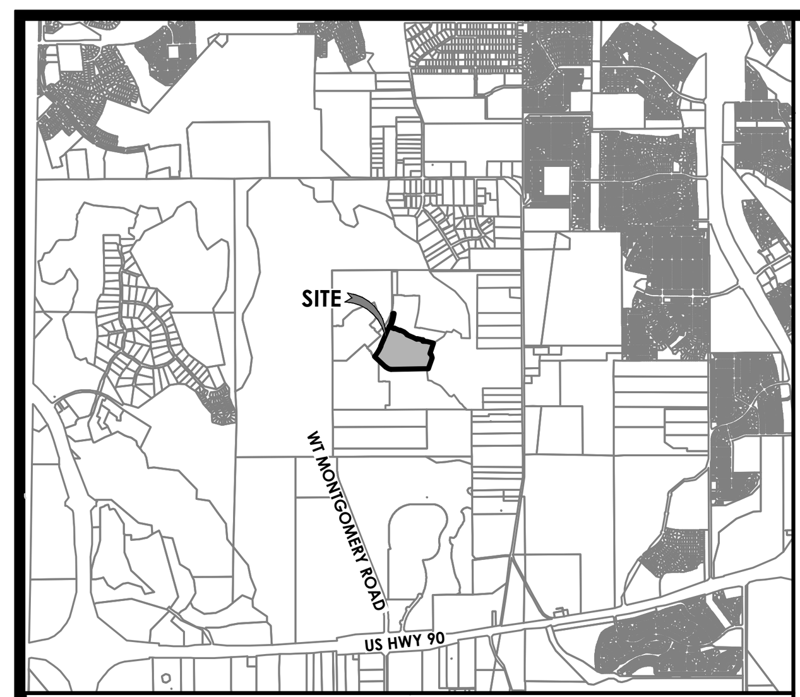
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C1.00



OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

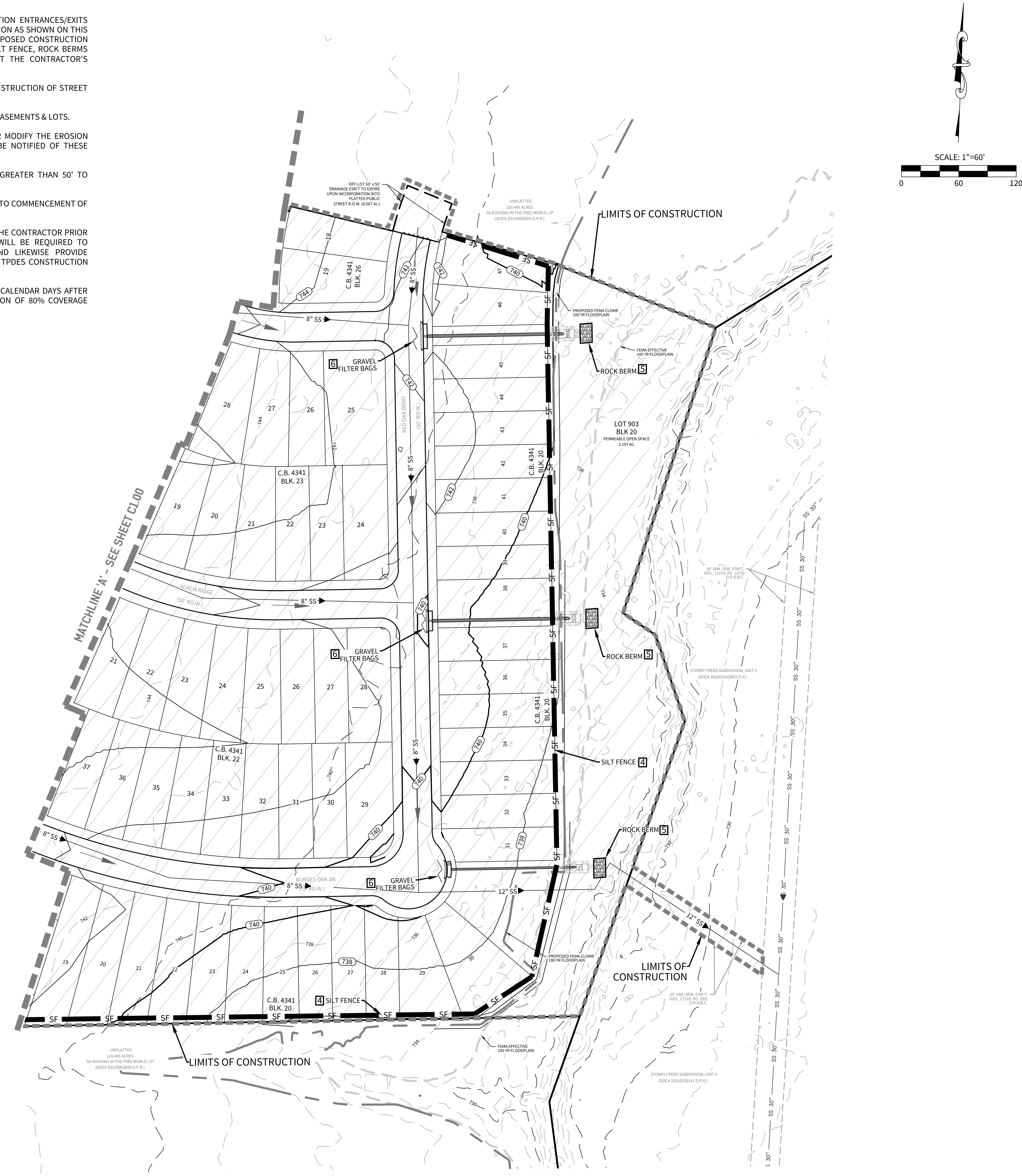
M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

LEGEND

PROPERTY LINE	
EXISTING CONTOURS	930
PROPOSED CONTOURS	754
BMP ITEM NUMBER	1
TEMPORARY CONSTRUCTION ENTRANCE/EXIT	
SILT FENCE	SF
FLOW ARROW EX. GROUND	
FLOW ARROW PROP. GROUND	
STAGING AREA	
CONCRETE WASHOUT PIT	
LIMITS OF CONSTRUCTION	
ROCK BERM	

NOTE:

1. ALL SILT FENCES AND/OR ROCK BERMS AND TEMPORARY CONSTRUCTION ENTRANCES/EXITS SHALL BE PLACED AT THE MOST DOWN-GRADIENT POINT OF CONSTRUCTION AS SHOWN ON THIS SITE PLAN. CONTRACTOR SHALL TAKE INTO CONSIDERATION ANY PROPOSED CONSTRUCTION THAT MAY TAKE PLACE AT THESE LOCATIONS. ANY RELOCATION OF SILT FENCE, ROCK BERMS AND/OR TEMPORARY CONSTRUCTION ENTRANCES/EXITS SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. CONTRACTOR TO PROVIDE SILT FENCE ALONG BACK OF CURB POST-CONSTRUCTION OF STREET RIGHT-OF-WAY.
3. AREA OF SOIL DISTURBANCES INCLUDE STREET RIGHT-OF-WAYS, UTILITY EASEMENTS & LOTS.
4. THE CITY INSPECTOR HAS THE AUTHORITY TO HAVE THE CONTRACTOR MODIFY THE EROSION CONTROLS AT THE DEVELOPER'S EXPENSE. THE DEVELOPER SHALL BE NOTIFIED OF THESE MODIFICATIONS PRIOR TO COMMENCEMENT OF MODIFICATIONS.
5. INSTALL SILT FENCE "J" HOOKS AS NECESSARY AT AN INTERVAL NO GREATER THAN 50' TO COMPLETE INSTALLATION.
6. ALL SWPPP PERMITS AND TEMPORARY CONTROLS TO BE IN PLACE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. THE SWPPP PLAN AND BMP'S SHOWN ARE INTENDED TO BE PLACED BY THE CONTRACTOR PRIOR TO THE RESPECTIVE WORK TO BE PERFORMED. THE CONTRACTOR WILL BE REQUIRED TO PERFORM ROUTINE INSPECTIONS, MAINTAIN/ADJUST ALL BMP'S, AND LIKEWISE PROVIDE ADDITIONAL BMP'S IF ANY PROVE TO BE INEFFECTIVE AS REQUIRED BY TPDES CONSTRUCTION GENERAL PERMIT TXR150000.
8. TEMPOPRARY STABILIZATION MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION OF SOIL STABILIZATION MEASURES, AND FINAL STABILIZATION OF 80% COVERAGE MUST BE ACHIEVED PRIOR TO TERMINATION OF PERMIT COVERAGE.



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STORMWATER POLLUTION PREVENTION PLAN

DATE	06/24/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

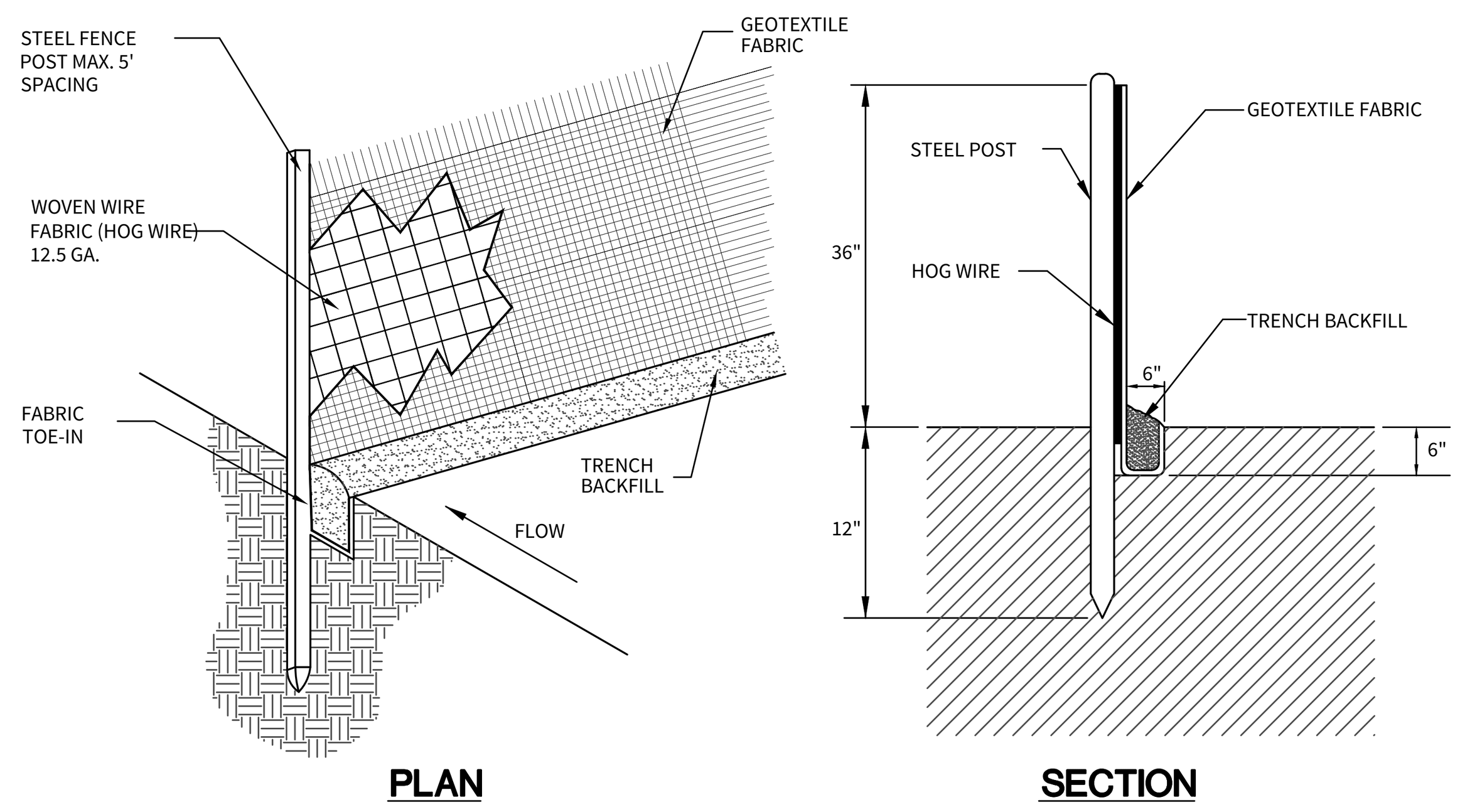
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C1.01

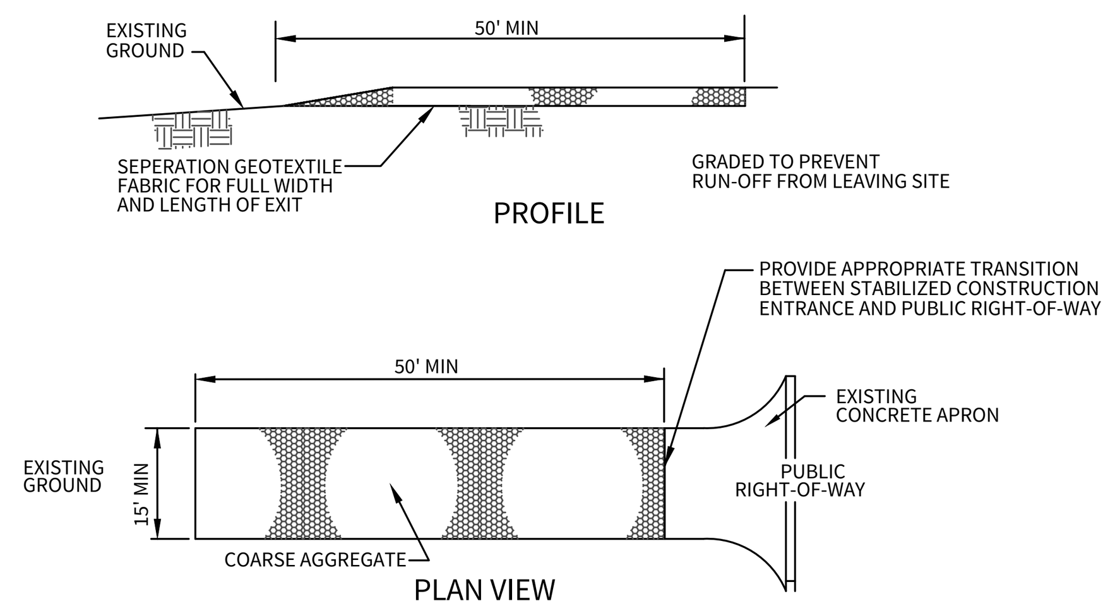


NOTES:

1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN OR NON WOVEN FABRIC. THE FABRIC WIDTH SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN 2 , ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
2. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT 2 , AND BRINDELL HARDNESS EXCEEDING 140.
3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12.5 GAUGE MINIMUM.
4. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1 FOOT DEEP AND SPACED NOT MORE THAN 5 FEET ON CENTER.
5. LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS ¼ ACRE/100 FEET OF FENCE.
6. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN-SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.
7. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
8. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
9. SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
10. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES, OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE OLD FENCE.
11. REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.
12. REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.

1 SILT FENCE DETAIL

SCALE: NONE



GENERAL NOTES

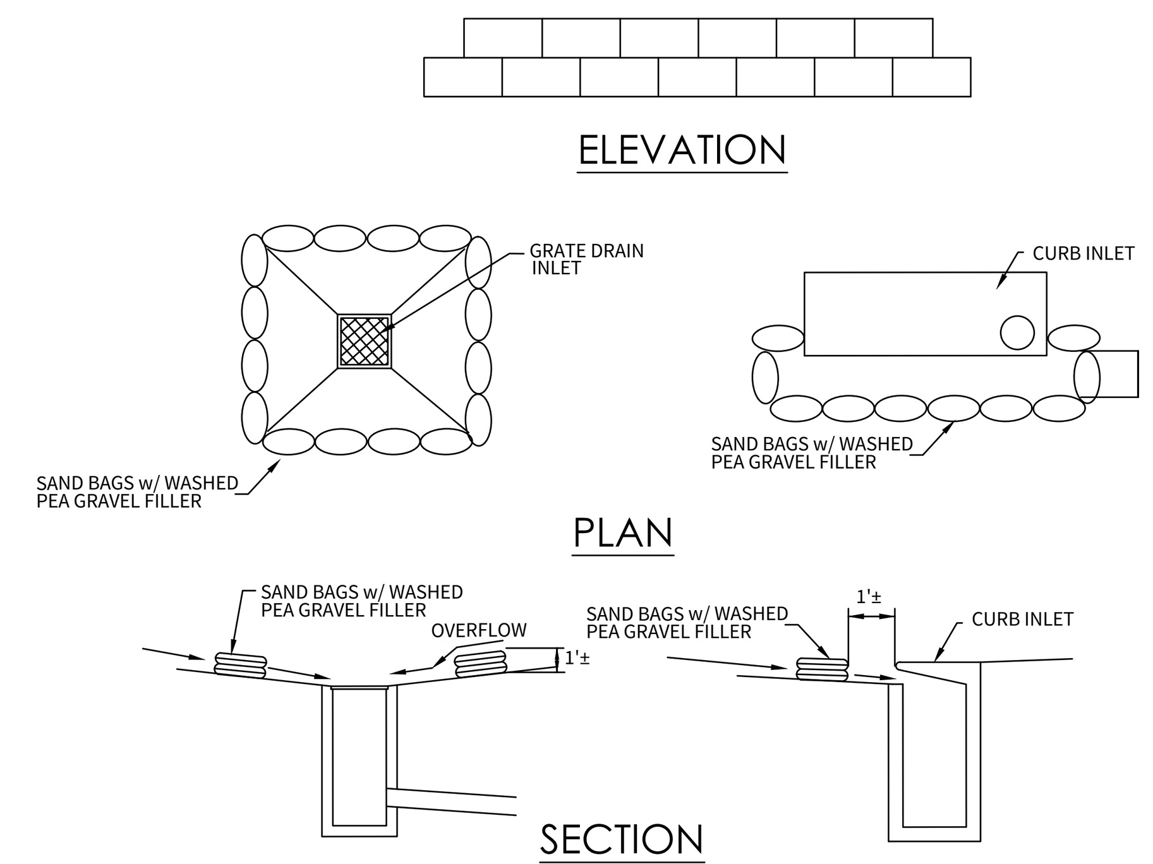
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A TRUCK WASHING AREA WHEN SHOWN ON THE CONSTRUCTION DRAWING. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA.
5. STONE MATERIAL SHALL CONSIST OF 3 TO 5 INCH OPEN GRADED ROCK AND SHALL BE PLACED IN A LAYER OF AT LEAST 8 INCHES THICKNESS.

NOTES:

1. THE AGGREGATE SHOULD CONSIST OF 4 TO 8 INCH WASHED STONE OVER A STABLE FOUNDATION.
2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8 INCHES.
3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/YD 2 , A MULLEN BURST RATING OF 140 LB/IN 2, AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.
4. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.
5. THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.
6. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG.
7. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.
8. PLACE STONE TO DIMENSIONS AND GRADE SHOWN. LEAVE SURFACE SMOOTH AND SLOPE FOR DRAINAGE.
9. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
10. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
11. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
12. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
13. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE.

2 TEMPORARY CONSTRUCTION ENTRANCE / EXIT

SCALE: NONE

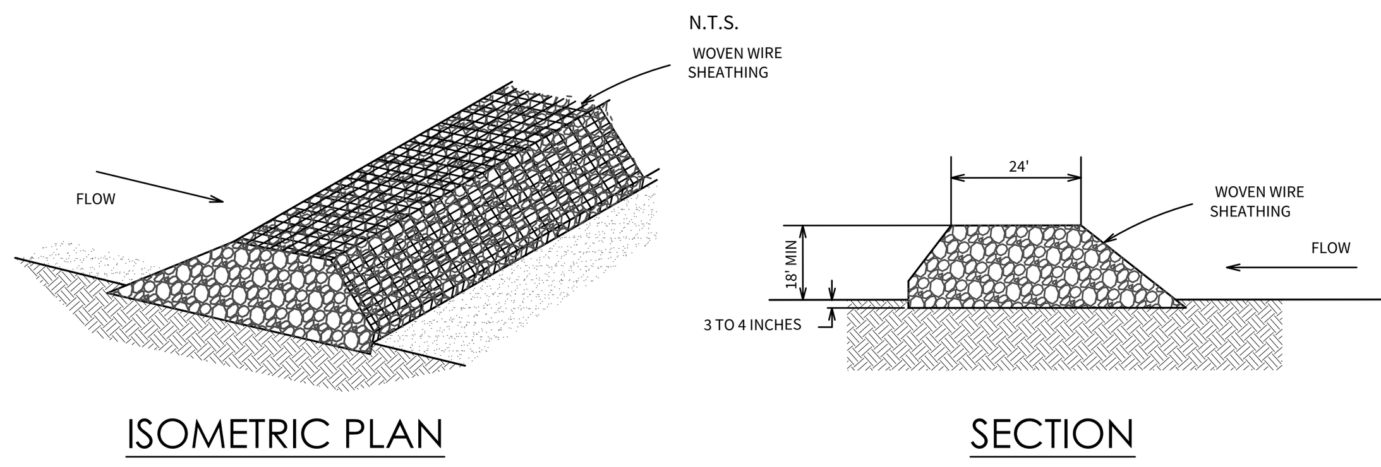


BAGGED GRAVEL INLET FILTER NOTES

1. THE GRAVEL BAG MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE, POLYAMIDE OR COTTON BURLAP WOVEN FABRIC, MINIMUM UNIT WEIGHT 4 OZ/YD 2 , MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70 PERCENT.
2. THE BAG LENGTH SHOULD BE 24 INCHES, WIDTH SHOULD BE 18 INCHES AND THICKNESS SHOULD BE 6 INCHES.
3. THE GRAVEL BAGS SHOULD BE FILLED WITH ¾" GRAVEL .
4. WHEN A GRAVEL BAG IS FILLED WITH GRAVEL, THE OPEN END OF THE GRAVEL BAG SHOULD BE STAPLED OR TIED WITH NYLON OR POLY CORD.
5. THE GRAVEL BAGS SHOULD BE PLACED AS SHOWN ON THE DETAIL. THE GRAVEL BAGS SHALL BE STACKED TO FORM A CONTINUOUS BARRIER AROUND THE INLETS. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.
6. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
7. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.
8. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
9. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

3 BAGGED GRAVEL INLET FILTER

SCALE: NONE

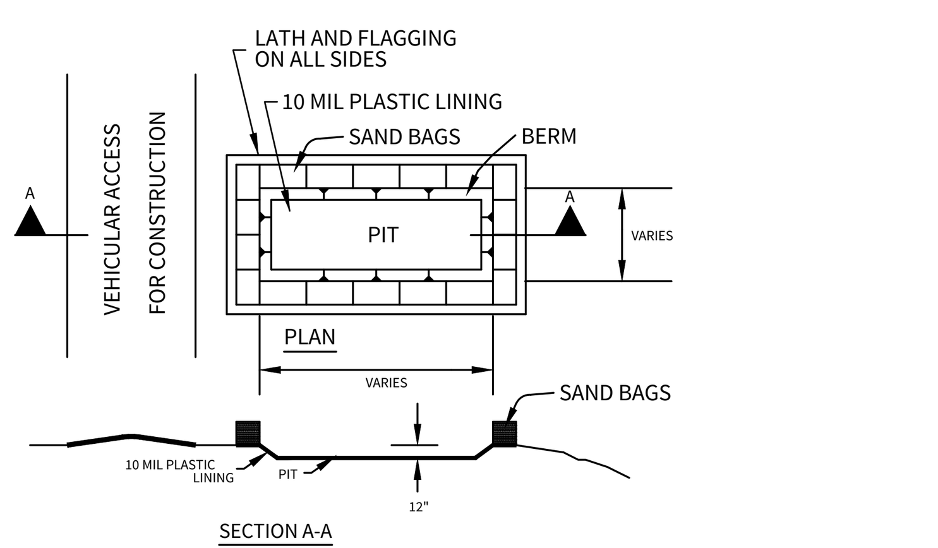


NOTES:

1. THE BERM STRUCTURE SHOULD BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 1 INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT RINGS.
2. CLEAN, OPEN GRADED 3 TO 5-INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5-TO 8-INCH DIAMETER ROCKS MAY BE USED.
3. LAY OUT THE WOVEN WIRE SHEATHING PERPENDICULAR TO THE FLOW LINE.
4. BERM SHOULD HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES BEING 2:1 (H:V) OR FLATTER.
5. PLACE THE ROCK ALONG THE SHEATHING TO A HEIGHT NOT LESS THAN 18".
6. WRAP THE WIRE SHEATHING AROUND THE ROCK AND SECURE WITH TIE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.
7. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.
8. THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
9. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
10. REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT OF IN AN APPROVED MANNER AND REPAIR ANY LOOSE WIRE SHEATHING.
11. THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
12. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

4 ROCK BERM DETAIL

SCALE: NONE

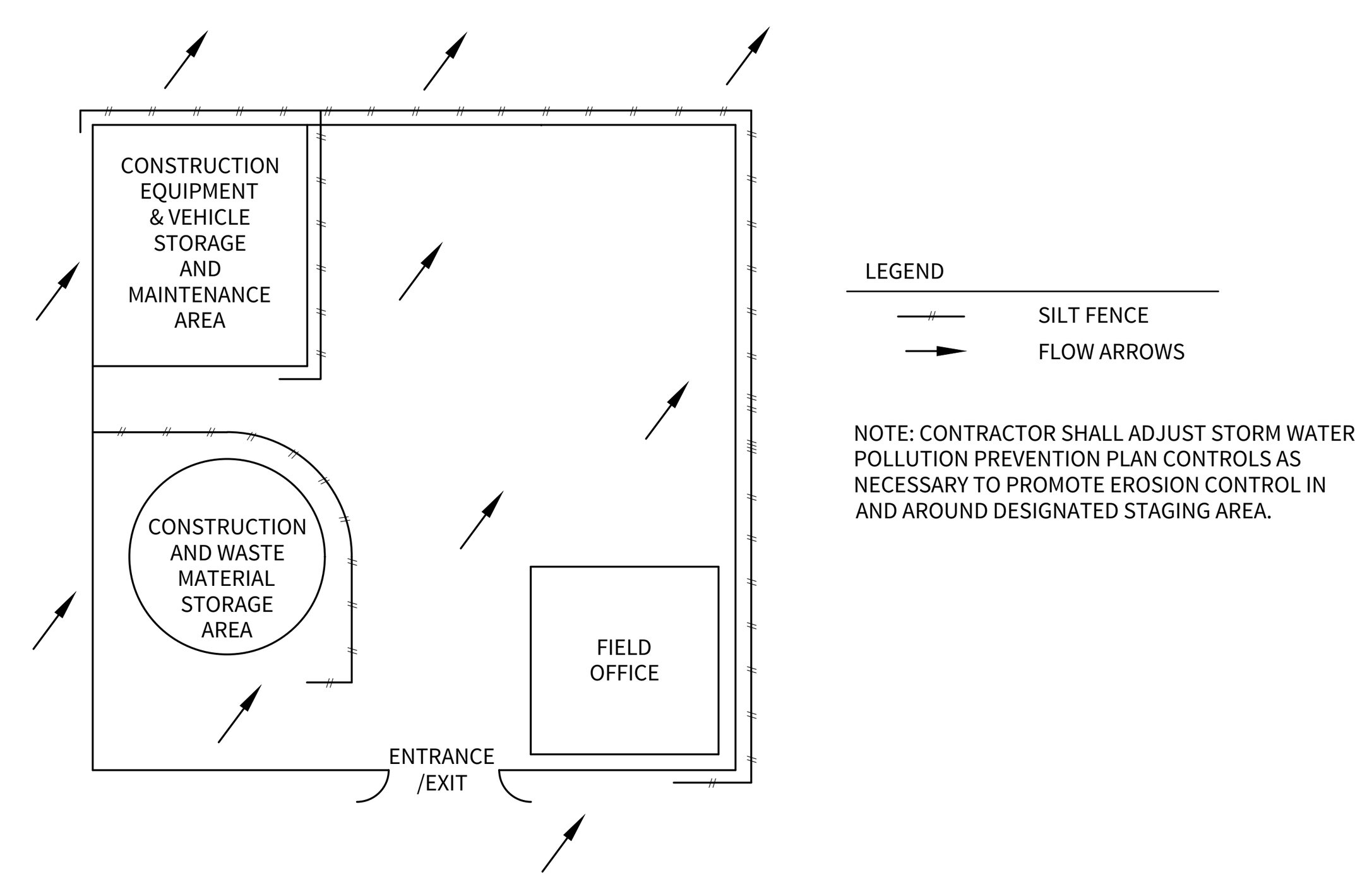


NOTES:

1. DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.
2. WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.
3. WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.

5 CONCRETE TRUCK WASHOUT PIT

SCALE: NONE



NOTE: CONTRACTOR SHALL ADJUST STORM WATER POLLUTION PREVENTION PLAN CONTROLS AS NECESSARY TO PROMOTE EROSION CONTROL IN AND AROUND DESIGNATED STAGING AREA.

6 TYP. CONSTRUCTION STAGING AREA

SCALE: NONE

CUDEENGINEERS.COM
EST. 1980 CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STORMWATER POLLUTION PREVENTION PLAN STANDARD DETAILS

DATE
04/22/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

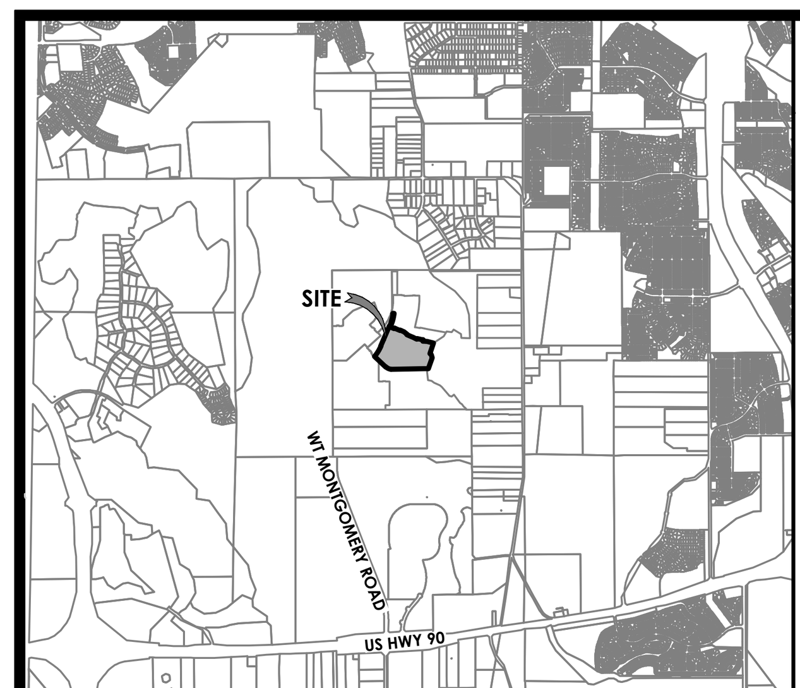
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

04/22/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C1.D1



LOCATION MAP

N.T.S.

OWNER/DEVELOPER:

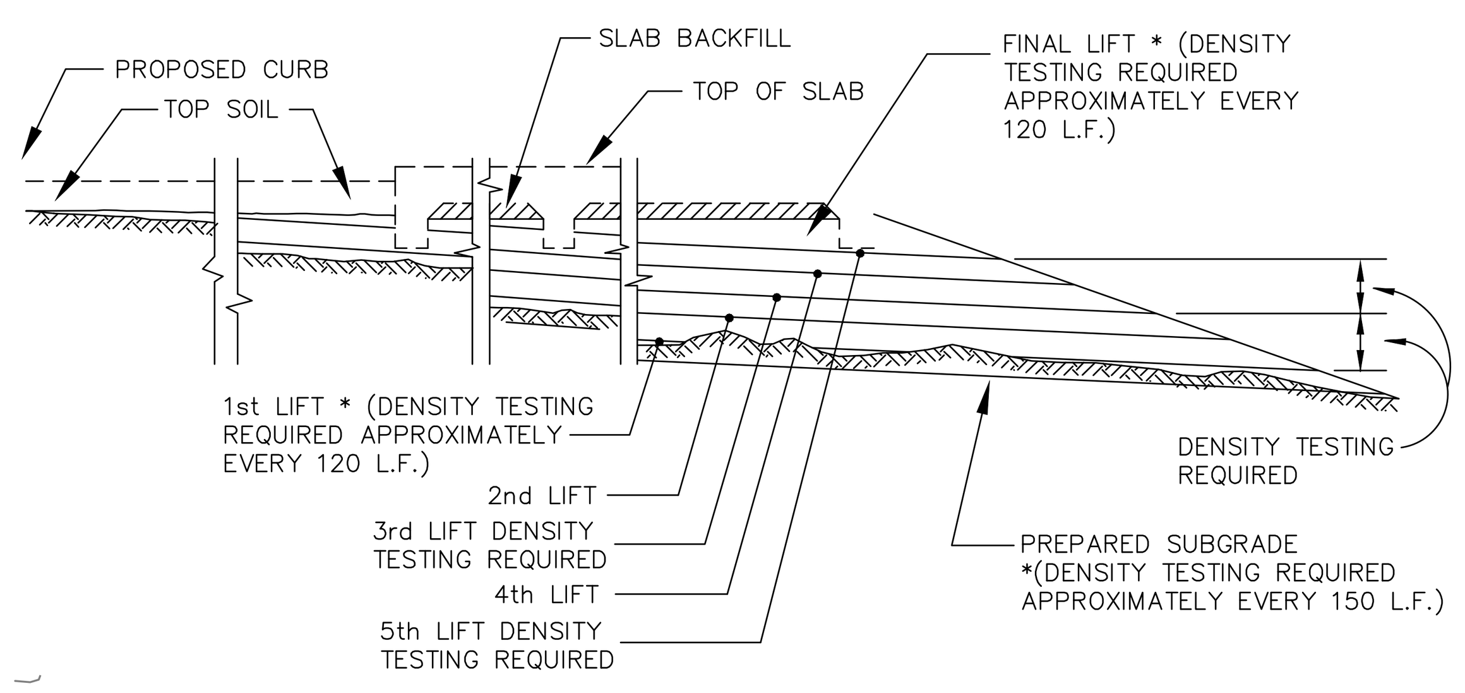
LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

LEGEND

PROPOSED CONTOUR	1000
EXISTING CONTOUR	1000
PROPOSED ELEVATION	1297.58
EXISTING ELEVATION	× 672.00E
GRADE BREAK	GRADE BREAK
BUILDING SETBACK	
SWALE	
LOMR FLOODPLAIN	
CLOMR FLOODPLAIN	

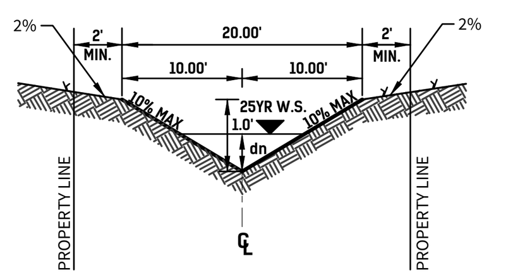


DENSITY TEST FREQUENCY

NOT TO SCALE

SCALE: 1"=60'

0 60 120



TYPICAL V-SWALE "A-1" SECTION (N.T.S.)

	"A-1"
Q_{25} (cfs)	2.00
B_W (ft)	0
z	10:1/10:1
n	0.035
S (%)	0.50
d_n (ft)	0.44
V (fps)	1.03

GENERAL SPECIFICATIONS FOR SITE PREPARATION

1. GENERAL DESCRIPTION

THIS ITEM SHALL CONSIST OF ALL CLEARING AND GRUBBING, DEMOLITION, PREPARATION OF LAND TO BE FILLED, FILLING OF THE LAND, SPREADING, COMPACTION TESTING AND INSPECTION OF THE FILL, AND ALL SUBSIDIARY WORK NECESSARY TO COMPLETE THE GRADING OF THE CUT AND FILL AREAS TO CONFORM WITH THE LINES, GRADES AND SLOPES AS SHOWN ON THE APPROVED PLANS.

ALL LOT GRADING MUST MEET REQUIREMENTS OF FHA/HUD HANDBOOK 4140.3, SPECIFICATIONS FOR LAND DEVELOPMENTS ON CONTROLLED EARTHWORK, DATASHEET 79G. HUD 79G REQUIREMENTS FOR FILL MATERIAL OF 6 INCHES AND MORE WILL BE CONDUCTED. ALL CUT AREAS WILL ALSO MEET THE REQUIREMENTS FOR HUD 79G COMPACTION TESTING. IN ADDITION, ENGINEERS MUST PROVIDED VERIFICATION OF ALL AREAS WHICH DO NOT REQUIRE HUD 79G.

2. CLEARING THE AREA TO BE FILLED

ALL TIMBER, LOGS, TREES, BRUSH AND RUBBISH SHALL BE REMOVED FROM THE SITE.

3. SCARIFYING THE AREA TO BE FILLED

ALL ORGANIC MATTER SHALL BE REMOVED FROM THE SURFACE UPON WHICH THE FILL IS TO BE PLACED, AND THE SURFACE SHALL THEN BE DISKED OR SCARIFIED TO A MINIMUM DEPTH OF SIX INCHES (6"), ALL SURFACE RUTS OR OTHER UNEVEN FEATURES WILL BE LEVELED PRIOR TO FIELD DENSITY TESTING.

4. COMPACTING THE AREA TO BE FILLED

FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.

5. FILL MATERIALS

THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.

6. DEPTH AND MIXING OF FILL LAYERS

THE SELECTED FILL MATERIAL SHALL BE PLACED IN LEVEL, UNIFORM LAYERS WHICH, WHEN COMPACTED, SHALL HAVE A DENSITY CONFORMING TO THAT STIPULATED ABOVE. EACH LAYER SHALL BE THOROUGHLY MIXED DURING THE SPREADING TO ENSURE UNIFORMITY OF MATERIAL IN EACH LAYER. COMPACTED LAYER THICKNESS MAY VARY DEPENDING ON THE COMPACTION EQUIPMENT OF DEMONSTRATED CAPABILITY. THE MAXIMUM LOOSE DEPTH FOR ANY MATERIAL SHALL NOT EXCEED TWELVE INCHES (12"). FOR TESTING REQUIREMENTS OF FILL MATERIAL, SEE DENSITY TESTING.

7. ROCK

WHEN FILL MATERIAL INCLUDES ROCK, THE MAXIMUM ROCK SIZE SHALL BE AS APPROVED BY THE GEOTECHNICAL ENGINEER. NO LARGE ROCKS SHALL BE ALLOWED TO NEST AND ALL VOIDS MUST BE FILLED WITH SMALL STONES OR SOIL AND ADEQUATELY COMPACTED. NO LARGE ROCKS WILL BE PERMITTED WITHIN EIGHTEEN INCHES (18") OF THE FINISHED GRADE.

8. COMPACTION OF FILL LAYER

COMPACTION EQUIPMENT SHALL BE CAPABLE OF COMPACTING THE FILL TO THE SPECIFIED DENSITY. COMPACTION SHALL BE ACCOMPLISHED WHILE THE FILL MATERIAL IS AT OR NEAR THE APPROPRIATE MOISTURE CONTENT. COMPACTION OF EACH LAYER SHALL BE CONTINUOUS OVER THE ENTIRE STRUCTURAL AREA (BENEATH PROPOSED STRUCTURES).

9. COMPACTION OF SLOPES

THE FACES OF FILL SLOPES SHALL BE COMPACTED. COMPACTING OPERATIONS SHALL BE CONTINUED UNTIL THE SLOPE FACES ARE STABLE BUT NOT TOO DENSE FOR PLANTING ON THE SLOPES. COMPACTION OF THE SLOPE FACES MAY BE DONE PROGRESSIVELY IN INCREMENTS OF THREE TO FIVE FEET (3' TO 5') IN FILL HEIGHT AS THIS FILL PROGRESSES OR AFTER THE FILL HAS BEEN BROUGHT TO ITS TOTAL HEIGHT.

10. MOISTURE CONTENT

THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

11. DENSITY TESTS

FIELD DENSITY TESTS SHALL BE PERFORMED ON LAYERS OF FILL WHEN THE FILL IS BEING PLACED AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE MAXIMUM FILL HEIGHT BETWEEN DENSITY TESTING SHALL BE EIGHTEEN INCHES (18"). ALL TESTING SHALL BE REQUESTED BY THE CONTRACTOR TO MEET THE CONTRACTOR'S CONSTRUCTION SCHEDULE. NOTIFICATION BY THE CONTRACTOR TO CONDUCT TESTS SHALL BE AT LEAST THE DAY BEFORE. THIS NOTIFICATION SHALL INCLUDE THE FILL AREA LOCATION (LOT AND BLOCK), THE LIFT OR HEIGHT OF FILL AND APPROXIMATE DESIRED TIME OF TESTING. WHEN THESE TESTS INDICATE THAT THE DENSITY OF ANY LAYER OF FILL OR PORTION THEREOF IS BELOW THE REQUIRED DENSITY, THE PARTICULAR LAYER OR PORTION SHALL BE REWORKED AND RETESTED AT THE EXPENSE OF THE CONTRACTOR UNLESS THE CONTRACTOR CAN SHOW EVIDENCE THAT CIRCUMSTANCES BEYOND HIS CONTROL REQUIRED THE RETESTING. GENERALLY, THE SPECIFIC TESTING WILL BE AS FOLLOWS AND CONDUCTED BY GEOTECHNICAL ENGINEER.

1. THE LAND TO BE FILLED (PREPARED SUBGRADE) SHALL BE PREPARED AND TESTED AT A FREQUENCY AS DETERMINED BY THE GEOTECHNICAL ENGINEER.
2. THE FIRST LIFT OF COMPACTED FILL (GENERALLY 8 TO 12-IN.) SHALL BE TESTED AS DETERMINED BY THE GEOTECHNICAL ENGINEER. ANY AREAS SUPPORTING THE PROPOSED STRUCTURES REQUIRING FILL SHALL BE TESTED FOR DENSITY COMPLIANCE.
3. FILLS SHALL BE TESTED A MAXIMUM OF EACH EIGHTEEN INCHES (18") OF FILL.
4. TEST RESULTS WILL BE PROVIDED BY THE FIELD TECHNICIAN TO THE CONTRACTOR WHEN POSSIBLE; HOWEVER, ALL TEST RESULTS ARE TO BE REVIEWED BY THE GEOTECHNICAL ENGINEER FOR COMPLIANCE. THE ENGINEER WILL NOTIFY THE CONTRACTOR OF ALL THE TEST RESULTS.

12. CUT/FILL LOTS

AREAS INVOLVING CUT ON ONE PORTION AND FILL ON ANOTHER PORTION OF A SPECIFIC LOT SHALL BE PREPARED TO A MINIMUM DEPTH OF 6-IN. AND WILL BE THE SAME MATERIAL CLASSIFICATION AT THE SAME COMPACTION AND MOISTURE CONTENT. A MINIMUM OF TWO (2) FIELD DENSITY TESTS SHALL BE REQUIRED ON EACH CUT/FILL LOT FOR THE PURPOSE OF DETERMINING UNIFORMITY OF THE AREA SUPPORTING THE PROPOSED STRUCTURES.

NOTE:

LOT GRADING BASED ON SLABS BEING 20' BEHIND FRONT PROPERTY LINE.

MINIMUM SLAB EXPOSURE IS 1.0'.

ALL ELEVATIONS AT FRONT PROPERTY LINE ARE 0.2' ABOVE CURB ELEVATION ON LOCAL TYPE "A" STREETS.

TYPICAL PAD SIZES ARE 80' x 25' ON LOCAL TYPE "A" STREETS.

CONTRACTOR TO REFERENCE TREE PRESERVATION PLAN.

CONTOURS SHOWN ON STREET ARE TOP OF STREET.

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

GRADING PLAN

DATE
06/26/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

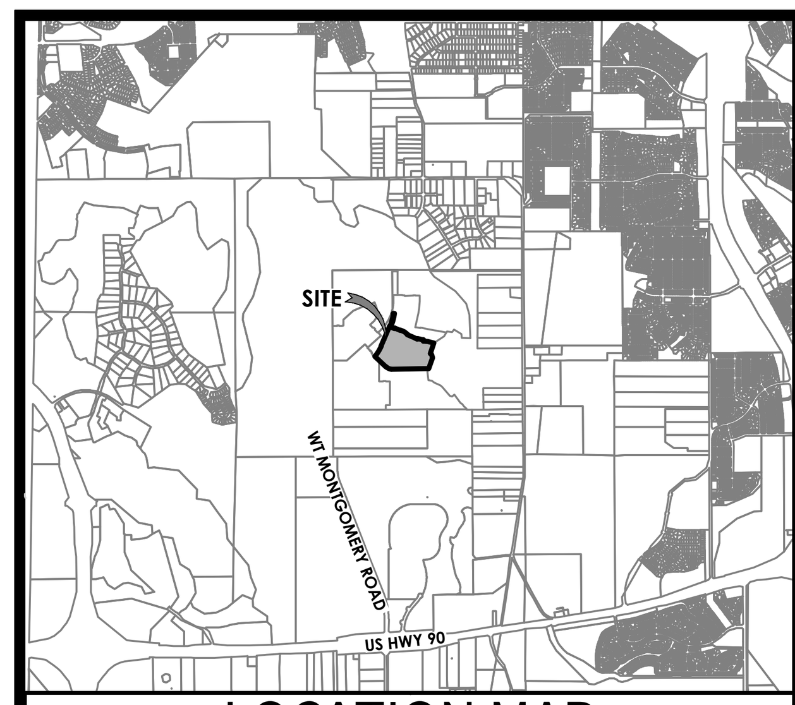
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C2.00



LOCATION MAP

N.T.S.

LEGEND

PROPOSED CONTOUR	1000
EXISTING CONTOUR	1000
PROPOSED ELEVATION	1297.58
EXISTING ELEVATION	× 672.00E
GRADE BREAK	GRADE BREAK
BUILDING SETBACK	
SWALE	
LOMR FLOODPLAIN	
CLOMR FLOODPLAIN	

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

NOTE:

LOT GRADING BASED ON SLABS BEING 20' BEHIND FRONT PROPERTY LINE.

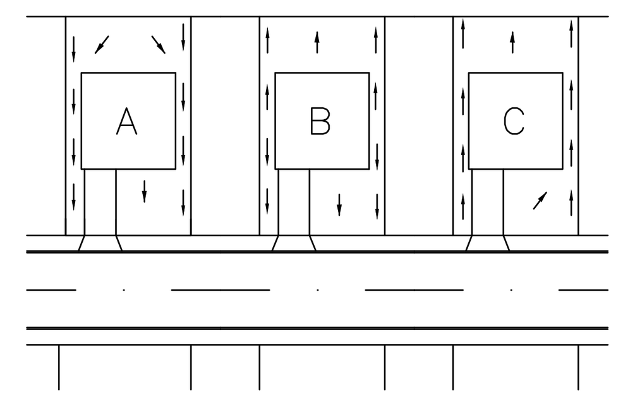
MINIMUM SLAB EXPOSURE IS 1.0'.

ALL ELEVATIONS AT FRONT PROPERTY LINE ARE 0.2' ABOVE CURB ELEVATION ON LOCAL TYPE "A" STREETS.

TYPICAL PAD SIZES ARE 80' x 25' ON LOCAL TYPE "A" STREETS.

CONTRACTOR TO REFERENCE TREE PRESERVATION PLAN.

CONTOURS SHOWN ON STREET ARE TOP OF STREET.



GENERAL SPECIFICATIONS FOR SITE PREPARATION

1. GENERAL DESCRIPTION

THIS ITEM SHALL CONSIST OF ALL CLEARING AND GRUBBING, DEMOLITION, PREPARATION OF LAND TO BE FILLED, FILLING OF THE LAND, SPREADING, COMPACTION TESTING AND INSPECTION OF THE FILL, AND ALL SUBSIDIARY WORK NECESSARY TO COMPLETE THE GRADING OF THE CUT AND FILL AREAS TO CONFORM WITH THE LINES, GRADES AND SLOPES AS SHOWN ON THE APPROVED PLANS.

ALL LOT GRADING MUST MEET REQUIREMENTS OF FHA/HUD HANDBOOK 4140.3, SPECIFICATIONS FOR LAND DEVELOPMENTS ON CONTROLLED EARTHWORK, DATASHEET 79G. HUD 79G REQUIREMENTS FOR FILL MATERIAL OF 6 INCHES AND MORE WILL BE CONDUCTED. ALL CUT AREAS WILL ALSO MEET THE REQUIREMENTS FOR HUD 79G COMPACTION TESTING. IN ADDITION, ENGINEERS MUST PROVIDED VERIFICATION OF ALL AREAS WHICH DO NOT REQUIRE HUD 79G.

2. CLEARING THE AREA TO BE FILLED

ALL TIMBER, LOGS, TREES, BRUSH AND RUBBISH SHALL BE REMOVED FROM THE SITE.

3. SCARIFYING THE AREA TO BE FILLED

ALL ORGANIC MATTER SHALL BE REMOVED FROM THE SURFACE UPON WHICH THE FILL IS TO BE PLACED, AND THE SURFACE SHALL THEN BE DISKED OR SCARIFIED TO A MINIMUM DEPTH OF SIX INCHES (6"), ALL SURFACE RUTS OR OTHER UNEVEN FEATURES WILL BE LEVELED PRIOR TO FIELD DENSITY TESTING.

4. COMPACTING THE AREA TO BE FILLED

FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.

5. FILL MATERIALS

THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.

6. DEPTH AND MIXING OF FILL LAYERS

THE SELECTED FILL MATERIAL SHALL BE PLACED IN LEVEL, UNIFORM LAYERS WHICH, WHEN COMPACTED, SHALL HAVE A DENSITY CONFORMING TO THAT STIPULATED ABOVE. EACH LAYER SHALL BE THOROUGHLY MIXED DURING THE SPREADING TO ENSURE UNIFORMITY OF MATERIAL IN EACH LAYER. COMPACTED LAYER THICKNESS MAY VARY DEPENDING ON THE COMPACTION EQUIPMENT OF DEMONSTRATED CAPABILITY. THE MAXIMUM LOOSE DEPTH FOR ANY MATERIAL SHALL NOT EXCEED TWELVE INCHES (12"). FOR TESTING REQUIREMENTS OF FILL MATERIAL, SEE DENSITY TESTING.

7. ROCK

WHEN FILL MATERIAL INCLUDES ROCK, THE MAXIMUM ROCK SIZE SHALL BE AS APPROVED BY THE GEOTECHNICAL ENGINEER. NO LARGE ROCKS SHALL BE ALLOWED TO NEST AND ALL VOIDS MUST BE FILLED WITH SMALL STONES OR SOIL AND ADEQUATELY COMPACTED. NO LARGE ROCKS WILL BE PERMITTED WITHIN EIGHTEEN INCHES (18") OF THE FINISHED GRADE.

8. COMPACTION OF FILL LAYER

COMPACTION EQUIPMENT SHALL BE CAPABLE OF COMPACTING THE FILL TO THE SPECIFIED DENSITY. COMPACTION SHALL BE ACCOMPLISHED WHILE THE FILL MATERIAL IS AT OR NEAR THE APPROPRIATE MOISTURE CONTENT. COMPACTION OF EACH LAYER SHALL BE CONTINUOUS OVER THE ENTIRE STRUCTURAL AREA (BENEATH PROPOSED STRUCTURES).

9. COMPACTION OF SLOPES

THE FACES OF FILL SLOPES SHALL BE COMPACTED. COMPACTING OPERATIONS SHALL BE CONTINUED UNTIL THE SLOPE FACES ARE STABLE BUT NOT TOO DENSE FOR PLANTING ON THE SLOPES. COMPACTION OF THE SLOPE FACES MAY BE DONE PROGRESSIVELY IN INCREMENTS OF THREE TO FIVE FEET (3' TO 5') IN FILL HEIGHT AS THIS FILL PROGRESSES OR AFTER THE FILL HAS BEEN BROUGHT TO ITS TOTAL HEIGHT.

10. MOISTURE CONTENT

THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

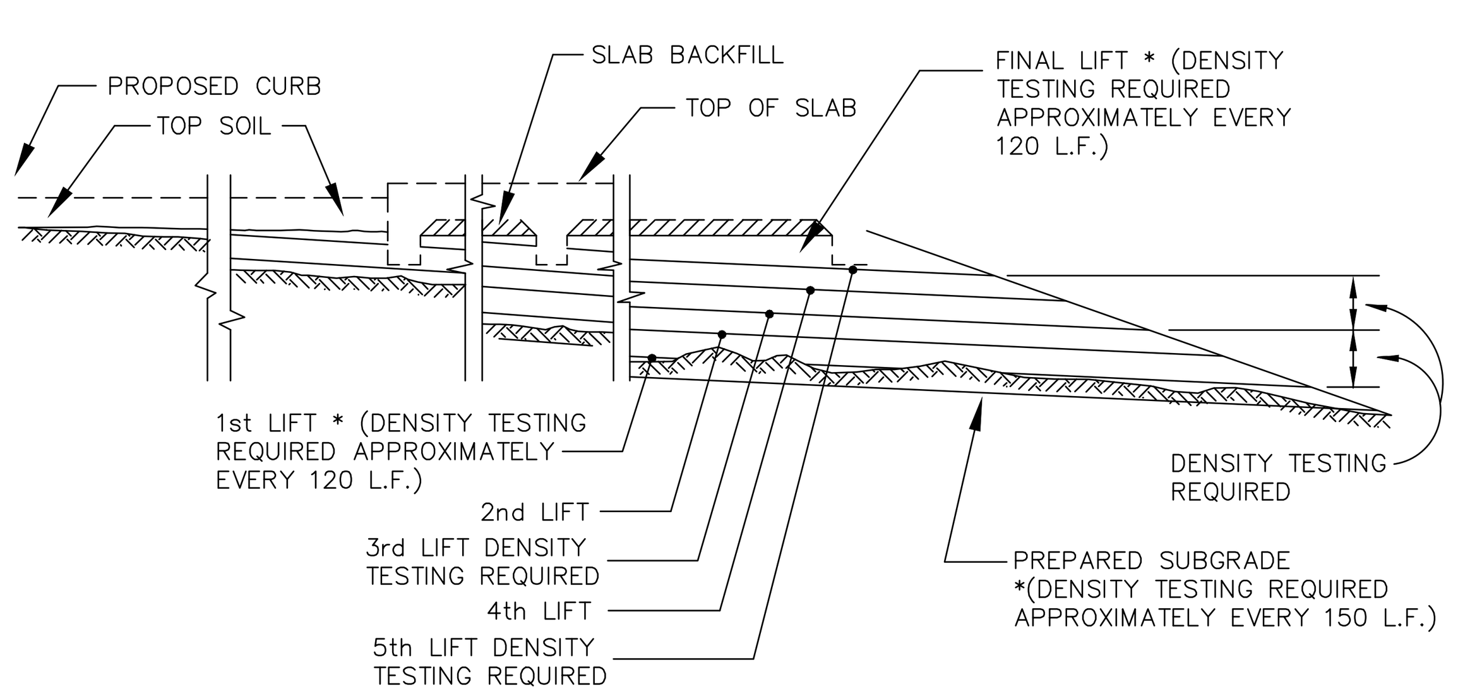
11. DENSITY TESTS

FIELD DENSITY TESTS SHALL BE PERFORMED ON LAYERS OF FILL WHEN THE FILL IS BEING PLACED AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE MAXIMUM FILL HEIGHT BETWEEN DENSITY TESTING SHALL BE EIGHTEEN INCHES (18"). ALL TESTING SHALL BE REQUESTED BY THE CONTRACTOR TO MEET THE CONTRACTOR'S CONSTRUCTION SCHEDULE. NOTIFICATION BY THE CONTRACTOR TO CONDUCT TESTS SHALL BE AT LEAST THE DAY BEFORE. THIS NOTIFICATION SHALL INCLUDE THE FILL AREA LOCATION (LOT AND BLOCK), THE LIFT OR HEIGHT OF FILL AND APPROXIMATE DESIRED TIME OF TESTING. WHEN THESE TESTS INDICATE THAT THE DENSITY OF ANY LAYER OF FILL OR PORTION THEREOF IS BELOW THE REQUIRED DENSITY, THE PARTICULAR LAYER OR PORTION SHALL BE REWORKED AND RETESTED AT THE EXPENSE OF THE CONTRACTOR UNLESS THE CONTRACTOR CAN SHOW EVIDENCE THAT CIRCUMSTANCES BEYOND HIS CONTROL REQUIRED THE RETESTING. GENERALLY, THE SPECIFIC TESTING WILL BE AS FOLLOWS AND CONDUCTED BY GEOTECHNICAL ENGINEER.

1. THE LAND TO BE FILLED (PREPARED SUBGRADE) SHALL BE PREPARED AND TESTED AT A FREQUENCY AS DETERMINED BY THE GEOTECHNICAL ENGINEER.
2. THE FIRST LIFT OF COMPACTED FILL (GENERALLY 8 TO 12-IN.) SHALL BE TESTED AS DETERMINED BY THE GEOTECHNICAL ENGINEER. ANY AREAS SUPPORTING THE PROPOSED STRUCTURES REQUIRING FILL SHALL BE TESTED FOR DENSITY COMPLIANCE.
3. FILLS SHALL BE TESTED A MAXIMUM OF EACH EIGHTEEN INCHES (18") OF FILL.
4. TEST RESULTS WILL BE PROVIDED BY THE FIELD TECHNICIAN TO THE CONTRACTOR WHEN POSSIBLE; HOWEVER, ALL TEST RESULTS ARE TO BE REVIEWED BY THE GEOTECHNICAL ENGINEER FOR COMPLIANCE. THE ENGINEER WILL NOTIFY THE CONTRACTOR OF ALL THE TEST RESULTS.

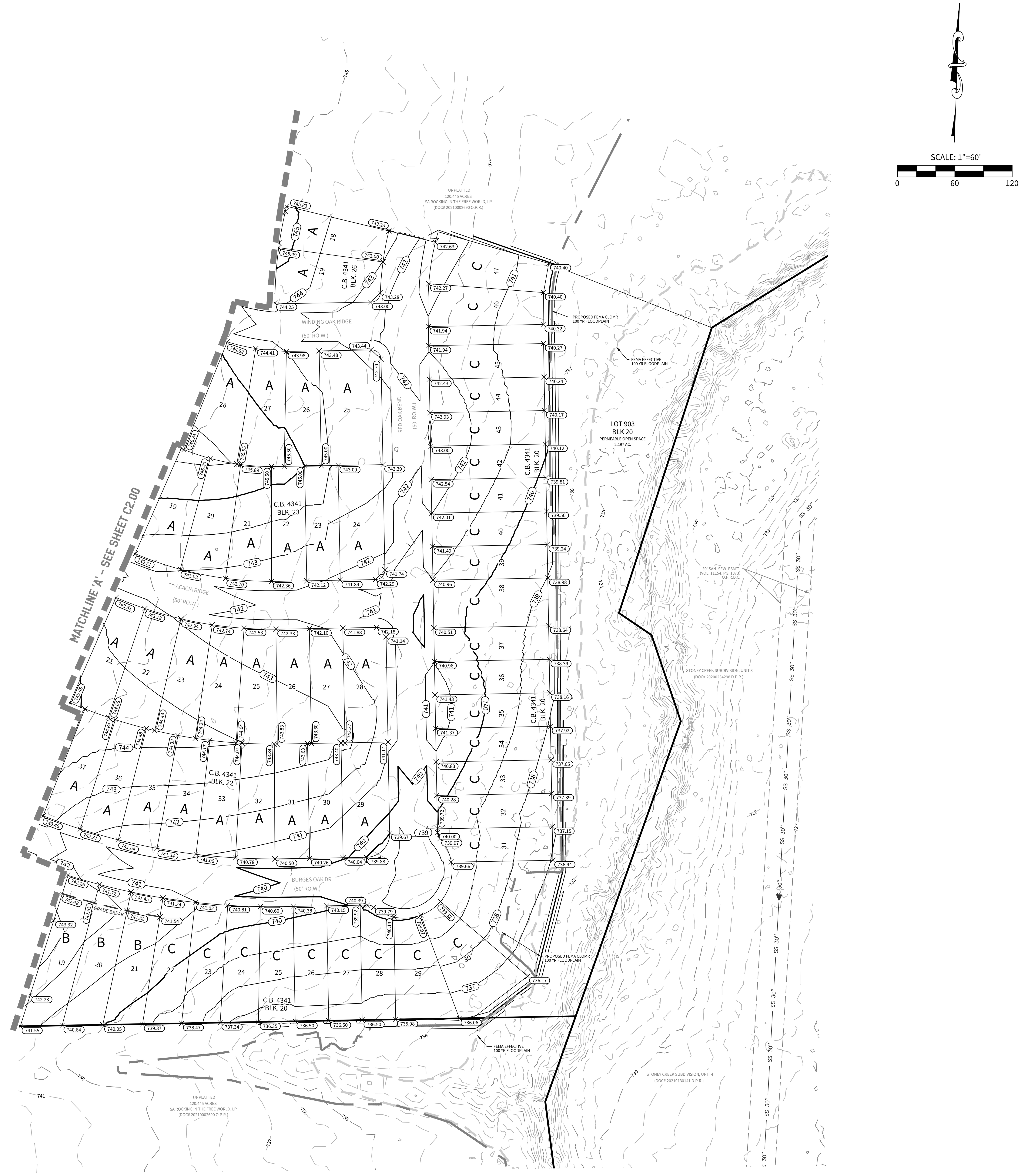
12. CUT/FILL LOTS

AREAS INVOLVING CUT ON ONE PORTION AND FILL ON ANOTHER PORTION OF A SPECIFIC LOT SHALL BE PREPARED TO A MINIMUM DEPTH OF 6-IN. AND WILL BE THE SAME MATERIAL CLASSIFICATION AT THE SAME COMPACTION AND MOISTURE CONTENT. A MINIMUM OF TWO (2) FIELD DENSITY TESTS SHALL BE REQUIRED ON EACH CUT/FILL LOT FOR THE PURPOSE OF DETERMINING UNIFORMITY OF THE AREA SUPPORTING THE PROPOSED STRUCTURES.



DENSITY TEST FREQUENCY

NOT TO SCALE



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

GRADING PLAN

DATE	06/27/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

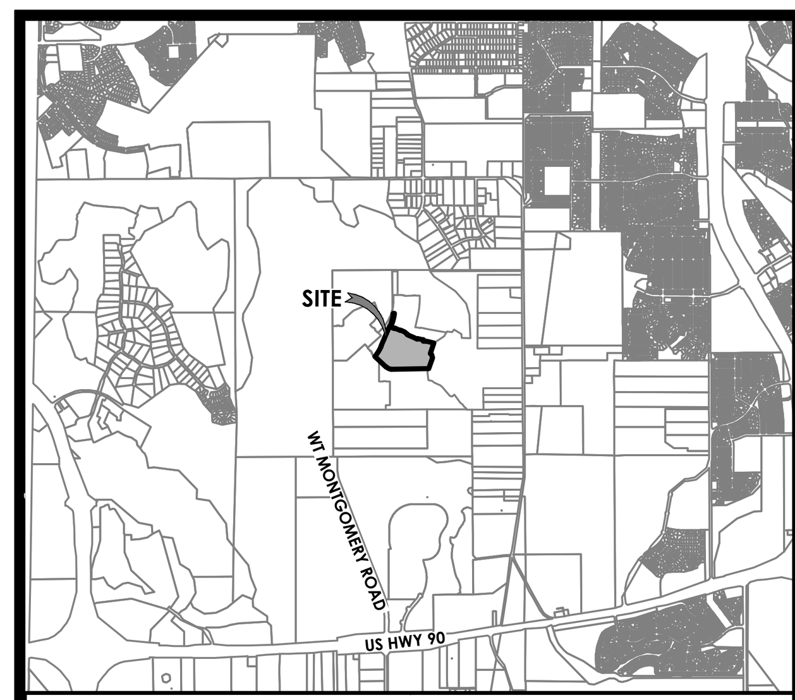
06/27/2024

STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C2.01

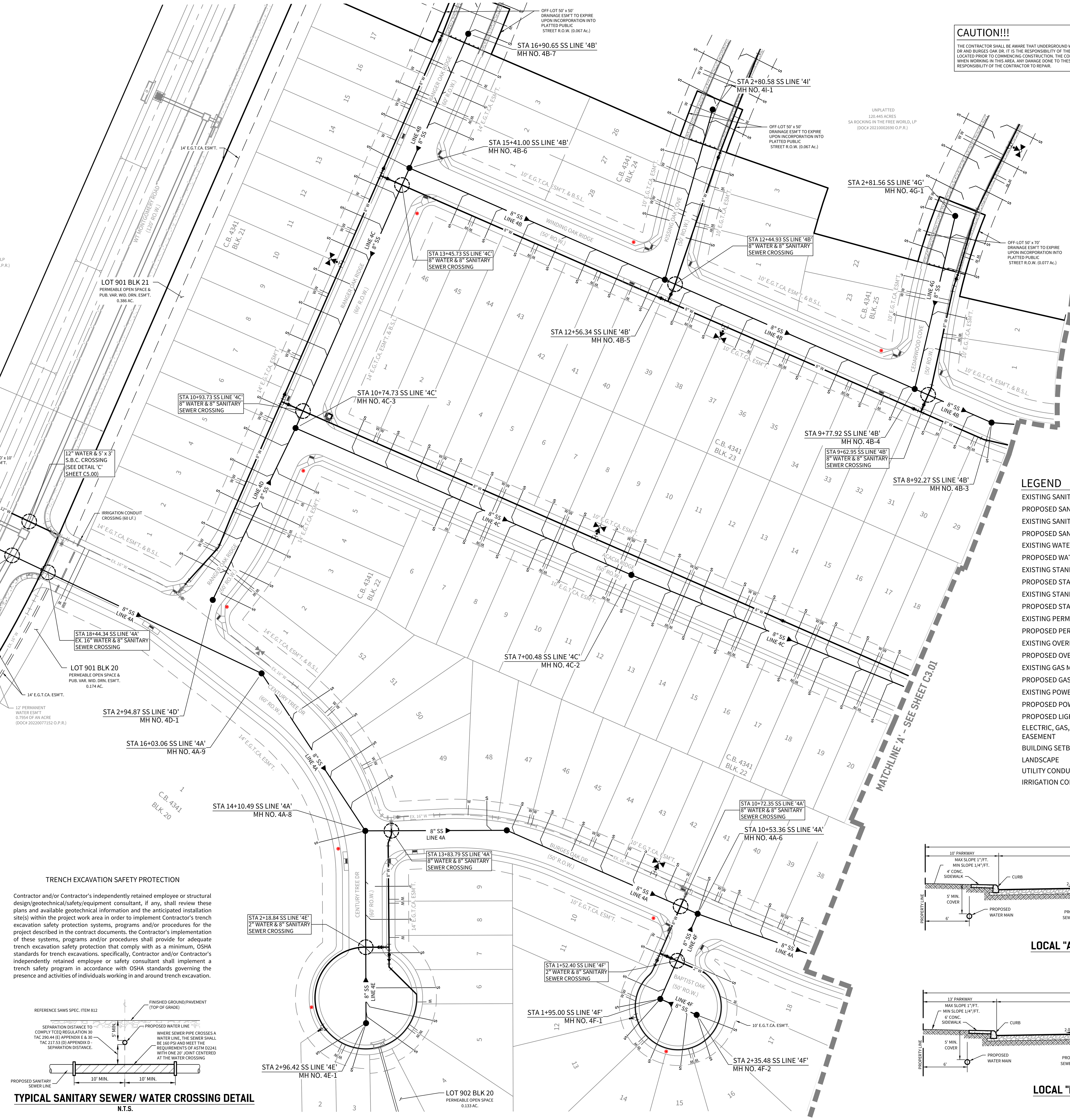


OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

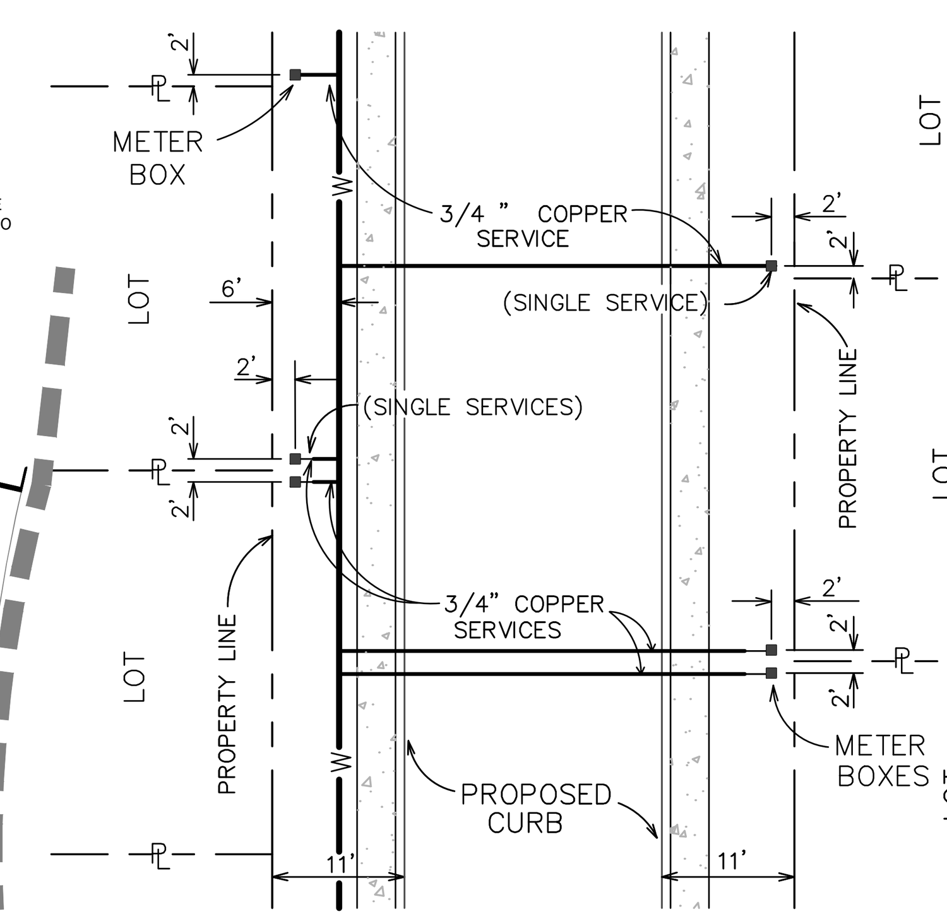
M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG CENTURY TREE DR AND BURGES OAK DR. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

SCALE: 1"=50'
0 50 100



WATER METER BOX LOCATION

N.T.S.

LEGEND

EXISTING SANITARY SEWER	EX 8" SS
PROPOSED SANITARY SEWER	8" SS
EXISTING SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER MANHOLE	
EXISTING WATER MAIN	EX 8" W
PROPOSED WATER MAIN	8" W
EXISTING STANDARD FIRE HYDRANT	
PROPOSED STANDARD FIRE HYDRANT	
EXISTING STANDARD GATE VALVE	
PROPOSED STANDARD GATE VALVE	
EXISTING PERMANENT BLOWOFF	
PROPOSED PERMANENT BLOWOFF	
EXISTING OVERHEAD ELECTRIC	EX. OHE
PROPOSED OVERHEAD ELECTRIC	OHE
EXISTING GAS MAIN	EX 2" GAS
PROPOSED GAS MAIN	2" GAS
EXISTING POWER POLE	
PROPOSED POWER POLE	
PROPOSED LIGHT POLE	
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T
BUILDING SETBACK LINE	B.S.L.
LANDSCAPE	L.S.
UTILITY CONDUIT CROSSING	
IRRIGATION CONDUIT CROSSING	

NOTE:

THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	210-233-2010
COSA DRAINAGE	210-207-2800
CITY SIDEWALK AND TRENCHING DIVISION	210-821-3240
COSA TRAFFIC SIGNAL OPERATIONS	210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
CITY PUBLIC SERVICE	"
AT&T	"
TIME WARNER	"
VALERO ENERGY CO.	"

AT&T AND TIME WARNER CABLE LINES TO GO INTO JOINT TRENCH WITH C.P.S. ENERGY
LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.

TYPICAL UTILITY CROSSINGS WILL HAVE
2 - 6" SCH 80 PVC CONDUIT WITH SWEEPS,
2 - 4" SCH 40 PVC CONDUIT WITH SWEEPS,
THE TOTAL AMOUNT OF CONDUIT TO BE USED WILL BE DETERMINED DURING CONSTRUCTION.

TYPICAL IRRIGATION CROSSING WILL HAVE
3 - 4" SCH 40 PVC CONDUIT WITH SWEEPS,

* CONDUIT ONLY TO BE INSTALLED IF:

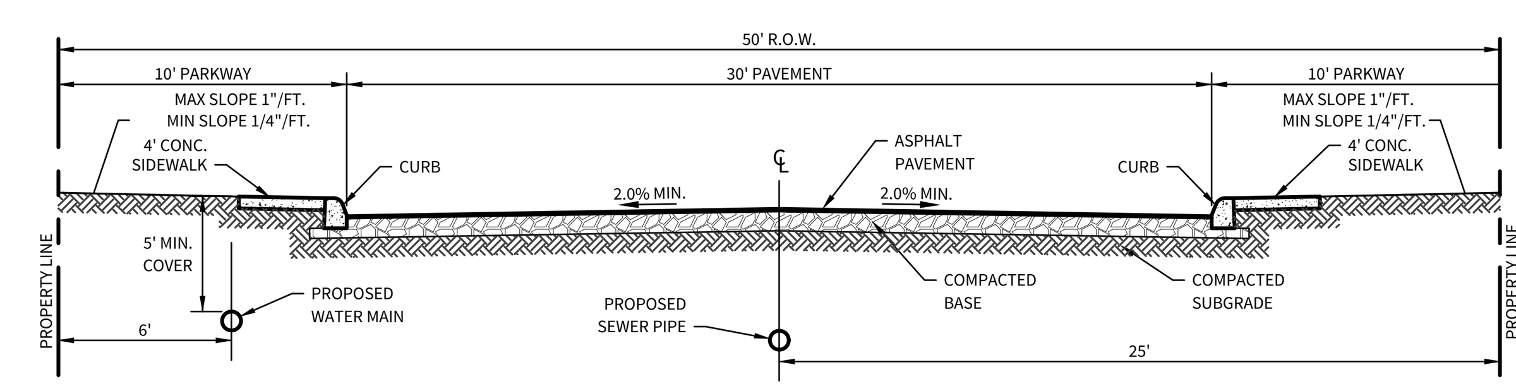
1.) STREET BASE AND DRAINAGE COMPLETION PRECEDES CPS UTILITY LINE INSTALLATION.
2.) INSTALLATION IS AUTHORIZED BY THE DEVELOPER.

TRENCH EXCAVATION SAFETY PROTECTION

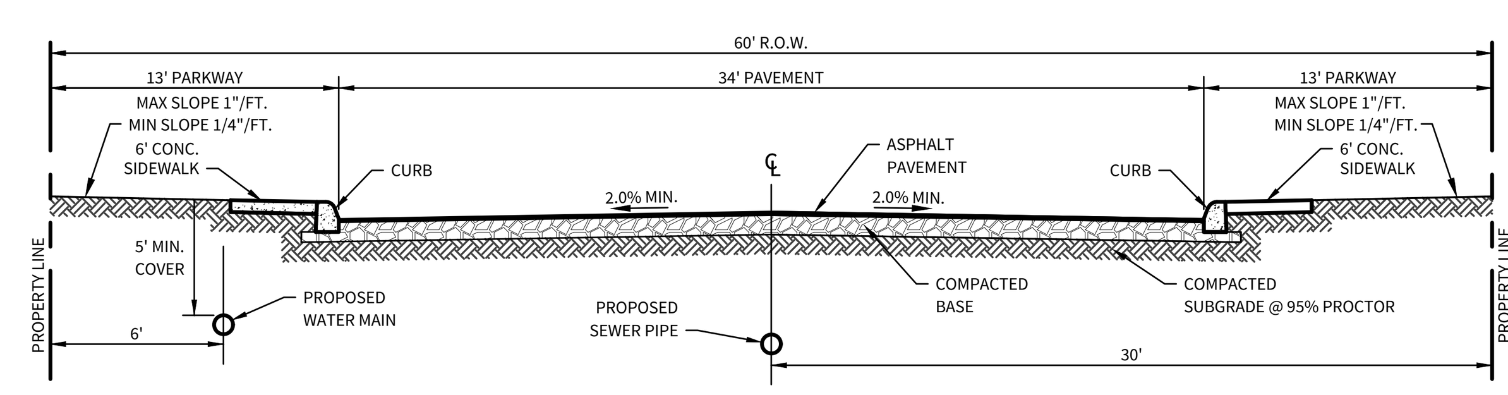
Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.



LOCAL "A" STREET CROSS-SECTION



LOCAL "B" STREET CROSS-SECTION

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

UTILITY LAYOUT PLAN

DATE	06/20/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

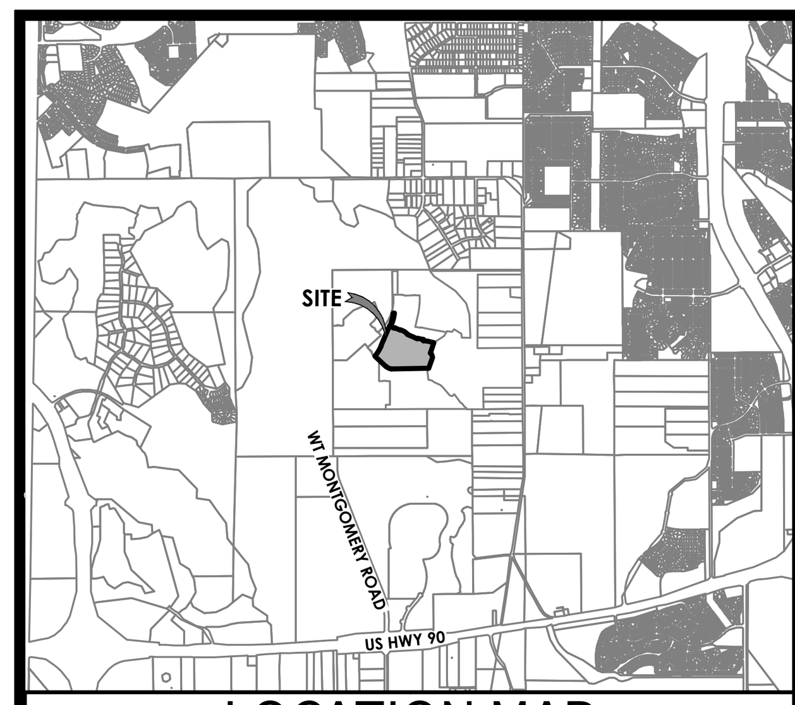
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

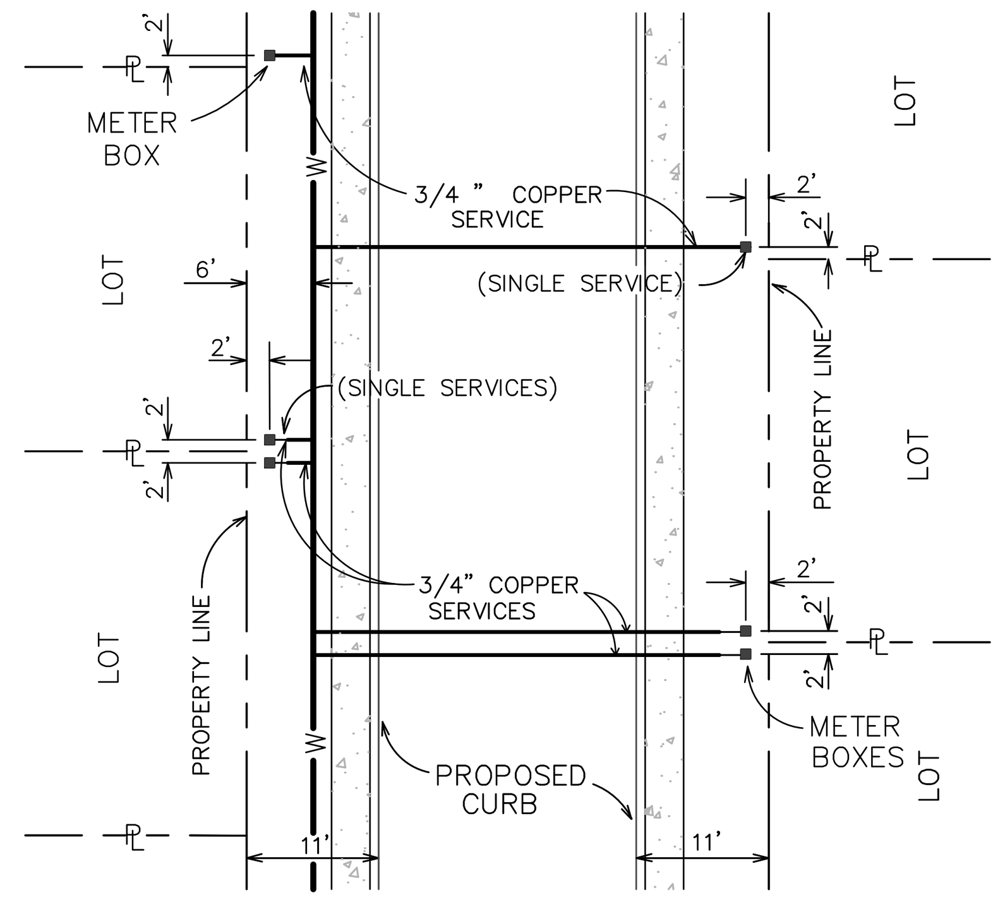
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C3.00



LOCATION MAP
N.T.S.



