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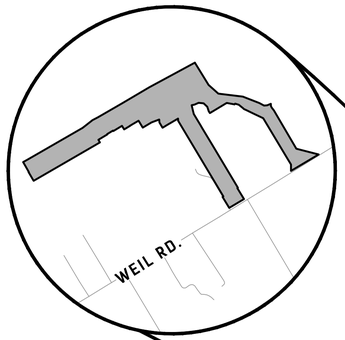

LOCATION MAP

VICINITY MAP

GRACE VALLEY RANCH
PHASE 6

CONSTRUCTION PLANS

DEVELOPER:

LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.
CONTACT: RICHARD MOTT, P.E.
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
TEL: (210) 403-6282

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

DRAWN BY	DATE	PLAT NO.
AC/AG/BK/SG/RB/JF	05/06/2025	
CHECKED BY	**PROJECT NO.**	**CUDE ENGINEERS**
KYLE HUDEK, P.E.	03346.008	TBPE No. 455 TBPLS No. 10048500

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

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

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

STREET AND DRAINAGE GENERAL NOTES:

1. ALL WORK IS TO BE INSTALLED IN ACCORDANCE WITH STANDARDS OF THE CITY OF SANTA CLARA MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT WILL CONFORM TO APPLICABLE CITY OF SANTA CLARA SUBDIVISION REGULATIONS AND, STANDARD SPECIFICATIONS AND DETAILS.

2. FOR ALL REFERENCES TO THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT), THE CONTRACTOR SHALL SEE THEIR CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES, WHICH IS ALSO LOCATED AT WWW.TXDOT.GOV.

3. ALL CONCRETE SHALL BE AS DETAILED ON THE PLAN SHEETS AND MEET MATERIAL REQUIREMENTS OF THE CITY OF SANTA CLARA.

4. ALL REINFORCING STEEL SHALL BE GRADE 60, MEET THE MATERIAL AND CONSTRUCTION REQUIREMENTS OF THE CITY OF SANTA CLARA.

5. CONCRETE CURING SHALL BE WITH AN IMPERVIOUS MEMBRANE APPLICATION AND SHALL MEET THE MATERIAL AND APPLICATION REQUIREMENTS OF THE CITY OF SAN ANTONIO'S "MEMBRANE CURING" AND BE LISTED ON THE GUADALUPE COUNTY APPROVED LIST OF SUPPLIERS IN ADDITION TO THE CONTRACTOR APPLYING THE CURING COMPOUND THEY ARE TO INSTALL CONTRACTION/EXPANSION JOINTS ON CONCRETE WORK.

6. ALL CONCRETE CONSTRUCTION AND FINISHING SHALL MEET THE REQUIREMENTS OF THE CITY OF SANTA CLARA.

7. PRIOR TO THE COMMENCEMENT OF ANY WORK, THE COUNTY SHALL ATTEND A PRECONSTRUCTION MEETING INCLUDING (BUT NOT LIMITED TO: THE CITY, ENGINEER, CONTRACTOR, DEVELOPER'S INSPECTION REPRESENTATIVE, AND DEVELOPER'S CONSTRUCTION MATERIAL TESTING REPRESENTATIVE.

8. DURING CONSTRUCTION, NOTIFY THE COUNTY AT CONSTRUCTION@CO.GUADALUPE.TX.US AT LEAST **48 HOURS** IN ADVANCE OF ANY WORK TO BE PERFORMED AFFECTING SUBGRADE, BASE, OR PAVEMENT INCLUDING BACKFILL OF ANY PROPOSED UTILITIES UNDERNEATH THE PAVEMENT AND FILL AREAS UPON WHICH PAVEMENT IS PROPOSED TO BE PLACED. SUCH NOTIFICATION IS ALSO REQUIRED BEFORE IMPLEMENTING ANY APPROVED TRAFFIC CONTROL PLANS ON EXISTING COUNTY MAINTAINED ROADS. FULL CLOSURE OF COUNTY ROADS REQUIRES AT LEAST **ONE MONTH** ADVANCE NOTICE AND IS SUBJECT TO THE DISCRETION OF THE COUNTY ENGINEER AND POSSIBLE APPROVAL BY GUADALUPE COUNTY COMMISSIONERS COURT PER TRANSPORTATION CODE, CHAPTER 251.

9. DURING CONSTRUCTION, PROVIDE ALL INSPECTION AND TESTING REPORTS TO THE COUNTY AT CONSTRUCTION@CO.GUADALUPE.TX.US AS SOON AS AVAILABLE FOR IDENTIFICATION AND CORRECTION OF ANY EMERGING DEFICIENCIES.

10. PROVIDE AS-BUILT DRAWINGS WITHIN **10 BUSINESS DAYS** OF THE COMPLETION OF CONSTRUCTION.

11. GUADALUPE COUNTY DOES NOT MAINTAIN SIDEWALKS, CURB AND GUTTER, CURB RAMPS, PAVERS, LUMINAIRES, STORM SEWER OR DETENTION APPURTENANCES.

12. MANHOLES SHALL BE BROKEN BELOW THE FINISH GRADE LEVEL UNTIL THE BASE IS COMPLETED AND THEN RESTORED.

13. THE ENGINEER WILL STAKE THE STREET ONE TIME ONLY AND FURNISH CUT SHEETS TO THE STREET CONTRACTOR: ANY CONSTRUCTION STAKES REMOVED OR DESTROYED BY THE CONTRACTOR OR HIS EMPLOYEES WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

14. AN INDEPENDENT TESTING LABORATORY APPROVED BY THE CITY OF SANTA CLARA SHALL PERFORM ALL "FIELD AND LABORATORY TESTING." THE CITY REQUIRES ALL INSPECTION AND/OR TESTING FIRMS TO BE ACCREDITED, QUALIFIED, AND IN COMPLIANCE WITH THE REQUIREMENTS OF ASTM E329, "STANDARD SPECIFICATION FOR AGENCIES ENGAGED IN CONSTRUCTION INSPECTION AND/OR TESTING." FIRMS MUST PRESENT A COPY OF THEIR CURRENT, OFFICIAL ACCREDITATION BY THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA) OR THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) AND CURRENT AMRL AND CCRL PROFICIENCY RESULTS. THE FIRMS SHALL BE ACCREDITED IN ALL MATERIAL TEST PROCEDURES REQUIRED TO BE PERFORMED FOR EACH PROJECT.

15. THE DEVELOPER WILL HIRE A THIRD PARTY FOR CONSTRUCTION MATERIAL TESTING IN WHICH THE CONTRACTOR WILL REQUIRE TO COORDINATE AND PROVIDE NECESSARY INFORMATION TO THEM.THE FOLLOWING TEST SCHEDULE SHALL BE ADHERE TO:

    A. ALL IMPORT FILL PLACED IN THE STREET'S SUBGRADE SHALL BE SELECT MATERIAL, WITH A PLASTICITY INDEX LESS THAN TWENTY (20), AND COMPACTED IN MAXIMUM EIGHT (8) INCH LIFTS TO 98% DENSITY OF TXDOTS TEST METHOD TEX 113-E PROVIDE TESTING ON EACH EIGHT (8) INCH COMPACTED LIFT. SUBGRADE MOISTURE DENSITY TESTING SHALL BE AT THE MINIMUM FREQUENCY OF THREE (3) PER BLOCK AND SHALL NOT TO EXCEED ONE-HUNDRED AND TWENTY (120) FOOT SPACING.

    B. FLEXIBLE BASE TESTING SHALL INCLUDE - P.I., LL, GRADATION, AND WET BALL MILL OF MATERIAL SHALL BE TESTED UPON DELIVERY TO THE PROJECT AND AS DIRECTED BY THE CITY. MOISTURE DENSITY TESTING SHALL BE AT THE MINIMUM RATE OF THREE (3) PER BLOCK AND SHALL NOT TO EXCEED FIVE HUNDRED (500) FOOT SPACING. THE QUALITY CONTROL TEST ON THE MATERIALS SHALL BE PERFORMED BY THE CONTRACTOR'S CITY APPROVED TESTING FIRM. IN-PLACE DENSITY SHALL MEET THE REQUIREMENTS DETAILED IN THE CITY'S SUBDIVISION REGULATIONS.