WATER METER BOX LOCATION
N.T.S.

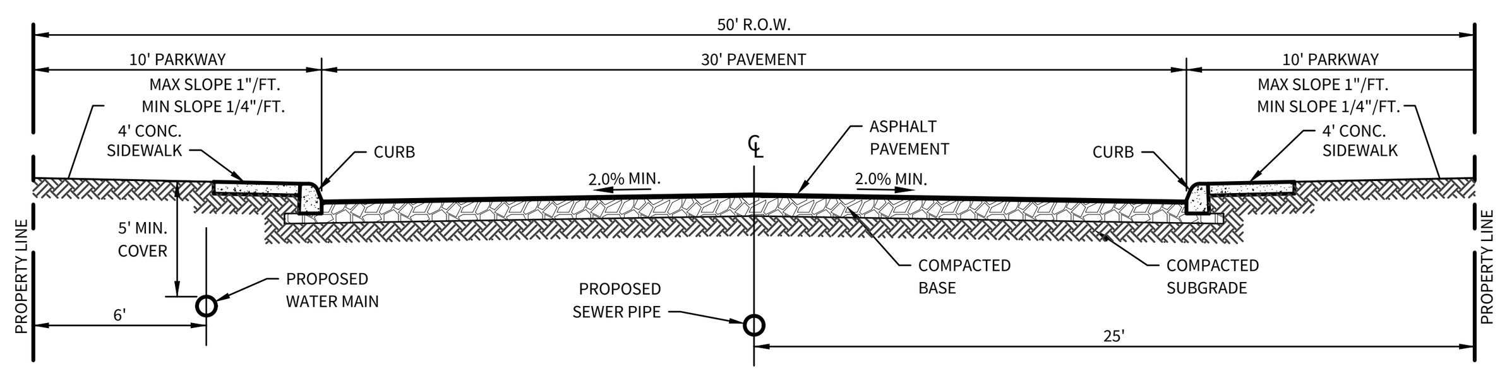
LEGEND

- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- EXISTING STANDARD FIRE HYDRANT
- PROPOSED STANDARD FIRE HYDRANT
- EXISTING STANDARD GATE VALVE
- PROPOSED STANDARD GATE VALVE
- EXISTING PERMANENT BLOWOFF
- PROPOSED PERMANENT BLOWOFF
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- EXISTING GAS MAIN
- PROPOSED GAS MAIN
- EXISTING POWER POLE
- PROPOSED POWER POLE
- PROPOSED LIGHT POLE
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.CA. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- LANDSCAPE — L.S.
- UTILITY CONDUIT CROSSING — UTIL
- IRRIGATION CONDUIT CROSSING — IRR

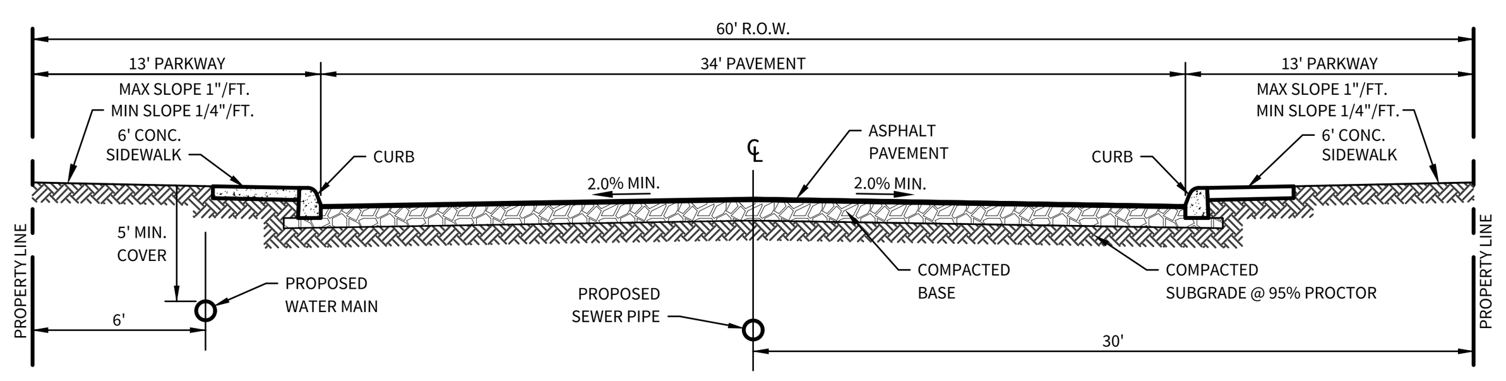
SCALE: 1"=50'
0 50 100

OWNER/DEVELOPER:
LENNAR HOMES OF TEXAS LAND ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



LOCAL "A" STREET CROSS-SECTION



LOCAL "B" STREET CROSS-SECTION

NOTE:

THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	210-233-2010
COSA DRAINAGE	210-207-2800
CITY SIDEWALK AND TRENCHING DIVISION	210-821-3240
COSA TRAFFIC SIGNAL OPERATIONS	210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
CITY PUBLIC SERVICE	"
AT&T	"
TIME WARNER	"
VALERO ENERGY CO.	"

AT&T AND TIME WARNER CABLE LINES TO GO INTO JOINT TRENCH WITH C.P.S. ENERGY
LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.

TYPICAL UTILITY CROSSINGS WILL HAVE
2 - 6" SCH 80 PVC CONDUIT WITH SWEEPS,
2 - 4" SCH 40 PVC CONDUIT WITH SWEEPS,
THE TOTAL AMOUNT OF CONDUIT TO BE USED WILL BE DETERMINED DURING CONSTRUCTION.

TYPICAL IRRIGATION CROSSING WILL HAVE
3 - 4" SCH 40 PVC CONDUIT WITH SWEEPS,

* CONDUIT ONLY TO BE INSTALLED IF:

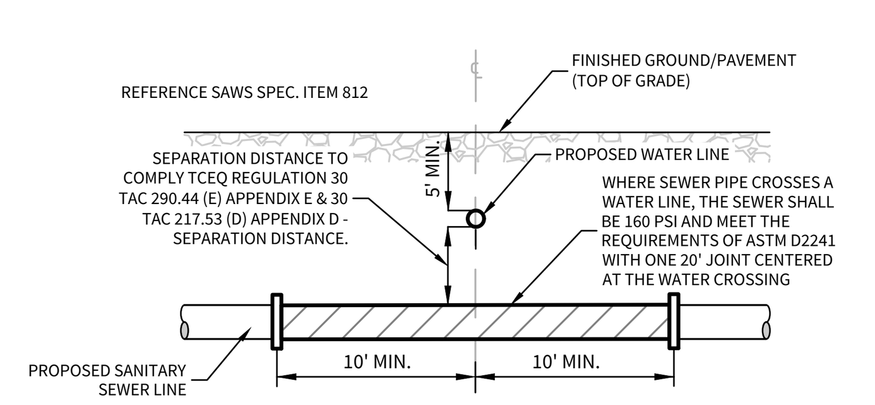
1.) STREET BASE AND DRAINAGE COMPLETION PRECEDES CPS UTILITY LINE INSTALLATION.
2.) INSTALLATION IS AUTHORIZED BY THE DEVELOPER.

CAUTION!!!

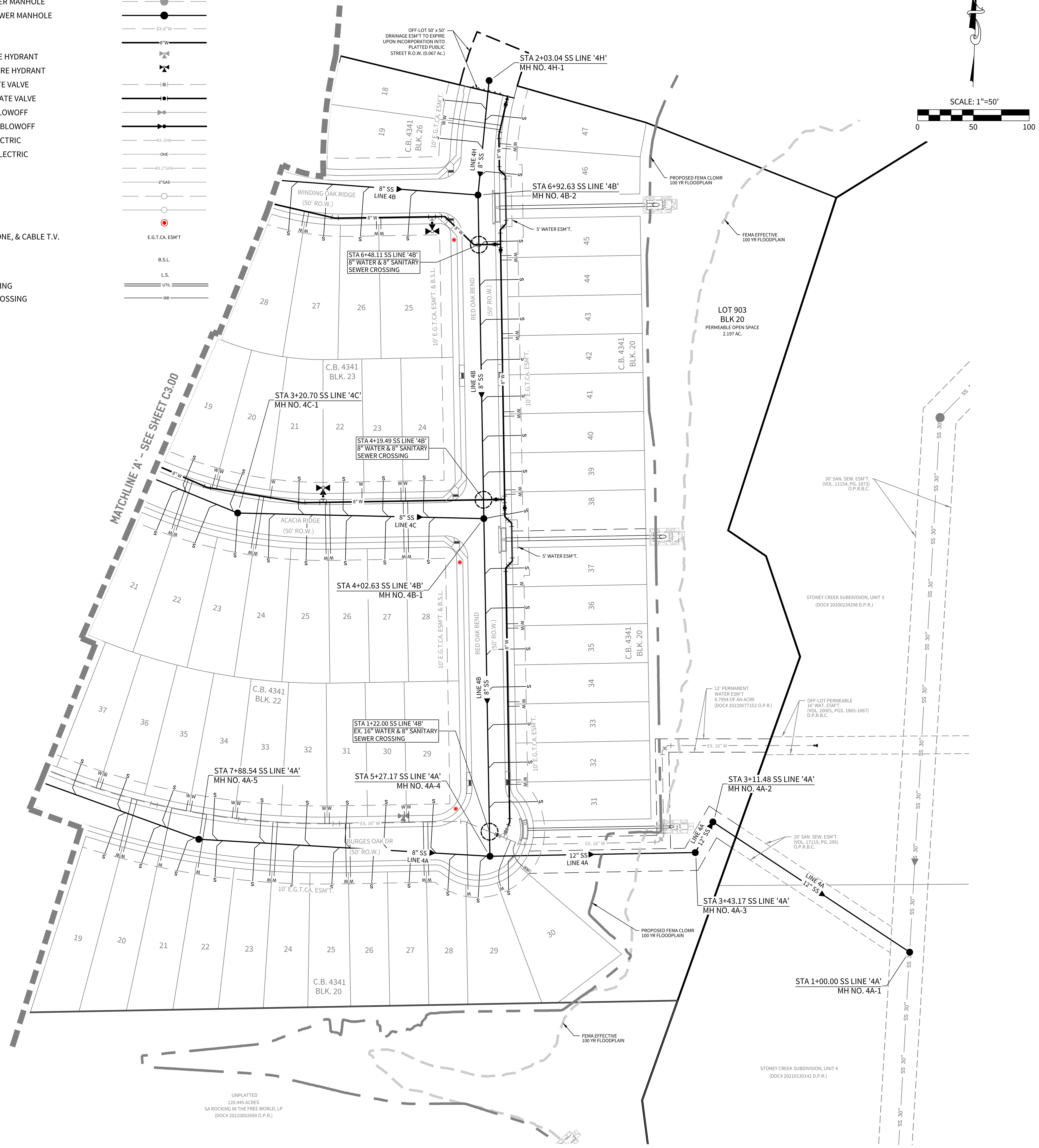
THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG CENTURY TREE DR AND BURGES OAK DR. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.



CUDEENGINEERS.COM
CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

UTILITY LAYOUT PLAN

DATE	05/31/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

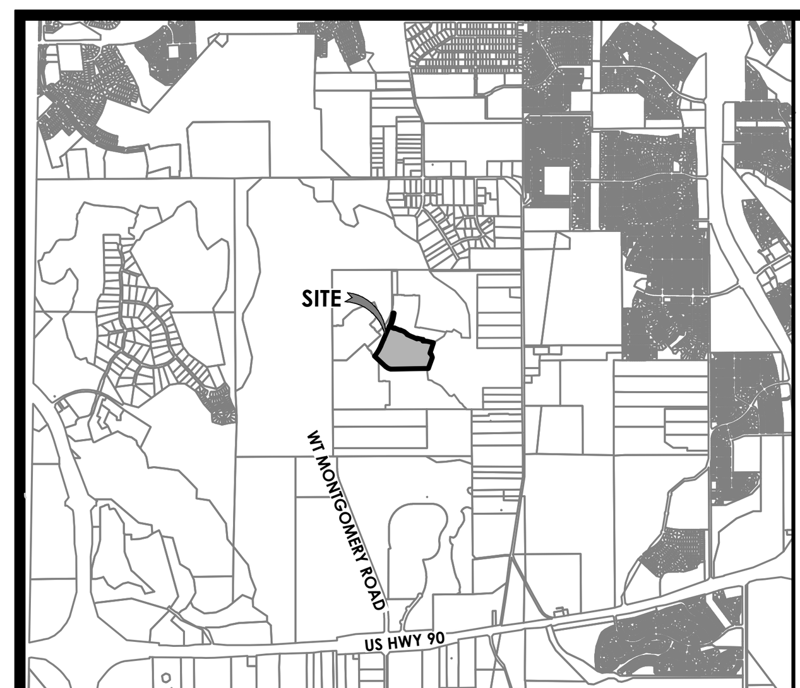
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C3.01



LOCATION MAP

N.T.S.

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

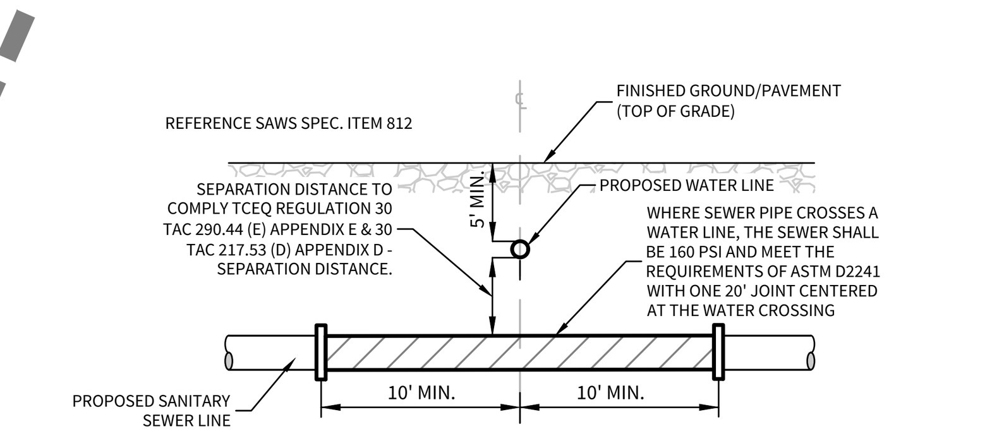
NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THUS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
2. ALL LATERALS TO BE BUILT TO FRONT UTILITY EASEMENT LINE.
3. ALL LATERAL SHALL BE INSTALLED @ MIN. 2.0% SLOPE, UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER PIPE SHALL BE PVC THAT MEETS ASTM SPECIFICATION, SDR-26, UNLESS OTHERWISE NOTED ON THE PLANS.
5. THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	210-233-2010
CoSA DRAINAGE	210-207-2800
CITY SIDEWALK TRENCHING DIVISION	210-821-3240
CoSA TRAFFIC SIGNAL OPERATIONS	210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
CITY PUBLIC SERVICE	"
AT&T	"
TIME WARNER	"
VALERO ENERGY CO.	"

BENCHMARK BM-1

BENCHMARK TO BE SET BY ENGINEER PRIOR TO CONSTRUCTION.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

SEWER/WATER LINE CROSSINGS	
LINE	STATION
"4A"	10+72.35
"4A"	13+83.79
"4A"	18+44.34
"4A"	20+29.79
"4B"	9+62.95
"4B"	12+44.93
"4C"	10+93.73
"4C"	13+45.73
"4E"	2+38.15
"4F"	1+52.40

SEWER/DRAIN CROSSINGS	
LINE	STATION
"4A"	18+85.00

SEWER: SOUTH SEWERSHED - DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES				
Developer's Address	100 NE LOOP 410 SUITE 1155				
City	SAN ANTONIO	State	TX	Zip	78216
Phone #	(210) 403-6200	Fax #	-		
SAWS Block Map #		Total EDU's	178	Total Acreage	31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26	Plat No.	24-11800118		
Number of Lots	178	SAWS Job No.	24-1545		

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER MASTER PLAN

DATE	05/21/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

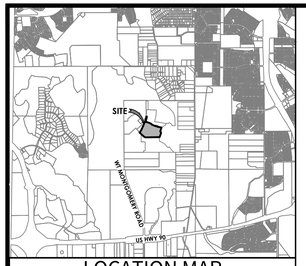
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

05/29/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

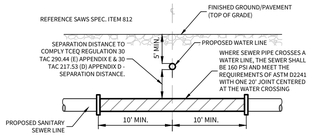
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1545

C4.00



LOCATION MAP
N.T.S.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

SEWER/WATER LINE CROSSINGS	
LINE	STATION
"4B"	1+22.00
"4B"	4+19.49
"4B"	6+48.11

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

SANITARY SEWER NOTES

1. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 P.S.I. AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT WATER MAIN.
2. NO VERTICAL STACKS SHALL BE ALLOWED, UNLESS OTHERWISE NOTED ON PLANS.
3. WHEN HORIZONTAL DISTANCE BETWEEN EWER PIPES AND WATER MAIN IS LESS THAN 9 FT. OF SEPARATION, SEWER MAIN SHALL BE INSTALLED WITH 160 PSI (MIN) PRESSURE PIPE AND FITTINGS IN ACCORDANCE WITH SAWS CONSTRUCTION CRITERIA FOR CONSTRUCTION OF SEWER MAINS IN THE VICINITY OF WATER MAINS.
4. ALL SEWER PIPES SHALL BE PVC (SDR 26), UNLESS OTHERWISE NOTED.
5. PRIOR TO CONSTRUCTION CONTRACTOR IS TO VERIFY EXISTING INVERT OF EXISTING SANITARY SEWER MAINS AND ALERT ENGINEER IMMEDIATELY OF ANY DIFFERENCE FROM INVERT SHOWN ON PLANS.
6. CONTOURS SHOWN ARE GRAPHICAL USE ONLY.
7. MANHOLE OPENING ARE 30" AS PER TCEQ CHAPTER 217.55.
8. CONTRACTOR TO INSTALL PERMANENT MARKERS AT THE END OF ALL SEWER LATERALS, PER HOUSE LATERAL DETAIL DD-854-01.
9. ALL 6" SEWER LATERALS WILL BE SET AT A MINIMUM 2% SLOPE.
10. BACKFILL MUST COMPLY WITH SAWS SPECIFICATIONS 804.4.
11. TOPS OF EXISTING MANHOLES SHALL BE ADJUSTED AS NECESSARY TO BE FLUSH WITH PROPOSED PAVEMENT ELEVATIONS, AND TO BE 0.50 FEET ABOVE FINISHED GROUND ELEVATIONS IN UNPAVED AREAS WITH WATER TIGHT LIDS.
12. CONTRACTOR TO INSTALL SERVICE LATERAL USING A LATERAL SADDLE (SAWS DETAIL DD 854-0). THE SADDLE SHALL BE PERMANENTLY BONDED TO THE EXISTING MAIN BY THE USE OF COMPOUNDS AND CLAMPS AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE SAN ANTONIO WATER SYSTEM.

NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THUS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
2. ALL LATERALS TO BE BUILT TO FRONT UTILITY EASEMENT LINE.
3. ALL LATERAL SHALL BE INSTALLED @ MIN. 2.0% SLOPE, UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER PIPE SHALL BE PVC THAT MEETS ASTM SPECIFICATION, SDR-26, UNLESS OTHERWISE NOTED ON THE PLANS.
5. THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	210-233-2010
CoSA DRAINAGE	210-207-2800
CITY SIDEWALK TRENCHING DIVISION	210-821-3240
CoSA TRAFFIC SIGNAL OPERATIONS	210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
CITY PUBLIC SERVICE	"
AT&T	"
TIME WARNER	"
VALERO ENERGY CO.	"

BENCHMARK BM-1

BENCHMARK TO BE SET BY ENGINEER PRIOR TO CONSTRUCTION.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. The Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

SEWER: SOUTH SEWERSHED - DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State TX	Zip 78216
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's 178	Total Acreage 31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26		Plat No. 24-11800118
Number of Lots	178	SAWS Job No.	24-1545

SCALE: 1"=50'
0 50 100

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER MASTER PLAN

DATE 05/22/2024
PROJECT NO. 03050.015
DRAWN BY RM / IV
CHECKED BY MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

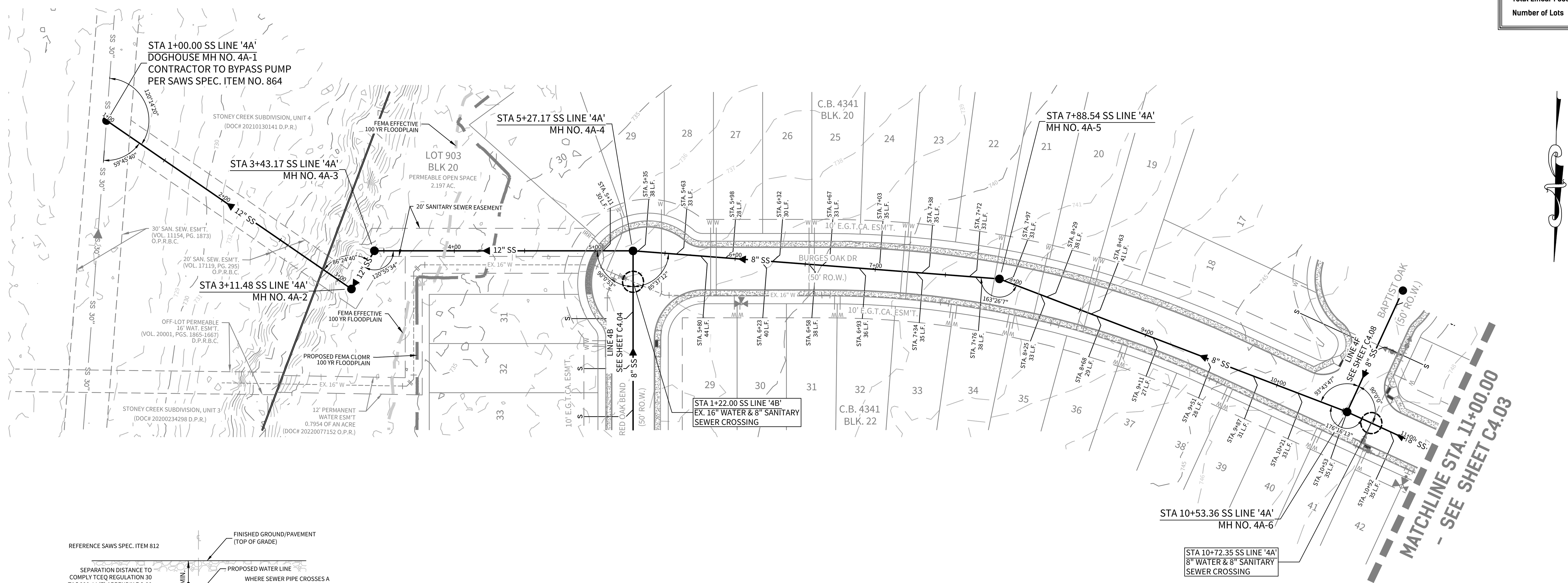
05/29/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO. 24-11800118
SAWS JOB NO. 24-1545

C4.01

SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State	TX
Zip	78216		
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's	178
Total Acreage	31.33		
Total Linear Footage of Pipe	5,397 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26	Plat No.	24-11800118
Number of Lots	178	SAWS Job No.	24-1545



NOTE:

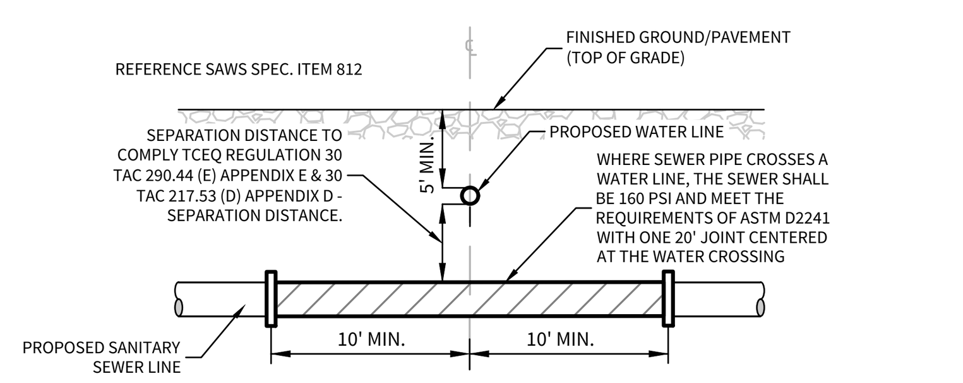
CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

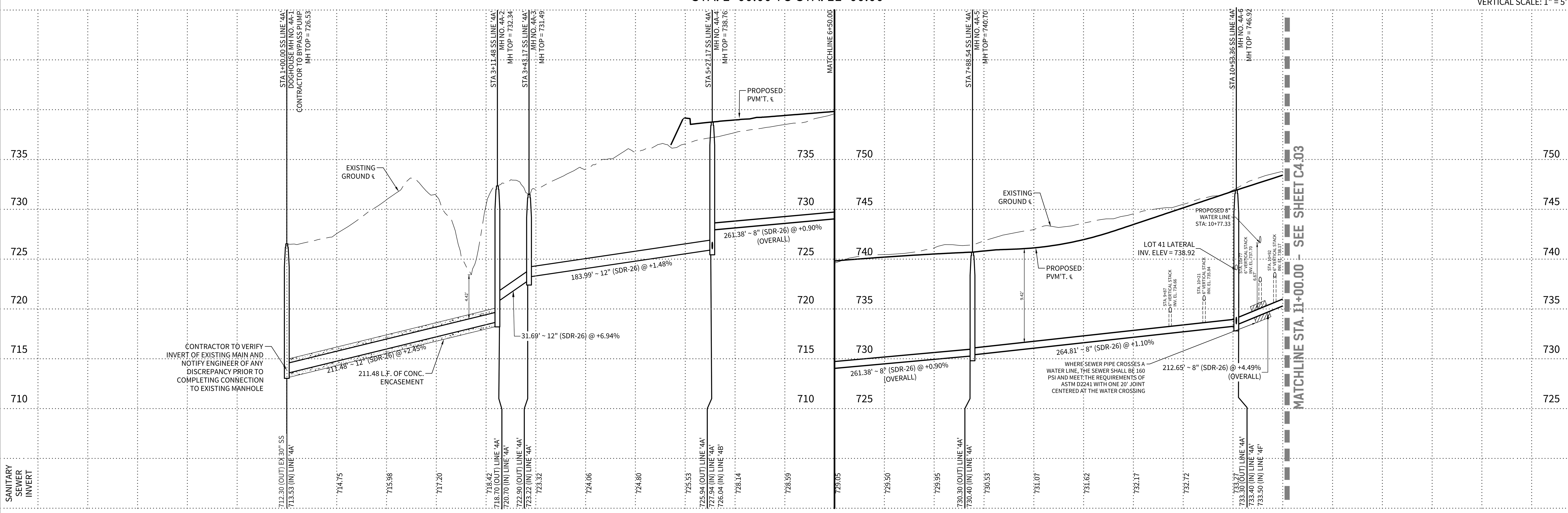


TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

LINE 4A

STA. 1+00.00 TO STA. 11+00.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINE '4A'

DATE	06/20/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

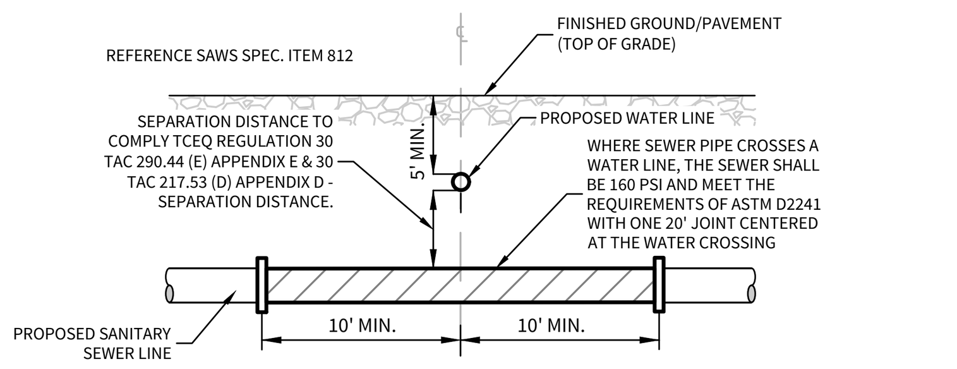
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1545

C4.02



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

NOTE:

CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

CAUTION!!!

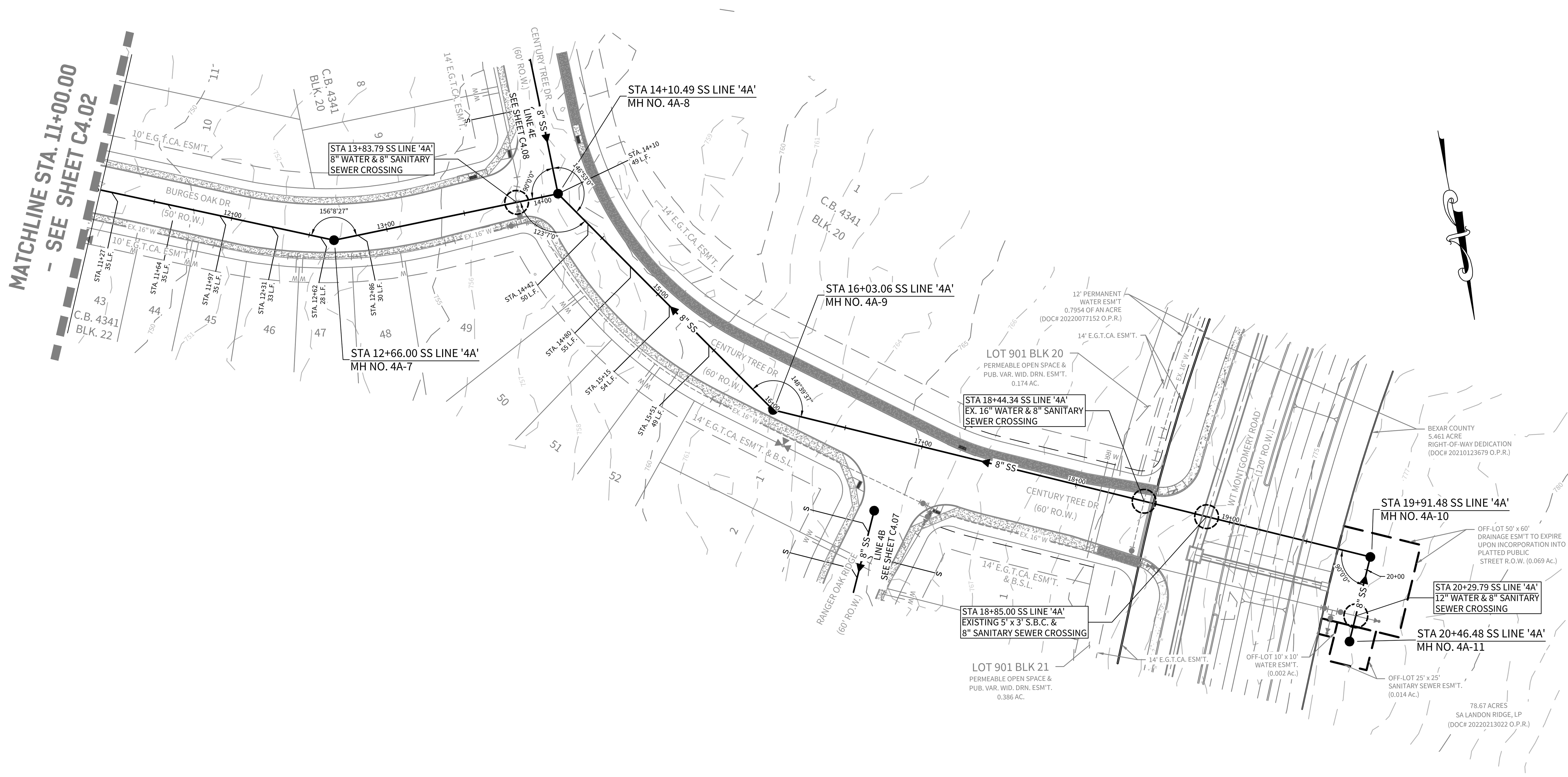
THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. The Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

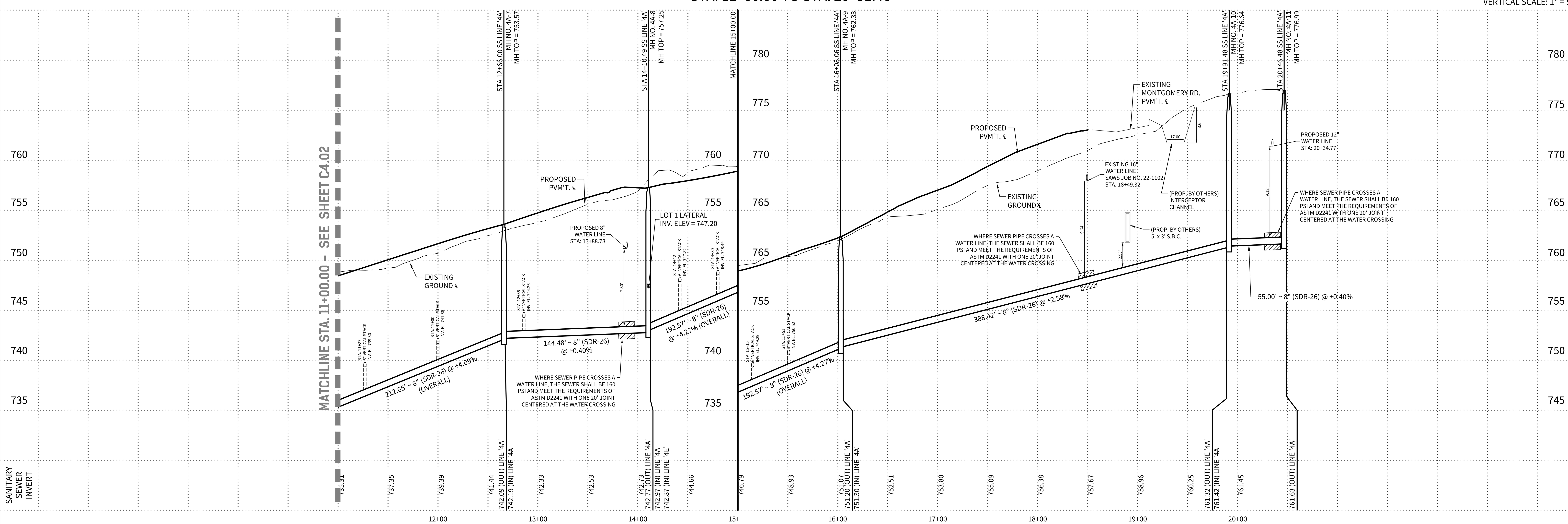
Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State	TX
Zip	78216		
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's	178
Total Acreage	31.33		
Total Linear Footage of Pipe	5,397 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26	Plat No.	24-11800118
Number of Lots	178	SAWS Job No.	24-1545



LINE 4A

STA. 11+00.00 TO STA. 20+51.46

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINE '4A'

DATE	06/25/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

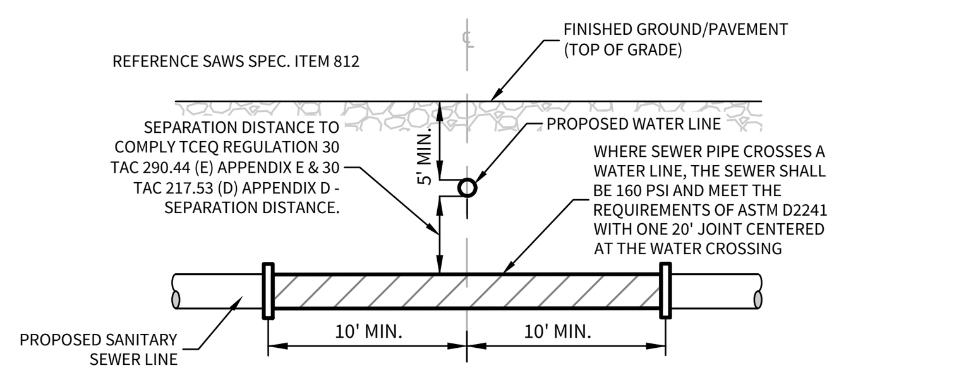
REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1545

C4.03



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

NOTE:

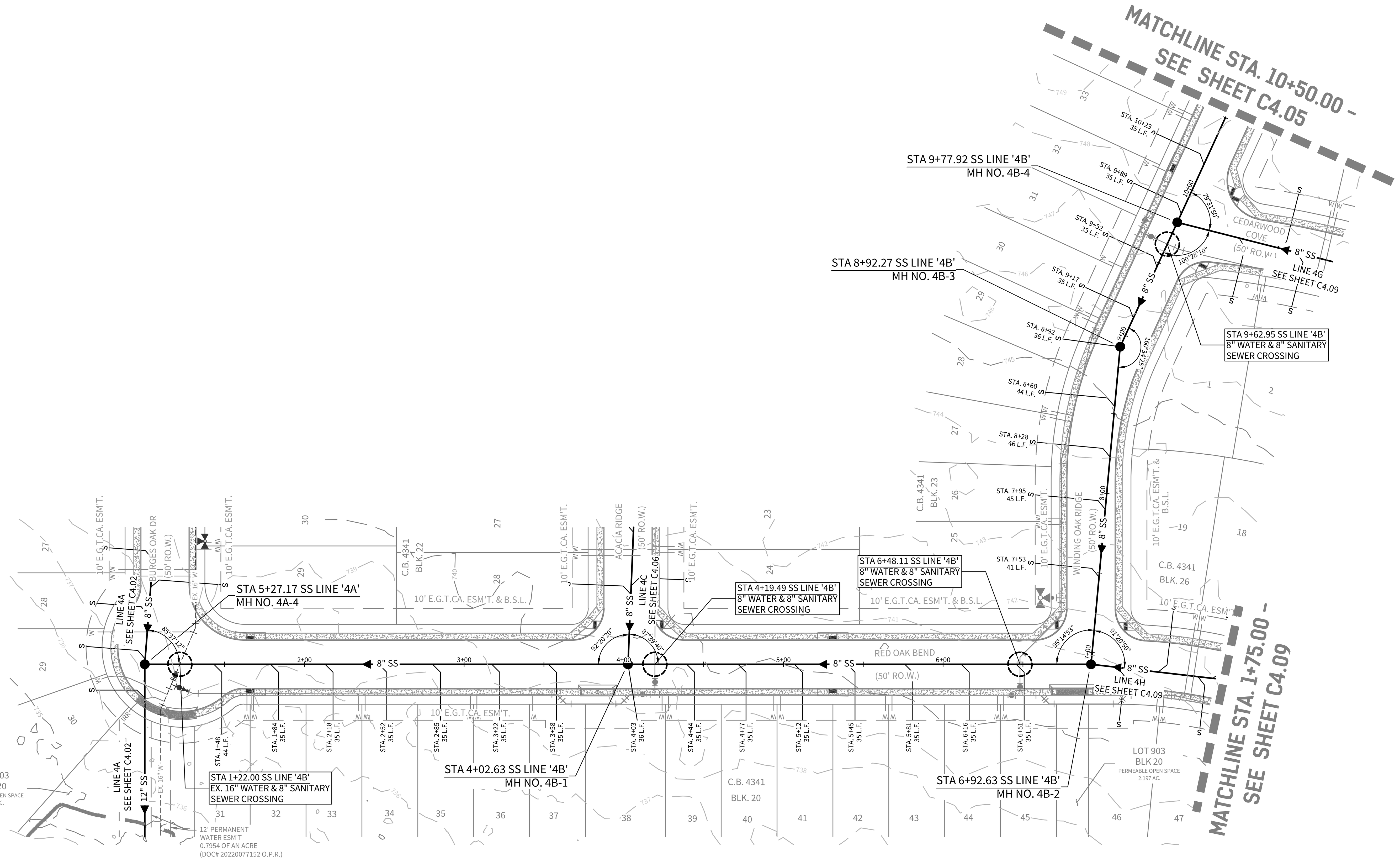
CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



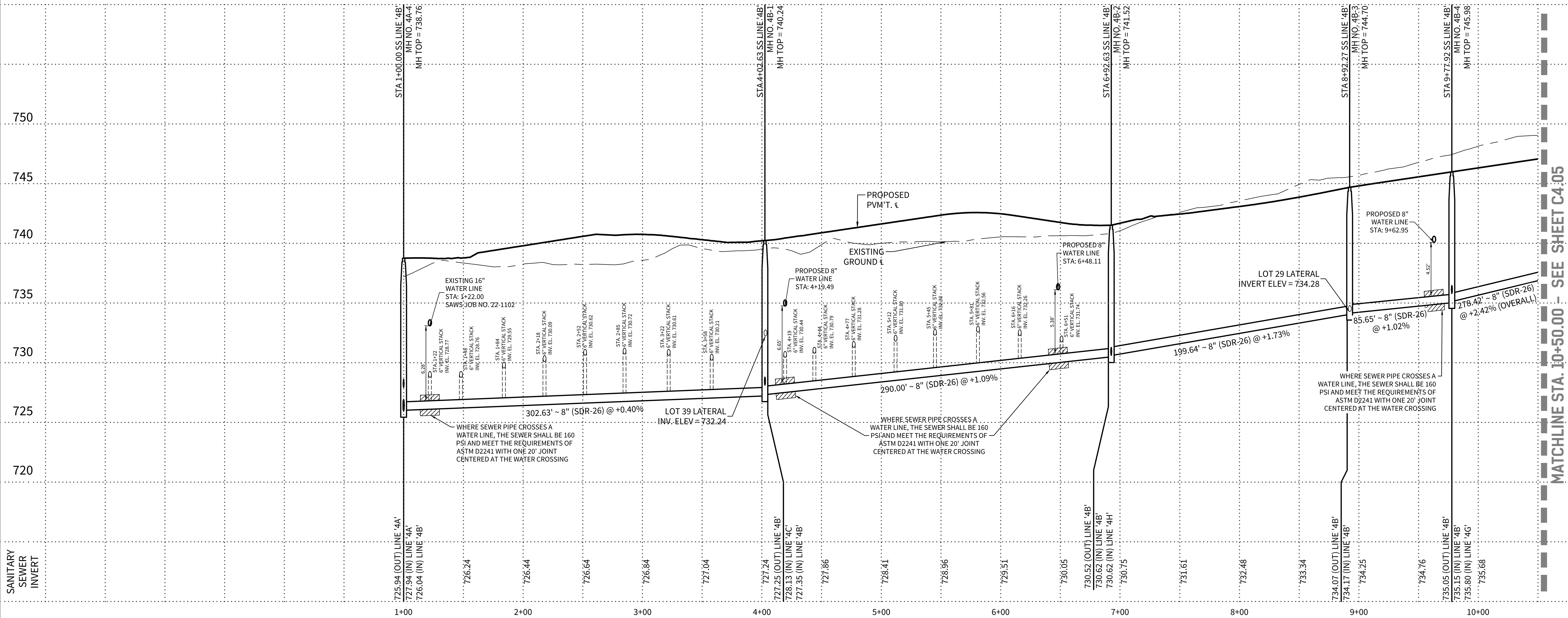
SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State	TX
Zip	78216		
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's	178
Total Acreage	31.33		
Total Linear Footage of Pipe	5,397 L.F. OF 8" SS – SDR 26 427 L.F. OF 12" SS – SDR 26	Plat No.	24-11800118
Number of Lots	178	SAWS Job No.	24-1545

LINE 4B

STA. 1+00.00 TO STA. 10+50.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINE '4B'

DATE	06/25/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

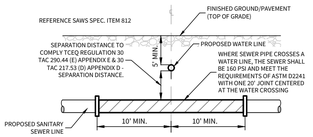
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

SAWS JOB NO.
24-1545

C4.04



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

NOTE:

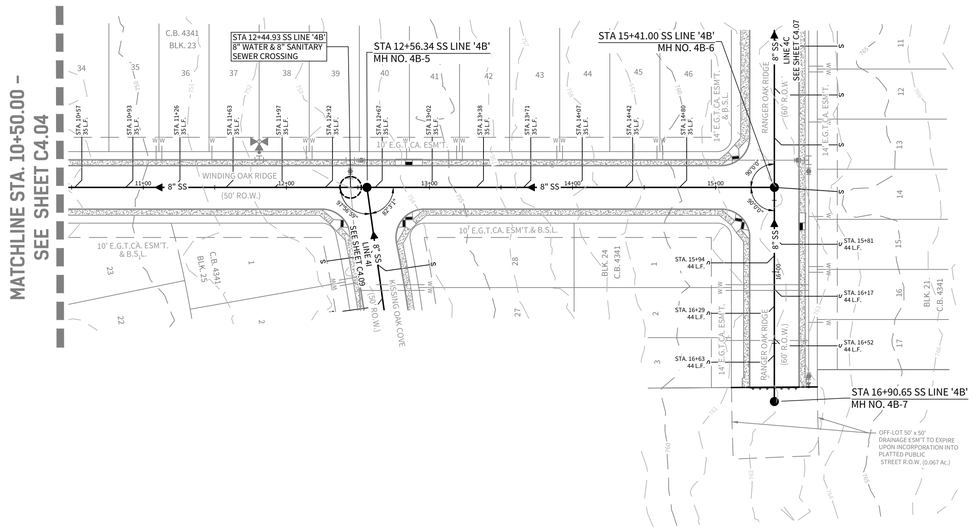
CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

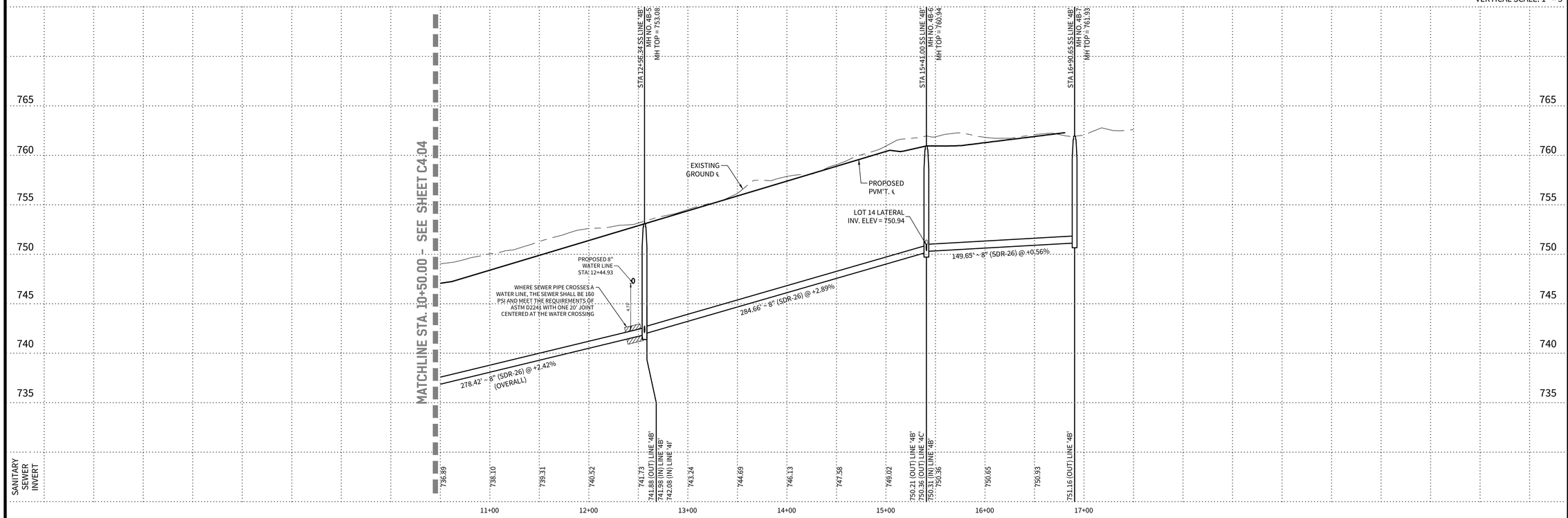
Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



LINE 4B

STA. 10+50.00 TO STA. 16+90.65

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State TX	Zip 78216
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's 178	Total Acreage 31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26		Plat No. 24-11800118
Number of Lots	178	SAWS Job No.	24-1545

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINE '4B'

DATE
05/22/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

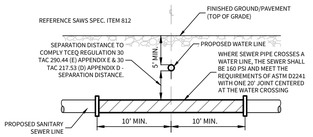
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
05/29/2024

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

SAWS JOB NO.
24-1545

C4.05



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

NOTE:

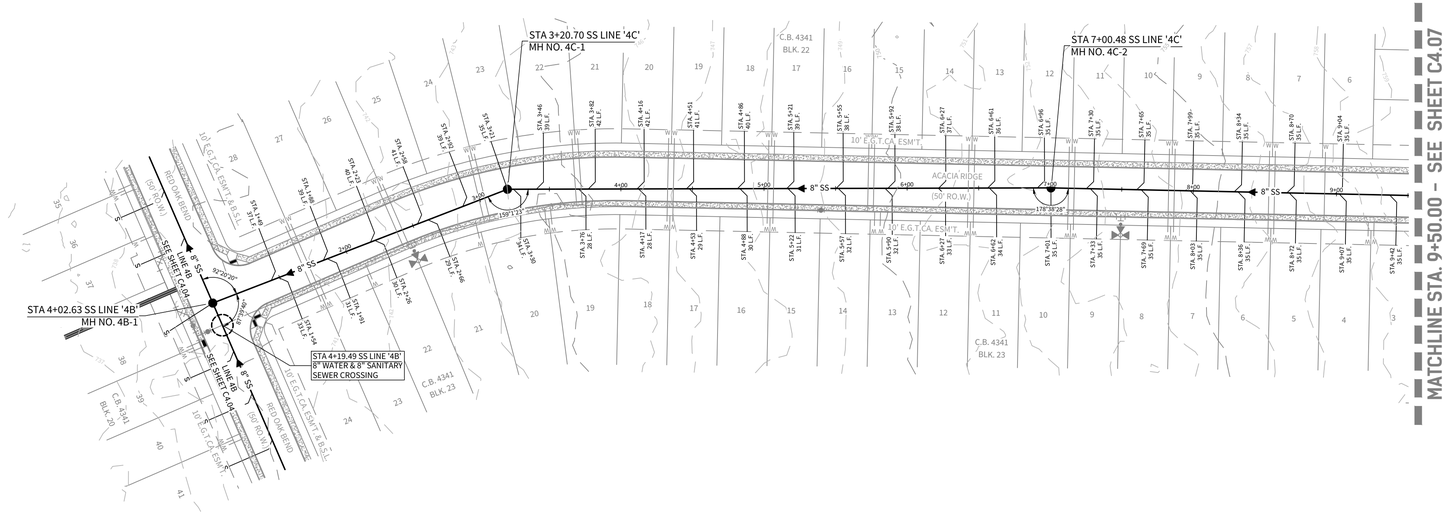
CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

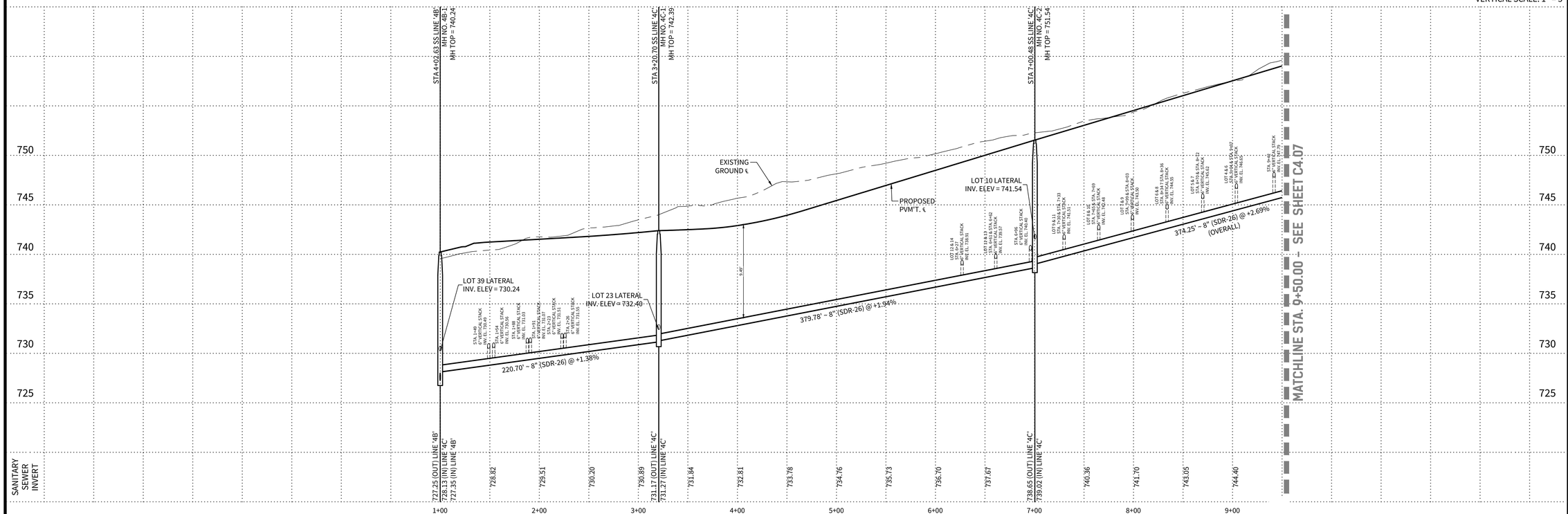
Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. The Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



LINE 4C

STA. 1+00.00 TO STA. 9+50.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State TX	Zip 78216
Phone #	(210) 403-6200	Fax #	–
SAWS Block Map #		Total EDU's 178	Total Acreage 31.33
Total Linear Footage of Pipe	5,367 LF. OF 8" SS – SDR 26 427 LF. OF 10" SS – SDR 26		Plat No. 24-11800118
Number of Lots	178	SAWS Job No.	24-1545

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINES '4C'

DATE 05/22/2024

PROJECT NO. 03050.015

DRAWN BY RM / IV

CHECKED BY MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

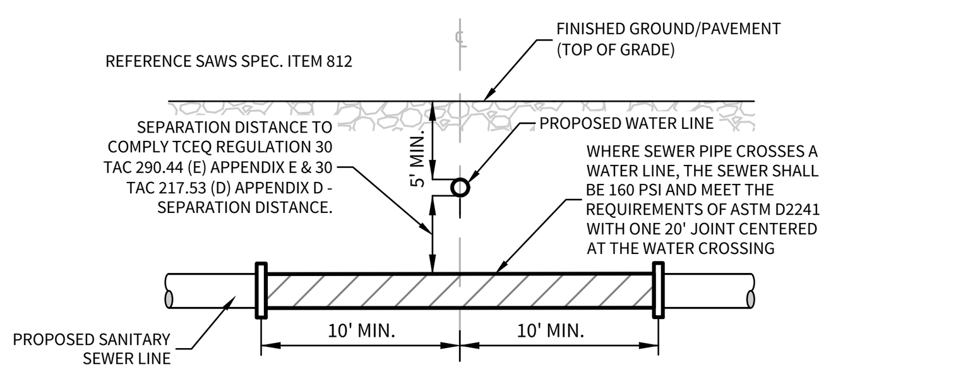
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
05/29/2024

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO. 24-11800118

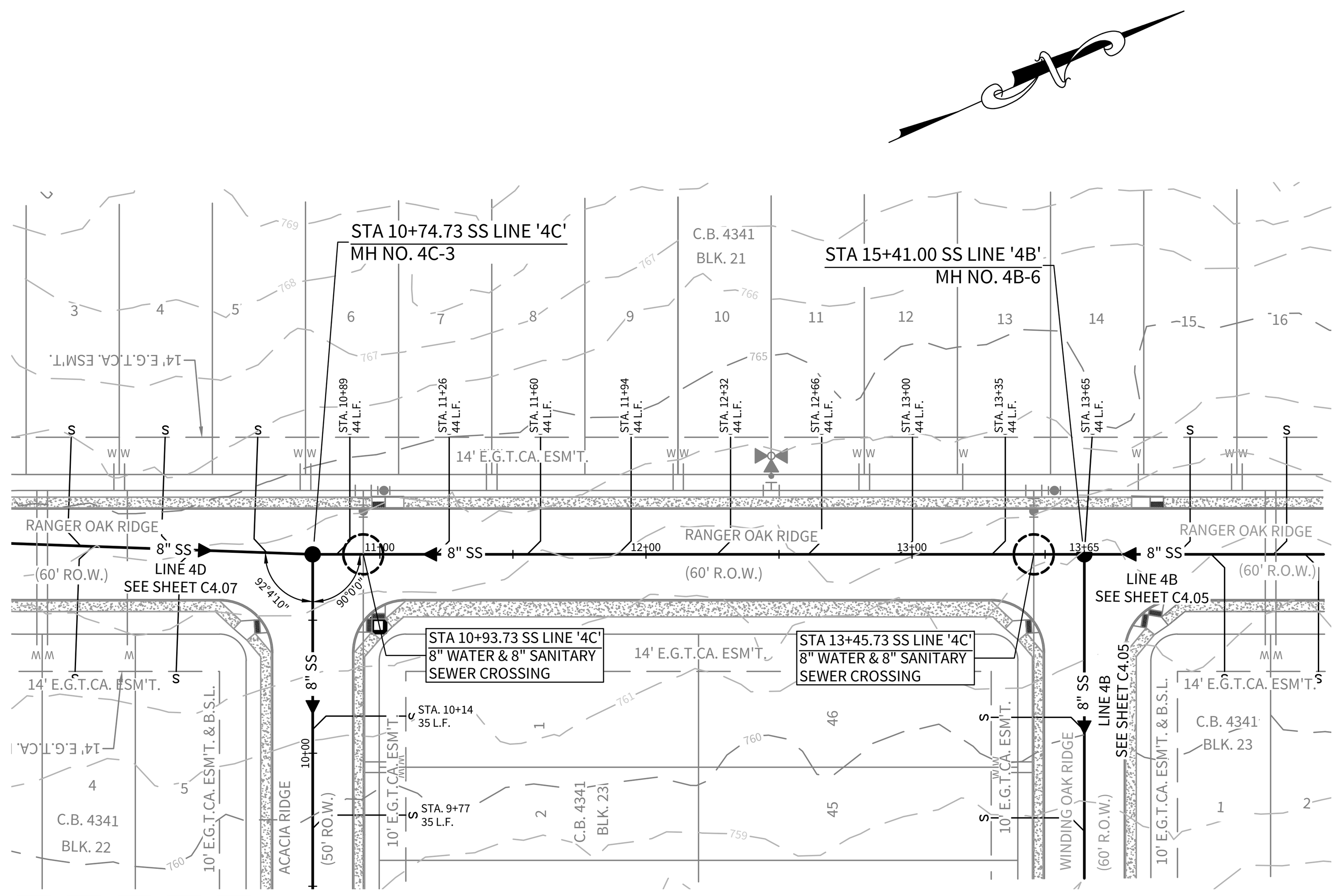
SAWS JOB NO. 24-1545

C4.06

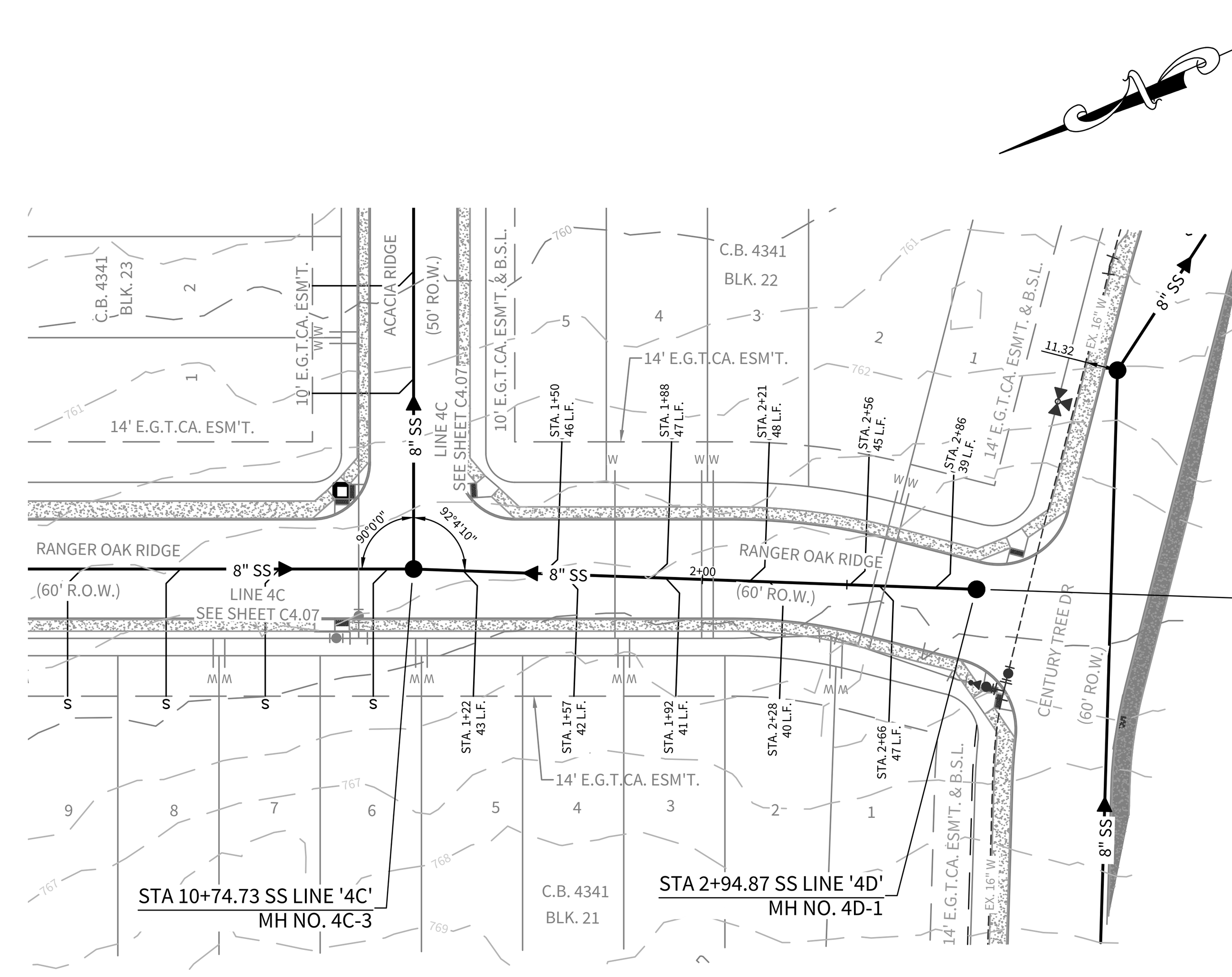


TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.



MATCHLINE STA. 9+50.00
– SEE SHEET C4.06



NOTE:

CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State	TX
Zip	78216		
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's	178
Total Acreage	31.33		
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26	Plat No.	24-11800118
Number of Lots	178	SAWS Job No.	24-1545

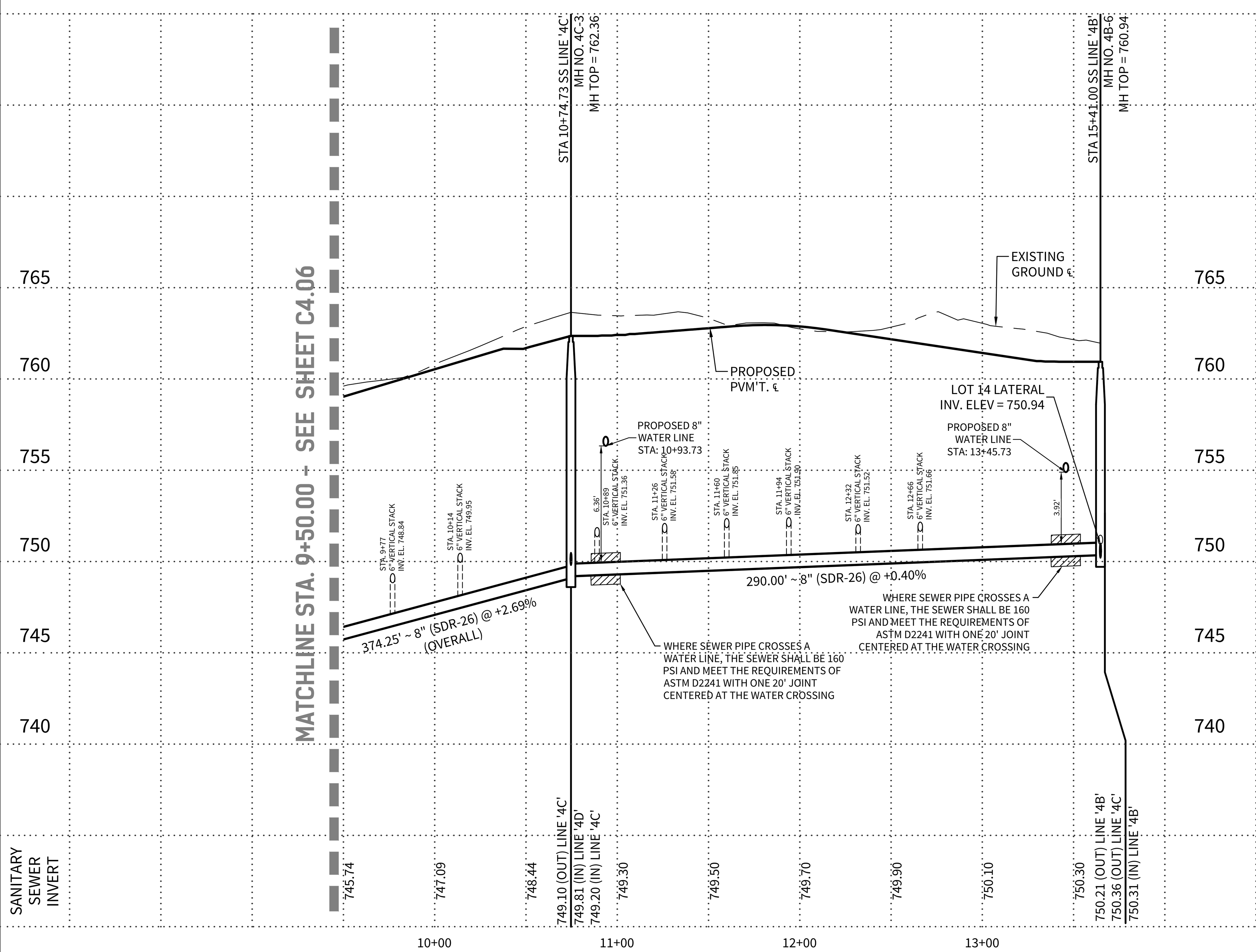
LINE 4C

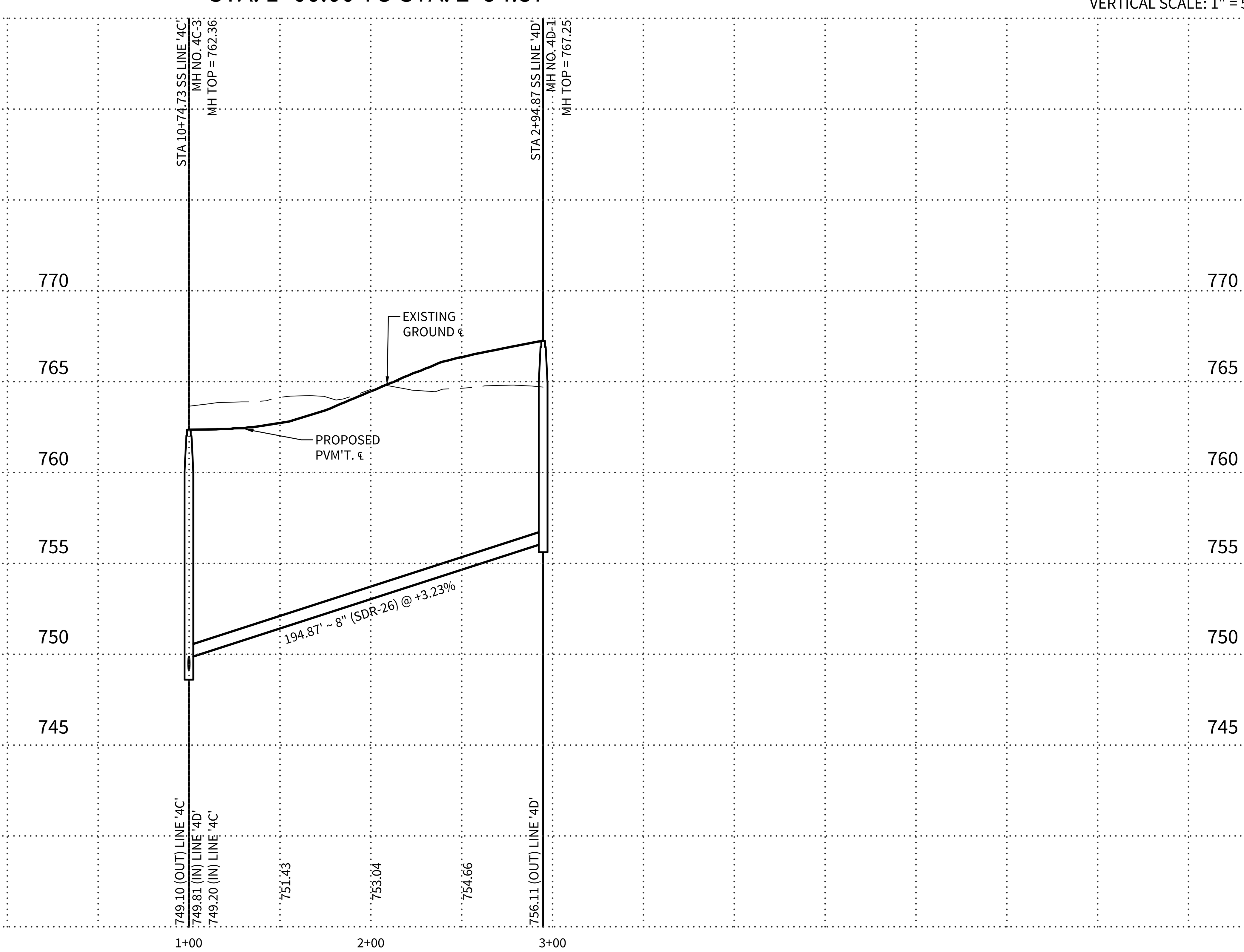
STA. 9+50.00 TO STA. 15+41.00

LINE 4D

STA. 1+00.00 TO STA. 2+94.87

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'





CUDEENGINEERS.COM
CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINES '4C' & '4D'

DATE	05/22/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

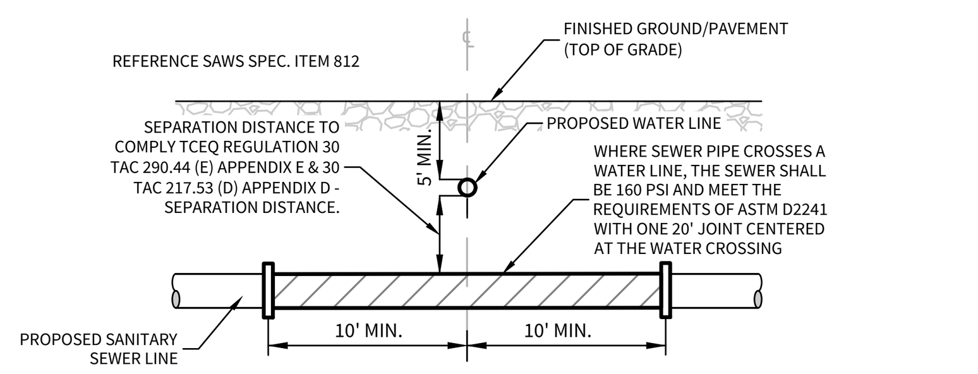
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

05/29/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1545

C4.07



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

NOTE:

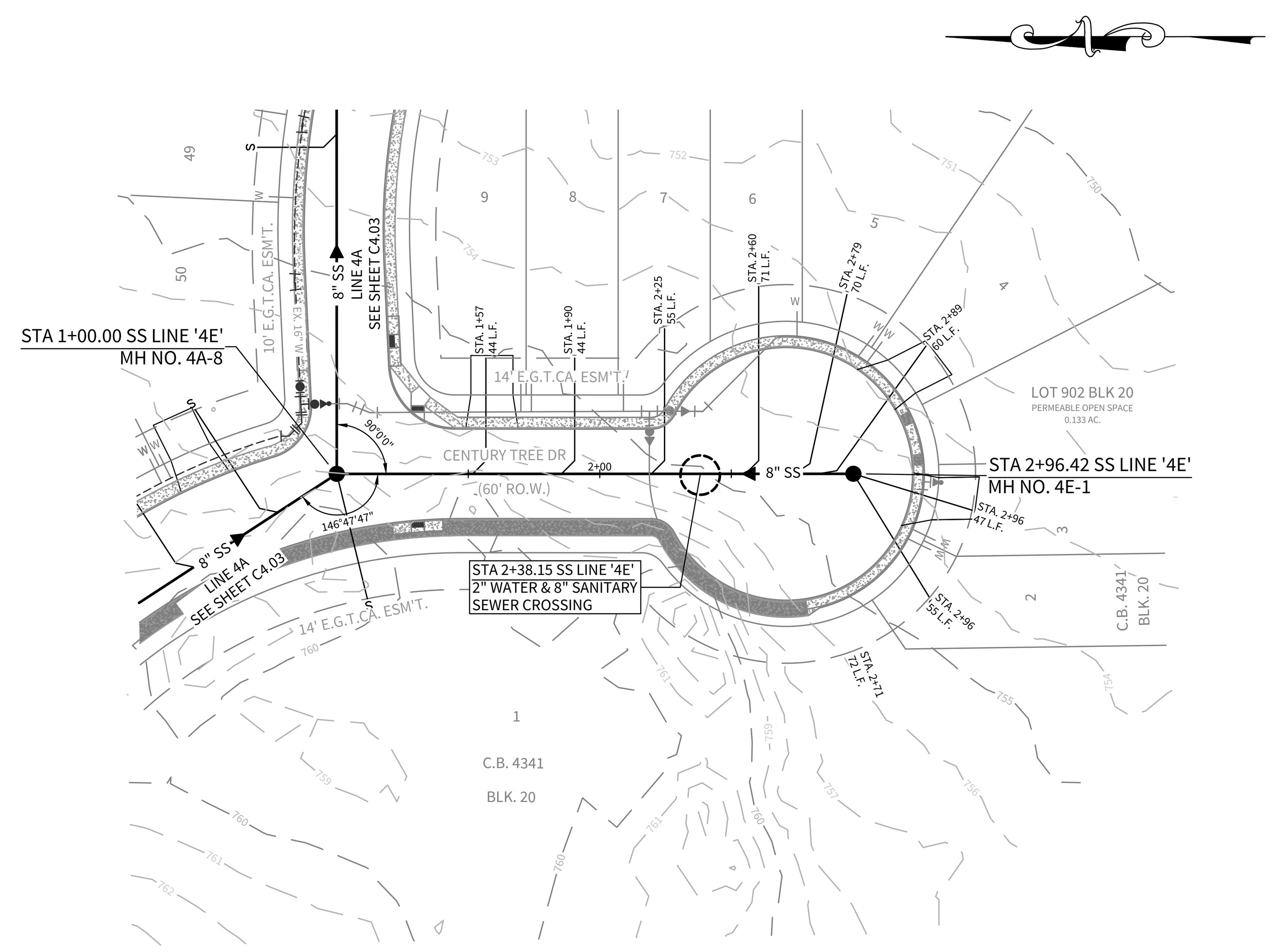
CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING SEWER MAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.

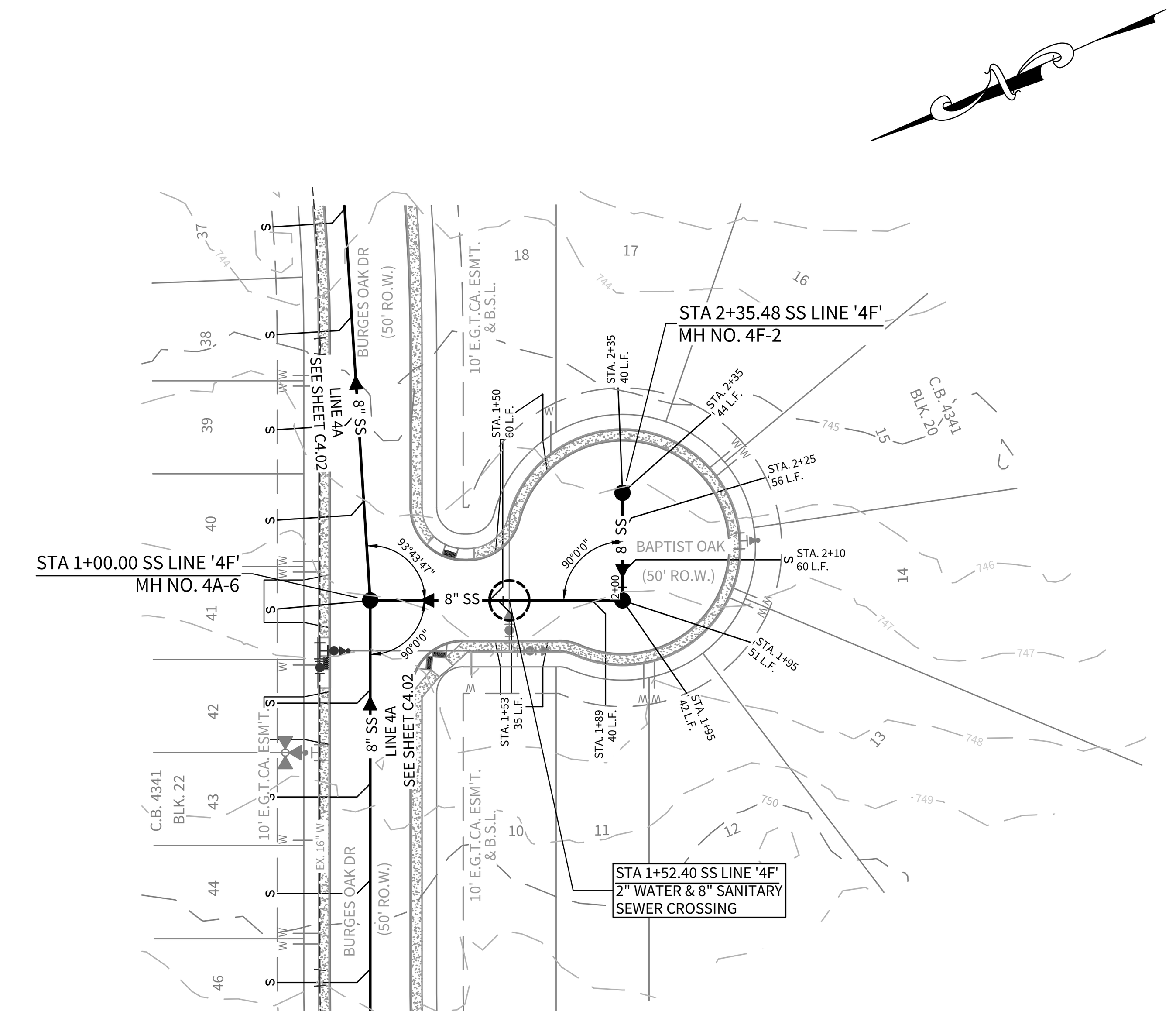
CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.





SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State	TX
Zip	78216		
Phone #	(210) 403-6200	Fax #	-
SAWS Block Map #		Total EDU's	178
Total Acreage	31.33		
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26	Plat No.	24-11800118
Number of Lots	178	SAWS Job No.	24-1545

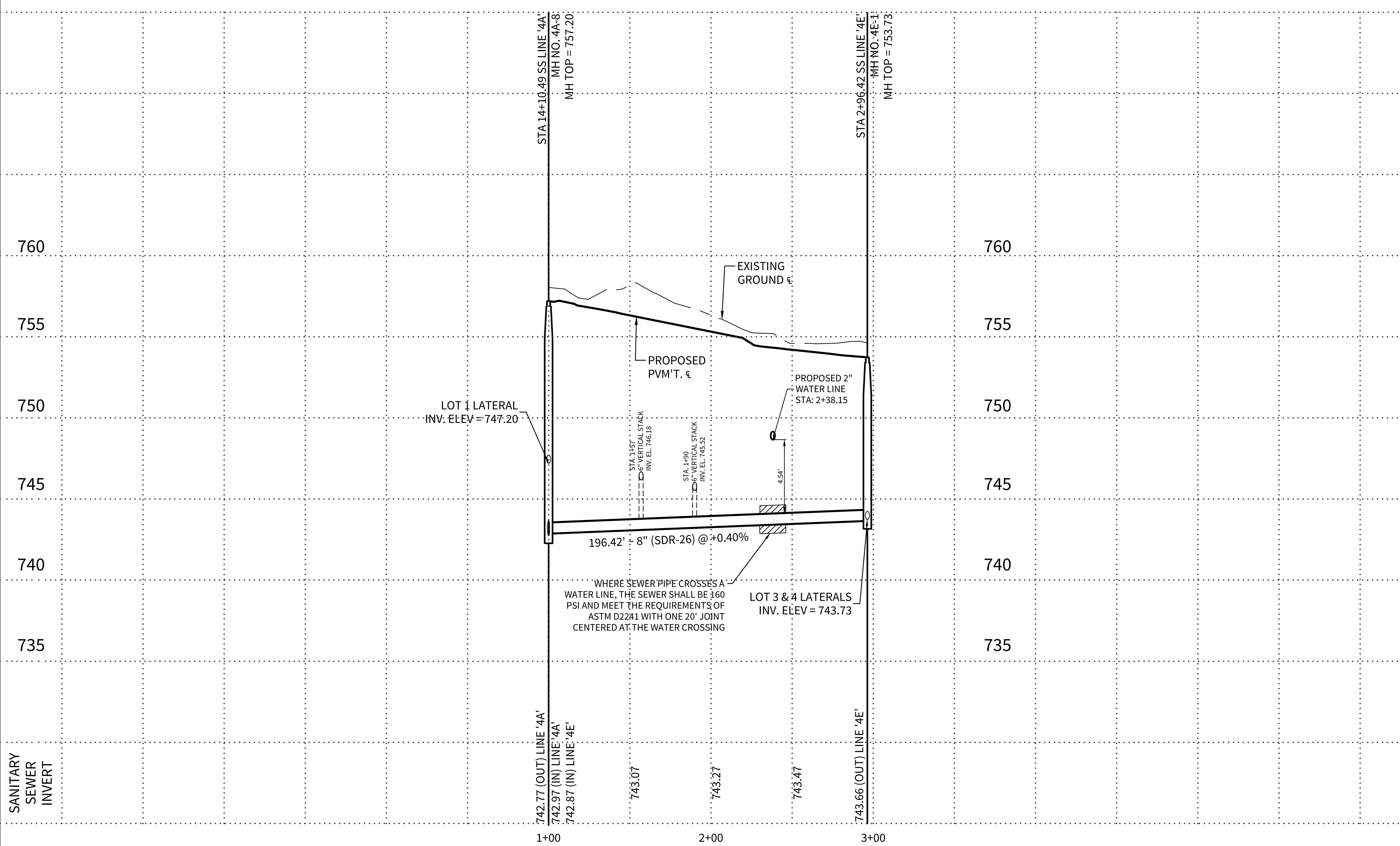
LINE 4E

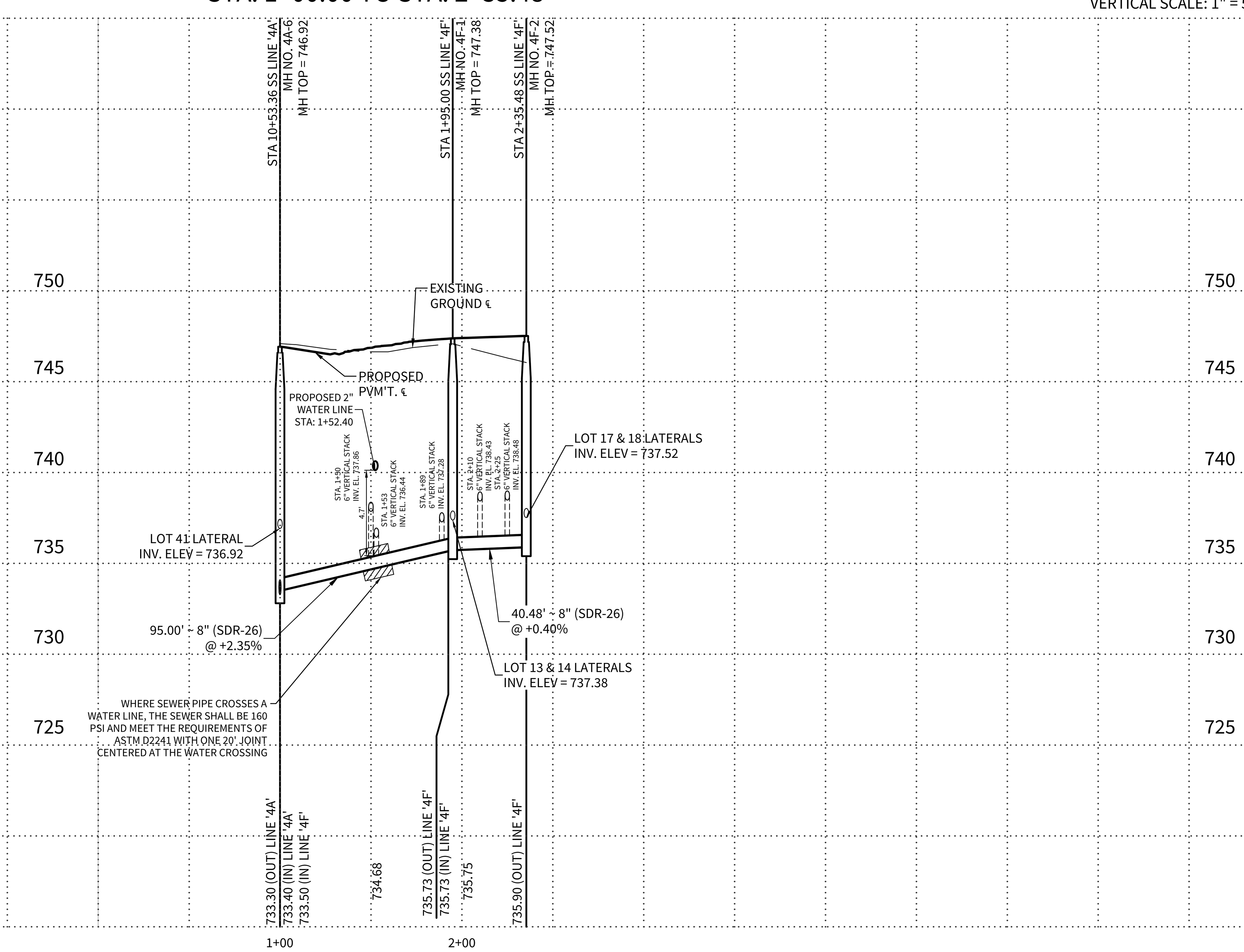
STA. 1+00.00 TO STA. 2+96.42

LINE 4F

STA. 1+00.00 TO STA. 2+35.48

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'





CUDEENGINEERS.COM

CUDE EST. 1980 ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINES '4E' & '4F'

DATE	05/22/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

05/29/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO. 24-11800118

SAWS JOB NO. 24-1545

C4.08

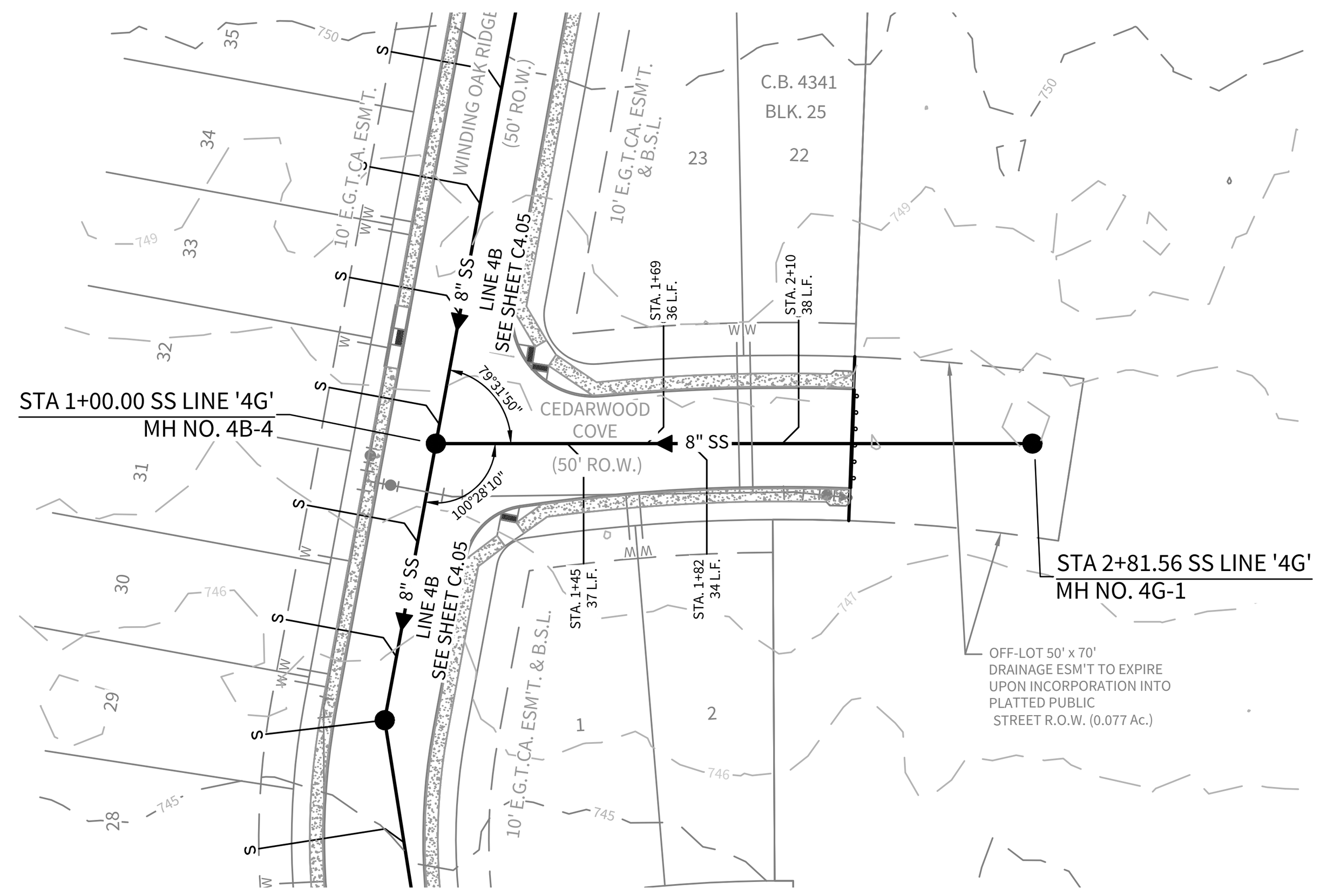
CUDEENGINEERS.COM

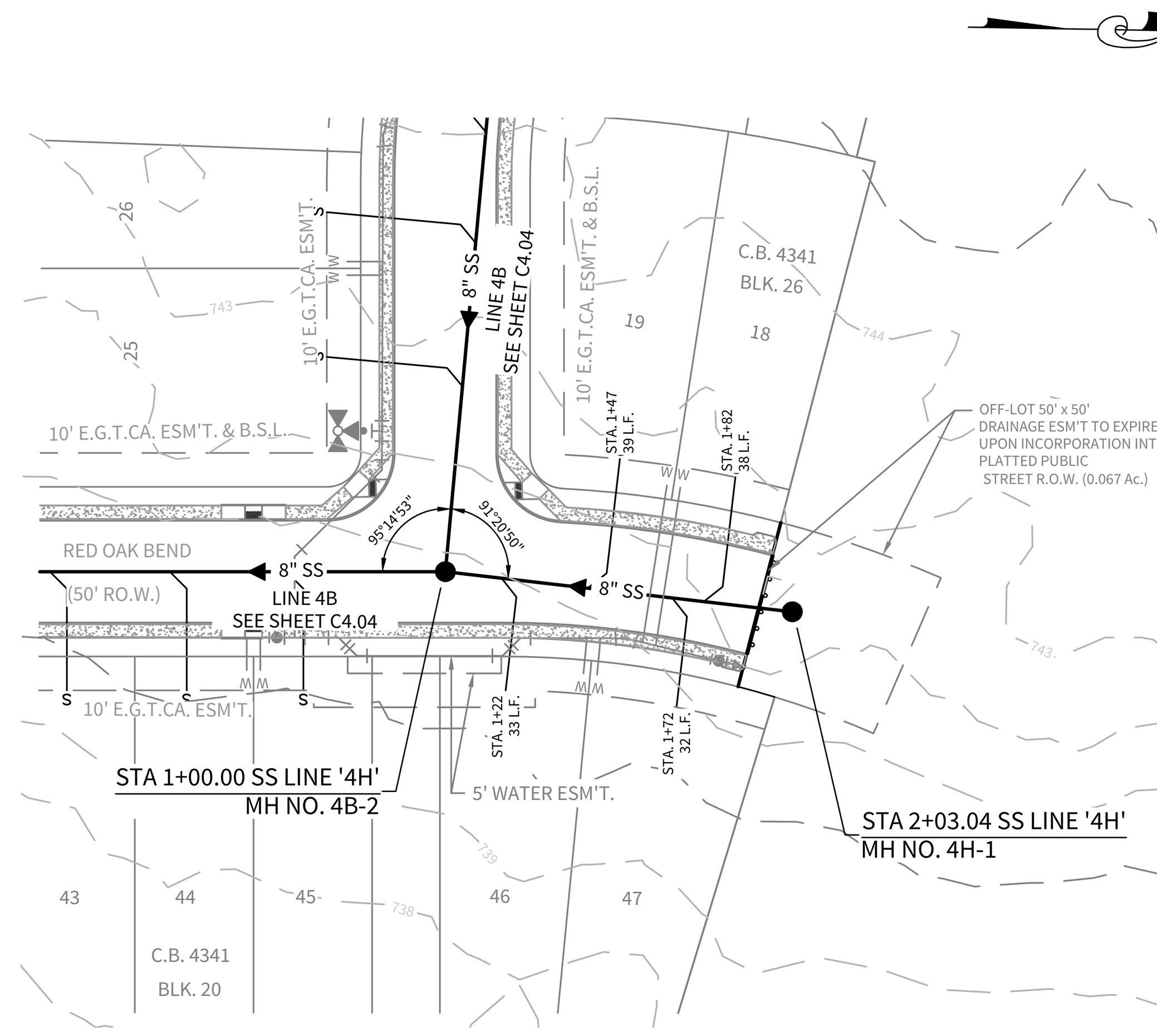
CUDE ENGINEERS EST. 1980

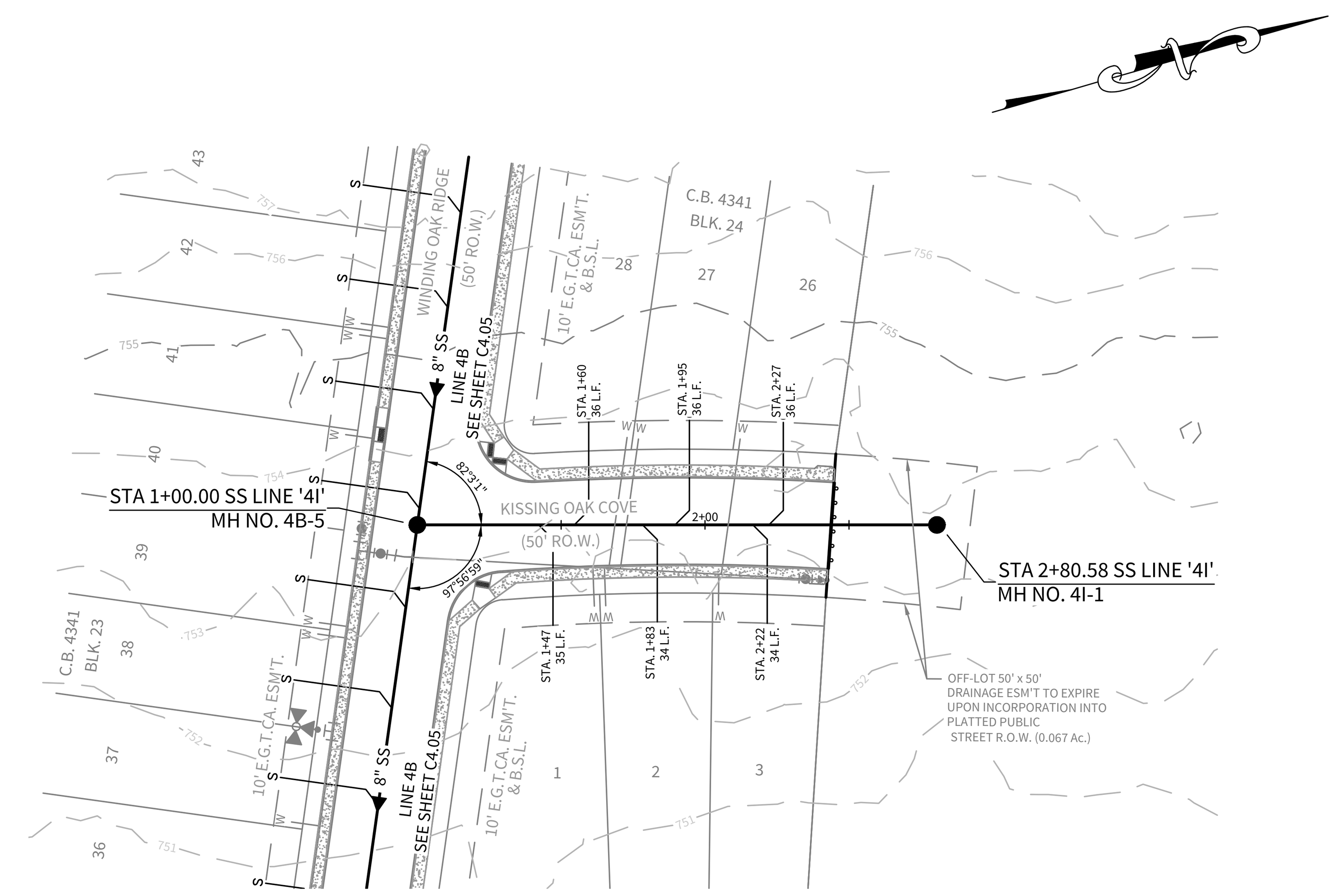
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER PLAN & PROFILE - LINES '4G', '4H' & '4I'





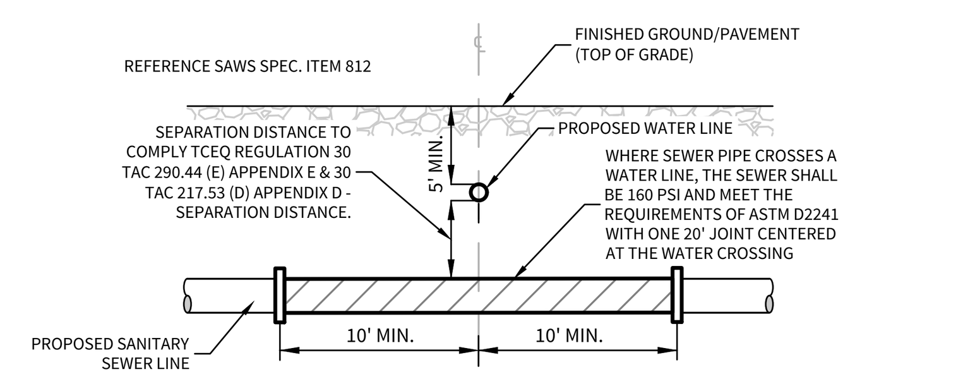


CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND WATER LINES EXIST ALONG WT MONTGOMERY ROAD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



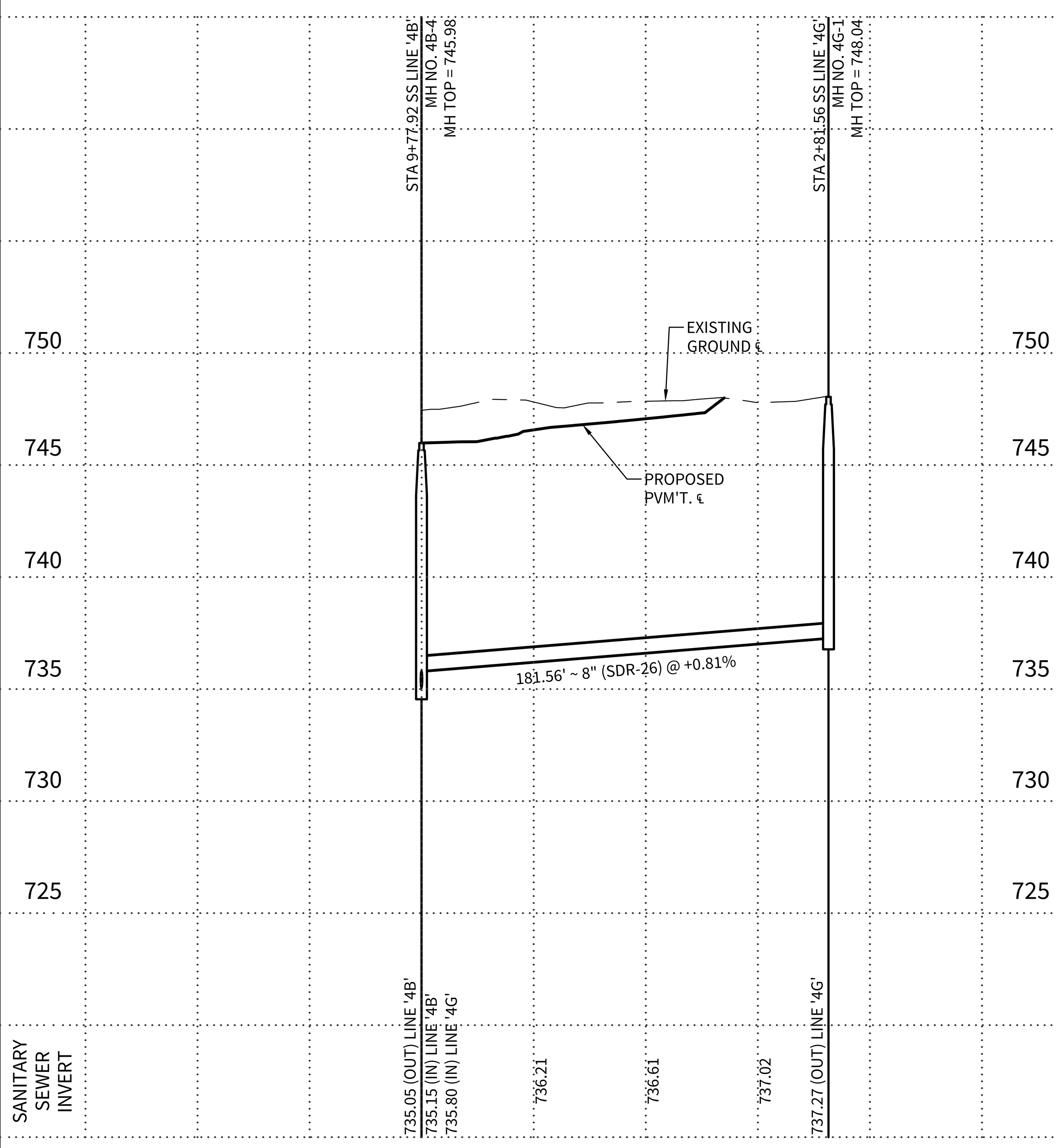
TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

SEWER: SOUTH SEWERSHED - DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES				
Developer's Address	100 NE LOOP 410 SUITE 1155				
City	SAN ANTONIO	State	TX	Zip	78216
Phone #	(210) 403-6200			Fax #	-
SAWS Block Map #		Total EDU's	178	Total Acreage	31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS - SDR 26 427 L.F. OF 12" SS - SDR 26			Plat No.	24-11800118
Number of Lots	178			SAWS Job No.	24-1545

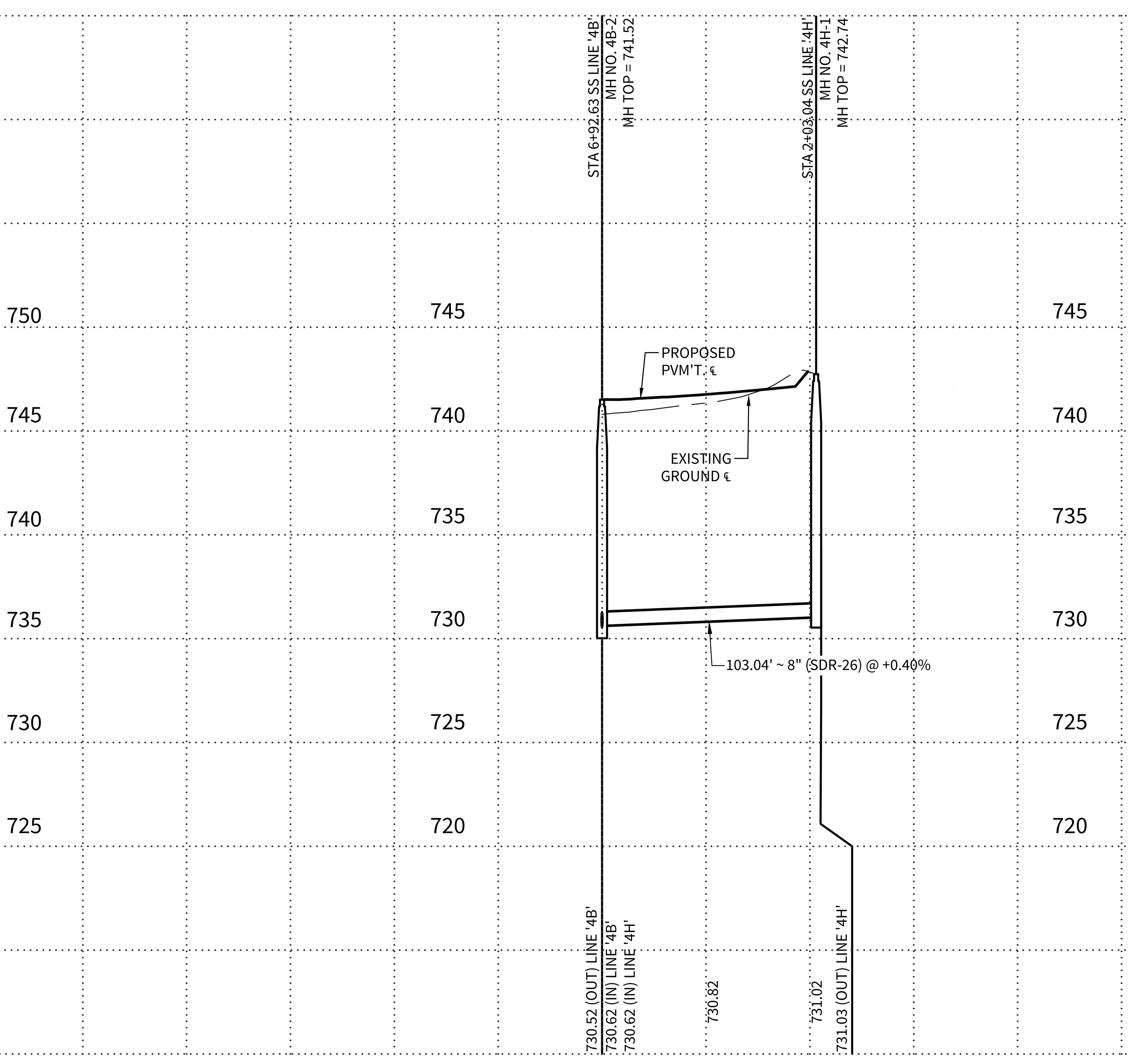
LINE 4G

STA. 1+00.00 TO STA. 2+81.56



LINE 4H

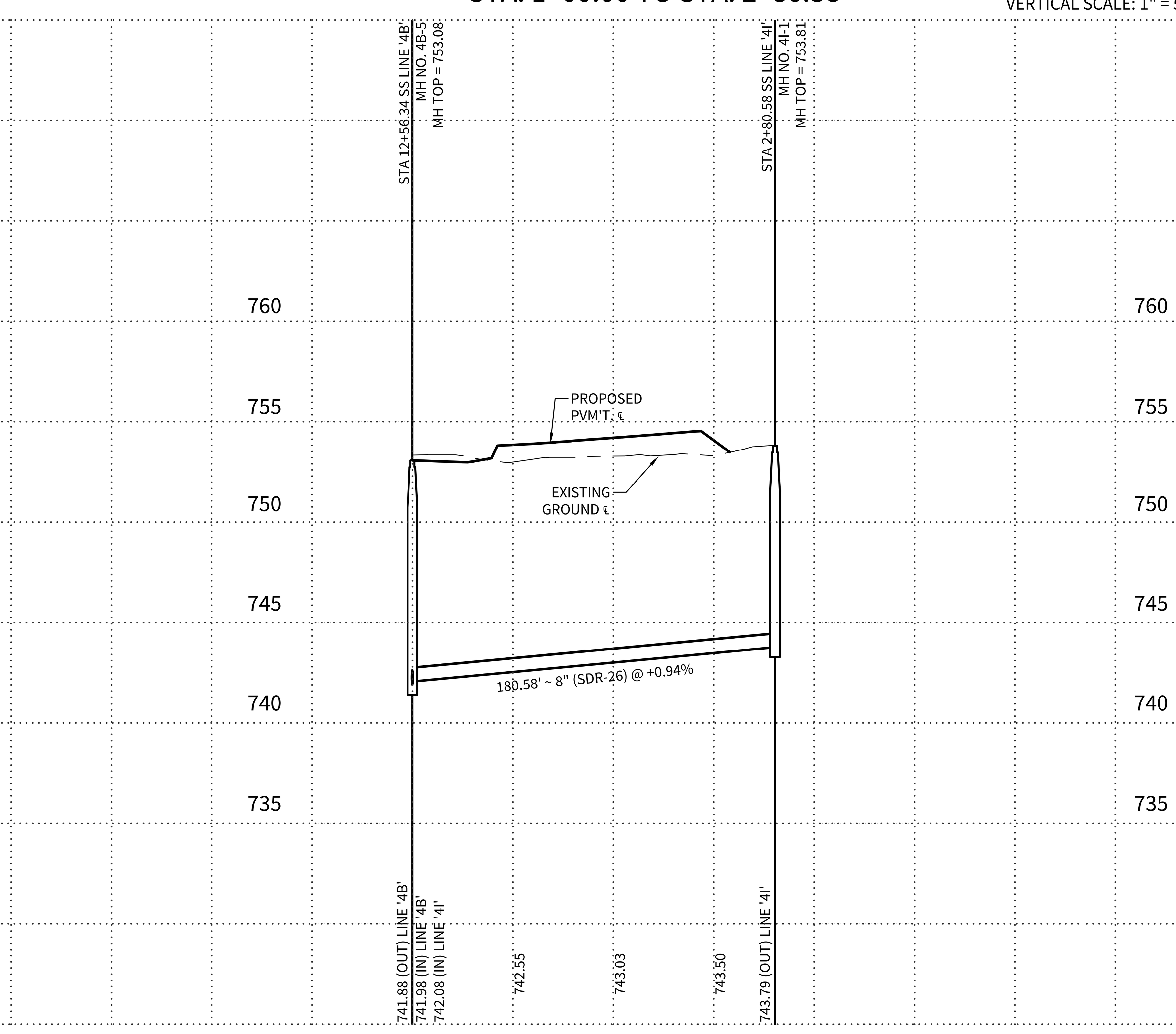
STA. 1+00.00 TO STA. 2+03.04



LINE 4I

STA. 1+00.00 TO STA. 2+80.58

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



DATE
05/22/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

05/29/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

SAWS JOB NO.
24-1545

C4.09

SAWS STANDARD GENERAL CONSTRUCTION NOTES ASSOCIATED WITH 2021 SAWS STANDARD SPECS *REVISED DECEMBER 2021*

GENERAL CONSTRUCTION

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITH THE SCOPE OF CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:

   A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM," TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART I CHAPTER 217 AND "PUBLIC DRINKING WATER," TAX TITLE 30 PART I CHAPTER 290.
   B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND DRAINAGE."
   C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION."
   D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR CONSTRUCTION."
   E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).

2. THE CONTRACTOR SHALL OBTAIN SAWS STANDARD DETAILS FROM SAWS WEBSITE, https://apps.saws.org/business_center/specs/constspecs/ UNLESS OTHERWISE NOTED WITHIN DESIGN PLANS.
3. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-3500 (DURING REGULAR SAWS WORKING HOURS) AND PROVIDE NOTIFICATION PROCEDURES THE CONTRACTOR WILL USE TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS TWO (2) WEEKS PRIOR TO EXCAVATION. OUTSIDE OF REGULAR SAWS WORKING HOURS THE SAWS EOC SHOULD BE CONTACTED AT 210-704-7297.
4. IF NECESSARY, CONTRACTOR WILL COORDINATE USE OF SAWS PREMISES AT NO ADDITIONAL COST TO SAWS. SUCH EFFORTS INCLUDE, BUT ARE NOT LIMITED TO, OBTAINING SECURITY IDENTIFICATION BADGES REQUIRED FOR ACCESS TO SAWS FACILITIES.
5. LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. AS-BUILTS FOR SAWS INFRASTRUCTURE CAN BE OBTAINED AT WEBSITE BELOW. CONTRACTOR SHALL COORDINATE PHYSICAL LOCATES FOR SAWS INFRASTRUCTURE THROUGH THE SAWS INSPECTOR. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS INFRASTRUCTURE. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:

   SAN ANTONIO WATER SYSTEM:
   REQUEST AS-BUILTS: https://www.saws.org/service/locates-service/

   COSA DRAINAGE: 210-206-8433
   COSA TRAFFIC SIGNAL OPERATIONS: 210-207-7720
   TEXAS STATEWIDE ONE CALL LOCATOR: 1-800-545-6005 OR 811

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING, AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGES DONE BY THE PROJECT'S CONSTRUCTION.
8. CONTRACTOR SHALL NOT MAKE USE OF DUMPSTERS OR WASTE BINS THAT ARE INTENDED TO SERVE RESIDENTS AND/OR BUSINESS.
9. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION AND BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.
10. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
11. ALL WORK WITHIN THE 100-YEAR FLOODPLAIN SHALL BE DONE IN ACCORDANCE WITH FLOODPLAIN DEVELOPMENT PERMIT.
12. ANY WORK COMPLETED WITHOUT PRIOR WRITTEN AUTHORIZATION WHICH IS NOT INCLUDED IN THESE PLANS AND SPECIFICATIONS WITH NOT BE COMPENSATED BY THE SAN ANTONIO WATER SYSTEM.
13. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS.

   WEEKEND WORK: CONTRACTORS ARE REQUIRED TO SUBMIT REQUEST TO THE SAWS INSPECTION CONSTRUCTION DEPARTMENT BY 12:00 PM ON THE WEDNESDAY PRIOR TO THE WEEKEND BEING REQUESTED. REQUEST SHOULD BE SENT TO constworkreq@saws.org.

   ANY AND ALL SAWS UTILITY INSTALLED WITHOUT WEEKEND APPROVAL WILL BE SUBJECT TO BY UNCOVERED FOR PROPER INSPECTION AT NO COST TO SAWS.

14. PRE-CON SITE VIDEO: BEFORE THE START OF ANY CONSTRUCTION. THE SITE MUST BE VIDEO RECORDED BY THE CONTRACTOR WITH ONE COPY SUBMITTED TO SAWS INSPECTIONS. A PRE-SITE VIDEO WILL PROVIDE ACCURATE DOCUMENTATION OF THE EXISTING CONDITIONS (NSPI).
15. POWER POLE BRACING: CONTRACTORS SHOULD BE ADVISED THAT THERE ARE EXISTING OVERHEAD UTILITY POLES ALONG THE PROJECT CORRIDOR. CONTRACTORS SHOULD FURTHER BE ADVISED THAT IS DISTANCE FROM THE OUTSIDE FACE OF A UTILITY TRENCH TO THE FACE OF A UTILITY POLE IS LESS THAN 5 FEET, SAID UTILITY POLE IS SUBJECT TO BRACING, BASED ON DOCUMENTATION MADE BY UTILITY POLE OWNER. COSTS INCURRED BY CONTRACTOR FOR BRACING OF THESE UTILITY POLES IS SUBSIDIARY TO THAT RESPECTIVE UTILITY COMPANY'S WORK. IT IS ADVISABLE FOR THE CONTRACTOR TO REVIEW THE CONSTRUCTION DOCUMENTS AND VISIT THE CONSTRUCTION SITE TO DETERMINE POTENTIAL IMPACTS.
16. CONSTRUCTION SEQUENCING: IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO SCHEDULE SEQUENCING FOR REMOVAL AND INSTALLATION OF EXISTING AND PROPOSED SAWS UTILITIES IN CONJUNCTION WITH GENERAL PROJECT CONSTRUCTION. SEQUENCE OF CONSTRUCTION ACTIVITIES SHALL BE CONSIDERED IN ORDER TO MINIMIZE THE EXTENT AND DURATION OF DISTURBANCES.
17. CONTRACTOR SHALL COMPLY WITH APPLICABLE REGULATIONS INCLUDING, BUT NOT LIMITED TO, THOSE OVERSEEN BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA). OSHA INFORMATION AND RELATED MATERIALS MAY BE OBTAINED AT https://www.osha.gov/ OR AT THE OSHA SAN ANTONIO OFFICE LOCATED AT FOUNTAINHEAD TOWER, SUITE 605 8200 W. INTERSTATE 10 SAN ANTONIO, TX 78230 WHICH IS ALSO REACHABLE AT (210) 472-5040.
18. TRENCH EXCAVATION SAFETY PROTECTION: CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREAS IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION, PROGRAMS, AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS, AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION PROTECTION THAT COMPLIES WITH, AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
19. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

NOTES:

1. CONTRACTOR TO MAINTAIN A MINIMUM 1' VERTICAL SEPARATION DISTANCE BETWEEN OF THE BOTTOM PROPOSED WATER MAIN AND TOP OF PROPOSED SANITARY SEWER MAIN AT WATER AND SANITARY SEWER CROSSINGS.
2. ALL LATERALS SHALL BE INSTALLED AT A MINIMUM 2.0% SLOPE UNLESS OTHERWISE NOTED.

SEWER NOTES

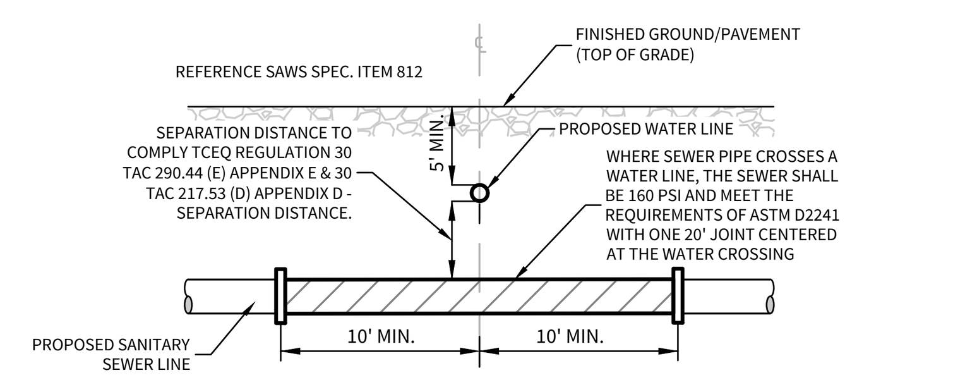
1. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTORS PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON A PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:

   A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS EMERGENCY OPERATIONS CENTER)EOC) IMMEDIATELY AT 210-704-SAWS (210-704-7297). PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OF FLOW.
   B. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
   C. CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.
   D. CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF THE CONTAMINATED SOIL/MATERIALS.
   E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
   F. MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 25 HOURS.

   SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS SATSIFACTION, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING AND FINES FROM EPA.

   NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND SAWS.

2. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED, IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 865, "BYPASS PUMPING SMALL DIAMETER SANITARY SEWER MAINS" AND STANDARD SPECIFICATION ITEM NO. 864, "BYPASS PUMPING LARGE DIAMETER SANITARY SEWER MAINS" AS APPLICABLE. PAYMENT FOR SUCH WORK WILL BE MADE UNDER THE APPROPRIATE BID ITEM ASSOCIATED WITH SANITARY SEWER BYPASS PUMPING IN ACCORDANCE WITH SAWS STANDARD SPECIFICATIONS 865 AND 864.
3. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-3500 AND/OR SAWS PRODUCTION GROUPS AT LEAST TWO WEEKS OR MORE IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.
4. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: IT SHALL BE THE RESPONSIBILITY FOR THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS (NSPI).
5. MANHOLE REMOVAL: WHERE EXISTING MANHOLES ARE TO BE REPLACED BY THE CONTRACTOR, THE EXISTING MANHOLES SHALL BE REMOVED (NSPI).
6. SMART MANHOLE COVERS: THE CONTRACTOR SHALL NOTIFY SAWS EOC AT 210-704-SAWS (210-233-7297) AND EITHER AMERICA ESPINOZA AT 210-233-2934 OR JOSE A. MARTINEZ AT 210-233-3071 A MINIMUM OF 72 HOURS, NOT COUNTING WEEKENDS OR SAWS HOLIDAYS, BEFORE WORKING ON THE PIPE OR MANHOLE, IN ORDER TO HAVE SAWS REMOVE THE SMART COVER. ANY DAMAGE DONE TO THE SMART COVER WILL BE CHARGED TO THE CONTRACTOR THROUGH A CHANGE ORDER.
7. FLOW METERS IN MANHOLES: THE CONTRACTOR SHALL NOTIFY BOBBY JOHNSON AT 210-233-3493 OR ABEL BORUNDA AT 210-233-3704 A MINIMUM OF 72 HOURS, NOT COUNTING WEEKENDS OR SAWS HOLIDAYS, BEFORE WORKING ON THE PIPE MANHOLE, IN ORDER TO HAVE SAWS REMOVE THE FLOW METER IN THE MANHOLE. ANY DAMAGE DONE TO THE FLOW METER WILL BE CHARGED TO THE CONTRACTOR THROUGH A CHANGE ORDER.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

<u>SUPPLEMENTARY</u>

No extra-payment shall be allowed for work called for on the plans but not included on the bid schedule. This incidental work will be required and shall be included under the pay item to which it relates.

The Developer dedicates the sanitary sewer mains upon completion by the Developer and acceptance by the San Antonio Water System. The San Antonio Water System will own and maintain said sanitary sewer mains which are located within this particular subdivision. (As applicable)

The Developer will be responsible for the lift station maintenance fee in effect at the time of certification. The current maintenance fee per lift station will be collected prior to plat recordation.

All PVC Sewer Pipe with over 14 feet of cover shall be extra strength pipe, Minimum Stiffness of 115 PSI.

<u>WORK COMPLETED BY THE CONTRACTOR WHICH HAS NOT RECEIVED A WORK ORDER OR THE NOTICE TO PROCEED WITH THE SAN ANTONIO WATER SYSTEM CONSTRUCTION INSPECTION DIVISION WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.</u>

The Contractor is responsible to ensure that no overflows of sewage occurs. Should this occur the Contractor shall:

A. Identify the source of the spill and attempt to eliminate any additional spillage. Notify SAWS Construction Inspections Division at 233-3500.

B. Contain the spill in place and prevent contamination of streams.

C. Clean up the spill and dispose of contaminated materials.

D. Disinfect the area of the spill with a mixture of HTH chlorine and water.

E. Identify and train personnel responsible for spillage prevention and control.

No separate measurement or payment shall be made for this work. All work shall be done in according to guidelines set by the Texas Natural Resource Contamination Commission (TNRCC) and the San Antonio Water System.

Service Lateral Connections:

A. The exact location and elevation of the service laterals and manholes shall be field verified by the Contractor (NSPI).

B. A minimum of 3 feet of cover is to be maintained over the sanitary sewer laterals or subgrade.

C. All sewer lateral services for future connections as identified on plan and profiles, shall be capped and sealed.

D. The Contractor shall be responsible for disconnecting each existing service line from the existing water main and re-connecting the service to the new service main. The Contractor shall be responsible for maintaining continuous service (NSPI).

E. Laterals shall be constructed to serve all existing houses and vacant lots.

The Contractor shall provide by-pass pumping of sewage around each segment of pipe to be replaced, in accordance with SAWS special specification "Sanitary Sewer". Payment for such work will be made under the bid item "Sanitary Sewer (By-Pass Pumping)" as per SAWS special specification "Sanitary Sewer".

Prior to tie-ins, any shutdowns of existing force mains of any size must be coordinated with the SAWS inspection and/or SAWS production groups at least one week or more in advance of the shutdown. The Contractor must also provide a sequence of work as related to the tie-ins; this is at no additional cost to SAWS or the project and it is the responsibility of the Contractor to sequence the work accordingly.

<u>WASTEWATER SPILLS, OVERFLOWS OR DISCHARGES</u>

1. <u>SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER</u>
   Attention contractors: All spills, overflows, or discharges of wastewater, recycled water, petroleum products, or chemicals must be reported immediately to the SAWS Inspector assigned to your counter permit or General Construction Permit (GCP). This requirement applies to every spill, overflow, or discharge - regardless of size. Your compliance will enable SAWS to fulfill regulatory reporting requirements.

   It is the Contractor's responsibility to control sewer flows so that a spill overflow, or discharge does not occur. In the event that a spill, overflow, or discharge occurs, the Contractor may be liable for:

   1. All. fines, penalties, or other costs assessed to or against SAWS by any State, Federal, or other governmental agency.

2. SAWS staff and material costs to respond to the spill, overflow, or discharge, or to mitigate the effects of the spill, overflow, or discharge, or to support the cleanup effort.

3. All damages caused to SAWS, or any other persons or entities that result from the spill, overflow or discharge.

NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THUS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
2. ALL LATERALS TO BE BUILT TO FRONT UTILITY EASEMENT LINE.
3. ALL LATERAL SHALL BE INSTALLED @ MIN. 2.0% SLOPE, UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER PIPE SHALL BE PVC THAT MEETS ASTM SPECIFICATION, SDR-26, UNLESS OTHERWISE NOTED ON THE PLANS.
5. THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	210-233-2010
CoSA DRAINAGE	210-207-2800
CITY SIDEWALK TRENCHING DIVISION	210-821-3240
CoSA TRAFFIC SIGNAL OPERATIONS	210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
CITY PUBLIC SERVICE	"
AT&T	"
TIME WARNER	"
VALERO ENERGY CO.	"

SAN ANTONIO WATER SYSTEM
CRITERIA FOR SEWER MAIN CONSTRUCTION
<u>IN THE VICINITY OF WATER MAINS</u>

I. For separation distance requirements between sewer mains & water mains, see the 30 TAC §217.53 Pipe Design notes included on this sheet.

II. Corrosion protected mechanical coupling devices of a cast iron or ductile iron material shall be used.

III. Plan & profile must show type of crossing and material to use.

<u>TCEQ - 30 TAC290.44(e)</u>

(e) Location of waterlines. The following rules apply to installations of waterlines, wastewater mains or laterals, and other conveyances/appurtenances identified as potential sources of contamination. Furthermore, all ratings specified shall be defined by ASTM or AWWA standards unless stated otherwise. New mains, service lines, or laterals are those that are installed where no main, service line, or lateral previously existed, or where existing mains, service lines, or laterals are replaced with pipes of different size or material.
(1) When new potable water distribution lines are constructed, they shall be installed no closer than nine feet in all directions to wastewater collection facilities. All separation distances shall be measured from the outside surface of each of the respective pieces.
(2) Potable water distribution lines and wastewater mains or laterals that form parallel utility lines shall be installed in separate trenches.
(3) No physical connection shall be made between a drinking water supply and a sewer line. Any appurtenance shall be designed and constructed so as to prevent any possibility of sewage entering the drinking water system.
(4) Where the nine-foot separation distance cannot be achieved, the following criteria shall apply.
(A) New waterline installation - parallel lines.
(i) Where a new potable waterline parallels an existing, non-pressure or pressure rated wastewater main or lateral and the licensed professional engineer licensed in the State of Texas is able to determine that the existing wastewater main or lateral is not leaking, the new potable waterline shall be located at least two feet above the existing wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the existing wastewater main or lateral. Every effort shall be exerted not to disturb the bedding and backfill of the existing wastewater main or lateral.
(ii) Where a new potable waterline parallels an existing pressure-rated wastewater main or lateral and it cannot be determined by the licensed professional engineer if the existing line is leaking, the existing wastewater main or lateral shall be replaced with at least 150 psi pressure-rated pipe. The new potable waterline shall be located at least two feet above the new wastewater line, measured vertically, and at least four feet away, measured horizontally, from the replaced wastewater main or lateral.
(iii) Where a new potable waterline parallels a new wastewater main, the wastewater main or lateral shall be constructed of at least 150 psi pressure-rated pipe. The new potable waterline shall be located at least two feet above the wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the wastewater main or lateral.
(B) New waterline installation - crossing lines.
(i) Where a new potable waterline crosses above a wastewater main or lateral, the segment of the waterline pipe shall be centered over and must be perpendicular to the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. When crossing an existing wastewater main or lateral and it is disturbed or shows signs of leaking, the wastewater main or lateral shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure-rated pipe embedded in cement stabilized sand (see clause (v) of this subparagraph) for the total length of one pipe segment plus 12 inches beyond the joint on each end.
(I) The potable waterline shall be at least two feet above an existing, non-pressure rated wastewater main or lateral.
(II) The potable waterline shall be at least six inches above an existing, pressure-rated wastewater main or lateral.
(ii) Where a new potable waterline crosses a new, non-pressure rated wastewater main or lateral, the segment of the waterline pipe shall be centered over and shall be perpendicular to the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. The wastewater pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The wastewater main or lateral shall be embedded in cement stabilized sand (see clause (v) of this subparagraph) for the total length of one pipe segment plus 12 inches beyond the joint on each end. The materials and method of installation shall conform to one of the following options:
(I) Within nine feet horizontally of either side of the waterline, the wastewater pipe and joints shall be constructed with pipe material having a minimum pressure rating of at least 150 psi. An absolute minimum vertical separation distance of two feet shall be provided. The wastewater main or lateral shall be located below the waterline.

NOTE:

THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	210-233-2010
COSA DRAINAGE	210-207-2800
CITY SIDEWALK AND TRENCHING DIVISION	210-821-3240
COSA TRAFFIC SIGNAL OPERATIONS	210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
CITY PUBLIC SERVICE	"
AT&T	"
TIME WARNER	"
VALERO ENERGY CO.	"

AT&T AND TIME WARNER CABLE LINES TO GO INTO JOINT TRENCH WITH C.P.S. ENERGY
LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.

SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES		
Developer's Address	100 NE LOOP 410 SUITE 1155		
City	SAN ANTONIO	State TX	Zip 78216
Phone #	(210) 403-6200	Fax #	–
SAWS Block Map #		Total EDU's 178	Total Acreage 31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS – SDR 26 427 L.F. OF 12" SS – SDR 26	Plat No.	24-11800118
Number of Lots	178	SAWS Job No.	24-1545

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER GENERAL NOTES

DATE	05/22/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

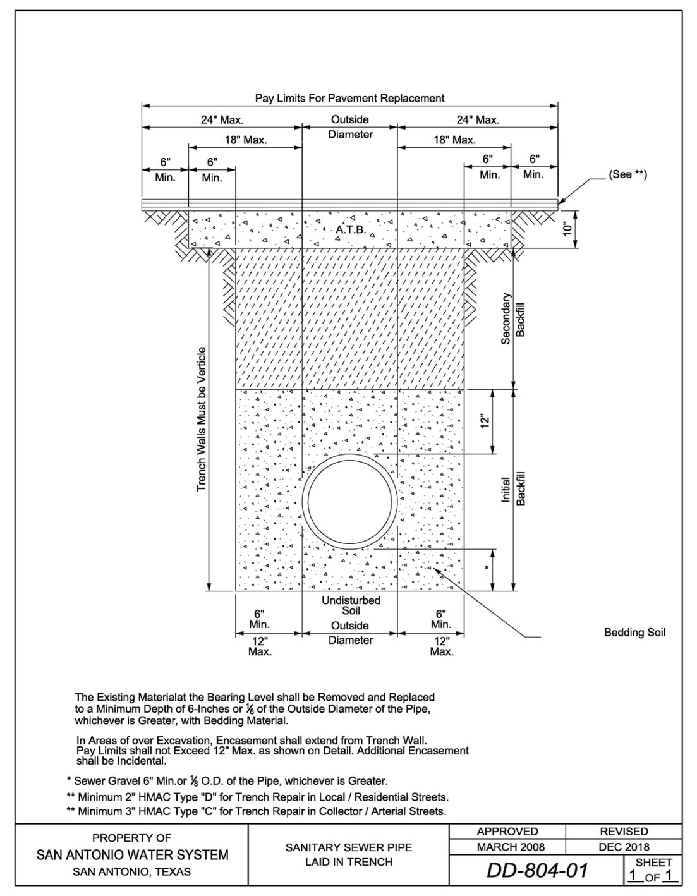
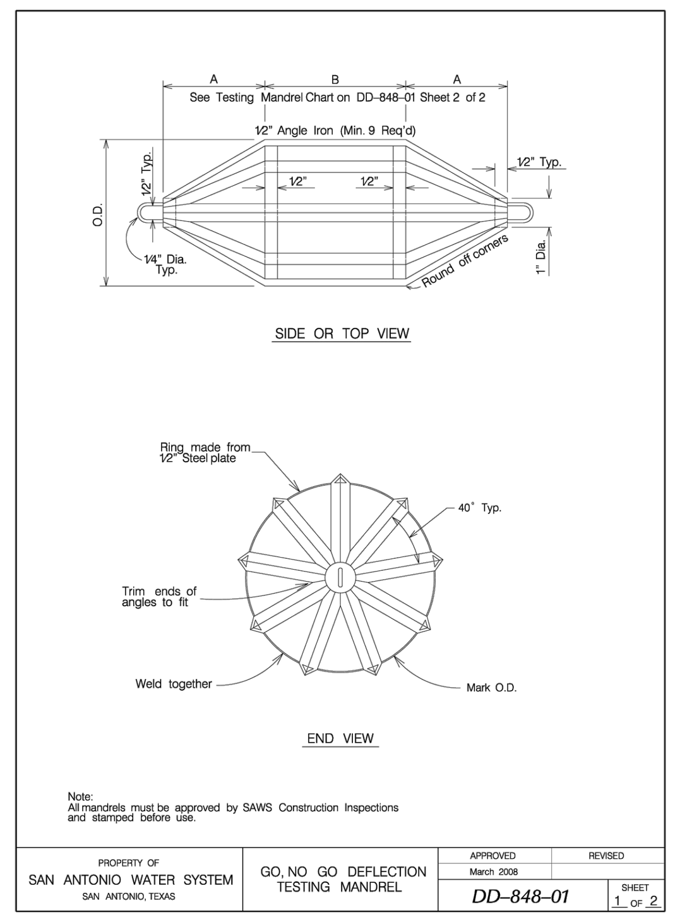
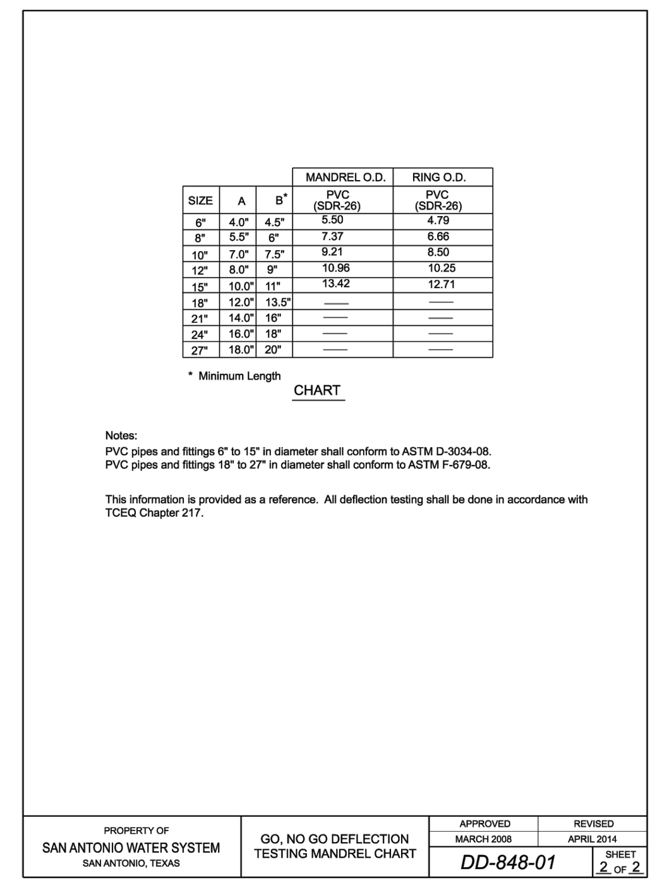
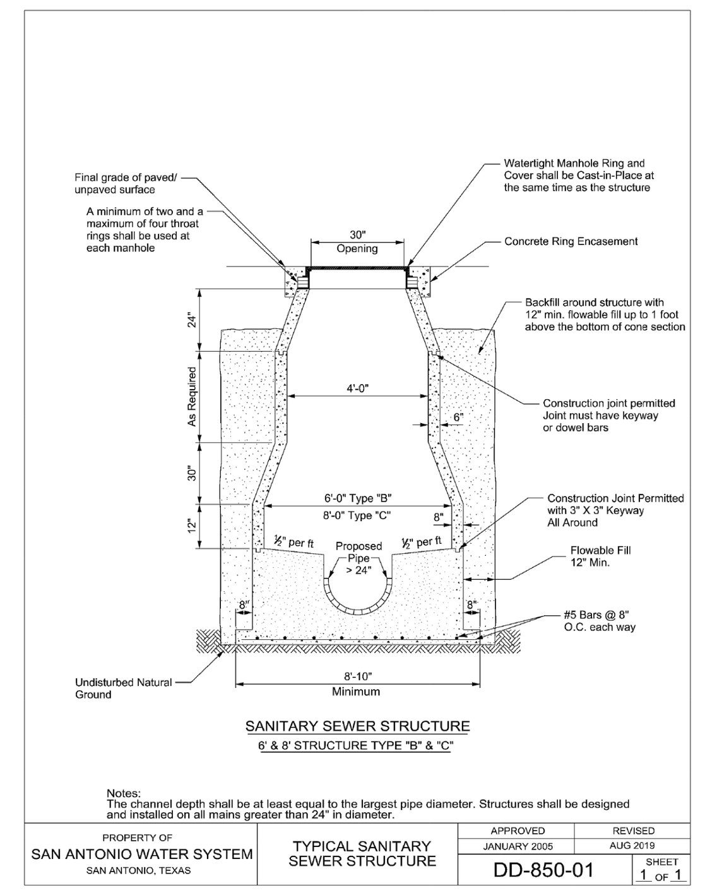
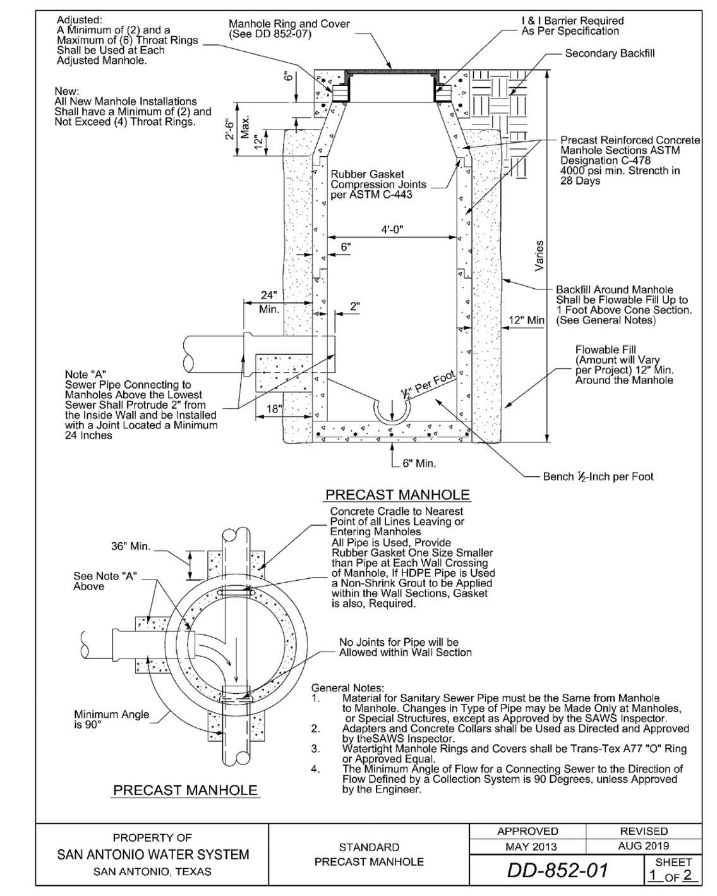
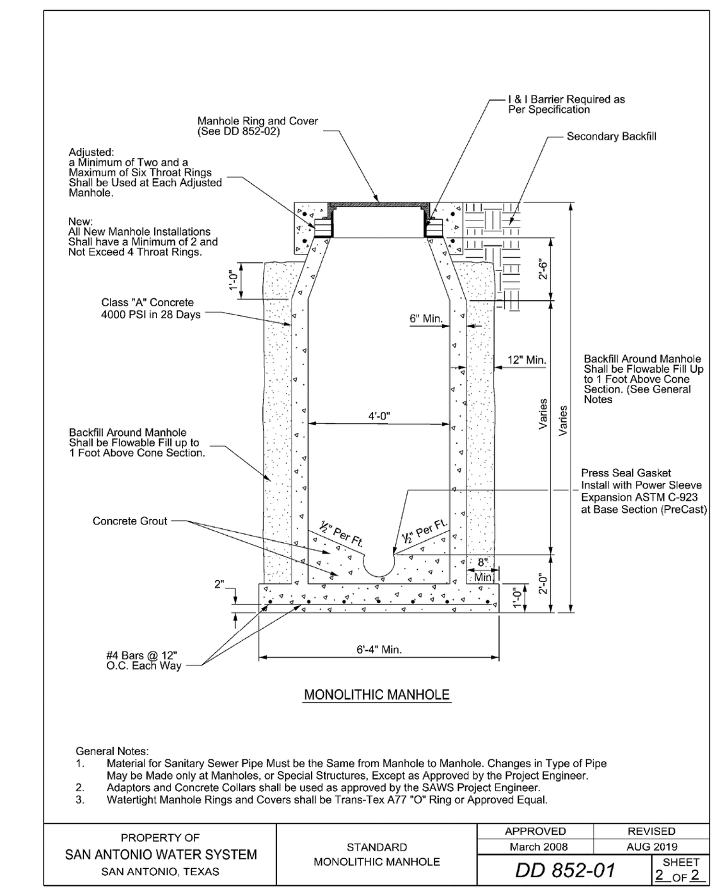
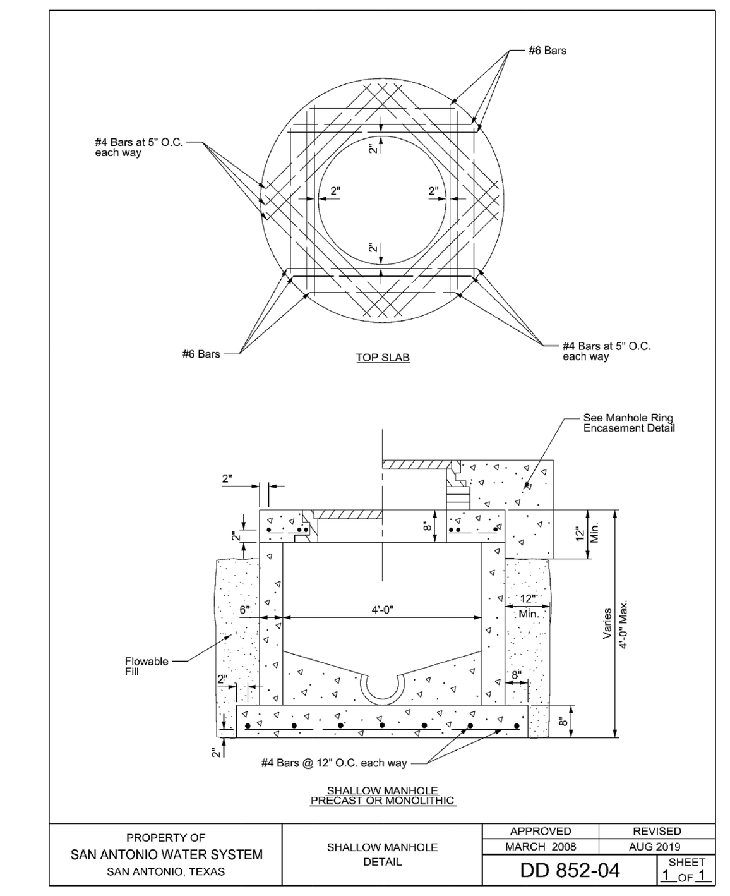
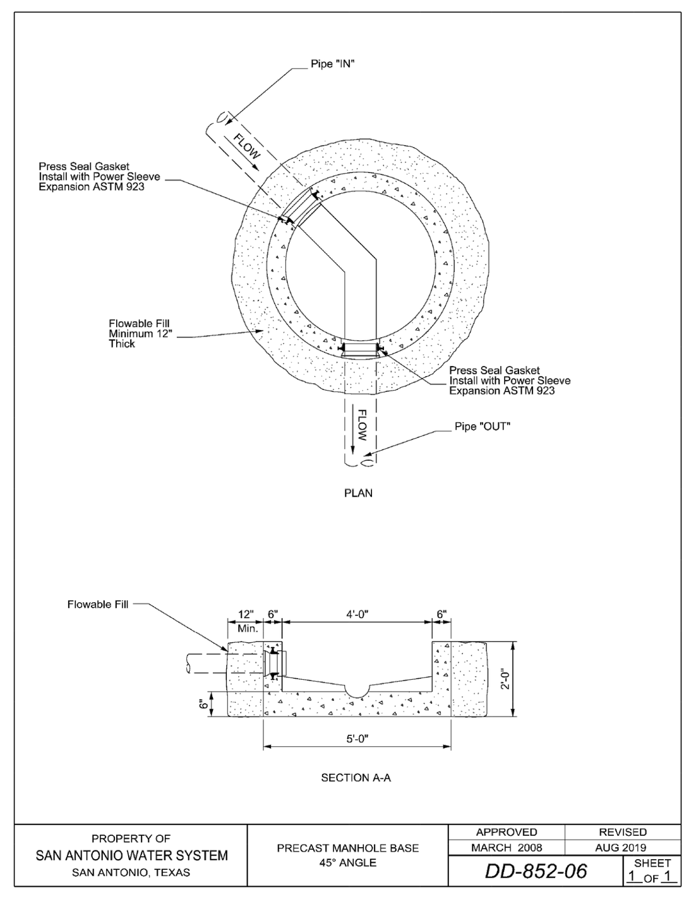
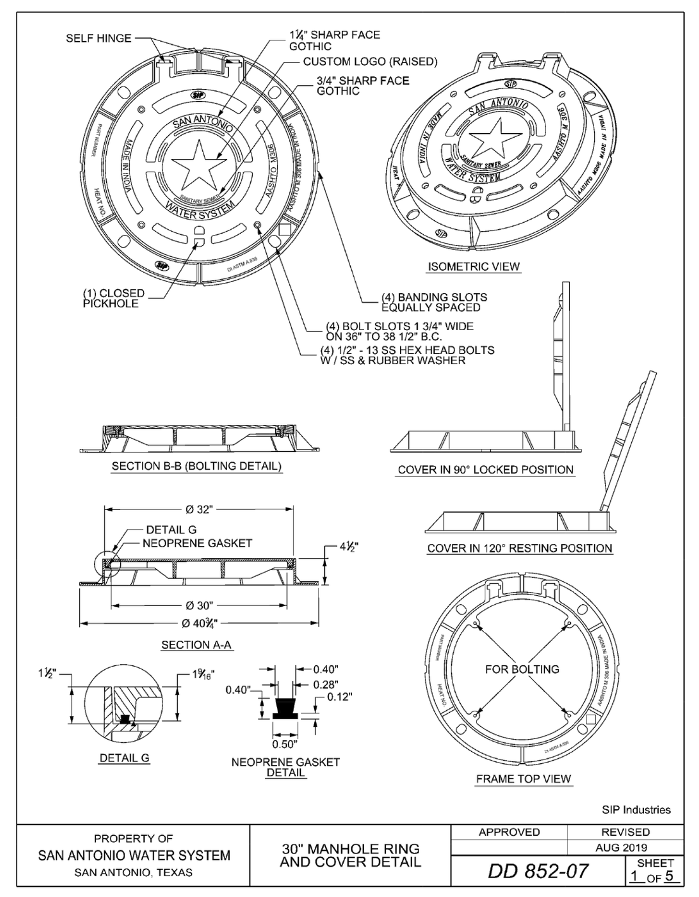
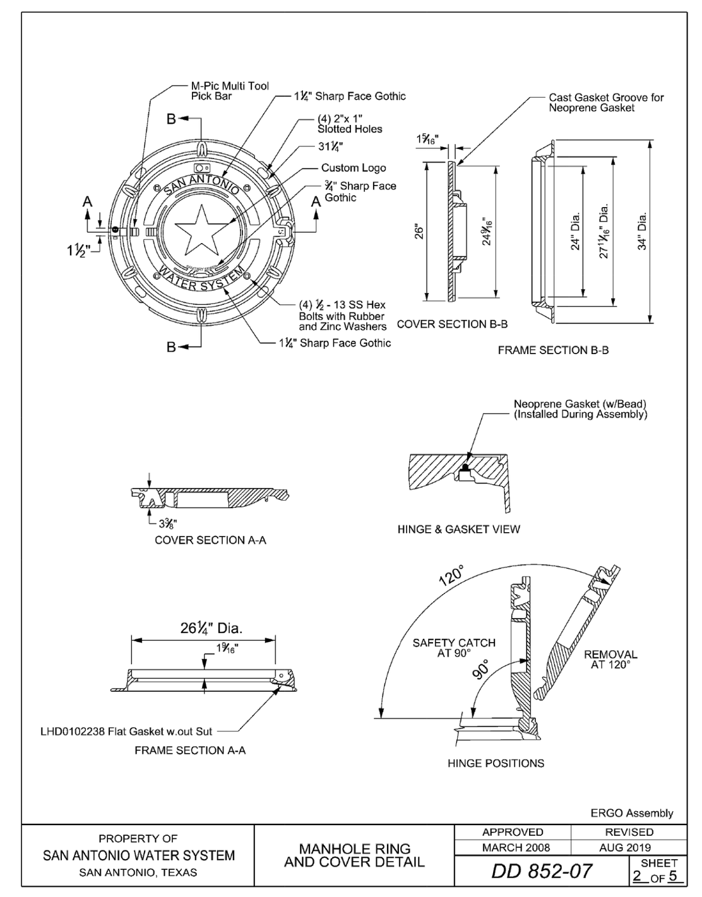
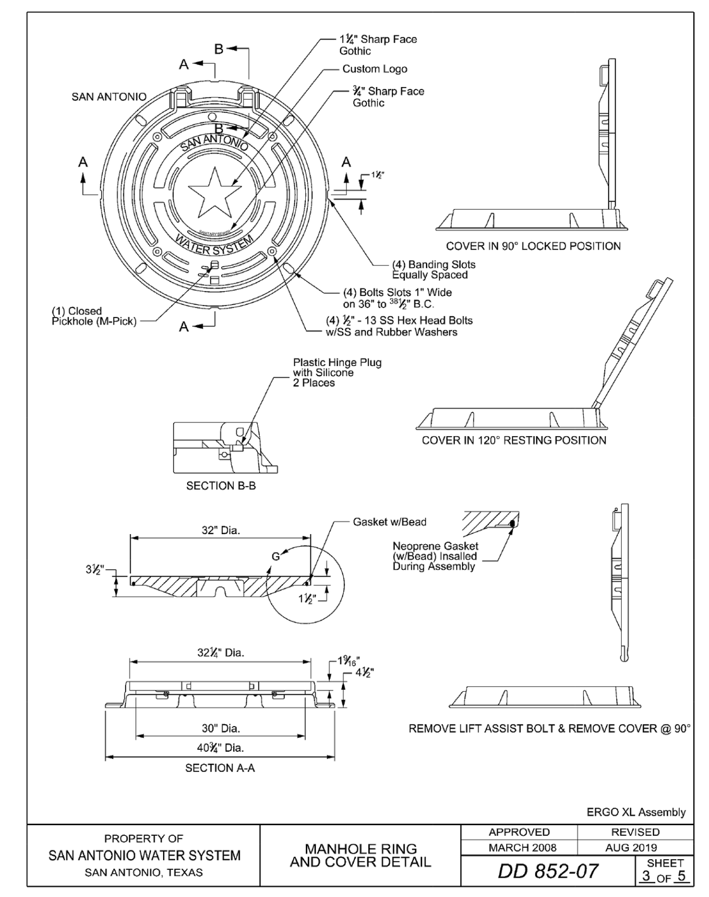
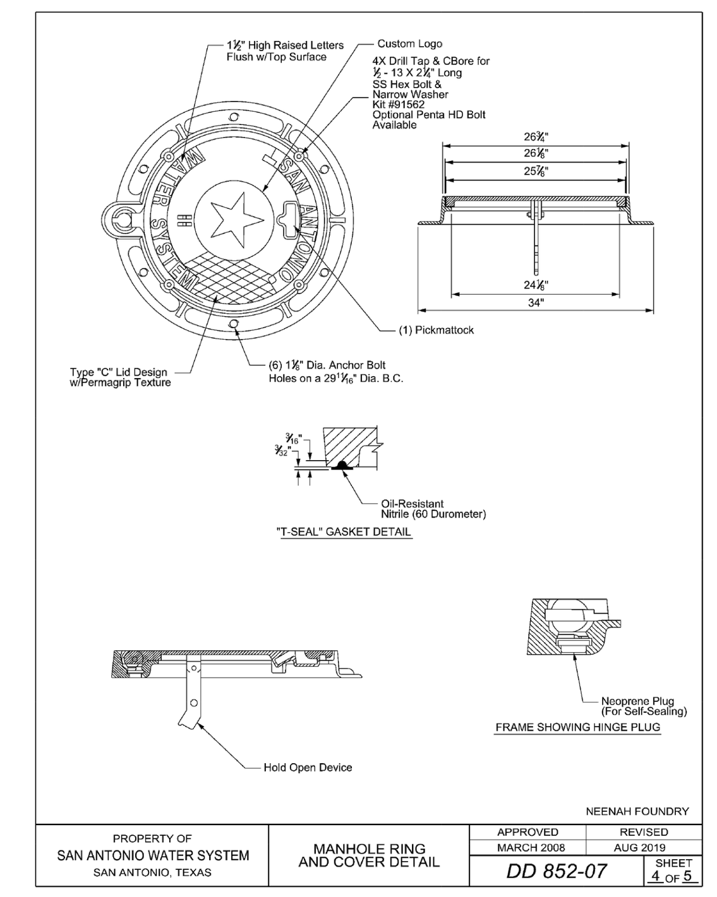
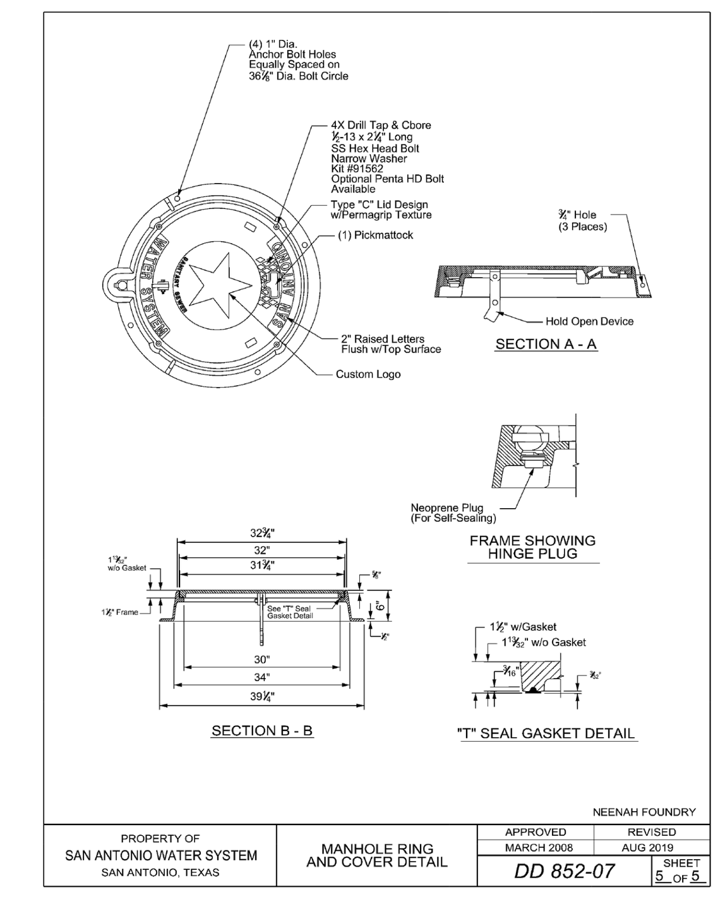
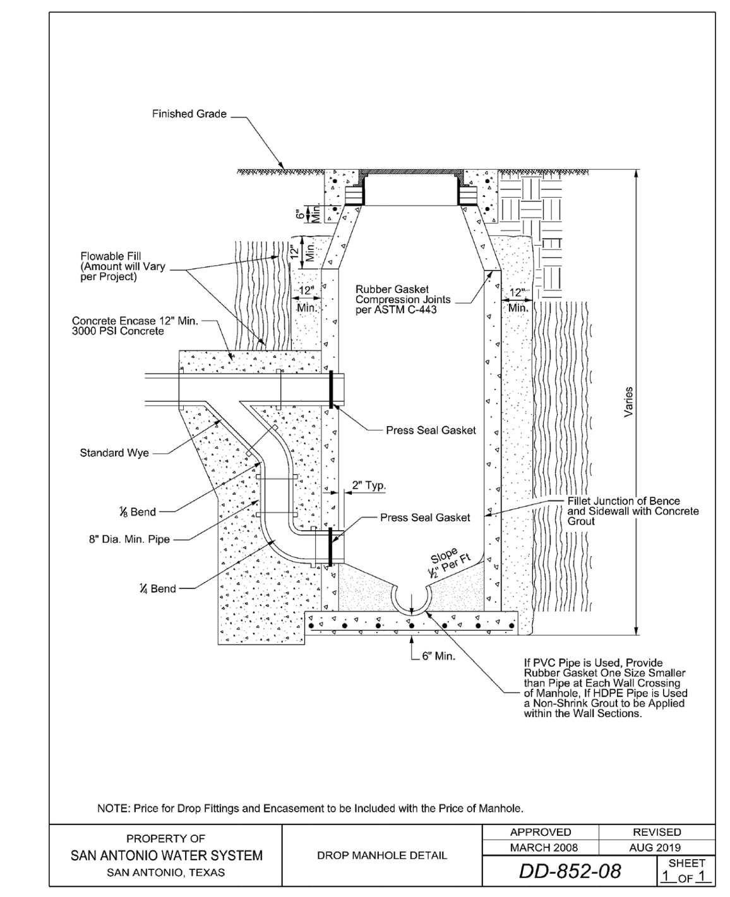
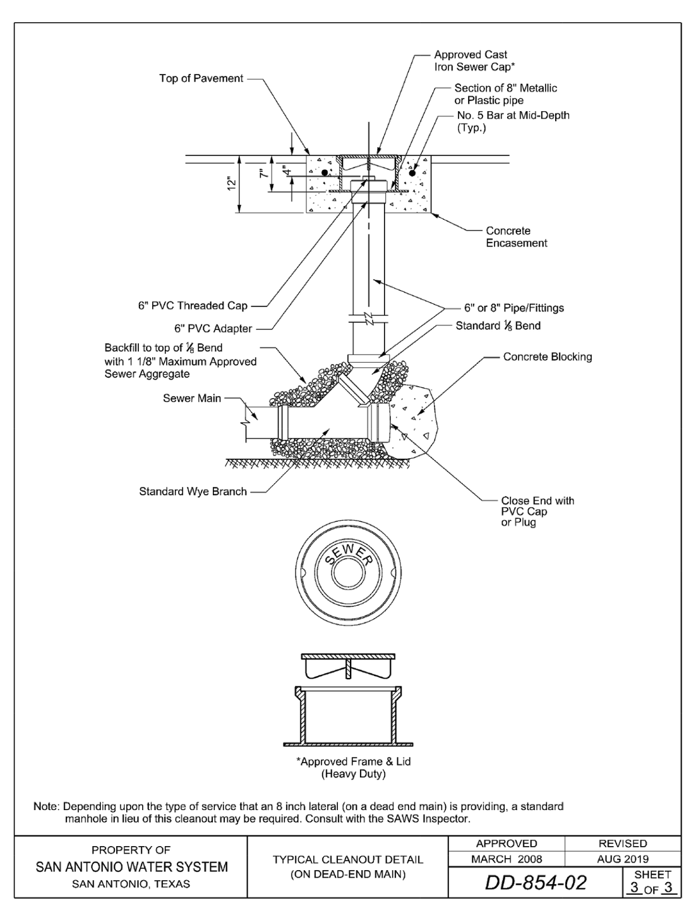
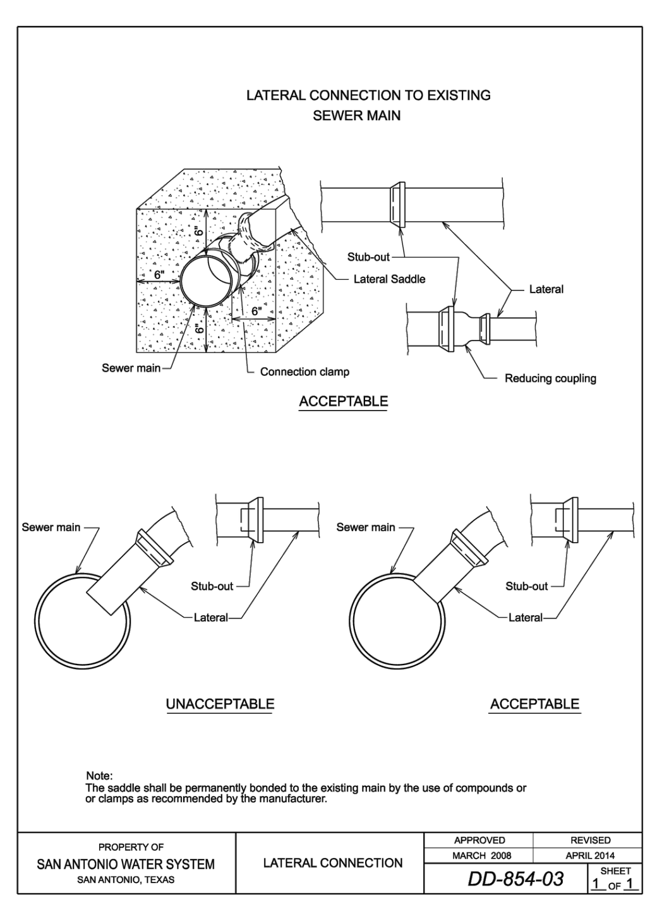
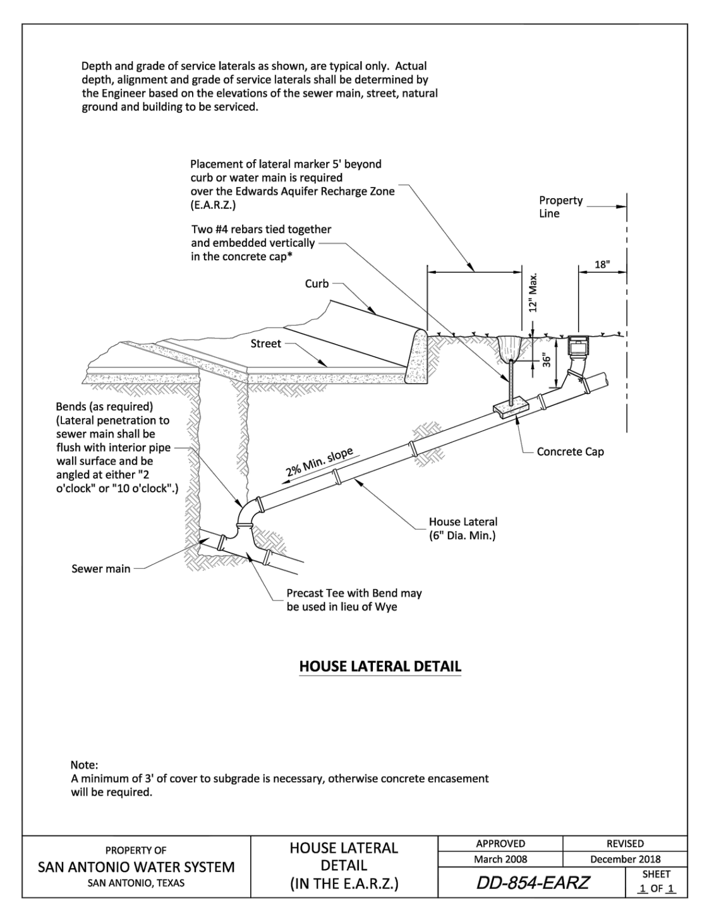
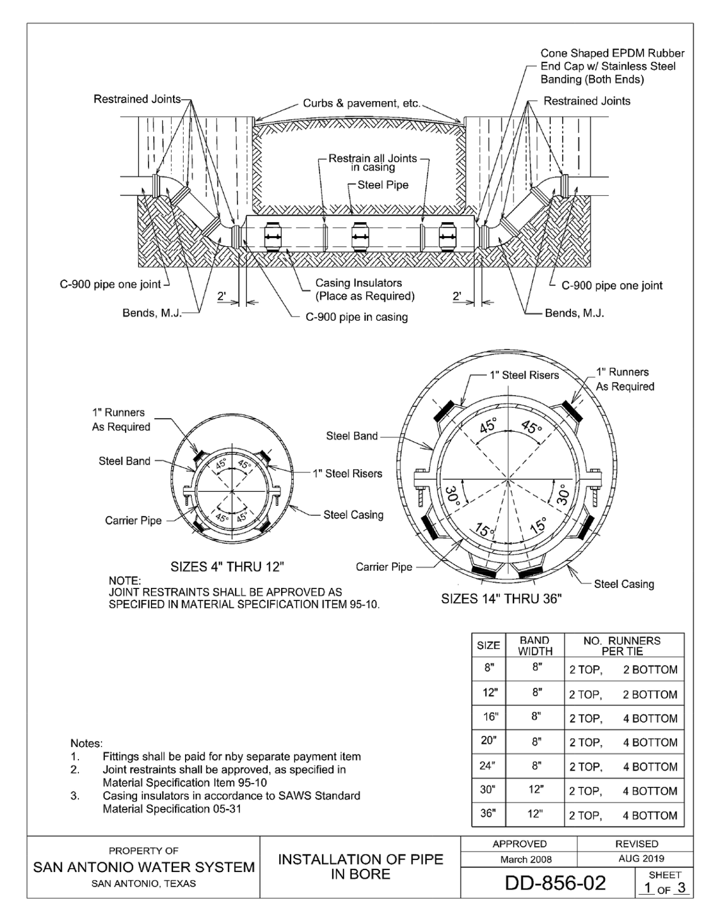
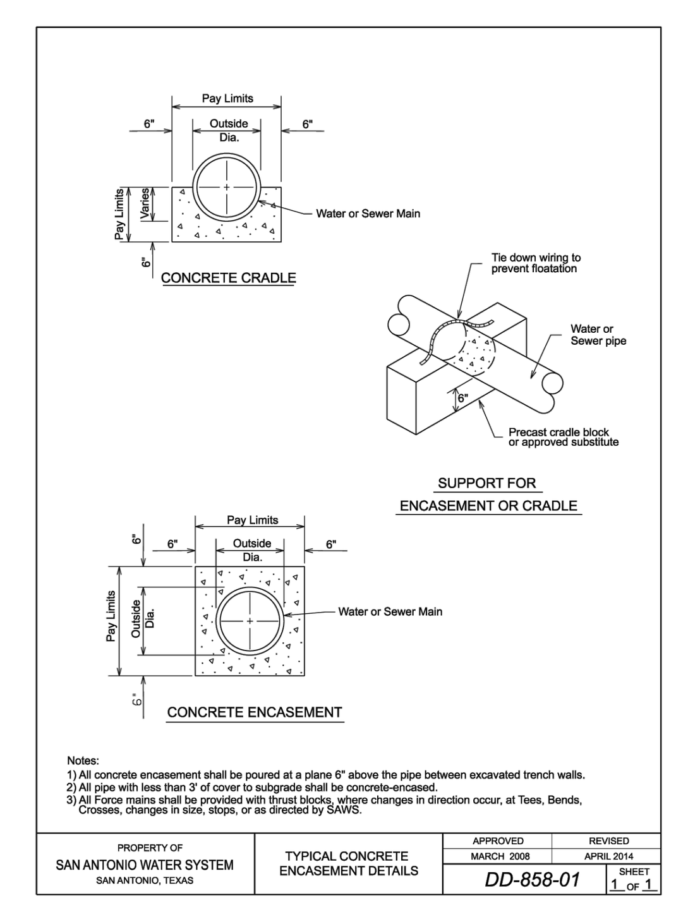
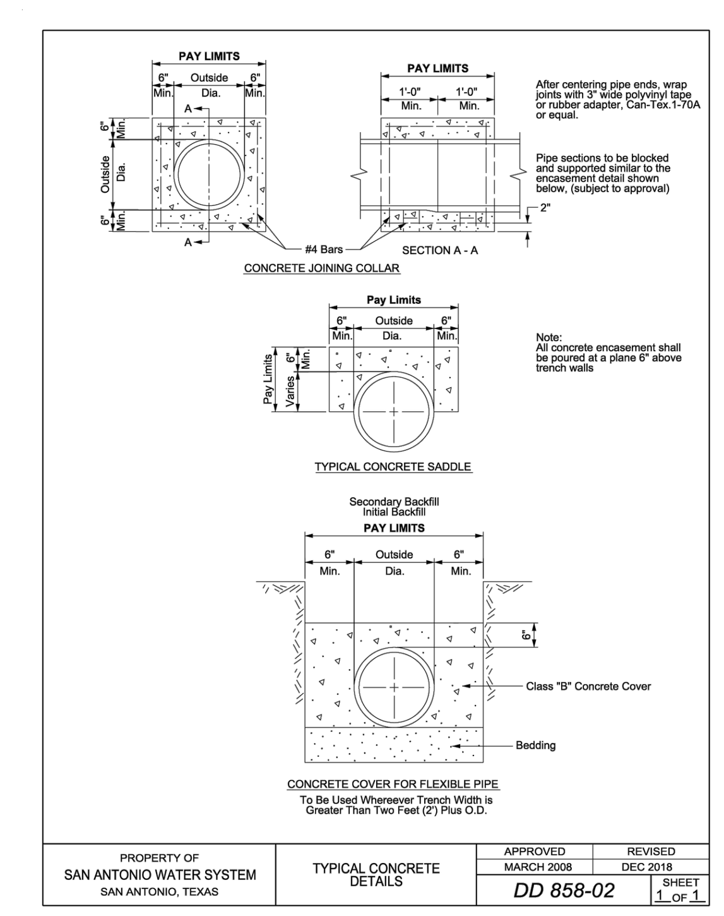
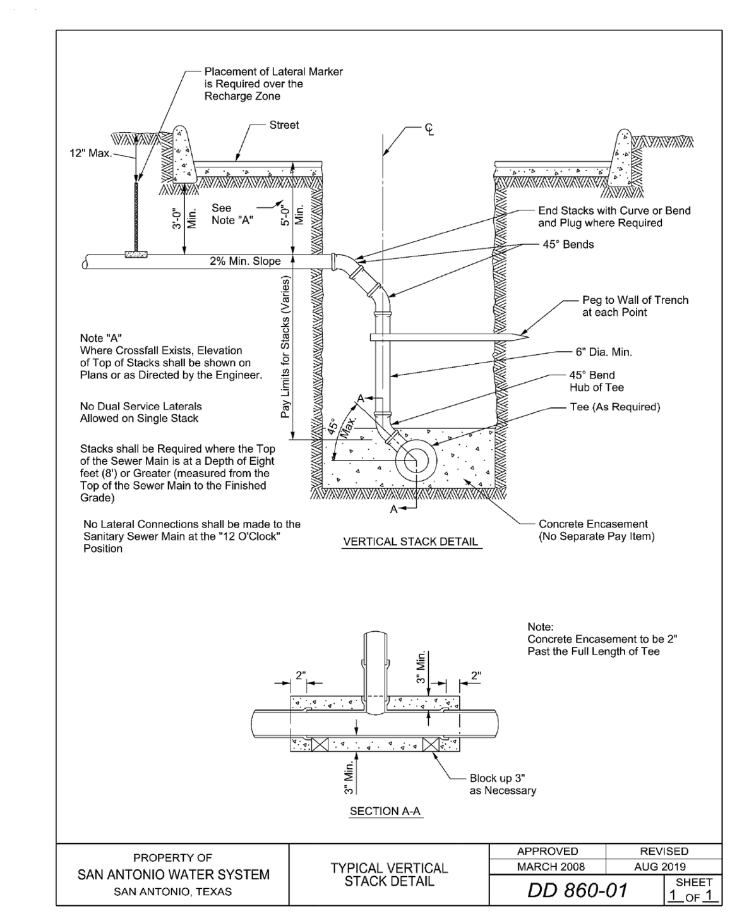
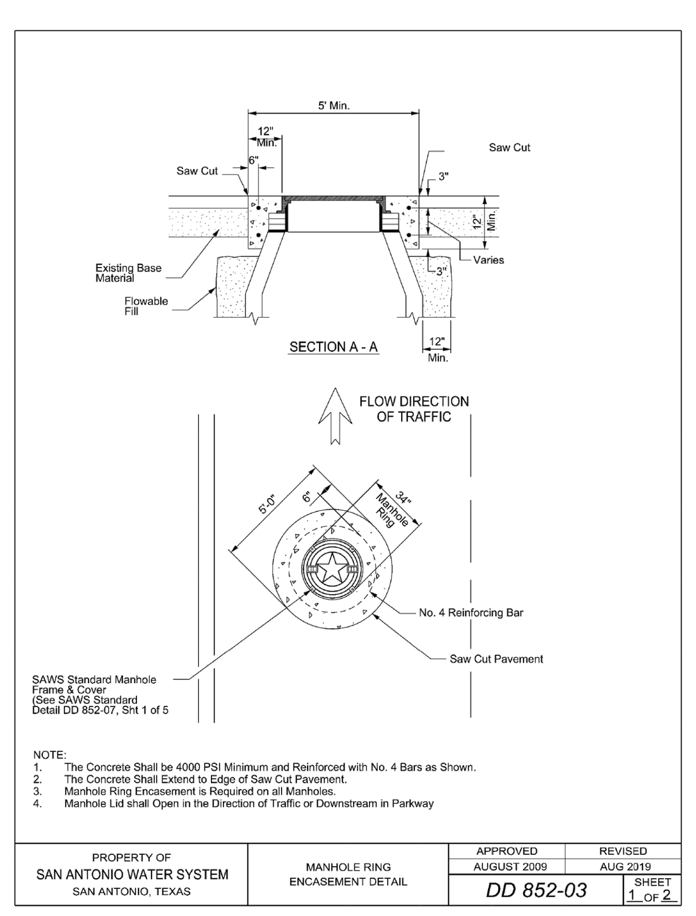
05/29/2024