    C. HOT AND WARM MIX ASPHALTIC CONCRETE (HMAC/WMAC) DENSITY - IN PLACE DENSITY TESTING SHALL RESULT BETWEEN 92% AND 97% OF THE MAXIMUM THEORETICAL GRAVITY PER TEX 207-F. A SET OF TWO (2) CORES SHALL BE RANDOMLY SAMPLED AT A DISTANCE NOT TO EXCEED FIVE HUNDRED (500) FOOT SPACING PER BLOCK. ALL QUALITY CONTROL NUCLEAR TESTING OF THE IN-PLACE HMAC/WMAC IS FOR QUALITY CONTROL INFORMATION ONLY. THE HMAC/WMAC THICKNESS IS REQUIRED TO BE MEASUREMENT BY CORE. FIELD QUALITY CONTROL PERSONNEL SHALL BE TXDOT LEVEL IB CERTIFIED AND BE PRESENT AT START AND THROUGH THE DURATION OF THE PLACEMENT OPERATIONS OF THE HMAC/WMAC TO DOCUMENT DENSITY, THICKNESS, AND COMPACTION AND PI ACEMENT OPERATIONS. THE CITY OF SANTA CLARA WILL DETERMINE THE REMOVAL AND REPLACEMENT OF ALL FAILED PRODUCTION AND PLACEMENT HMAC/WMAC TEST RESULTS.

    D. RECYCLED ASPHALT SHINGLES (RAS) AND RECYCLED ASPHALT PAVEMENT (RAP) SHALL NOT BE USED IN ANY HMAC OR WMAC MIXES.

    E. CONCRETE STRUCTURES - A MINIMUM OF ONE (1) SET OF COMPRESSIVE CONCRETE STRENGTH TEST OF 4, SIX (6) INCH DIAMETER CYLINDERS EACH WILL BE TESTED PER EACH STRUCTURE AND THE FREQUENCY SHALL BE NO LESS THAN ONE (1) SET PER SIXTY (60) CUBIC YARDS OF CONCRETE PLACED AND AT LEAST ONE (1) SET PER DAY.

    F. CONCRETE CURB AND SIDEWALK - PROVIDE ONE (1) SET OF FOUR (4), SIX (6) INCH DIAMETER CYLINDERS PER EACH 500 LINEAR FEET OF CURB AND/OR SI DEW ALK AND AT LEAST ONE (1) SET PER DA Y.

    G. THE CONTRACTOR SHALL SUBMIT CONCRETE, WMAC, AND HMAC DESIGNS A MINIMUM OF 2 WEEKS PRIOR TO THE PLACEMENT OF THE MATERIAL.

16. PROOF ROLLING - ALL SUBGRADE AND EACH LIFT OF BASE MATERIAL SHALL BE PROOF-ROLLED TO THE SATISFACTION OF THE CITY. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT AND OPERATORS FOR PROOF- ROLLING AS DIRECTED BY THE CITY. SOFT AND YIELDING AREAS DISCOVERED SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR EXPENSE .

17. SURFACE STRUCTURES SUCH AS MAILBOXES, STREET SIGNS, FENCES, DRIVEWAYS, SIDEWALKS, LANDSCAPING, CONCRETE ISLANDS, CURBS OR CONCRETE DRIVEWAYS, ETC., VISIBLE AT THE TIME OF THE SURVEY ARE SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SAFEGUARD AND MAINTAIN ANY AND ALL SURFACE STRUCTURES DURING THE COURSE OF WORK AND TO REPLACE OR REPAIR THOSE ITEMS WHICH ARE DAMAGED BY THE CONTRACTOR WITH LIKE OR BETTER QUALITY AND SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION (NO SEPARATE PAY ITEM).

18. LOCATIONS AND DEPTHS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, PROTECT THEM DURING CONSTRUCTION AND REPAIR ANY DAMAGE TO OTHER UTILITIES AT NO COST TO THE CITY OF SANTA CLARA.

19. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SIGNS AND BARRICADES ARE PROPERLY INSTALLED AND MAINTAINED. ALL LOCATIONS AND DISTANCES WILL BE DECIDED UPON IN THE FIELD BY THE CONTRACTOR, USING THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE CITY'S CONSTRUCTION INSPECTOR/TRAFFIC ENGINEERING REPRESENTATIVE WILL ONLY BE RESPONSIBLE TO INSPECT BARRICADES AND SIGNS. IF IN THE OPINION OF THE TRAFFIC ENGINEERING REPRESENTATIVE/ CONSTRUCTION INSPECTOR, THE TRAFIC CONTROL DEVICES DO NOT CONFORM TO ESTABLISHED STANDARDS, ARE INCORRECTLY PLACED OR INSUFFICIENT IN QUANTITY TO PROTECT THE TRAVELING GENERAL PUBLIC. THE CONSTRUCTION INSPECTOR WILL HAVE THE OPTION OF STOPPING THE OPERATIONS UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED AT NO EXPENSE TO THE CITY OF SANTA CLARA.

20. DEVELOPER/CONTRACTOR TO INSTALL ALL STREET NAME SIGNS, STOP SIGNS, SPEED LIMIT, YIELD SIGNS, ETC. SIGNS AND STREET NAMES SHALL MEET TEXAS MUTCD STANDARDS.

21. THE STREET CONTRACTOR IS REQUIRED TO ADJUST ALL EXISTING MANHOLES (SEE "ADJUSTING EXISTING MANHOLES" OF THE SPECIFICATION) AND WATER VALVES TO MATCH THE GRADE OF THE STREET SECTION OR THE ELEVATION SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

22. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181 ACCESS TO GAS VALVES MUST BE MAINTAINED AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

23. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. CONTRACTOR WILL NOTIFY ALL UTILITY COMPANIES AT LEAST 72 HOURS PRIOR TO EXCAVATION.

CITY OF SANTA CLARA	
GVSUD	
GVTC	
GVEC	1-800-401-8845
DIG TEST	1-800-344-8377
TEXAS STATE WIDE ONE CALL LOCATORS	1-800-545-6005 OR 811
TIME WARNER CABLE	
AT&T	
MCI	
VERIZON	

24. CONCRETE CURB SHALL BE CONSTRUCTED WITH A MAXIMUM OF EIGHTY (80) FEET BETWEEN EXPANSION JOINTS AND MARKED AT TEN (10) FOOT INTERVALS WITH APPROVED STEEL MARKING TOOLS. EXPANSION JOINTS SHALL BE PLACED AT THE BEGINNING OF ALL RADII AND AT A MAXIMUM OF EIGHTY (80) FOOT INTERVALS AS DIRECTED BY THE ENGINEER.

25. THE CONTRACTOR SHALL NOTIFY THE CITY OF SANTA CLARA PLANNING AND ENGINEERING DEPARTMENT PRIOR TO PLACING BACKFILL OR CONCRETE AND PRIOR TO ANY TESTING. CONTRACTOR SHALL REQUIEST INSPECTIONS A MINIMUM OF 24 HOURS IN ADVANCE. NO INSPECTIONS ARE AVAILABLE BETWEEN 12:00 P.M. AND 1:00 P.M. OR AFTER 4:00 PM DAILY, ON WEEKENDS, OR ON CITY HOLIDAYS.

26. CONCRETE SIDEWALKS SHALL HAVE TOOLED WEAKENED PLANE JOINTS EVERY FOUR (4) FEET AND DOWELED EXPANSION JOINT WITH ONE QUARTER INCH (1/4) BITUMASTIC MATERIAL ON CENTER AND ABUTTING EXISTING STRUCTURES.