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1545

C4.D1

P:\03050\015\2-DWG\4-Plans\04_D1 SSGN.dwg 2024/05/22 3:26pm rmata

SEWER: SOUTH SEWERSHED – DOS RIOS W.R.C. (LOWER MEDINA RIVER WATERSHED)

Developer's Name	LENNAR HOMES
Developer's Address	100 NE LOOP 410 SUITE 1155
City	SAN ANTONIO
State	TX
Zip	78216
Phone #	(210) 403-6200
Fax #	–
SAWS Block Map #	
Total EDU's	178
Total Acreage	31.33
Total Linear Footage of Pipe	5,367 L.F. OF 8" SS – SDR 26 427 L.F. OF 12" SS – SDR 26
Plat No.	24-11800118
Number of Lots	178
SAWS Job No.	24-1545

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

SANITARY SEWER STANDARD DETAILS

DATE 05/22/2024

PROJECT NO. 03050.015

DRAWN BY RM / IV

CHECKED BY MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

05/29/2024

STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

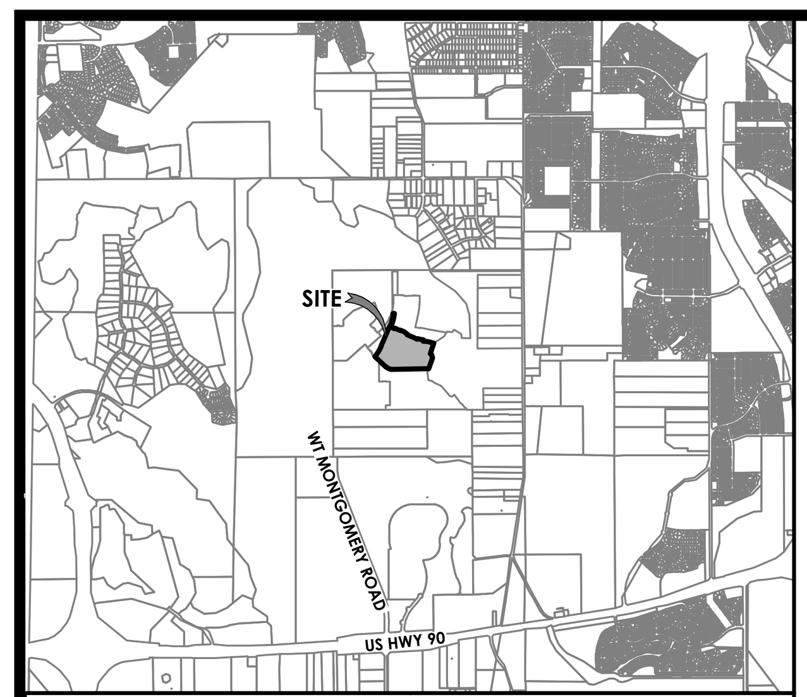
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO. 24-11800118

SAWS JOB NO. 24-1545

C4.D2

P:\03050\015\2-DWG\4-Plans\04_D2 SSDT.dwg 2024/05/22 3:26pm rmata



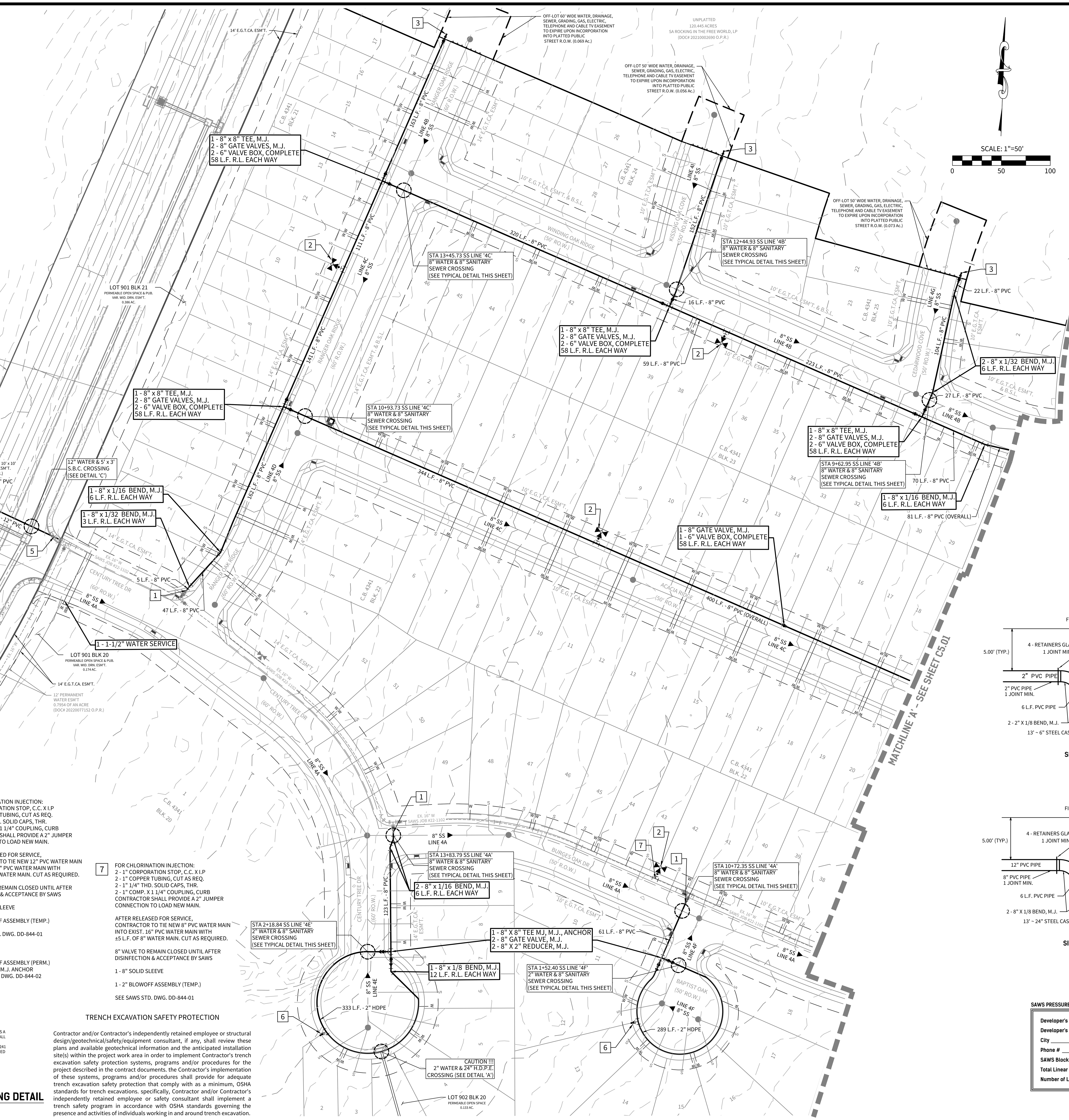
LOCATION MAP
N.T.S.

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



KEYNOTES:

1. FOR CHLORINATION INJECTION:
   2 - 1" CORPORATION STOP, C.C. X I.P
   2 - 1" COPPER TUBING, CUT AS REQ.
   2 - 1" 1/4" THD. SOLID CAPS, THR.
   2 - 1" COMP. X 1 1/4" COUPLING, CURB
   CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN.

   AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 8" PVC WATER MAIN INTO EXIST. 12" PVC WATER MAIN WITH ±5 L.F. OF 8" WATER MAIN. CUT AS REQUIRED.

   8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY SAWS

   1 - 8" SOLID SLEEVE

   1 - 2" BLOWOFF ASSEMBLY (TEMP.)

   SEE SAWS STD. DWG. DD-844-01

2. 1 - 8" x 6" TEE, M.J. ANCHOR
   1 - 6" x 1/4 BEND, M.J.
   1 - 6" GATE VALVE, M.J.
   1 - 6" VALVE BOX, COMPLETE
   1 - STD. FIRE HYDRANT
   1 - 6" D.I. PIPE, CUT AS REQ'D.
   SEE S.A.W.S. STD. DWG DD-834-01 (SHEET 1 OF 3)

3. 1 - 8" GATE VALVE, M.J.
   1 - 6" VALVE BOX, COMPLETE
   1 - 2" BLOWOFF ASSEMBLY (PERM.)
   SEE SAWS STD DWG. DD-844-02

4. 1 - 12" GATE VALVE, M.J.
   1 - 2" BLOWOFF ASSEMBLY (PERM.)
   SEE SAWS STD DWG. DD-844-02

5. FOR CHLORINATION INJECTION:
   2 - 1" CORPORATION STOP, C.C. X I.P
   2 - 1" COPPER TUBING, CUT AS REQ.
   2 - 1" 1/4" THD. SOLID CAPS, THR.
   2 - 1" COMP. X 1 1/4" COUPLING, CURB
   CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN.

   AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 12" PVC WATER MAIN INTO EXIST. 16" PVC WATER MAIN WITH ±5 L.F. OF 12" WATER MAIN. CUT AS REQUIRED.

   12" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY SAWS

   1 - 12" SOLID SLEEVE

   1 - 2" BLOWOFF ASSEMBLY (TEMP.)

   SEE SAWS STD. DWG. DD-844-01

6. 1 - 2" BLOWOFF ASSEMBLY (PERM.)
   1 - 2" x 2" TEE, M.J. ANCHOR
   SEE SAWS STD DWG. DD-844-02

7. FOR CHLORINATION INJECTION:
   2 - 1" CORPORATION STOP, C.C. X I.P
   2 - 1" COPPER TUBING, CUT AS REQ.
   2 - 1" 1/4" THD. SOLID CAPS, THR.
   2 - 1" COMP. X 1 1/4" COUPLING, CURB
   CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN.

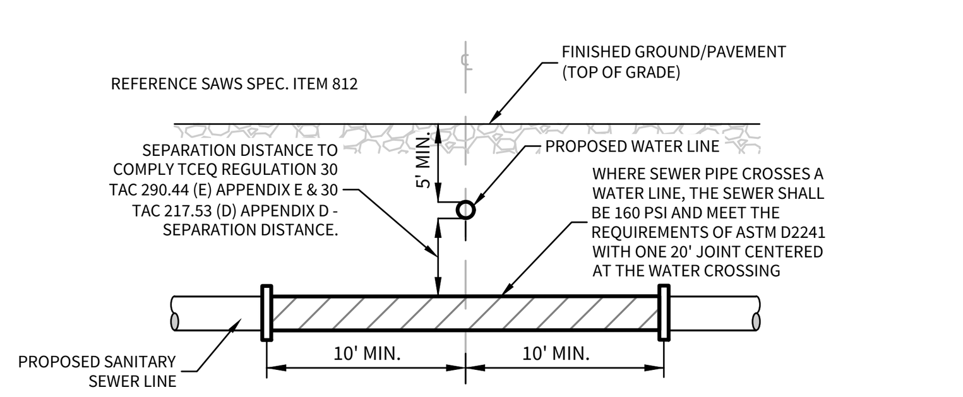
   AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 8" PVC WATER MAIN INTO EXIST. 16" PVC WATER MAIN WITH ±5 L.F. OF 8" WATER MAIN. CUT AS REQUIRED.

   8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY SAWS

   1 - 8" SOLID SLEEVE

   1 - 2" BLOWOFF ASSEMBLY (TEMP.)

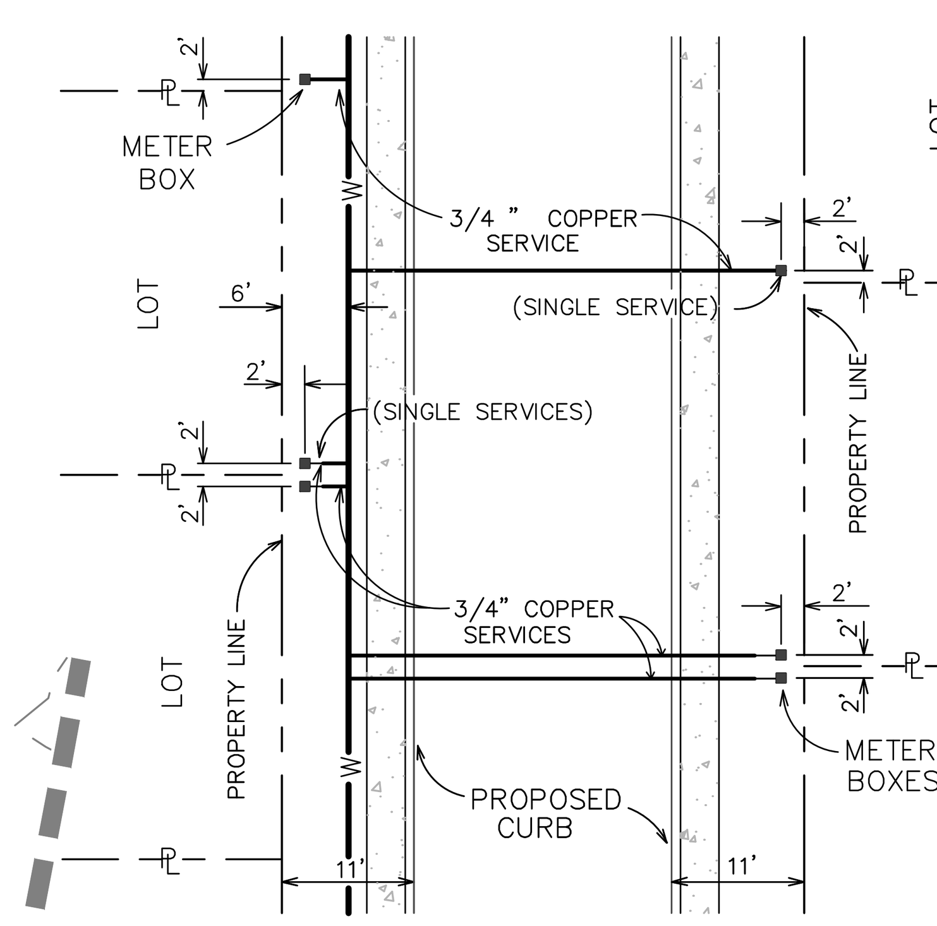
   SEE SAWS STD. DWG. DD-844-01



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

TRENCH EXCAVATION SAFETY PROTECTION

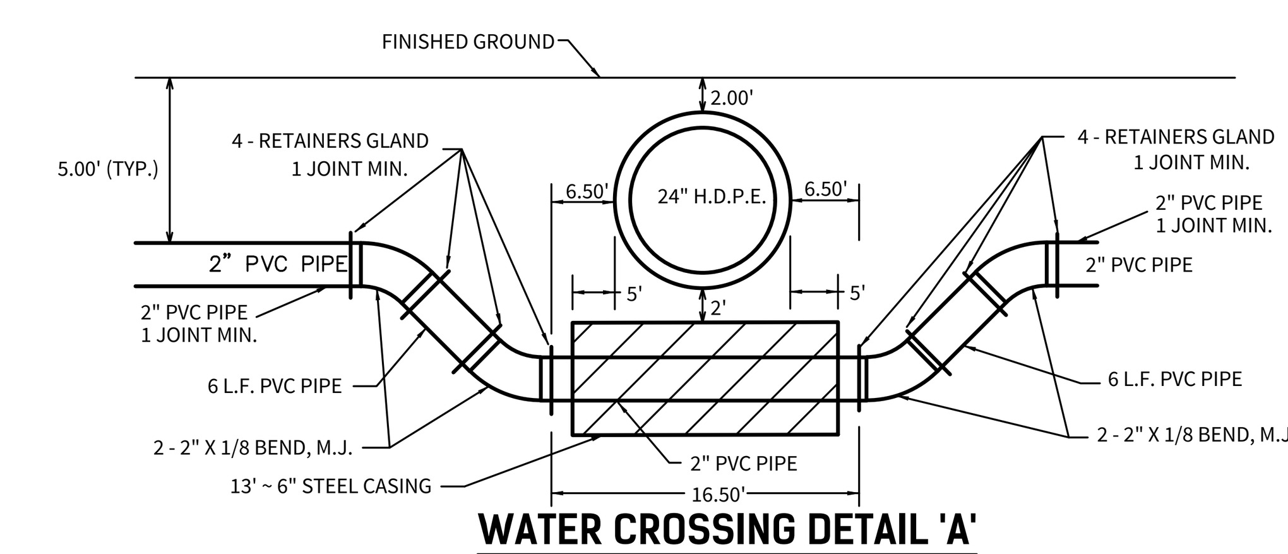
Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



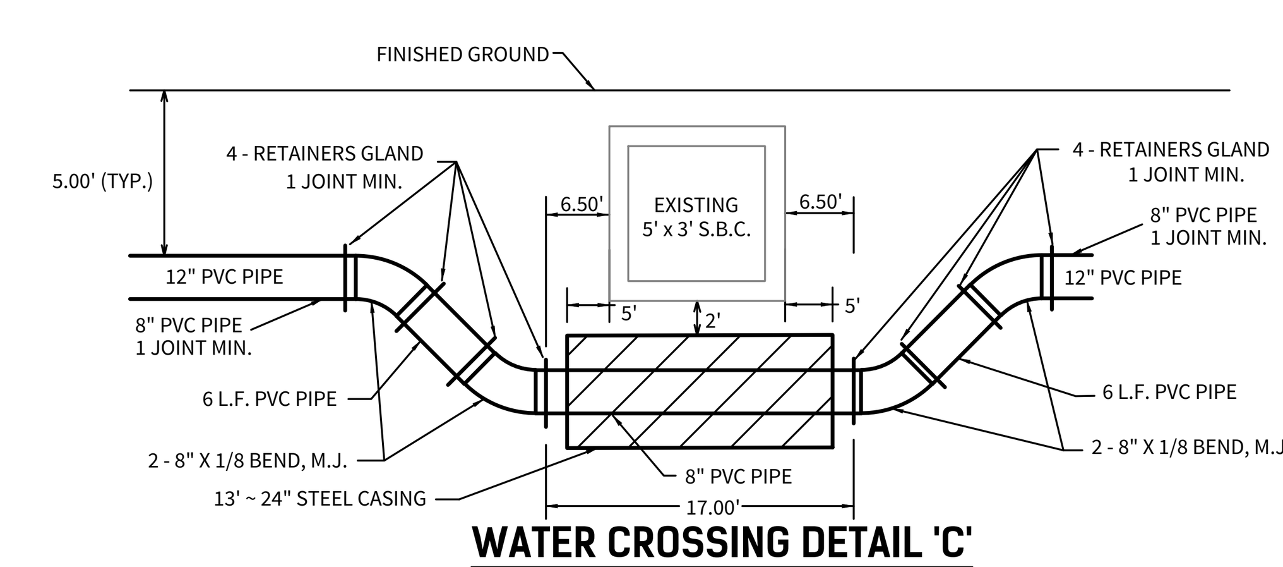
WATER METER BOX LOCATION
N.T.S.

LEGEND

EXISTING SANITARY SEWER	
PROPOSED SANITARY SEWER	
EXISTING SANITARY SEWER MANHOLE	
PROPOSED WATER MAIN	
EXISTING WATER MAIN	
EXISTING STANDARD FIRE HYDRANT	
PROPOSED STANDARD FIRE HYDRANT	
PROPOSED STANDARD GATE VALVE	
PROPOSED PERMANENT BLOWOFF	
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T
PROPOSED 3/4" WATER SERVICE WITH 5/8" METER	



WATER CROSSING DETAIL 'A'
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) N.T.S.



WATER CROSSING DETAIL 'C'
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) N.T.S.

SAWS PRESSURE ZONE 950W

Developer's Name	LENNAR HOMES				
Developer's Address	100 NE LOOP 410 SUITE 1155				
City	SAN ANTONIO	State	TX	Zip	78216
Phone #	(210) 403-6200	Fax #	-		
SAWS Block Map #		Total EDU's	185	Total Acreage	31.33
Total Linear Footage of Pipe	12" - 165 L.F. ; 8" - 3,727 L.F. ; 2" H.D.P.E. - 622 L.F.	Plat No.	24-11800118		
Number of Lots	178	SAWS Job No.	24-1050		

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

WATER DISTRIBUTION PLAN

DATE	06/24/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

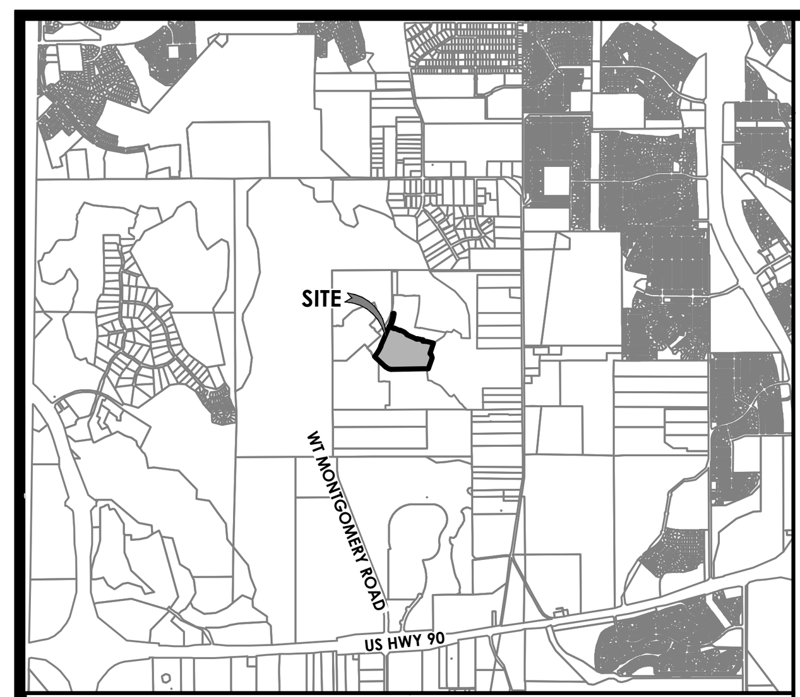
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1050

C5.00



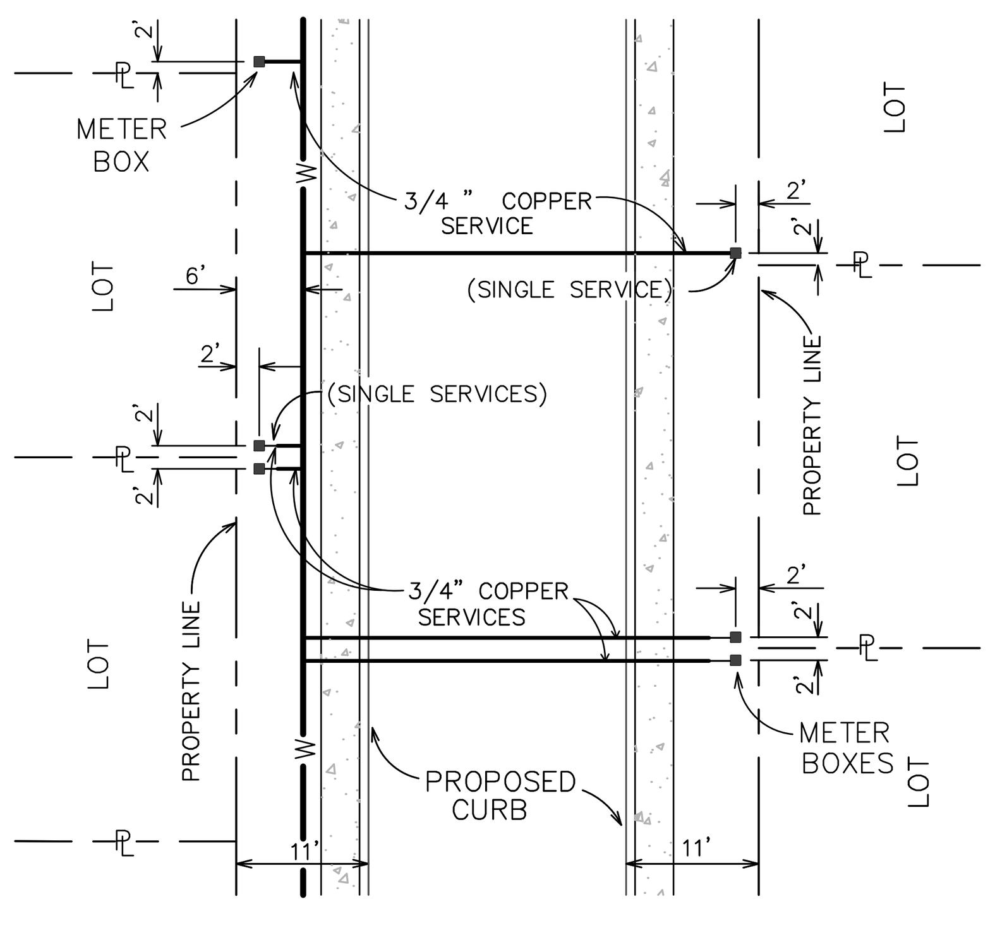
LOCATION MAP
N.T.S.

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



WATER METER BOX LOCATION
N.T.S.

KEYNOTES:

1. FOR CHLORINATION INJECTION:
2 - 1" CORPORATION STOP, C.C. X I.P
2 - 1" COPPER TUBING, CUT AS REQ.
2 - 1" 1/4" THD. SOLID CAPS, THR.
2 - 1" COMP. X 1 1/4" COUPLING, CURB
CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN.
AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 8" PVC WATER MAIN INTO EXIST. 12" PVC WATER MAIN WITH ±5 L.F. OF 8" WATER MAIN. CUT AS REQUIRED.
8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY SAWS
1 - 8" SOLID SLEEVE
1 - 2" BLOWOFF ASSEMBLY (TEMP.)
SEE SAWS STD. DWG. DD-844-01

2. 1 - 8" x 6" TEE, M.J. ANCHOR
1 - 6" x 1/4 BEND, M.J.
1 - 6" GATE VALVE, M.J.
1 - 6" VALVE BOX, COMPLETE
1 - STD. FIRE HYDRANT
1 - 6" D.I. PIPE, CUT AS REQ'D.
SEE S.A.W.S. STD. DWG
DD-834-01 (SHEET 1 OF 3)

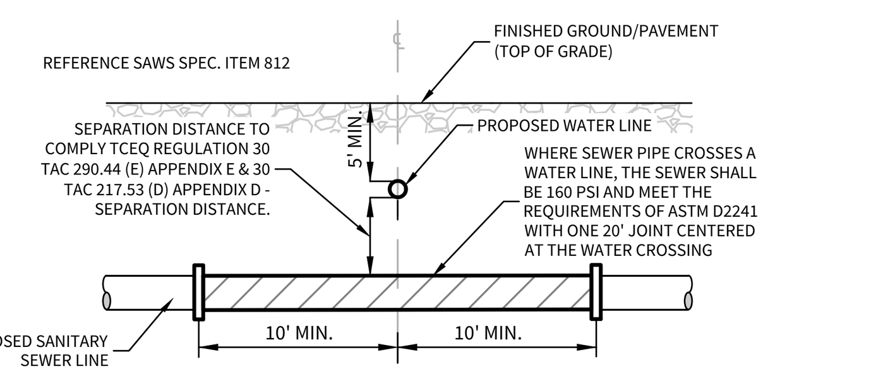
3. 1 - 8" GATE VALVE, M.J.
1 - 6" VALVE BOX, COMPLETE
1 - 2" BLOWOFF ASSEMBLY (PERM.)
SEE SAWS STD DWG. DD-844-02

TRENCH EXCAVATION SAFETY PROTECTION

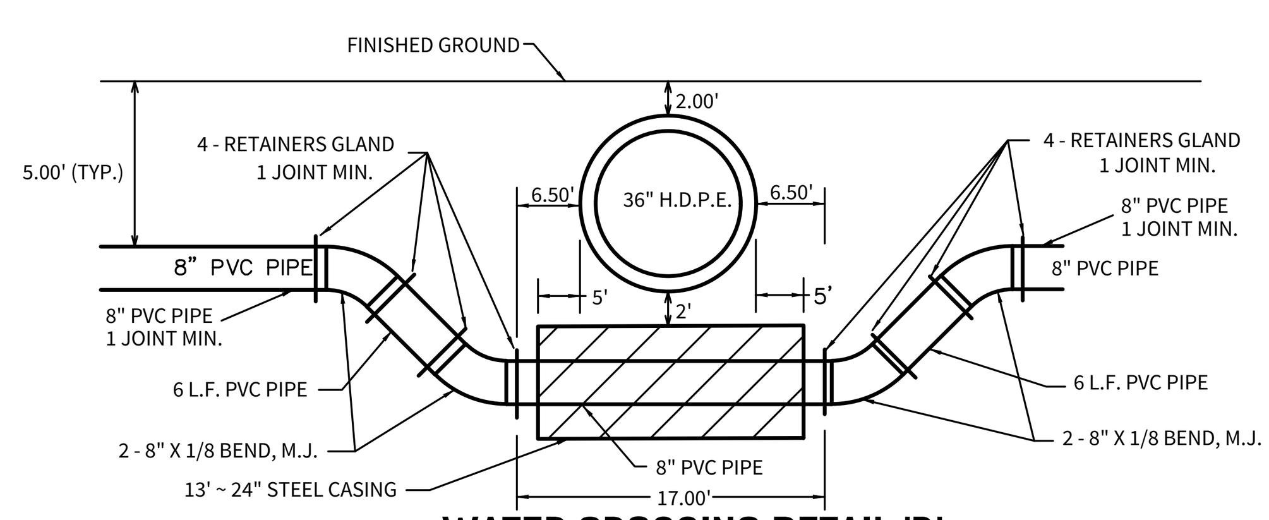
Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

LEGEND

EXISTING SANITARY SEWER	EX.8"SS
PROPOSED SANITARY SEWER	8"SS
EXISTING SANITARY SEWER MANHOLE	
PROPOSED WATER MAIN	8"W
EXISTING WATER MAIN	EX. 8"W
EXISTING STANDARD FIRE HYDRANT	
PROPOSED STANDARD FIRE HYDRANT	
PROPOSED STANDARD GATE VALVE	
PROPOSED PERMANENT BLOWOFF	
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T
PROPOSED 3/4" WATER SERVICE WITH 5/8" METER	W



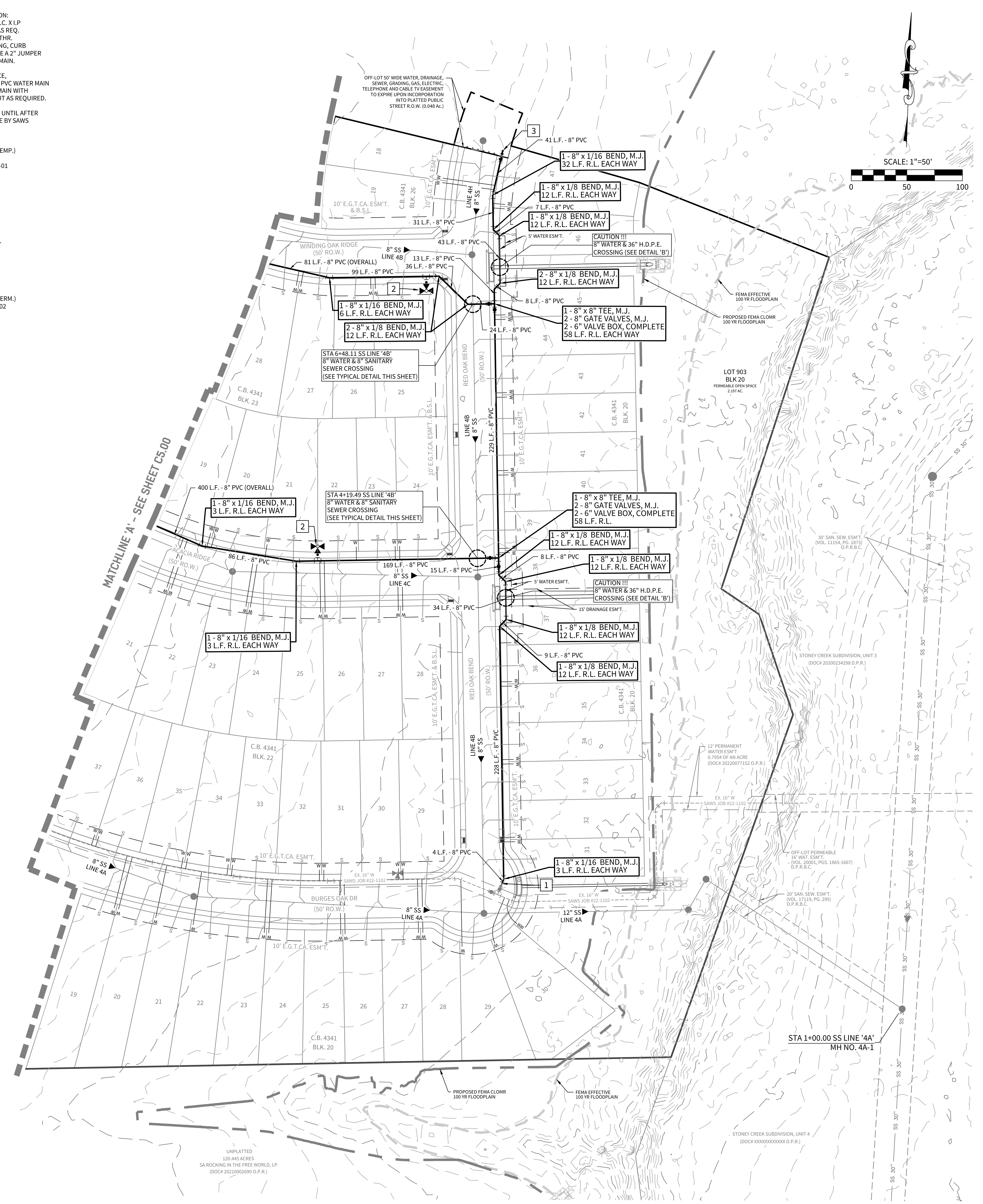
TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.



WATER CROSSING DETAIL 'B'
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) N.T.S.

SAWS PRESSURE ZONE 950W

Developer's Name	LENNAR HOMES				
Developer's Address	100 NE LOOP 410 SUITE 1155				
City	SAN ANTONIO	State	TX	Zip	78216
Phone #	(210) 403-6200	Fax #	-		
SAWS Block Map #		Total EDU's	185	Total Acreage	31.33
Total Linear Footage of Pipe	12" - 165 L.F. ; 8" - 3,727 L.F. ; 2" H.D.P.E. - 622 L.F.	Plat No.	24-11800118		
Number of Lots	178	SAWS Job No.	24-1050		



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

WATER DISTRIBUTION PLAN

DATE	06/24/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

SAWS JOB NO.
24-1050

C5.01

GENERAL SECTION

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
   - A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
   - B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
   - C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
   - D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
   - E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS. WORK COMPLETED BY THE CONTRACTOR WITHOUT AN APPROVED COUNTER PERMIT AND/OR A GCP WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTORS AND/OR THE DEVELOPER.
3. THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS. UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
4. THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:
   - SAWS UTILITY LOCATES: HTTP://WWW.SAWS.ORG/SERVICE/LOCATES
   - COSA DRAINAGE (210) 207-0724 OR (210) 207-6026
   - COSA TRAFFIC SIGNAL OPERATIONS (210) 206-8480
   - COSA TRAFFIC SIGNAL DAMAGES (210) 207-3951
   - TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005 OR 811
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
9. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
10. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.
11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.

WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.

ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.

12. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
13. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

SAWS PRESSURE ZONE 950W

Developer's Name	LENNAR HOMES
Developer's Address	100 NE LOOP 410 SUITE 1155
City	SAN ANTONIO
State	TX
Zip	78216
Phone #	(210) 403-6200
Fax #	-
SAWS Block Map #	
Total EDU's	185
Total Acreage	31.33
Total Linear Footage of Pipe	12" - 177 L.F. ; 8" - 3,727 L.F. ; 2" H.D.P.E. - 621 L.F.
Plat No.	24-11800118
Number of Lots	178
SAWS Job No.	24-1050

WATER SECTION

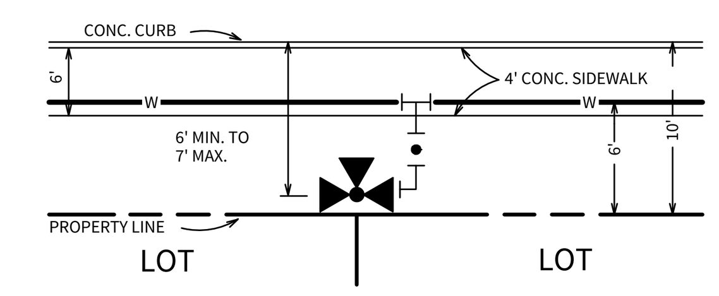
1. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY. FOR WATER MAINS 12" OR HIGHER: SAWS EMERGENCY OPERATIONS CENTER (210) 233-2014
2. ASBESTOS CEMENT (AC) PIPE, ALSO KNOWN AS TRANSITE PIPE WHICH IS KNOWN TO CONTAIN ASBESTOSCONTAINING MATERIAL (ACM), MAY BE LOCATED WITHIN THE PROJECT LIMITS. SPECIAL WASTE MANAGEMENT PROCEDURES AND HEALTH AND SAFETY REQUIREMENTS WILL BE APPLICABLE WHEN REMOVAL AND/OR DISTURBANCE OF THIS PIPE OCCURS. SUCH WORK IS TO BE MADE UNDER SPECIAL SPECIFICATION ITEM NO. 3000, "SPECIAL SPECIFICATION FOR HANDLING ASBESTOS CEMENT PIPE".
3. VALVE REMOVAL: WHERE THE CONTRACTOR IS TO ABANDON A WATER MAIN, THE CONTROL VALVE LOCATED ON THE ABANDONING BRANCH WILL BE REMOVED AND REPLACED WITH A CAP/PLUG. (NSPI)
4. SUITABLE ANCHORAGE/THRUST BLOCKING OR JOINT RESTRAINT SHALL BE PROVIDED AT ALL OF THE FOLLOWING MAIN LOCATIONS: DEAD ENDS, PLUGS, CAPS, TEES, CROSSES, VALVES, AND BENDS, IN ACCORDANCE WITH THE STANDARD DRAWINGS DD-839 SERIES AND ITEM NO. 839, IN THE SAWS STANDARD SPECIFICATIONS FOR CONSTRUCTION.
5. ALL VALVES SHALL READ "OPEN RIGHT".
6. PRVS REQUIRED: CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 765 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 765 FEET, THE DEVELOPER OR BUILDER SHALL INSTALL AT EACH LOT, ON THE CUSTOMER'S SIDE OF THE METER, AN APPROVED TYPE PRESSURE REGULATOR IN CONFORMANCE WITH THE PLUMBING CODE OF THE CITY OF SAN ANTONIO. NO DUAL SERVICES ALLOWED FOR ANY LOT(S) IF *PRV IS/ARE REQUIRED FOR SUCH LOT(S), ONLY SINGLE SERVICE CONNECTIONS SHALL BE ALLOWED. *NOTE: A PRESSURE REGULATOR IS ALSO KNOWN AS A PRESSURE REDUCING VALVE (PRV).
7. PIPE DISINFECTION WITH DRY HTH FOR PROJECTS LESS THAN 800 LINEAR FEET. (ITEM NO. 847.3): MAINS SHALL BE DISINFECTED WITH DRY HTH WHERE SHOWN IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE INSPECTOR, AND SHALL NOT EXCEED A TOTAL LENGTH OF 800 FEET. THIS METHOD OF DISINFECTION WILL ALSO BE FOLLOWED FOR MAIN REPAIRS. THE CONTRACTOR SHALL UTILIZE ALL APPROPRIATE SAFETY MEASURE TO PROTECT HIS PERSONNEL DURING DISINFECTION OPERATIONS.
8. BACKFLOW PREVENTION DEVICES:
   - ALL IRRIGATION SERVICES WITHIN RESIDENTIAL AREAS ARE REQUIRED TO HAVE BACKFLOW PREVENTION DEVICES.
   - ALL COMMERCIAL BACKFLOW PREVENTION DEVICES MUST BE APPROVED BY SAWS PRIOR TO INSTALLATION.
9. FINAL CONNECTION TO THE EXISTING WATER MAIN SHALL NOT BE MADE UNTIL THE WATER MAIN HAS BEEN PRESSURE TESTED, CHLORINATED, AND SAWS HAS RELEASED THE MAIN FOR TIE-IN AND USE.
10. DIVISION VALVES SHOWN ON PLANS OR NOT SHOWN ON PLANS BUT FOUND IN THE FIELD SHALL ONLY BE OPERATED BY SAWS DISTRIBUTION AND COLLECTION STAFF AND ONLY WITH PRIOR WRITTEN APPROVAL OF THE SAWS DIRECTOR OF PRODUCTION AND OPERATIONS AND PROPER COORDINATION WITH ALL SAWS DEPARTMENTS. CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE INSPECTOR A MINIMUM OF TWO WEEKS IN ADVANCE TO START THE COORDINATION PROCESS AND WILL BE INFORMED BY THE INSPECTOR WHEN THE DIVISION VALVE WILL BE OPERATED BY THE SAWS DISTRIBUTION AND COLLECTION STAFF. THE DIVISION VALVE CAN ONLY BE OPERATED BY SAWS DISTRIBUTION AND COLLECTION STAFF MEMBER NOT THE INSPECTOR OR THE CONTRACTOR. OPERATION OF A DIVISION VALVE WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE SAWS DISTRIBUTION AND COLLECTION STAFF WILL CONSTITUTE A MATERIAL BREACH OF ANY WRITTEN SAWS CONTRACT OR PERMIT IN ADDITION TO SUBJECTING THE CONTRACTOR TO LIABILITY FOR ANY AND ALL FINES, FEES, OR OTHER DAMAGES, DIRECT OR CONSEQUENTIAL, THAT MAY ARISE FROM OR BE CAUSED BY THE OPERATION OF THE VALVE WITHOUT PRIOR WRITTEN PERMISSION. PLEASE BE INFORMED THAT THE APPROVAL OF THE OPERATION OR OPENING OR CLOSING OF A DIVISION VALVE CAN TAKE SEVERAL WEEKS FOR APPROVAL. DIVISION VALVES WILL ALSO HAVE A VALVE LID LABELED DIVISION VALVE AND A LOCKING MECHANISM INSTALLED WITH A KEY. THE LOCK AND KEY MECHANISM WILL BE PAID FOR BY THE CONTRACTOR BUT WILL BE INSTALLED BY SAWS DISTRIBUTION AND COLLECTION STAFF
11. IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1000 G.P.M. AT 25 P.S.I. RESIDUAL PRESSURE. THE FIRE FLOW REQUIREMENTS FOR INDIVIDUAL STRUCTURES WILL BE REVIEWED DURING THE BUILDING PERMIT PROCESS IN ACCORDANCE WITH THE PROCEDURES SET FORTH BY THE CITY OF SAN ANTONIO DIRECTOR OF DEVELOPMENT SERVICES AND THE SAN ANTONIO FIRE DEPARTMENT FIRE MARSHAL
12. ALL PIPES SHALL BE C900 CLASS 235 DR-18, UNLESS OTHERWISE NOTED.
13. ALL METERS SHALL BE 5/8", UNLESS OTHERWISE NOTED.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT UNDERGROUND ELECTRIC AND GAS LINES EXIST ALONG WT MONTGOMERY RD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

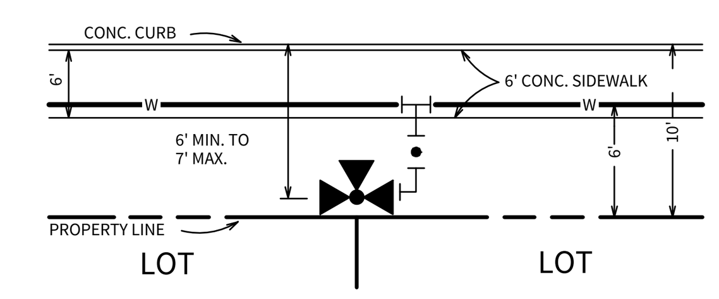


NOTE:

1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK/ 50' ROW)

N.T.S.

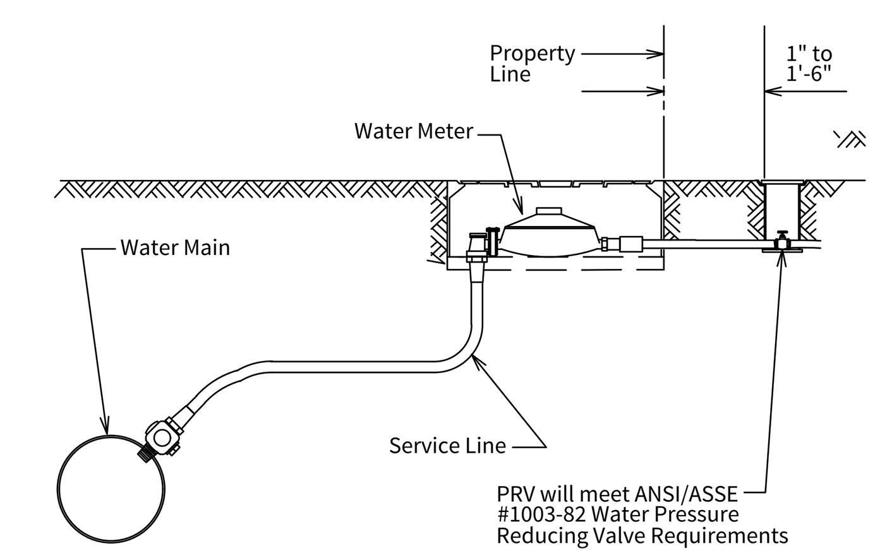


NOTE:

1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

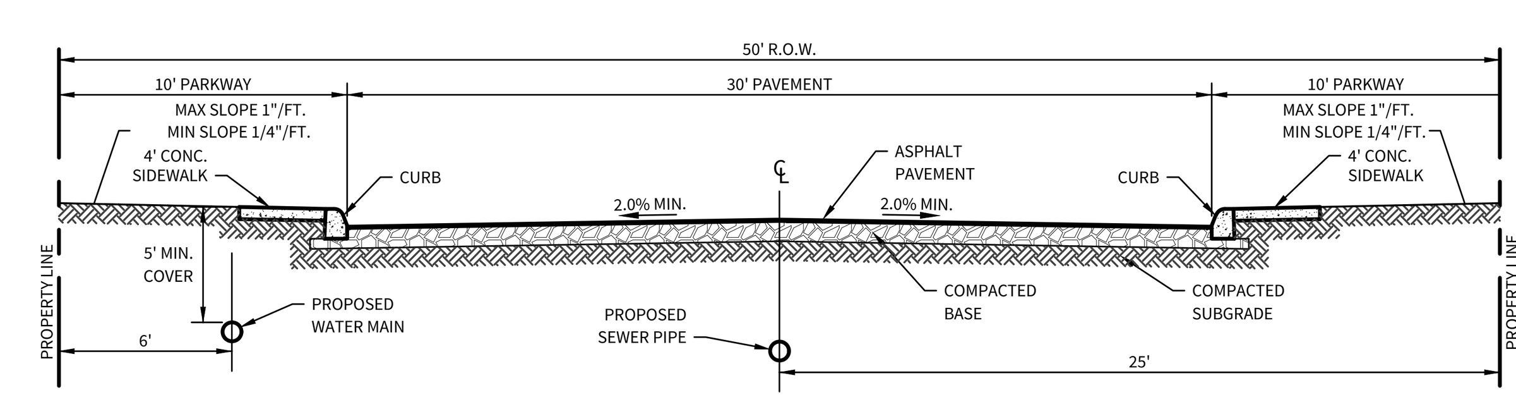
TYPICAL FIRE HYDRANT DETAIL (6' SIDEWALK/ 60' ROW)

N.T.S.

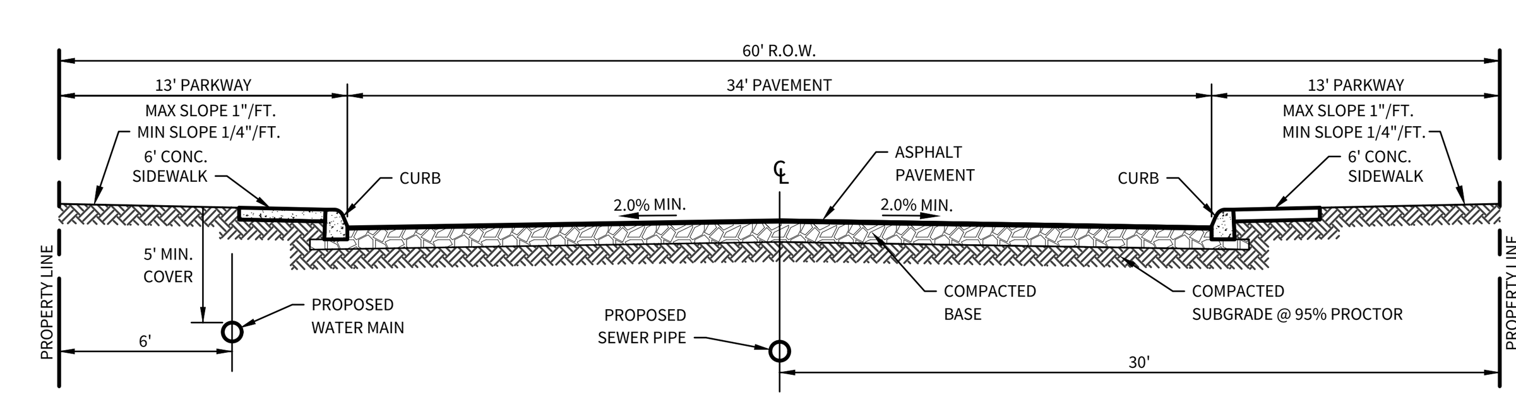


3/4" THRU 2" SERVICE PRESSURE REDUCING VALVE

N.T.S.



LOCAL "A" STREET CROSS-SECTION



LOCAL "B" STREET CROSS-SECTION

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

WATER DISTRIBUTION SYSTEM GENERAL NOTES

DATE	06/10/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024

STATE OF TEXAS MATTHEW A. TRINKLE 147558 LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.	24-11800118
SAWS JOB NO.	24-1050

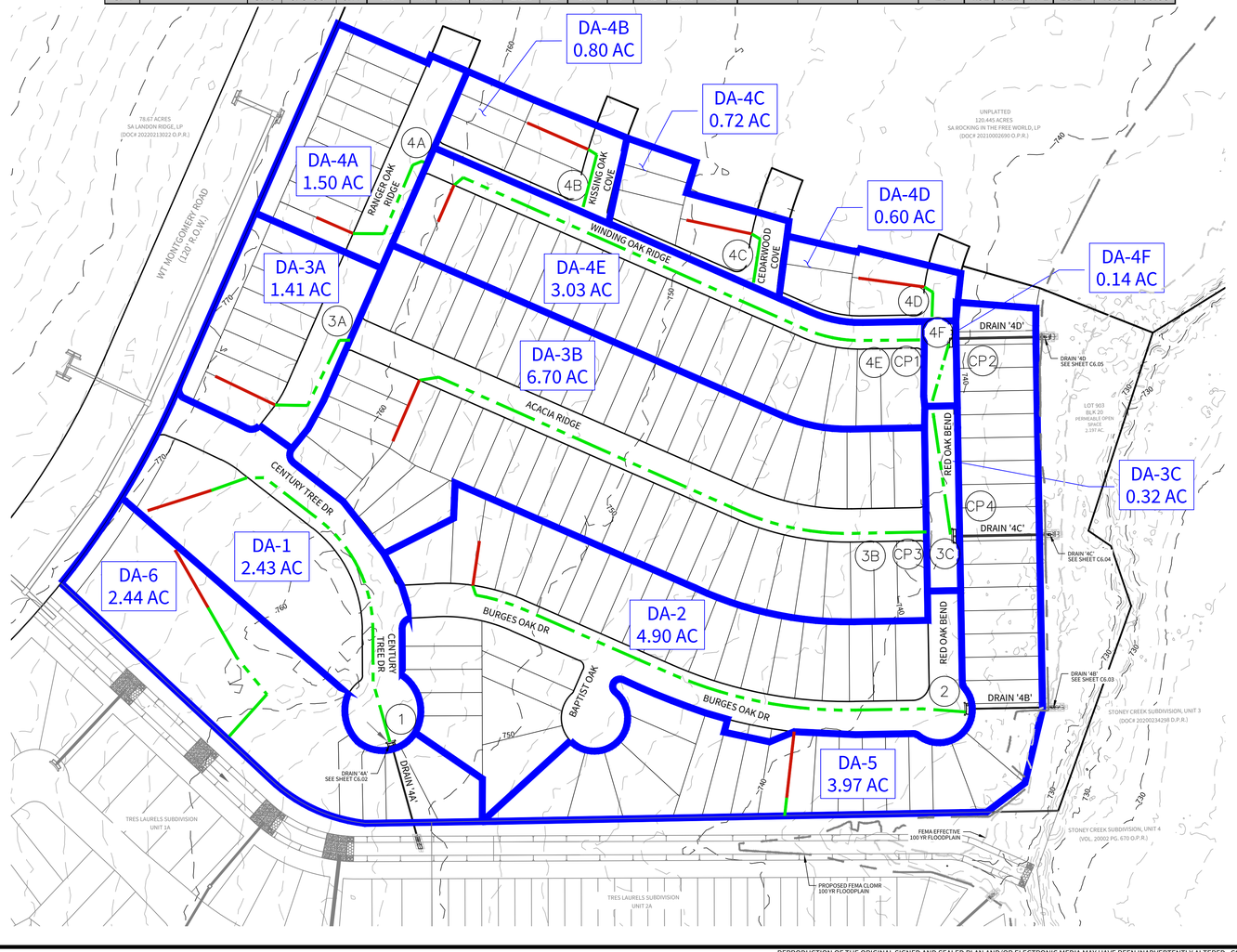
C5.D1

LOCATION MAP
N.T.S.

Project Name: Tres Laurels – Unit 4A — Precipitation: **PA4**

Calculation Summary for Time of Concentrations & Proposed Flow (USED FOR SIZING CURB INLET AND VERIFYING STREET CAPACITY)

Drainage Shed/ Computation Point	Structure/ Description	Shed Area (Ac.)	AREA OF ACCUMULATION (Ac.)	C	Sheet Flow Tc Compuations: Length < 100'	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Shallow Conc. Tc Compuations: Length	Paved (Y or N)	Downstream Elev	Slope	Time of Concentration	Concentrated Tc Computations: Length	Velocity (fps)	Time of Concentration	Overall Time of Concentration (min)	INTENSITY: I5	I25	I100	Q FLOW: Q5	Q25	Q100
1	Century Tree Dr Curb Inlet 4A-1 10' Curb Inlet (In Sag)	2.43	= 1	0.65	100	N	771	769	2.09%	13	550	Y	753	2.82%	3				15	5.24	7.24	9.03	8.22	11.35	14.16
2	Burges Oak Dr Curb Inlet 4B-1 15' Curb Inlet (In Sag)	4.90	= 2	0.77	100	N	756	754	1.51%	14	783	Y	738	2.02%	5				18	4.76	6.56	8.16	17.96	24.75	30.79
3A	Ranger Oak Ridge	1.41	= 3A	0.77	100	N	769	768	1.02%	15	174	Y	762	3.47%	1				15	5.24	7.24	9.03	5.69	7.86	9.80
3B	Acacia Ridge	6.70	= 3B	0.77	100	N	760	759	1.02%	15	851	Y	740	2.22%	5				19	4.63	6.37	7.93	23.89	32.86	40.91
3C	Red Oak Bend	0.32	= 3C	0.96					#DIV/0!		184	Y	740		1				5	7.76	10.83	13.54	2.38	3.33	4.16
4A	Ranger Oak Ridge	1.50	= 4A	0.77	100	N	770	768	1.50%	14	182	Y	760	4.33%	1				14	5.42	7.53	9.39	6.26	8.70	10.85
4B	Kissing Oak Cove	0.80	= 4B	0.77	100	N	756	755	1.42%	14	96	Y	753	1.60%	1				14	5.42	7.53	9.39	3.34	4.64	5.78
4C	Cedarwood Cove	0.72	= 4C	0.77	100	N	749	748	1.68%	14	81	Y	746	1.83%	0				14	5.42	7.53	9.39	3.00	4.17	5.21
4D	Red Oak Bend	0.60	= 4D	0.77	100	N	745	743	2.05%	13	52	Y	742	2.35%	0				13	5.61	7.82	9.76	2.59	3.61	4.51
4E	Winding Oak Ridge	3.03	= 4E	0.77	100	N	761	760	1.65%	14	799	Y	741	2.30%	4				18	4.76	6.56	8.16	11.11	15.31	19.04
4F	Red Oak Bend	0.14	= 4F	0.96					#DIV/0!		89	Y	741		1				5	7.76	10.83	13.54	1.04	1.46	1.82
5		3.97	= 5	0.77	100	N	741	740	1.06%	15	42	N	740	0.69%	1				15	5.24	7.24	9.03	16.02	22.13	27.60
6		3.83	= 6	0.41	100	N	772	767	4.71%	11	402	N	757	2.52%	3				13	5.61	7.82	9.76	8.81	12.28	15.33
CP1		6.05	= 4A+4B+4C +4E	0.77	100	N	770	768	1.50%	14	981	Y	741	2.76%	5				18	4.76	6.56	8.16	22.17	30.56	38.01
CP2		6.79	= CP1+4D+4F	0.77	100	N	770	768	1.50%	14	1031	Y	741	2.63%	5				19	4.63	6.37	7.93	24.33	33.47	41.67
CP3		8.11	=3A+3B	0.77	100	N	769	768	1.02%	15	1025	Y	741	2.62%	5				20	4.51	6.21	7.71	28.16	38.78	48.15
CP4		8.43	=CP3+3C	0.77	100	N	769	768	1.02%	15	1075	Y	741	2.50%	6				20	4.51	6.21	7.71	29.27	40.31	50.05



SCALE: 1"=100'
100 50 0 100

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

LEGEND

- SITE BOUNDARY
- DRAINAGE AREA
- Tc FLOW PATH (SHEET FLOW)
- Tc FLOW PATH (SHALLOW CONC.)
- Tc FLOW PATH (CONCENTRATED)
- FLOW ARROW PROP. GROUND
- FLOW ARROW EX. GROUND
- ACCUMULATION POINT (XX)

CUDEENGINEERS.COM
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

PROPOSED DRAINAGE MASTER PLAN

DATE
06/24/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C6.00

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

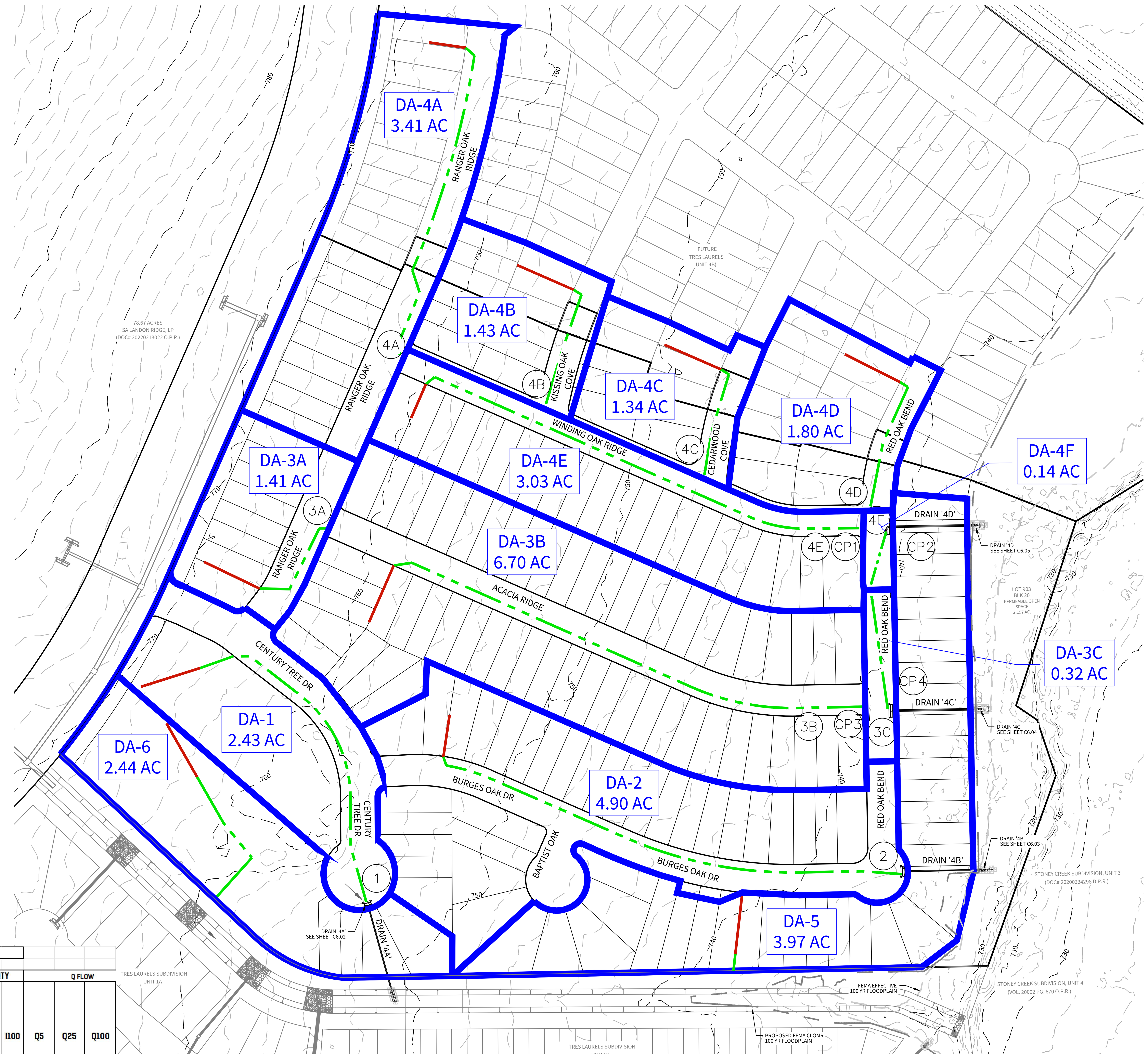
CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

LEGEND

SITE BOUNDARY
DRAINAGE AREA
Tc FLOW PATH (SHEET FLOW)
Tc FLOW PATH (SHALLOW CONC.)
Tc FLOW PATH (CONCENTRATED)
FLOW ARROW PROP. GROUND
FLOW ARROW EX. GROUND
ACCUMULATION POINT (XX)

SCALE: 1"=100'
100 50 0 100



Project Name: Tres Laurels - Unit 4A																			Precipitation		PA4			
Calculation Summary for Time of Concentrations & Proposed Flow (USED FOR SIZING CURB INLET AND VERIFYING STREET CAPACITY)																								
HYDROLOGY					Sheet Flow Tc Compuations						Shallow Conc. Tc Compuations					Concentrated Tc Computations			Overall	INTENSITY			Q FLOW		
Drainage Shed/ Computation Point	Structure/ Description	Shed Area (Ac.)	AREA OF ACCUMULATION (Ac.)	C	Length < 100'	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	Length	Paved (Y or N)	Downstream Elev	Slope	Time of Concentration	Length	Velocity (fps)	Time of Concentration	Time of Concentration (min)	I5	I25	I100	Q5	Q25	Q100
1	Century Tree Dr Curb Inlet 4A-1 10' Curb Inlet (In Sag)	2.43	= 1	0.65	100	N	771	769	2.09%	13	550	Y	753	2.82%	3				15	5.24	7.24	9.03	8.22	11.35	14.16
2	Burges Oak Dr Curb Inlet 4B-1 15' Curb Inlet (In Sag)	4.90	= 2	0.77	100	N	756	754	1.51%	14	783	Y	738	2.02%	5				18	4.76	6.56	8.16	17.96	24.75	30.79
3A	Ranger Oak Ridge	1.41	= 3A	0.77	100	N	769	768	1.02%	15	174	Y	762	3.47%	1				15	5.24	7.24	9.03	5.69	7.86	9.80
3B	Acacia Ridge	6.70	= 3B	0.77	100	N	760	759	1.02%	15	851	Y	740	2.22%	5				19	4.63	6.37	7.93	23.89	32.86	40.91
3C	Red Oak Bend	0.32	= 3C	0.96							184	Y	740		1				5	7.76	10.83	13.54	2.38	3.33	4.16
4A	Ranger Oak Ridge	3.41	= 4A	0.77	100	N	770	768	1.50%	14	529	Y	760	1.49%	4				17	4.91	6.76	8.42	12.89	17.75	22.11
4B	Kissing Oak Cove	1.43	= 4B	0.77	100	N	757	755	1.50%	14	201	Y	753	1.07%	2				15	5.24	7.24	9.03	5.77	7.97	9.94
4C	Cedarwood Cove	1.34	= 4C	0.77	100	N	750	748	1.50%	14	182	Y	746	1.27%	1				15	5.24	7.24	9.03	5.41	7.47	9.32
4D	Red Oak Bend	1.80	= 4D	0.77	100	N	745	743	2.05%	13	52	Y	742	2.35%	0				13	5.61	7.82	9.76	7.78	10.84	13.53
4E	Winding Oak Ridge	3.03	= 4E	0.77	100	N	761	760	1.65%	14	799	Y	741	2.30%	4				18	4.76	6.56	8.16	11.11	15.31	19.04
4F	Red Oak Bend	0.14	= 4E	0.96							90	Y	741		1				5	7.76	10.83	13.54	1.04	1.46	1.82
5		3.97	= 5	0.77	100	N	741	740	1.06%	15	42	N	740	0.69%	1				15	5.24	7.24	9.03	16.02	22.13	27.60
6		3.83	= 6	0.41	100	N	772	767	4.71%	11	402	N	757	2.52%	3				13	5.61	7.82	9.76	8.81	12.28	15.33
CP1		9.21	= 4A+4B+4C +4E	0.77	100	N	770	768	1.50%	14	1330	Y	741	2.04%	8				21	4.40	6.05	7.52	31.20	42.90	53.33
CP2		11.15	= CP1+4D+4F	0.77	100	N	770	768	1.50%	14	1380	Y	741	1.96%	8				22	4.30	5.91	7.34	36.92	50.74	63.02
CP3		8.11	=3A+3B	0.77	100	N	769	768	1.02%	15	1025	Y	741	2.62%	5				20	4.51	6.21	7.71	28.16	38.78	48.15
CP4		8.43	=CP3+3C	0.77	100	N	769	768	1.02%	15	1075	Y	741	2.50%	6				20	4.51	6.21	7.71	29.27	40.31	50.05

CUDEENGINEERS.COM
CUDE EST. 1980 ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A
ULTIMATE DRAINAGE MASTER PLAN

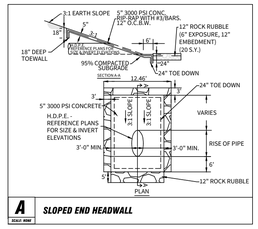
DATE
06/24/2024
PROJECT NO.
03050.015
DRAWN BY
RM / IV
CHECKED BY
MAT/CJC

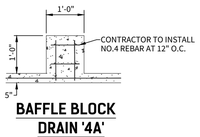
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

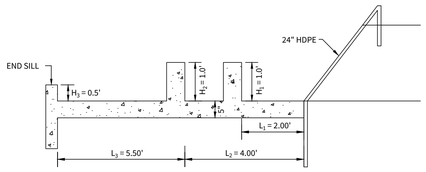
PLAT NO.
24-11800118

C6.01



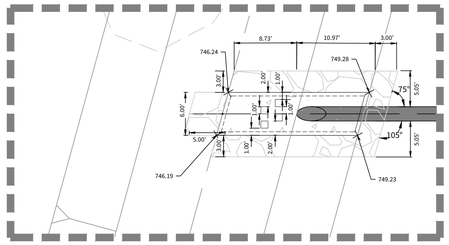


BAFFLE BLOCK DRAIN '4A' REINFORCEMENT DETAIL
(N.T.S.)

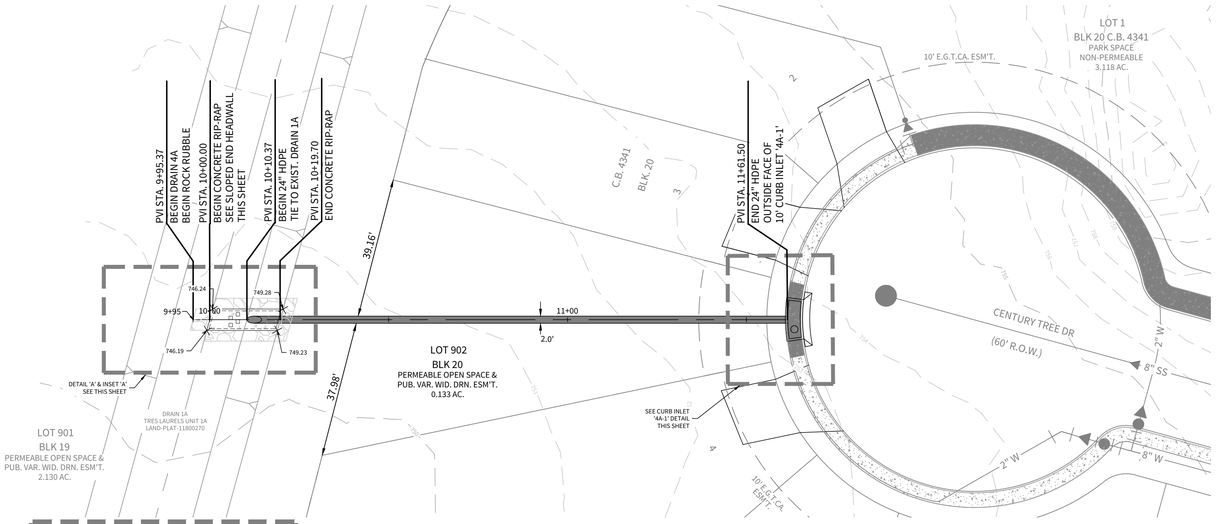


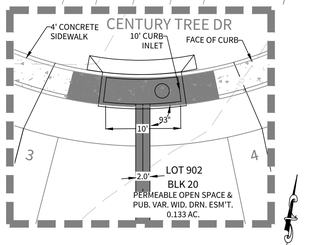
BAFFLE BLOCK CALCULATIONS
(N.T.S.)

TAILWATER DEPTH = 0.79'
Fr = 1.99
Y_C = 0.47 FT
Y_2 = 1.86 FT
Y_3 = 0.47 FT
BASIN OUTLET VELOCITY = 3.75 FT/S



INSET 'A'
(SCALE 1" = 10')

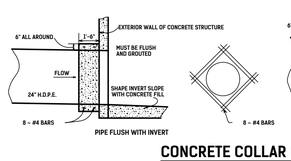


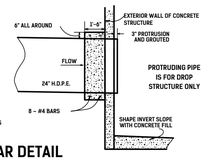


CURB INLET '4A–1' DETAIL
(SCALE 1" = 10')

DRAIN 4A

STA. 9+95.37 TO STA. 11+61.50





CONCRETE COLLAR DETAIL

GENERAL SPECIFICATIONS FOR COMPACTED FILL

1. FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.
2. THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.
3. THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

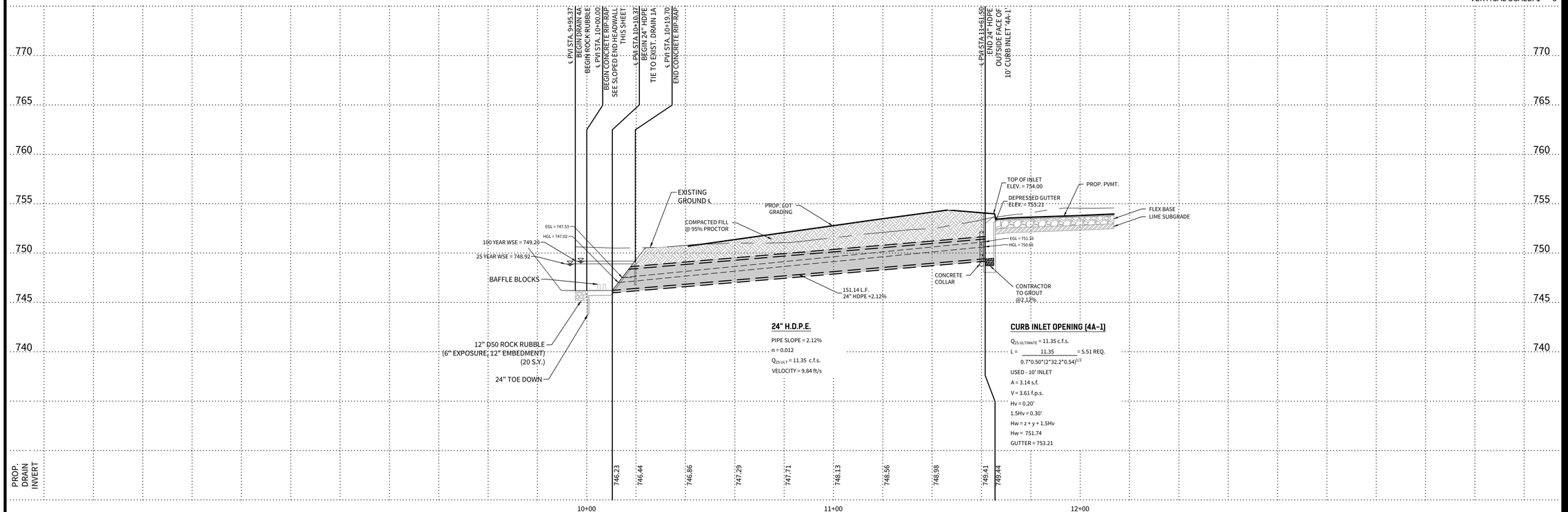
NOTES:

1. **REFER TO GENERAL NOTES AND SPECIFICATIONS CO.00.**
2. **CONTRACTOR TO ENSURE POSITIVE DRAINAGE AT ALL GRADE BREAKS.**
3. **THE CONTRACTOR SHALL NOTIFY A UTILITY COORDINATOR AT LEAST 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION ACTIVITY ADJACENT TO THE CONSTRUCTION OF AN ON–SITE DRAINAGE FACILITIES TO PROTECT ANY UNIDENTIFIED EXISTING UNDERGROUND UTILITY FACILITY FROM DAMAGE OR HARM. THE CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY FOR ANY DAMAGES TO UTILITIES AS A RESULT OF NOT LOCATING UNDERGROUND UTILITY RESOURCES.**
4. **ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF SAN ANTONIO.**
5. **ANY AREAS EXPOSED TO HIGH VELOCITY FLOWS SHALL EITHER HAVE A 6" THICK GABION MATTRESS INSTALLED OR THE INSTALLATION OF APPROPRIATE GEOTECHNICAL LINER AS DIRECTED BY THE CONSTRUCTION ENGINEER IN CHARGE.**
6. **ALL CONCRETE SHALL BE A MINIMUM OF 3500 PSI @ 28 DAYS COMPRESSIVE STRENGTH UNLESS OTHERWISE SPECIFIED HEREIN ON THESE DOCUMENTS.**
7. **85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SAN ANTONIO & BEXAR COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.**
8. **REFERENCE TYPICAL CONCRETE CHANNEL RIP–RAP STANDARDS FOUND ON SHEET ---.**
9. **A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING IN EXISTING BEXAR COUNTY R.O.W.**
10. **CONTRACTOR TO RECONSTRUCT EXISTING SIDEWALK, AS NECESSARY, FOR PROPOSED SIDEWALK TRANSITION.**
11. **CONTRACTOR TO GROUT BOTTOM/FLOW LINE OF SEWER MANHOLES AND/OR CURB INLETS AS NECESSARY TO PROVIDE POSITIVE DRAINAGE**

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



24" H.D.P.E.

PIPE SLOPE = 2.12%
n = 0.012
$Q_{25\,ULT}$ = 11.35 c.f.s.
VELOCITY = 9.84 ft/s

CURB INLET OPENING (4A–1)

$Q_{25\,ULTIMATE}$ = 11.35 c.f.s.

$L = \frac{11.35}{0.7*0.50*(2*32.2*0.54)^{1/2}} = 5.51$ REQ.

USED - 10' INLET
A = 3.14 s.f.
V = 3.61 f.p.s.
Hv = 0.20'
1.5Hv = 0.30'
Hw = z + y + 1.5Hv
Hw = 753.74
GUTTER = 753.21

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

DRAINAGE PLAN & PROFILE - DRAIN '4A'

DATE
06/24/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

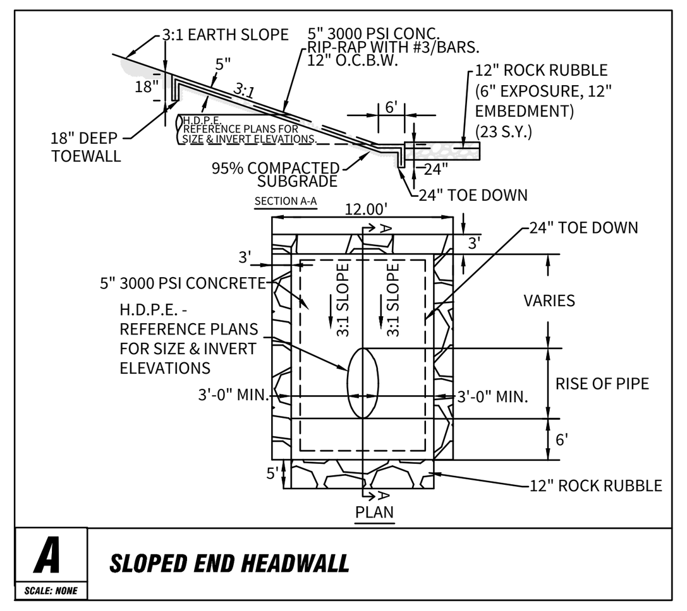
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

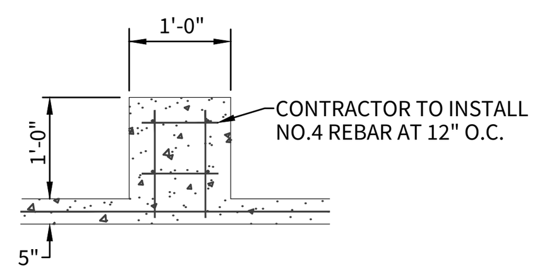
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

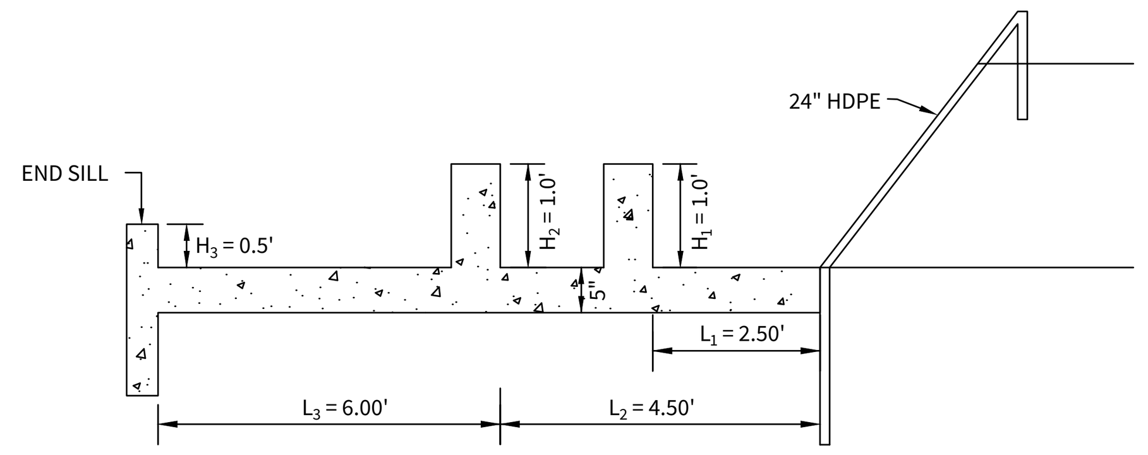
C6.02





BAFFLE BLOCK DRAIN '4B' REINFORCEMENT DETAIL

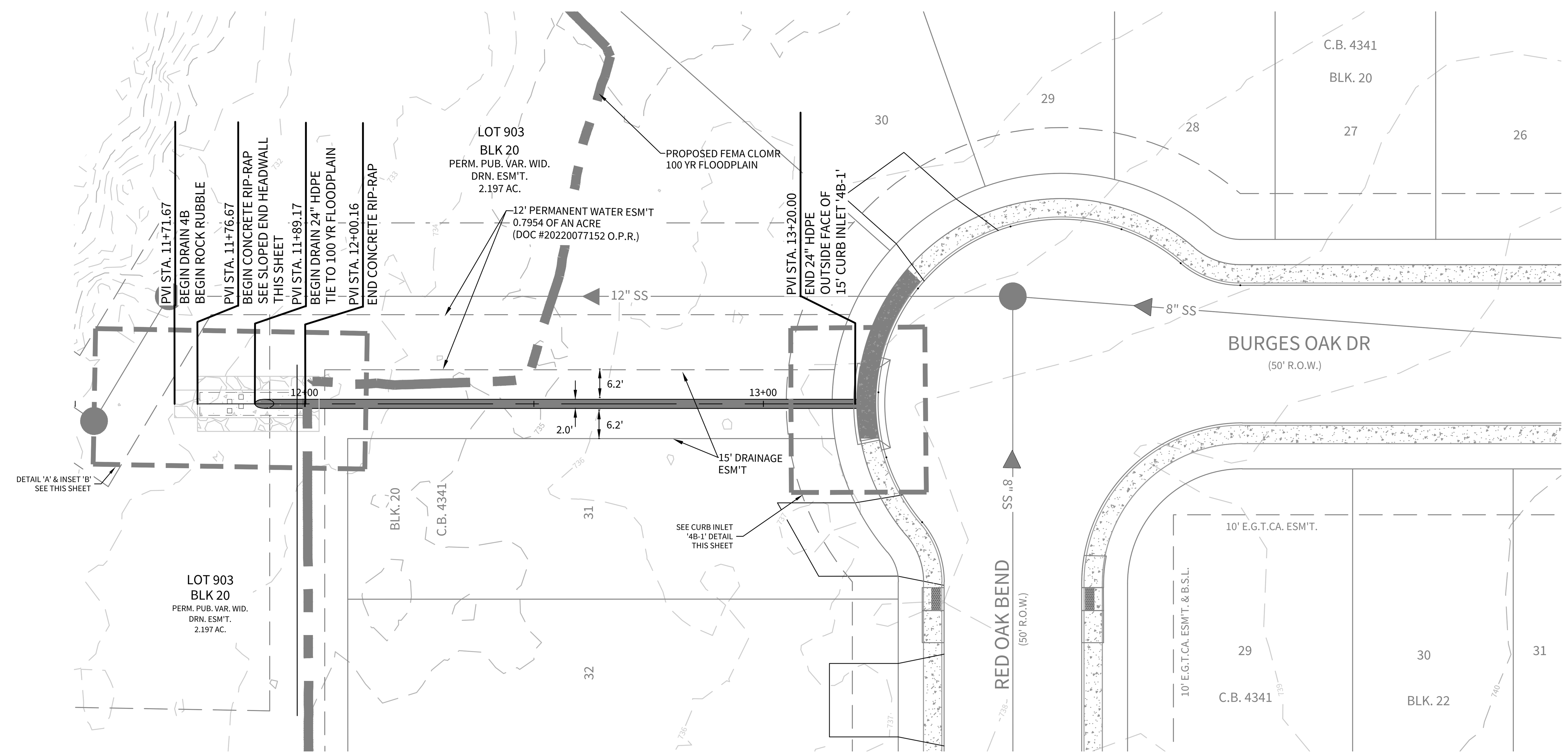
(N.T.S.)



BAFFLE BLOCK CALCULATIONS

(N.T.S.)

TAILWATER DEPTH = 1.31'
Fr = 1.96
Y_C = 0.77 FT
Y_2 = 2.52 FT
Y_3 = 0.77 FT
BASIN OUTLET VELOCITY = 4.73 FT/S

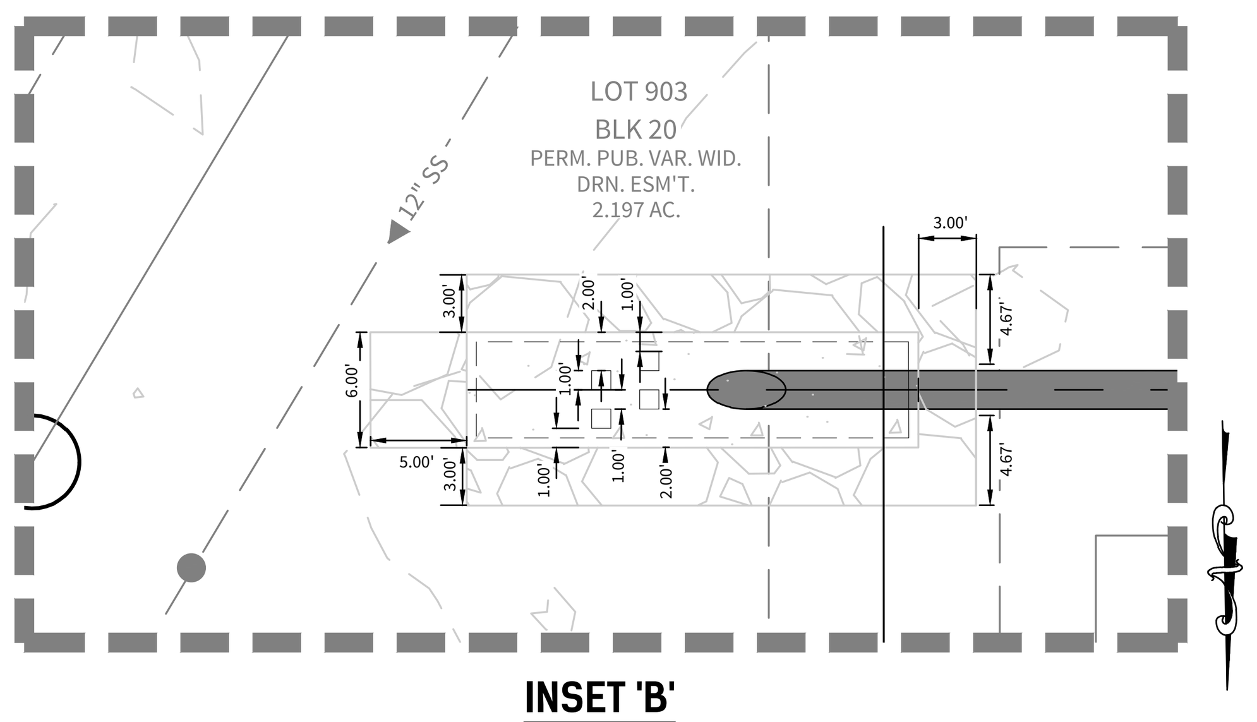


GENERAL SPECIFICATIONS FOR COMPACTED FILL

1. FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.
2. THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.
3. THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

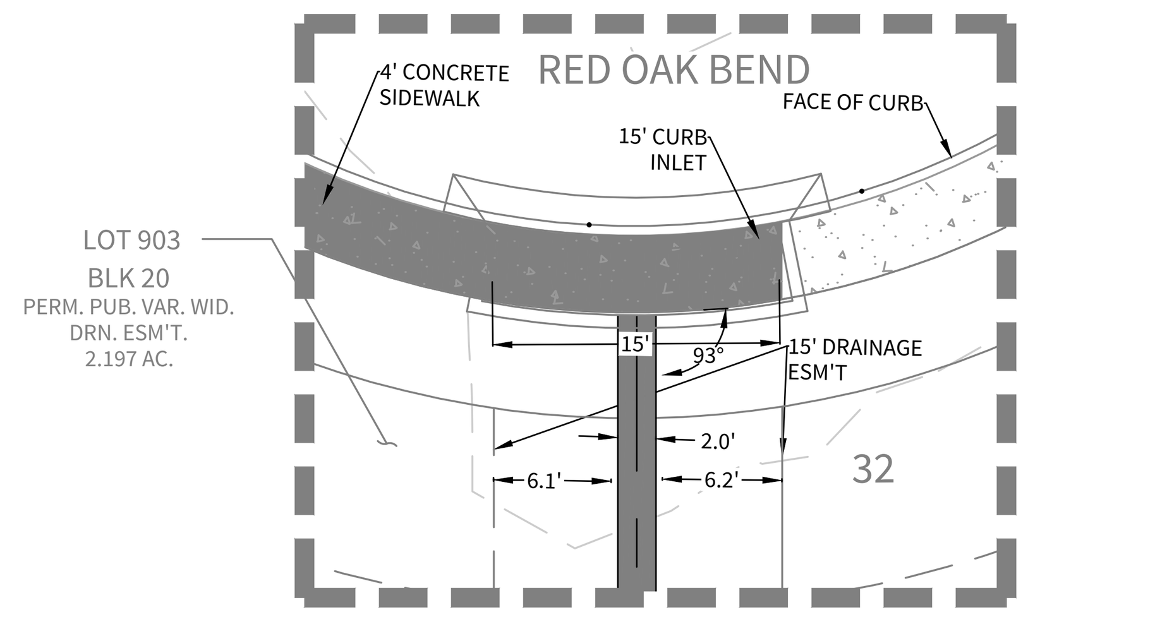
NOTES:

1. REFER TO GENERAL NOTES AND SPECIFICATIONS C0.00.
2. CONTRACTOR TO ENSURE POSITIVE DRAINAGE AT ALL GRADE BREAKS.
3. THE CONTRACTOR SHALL NOTIFY A UTILITY COORDINATOR AT LEAST 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION ACTIVITY ADJACENT TO THE CONSTRUCTION OF AN ON-SITE DRAINAGE FACILITIES TO PROTECT ANY UNIDENTIFIED EXISTING UNDERGROUND UTILITY FACILITY FROM DAMAGE OR HARM. THE CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY FOR ANY DAMAGES TO UTILITIES AS A RESULT OF NOT LOCATING UNDERGROUND UTILITY RESOURCES.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF SAN ANTONIO.
5. ANY AREAS EXPOSED TO HIGH VELOCITY FLOWS SHALL EITHER HAVE A 6" THICK GABION MATTRESS INSTALLED OR THE INSTALLATION OF APPROPRIATE GEOTECHNICAL LINER AS DIRECTED BY THE CONSTRUCTION ENGINEER IN CHARGE.
6. ALL CONCRETE SHALL BE A MINIMUM OF 3500 PSI @ 28 DAYS COMPRESSIVE STRENGTH UNLESS OTHERWISE SPECIFIED HEREIN ON THESE DOCUMENTS.
7. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SAN ANTONIO & BEXAR COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
8. REFERENCE TYPICAL CONCRETE CHANNEL RIP-RAP STANDARDS FOUND ON SHEET --.
9. A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING IN EXISTING BEXAR COUNTY R.O.W.
10. CONTRACTOR TO RECONSTRUCT EXISTING SIDEWALK, AS NECESSARY, FOR PROPOSED SIDEWALK TRANSITION.
11. CONTRACTOR TO GROUT BOTTOM/FLOW LINE OF SEWER MANHOLES AND/OR CURB INLETS AS NECESSARY TO PROVIDE POSITIVE DRAINAGE



INSET 'B'

(SCALE 1" = 10')

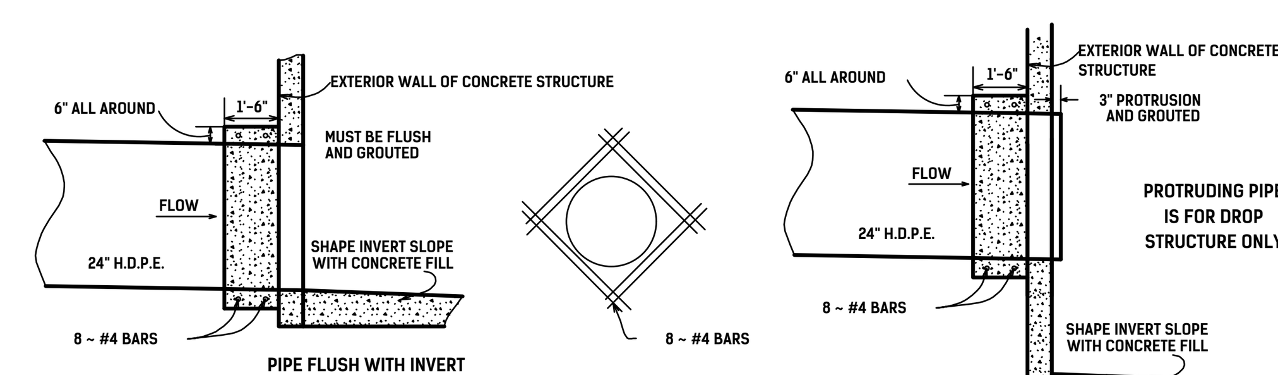


CURB INLET '4B-1' DETAIL

(SCALE 1" = 10')

DRAIN 4B

STA. 11+71.67 TO STA. 13+20.00

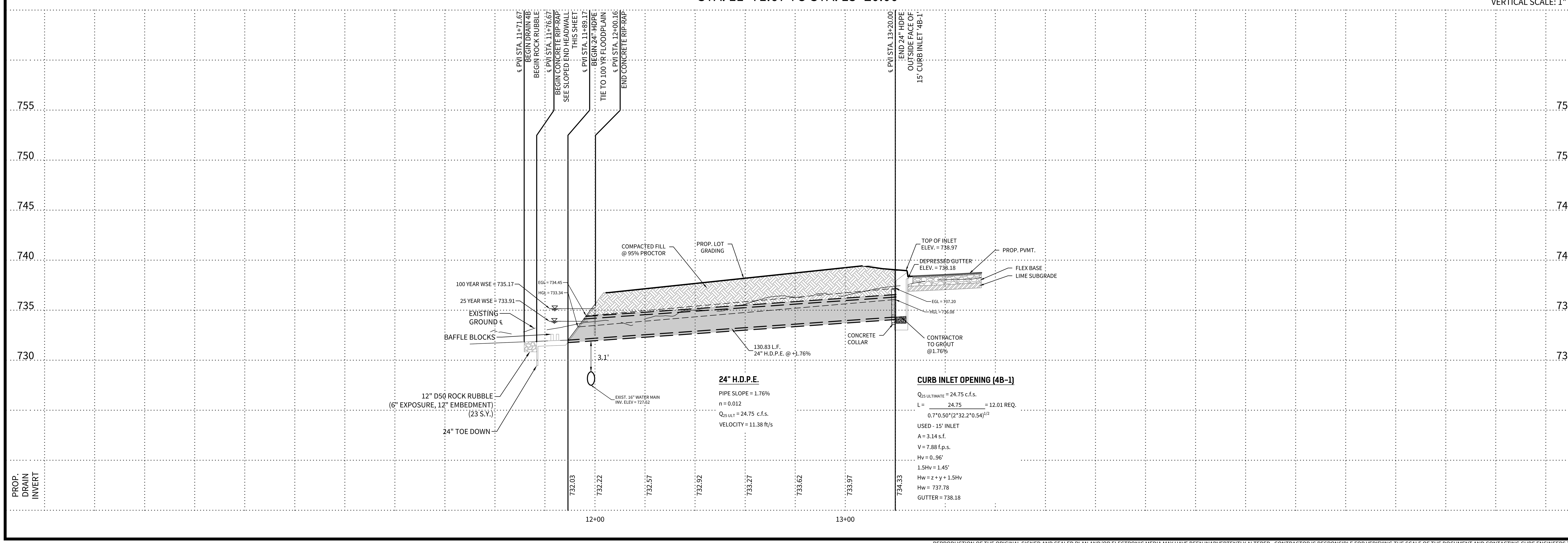


CONCRETE COLLAR DETAIL

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



24" H.D.P.E.

PIPE SLOPE = 1.76%
n = 0.012
$Q_{25\,ULT}$ = 24.75 c.f.s.
VELOCITY = 11.38 ft/s

CURB INLET OPENING (4B-1)

$Q_{25\,ULTIMATE}$ = 24.75 c.f.s.

$$L = \frac{24.75}{0.7*0.50*(2*32.2*0.54)^{1/2}} = 12.01 \text{ REQ.}$$

USED - 15' INLET
A = 3.14 s.f.
V = 7.88 f.p.s.
Hv = 0..96'
1.5Hv = 1.45'
Hw = z + y + 1.5Hv
Hw = 737.78
GUTTER = 738.18

CUDE ENGINEERS
EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

DRAINAGE PLAN & PROFILE - DRAIN '4B'

DATE	06/24/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

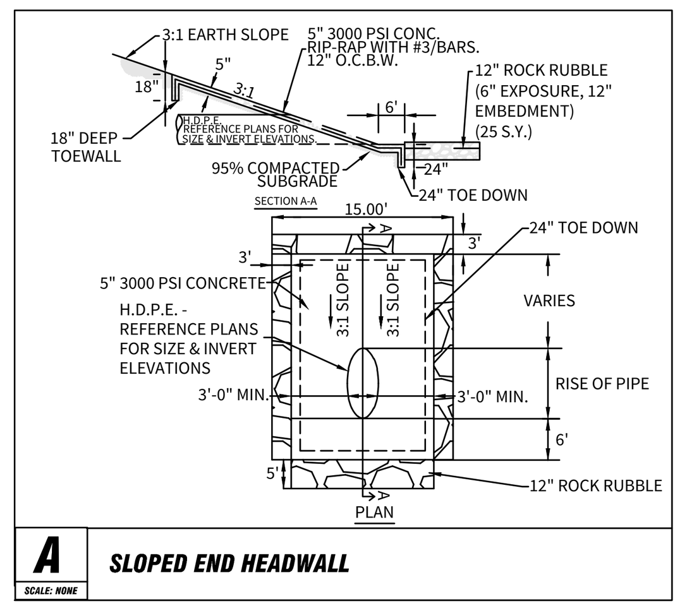
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

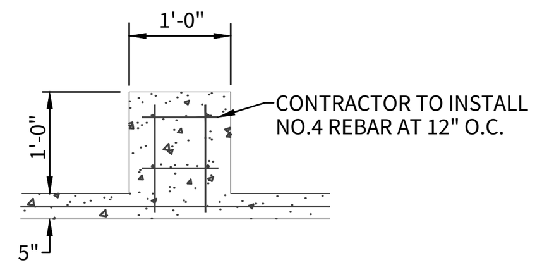
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

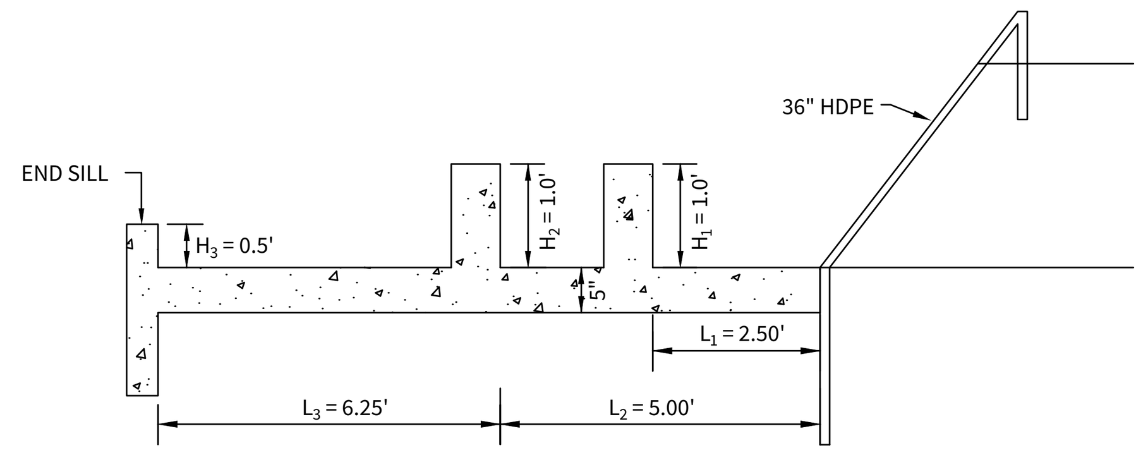
PLAT NO.
24-11800118

C6.03



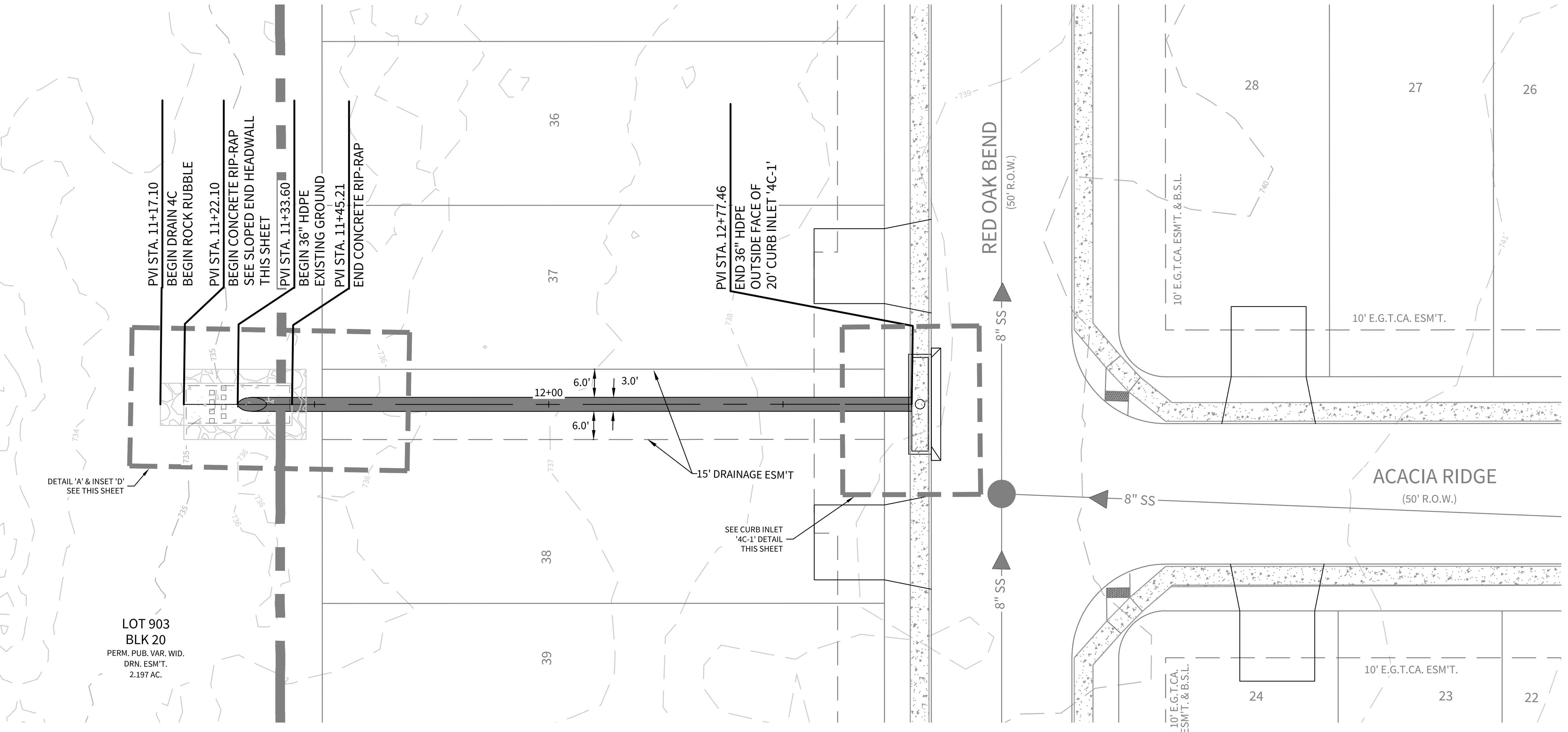


BAFFLE BLOCK
DRAIN '4C'
REINFORCEMENT DETAIL
(N.T.S.)



BAFFLE BLOCK CALCULATIONS
(N.T.S.)

TAILWATER DEPTH = 1.79'
Fr = 1.33
Y_C = 0.83 FT
Y_2 = 2.30 FT
Y_3 = 0.83 FT
BASIN OUTLET VELOCITY = 4.96 FT/S

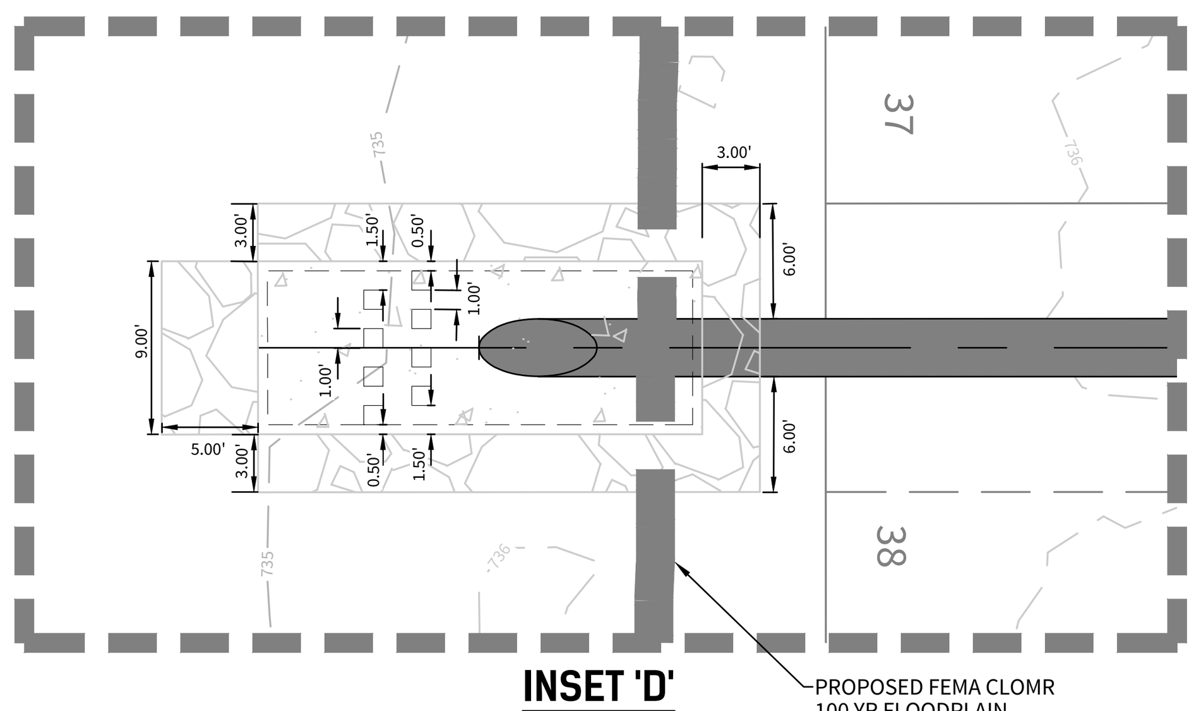


GENERAL SPECIFICATIONS FOR COMPACTED FILL

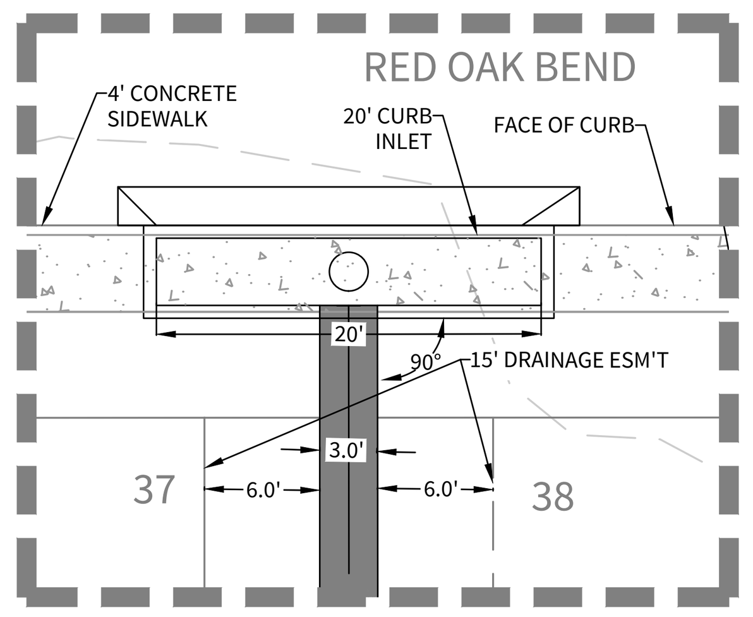
1. FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.
2. THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.
3. THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

NOTES:

1. REFER TO GENERAL NOTES AND SPECIFICATIONS C0.00.
2. CONTRACTOR TO ENSURE POSITIVE DRAINAGE AT ALL GRADE BREAKS.
3. THE CONTRACTOR SHALL NOTIFY A UTILITY COORDINATOR AT LEAST 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION ACTIVITY ADJACENT TO THE CONSTRUCTION OF AN ON-SITE DRAINAGE FACILITIES TO PROTECT ANY UNIDENTIFIED EXISTING UNDERGROUND UTILITY FACILITY FROM DAMAGE OR HARM. THE CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY FOR ANY DAMAGES TO UTILITIES AS A RESULT OF NOT LOCATING UNDERGROUND UTILITY RESOURCES.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF SAN ANTONIO.
5. ANY AREAS EXPOSED TO HIGH VELOCITY FLOWS SHALL EITHER HAVE A 6" THICK GABION MATTRESS INSTALLED OR THE INSTALLATION OF APPROPRIATE GEOTECHNICAL LINER AS DIRECTED BY THE CONSTRUCTION ENGINEER IN CHARGE.
6. ALL CONCRETE SHALL BE A MINIMUM OF 3500 PSI @ 28 DAYS COMPRESSIVE STRENGTH UNLESS OTHERWISE SPECIFIED HEREIN ON THESE DOCUMENTS.
7. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SAN ANTONIO & BEXAR COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
8. REFERENCE TYPICAL CONCRETE CHANNEL RIP-RAP STANDARDS FOUND ON SHEET --.
9. A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING IN EXISTING BEXAR COUNTY R.O.W.
10. CONTRACTOR TO RECONSTRUCT EXISTING SIDEWALK, AS NECESSARY, FOR PROPOSED SIDEWALK TRANSITION.
11. CONTRACTOR TO GROUT BOTTOM/FLOW LINE OF SEWER MANHOLES AND/OR CURB INLETS AS NECESSARY TO PROVIDE POSITIVE DRAINAGE



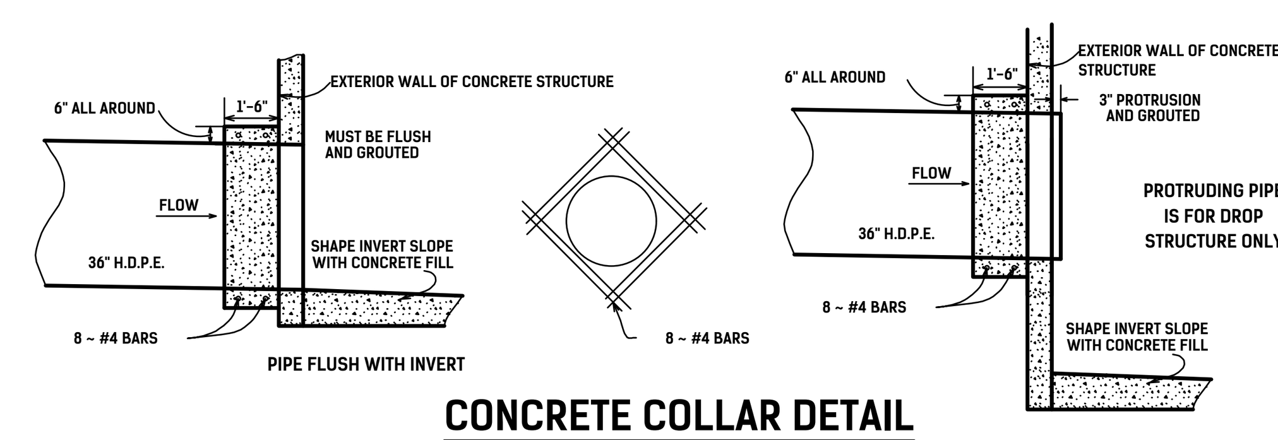
INSET 'D'
(SCALE 1" = 10')



CURB INLET '4C-1' DETAIL
(SCALE 1" = 10')

DRAIN 4C

STA. 11+17.10 TO STA. 12+77.46

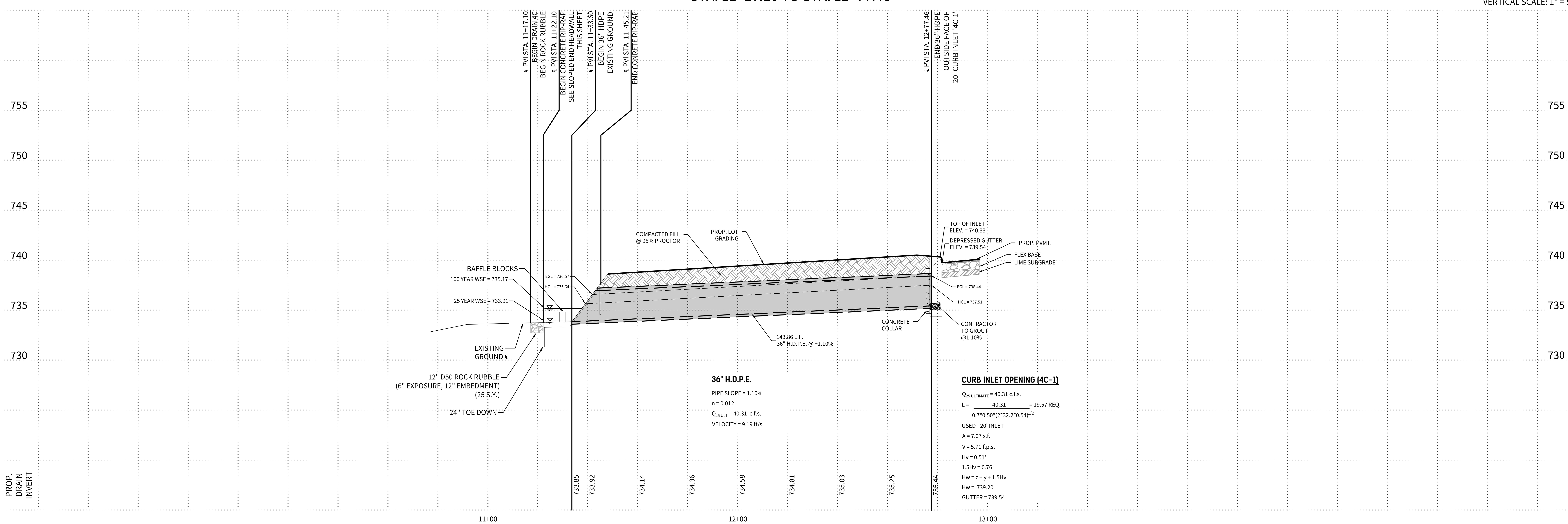


CONCRETE COLLAR DETAIL

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



36" H.D.P.E.

PIPE SLOPE = 1.10%
n = 0.012
$Q_{25\ ULT}$ = 40.31 c.f.s.
VELOCITY = 9.19 ft/s

CURB INLET OPENING (4C-1)

$Q_{25\ ULTIMATE}$ = 40.31 c.f.s.
$L = \frac{40.31}{0.7*0.50*(2*32.2*0.54)^{1/2}}$ = 19.57 REQ.
USED - 20' INLET
A = 7.07 s.f.
V = 5.71 f.p.s.
Hv = 0.51'
1.5Hv = 0.76'
Hw = z + y + 1.5Hv
Hw = 739.20
GUTTER = 739.54

CUDEENGINEERS.COM
CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS
UNIT 4A

DRAINAGE PLAN & PROFILE - DRAIN '4C'

DATE	06/24/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

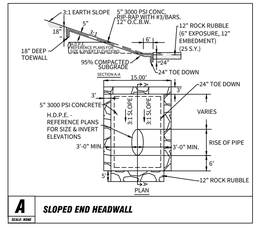
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

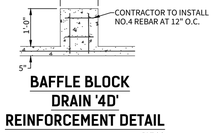
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

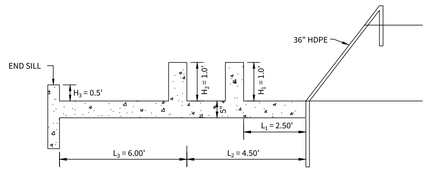
PLAT NO.
24-11800118

C6.04



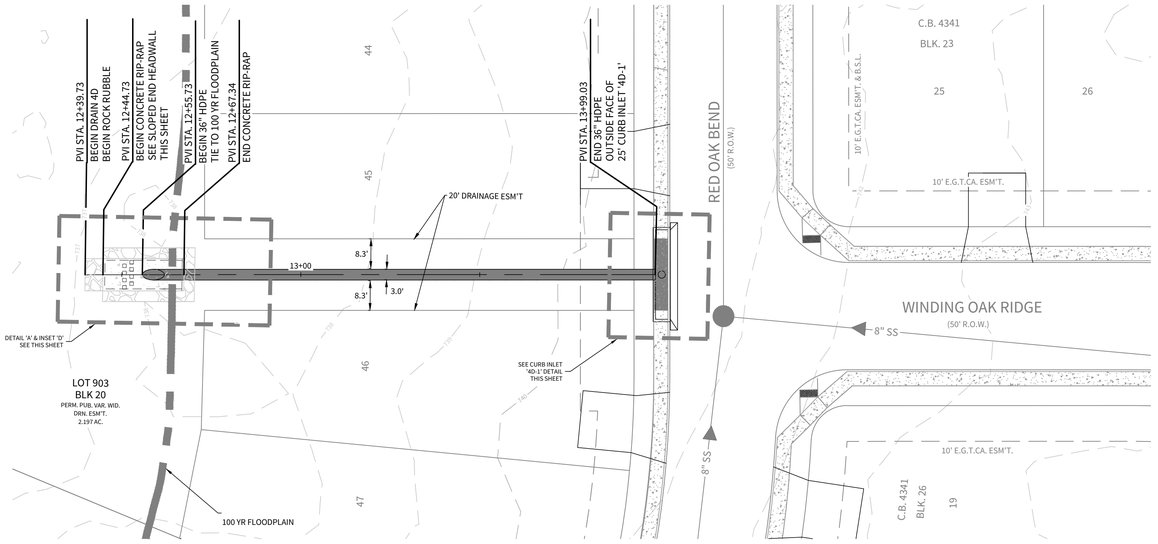


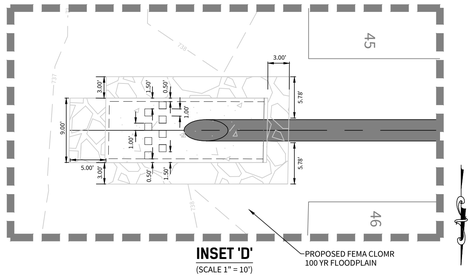
BAFFLE BLOCK DRAIN '4D' REINFORCEMENT DETAIL
(N.T.S.)



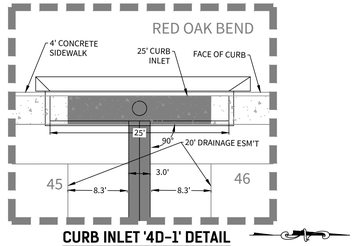
BAFFLE BLOCK CALCULATIONS
(N.T.S.)

TAILWATER DEPTH = 2.63'
Fr = 1.01
Y_C = 0.96 FT
Y_2 = 2.12 FT
Y_3 = 0.96 FT
BASIN OUTLET VELOCITY = 5.31 FT/S





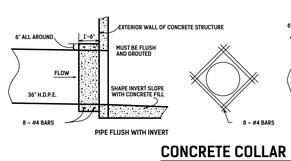
INSET 'D'
(SCALE 1" = 10')

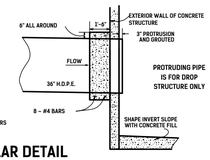


CURB INLET '4D–1' DETAIL
(SCALE 1" = 10')

DRAIN 4D

STA. 12+39.73 TO STA. 13+99.03





CONCRETE COLLAR DETAIL
(N.T.S.)

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

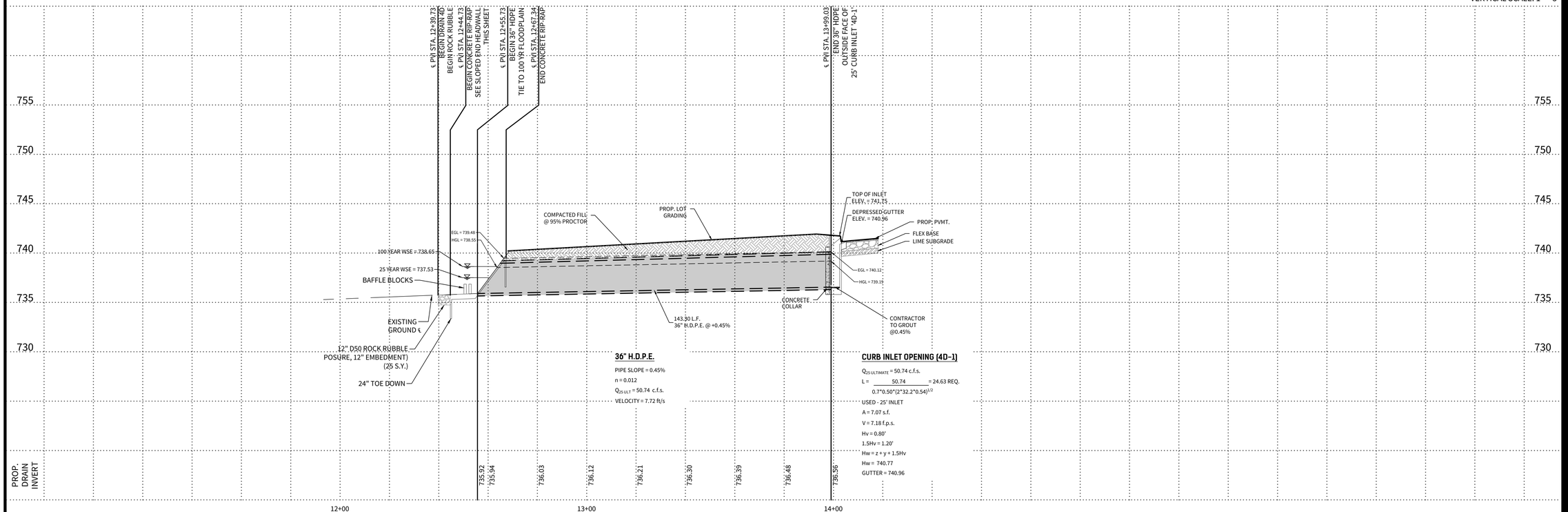
GENERAL SPECIFICATIONS FOR COMPACTED FILL

1. FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.
2. THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.
3. THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

NOTES:

1. **REFER TO GENERAL NOTES AND SPECIFICATIONS CO.00.**
2. **CONTRACTOR TO ENSURE POSITIVE DRAINAGE AT ALL GRADE BREAKS.**
3. **THE CONTRACTOR SHALL NOTIFY A UTILITY COORDINATOR AT LEAST 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION ACTIVITY ADJACENT TO THE CONSTRUCTION OF AN ON–SITE DRAINAGE FACILITIES TO PROTECT ANY UNIDENTIFIED EXISTING UNDERGROUND UTILITY FACILITY FROM DAMAGE OR HARM. THE CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY FOR ANY DAMAGES TO UTILITIES AS A RESULT OF NOT LOCATING UNDERGROUND UTILITY RESOURCES.**
4. **ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF SAN ANTONIO.**
5. **ANY AREAS EXPOSED TO HIGH VELOCITY FLOWS SHALL EITHER HAVE A 6" THICK GABION MATTRESS INSTALLED OR THE INSTALLATION OF APPROPRIATE GEOTECHNICAL LINER AS DIRECTED BY THE CONSTRUCTION ENGINEER IN CHARGE.**
6. **ALL CONCRETE SHALL BE A MINIMUM OF 3500 PSI @ 28 DAYS COMPRESSIVE STRENGTH UNLESS OTHERWISE SPECIFIED HEREIN ON THESE DOCUMENTS.**
7. **85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SAN ANTONIO & BEXAR COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.**
8. **REFERENCE TYPICAL CONCRETE CHANNEL RIP–RAP STANDARDS FOUND ON SHEET ---.**
9. **A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING IN EXISTING BEXAR COUNTY R.O.W.**
10. **CONTRACTOR TO RECONSTRUCT EXISTING SIDEWALK, AS NECESSARY, FOR PROPOSED SIDEWALK TRANSITION.**
11. **CONTRACTOR TO GROUT BOTTOM/FLOW LINE OF SEWER MANHOLES AND/OR CURB INLETS AS NECESSARY TO PROVIDE POSITIVE DRAINAGE**

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



36" H.D.P.E.

PIPE SLOPE = 0.45%
n = 0.012
$Q_{25\ ULT}$ = 50.74 c.f.s.
VELOCITY = 7.72 ft/s

CURB INLET OPENING (4D–1)

$Q_{25\ ULTIMATE}$ = 50.74 c.f.s.

$$L = \frac{50.74}{0.7*0.50*(2*32.2*0.54)^{1/2}} = 24.63 \text{ REQ.}$$

USED - 25' INLET
A = 7.07 s.f.
V = 7.18 f.p.s.
Hv = 0.80'
1.5Hv = 1.20'
Hw = z + y + 1.5Hv
Hw = 740.77
GUTTER = 740.96

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

DRAINAGE PLAN & PROFILE - DRAIN '4D'

DATE
06/25/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

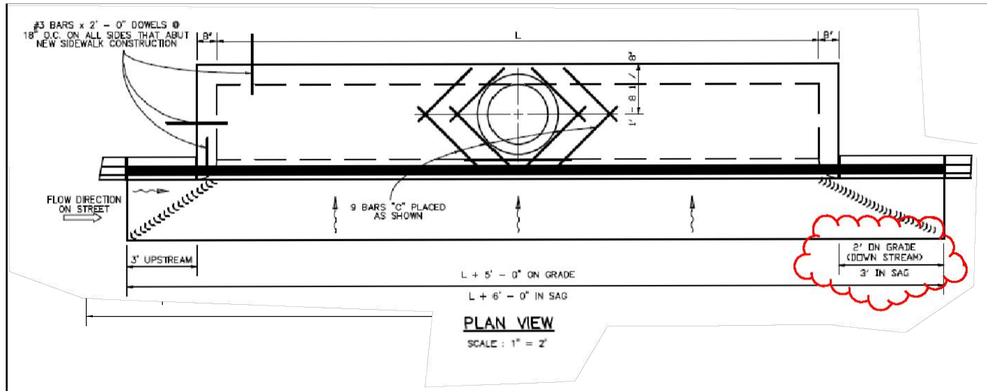
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
06/25/2024

CUDE ENGINEERS
TBPELS No. 10048500

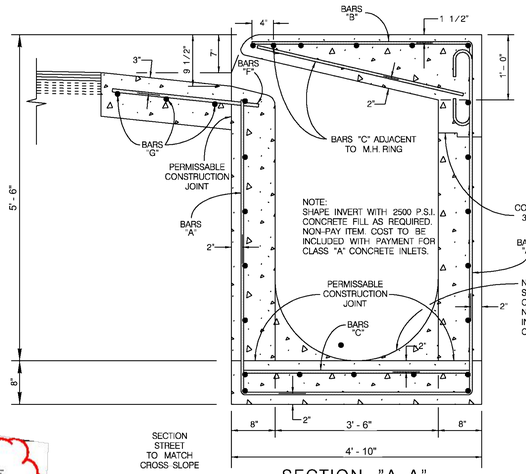
PLAT NO.
24-11800118

C6.05



PLAN VIEW

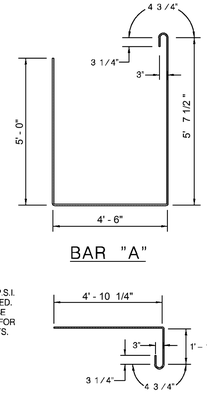
SCALE : 1" = 2'



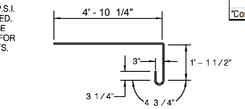
SECTION STREET TO MATCH CROSS SLOPE

SECTION "A-A"

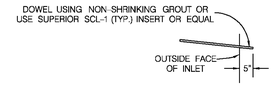
SCALE : 1" = 1'



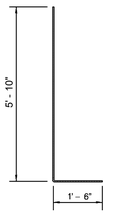
BAR "A"



BAR "B"



BAR "F"



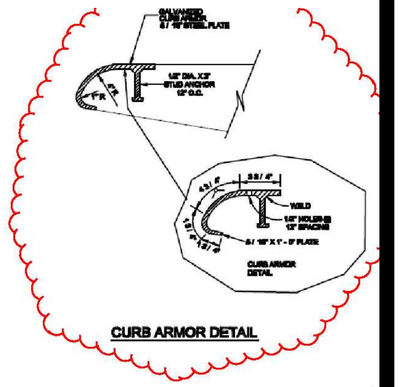
BAR "E"

INLET LENGTH	REINFORCING STEEL SCHEDULE					
	BAR	No.	Size	Spa.	Length	Weight lbs.
	A	27	4	5' o.c.	15' 9 1/2"	284.82
DRAIN "4A"	B	27	4	5"	6' 7 3/4"	119.86
L= 10'	C	38	4	9"	4' 6"	114.23
DEPTH= 5.5'	D	25	4	10"	11' 1"	185.09
	E	12	4	10 1/2"	7' 4"	58.78
	F	12	5	12"	2' 3"	28.16
	G	3	4	12"	14' 8"	29.39
	H	5	5	12"	1' 8"	8.69

*Concrete Total = 6.62 C.Y. Manhole Casting = 260 lbs. Steel Total = 1089.03 lbs.

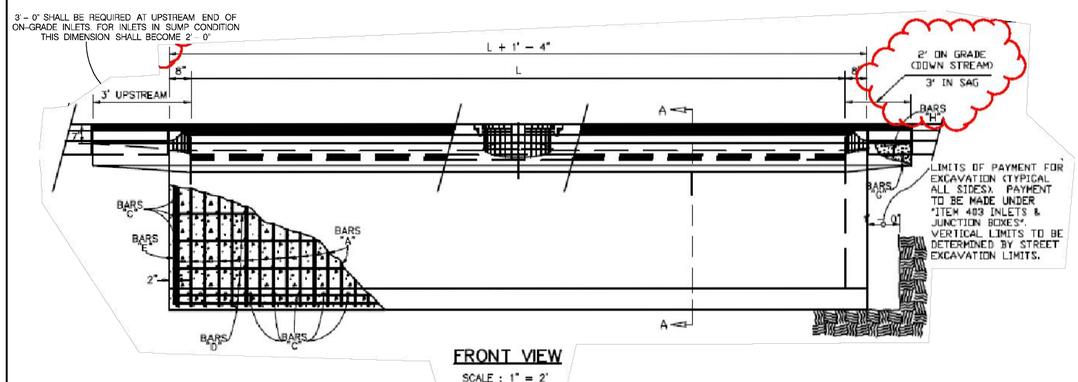
INLET LENGTH	REINFORCING STEEL SCHEDULE					
	BAR	No.	Size	Spa.	Length	Weight lbs.
	A	30	4	5' o.c.	15' 9 1/2"	411.40
DRAIN "4B"	B	39	4	5"	6' 7 3/4"	173.14
L= 15'	C	44	4	9"	4' 6"	132.26
DEPTH= 5.5'	D	25	4	10"	16' 1"	268.59
	E	12	4	10 1/2"	7' 4"	58.78
	F	17	5	12"	2' 3"	39.89
	G	3	4	12"	19' 8"	39.41
	H	5	5	12"	1' 8"	8.69

*Concrete Total = 9.19 C.Y. Manhole Casting = 260 lbs. Steel Total = 1392.18 lbs.



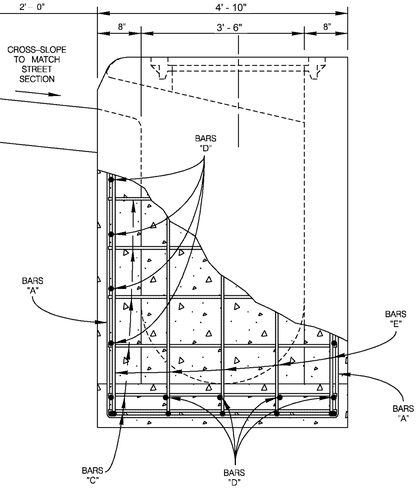
CURB ARMOR DETAIL

* THESE FIGURES DO NOT EXCLUDE CONCRETE & STEEL INTERCEPTED BY MANHOLE AND REINFORCED CONC. PIPE
* INCLUDES CONCRETE GUTTER FOR ON GRADE INLET. REDUCE BY .05 C.Y. FOR INLETS IN SUMP.



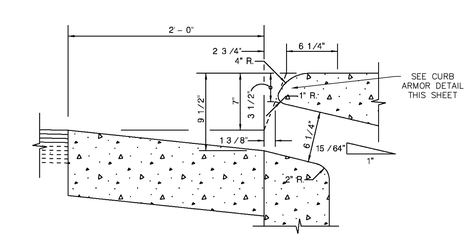
FRONT VIEW

SCALE : 1" = 2'



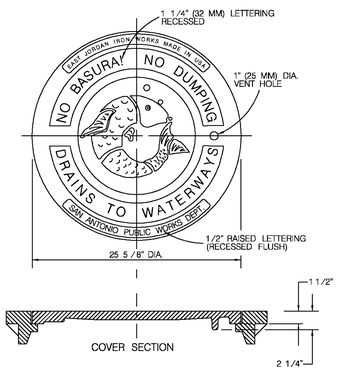
SIDE VIEW

SCALE : 1" = 1'



OPENING DETAIL FOR CURB SECTION

SCALE : 1" = 6"

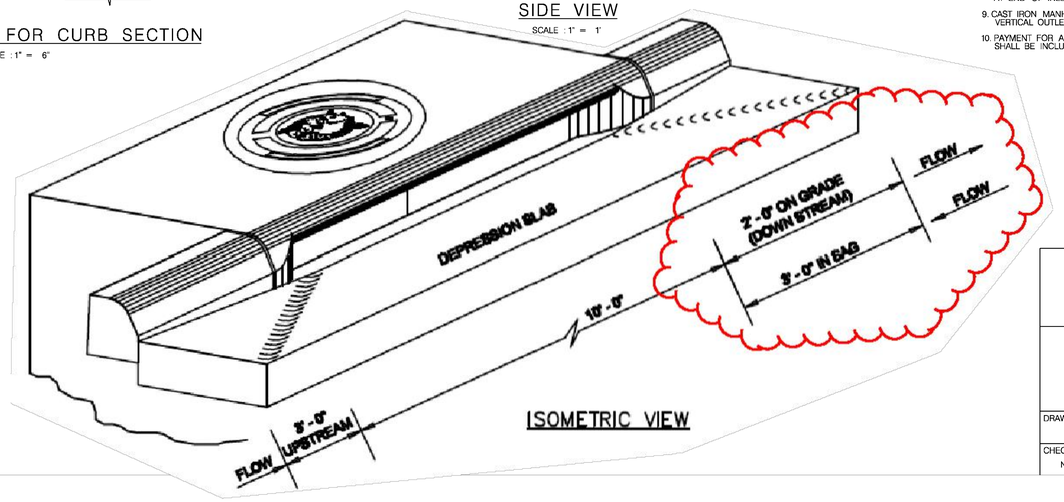


MANHOLE LID & RING DETAIL (ITEM 409)

SCALE : 1" = 8"

NOTES FOR MANHOLE LID AND RING

1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT.".
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.



ISOMETRIC VIEW

GENERAL NOTES

1. ALL BARS INTERCEPTING MANHOLE RING & REINFORCING CONCRETE PIPE SHALL BE FIELD CUT.
2. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
3. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER BARS.
4. ALL EXPOSED CORNERS SHALL BE CHAMFERED TO 3/4".
5. CONSTRUCTION JOINT SHOWN AT FLOWLINE MAY BE RAISED A MAXIMUM OF 6" AT THE CONTRACTOR'S DISCRETION. ADJUST LENGTH OF VERTICAL STEEL AS REQUIRED.
6. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A 615, GRADE 60 REQUIREMENTS.
7. INVERT OF DROP INLET TO BE SHAPED WITH CONCRETE FILL TO AFFECT DRAINAGE TO OUTLET PIPE.
8. DELETE 4 "C" BARS FROM SCHEDULE QUANTITIES IF MANHOLE RING AND COVER ARE PLACED AT END OF INLET.
9. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
10. PAYMENT FOR ALL EXCAVATION, BACK FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".

JANUARY 2005

STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEPARTMENT OF PUBLIC WORKS

TYPE "C" INLET DETAILS

DRAWN BY:	DATE	REVISIONS	SCALE: SEE ABOVE
V. VASQUEZ			DATE:
CHECKED BY:			SHEET: OF
NAT HARDY, P.E.			

CUDEENGINEERS.COM
CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

DRAINAGE DETAILS

DATE
05/28/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

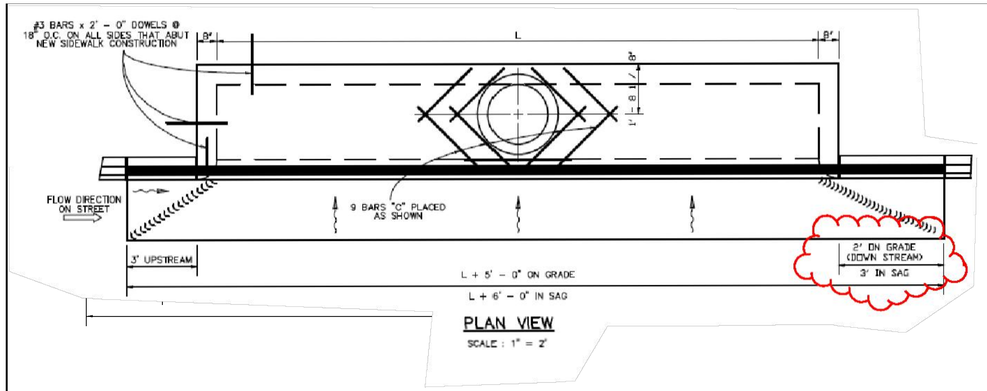
CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

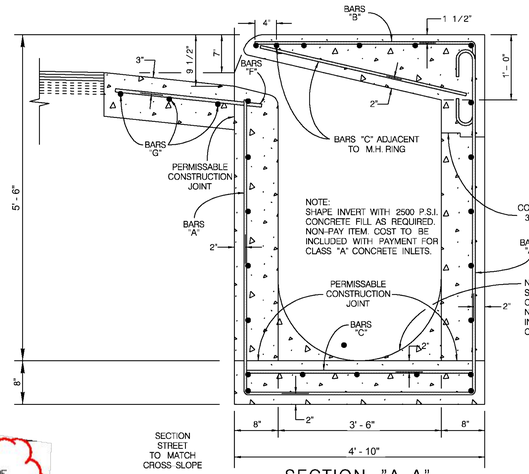
PLAT NO.
24-11800118

C6.D1



PLAN VIEW

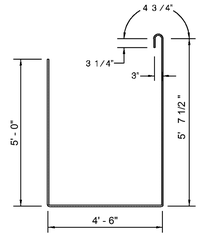
SCALE : 1" = 2'



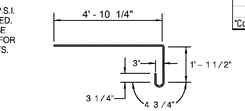
SECTION "A-A"

SCALE : 1" = 1'

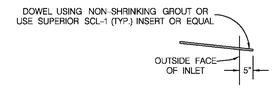
SECTION STREET TO MATCH CROSS SLOPE



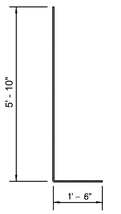
BAR "A"



BAR "B"



BAR "F"



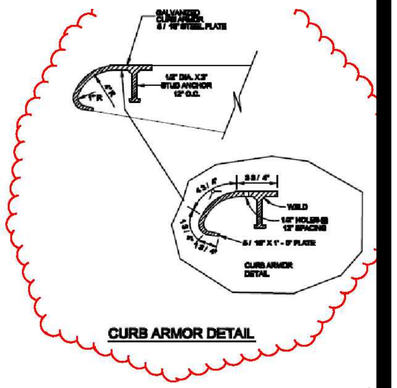
BAR "E"

INLET LENGTH	REINFORCING STEEL SCHEDULE					
	BAR	No.	Size	Spa.	Length	Weight lbs.
	A	51	4	5" o.c.	15' 9 1/2"	537.99
DRAIN "4C"	B	51	4	5"	6' 7 3/4"	226.41
L= 20'	C	51	4	9"	4' 6"	153.31
DEPTH= 5.5'	D	25	4	10"	21' 1"	352.09
	E	12	4	10 1/2"	7' 4"	58.78
	F	22	5	12"	2' 3"	51.63
	G	3	4	12"	24' 8"	49.43
	H	5	5	12"	1' 8"	8.69

*Concrete Total = 11.77 C.Y. Manhole Casting = 260 lbs. Steel Total = 1698.33 lbs.