27. ALL WORKMANSHIP AND MATERIAL SHALL CONFORM TO THE CITY OF SANTA CLARA ORDINANCES FOR PUBLIC WORKS CONSTRUCTION.

28. CONTRACTOR SHALL INSTALL CURB FOR HANDICAP RAMPS AS SHOWN ON THE PLANS AND ADA STANDARD PLAN SHEETS.

29. CONTRACTOR SHALL PROVIDE BRASS KEYS TO BE USED TO OPEN LOCKING MANHOLE COVERS ON DRAINAGE STRUCTURES DURING PRELIMINARY INSPECTION FOR ACCEPTANCE OF PROJECT.

30. EXISTING STREETS TRENCHES ARE TO BE BACKFILLED WITH FLOWABLE FILL FROM THE TOP OF THE BEDDING MATERIAL TO WITHIN TWO (2) INCHES OF THE FINISHED GRADE ALLOWING FOR THE SURFACE HMAC/WMAC.

31. REMOVE EXISTING CURB ON ALL NEW DRIVEWAYS AND PLACE THE COMPLETE PAVEMENT THICKNESS WITH A MINIMUM OF FIVE (5) INCHES THICKNESS ON RESIDENTIAL AND SIX (6) INCHES MINIMUM ON COMMERCIAL; DEPENDING ON TRAFFIC WEIGHT.

32. CONCRETE PLACED IN NEW DRIVEWAYS INCLUDING ALLEYS SHALL MEET A MINIMUM 3,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

33. EXCESS MATERIAL IS TO BE EMBANKED AND COMPACTED TO FINAL GRADE FOR FUTURE PHASES. NO EXCESS MATERIAL SHALL BE DUMPED OR ALLOWED TO ENTER ANY WATERWAY, CULVERT OR OTHER DRAINAGE STRUCTURE. THE CONTRACTOR SHALL NOT PLACE ANY MATERIAL IN THE 100-YEAR FLOODPLAIN WITHOUT OBTAINING AN APPROVED FLOOD PLAIN PERMIT.

34. ANY WORK COMPLETED WITHOUT PRIOR AUTHORIZATION WHETHER INCLUDED IN THE PLANS AND SPECIFICATIONS OR NOT. SHALL NOT BE COMPENSATED BY THE CITY OF SANTA CLARA.

MISCELLANEOUS NOTES:

1. ACCESS TO THIS SITE IS PROVIDED THROUGH TWO PROPOSED DRIVEWAYS ALONG WEIL RD.

2. DRIVEWAYS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY TO DENOTE A POTENTIAL CONFLICT WITH DRAINAGE FACILITY AND/OR ADA RAMP. ALL DRIVEWAYS WILL BE BUILT WITH HOMEBUILDING.

3. ALL REQUIRED ADA RAMPS ARE SHOWN ON THE PLANS. ONLY ADA RAMPS WITHOUT RESIDENTIAL LOT FRONTAGE SHALL BE BUILT WITH THE STREET INFRASTRUCTURE.

4. CONTRACTOR SHALL REFERENCE TREE PLAN AND PRIVATE GRADING PLAN FOR CLEARING AND GRADING LIMITS.

5. PRIOR TO THE INSTALLATION OF STREET BASE MATERIAL, CONTRACTOR SHALL COORDINATE WITH ENGINEER AND UTILITY PROVIDERS TO INSTALL NECESSARY CONDUITS FOR UTILITY INSTALLATION.

6. CONTRACTOR IS RESPONSIBLE FOR ENSURING POSITIVE SITE DRAINAGE AT ALL TIMES DURING AND UPON COMPLETION OF INFRASTRUCTURE.

7. CONTRACTOR IS REQUIRED TO NOTIFY ENTERPRISE UTILITIES WHEN ENCROACHING UPON THE EXISTING GAS EASEMENT ON SITE.

CONSTRUCTION SEQUENCING: (LIST PROCESS ON CONSTRUCTION PLAN SET)

1. CALL THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT 48 HOURS PRIOR TO BEGINNING ANY WORK AND SCHEDULE A RECONSTRUCTION MEETING WITH THE CITY AND ALL AFFECTED UTILITY PROVIDERS, THE GENERAL CONTRACTOR, THE DEVELOPER AND THE DEVELOPER'S ENGINEER.