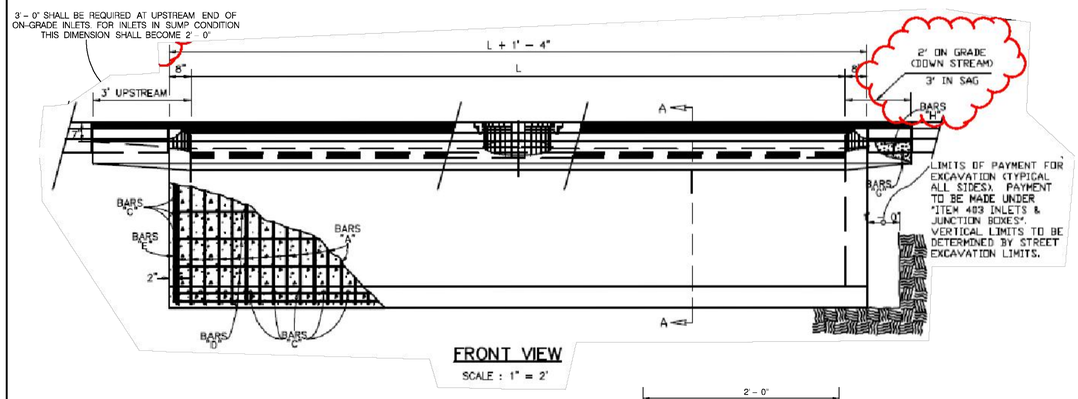
INLET LENGTH	REINFORCING STEEL SCHEDULE					
	BAR	No.	Size	Spa.	Length	Weight lbs.
	A	63	4	5" o.c.	15' 9 1/2"	664.58
DRAIN "4D"	B	63	4	5"	6' 7 3/4"	279.68
L= 25'	C	58	4	9"	4' 6"	174.35
DEPTH= 5.5'	D	25	4	10"	26' 1"	435.59
	E	12	4	10 1/2"	7' 4"	58.78
	F	27	5	12"	2' 3"	63.36
	G	3	4	12"	29' 8"	59.45
	H	5	5	12"	1' 8"	8.69

*Concrete Total = 14.34 C.Y. Manhole Casting = 260 lbs. Steel Total = 2004.49 lbs.



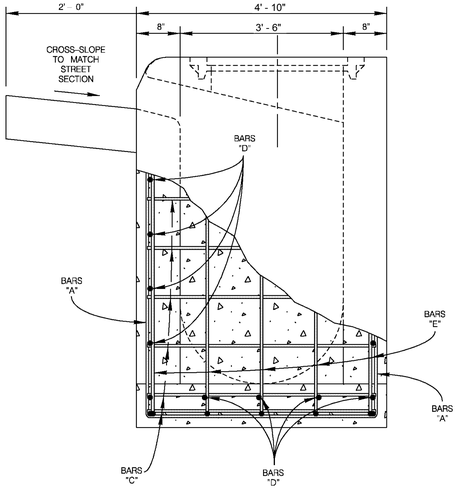
CURB ARMOR DETAIL

* THESE FIGURES DO NOT EXCLUDE CONCRETE & STEEL INTERCEPTED BY MANHOLE AND REINFORCED CONC. PIPE
* INCLUDES CONCRETE GUTTER FOR ON GRADE INLET. REDUCE BY .05 C.Y. FOR INLETS IN SUMP.



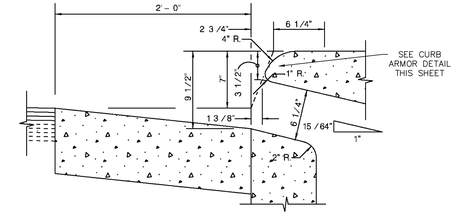
FRONT VIEW

SCALE : 1" = 2'



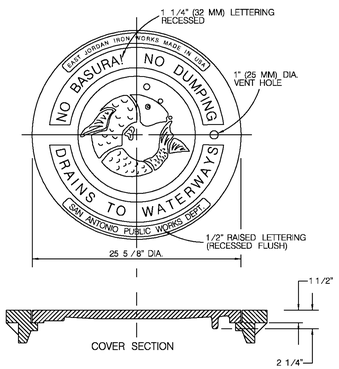
SIDE VIEW

SCALE : 1" = 1'



OPENING DETAIL FOR CURB SECTION

SCALE : 1" = 6"

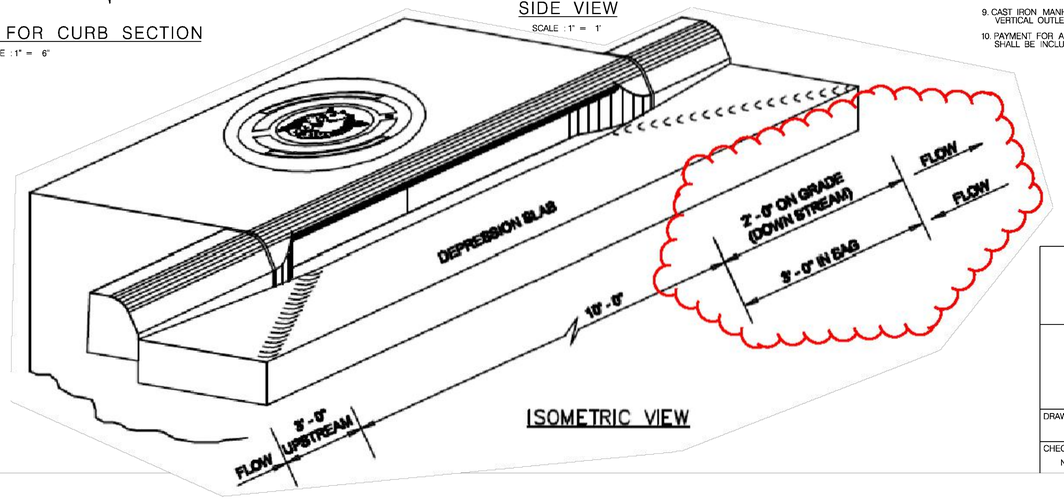


MANHOLE LID & RING DETAIL (ITEM 409)

SCALE : 1" = 8"

NOTES FOR MANHOLE LID AND RING

1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT.".
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.



ISOMETRIC VIEW

GENERAL NOTES

1. ALL BARS INTERCEPTING MANHOLE RING & REINFORCING CONCRETE PIPE SHALL BE FIELD CUT.
2. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
3. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER BARS.
4. ALL EXPOSED CORNERS SHALL BE CHAMFERED TO 3 /4".
5. CONSTRUCTION JOINT SHOWN AT FLOWLINE MAY BE RAISED A MAXIMUM OF 6" AT THE CONTRACTOR'S DISCRETION. ADJUST LENGTH OF VERTICAL STEEL AS REQUIRED.
6. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A 615, GRADE 60 REQUIREMENTS.
7. INVERT OF DROP INLET TO BE SHAPED WITH CONCRETE FILL TO AFFECT DRAINAGE TO OUTLET PIPE.
8. DELETE 4 "C" BARS FROM SCHEDULE QUANTITIES IF MANHOLE RING AND COVER ARE PLACED AT END OF INLET.
9. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
10. PAYMENT FOR ALL EXCAVATION, BACK FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".

JANUARY 2005

STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEPARTMENT OF PUBLIC WORKS

TYPE "C" INLET DETAILS

DRAWN BY:	DATE	REVISIONS	SCALE: SEE ABOVE
V. VASQUEZ			DATE:
CHECKED BY:			SHEET: OF
NAT HARDY, P.E.			

CUDEENGINEERS.COM
CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS
UNIT 4A

DRAINAGE DETAILS

DATE
05/28/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

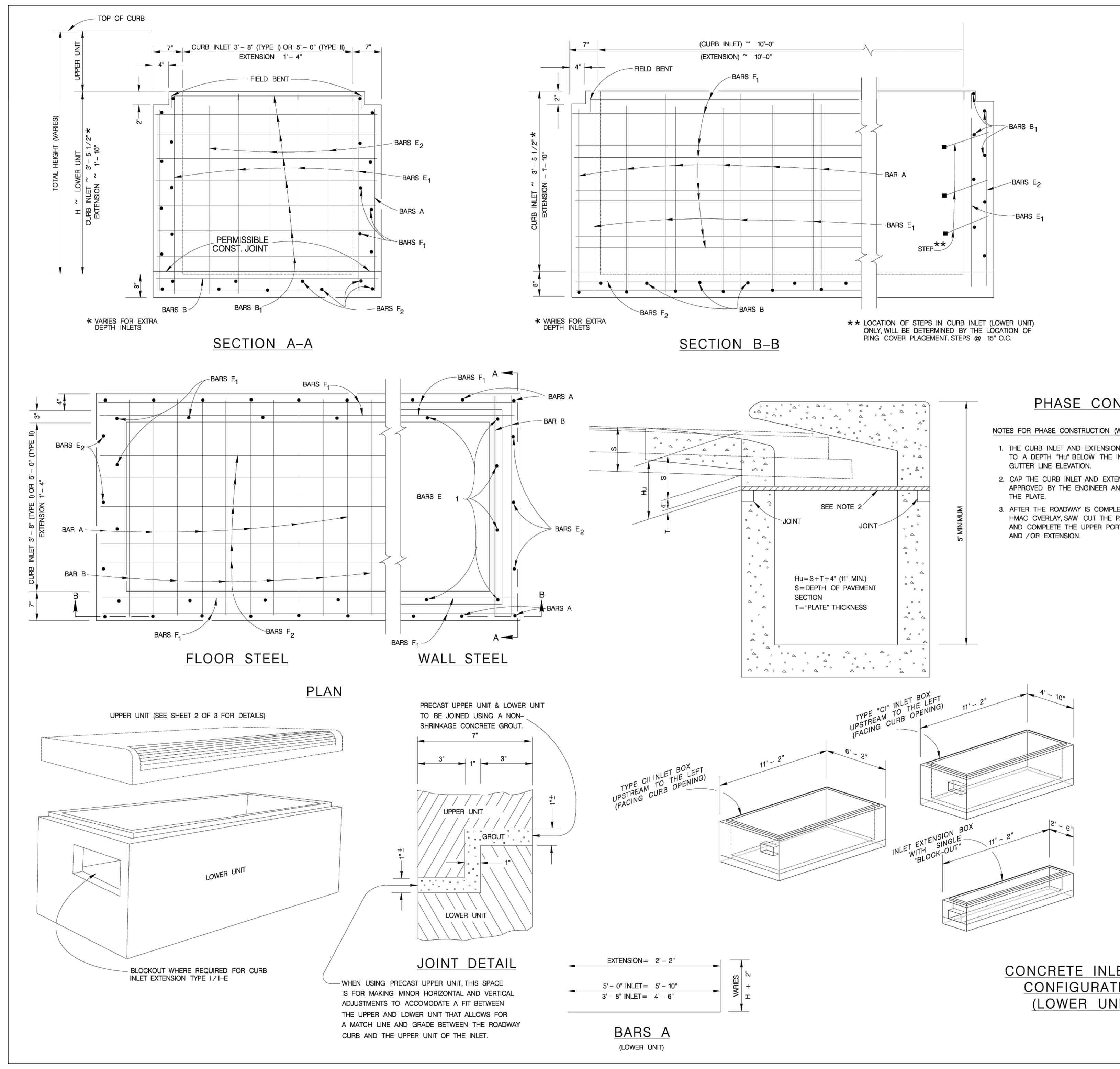
CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C6.D2



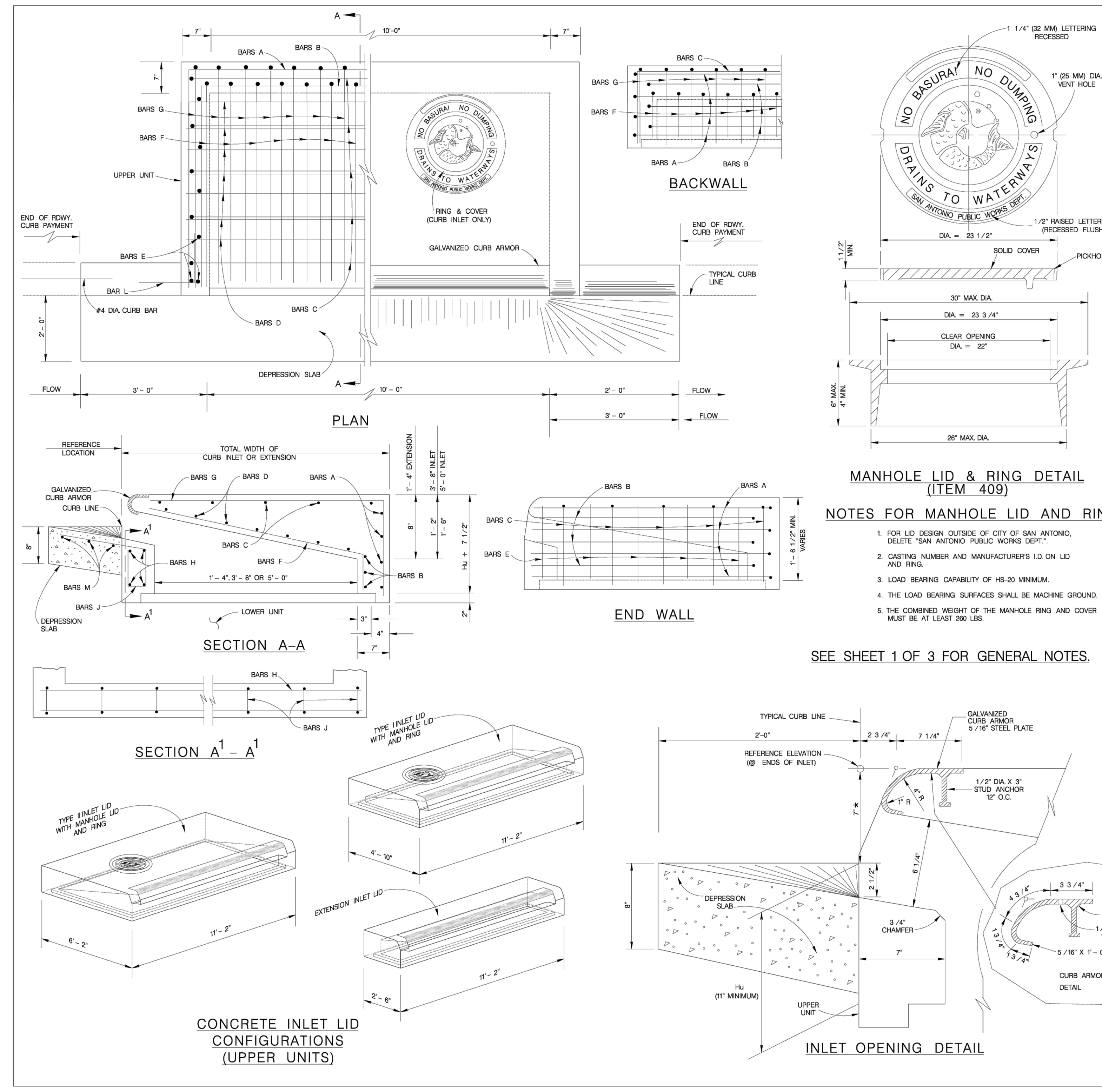
REINFORCING STEEL

LOWER UNIT 10' X 3' – 8" (TYPE I)				
BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	4'–6"
B_1	VARIES	#4	12"	4'–6"
E_1	20	#4	18"±	VARIES
E_2	6	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'–10"
F_2	9	#4	—	10'–10"

LOWER UNIT 10' X 5' – 0" (TYPE II)				
BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	5'–10"
B_1	VARIES	#4	12"	5'–10"
E_1	22	#4	18"±	VARIES
E_2	8	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'–10"
F_2	11	#4	—	10'–10"

GENERAL NOTES

1. 5' INLETS AND 5' EXTENSIONS MUST BE IN ACCORDANCE WITH THE LATEST TXDOT CURB INLET TYPE "C" AND EXTENSION TYPE E (IL–C).
2. TYPE C–II INLET TO BE USED ONLY WHEN STORM DRAIN PIPE IS IN–LINE WITH CURB INLET AND APPROVED BY THE ENGINEER.
3. QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY.
4. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
5. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
6. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2".
7. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A–615, GRADE 60 REQUIREMENTS.
8. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
9. DEPRESSION SLAB SHALL RECEIVE A WOOD FLOAT FINISH.
10. FACE OF INLET TO CONFORM TO FACE OF CURB LINE.
11. ALL BARS INTERCEPTING MANHOLE RING & COVER SHALL BE CUT OR BENT.
12. PAYMENT FOR ALL EXCAVATION, BACK–FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER, CURB ARMOR AND STEPS SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".
13. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
14. GALVANIZED BOLTS, NUTS, WASHERS, PLATES AND GASKETS ARE SUBSIDIARY TO INLETS.
15. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MEANS TO LIFT AND PLACE THE INLETS, WHEN USING PRECAST UNITS.
16. ALL BARS AT PIPE BLOCKOUT LOCATIONS SHALL BE CUT OR BEND.
17. ALL LOWER UNITS SHALL RECEIVE INVERT MORTAR SHAPING.
18. PIPE BLOCKOUTS IN INLET WALLS SHOULD NOT EXCEED 3" BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SKEW OF THE PIPE AS NECESSARY. CONSTRUCTION JOINT MAY BE RAISED A MAXIMUM OF 6".



REINFORCING STEEL (FOR Hu = 11")

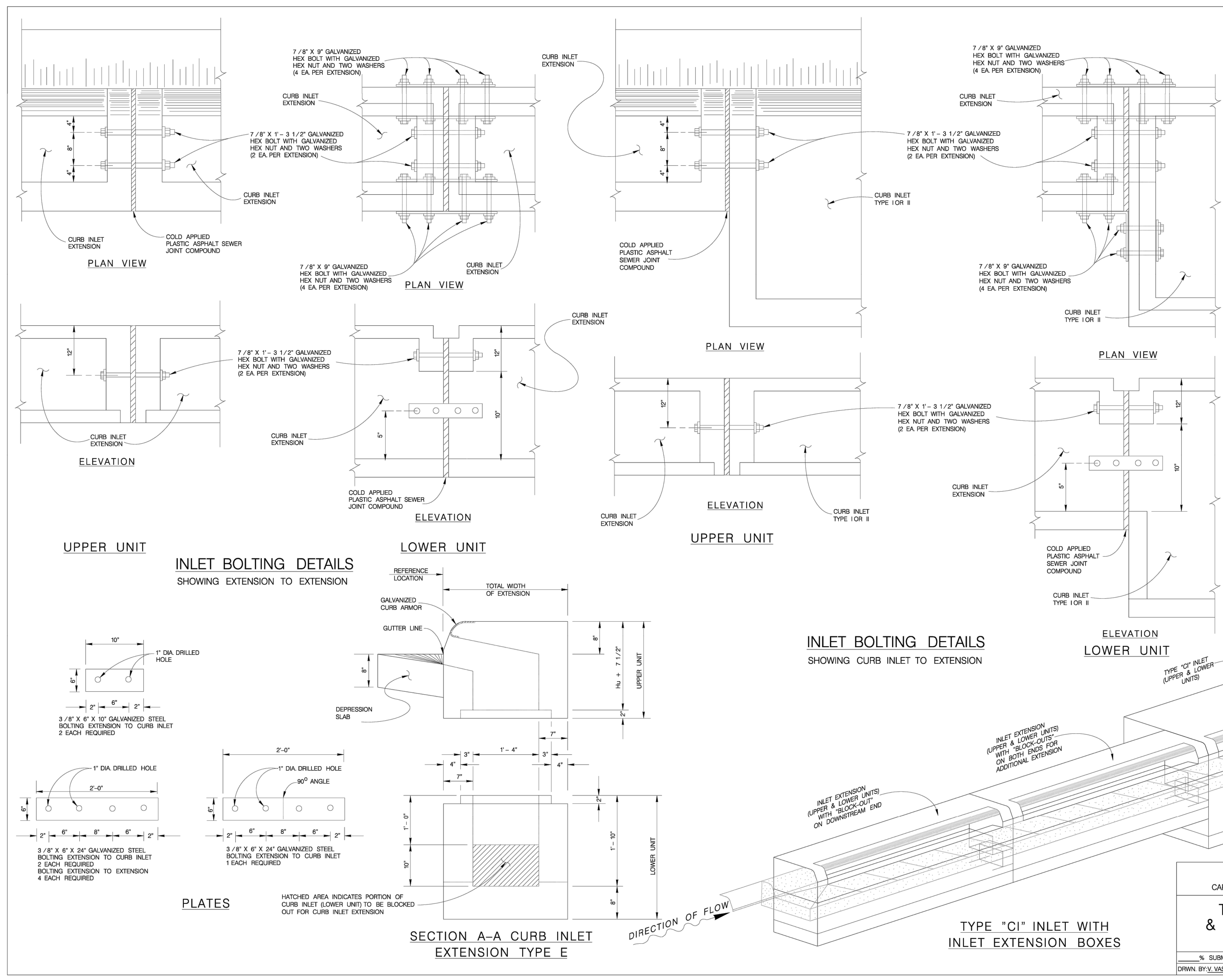
UPPER UNIT 10' X 3'–8" (TYPE I)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	19'–10"	53
B	3	#4	—	18'–10"	38
C	5	#4	11"	13'–2"	44
D	7	#4	6"	10'–10"	51
E	12	#4	11"	1'–2"	9
F	21	#6	6"	4'–8"	147
G	22	#6	6"	5'–8"	187
H	4	#4	—	10'–10"	29
J	12	#4	12"	3'–6"	28
L	4	#4	—	2'–0"	5
M	3	#4	—	14'–8"	29
TOTAL WEIGHT					620 LBS.

UPPER UNIT 10' X 5' (TYPE II)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	22'–6"	60
B	3	#4	—	21'–6"	43
C	7	#4	11"	13'–2"	62
D	11	#4	6"	10'–10"	80
E	16	#4	11"	1'–2"	13
F	21	#6	6"	5'–8"	179
G	22	#6	6"	7'–0"	231
H	4	#4	—	10'–10"	29
J	12	#4	12"	3'–6"	28
L	4	#4	—	2'–0"	5
M	3	#4	—	14'–8"	29
TOTAL WEIGHT					759 LBS.

CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

UPPER UNIT (ONLY)	C.Y.
10' X 3'–8" CURB INLET	1.9
10' X 5'–0" CURB INLET	2.7
10' EXTENSION	1.0



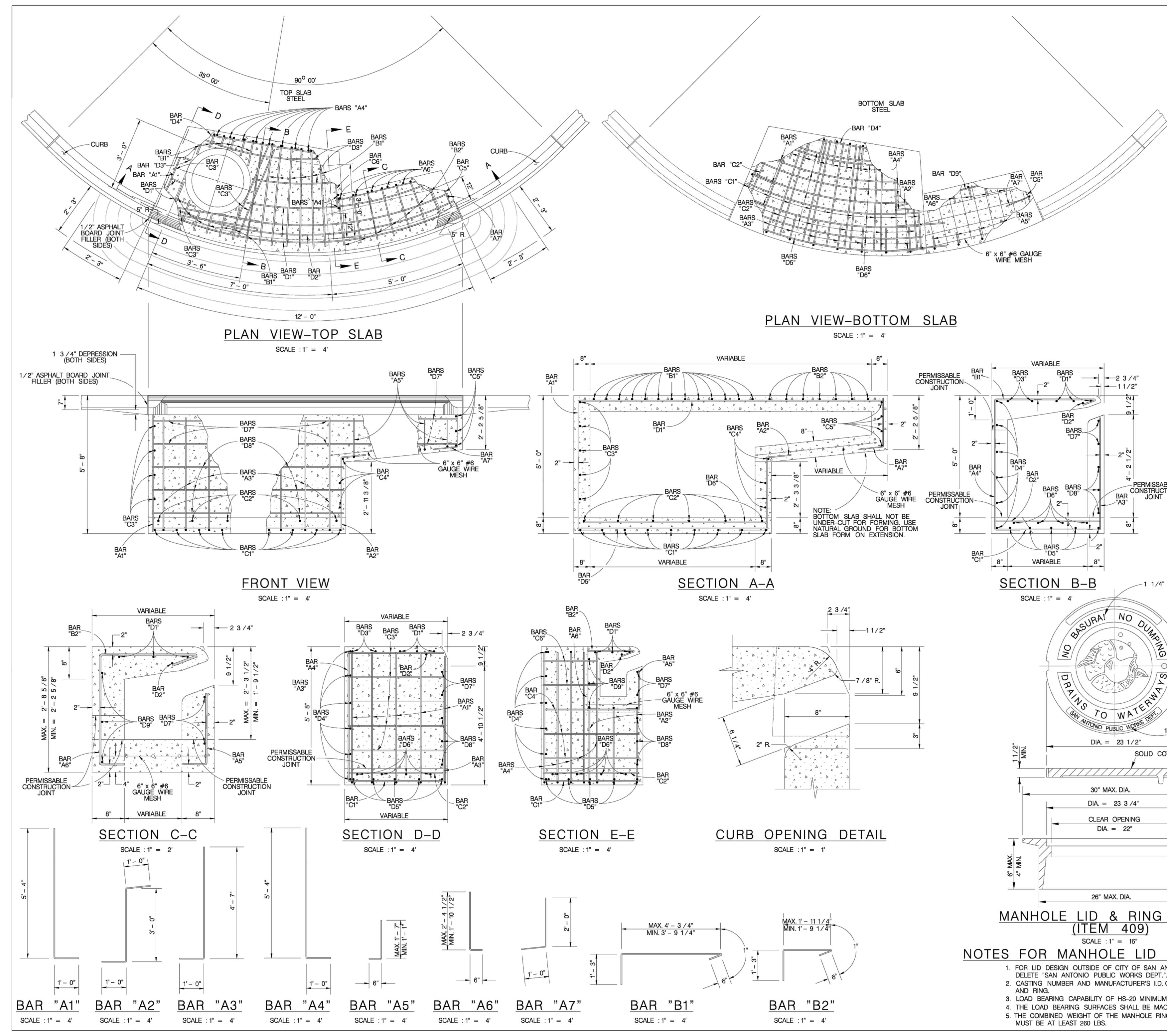
UPPER UNIT EXTENSION (FOR Hu = 11")					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	15' – 2"	41
B	3	#4	—	14' – 2"	28
C	3	#4	11"	13' – 2"	26
D	3	#4	6"	10' – 10"	22
E	8	#4	11"	1 '– 2"	6
F	21	#6	6"	2' – 0"	63
G	22	#6	6"	3' – 4"	110
H	4	#4	—	10' – 10"	29
J	12	#4	12"	3' – 6"	28
L	4	#4	—	2' – 0"	5
M	3	#4	—	14' – 8"	29
REINFORCING STEEL				LBS.	387
CLASS "A" CONCRETE				C.Y.	1.0

LOWER UNIT EXTENSION					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	6' – 2"	49
B	11	#4	12"	2' – 2"	16
B_1	3	#4	12"	2' – 2"	4
E_1	18	#4	18" ±	2' – 3"	27
E_2	4	#4	18" ±	2' – 1"	6
F_1	16	#4	12" ±	10' – 10"	116
F_2	5	#4	—	10' – 10"	36
REINFORCING STEEL				LBS.	254
CLASS. "A" CONCRETE				C.Y.	1.4

GENERAL NOTES

1. WHEN INLET EXTENSIONS ARE REQUIRED FOR ON GRADE INLETS THE EXTENSION(S) SHALL BE PLACED ON THE UPSTREAM END OF THE INLET.
2. FOR CURB INLET EXTENSION REINFORCING STEEL, NOTES & VARIOUS OTHER APPLICABLE DETAILS NOT FOUND ON THIS SHEET, REFER TO SHEETS 1 & 2.

MAY 2009
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT
TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS
SHEET 3 OF 3



REINFORCING STEEL SCHEDULE

SHAPE	BAR	NO.	SIZE	SPACE	LENGTH	WEIGHT
	A1	5	4	12" C–C	6' – 4"	21
	A2	3	4	12"	5' – 0"	10
	A3	8	4	12"	5' – 7"	30
	A4	16	5	6 1/2"	6' – 4"	106
	A5	5	3	12"	MAX = 2' – 1" MIN = 1' – 7"	3
	A6	7	4	8"	MAX = 2' – 10 1/2" MIN = 2' – 4 1/2"	12
	A7	3	3	12"	3' – 0"	3
	B1	13	5	6 1/2"	MAX = 5' – 10 3/4" MIN = 5' – 7 1/4"	80
	B2	7	4	8"	MAX = 3' – 9 1/4" MIN = 3' – 7 1/4"	17
STRAIGHT	C1	9	4	12"	MAX = 4' – 3 1/2" MIN = 3' – 10"	24
STRAIGHT	C2	6	4	18"	MAX = 4' – 3 1/2" MIN = 3' – 11"	17
STRAIGHT	C3	9	4	12"	3' – 11"	23
STRAIGHT	C4	3	4	12"	3' – 11"	8
STRAIGHT	C5	4	3	7 1/2"	2' – 0"	3
STRAIGHT	C6	2	4	AS SHOWN	2' – 3"	3
	D1	3	4	12"	MAX = 12' – 10" MIN = 11' – 4"	24
	D2	1	4	AS SHOWN	12' – 7"	8
	D3	2	4	12"	MAX = 6' – 7" MIN = 6' – 2"	9
STRAIGHT	D4	6	4	12"	6' – 1"	24
	D5	5	4	12"	MAX = 8' – 0" MIN = 6' – 2"	24
	D6	4	4	12"	MAX = 7' – 9" MIN = 6' – 5"	19
	D7	2	3	12"	12' – 10"	10
	D8	3	4	12"	8' – 0"	16
STRAIGHT	D9	3	3	12"	4' – 5"	5
					TOTAL =	499 LBS.

ESTIMATED QUANTITIES

ITEM	UNIT	NEAT QUANTITY
CLASS "A" CONCRETE	C.Y.	
REINFORCING STEEL	LBS.	499
STORM SEWER CASTINGS	LBS.	260

* THESE FIGURES DO NOT EXCLUDE CONCRETE & STEEL INTERCEPTED BY REINFORCED CONCRETE PIPE AND MANHOLE COVER.

GENERAL NOTES

1. ALL BARS INTERCEPTING REINFORCED CONCRETE PIPE & MANHOLE RING SHALL BE FIELD CUT.
2. CONCRETE FOR STRUCTURE SHALL BE CLASS "A", 3000 P.S.I. IN 28 DAYS.
3. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
4. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
5. CONSTRUCTION JOINT SHOWN AT FLOWLINE MAY BE RAISED A MAXIMUM OF 6" AT THE OPTION OF THE CONTRACTOR. ADJUST LENGTH OF VERTICAL STEEL AS REQUIRED.
6. ALL REINFORCING STEEL SHALL MEET A.S.T.M. SPECIFICATION A–615, GRADE 60.
7. INVERT OF DROP INLET TO BE SHAPED WITH CONCRETE FILL (2500 P.S.I. MINIMUM) TO EFFECT DRAINAGE TO OUTLET PIPE.
8. ALL CONSTRUCTION JOINTS SHALL BE KEYED 3/4" x 3 1/2".
9. PAYMENT FOR ALL EXCAVATION, BACKFILLING, CONCRETE, REINFORCING STEEL, RING & COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".

JANUARY 2005
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT
TYPE "D" INLET STANDARDS

CUDEENGINEERS.COM
CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

DRAINAGE DETAILS

DATE
05/28/2024
PROJECT NO.
03050.015
DRAWN BY
RM / IV
CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

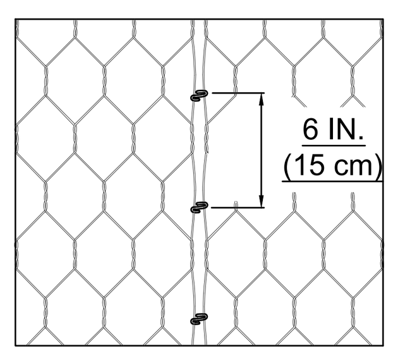
PLAT NO.
24-11800118

C6.D3

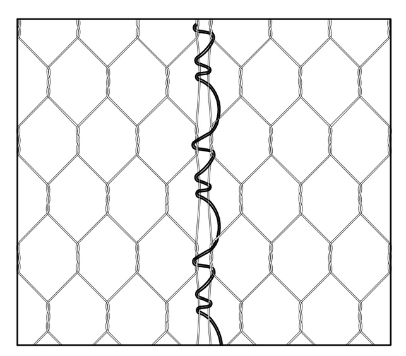
NOTES:

1. GABION MATRESS MESH TO ASTM A975.
2. GABIONS USED SHALL BE ZINC.
3. BACKFILL COMPACTION 95% TO ASTM D698/D1557
4. GABION FILL TO ASTM D6711:
   - 6.1. ROCK SIZE 4" - 12", D50 = 6"
   - 6.2. ROCK UNIT WEIGHT 157 PCF MIN.
   - 6.3. VOIDS 30% MAX.
5. TYPE 2 FILTER FABRIC IN ACCORDANCE WITH DMS-6200, TO BE USED BELOW GABION BASKET AND GABION MATTRESS AT ALL LOCATIONS.
6. GABION WIRE SHALL MEET THE REQUIREMENTS

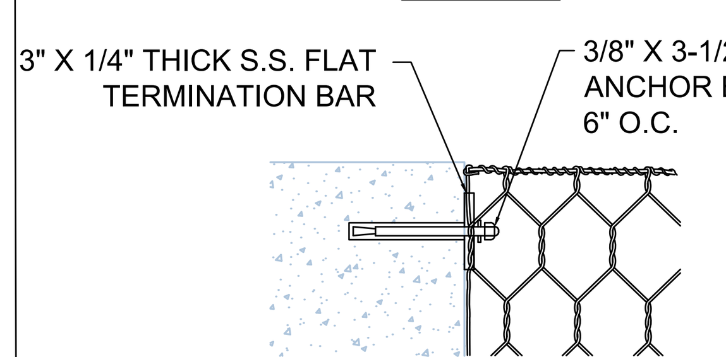
   OF 12 WIRE GAUGE FOR GABION BASKET AND 13.5 WIRE GAUGE FOR GABION MATTRESS.



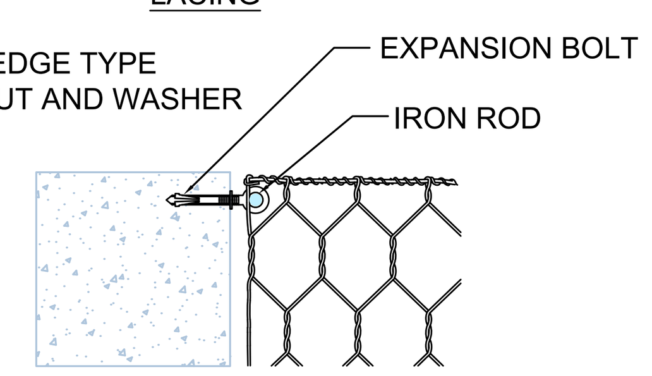
FASTNERS



LACING



GABION TO CONCRETE CONNECTION - A



GABION TO CONCRETE CONNECTION - B

NOTES:

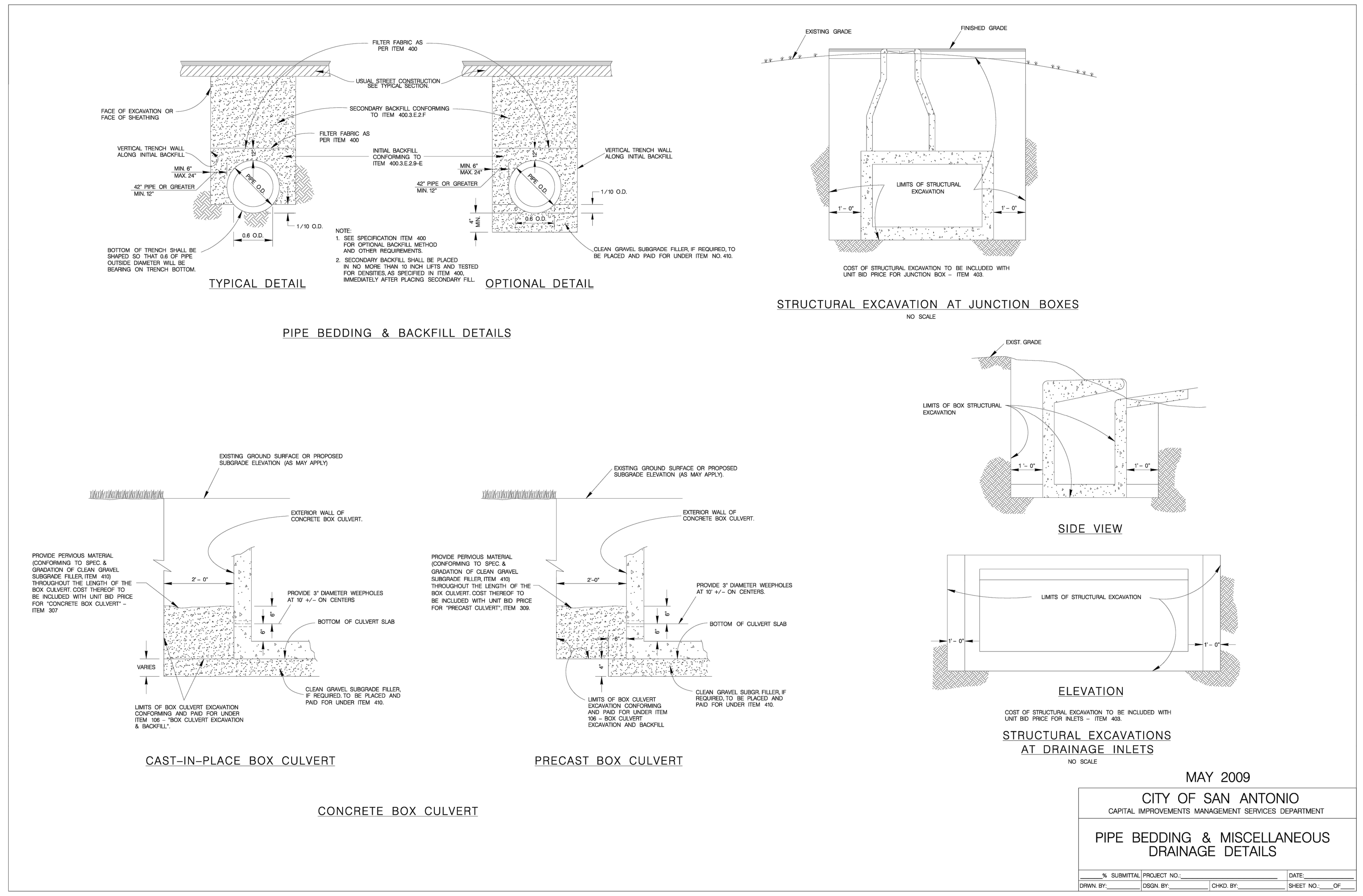
1. EDGES ARE JOINED TOGETHER, USING THE APPROPRIATE LACING TECHNIQUES OR FASTENERS.

   LACING: CONTINUOUS WIRE LOOPED TIGHTLY AROUND EVERY MESH OPENING, ALTERNATING SINGLE AND DOUBLE LOOPS

   FASTENERS: USE A PNEUMATIC OR HAND POWER TOOL, EMPLOYING SPENAX "C" SHAPED FASTENERS (FIG. 6.). FOR CLOSURE AND STRENGTH, THE RECOMMENDED SPACING IS EVERY MESH OPENING, NOT TO EXCEED 6 INCHES (150 MM).

1 — ***GABION MATTRESS CONNECTION DETAILS***

SCALE: NONE



CUDEENGINEERS.COM

CUDE — EST. 1980 — ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

DRAINAGE DETAILS

DATE	05/28/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024

STATE OF TEXAS — MATTHEW A. TRINKLE — 147558 — LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

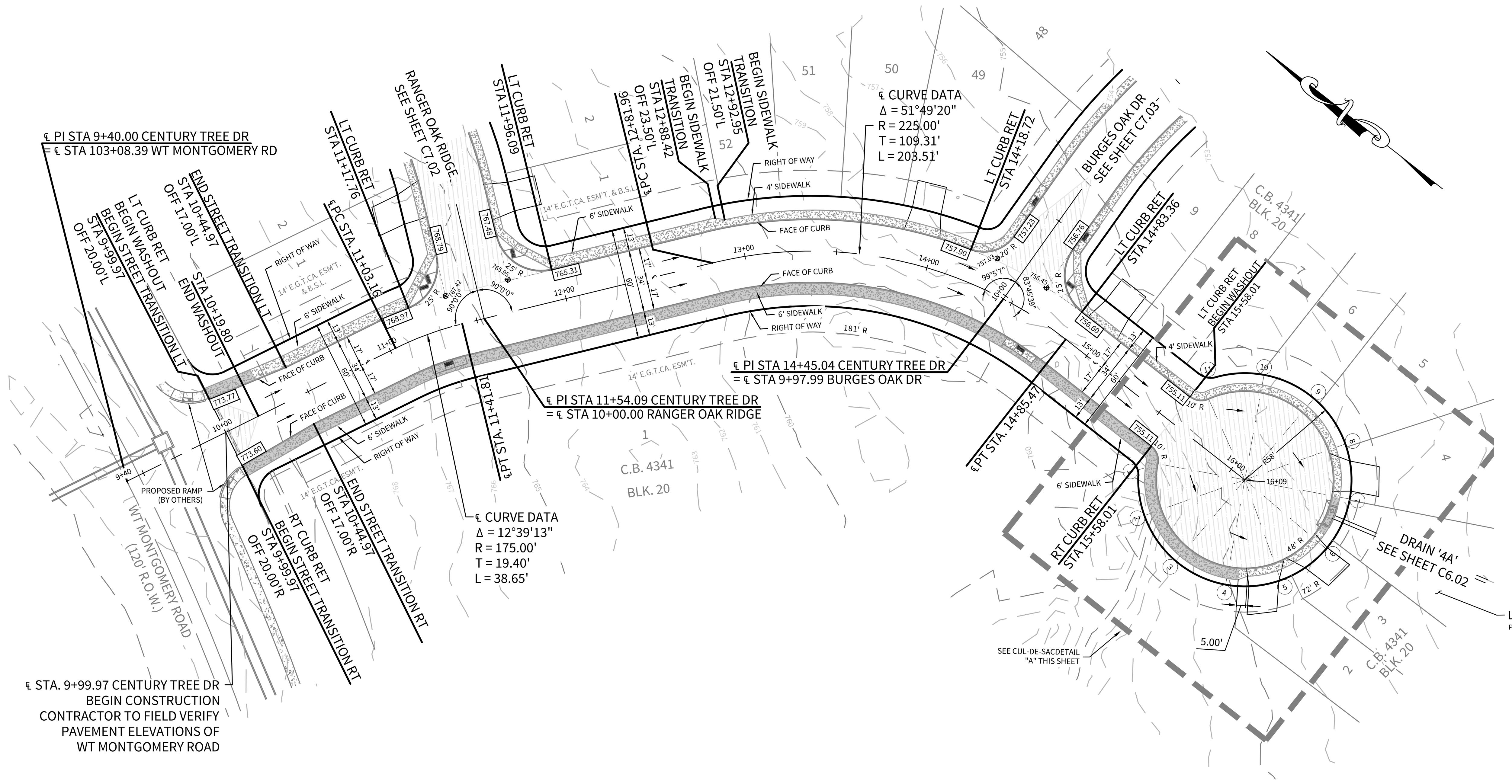
C6.D4

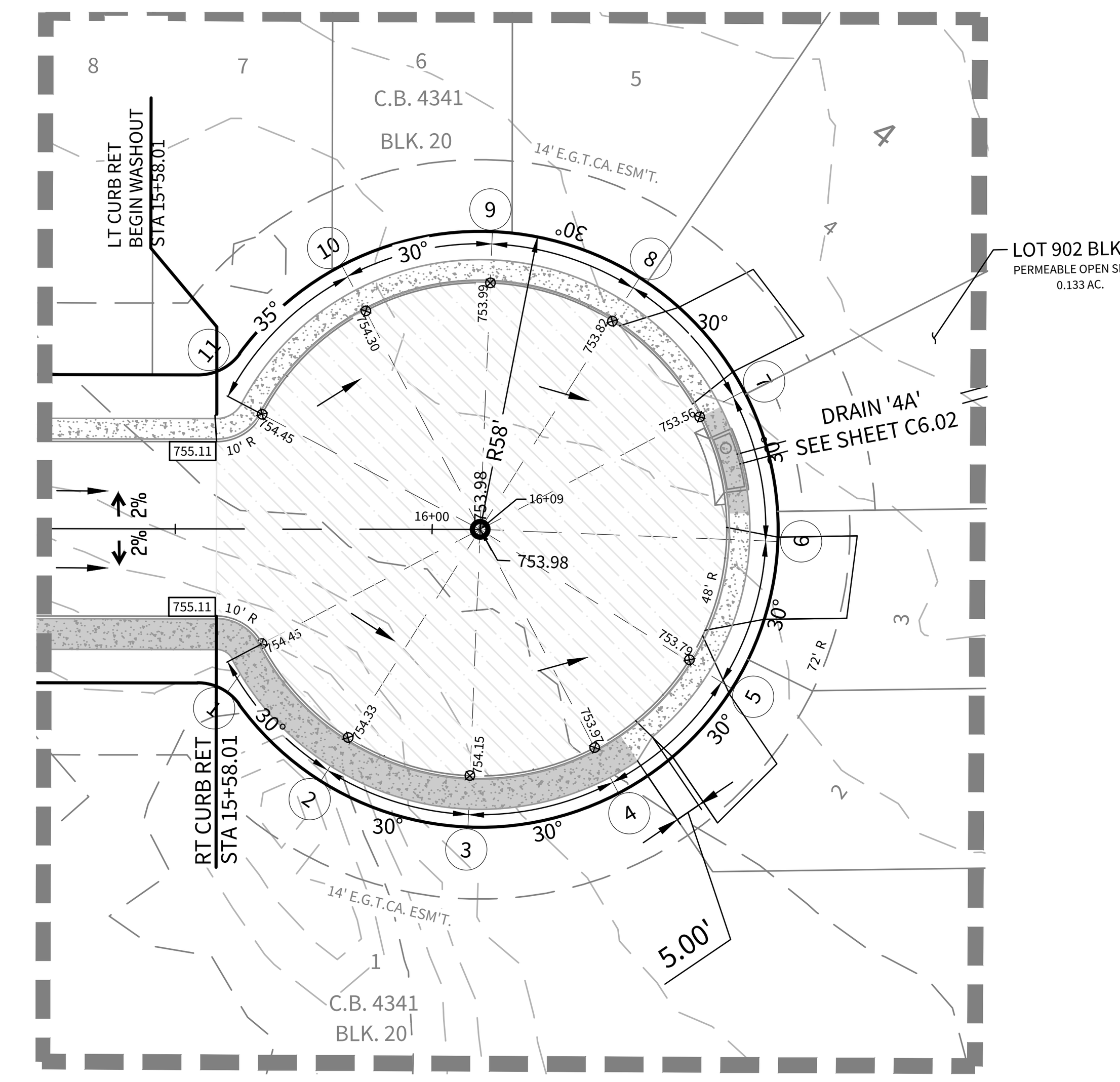
ELEVATIONS:

- PROPOSED TOP OF CONCRETE CURB ELEVATION
- PROPOSED ASPHALT PAVEMENT ELEVATION
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)
TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

FOR ADA RAMPS AT SIDEWALK INTERSECTIONS. DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY. ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE. WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING





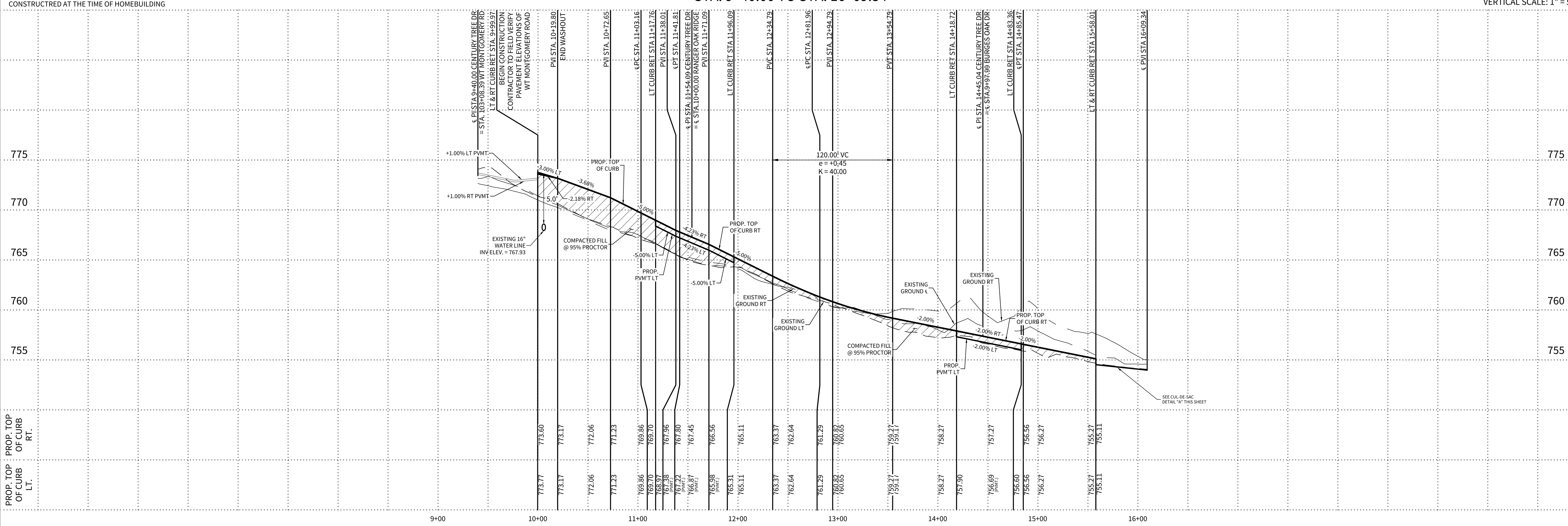
CUL-DE-SAC DETAIL "A"
SCALE: 1" = 30'

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

CENTURY TREE DR

STA. 9+40.00 TO STA. 16+09.34

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STREET PLAN & PROFILE - CENTURY TREE DR

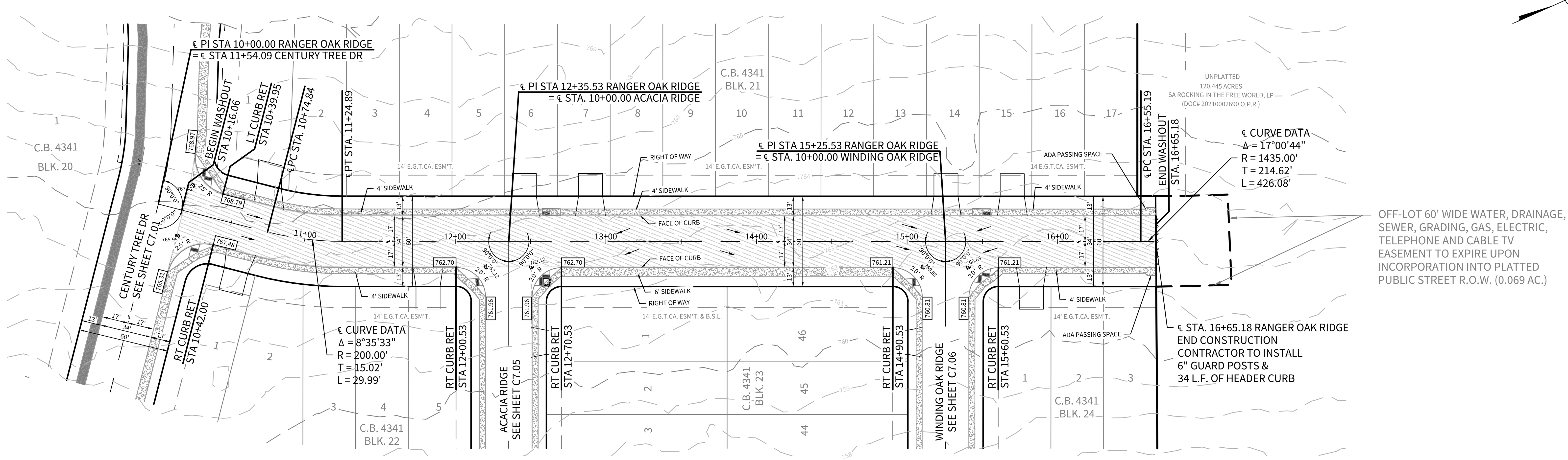
DATE	06/25/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS MATTHEW A. TRINKLE 147558 LICENSED PROFESSIONAL ENGINEER
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.01



ELEVATIONS:

- PROPOSED TOP OF CONCRETE CURB ELEVATION
- PROPOSED ASPHALT PAVEMENT ELEVATION
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)
TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

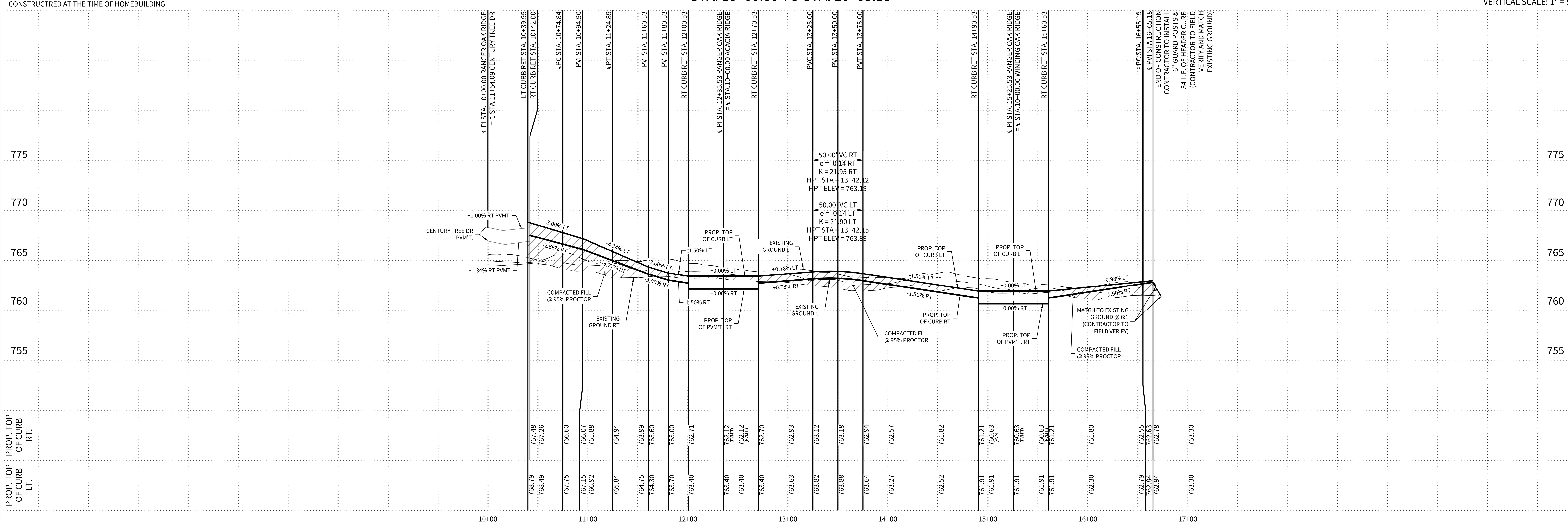
FOR ADA RAMPS AT SIDEWALK INTERSECTIONS . DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY. ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE. WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING

RANGER OAK RIDGE

STA. 10+00.00 TO STA. 16+65.18

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STREET PLAN & PROFILE - RANGER OAK RIDGE

DATE	06/23/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

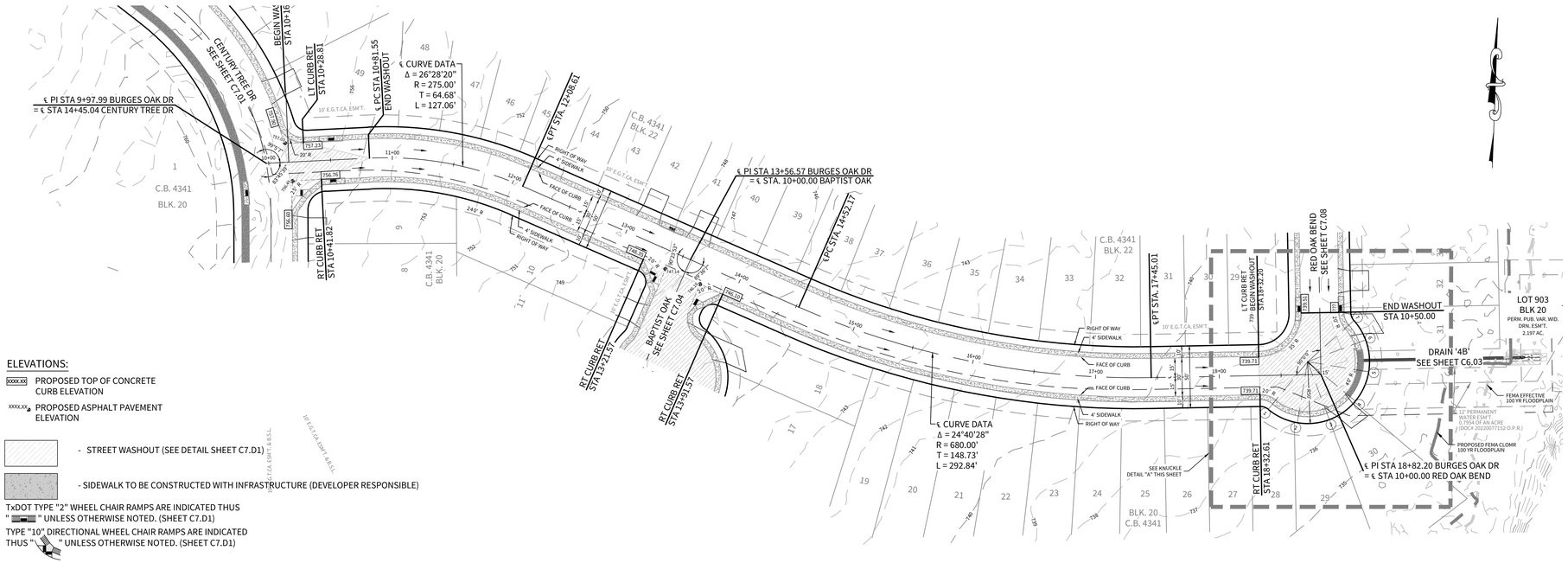
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

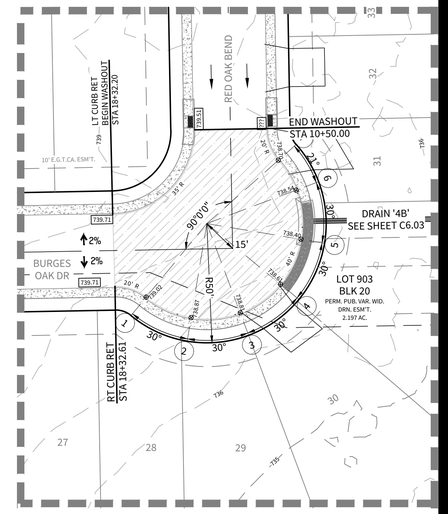
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.02





KNUCKLE DETAIL "A"

SCALE: 1" = 30'

ELEVATIONS:

XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

- STREET WASHOUT (SEE DETAIL SHEET C7.D1)

- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

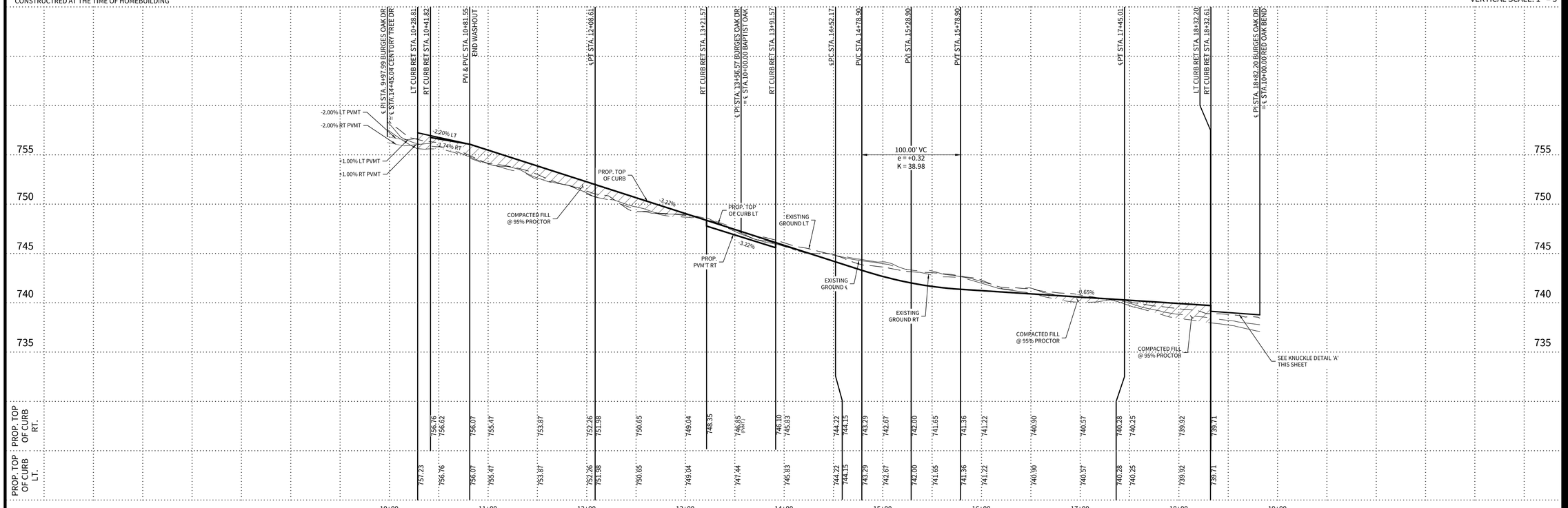
FOR ADA RAMPS AT SIDEWALK INTERSECTIONS .
DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY.
ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE.
WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING

BURGES OAK DR

STA. 9+97.99 TO STA. 18+82.20

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS
UNIT 4A

STREET PLAN & PROFILE - BURGES OAK DR

DATE
06/23/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.03

ELEVATIONS:

XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

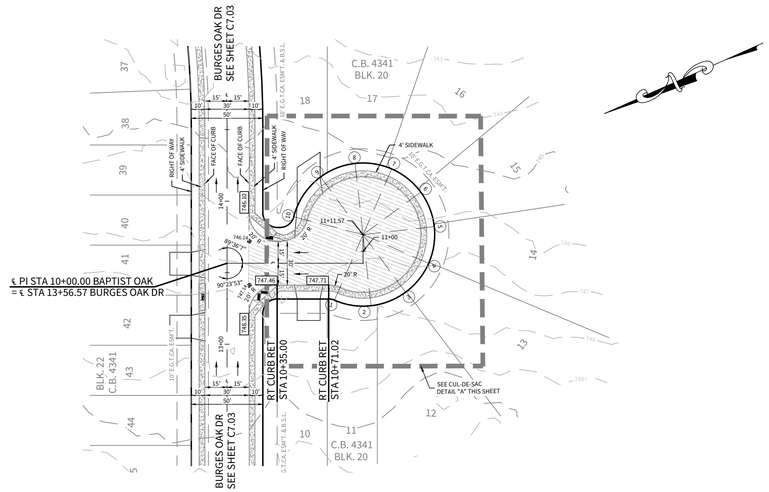
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)

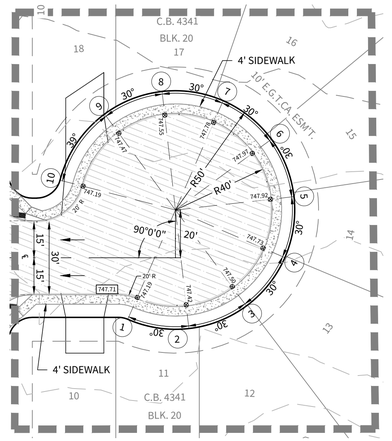
- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

FOR ADA RAMPS AT SIDEWALK INTERSECTIONS .
DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY.
ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE.
WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING





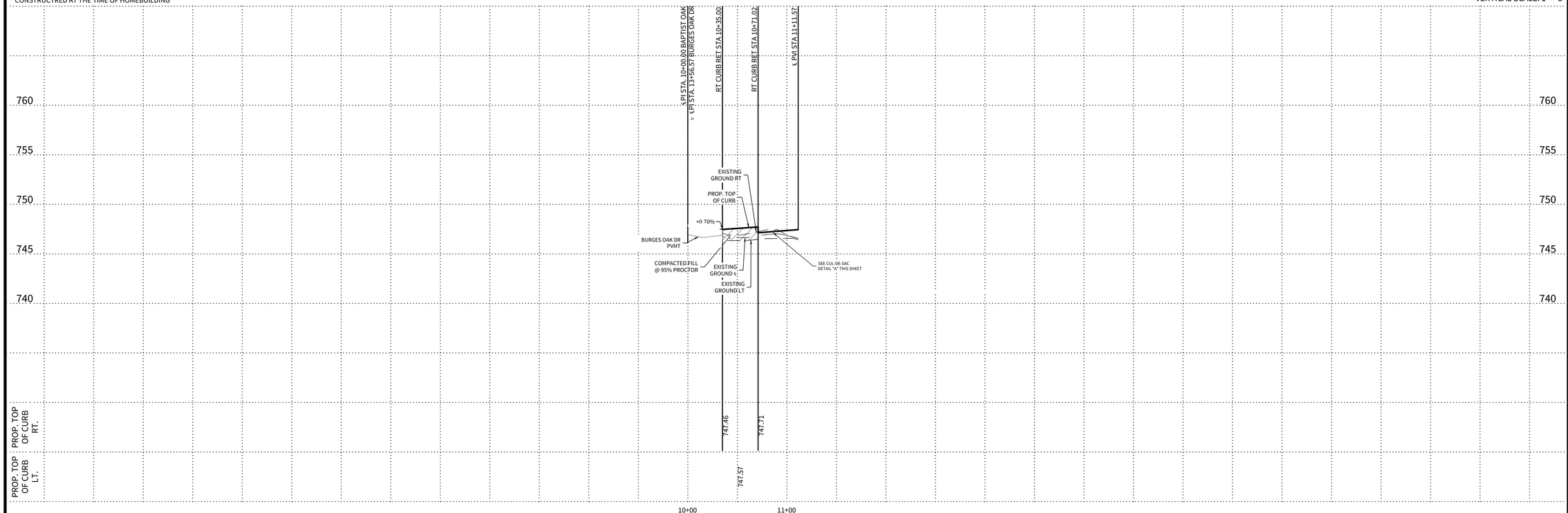
CUL-DE-SAC DETAIL "A"
SCALE: 1" = 30'

BAPTIST OAK

STA. 10+00.00 TO STA. 11+11.57

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STREET PLAN & PROFILE - BAPTIST OAK

DATE
06/21/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

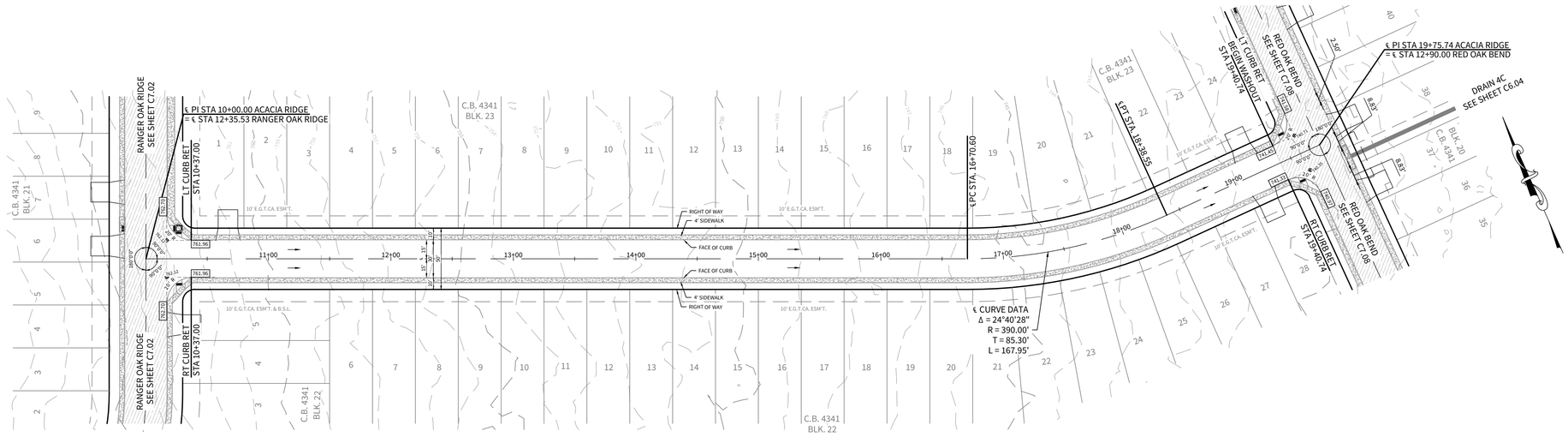
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.04



ELEVATIONS:

▭ XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

▨ - STREET WASHOUT (SEE DETAIL SHEET C7.D1)

▩ - SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " ▥ " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " ▥ " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

FOR ADA RAMPS AT SIDEWALK INTERSECTIONS .
DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY.
ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE.
WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING

ACACIA RIDGE

STA. 10+00.00 TO STA. 19+75.74

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

CUDEENGINEERS.COM

EST. 1980
CUDE
ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

**TRES LAURELS
UNIT 4A**

STREET PLAN & PROFILE -
ACACIA RIDGE

DATE
06/21/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

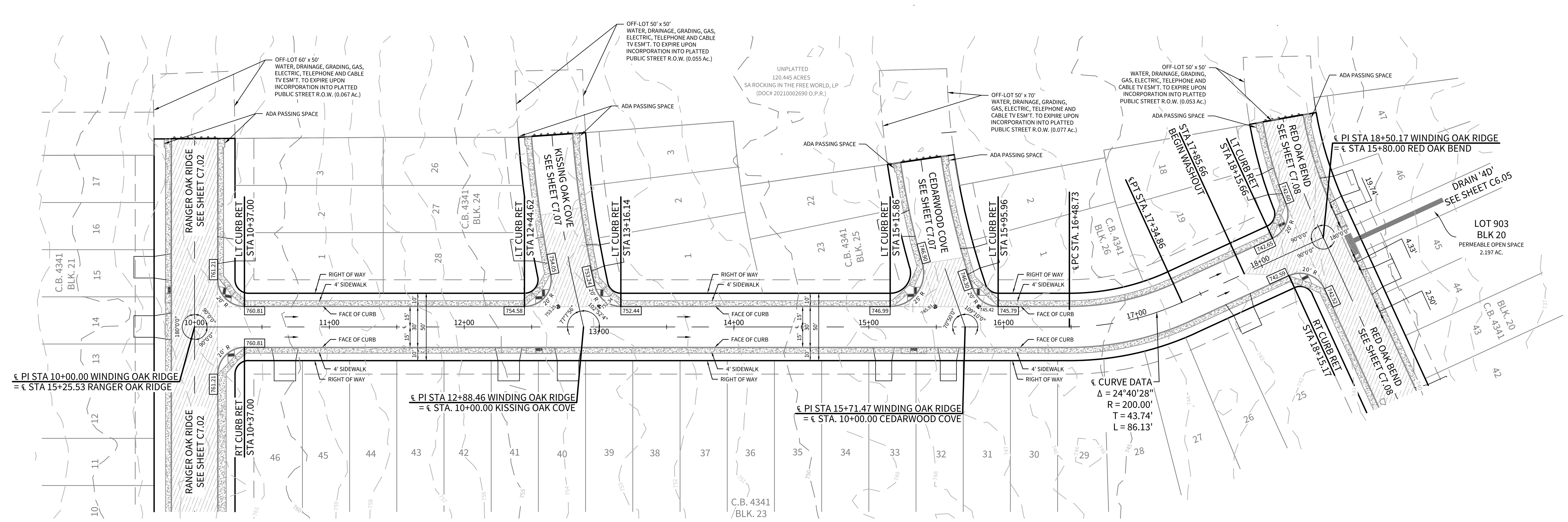
06/25/2024
MATTHEW A. TRINKLE
147558

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.05

CUDEENGINEERS.COM
EST. 1980 CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951



ELEVATIONS:

- PROPOSED TOP OF CONCRETE CURB ELEVATION
- PROPOSED ASPHALT PAVEMENT ELEVATION
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)
TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

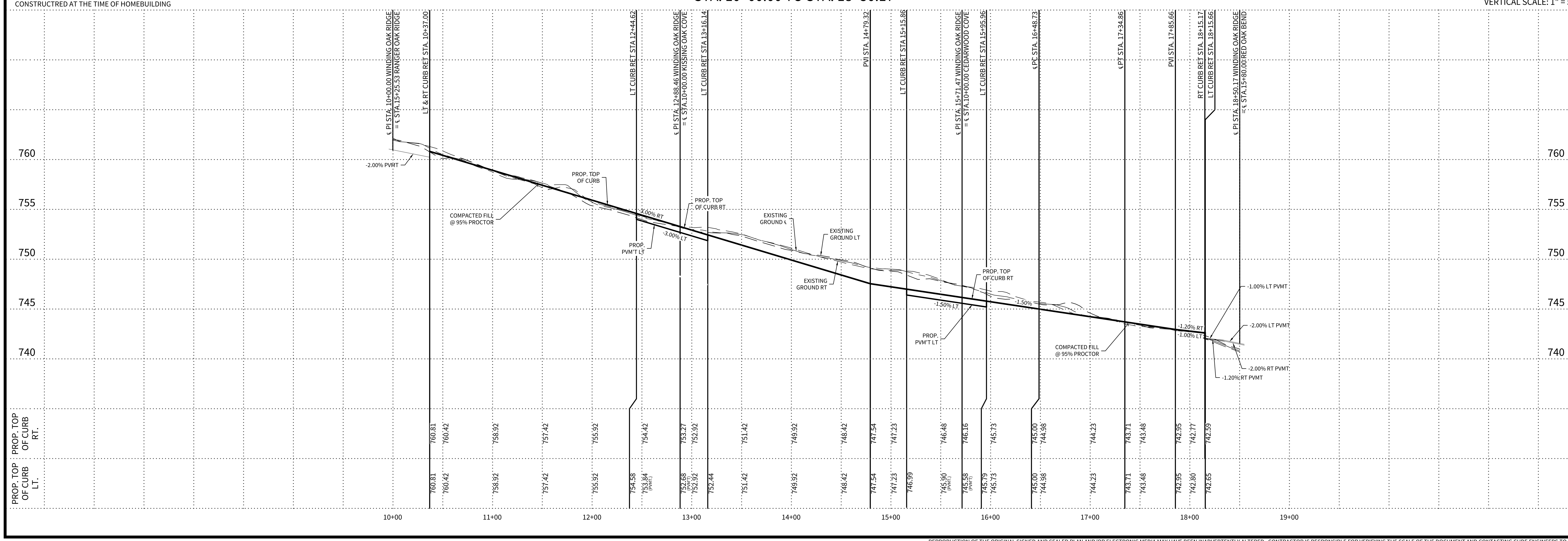
FOR ADA RAMPS AT SIDEWALK INTERSECTIONS. DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY. ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE. WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING

WINDING OAK RIDGE

STA. 10+00.00 TO STA. 18+50.17

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



TRES LAURELS UNIT 4A

STREET PLAN & PROFILE - WINDING OAK RIDGE

DATE
06/23/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

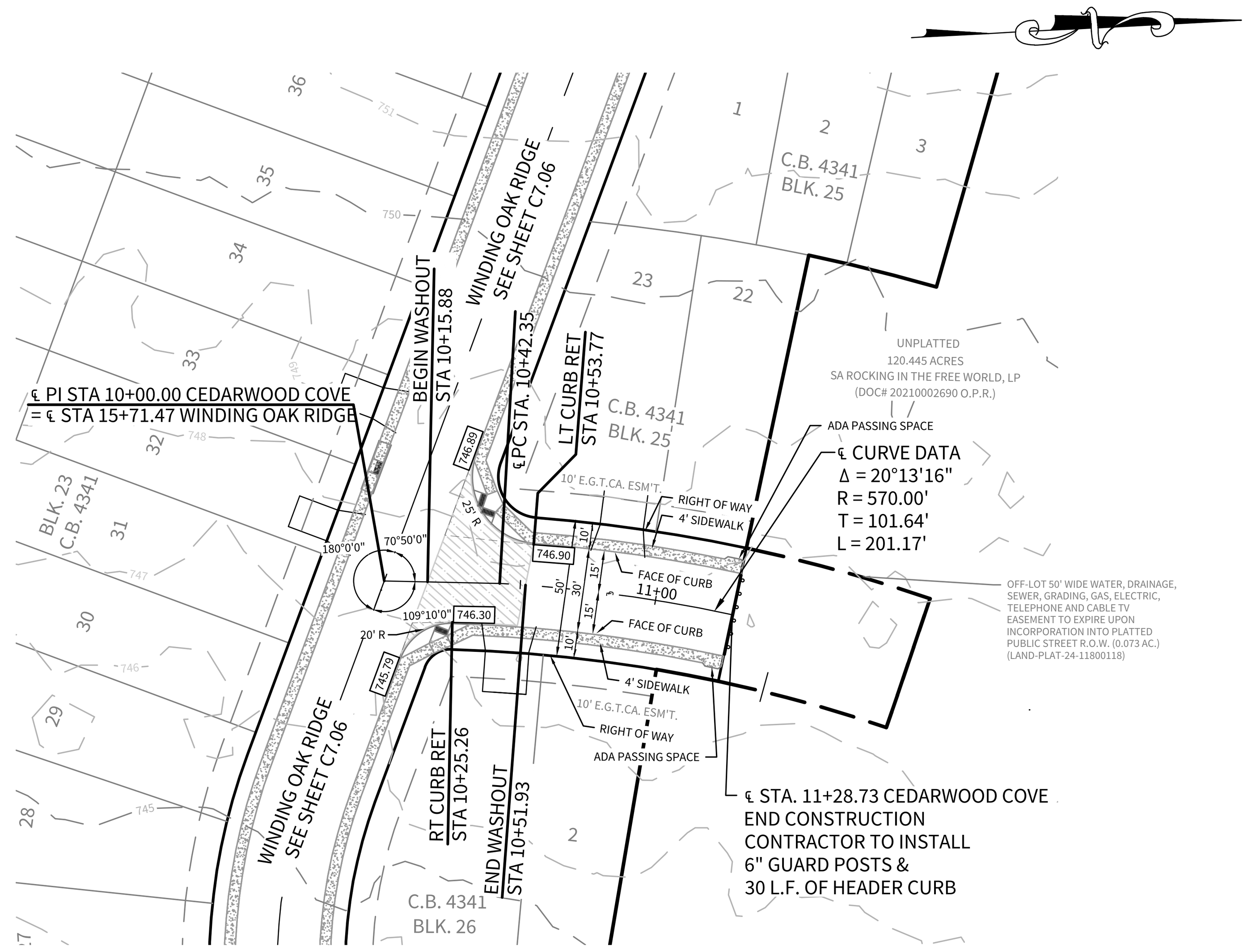
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

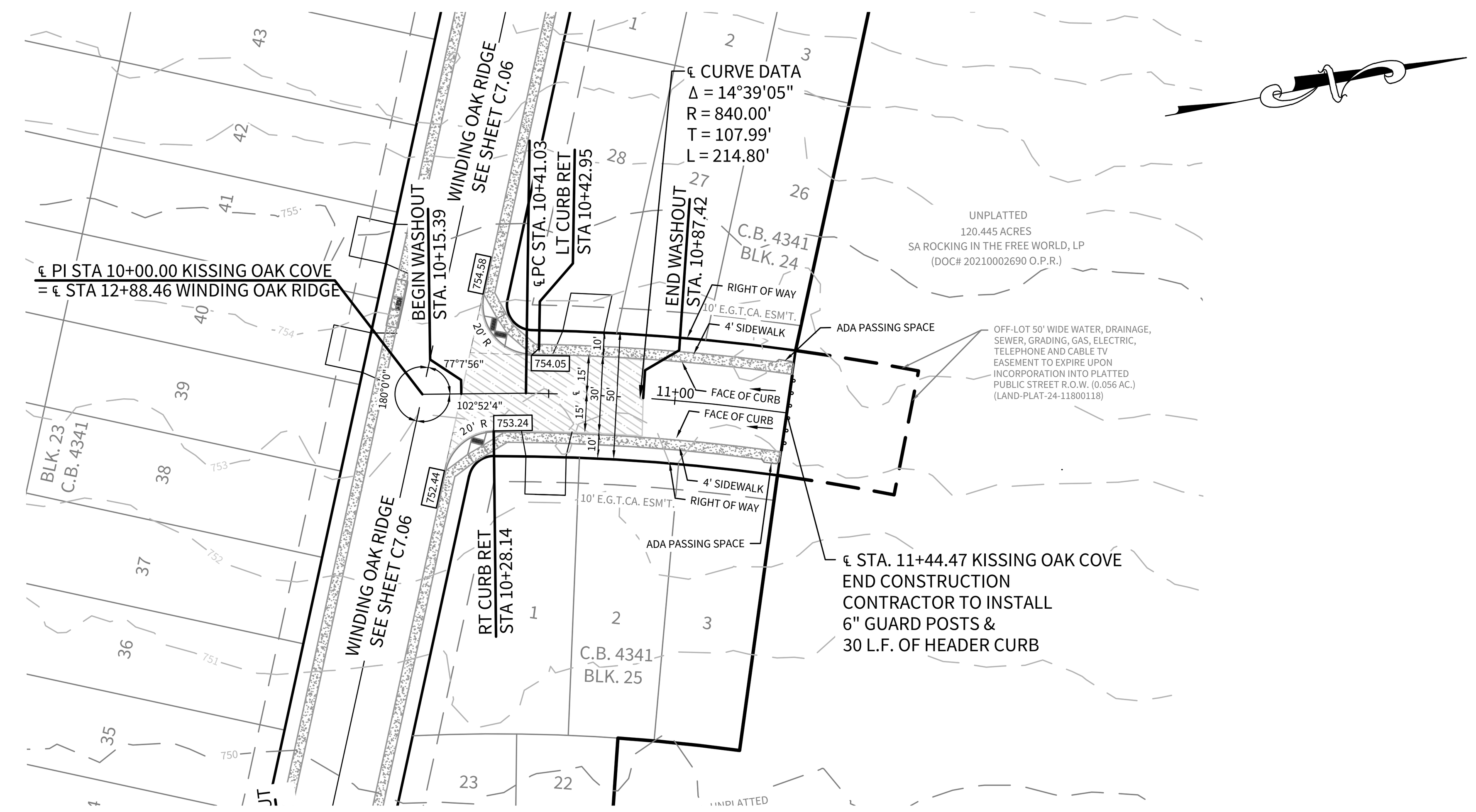
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.06





ELEVATIONS:

- PROPOSED TOP OF CONCRETE CURB ELEVATION
- PROPOSED ASPHALT PAVEMENT ELEVATION
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)
TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

FOR ADA RAMPS AT SIDEWALK INTERSECTIONS . DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY. ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE. WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING

CEDARWOOD COVE

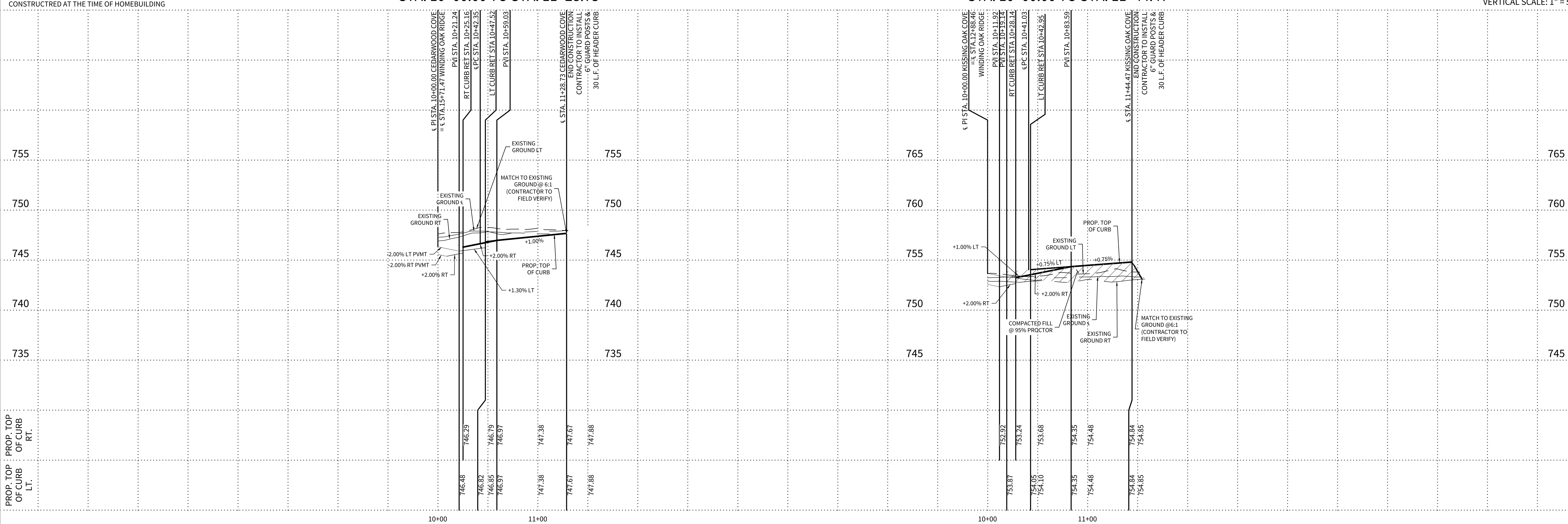
STA. 10+00.00 TO STA. 11+28.73

KISSING OAK COVE

STA. 10+44.47 TO STA. 11+44.47

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

CUDE EST. 1980 ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STREET PLAN & PROFILE - KISSING OAK COVE & CEDARWOOD COVE

DATE	06/23/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

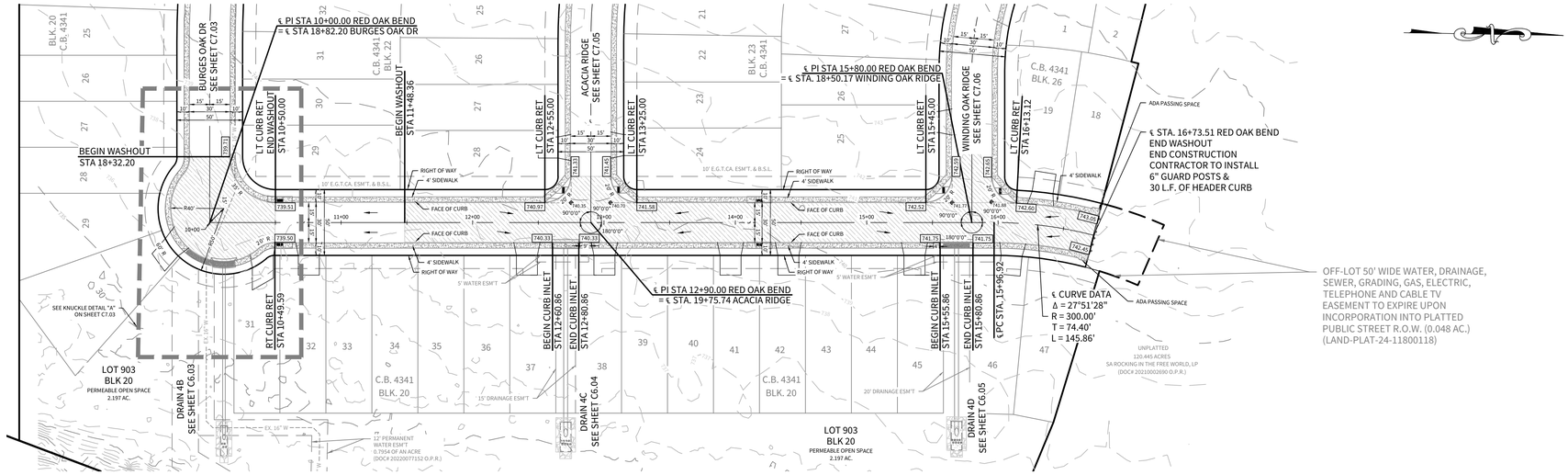
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.07



ELEVATIONS:

XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

- STREET WASHOUT (SEE DETAIL SHEET C7.D1)

- SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE (DEVELOPER RESPONSIBLE)

TxDOT TYPE "2" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

TYPE "10" DIRECTIONAL WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED. (SHEET C7.D1)

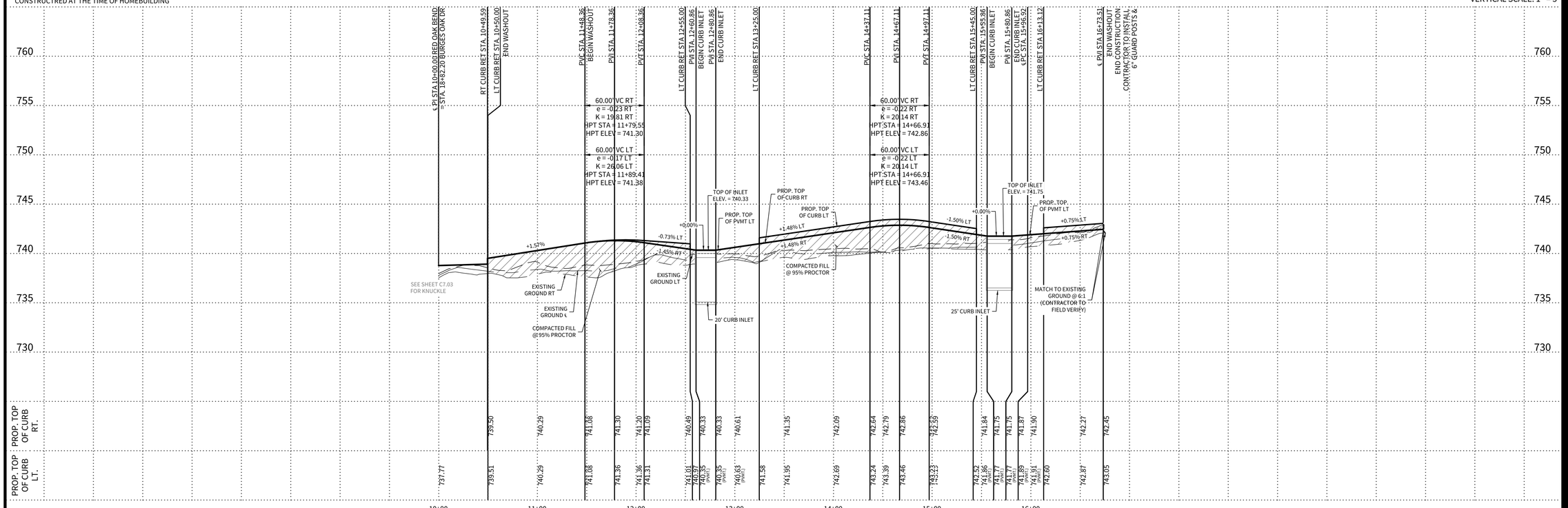
FOR ADA RAMPS AT SIDEWALK INTERSECTIONS . DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY. ADA RAMPS TO BE CONSTRUCTED WITH INFRASTRUCTURE. WHERE RESIDENTIAL LOT FRONTAGE DOES NOT EXIST, ALL ADA RAMPS ADJACENT TO A RESIDENTIAL LOT SHALL BE CONSTRUCTRED AT THE TIME OF HOMEBUILDING

RED OAK BEND

STA. 10+00.00 TO STA. 16+73.51

NOTE: A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT OF WAY

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STREET PLAN & PROFILE - RED OAK BEND

DATE
06/23/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

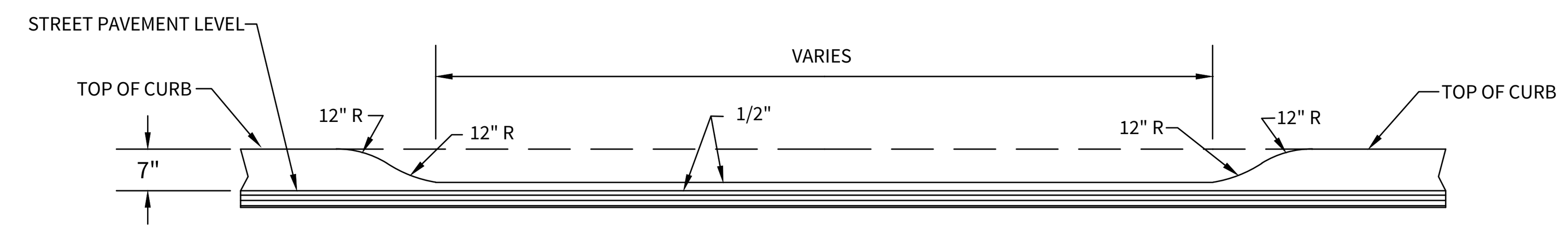
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

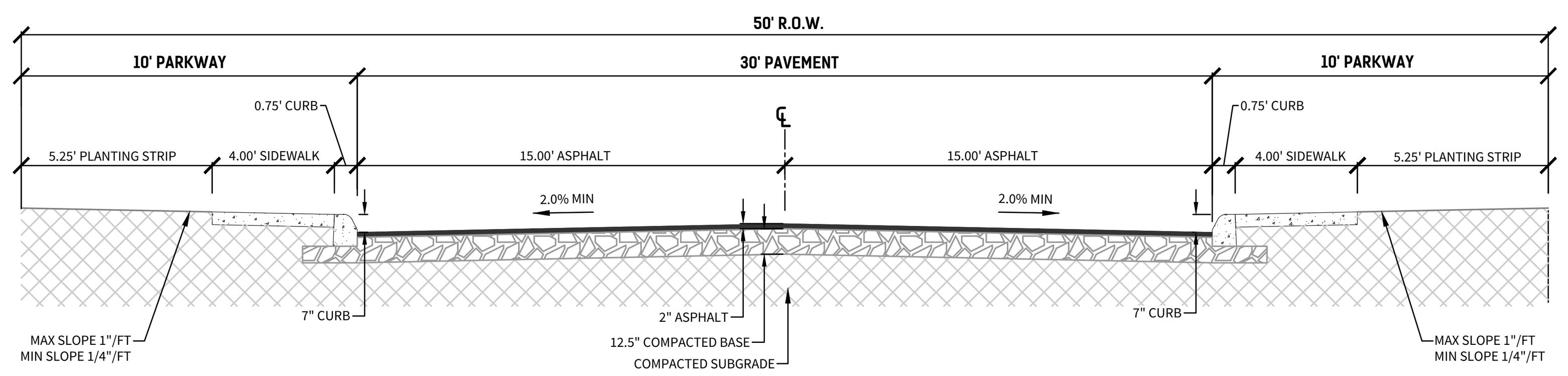
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.08

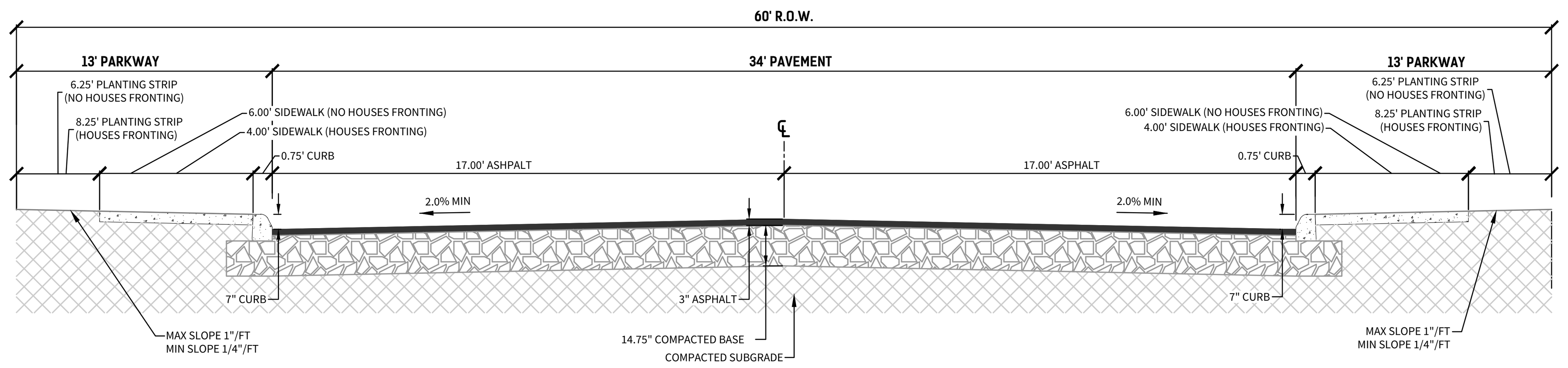


TYPICAL DRIVEWAY CUT SECTION



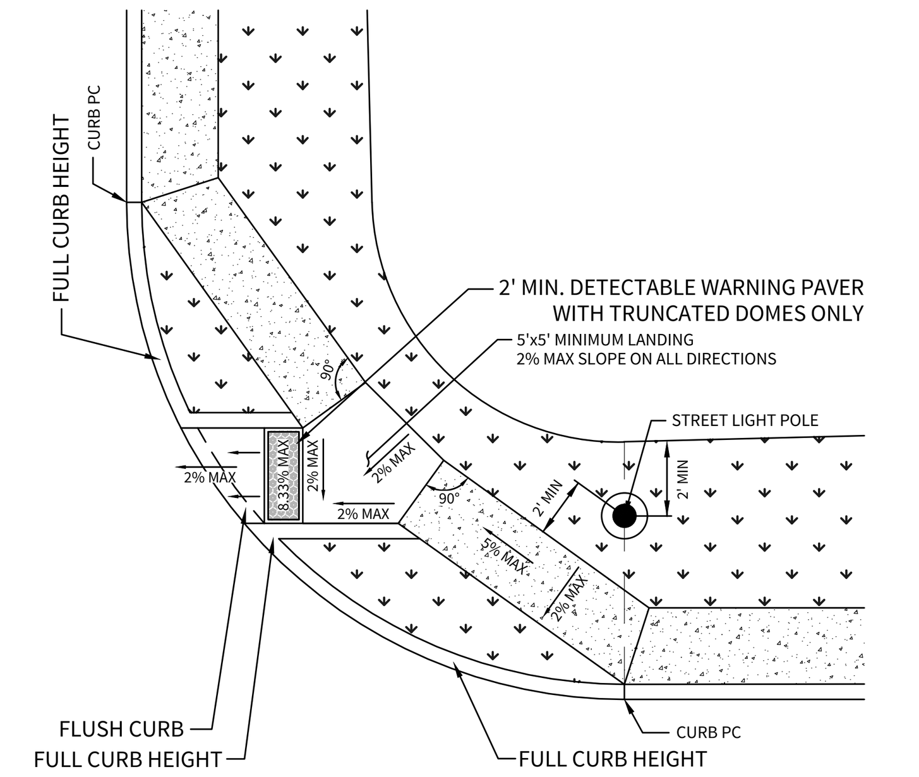
TYPICAL "LOCAL A" STREET CROSS SECTION

1" = 5'



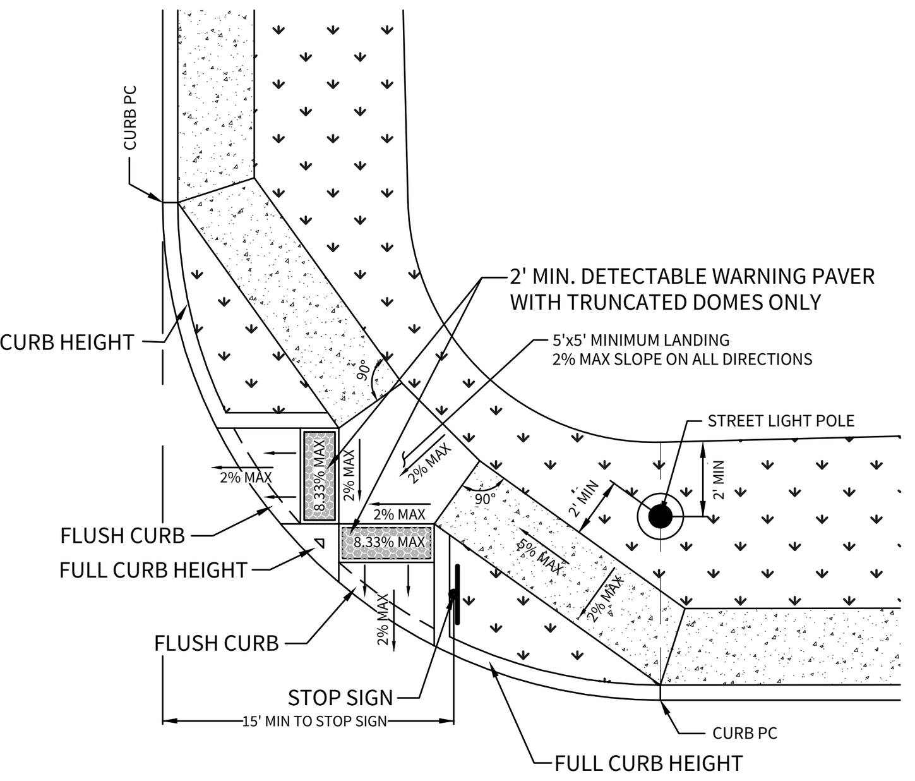
TYPICAL LOCAL "B" STREET CROSS SECTION

1" = 5'



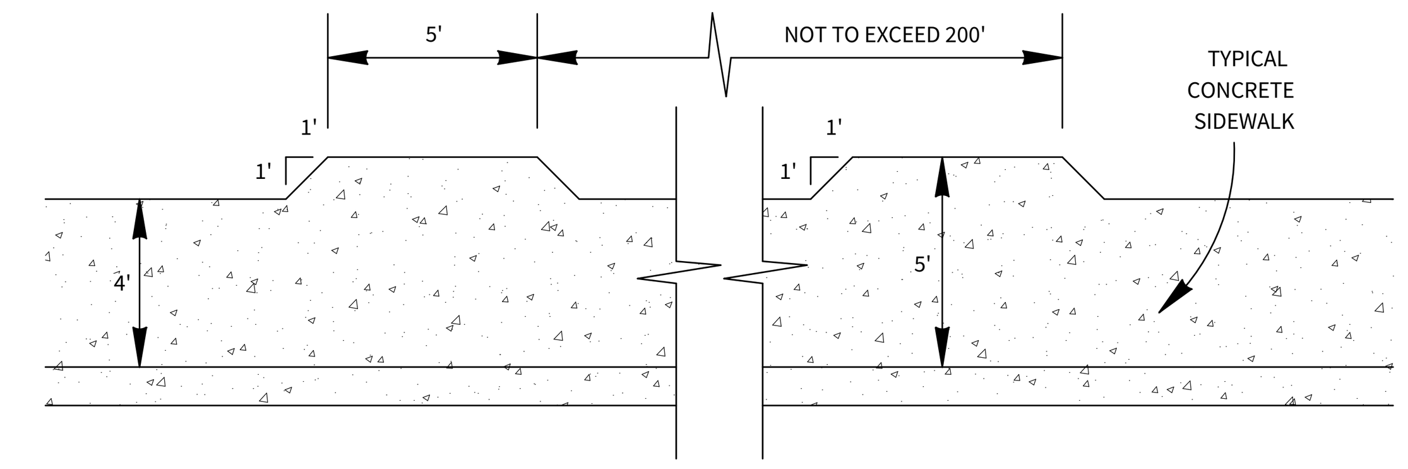
SINGLE ADA RAMP INTERSECTION LAYOUT DETAIL (TYPE 10 DIRECTIONAL RAMPS)

N.T.S.



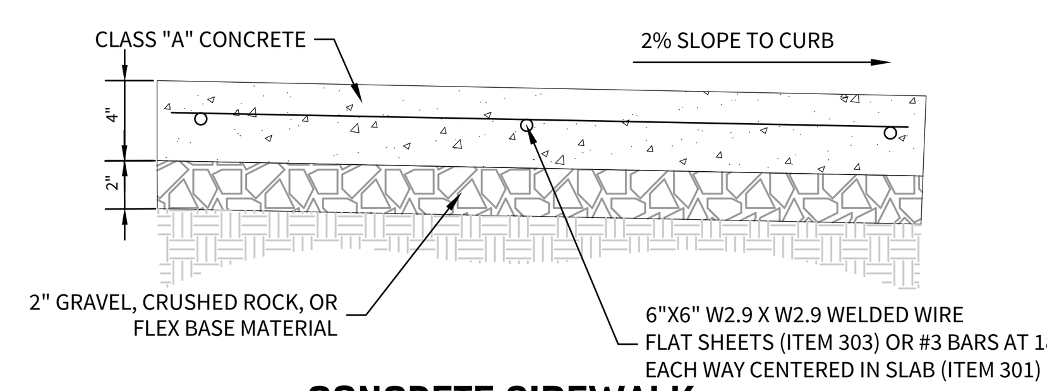
DUAL ADA RAMP INTERSECTION LAYOUT DETAIL (TYPE 10 DIRECTIONAL RAMPS)

N.T.S.



SIDEWALK PASSING SPACE

1. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
2. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.

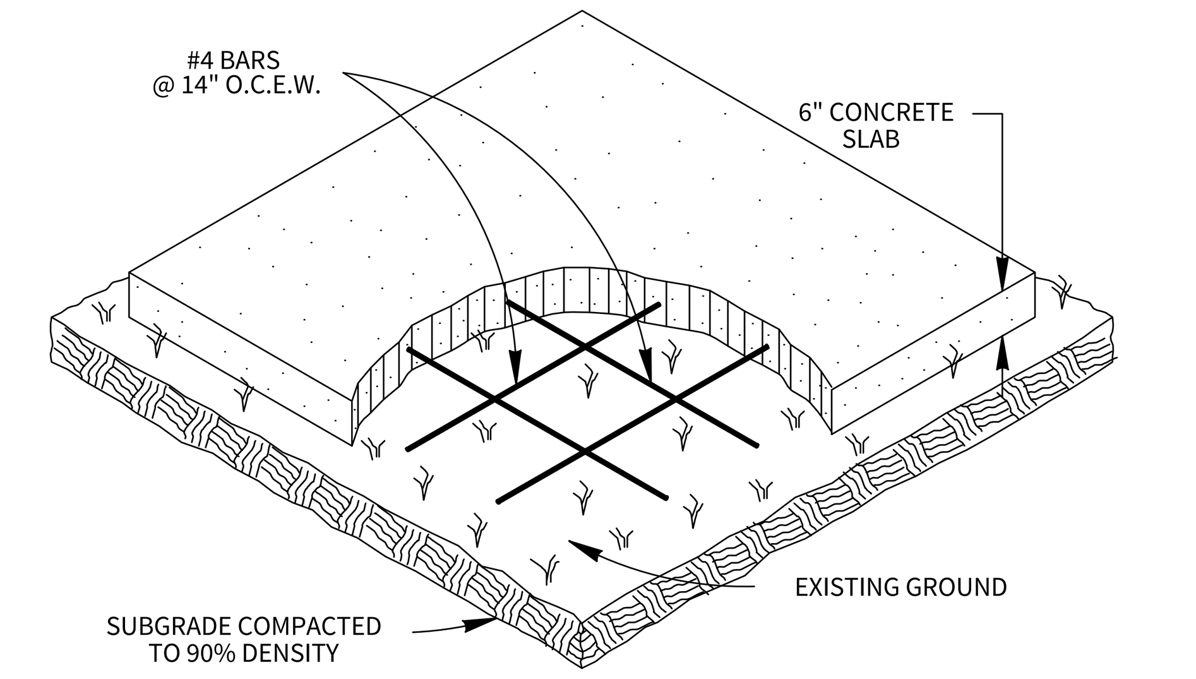


CONCRETE SIDEWALK

N.T.S.

GENERAL SPECIFICATIONS FOR COMPACTED FILL

1. FOLLOWING THE CLEARING AND DISKING OR SCARIFYING OF THE FILL AREA, IT SHALL BE BLADED UNTIL IT IS UNIFORM AND FREE FROM LARGE CLODS. THE AREA SHALL BE BROUGHT TO THE ADEQUATE MOISTURE CONTENT AND COMPACTED (TYPICALLY) TO NOT LESS THAN NINETY PERCENT (90%) OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT ASTM D 1557 COMPACTION PROCEDURE, OR 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH THE CURRENT THD--TEX--113--E COMPACTION PROCEDURE.
2. THE MATERIALS USED SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, SUCH AS TREES, BRUSH AND RUBBISH.
3. THE FILL MATERIAL SHALL BE COMPACTED AT THE APPROPRIATE MOISTURE CONTENT SPECIFIED FOR THE SOILS BEING USED. APPROPRIATE MOISTURE CONTENT IS DEFINED, TYPICALLY, AS OPTIMUM MOISTURE CONTENT; HOWEVER, FOR EXPANSIVE SOILS IT MAY BE GREATER THAN OPTIMUM MOISTURE CONTENT, AND OTHER MOISTURE CONTENTS MAY BE NECESSARY TO PRODUCE THE DESIRED RESULTS WITH CERTAIN SOILS.

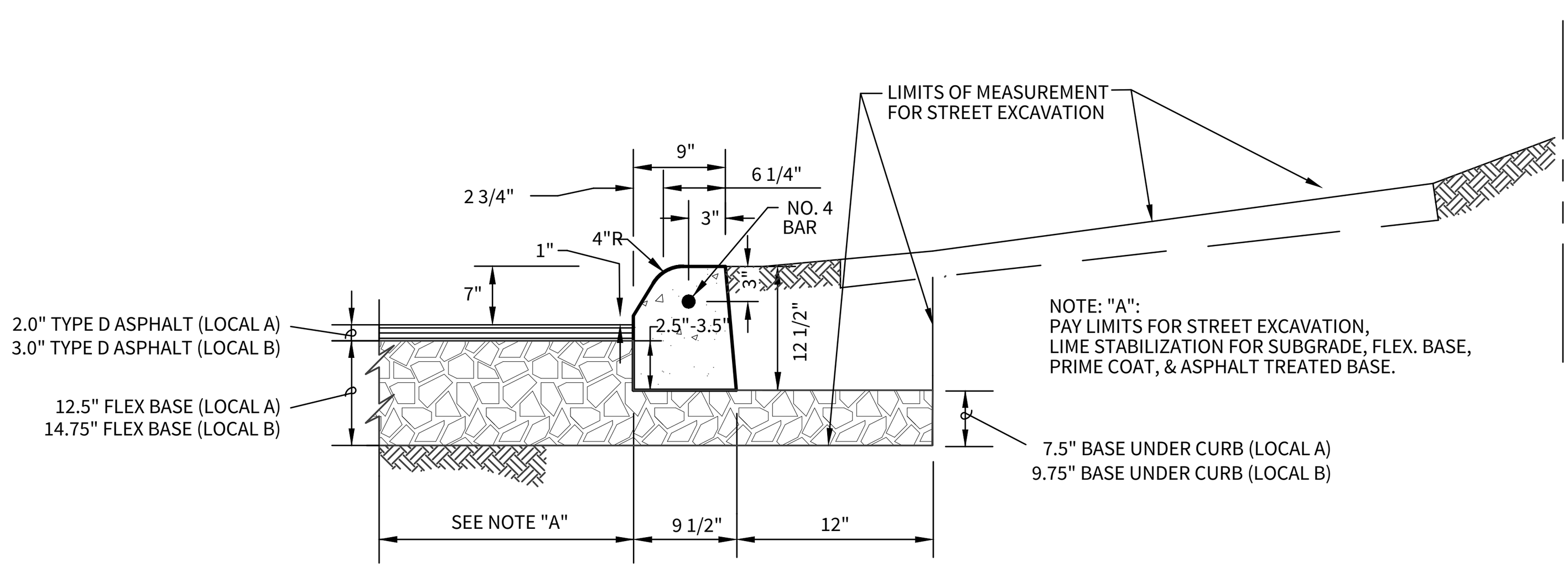


MAIL BOX PAD NOTE:

1. THE CONTRACTOR WILL CONSTRUCT SLABS FOR "TEMPORARY MAIL BOX COLLECTION PAD" FOR THE UNITED STATES POSTAL SERVICE WITH LOCATIONS AND SIZES SPECIFIED BY THE CITY ENGINEER DURING CONSTRUCTION.
2. THE CONSTRUCTION OF SLABS SHALL CONFORM TO ITEM 513 "REMOVING AND RELOCATING MAILBOXES".
3. PAYMENT WILL BE MADE UNDER ITEM 513.2 "COMMUNITY MAILBOX SLAB - PER SQUARE YARD".
4. UNIT PRICE WILL INCLUDE REMOVAL OF "TEMPORARY MAIL BOX COLLECTION PAD" SLABS AT THE END OF THE PROJECT. NO SEPARATE PAY ITEM.

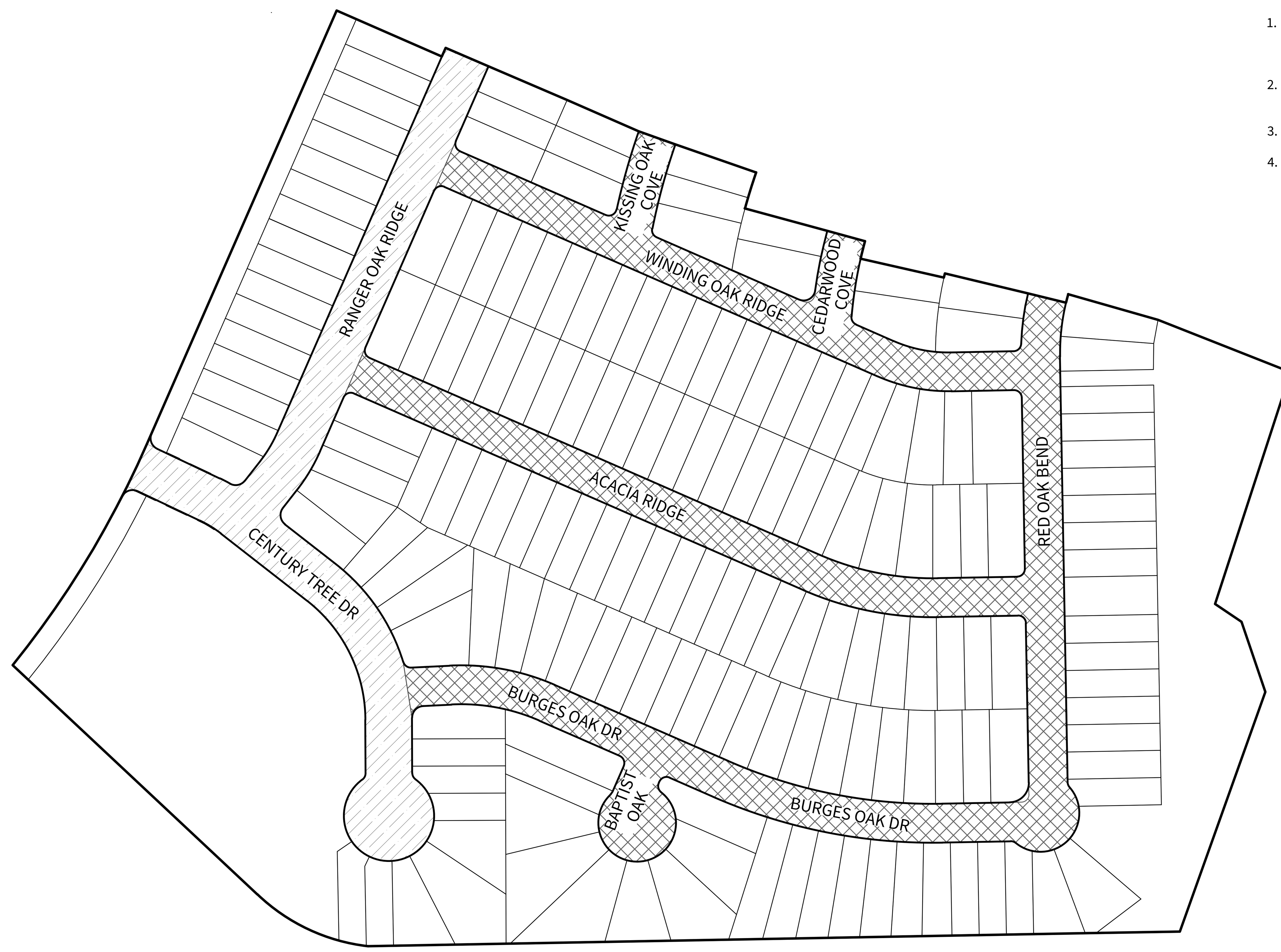
COMMUNITY MAIL BOX SLAB

ITEM 513.2



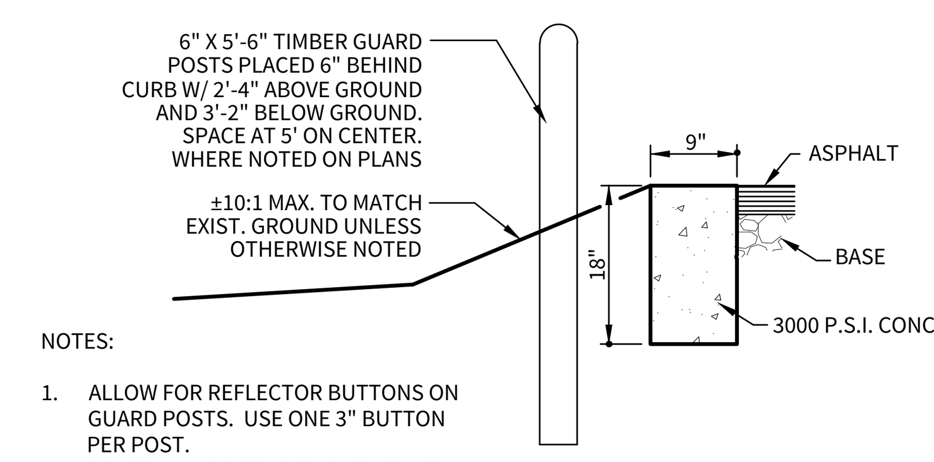
CURB SECTIONS

N.T.S.



STREET PAVEMENT DESIGN DETAIL

N.T.S.

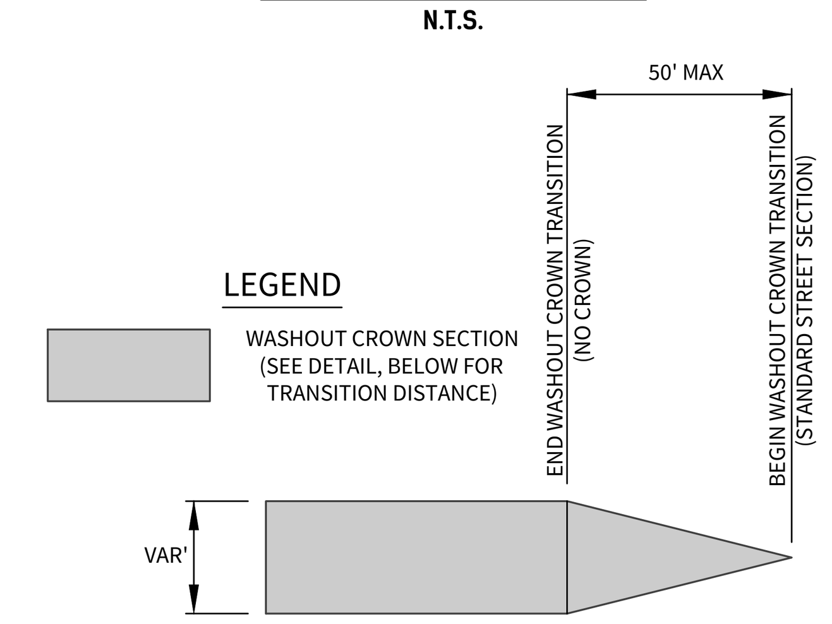


NOTES:

1. ALLOW FOR REFLECTOR BUTTONS ON GUARD POSTS. USE ONE 3" BUTTON PER POST.
2. POSTS WILL RECEIVE TWO COATS OF ALUMINUM PAINT.

HEADER CURB DETAIL

N.T.S.



WASHOUT CROWN TRANSITION DETAIL

N.T.S.

STREET PAVEMENT DESIGN OPTIONS

GEOTECH ENGINEER WILL BE PRESENT TO DETERMINE IF LIME STABILIZATION IS REQUIRED. IF LIME STABILIZATION IS REQUIRED, BEXAR COUNTY PUBLIC WORKS WILL BE INFORMED OF ALL CHANGES. REVISIONS WILL BE SUBMITTED INDICATING WHERE LIME STABILIZATION WAS USED, ALONG WITH STATIONING. CONTRACTOR TO REVIEW GEOTECH RECOMMENDATIONS PRIOR TO FINAL SUBGRADE PREP. (REF. FROST GEOSCIENCES, INC. PROJECT #FGS-G-20016 JULY 23RD, 2020 & PAVEMENT SUPPLEMENT NOVEMBER 2ND, 2022)

STREET TYPE (CBR = 4.5)	HMAC TYPE "D"	FLEX BASE (TY A GR 2)	LIME STABILIZED SUBGRADE	BASE UNDER CURB	STRUCTURAL NUMBER
LOCAL "A"	2"	12.50"	6" (27 LB/SY)	5"	3.11
LOCAL "B"	3"	14.75"	6" (27 LB/SY)	15"	3.87

NOTE:

1. FILL MATERIAL FOR SUBGRADES BELOW PAVED AREAS SHALL BE OF NATIVE MATERIALS (NO STONES LARGER THAN 3") & BE OF SIMILAR CHARACTERISTICS AS FOUND WITHIN THE PAVED AREAS. FILL MATERIAL SHALL BE PLACED IN MAX. 8" LOOSE LIFTS & BE COMPACTED TO AT LEAST 95% MAX DRY DENSITY. FILL MATERIAL SHALL HAVE A PLASTICITY INDEX OF 20 & A CBR OF 4.5.
2. IF THE FILL MATERIAL CONSISTS OF A PLASTICITY INDEX OF LESS THAN 20, THEN LIME STABILIZATION WILL NOT BE NEEDED. CONTRACTOR SHALL MAKE ALL EFFORTS TO USE FILL MATERIAL FROM AREAS OF SIMILAR SUBGRADE MATERIAL FOR ROADWAY EMBANKMENTS. ANY OFFSITE FILL MATERIAL SHALL BE TESTED TO VERIFY MINIMUM PI AND CBR VALUES ARE WITHIN CALCULATED PARAMETERS.
3. PI VALUES OBTAINED FROM THE SOIL SAMPLES TAKEN NEAR THE SURFACE RANGES FROM 46 TO 51 IN THE CLAY SUBGRADE SOIL. PER GEOTECH REPORT, LIME STABILIZATION IS RECOMMENDED WHERE SUITABLE FILL MATERIAL IS NOT USED.

LIME STABILIZATION:

TO INCLUDE A LIME STABILIZED LAYER AS PART OF THE STRUCTURAL PAVEMENT SYSTEM, THE APPLICATION RATE OF LIME SHALL BE DETERMINED BASED ON LABORATORY TESTING AND SHALL BE THE LOWEST PERCENTAGE OF LIME THAT PROVIDES:

- A pH OF 12.4 OR THE HIGHEST pH ACHIEVED IN ACCORDANCE WITH ASTM D6276 STANDARD TEST METHOD FOR USING pH TO ESTIMATE THE SOIL-LIME PROPORTION REQUIREMENT FOR SOIL STABILIZATION,
- A PI OF LESS THAN 20 IN ACCORDANCE WITH ASTM D4318 STANDARD TEST METHODS FOR LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS,
- AN UNCONFINED COMPRESSIVE STRENGTH (UCS) AT 7-DAYS OF AT LEAST 160 PSI IN ACCORDANCE WITH ASTM D5102 STANDARD TEST METHODS FOR UNCONFINED COMPRESSIVE STRENGTH OF COMPACTED SOIL-LIME MIXTURES (PROCEDURE B) (IN ADDITION, CURING SHOULD OCCUR FOR 7 DAYS AT 40°C AND SPECIMENS SHOULD BE SUBJECTED TO 24-HR CAPILLARY SOAK PRIOR TO TESTING), AND
- [OPTIONAL CRITERIA FOR EXPANSIVE SOILS] A THREE DIMENSIONAL EXPANSION OF LESS THAN 1% (OR MAYBE 2%).

LIME STABILIZATION

FOR CONSTRUCTION VERIFICATION THE FOLLOWING SHALL BE CONDUCTED IN THE FIELD:

- AFTER INITIAL MIXING, THE SOIL-LIME MIXTURE SHALL MELLOW FOR A PERIOD OF TWO TO THREE (2-3) DAYS. MAINTAIN A MOISTURE DURING MELLOWING;
- AFTER MELLOWING AND FINAL MIXING, THE PULVERIZATION SHALL BE CHECKED USING THE FOLLOWING CRITERIA (REMOVE NON-SLAKING AGGREGATES RETAINED ON THE ¾ INCH SIEVE FOR THE SAMPLE:

MINIMUM PASSING 1 ¾" SIEVE	100
MINIMUM PASSING ¾" SIEVE	85
MINIMUM PASSING NO. 4 SIEVE	60

- SAMPLE SOIL-LIME MIXTURE FOR DETERMINATION OF MDD. IN THE LABORATORY, MOLD SPECIMENS TO 95% OF MDD AT OPTIMUM MOISTURE CONTENT AND VERIFY UCS TO BE AT LEAST 160 PSI IN ACCORDANCE WITH PROCEDURE OUTLINED ABOVE FOR MIXTURE DESIGN.
- COMPACT AND CHECK FIELD DENSITY (MINIMUM OF 95% MDD REQUIRED);
- CURE FOR AN ADDITIONAL 2 TO 5 DAYS (TOTAL MELLOWING AND CURING TIME SHOULD TOTAL AT LEAST 5 DAYS).
- VERIFY DEPTH OF LIME STABILIZED LAYER TO DEPTH AS NOTED ON PLAN WITHIN +/- 1.0 INCHES.

PAVEMENT DESIGN SCHEMATIC

NOTE:

1. REFERENCE GEOTECHNICAL REPORT (#FGS-G-20016 JULY 23RD, 2020) FOR BORING INFORMATION AND CBR LOCATIONS.

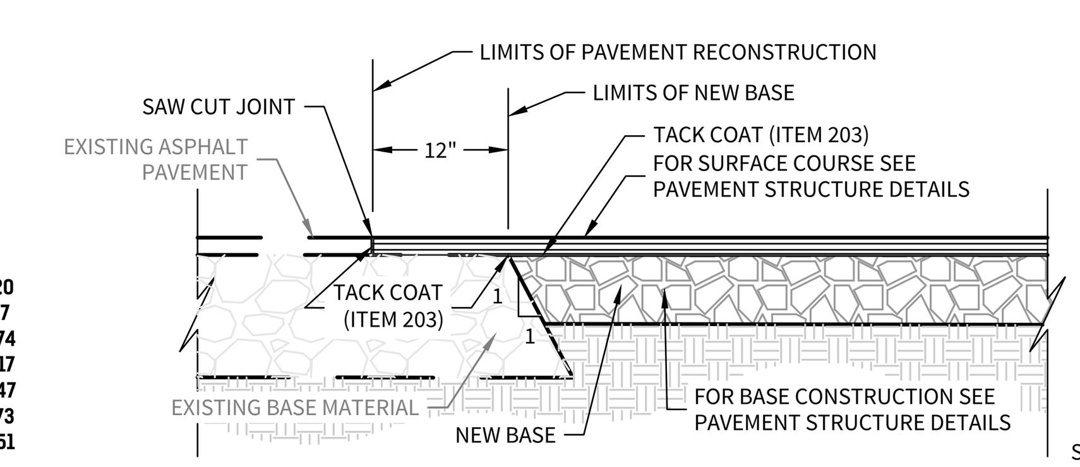
LEGEND:

LOCAL "A"

BURGES OAK DR	STA 9+97.99 – 18+82.20
BAPTIST OAK	STA 10+00.00 – 11+11.57
ACACIA RIDGE	STA 10+00.00 – 19+75.74
WINDING OAK RIDGE	STA 10+00.00 – 18+50.17
KISSING OAK COVE	STA 10+00.00 – 11+44.47
CEDARWOOD COVE	STA 10+00.00 – 11+28.73
RED OAK BEND	STA 10+00.00 – 16+73.51

LOCAL "B"

CENTURY TREE DR	STA 9+40.00 – 16+09.34
RANGER OAK RIDGE	STA 10+00.00 – 16+65.18



PAVEMENT JUNCTION DETAILS

N.T.S.

GENERAL NOTES

THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM	233-2010
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
C.P.S. ENERGY	"
AT&T	"
TIME WARNER CABLE	"
VALERO ENERGY CO.	"
GREY FOREST UTILITIES	"

CUDEENGINEERS.COM

CUDE EST. 1980 ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STANDARD STREET DETAILS

DATE 05/29/2024

PROJECT NO. 03050.015

DRAWN BY RM / IV

CHECKED BY MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/05/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

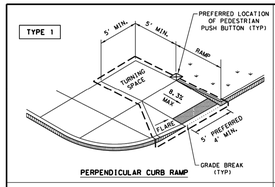
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO. 24-11800118

C7.D1

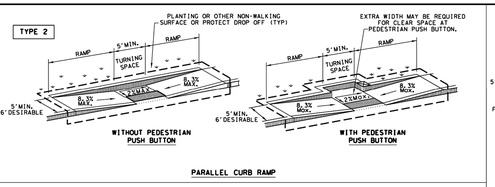
DATE:
FILE:

TYPE 1



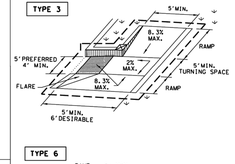
PERPENDICULAR CURB RAMP

TYPE 2

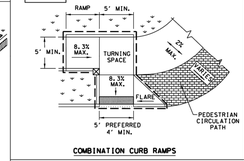


PARALLEL CURB RAMP

TYPE 3

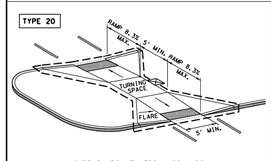


TYPE 6



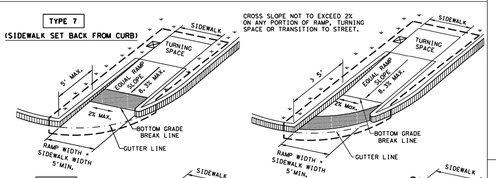
COMBINATION CURB RAMPS

TYPE 20

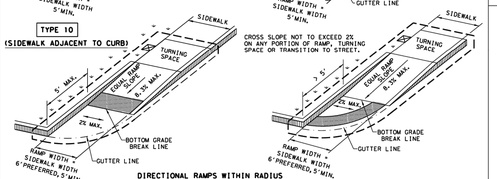


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7
(SIDEWALK SET BACK FROM CURB)

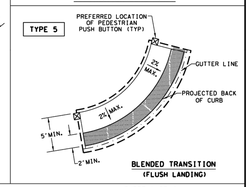


TYPE 10
(SIDEWALK ADJACENT TO CURB)



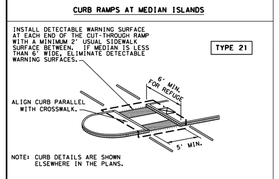
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5



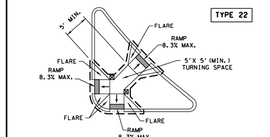
BLENDED TRANSITION (FLUSH LANDING)

TYPE 21

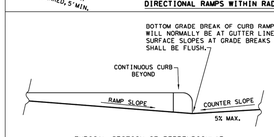


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH. — GUTTER LINE

DETECTABLE WARNING SURFACE — GRADE BREAK

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE. — RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK: VP	CK: KM	CK: FK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.
REVISED ON: 2012				
REVISED ON: 2014				
REVISED ON: 2018				

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

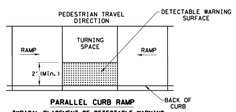
DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

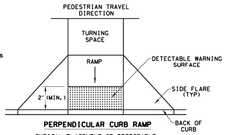
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

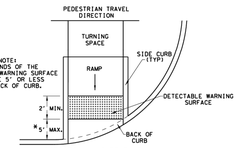
DETECTABLE WARNING SURFACE DETAILS



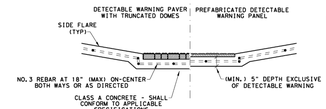
PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

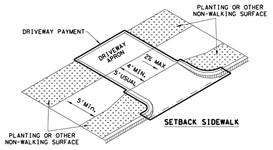
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

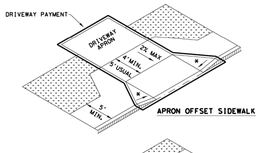
FILE: ped18	DN:TxDOT	CK: VP	CK: KM	CK: FK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.
REVISED ON: 2012				
REVISED ON: 2014				
REVISED ON: 2018				

DATE:
FILE:

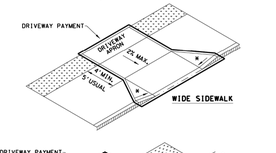
SIDEWALK TREATMENT AT DRIVEWAYS



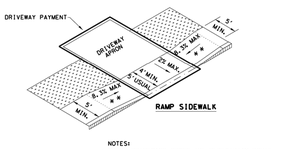
SETBACK SIDEWALK



APRON OFFSET SIDEWALK

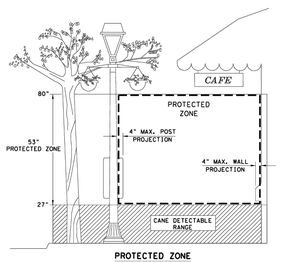


WIDE SIDEWALK



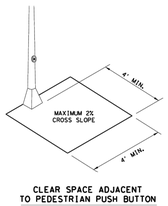
RAMP SIDEWALK

NOTES:
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.
* * IF CURB HEIGHT IS GREATER THAN 6 INCHES; USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

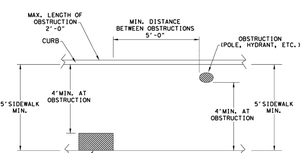


PROTECTED ZONE

NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.

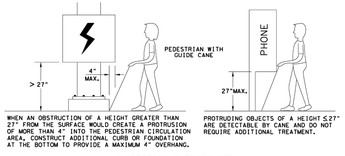


CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



PLAN VIEW
PLACEMENT OF STREET FIXTURES

NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.

PROTRUDING OBJECTS OF A HEIGHT ≤27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation | Design Division Standard

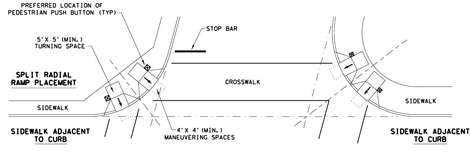
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

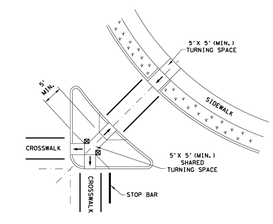
FILE: ped18	DN:TxDOT	CK: VP	CK: KM	CK: FK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.
REVISED ON: 2012				
REVISED ON: 2014				
REVISED ON: 2018				

DATE:
FILE:

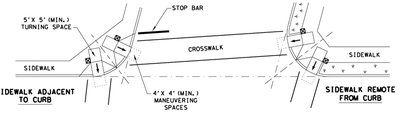
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



SKEWED INTERSECTION WITH "LARGE" RADIUS

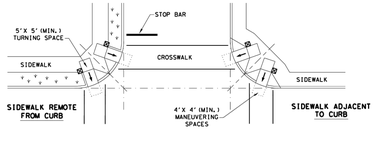


AT INTERSECTION W/FREE RIGHT TURN & ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS

MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ⊠

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK: VP	CK: KM	CK: FK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.
REVISED ON: 2012				
REVISED ON: 2014				
REVISED ON: 2018				

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

STREET DETAILS

DATE
04/22/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

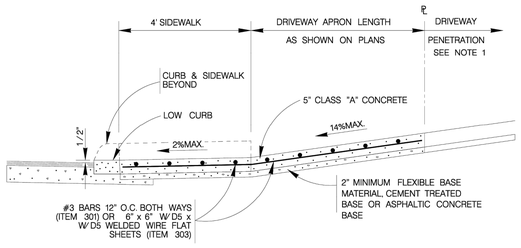
04/22/2024

STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

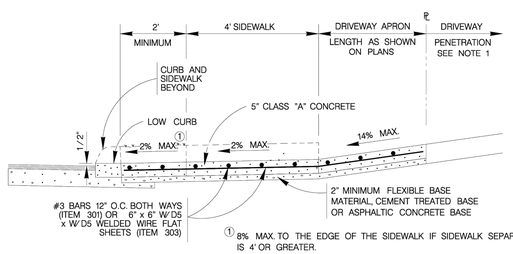
PLAT NO.
24-11800118

C7.D2



TYPICAL RESIDENTIAL DRIVEWAY SECTION

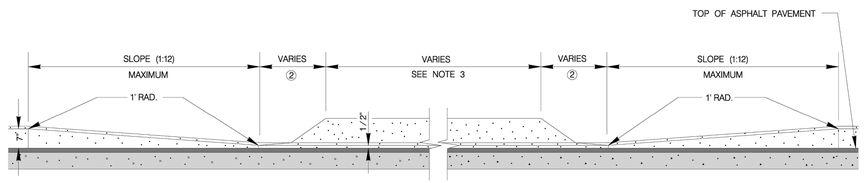
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

TYPICAL RESIDENTIAL DRIVEWAY SECTION

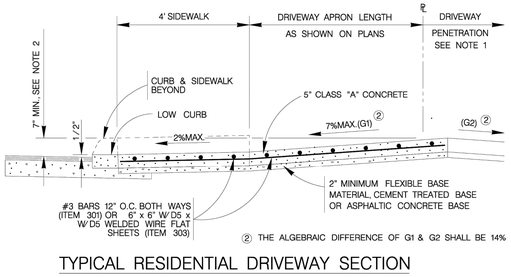
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



② RESIDENTIAL : 2' MAXIMUM;
COMMERCIAL: SEE PLAN VIEW

CURB PROFILE AT DRIVEWAY

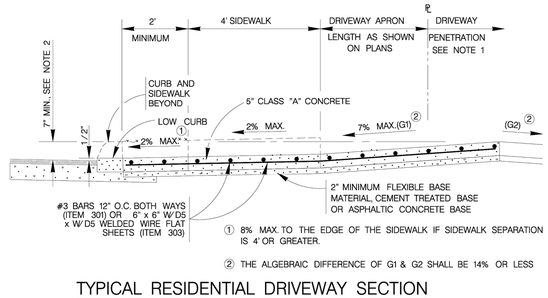
WITH SIDEWALK ABUTTING CURB



② THE ALGEBRAIC DIFFERENCE OF G1 & G2 SHALL BE 14% OR LESS

TYPICAL RESIDENTIAL DRIVEWAY SECTION

WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS ABUTTING CURB
ITEM 503.1

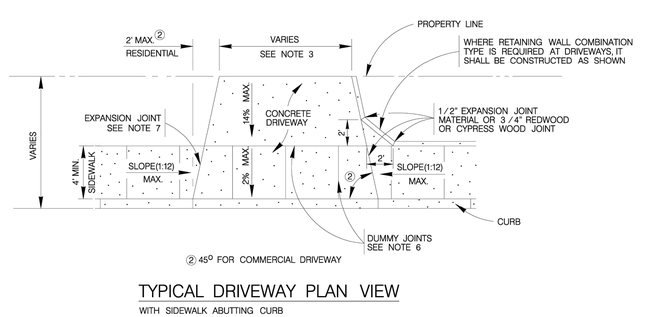


① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

② THE ALGEBRAIC DIFFERENCE OF G1 & G2 SHALL BE 14% OR LESS

TYPICAL RESIDENTIAL DRIVEWAY SECTION

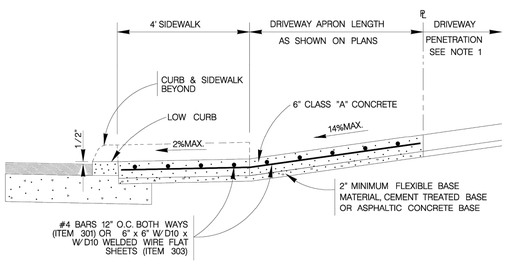
WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS SEPARATED FROM CURB
ITEM 503.1



② 45° FOR COMMERCIAL DRIVEWAY

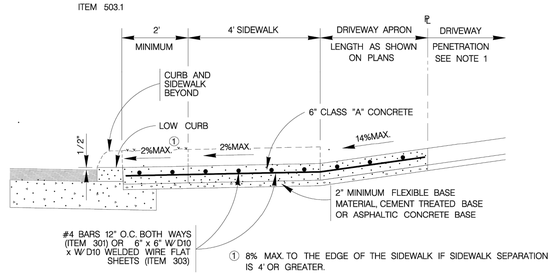
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



TYPICAL COMMERCIAL DRIVEWAY SECTION

WITH SIDEWALK ABUTTING CURB
ITEM 503.2



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

TYPICAL COMMERCIAL DRIVEWAY SECTION

WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2

CONCRETE DRIVEWAY NOTES

1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY THAT MAY BE NECESSARY TO RECONSTRUCT WITHIN PRIVATE PROPERTY TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE. THIS PORTION OF THE DRIVEWAY SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS AS MAY APPLY:
   A.) CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.1 OR 503.2.
   B.) ASPHALTIC CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.4 AND SHALL INCLUDE A MINIMUM OF 1" ASPHALT TYPE 'D' & 6" FLEXIBLE BASE
   C.) GRAVEL DRIVEWAY PAID FOR UNDER ITEM NO. 503.5 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE

2. 7" MINIMUM HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.

3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

TYPE	MINIMUM	MAXIMUM
RESIDENTIAL	10'	20'
COMMERCIAL – ONE WAY	12'	20'
COMMERCIAL – TWO WAY	24'	30'

4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.

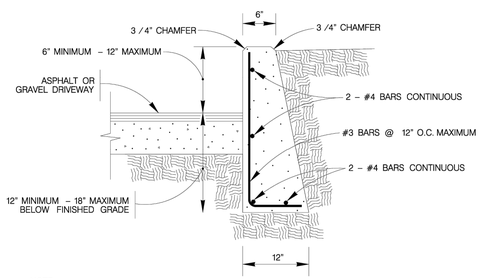
5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' FROM THE BACK OF CURB OR, AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.

6. DUMMY JOINTS PARALLEL TO THE CURB SHALL BE PLACED WHERE THE SIDEWALK MEETS THE DRIVEWAY. DUMMY JOINTS PERPENDICULAR TO THE CURB, AND WITHIN THE BOUNDARIES OF THE PARALLEL DUMMY JOINTS, SHALL BE PLACED AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK.

7. A MINIMUM OF TWO ROUND AND SMOOTH DOWEL BARS 3 /8" IN DIAMETER AND 18" IN LENGTH SHALL BE SPACED 18" APART AT EACH EXPANSION JOINT.

8. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE. WHERE SIDEWALKS CROSS DRIVEWAYS, SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2%.

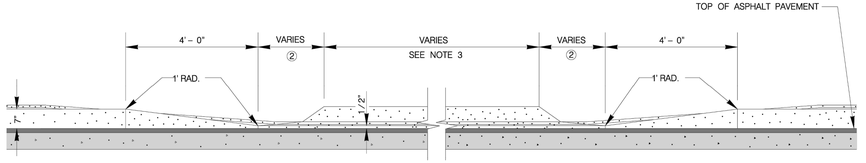
9. SIDEWALK RAMP SURFACE SHALL BE BRUSH FINISHED.



NOTE:
1. COST OF REINFORCEMENT TO BE INCLUDED IN UNIT COST OF ITEM 307.1.
2. CONCRETE RETAINING WALL COMBINATION TYPE SHALL BE USED FOR CONCRETE DRIVEWAYS.

DRIVEWAY – CONCRETE RETAINING WALL

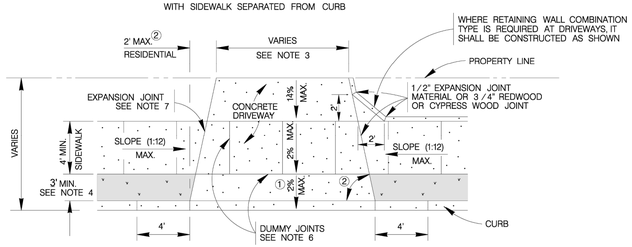
ON COMPACTED SUBGRADE
ITEM 307.1



② RESIDENTIAL : 2' MAXIMUM;
COMMERCIAL: SEE PLAN VIEW

CURB PROFILE AT DRIVEWAY

WITH SIDEWALK SEPARATED FROM CURB



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

② 45° FOR COMMERCIAL DRIVEWAY

TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK SEPARATED FROM CURB

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

% SUBMITTAL	PROJECT NO.:	DATE:
DRWN. BY: V. VASQUEZ	DSGN. BY:	CHKD. BY: R.S. HOSSEINI, P.E.	SHEET NO.: OF

CUDEENGINEERS.COM
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS
UNIT 4A

STREET DETAILS

DATE
04/22/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

04/22/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C7.D3

NOTE:

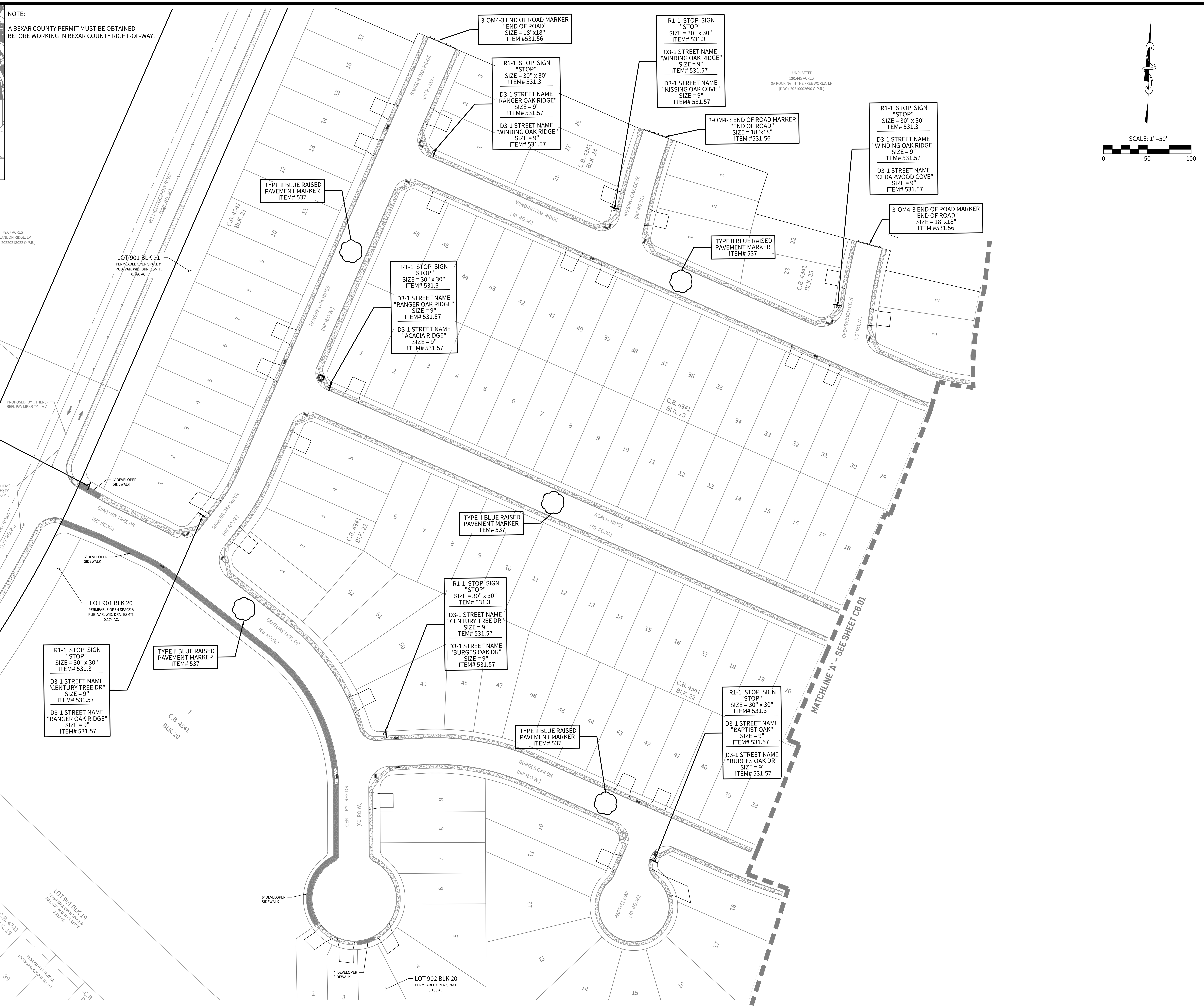
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT-OF-WAY.

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

TRAFFIC SIGNAGE PLAN

DATE	06/24/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

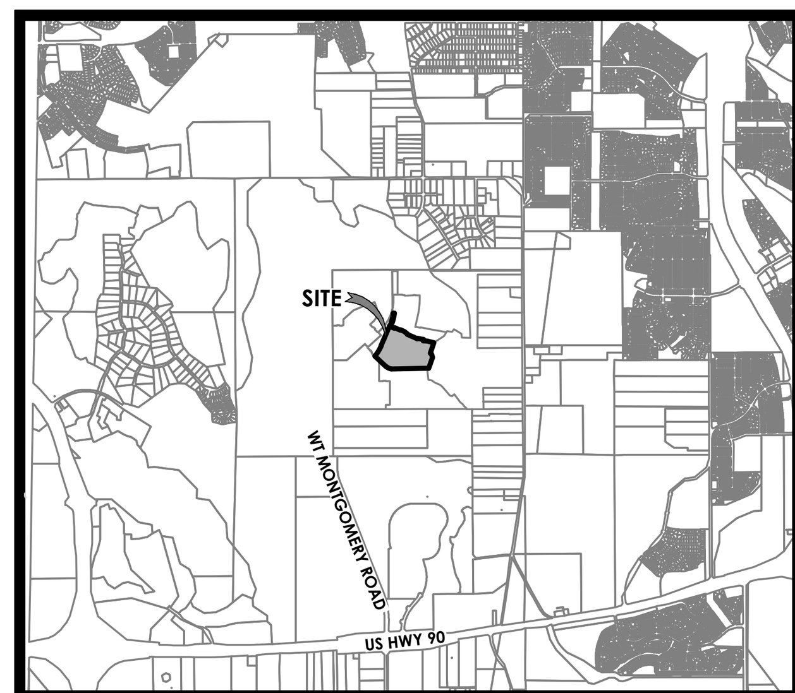
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C8.00

NOTE:

A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHT-OF-WAY.



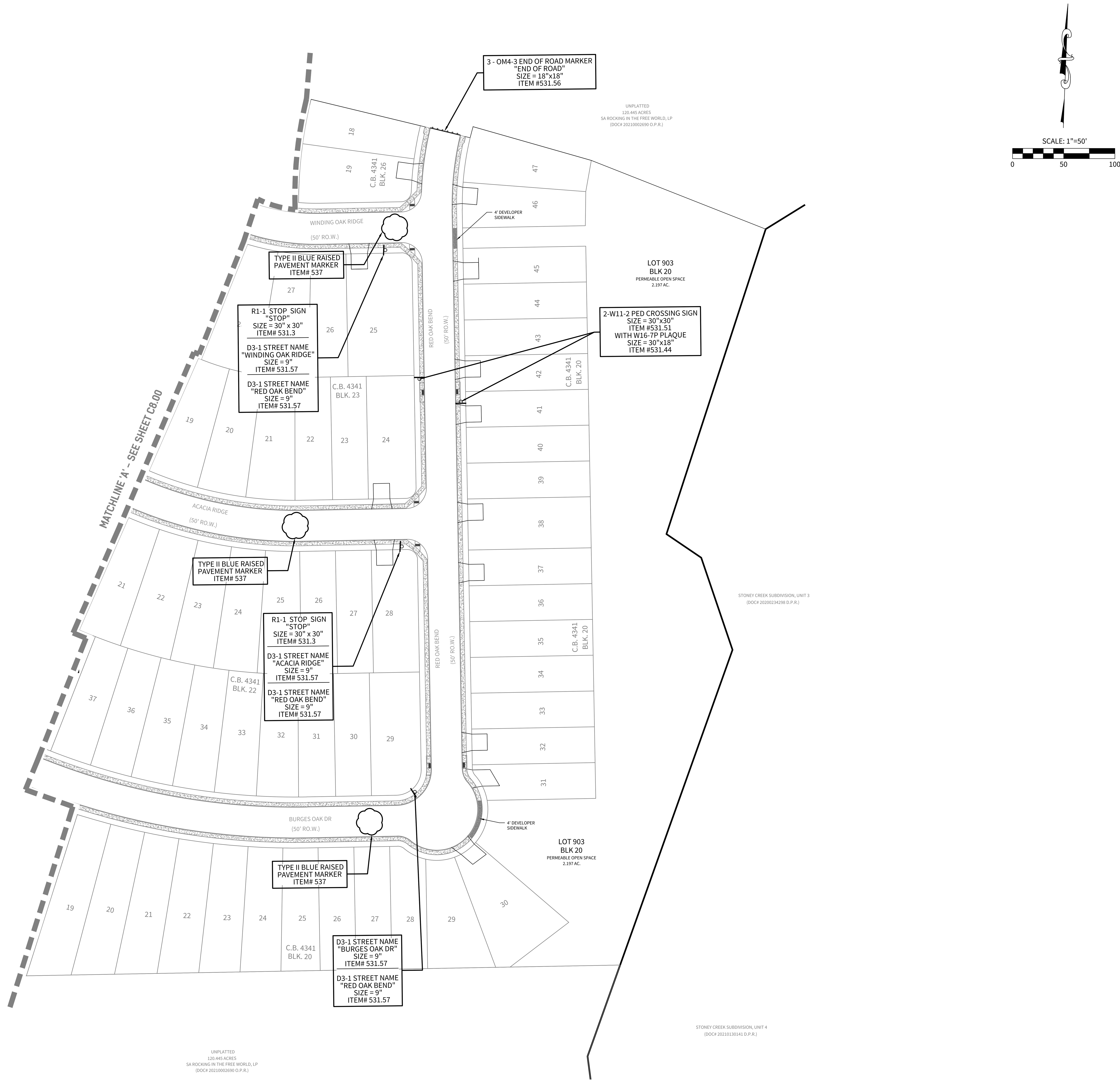
LOCATION MAP
N.T.S.