2. OBTAIN A SITE DEVELOPMENT PERMIT FROM THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT.

3. PROVIDE THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT WITH EVIDENCE ALL TCEQ LICENSES AND REQUIREMENTS ARE UP TO DATE.

4. INSTALL TEMPORARY EROSION CONTROLS AND TREE PROTECTION FENCING PRIOR TO ANY CLEARING AND GRUBBING. NOTIFY THE CITY WHEN INSTALLED.

5. ROUGH-CUT ALL REQUIRED OR NECESSARY PONDS. EITHER THE PERMANENT OUTLET STRUCTURE OR A TEMPORARY OUTLET MUST BE CONSTRUCTED DURING DEVELOPMENT OF ANY EMBANKMENT OR EXCAVATION THAT LEADS TO PONDING CONDITIONS. THE OUTLET SYSTEM MUST CONSIST OF A LOW-LEVEL OUTLET AND AN EMERGENCY OVERFLOW MEETING THE REQUIREMENTS OF THE UDC. THE OUTLET SYSTEM SHALL BE PROTECTED FROM EROSION AND SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION UNTIL FINAL RESTORATION IS ACHIEVED.

6. DELIVER APPROVED ROUGH CUT SHEETS TO THE CITY ENGINEER PRIOR TO CLEARING AND GRUBBING.

7. ROUGH GRADE STREETS. NO DEVELOPMENT OF EMBANKMENT WILL BE PERMITTED AT THIS TIME.

8. INSTALL ALL UTILITIES TO BE LOCATED UNDER THE PROPOSED PAVEMENT OR WITHIN THE ROAD RIGHT-OF-WAY.

9. DELIVER STORM SEWER CUT SHEETS TO THE CITY ENGINEER.

10. BEGIN INSTALLATION OF STORM SEWER LINES. UPON COMPLETION, RESTORE AS MUCH DISTURBED AREA AS POSSIBLE, PARTICULARLY CHANNELS AND LARGE OPEN AREAS.

11. DELIVER FINAL GRADE CUT SHEETS TO THE CITY ENGINEER.

12. RE-GRADE STREETS TO SUB-GRADE.

13. ENSURE THAT UNDERGROUND UTILITY CROSSINGS ARE COMPLETED. LAY 1ST COURSE BASE MATERIAL ON STREETS.

14. INSTALL CURB AND GUTTER.

15. LAY FINAL BASE COURSE ON ALL STREETS.

16. LAY ASPHALT.

17. COMPLETE FINAL GRADING AND RESTORATION OF DETENTION, SEDIMENTATION / FILTRATION PONDS.

18. COMPLETE PERMANENT EROSION CONTROL AND RESTORATION OF SITE VEGETATION.

19. REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROLS.

20. COMPLETE ANY NECESSARY FINAL DRESS UP OF AREAS DISTURBED.

CITY OF SANTA CLARA NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF SANTA CLARA DESIGN AND CONSTRUCTION MANUAL AND THE UNIFIED DEVELOPMENT CODE, HERE AFTER REFERRED TO THE UDC.

2. APPROVAL OF THESE CONSTRUCTION PLANS BY THE CITY OF SANTA CLARA DOES NOT CONSTITUTE A VERIFICATION OF ALL DATA, INFORMATION AND CALCULATIONS SUPPLIED BY THE APPLICANT. THE ENGINEER OF RECORD IS SOLELY RESPONSIBLE FOR THE COMPLETENESS, ACCURACY AND ADEQUACY OF HIS/HER SUBMITTAL WHETHER OR NOT THE APPLICATION IS REVIEWED FOR CODE COMPLIANCE BY THE CITY ENGINEER.

3. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN APPROVING THESE PLANS, THE CITY OF SANTA CLARA MUST RELY ON THE ADEQUACY OF THE WORK OF THE ENGINEER.