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

TRAFFIC SIGNAGE PLAN

DATE
06/24/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS

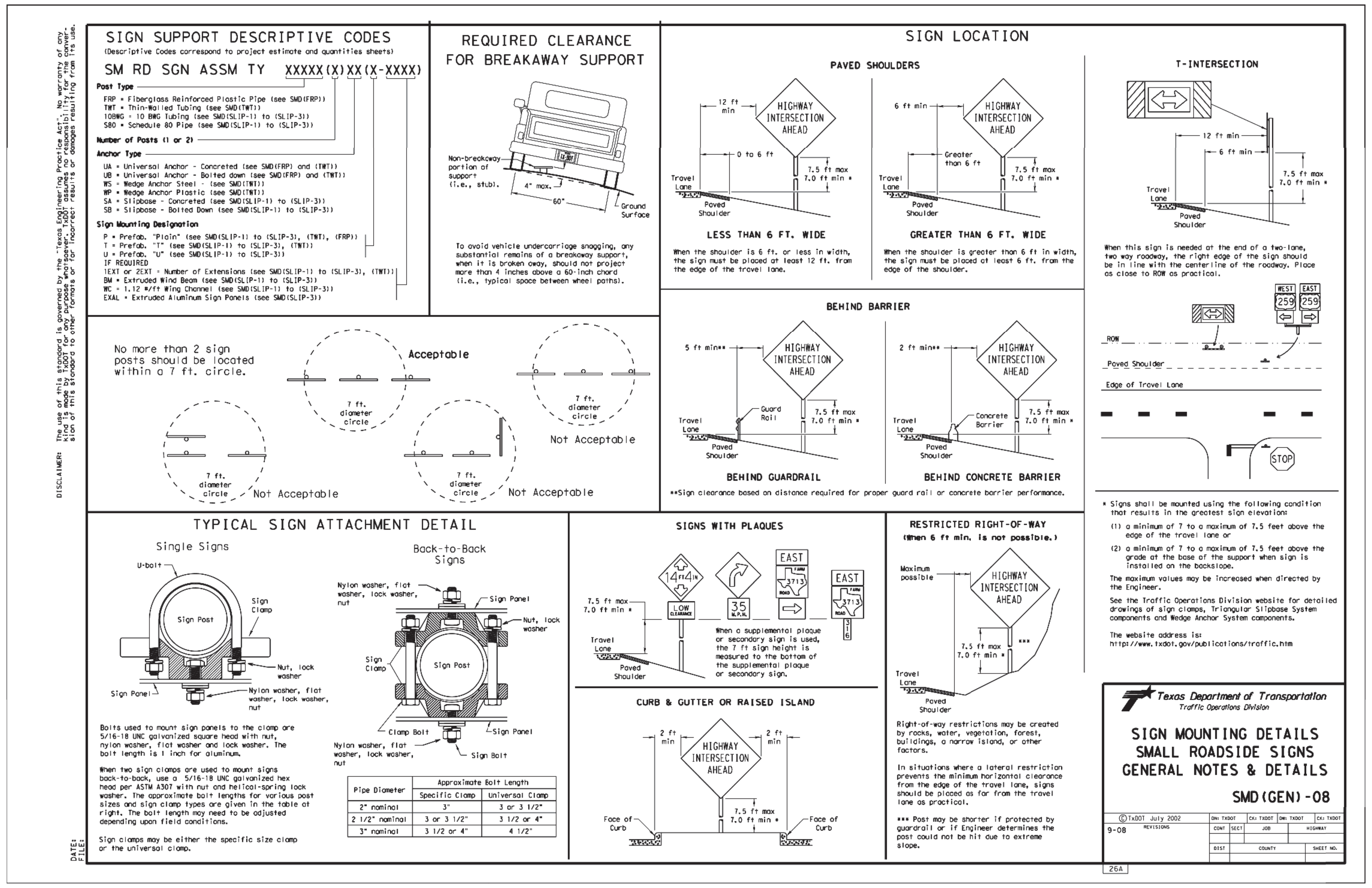
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

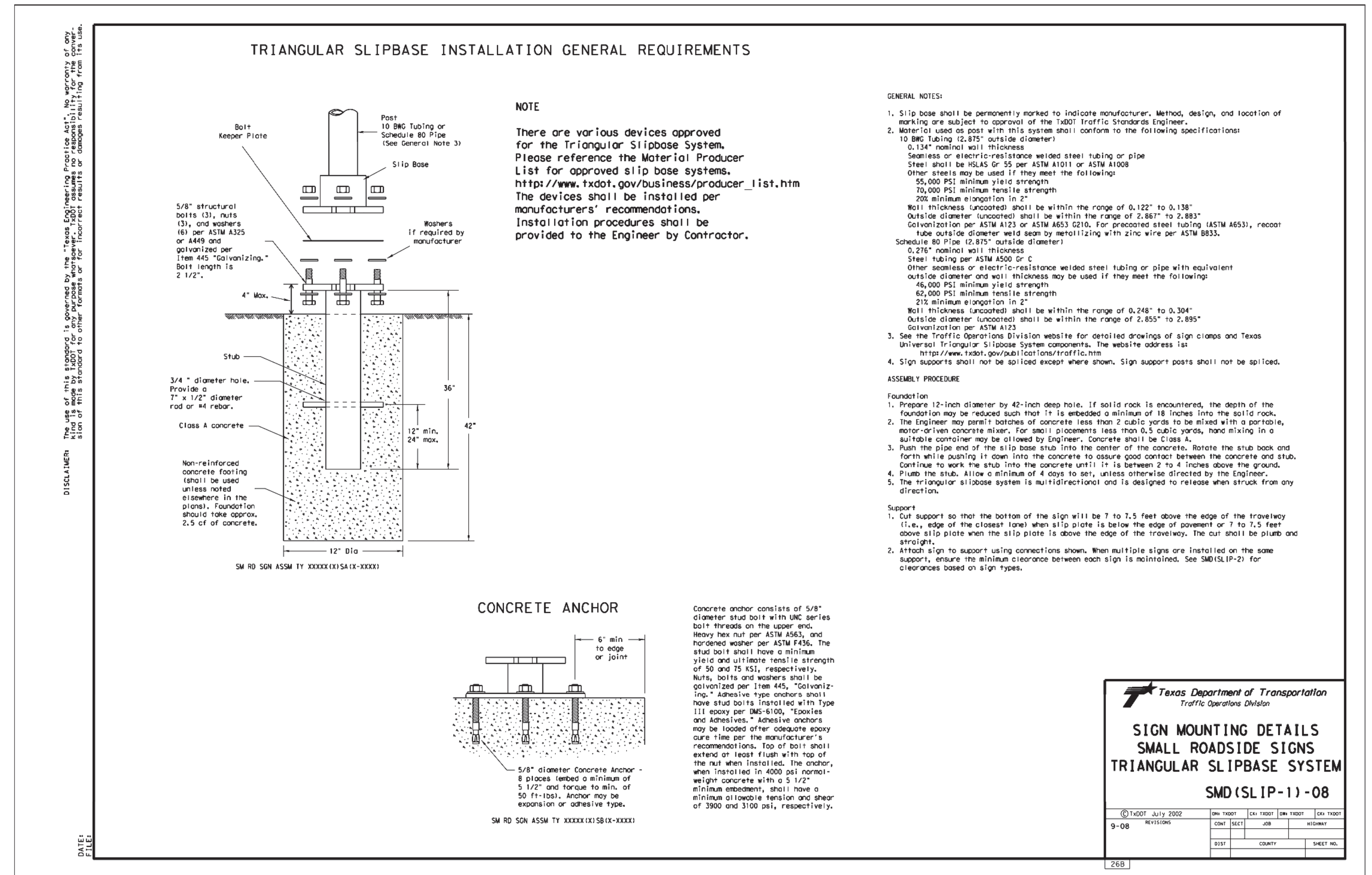
06/25/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

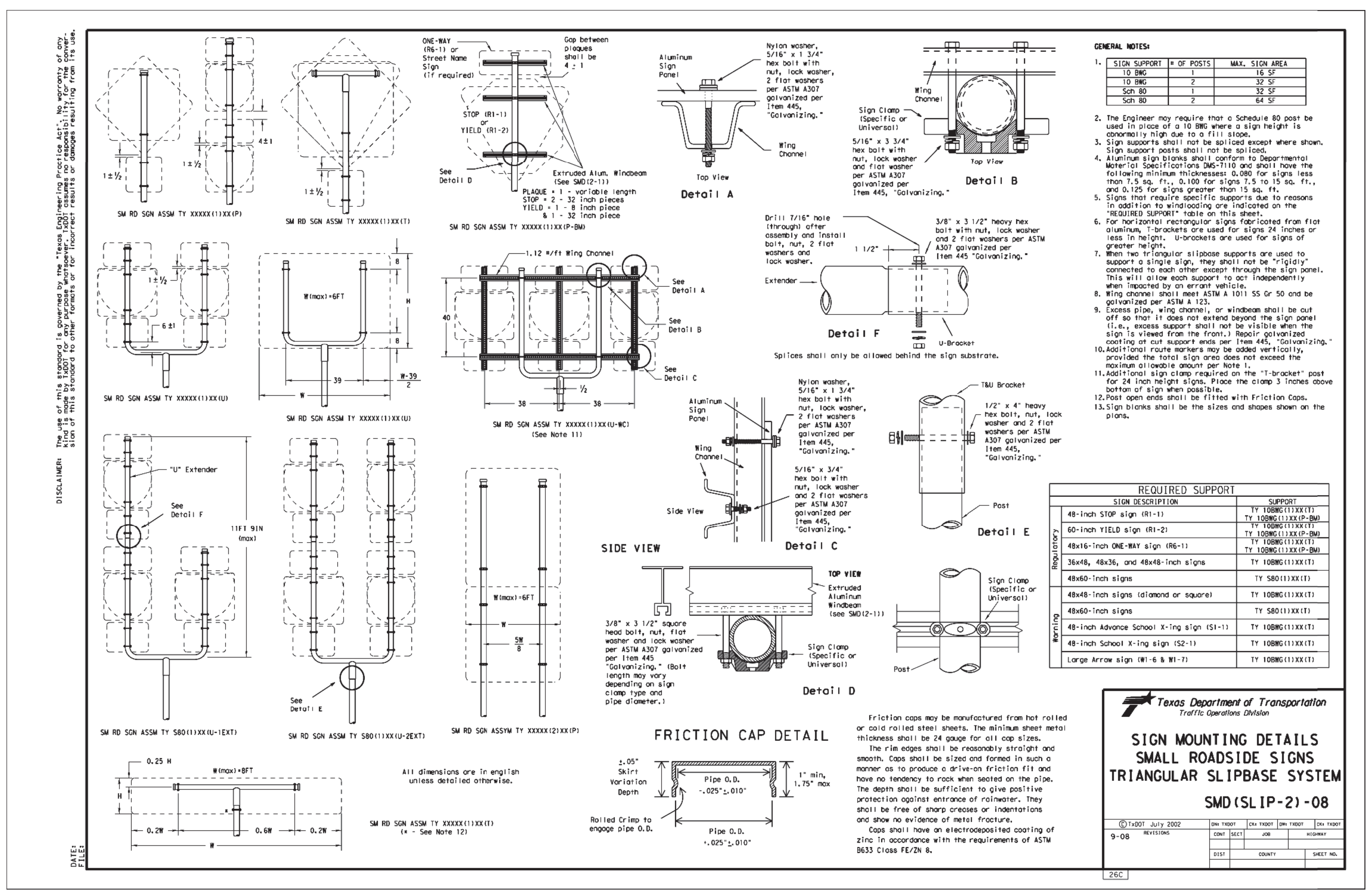
CUDE ENGINEERS
TBPELS No. 10048500

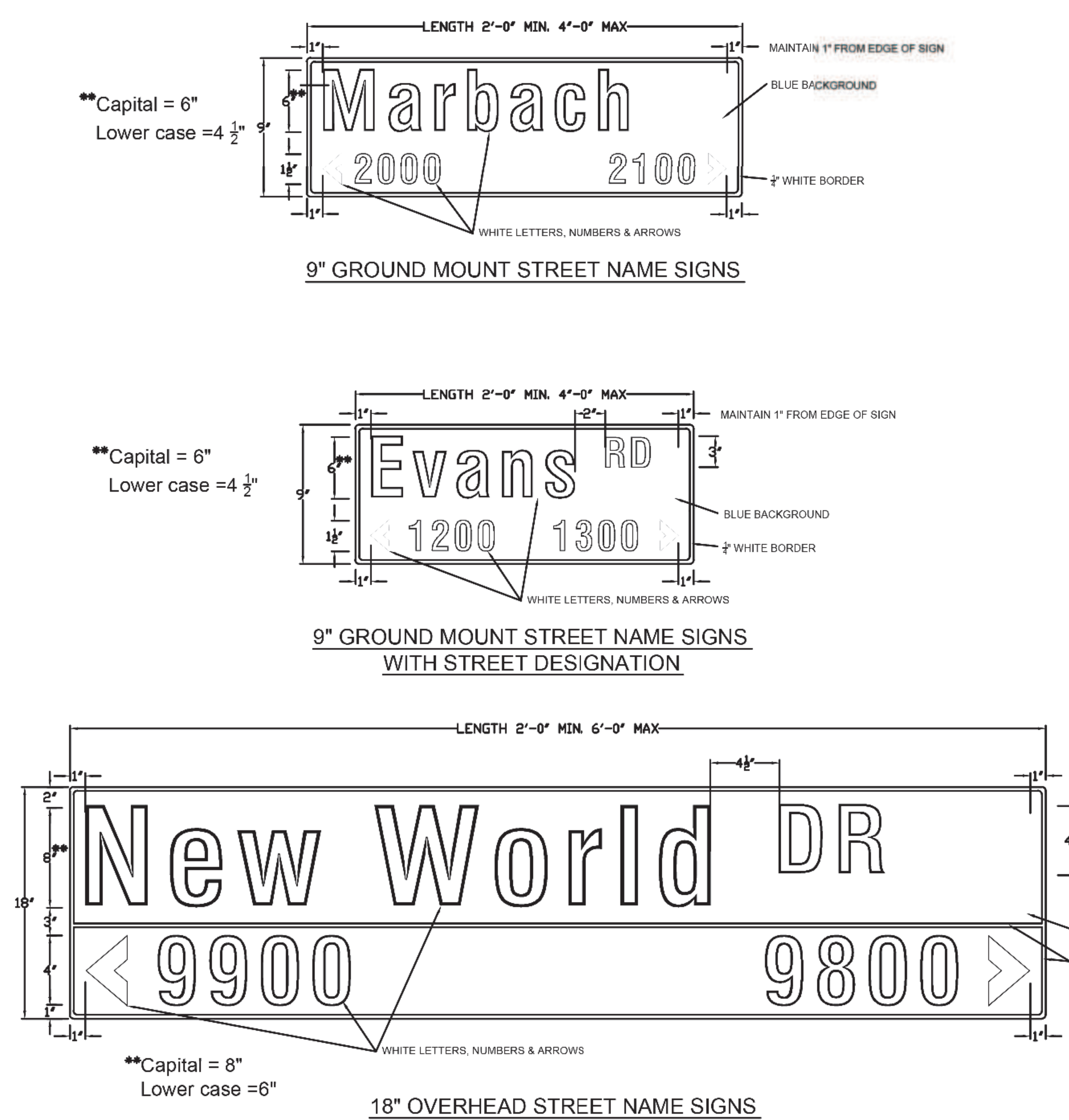
PLAT NO.
24-11800118

C8.01



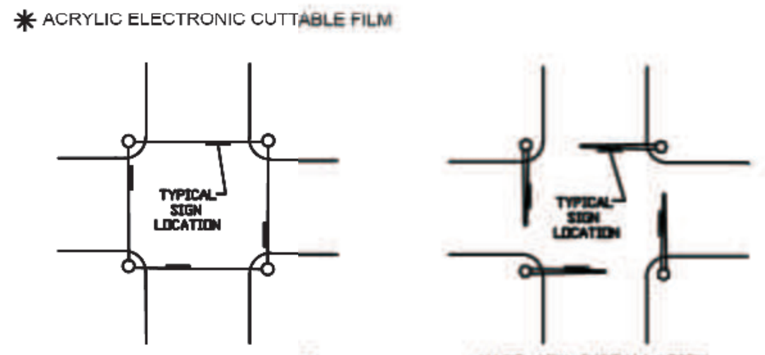






	18" OVERHEAD SIGN	9" GROUND MOUNT SIGNS
HEIGHT	18" (381 mm)	9" (228 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX. 1' (300mm) INCREMENTS OF LENGTH	24" (600 mm) MIN. 48" (1200 mm) MAX. 6" (150mm) INCREMENTS OF LENGTH
THICKNESS	0.125" (3 mm)	
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209 GOLD CHROMATE FINISH	
SIGN FACE MATERIALS	BLUE FILM ✱ OVER DIAMOND GRADE - ASTM Type XI Non-Fluorescent	BLUE FILM ✱ OVER HIGH INTENSITY PRISMATIC- ASTM Type IV
LEGENDS AND SYMBOLS	SERIES D, B OR C IF NAME OTHERWISE EXCEEDS MAXIMUM SIGN LENGTH	
COLOR	WHITE LEGEND ON BLUE BACKGROUND	
LETTER TRACKING	17% (USUAL) 10% (MIN.)	10%

✱ ACRYLIC ELECTRONIC CUTTABLE FILM



SIGN FACE MATERIALS SHALL CONFORM TO:

1. STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS & BRIDGES ON FEDERAL HIGHWAY PROJECTS - FP-03 U.S. CUSTOMARY UNITS SECTION 718
2. GENERAL SERVICES ADMINISTRATION FEDERAL SPECIFICATIONS L-S-300C
3. ASTM D 4956 - 09e1

INFRASTRUCTURE SERVICES DEPARTMENT PUBLIC WORKS DIVISION

STREET NAME SIGNING DETAILS

CUDEENGINEERS.COM
CUDE EST. 1980 ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

TXDOT & BEXAR COUNTY DETAILS - SIGN MOUNTING

DATE 04/22/2024
PROJECT NO. 03050.015
DRAWN BY RM / IV
CHECKED BY MAT/CJC

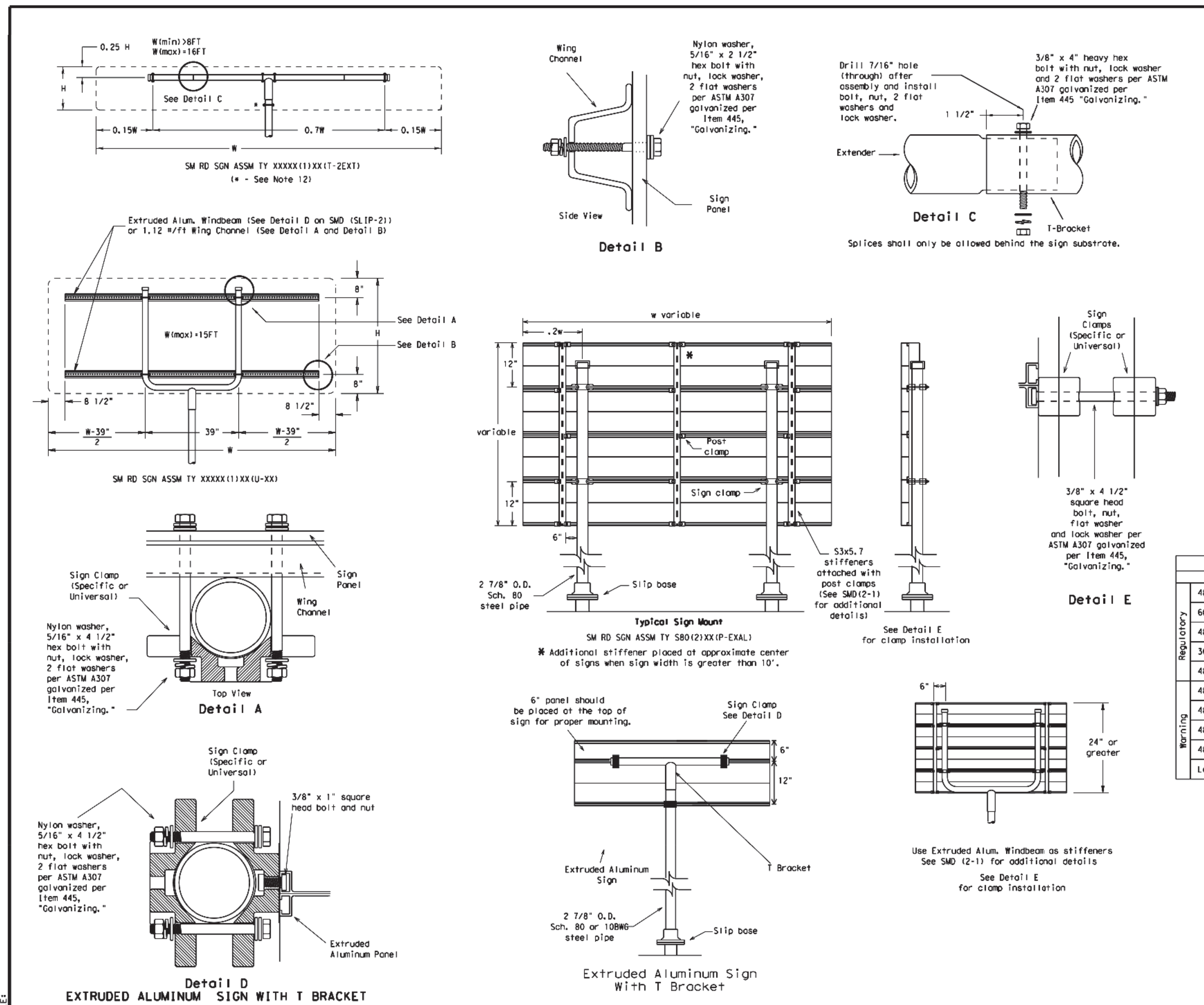
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

04/22/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED PROFESSIONAL ENGINEER

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO. 24-11800118

C8.D1



GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

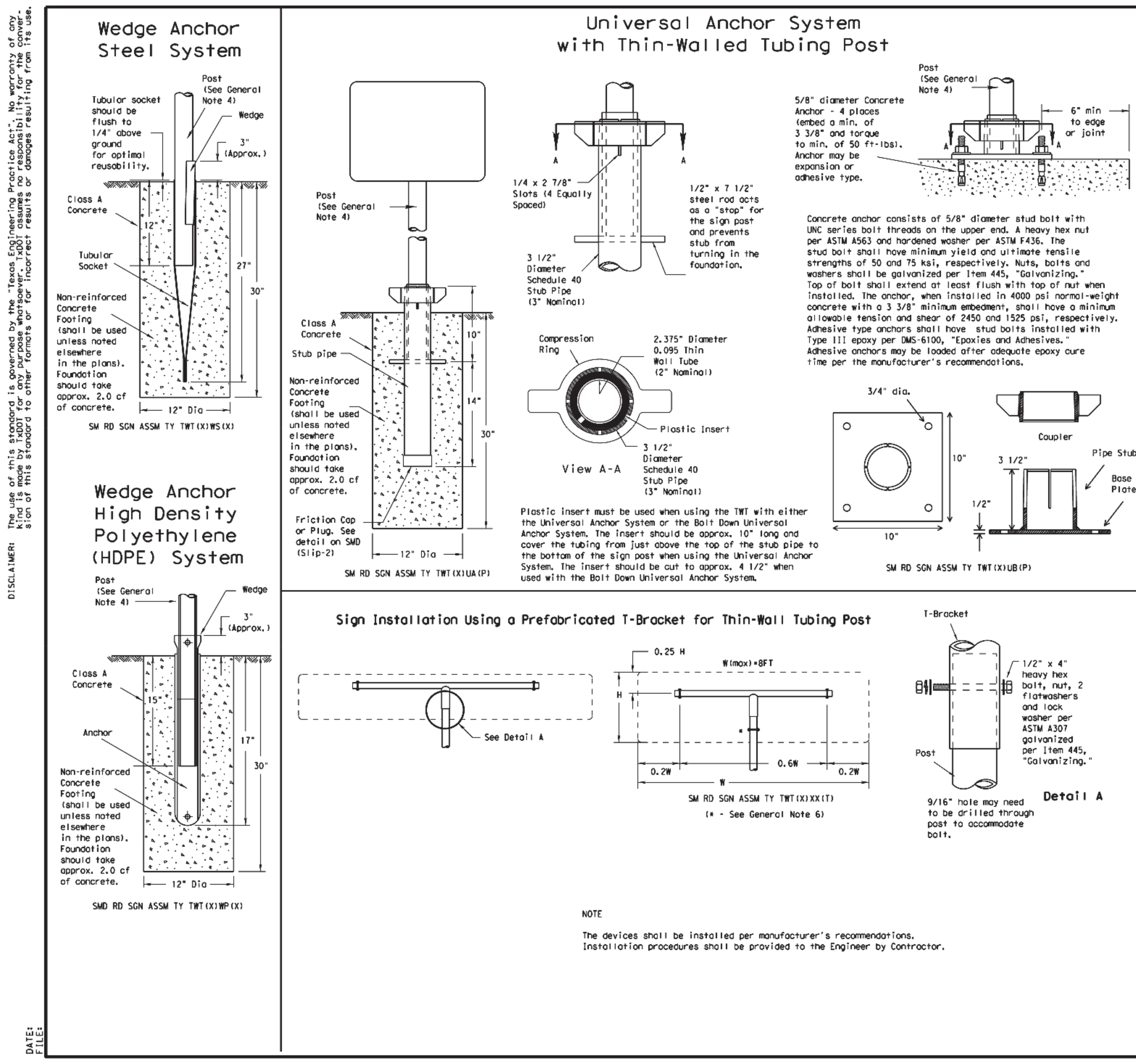
REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-3)-08

26D



GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

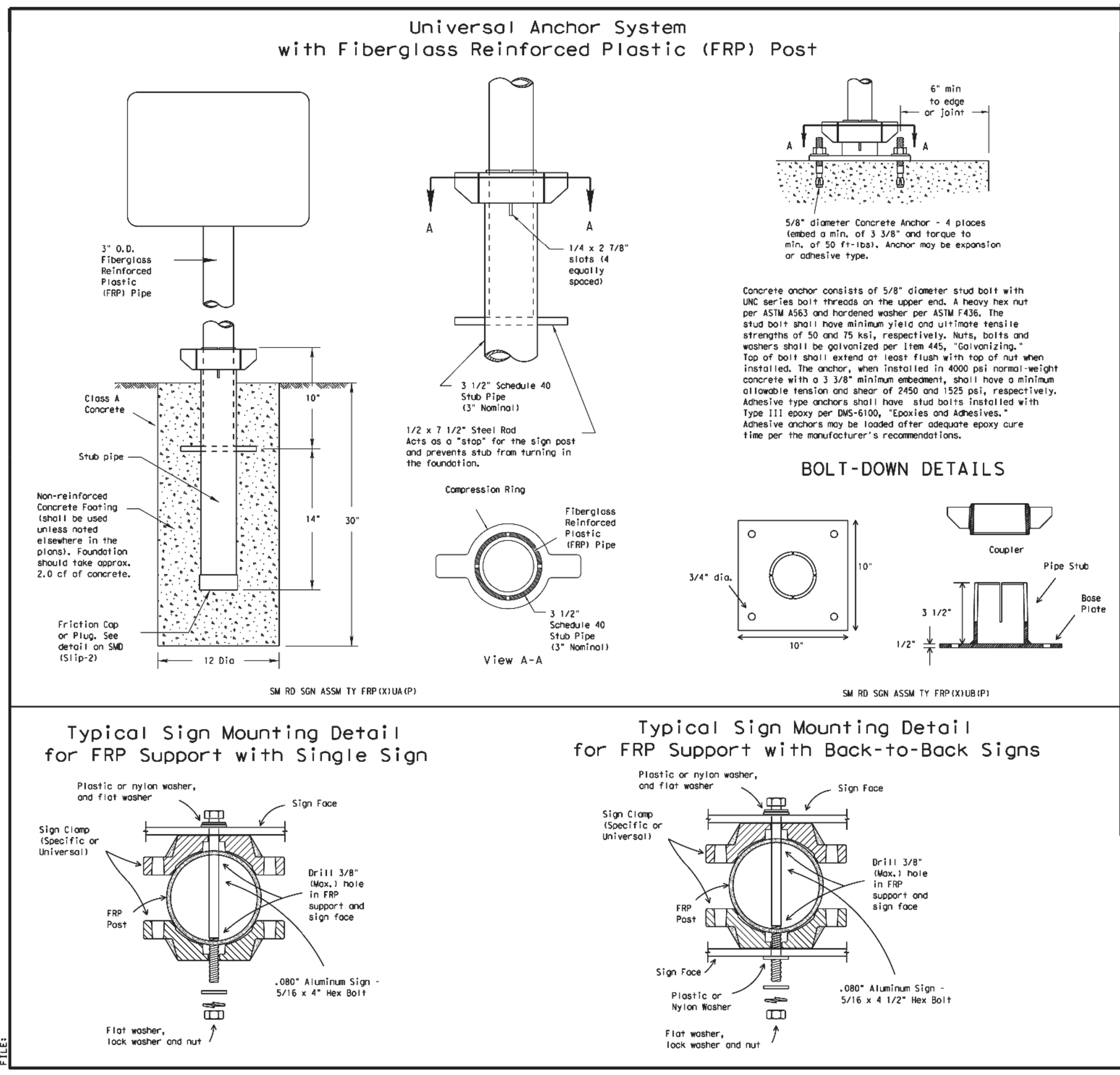
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
WEDGE & UNIVERSAL ANCHOR
WITH THIN WALL TUBING POST
SMD(TWT)-08

26E



GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
UNIVERSAL ANCHOR SYSTEM
WITH FRP POST
SMD(FRP)-08

26F

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

TXDOT DETAIL - SIGN MOUNTING

DATE
04/22/2024

PROJECT NO.
03050.015

DRAWN BY
RM / IV

CHECKED BY
MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

04/22/2024
STATE OF TEXAS
MATTHEW A. TRINKLE
147558
LICENSED
PROFESSIONAL ENGINEER

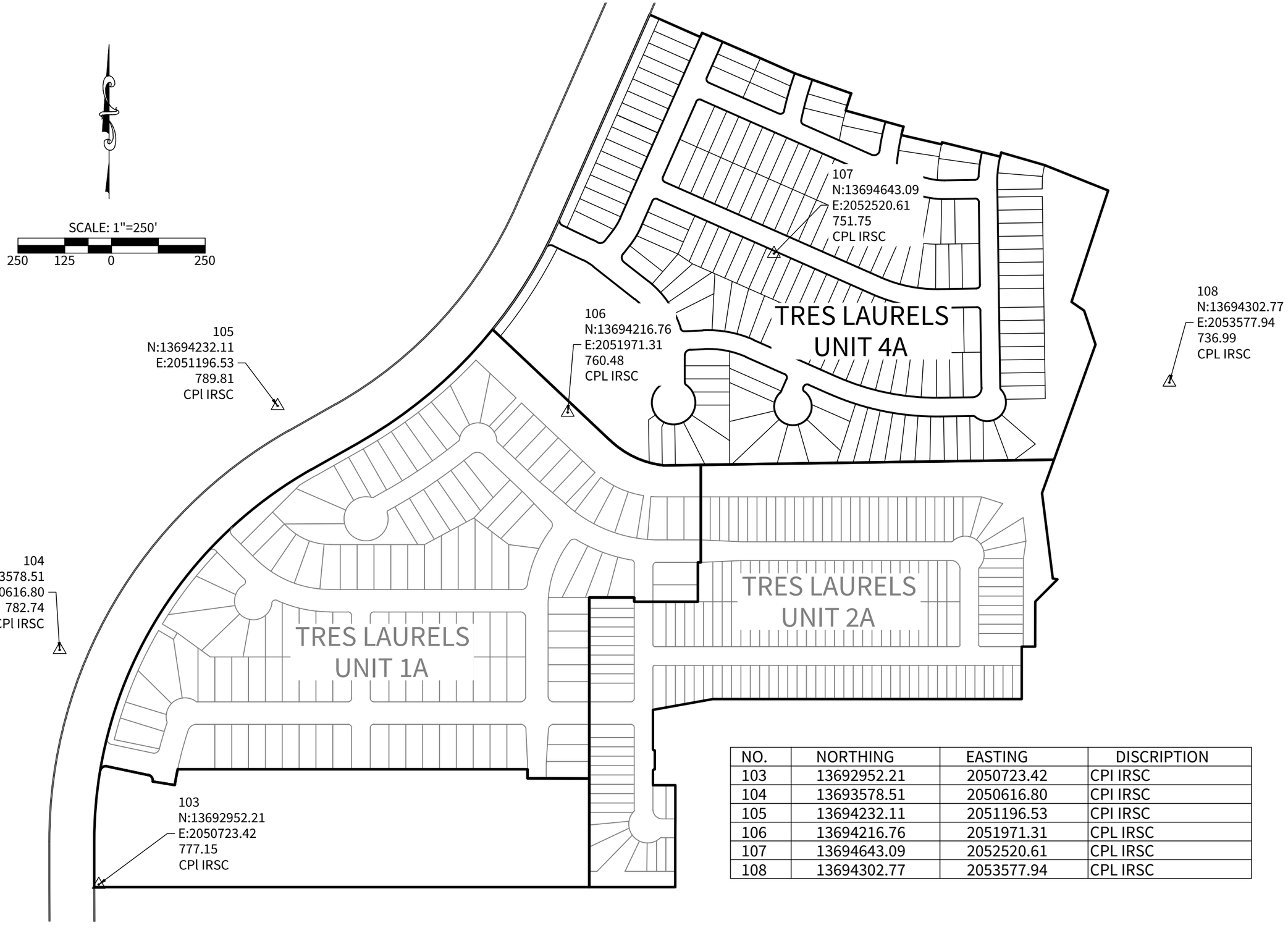
CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

C8.D2

CONTROL POINT EXHIBIT

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)



NO.	NORTHING	EASTING	DISCRIPTION
103	13692952.21	2050723.42	CPI IRSC
104	13693578.51	2050616.80	CPI IRSC
105	13694232.11	2051196.53	CPI IRSC
106	13694216.76	2051971.31	CPL IRSC
107	13694643.09	2052520.61	CPL IRSC
108	13694302.77	2053577.94	CPL IRSC

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

TRES LAURELS – UNIT 4A

CONTROL POINT EXHIBIT

DATE
07/02/2024

PROJECT NO.
03050.015

DRAWN BY
MAT

CHECKED BY
MAT

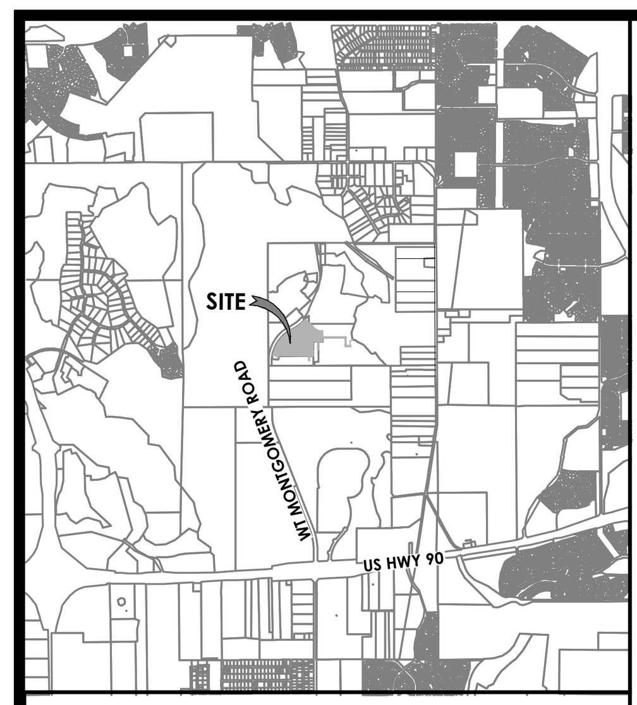
CUDE ENGINEERS
TBPE No. 455

EX-CP

P:\03050\015\2-DWG\1-Exhibits\2024-07-02 - Control Point Exhibit.dwg 2024/07/02 11:36am mtrinkle

CONSTRUCTION PERMITS

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)



LOCATION MAP

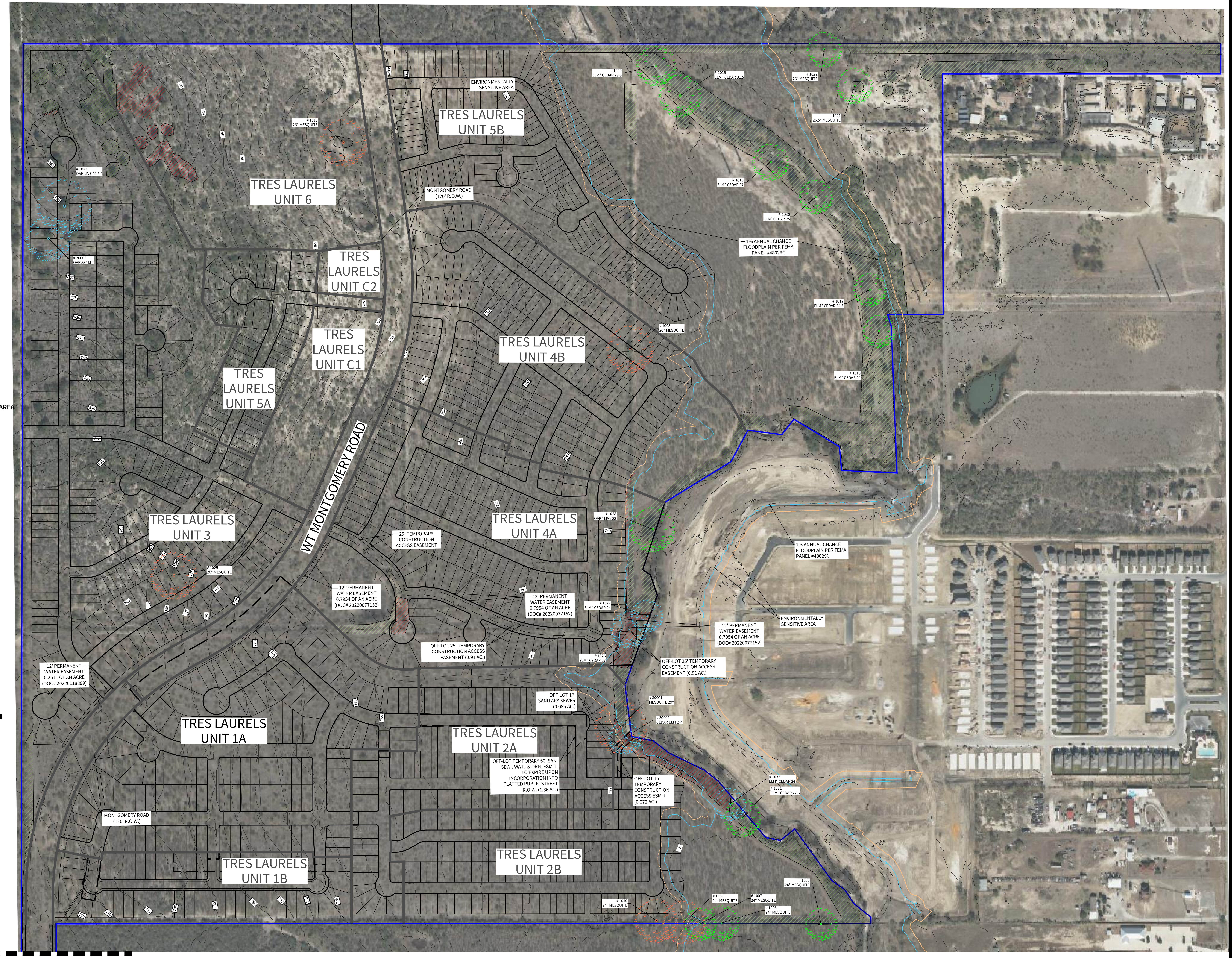
OWNER/DEVELOPER:
LENNAR HOMES
CONTACT PERSON: RICHARD MOTT
100 NE LOOP 410 SUITE 1155
SAN ANTONIO, TX 78216
TEL: (210) 403-6200

CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: CHRIS CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

SCALE: 1"=200'
200 100 0 200

LEGEND

- PROJECT BOUNDARY
- REMOVED CANOPY
- PRESERVED CANOPY
- 100-YEAR EFFECTIVE FLOODPLAIN
- 30' ENVIRONMENTALLY SENSITIVE AREA
- HERITAGE TREE TO BE PRESERVED
- HERITAGE TREE TO BE REMOVED
- EXEMPT TREE TO BE REMOVED
- 800 PROPOSED CONTOUR
- 800 EXISTING CONTOUR



MATCHLINE A

MATCHLINE A

DEVELOPMENT SERVICES TREE PROTECTION SECTION REVIEWED FOR COMPLIANCE

DEVELOPMENT SERVICES Tree Pre-Construction Meeting Required prior to Site Work

It shall be the responsibility of the permit holder to maintain a copy of the approved tree plans, approved tree permit and the conditions of approval readily available at all times.

Failure to schedule a fencing inspection prior to start of work may result in a stop Work order or a Penalty of $1,000.00 or both. UDC §35-523 (k)(2)

City of San Antonio Plan Reviewed
Development Services Dept

CUDEENGINEERS.COM
CUDE EST. 1980 ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

TRES LAURELS
TREE CANOPY PRESERVATION PLAN

DATE
03/25/2024
PROJECT NO.
03050.006
DRAWN BY
MAT/IRV/DAF
CHECKED BY
SPM/CJC

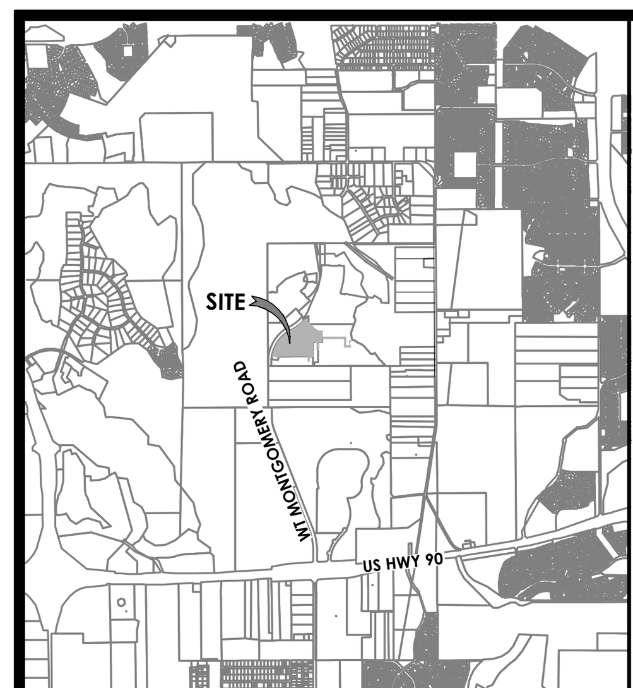
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

PLAT NO.
22-11800270

TPP-1

Xref .\00_map_location.dwg

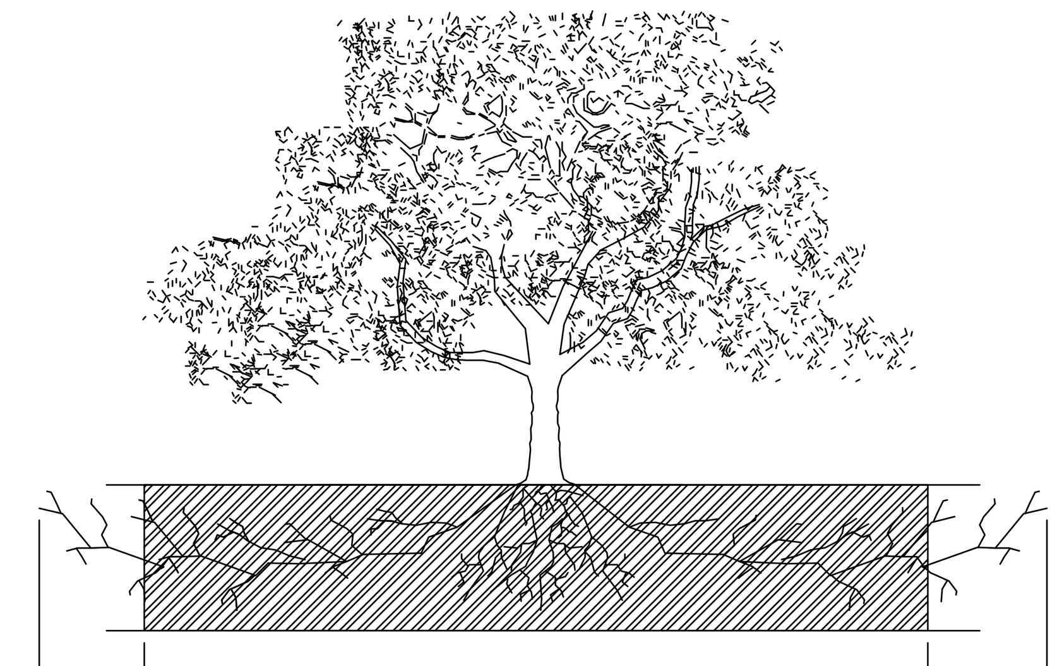


LOCATION MAP

OWNER/DEVELOPER:
MOSAIC LAND DEVELOPMENT, L.L.C.
CONTACT PERSON: BLAKE YANTIS
6812 WEST AVE., SUITE 100
SAN ANTONIO, TX 78213
TEL: (210) 247-8604

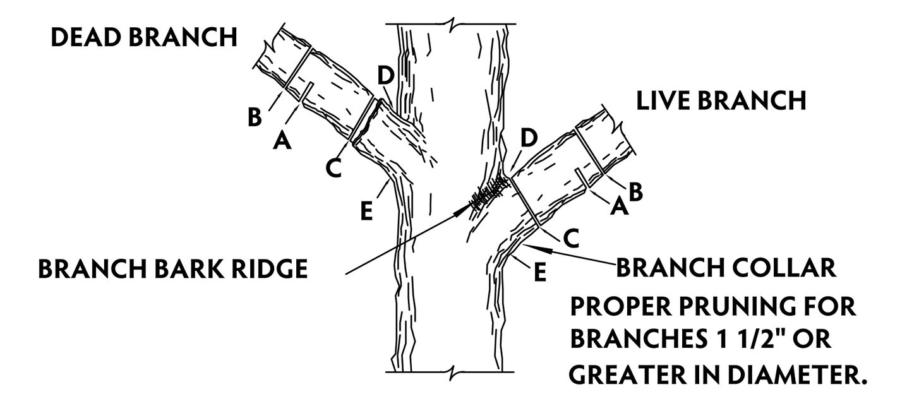
CIVIL ENGINEER:
M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: CHRIS CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

TREE CANOPY PRESERVATION REQUIREMENTS AND CALCULATIONS (RESIDENTIAL)	VALUE	UNIT	COMMENTS
Overall Preservation			
Total	1,017,680.00	Sq. Ft.	
Removed	130,627.00	Sq. Ft.	
Preserved	887,053.00	Sq. Ft.	87.16%
100 yr Floodplain			
Protected			
Total	608,941.00	Sq. Ft.	
Removed	45,146.00	Sq. Ft.	
Preserved	563,795.00	Sq. Ft.	92.59%
Required 80%		0.00%	Mitigation
Heritage			
Total	369.00	in.	
Removed	75.00	in.	
Preserved	294.00	in.	79.67%
Required 100%		20.33%	Mitigation
VARIANCE REQUIRED FOR MITIGATION IN FLOODPLAIN			
Enviromentally Sensitive Areas			
Protected			
Total	48,189.00	Sq. Ft.	
Removed	18,503.00	Sq. Ft.	
Preserved	29,686.00	Sq. Ft.	61.60%
Required 80%		18.40%	Mitigation
Heritage			
Total	24.00	in.	
Removed (Non-Exempt)	24.00	in.	
Preserved	-	in.	0.00%
Required 100%		100.00%	Mitigation
VARIANCE REQUIRED FOR MITIGATION IN ESA			
Outside of Floodplain			
Protected			
Total	360,550.00	Sq. Ft.	
Removed	66,978.00	Sq. Ft.	
Preserved	293,572.00	Sq. Ft.	81.42%
Required 35%		0.00%	Mitigation
Heritage			
Total	126.00	in.	
Removed (Non-Exempt)	73.50	in.	
Preserved	52.50	in.	41.67%
Required 100%		58.33%	Mitigation
PRESERVATION MITIGATION REQUIRED			
100 yr Floodplain - Protected Required Mitigation	-	Sq. Ft.	
100 yr Floodplain - Heritage Required Mitigation	75.00	in.	(removed)
	225.00	in.	(removed x 3)
Enviromentally Sensitive Areas - Protected Required Mitigation	8,866.00	Sq. Ft.	
Enviromentally Sensitive Areas - Heritage Required Mitigation	24.00	in.	(removed)
	72.00	in.	(removed x 3)
Outside of Floodplain - Protected Required Mitigation	-	Sq. Ft.	
Outside of Floodplain - Heritage Required Mitigation	74.00	in.	(removed)
	222.00	in.	(removed x 3)
Total - Protected Mitigation Required	**8,866.00**	**Sq. Ft.**	
**Assumed M-L trees from Appendix E	169.21	**in.**	(Sq. Ft. / 875)*16.7
Total - Heritage Mitigation Required	**519.00**	**in.**	
TOTAL MITIGATION REQUIRED	**688.21**	**in.**	
PRESERVATION MITIGATION PROVIDED			
Total Inches Planted	**2,976.00**	**in.**	
TOTAL MITIGATION (In.) FROM THE "TOTAL PLANTED TREES" TABLE			
Total Inches to be Paid	**-**	**in.**	**No payment is required based off mitigation.**
$	**-**		**($200 per inch)**
POST CONSTRUCTION TREE CANOPY REQUIRED (RESIDENTIAL)			
Total Area Outside of Floodplain	242.47	Ac.	
Number of Residential Dwellings	1,088	Dwellings	
Required Canopy (38%)	**4,013,557.42**	**Sq. Ft.**	
Preserved Canopy (ESA & Outside of Floodplain)	**323,258.00**	**Sq. Ft.**	
Preserved Heritage Canopy (ESA & Outside of Floodplain)	**1,100.00**	**Sq. Ft.**	
Required Canopy to be Planted	**3,689,199.42**	**Sq. Ft.**	
POST CONSTRUCTION TREE CANOPY REQUIRED (COMMERCIAL)			
Total Area Outside of Floodplain	8.00	Ac.	
Required Canopy (25%)	**87,120.00**	**Sq. Ft.**	
Preserved Canopy (ESA & Outside of Floodplain)		**Sq. Ft.**	
Required Canopy to be Planted	**87,120.00**	**Sq. Ft.**	
POST CONSTRUCTION TREE CANOPY MITIGATION PROVIDED			
Total Canopy Planted	**3,906,000.00**	**Sq. Ft.**	
TOTAL MITIGATION (SQ. FT.) FROM THE "TOTAL PLANTED TREES" TABLE			
Total Required Canopy	**3,776,319.42**	**Sq. Ft.**	
Canopy Mitigation	**-**	**Sq. Ft.**	
Total inches to be paid	**-**	**in.**	**No payment is required based off canopy requirements.**
$	**-**		**($200 per inch)**



(ROOT PROTECTION ZONE)

ROOT PROTECTION ZONE
THE ROOT PROTECTION ZONE IS A CIRCULAR AREA AROUND A TREE THAT IS BASED ON THE DIAMETER OF THE TREE. EACH 1 INCH DIAMETER OF THE TREE EQUALS 1 FOOT RADIUS FOR ROOT PROTECTION ZONE.

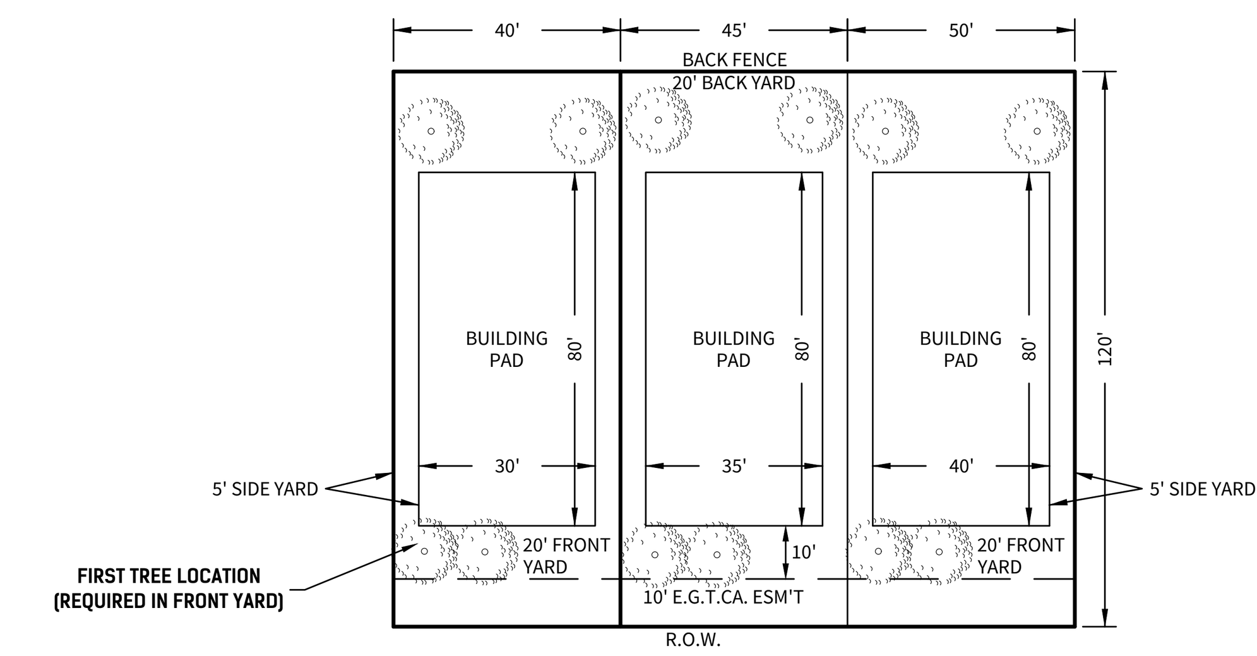


PROPER PRUNING FOR BRANCHES 1 1/2" OR GREATER IN DIAMETER.

NOTE: DO NOT CUT FROM D to E.

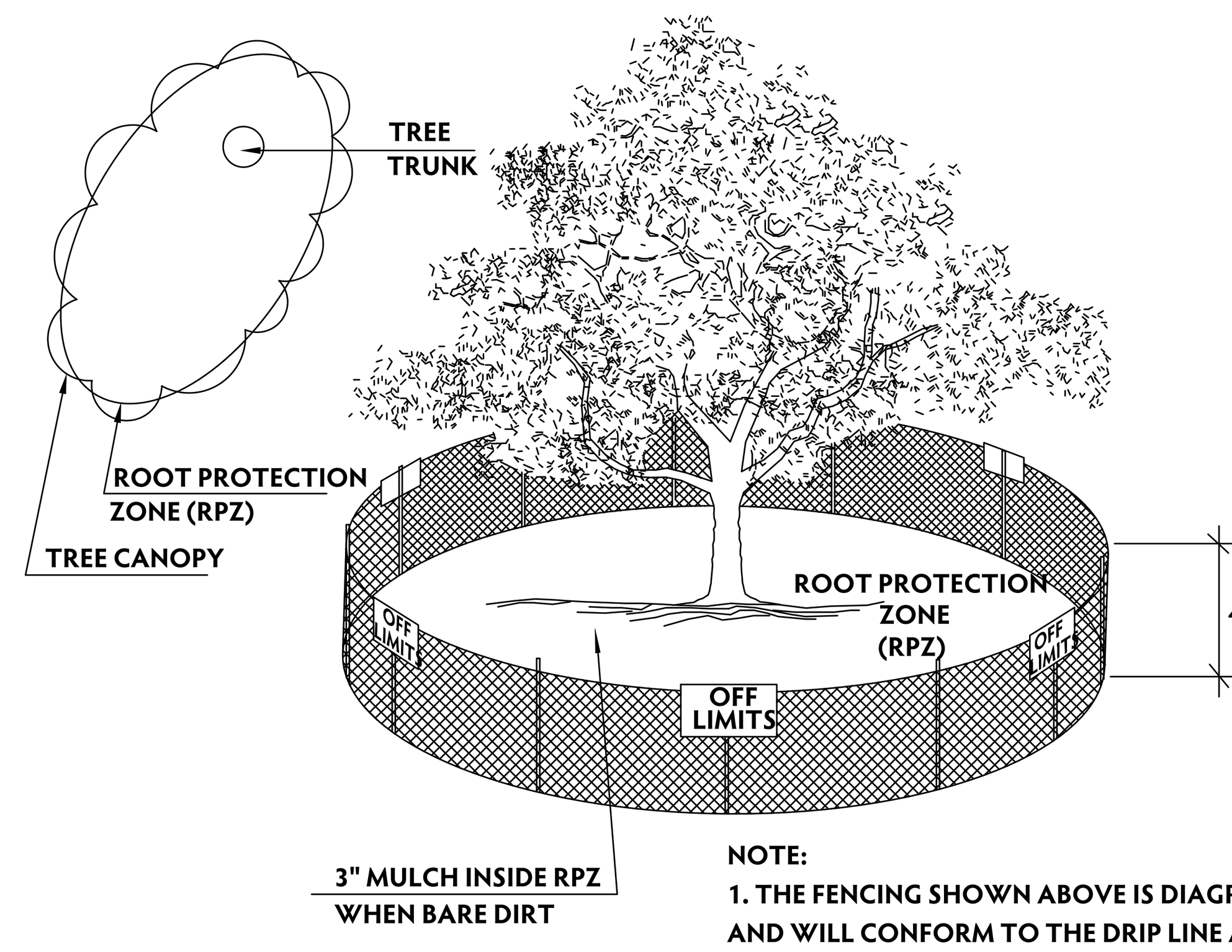
A. FIRST CUT - TO PREVENT THE BARK FROM BEING PEELED WHEN THE BRANCH FALLS.
B. SECOND CUT - TO REDUCE THE WEIGHT OF BRANCH.
C. FINAL CUT - ALLOW FOR HEALING COLLAR BUT NO STUBS
D. BRANCH RIDGES - INDENT PROPERLY BRANCH RIDGES WHICH ARE SITE FOR DECAY.

FOR OAKS ONLY: PAINT ALL WOUNDS OR CUTS WITH PRUNING PAINT WITHIN 20 MIN TO PREVENT THE SPREAD OF OAK WILT.



LOT PLANTING DETAIL

NOTES:
1. TREES MUST BE FROM THE CITY OF SAN ANTONIO PREFERRED PLANT LIST.
2. TWO TREES MINIMUM ARE REQUIRED TO BE PLANTED FOR EACH RESIDENTIAL LOT WITH ONE OF THOSE TREES REQUIRED TO BE PLANTED IN THE FRONT YARD.
3. TREES PLANTED IN THE SOUTH OR WEST OF PROPSED HOME SHALL RECEIVE ENERGY CREDIT PER UDC SECTION 35-523.



NOTE:
1. THE FENCING SHOWN ABOVE IS DIAGRAMATIC ONLY AND WILL CONFORM TO THE DRIP LINE AND LIMITED TO PROJECT BOUNDARY.
2. FOR ACCEPTABLE FENCING MATERIALS SEE SPECIFICATIONS.

1.1.2 LEVEL I & FENCE PROTECTION

N. T. S.

NOTES:
1. TRES LAURELS SUBDIVISION IS SUBJECT TO THE CITY OF SAN ANTONIO 2010 TREE ORDINANCE
2. NON-EXEMPT TREES ARE CLASSIFIED AS TREES LOCATED OUTSIDE EXEMPT AREAS (STREET R.O.W. & EASEMENTS) & ARE THE TREES USED IN CALCULATING MINIMUM PRESERVATION REQUIREMENTS PER THE 2010 TREE ORDINANCE.
3. ANY SUBSEQUENT NOTES DEALING WITH ROOT PROTECTION DO NOT APPLY TO RESIDENTIAL DEVELOPMENTS.
4. ALL EXISTING TREES DENOTED ON THIS PLAN TO BE PRESERVED AS SHOWN AND PROTECTED AT THE ROOT PROTECTION ZONE (RPZ). THE RPZ SHALL BE DETERMINED BY TREE SIZE (RECOMMENDED 12" RADIUS FROM TRUNK FOR EVERY 1" DIAMETER OF TRUNK AT 4.5' FROM GROUND) WITH A MINIMUM 5' DIAMETER FROM THE TRUNK.
5. A (CHAINLINK OR ORANGE MESH FENCE) BARRIER AROUND THE RPZ SHALL BE ERECTED AND MAINTAINED UNTIL CONSTRUCTION IS COMPLETED.
6. RPZ 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.
7. THE RPZ SHALL BE COVERED WITH 6" OF COARSE MULCH TO REDUCE MOISTURE STRESS.
8. ANY DAMAGE DONE TO EXISTING TREE CROWNS OR ROOT SYSTEMS SHALL BE REPAIRED IMMEDIATELY. ALL WOUNDS TO OAKS WILL BE PAINTED WITH PRUNING PAINT WITHIN 30 MINUTES AFTER DAMAGE. ROOTS EXPOSED DURING CONSTRUCTION OPERATIONS WILL BY CUT CLEANLY.
9. THE PROPOSED FINISH GRADE AND ELEVATION OF LAND WITHIN THE ROOT PROTECTION ZONE OF ANY TREE TO BE PRESERVED SHALL NOT BE RAISED OR LOWERED MORE THEN 3". WELLING AND RETAINING METHODS ARE ALLOWED OUTSIDE THE RPZ.
10. THE RPZ SHALL REMAIN PERVIOUS, I.E. GROUND COVER OR TURF AT COMPLETION OF LANDSCAPE DESIGN.
11. PROTECTED TREES SHALL BE PROTECTED UNTIL SUCH TIME AS THE CONCRETE WORK CAN BE STAKED TO DETERMINE ITS DISTANCE FROM SIGNIFICANT TREES. (IF FOUND THAT THE CONCRETE WORK WILL BE CLOSER THAN 5', THE CONTRACTOR WILL MEET WITH REPRESENTATIVES OF THE ENVIRONMENTAL REVIEW DEPARTMENT TO MINIMIZE IMPACT.)
12. CONTRACTOR TO UPDATE TREE PRESERVATION PLAN FOR CHANGES DURING CONSTRUCTION AND NOTIFY ENGINEER ACCORDINGLY. THE REVISED TREE PRESERVATION PLAN WILL BE RESUBMITTED AND APPROVED BY THE CITY OF SAN ANTONIO ARBORIST DEPARTMENT UPON FINAL ACCEPTANCE OF ALL SUBDIVISION IMPROVEMENTS.

DEVELOPMENT SERVICES
TREE PROTECTION SECTION
REVIEWED FOR COMPLIANCE

TRES LAURELS HERITAGE TREES

		FLOOD PLAIN		ESA			OUTSIDE OF FLOOD PLAIN		
POINT #	SPECIES	PRESERVE	REMOVE	PRESERVE	REMOVE	EXEMPT TO BE REMOVED VERY POOR CONDITION	PRESERVE	REMOVE	EXEMPT TO BE REMOVED VERY POOR CONDITION
1003	MESQUITE								26
1005	MESQUITE	24							
1006	MESQUITE	24							
1007	MESQUITE	24							
1008	MESQUITE								24
1010	MESQUITE								24
1013	MESQUITE								26
1015	ELM	31.5							
1016	ELM	27							
1017	ELM	24.5							
1018	ELM	24							
1021	MESQUITE						26.5		
1022	MESQUITE						26		
1023	OAK							40.5	
1025	MESQUITE								26
1026	ELM		27						
1027	ELM		24						
1028	OAK	33							
1029	ELM	29.5							
1030	ELM	25							
1031	ELM	27.5							
1032	ELM		24						
30001	MESQUITE					29			
30002	ELM				24				
30003	OAK							33	
TOTAL		**294**	**75**	**0**	**24**	**29**	**52.5**	**73.5**	**126**

TOTAL PLANTED TREES

Description	Number of Trees	Diameter (in.)	Required Diameter	Extra Diameter (in.)	Shade Value (Sq. Ft.)	Energy Credit	Total Planted Diameter (in.)	TOTAL MITIGATION (in.)	TOTAL MITIGATION (Sq. Ft.)
Required 2 trees per lot (NON-E.C.)	1,984	1.5	1.5	-	875.0	-	2,976	-	1,562,400.00
2 extra trees per lot (E.C.)	1,984	1.5	-	1.5	875.0	1.5	2,976	2,976	2,343,600.00
TOTAL	**3,968**						**5,952**	**2,976**	**3,906,000.00**

City of San Antonio
Plan Reviewed
Development Services Dept

CUDEENGINEERS.COM
CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

TRES LAURELS
TREE CANOPY PRESERVATION PLAN

DATE	02/28/2023
PROJECT NO.	03050.006
DRAWN BY	MAT/IRV/DAF
CHECKED BY	SPM/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

PLAT NO.
22-11800270

TPP-2

Permit Issuance Information

Report Date: 5/15/2024

Application No	TRE-APP-APP24-38800617
Permit No	TRE-PMT-24-38900617
Site Address	3411 GROSENBACHER RD, CITY OF SAN ANTONIO ETJ, TX 78245
Type of Record	Building/Permits/Tree Permit/Permit
Date Issued	05/15/2024
Record Status	Active
Primary Applicant	Cude Engineers
Scope of Work	PLAT-24-11800105 - Tres Laurels, Unit 2A Platting

Approval Comments

Completeness Review		Comments	Tree permit application submittal complete.

Permit Issuance Information

Report Date: 5/15/2024

Technical Review - Tree Land Development	Comments	***SCOPE OF WORK: PLATTING AND TREE REMOVAL FOR RESIDENTIAL DEVELOPMENT*** ***REFER TO TRE-APP-APP22-38801338 FOR OVERALL APPROVED TREE PRESERVATION PLAN***
		
		// STATUS: APPROVED 5.15.24 (UNIT 2A ONLY – 2010 TREE SURVEY METHOD)
		
		// PLEASE SEE COMMENTS/CONDITIONS BELOW:
		
		-(4)-1.5” CALIPER NATIVE MEDIUM TO LARGE SHADE TREES ARE REQUIRED PER LOT AT BUILDING STAGE FOR MITIGATION AND CANOPY COVER REQUIREMENTS. 2 OUT OF THE 4 TREES SHALL BE PLANTED ON THE SOUTH OR WEST SIDE OF BUILDING FOR ENERGY CONSERVATION CREDIT.
		-NO STREETSCSAPE OR TREE CANOPY BOND REQUIRED.
		-THIS SUBDIVISION IS SUBJECT TO A MASTER TREE PLAN (TRE-APP-APP22-38801338) WHICH REQUIRES COMPLIANCE BY THE OWNERS OF ALL PROPERTY WITHIN THE PLAT BOUNDARY, AND THEIR EMPLOYEES AND CONTRACTORS, AND SHALL BE BINDING ON ALL SUCCESSORS IN TITLE EXCEPT FOR OWNERS OF SINGLE-FAMILY

RESIDENTIAL LOTS SUBDIVIDED HEREUNDER FOR WHICH CONSTRUCTION OF A RESIDENTIAL STRUCTURE HAS BEEN COMPLETED. THE MASTER TREE PLAN IS ON FILE AT THE CITY OF SAN ANTONIO ARBORISTS OFFICE. NO TREES OR UNDERSTORY SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE CITY ARBORIST OFFICE PER 35-477(H).
-CONSTRUCTION ON INDIVIDUAL RESIDENTIAL LOTS OUTSIDE OF CITY LIMITS ARE REQUIRED TO SUBMIT A TREE PERMIT APPLICATION REFERENCING APPROVED TREE PRESERVATION PLAN TO VERIFY COMPLIANCE AT BUILDING STAGE. FAILURE TO DO SO COULD INCUR CESSATION OF ON-SITE CONSTRUCTION, ADDITIONAL MITIGATION, AND/OR WORK WITHOUT PERMIT PENALTIES.
-PRIOR TO COMMENCEMENT OF ANY ACTIVITIES REQUIRING A TREE PERMIT, THE APPLICANT SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY ARBORIST TO REVIEW PROCEDURES FOR PROTECTION AND MANAGEMENT OF ALL SIGNIFICANT, HERITAGE OR MITIGATION TREES (CAN BE SCHEDULED WITH TREE FENCING INSPECTION). INSPECTIONS CAN BE

SCHEDULED ONLINE THROUGH ACCELA.
-IT SHALL BE THE RESPONSIBILITY OF THE PERMIT HOLDER TO MAINTAIN A COPY OF THE APPROVED TREE PLANS, APPROVED TREE PERMIT AND THE CONDITIONS OF APPROVAL IMPOSED BY THE CITY ARBORIST READILY AVAILABLE AT THE SITE AT ALL TIMES DURING WHICH AUTHORIZED WORK IS IN PROGRESS.
ALL OFFSITE STAGING, STORAGE, PROJECT TRAILERS, EMPLOYEE PARKING, ETC. IS REQUIRED APPLY FOR A TEMPORARY USES APPLICATION AND TO COMPLY WITH THE TERMS AND CONDITIONS OF THE APPROVED TREE PERMIT.
-**FAILURE TO SCHEDULE A FENCING INSPECTION PRIOR TO START OF WORK MAY RESULT IN A STOP WORK ORDER OR A PENALTY OF $1000.00 OR BOTH.
- A DO NOT RECORD IS PLACED ON THIS PLAT. THE APPLICANT/OWNER IS RESPONSIBLE FOR SCHEDULING A TREE FINAL INSPECTION PRIOR TO PLAT RECORDATION TO ENSURE THE PROJECT MEETS THE TERMS AND CONDITIONS OF APPROVAL PER 35-523. MUST SCHEDULE AND PASS FINAL TREE INSPECTION AFTER OTHER DISCIPLINE HOLDS ARE REMOVED AND/OR WITHIN THREE (3) WEEKS PRIOR TO RECORDATION.

SCHEDULE VIA BUILD SA.

- TREE PLANTING SOIL REQUIREMENT NOTE: PER 35-523(M)(7), ALL TREE PLANTING SUBJECT TO SECTION 35-523(M) SHALL BE REQUIRED TO BE PLANTED IN SOIL THAT IS SUITABLE FOR ESTABLISHING AND SUSTAINING THE PLANTINGS, IN ADDITION TO CONTAINING SUITABLE SOIL PARTICLE SIZE AND DEPTH OF SOIL ZONE, THE SOIL MUST CONTAIN SUFFICIENT ORGANIC MATTER AND NUTRIENTS. TESTING AND CONFIRMATION BY A LANDSCAPE ARCHITECT, OR A TEXAS LICENSED SOIL TESTING FIRM SHALL BE COMPLETED TO ENSURE THE SOILS ARE SUITABLE. IN LIEU OF CONFIRMATION BY A LANDSCAPE ARCHITECT, OR A TEXAS LICENSED SOIL TESTING FIRM, SOIL MAY BE AMENDED WITH COMPOST BY ADDING THREE (3) INCHES OF COMPOST BLENDED INTO EVERYONE (1) FOOT OF SOIL. FOR COMPLETE SOIL REPLACEMENT, SUCH AS TREE PLANTINGS, AN AMOUNT OF TWENTY-FIVE (25) PERCENT COMPOST MAY BE ADDED TO SEVENTY-FIVE (75) PERCENT NATIVE SOIL.

// NOTE: APPLICATION IS FOR PLATTING AND TREE REMOVAL PURPOSES. TREE REVIEW APPROVAL IS FOR TREE REMOVAL

Permit Issuance Information

Report Date: 5/15/2024

WITHIN UNIT 2A ONLY. ANY SITE WORK OR TREE REMOVAL OUTSIDE OF UNIT 2A SHALL REQUIRED A SEPARATE TREE APPLICATION BE SUBMITTED AND APPROVED PRIOR TO START OF WORK.

Required Inspections	Inspection Status
Tree - Fencing	Pending
Tree - Fencing Follow Up	Pending
Tree - Final	Pending
Tree - Pre-Construction Meeting	Pending

Related Records

(This is other Permits Created from the Applications, Amendments etc)

Record Number	Record Type	Status
LAND-PLAT-24-11800105	Major Plat	Under Review
TRE-APP-APP22-38801338	Tree Affidavit/Permit Application	Issued

CPS ELECTRIC OHE/URD DESIGN

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)

Tres Laurels Unit 4A

N

PG NO.1

ALL ELECTRIC

Average Living Space	2800	TRES LAURELS UNIT 4A			
# OF HOMES	TRANSFORMER KVA NAMEPLATE	TOTAL KVA		MAX DISTANCE 3/0	MAX DISTANCE 4/0
1	25	23		165	305
2	50	41		90	170
3	50	57	DO NOT USE	0	120
4	75	72		0	0
5	75	86	DO NOT USE	0	0
6	100	99		0	0
7	100	111	DO NOT USE	0	0
8	0	0		0	0
9	0	0		0	0
10	0	0		0	0
11	0	0		0	0
12	0	0		0	0

Red Loop		
Xfmr Size	QTY	Total
50kva	0	0
75kva	8	600
100kva	10	1,000
Total Xfmr KVA Used=1,600		

Purple Loop		
Xfmr Size	QTY	Total
50kva	0	0
75kva	4	300
100kva	13	1,300
Total Xfmr KVA Used=1,600		

- = Transformer
- = Pull Box
- = Fire Hydrant
- = SE6
- = Sewer Hole
- = Streetlight
- = New Pole
- = Replace/Upgrade Pole
- = Remove Pole

Set Poles 14' from Lot#17 PL

For Future Use

Placed on a double water

Placed on a double water

Placed on a double water

Curb Inlet/Drain crossing:
-add water easement to plat (5'?)
-Verify depth of drain
-Trench at 8'

Curb Inlet/Drain crossing:
-add water easement to plat (5'?)
-Verify depth of drain
-Trench at 8'

Reference BCA#181230 and WR#40788468 for DP Comments and OH Route

Existing 12' permanent water easement and water line

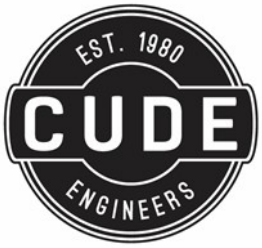
Sewer Line

Sewer crossing: Verify depth

OPEN POINT LA-SW

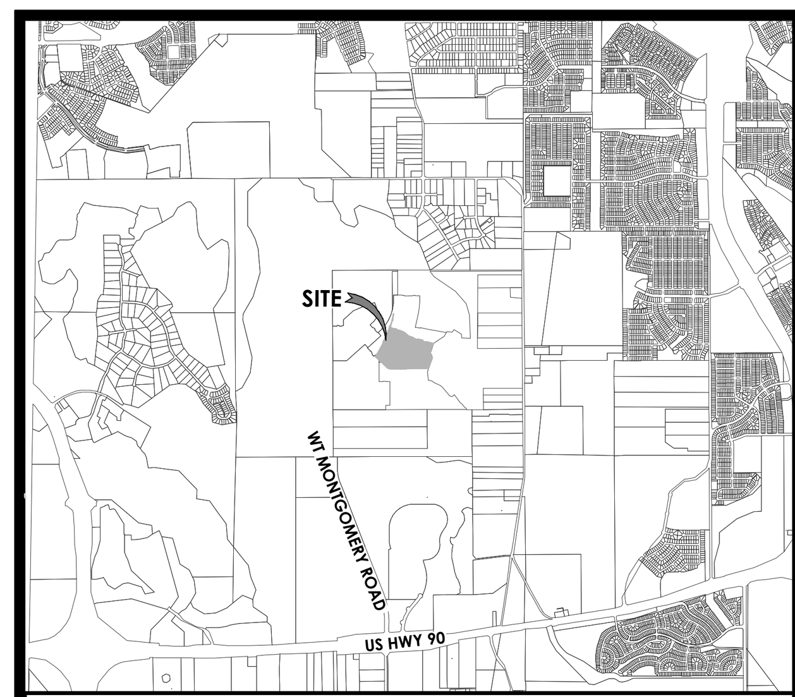
MONTGOMERY RD
RANGER OAK RIDGE
WINDING OAK RIDGE
CEDARWOOD COVE
ACACIA RIDGE
CENTURY TREE DR
RED OAK BEND
BURGES OAK DR
BAPTIST OAK DR
POTRANCO CR.
LAGUNA AZUL
MONTE AZUL
LAS RANAS
SCORZA
TORREBLANCA
LOURDES
SAYULITA
KETTLE RIVER
SAMPSON CREEK
MULBERRY CREEK
ANGUS CREEK
PEASE RIVER
HOLSTEIN COVE

TRES LAURELS UNIT 1A
TRES LAURELS UNIT 2A
STONEY CREEK SUBDIVISION UNIT 3
STONEY CREEK SUBDIVISION UNIT 4
STONEY CREEK SUBDIVISION UNIT 1



CONDUIT PLAN

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)



LOCATION MAP
N.T.S.

OWNER/DEVELOPER:

LENNAR HOMES OF TEXAS LAND
ANDCONSTRUCTION, LTD.
A TEXAS LIMITED PARTNERSHIP
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT: CHRIS CHAFFEE, P.E.
4122 POND HILL RD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951

SCALE: 1"=60'
0 60 120

NOTE:

THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

AT&T AND TIME WARNER CABLE LINES TO GO INTO JOINT TRENCH WITH C.P.S. ENERGY
LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.

TYPICAL UTILITY CROSSINGS WILL HAVE
2 - 6" SCH 80 PVC CONDUIT WITH SWEEPS,
2 - 4" SCH 40 PVC CONDUIT WITH SWEEPS,
THE TOTAL AMOUNT OF CONDUIT TO BE USED
WILL BE DETERMINED DURING CONSTRUCTION.

TYPICAL IRRIGATION CROSSING WILL HAVE
3 - 4" SCH 40 PVC CONDUIT WITH SWEEPS,

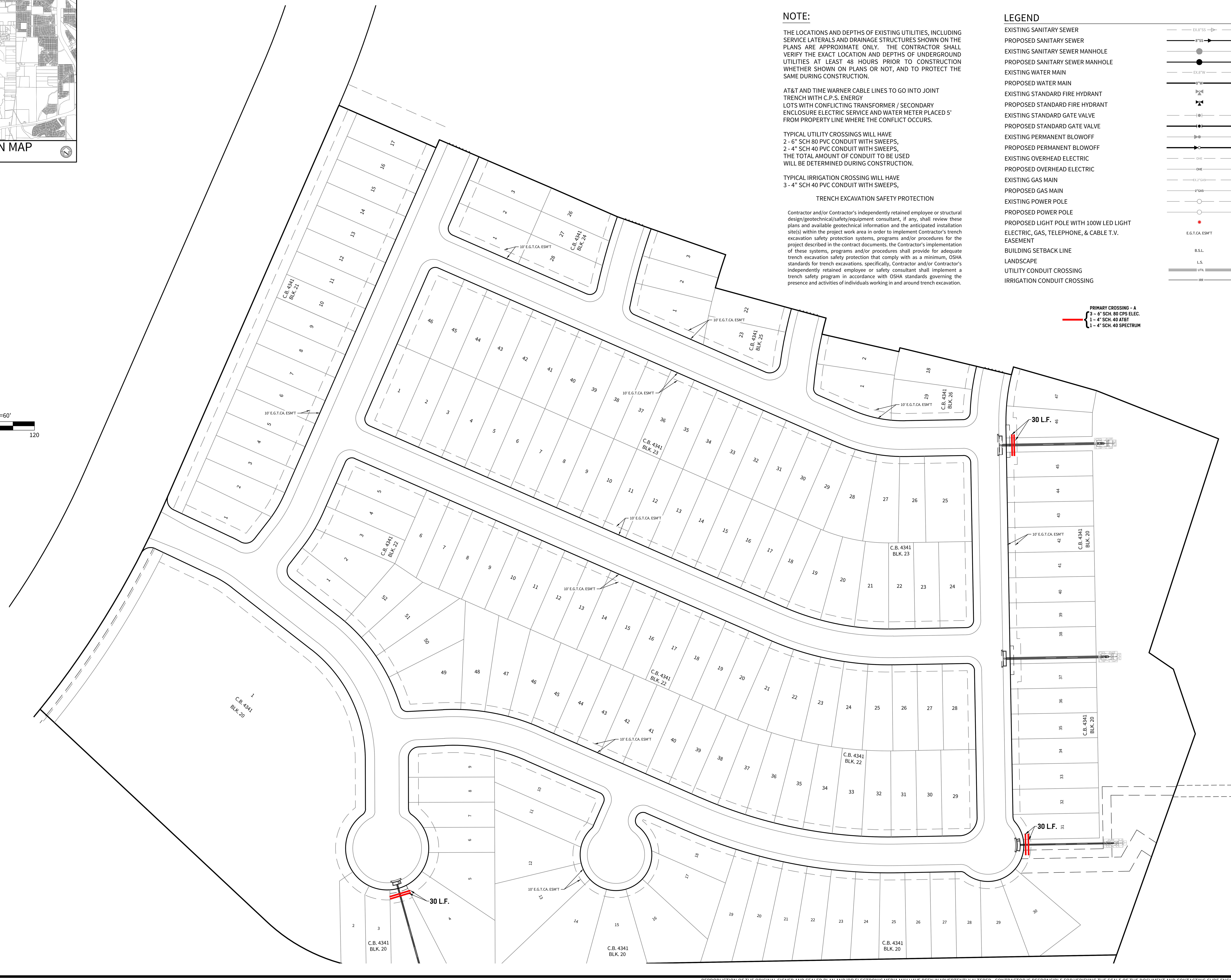
TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. the Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that comply with as a minimum, OSHA standards for trench excavations. specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.

LEGEND

EXISTING SANITARY SEWER	EX.8"SS
PROPOSED SANITARY SEWER	8"SS
EXISTING SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER MANHOLE	
EXISTING WATER MAIN	EX.8"W
PROPOSED WATER MAIN	8"W
EXISTING STANDARD FIRE HYDRANT	
PROPOSED STANDARD FIRE HYDRANT	
EXISTING STANDARD GATE VALVE	
PROPOSED STANDARD GATE VALVE	
EXISTING PERMANENT BLOWOFF	
PROPOSED PERMANENT BLOWOFF	
EXISTING OVERHEAD ELECTRIC	OHE
PROPOSED OVERHEAD ELECTRIC	OHE
EXISTING GAS MAIN	EX.2"GAS
PROPOSED GAS MAIN	2"GAS
EXISTING POWER POLE	
PROPOSED POWER POLE	
PROPOSED LIGHT POLE WITH 100W LED LIGHT	
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T
BUILDING SETBACK LINE	B.S.L.
LANDSCAPE	L.S.
UTILITY CONDUIT CROSSING	UTIL
IRRIGATION CONDUIT CROSSING	IRR

PRIMARY CROSSING – A
3 ~ 6" SCH. 80 CPS ELEC.
1 ~ 4" SCH. 40 AT&T
1 ~ 4" SCH. 40 SPECTRUM



CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951

TRES LAURELS UNIT 4A

CONDUIT PLAN

DATE	07/02/2024
PROJECT NO.	03050.015
DRAWN BY	RM / IV
CHECKED BY	MAT/CJC

REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

CUDE ENGINEERS
TBPELS No. 10048500

PLAT NO.
24-11800118

E1

DIGITAL FILES

M.W. CUDE ENGINEERS, L.L.C 4122 Pond Hill Road, Suite 101 San Antonio, Texas 78231 210.681.2951 (tel) 210.523.7112 (fax)