4. DESIGN PROCEDURES ARE IN COMPLETE COMPLIANCE WITH THE CITY OF SANTA CLARA DESIGN AND CONSTRUCTION MANUAL. IT IS THE RESPONSIBILITY OF THE ENGINEER TO REQUEST A WAIVER FROM ANY ASPECT OF THESE PLANS THAT DO NOT COMPLY WITH THE UDC.

5. A MINIMUM OF TWO EXISTING BENCH MARKS TIED TO CITY OF SANTA CLARA GRID SHOULD BE SHOWN ON THE PLANS. IN ADDITION TWO PERMANENT BENCHMARKS PER SUBDIVISION SHALL BE INSTALLED IN EACH SUBDIVISION TO INCLUDE DESCRIPTION, LOCATION, AND ELEVATION AND TIE TO CITY OF SANTA CLARA STANDARDS WHEN POSSIBLE.

6. CAST BRONZE SURVEY MARKERS SHALL BE PLACED IN CONCRETE IN PERMANENT, ACCESSIBLE LOCATIONS AT THE TIME OF CONSTRUCTION. THE LOCATIONS OF THE MARKERS SHALL BE INDICATED ON THE CONSTRUCTION PLANS. A MINIMUM OF ONE MARKER SHALL BE PLACED FOR EACH 20 ACRES OF THE PROJECT.

7. PRIOR TO BEGINNING CONSTRUCTION, THE OWNER OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY OF SANTA CLARA, CONSULTING ENGINEER, CONTRACTOR, GUADALUPE COUNTY AND ANY OTHER AFFECTED PARTIES. NOTIFY THE CITY OF SANTA CLARA AT LEAST 48 HOURS PRIOR TO THE TIME OF THE CONFERENCE AND 48 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.

8. THE CONTRACTOR SHALL GIVE THE CITY OF SANTA CLARA AND GUADALUPE COUNTY A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.

9. BARRICADES, BUILT TO CITY OF SANTA CLARA SPECIFICATIONS, SHALL BE CONSTRUCTED ON ALL DEAD-END STREETS AND AS NECESSARY DURING CONSTRUCTION TO MAINTAIN JOB SAFETY. (STREETS, ETC. MAY BE LISTED IN ADDITION TO OR INSTEAD OF NOTE.)

10. IF BLASTING IS PLANNED BY THE CONTRACTOR, A BLASTING PERMIT MUST BE SECURED PRIOR TO COMMENCEMENT OF ANY BLASTING.

11. ANY EXISTING PAVEMENT, CURBS, AND/ OR SIDEWALKS DAMAGED OR REMOVED WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE BEFORE ACCEPTANCE OF THE SUBDIVISION.

12. THE LOCATION OF ANY WATER AND / OR WASTEWATER LINES SHOWN ON THE PLANS MUST BE VERIFIED BY THE CITY OF SANTA CLARA PUBLIC WORKS DEPARTMENT.

13. USE ONE CALL UTILITY SYSTEM: DIAL 1-800-344-8377, 48 HOURS BEFORE YOU DIG.

14. ALL STORM SEWER PIPES TO BE CLASS III RCP UNLESS NOTED OTHERWISE.

CERTIFICATE OF APPROVAL BY CITY ENGINEER:

APPROVED ON THIS THE ____ DAY OF _____, 20 ____, BY THE CITY ENGINEER, CITY OF SANTA CLARA, TEXAS.

_____

CITY ENGINEER, CITY OF SANTA CLARA

"RELEASE OF THIS APPLICATION DOES NOT CONSTITUTE A VERIFICATION OF ALL DATA, INFORMATION AND CALCULATIONS SUPPLIED BY THE APPLICANT. THE ENGINEER OF RECORD IS SOLELY RESPONSIBLE FOR THE COMPLETENESS, ACCURACY AND ADEQUACY OF HIS/HER SUBMITTAL, WHETHER OR NOT THE APPLICATION IS REVIEWED FOR CODE COMPLIANCE BY THE CITY ENGINEER."

"ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN APPROVING THESE PLANS, THE CITY OF SANTA CLARA MUST RELY UPON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER."

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

GENERAL NOTES

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C0.00

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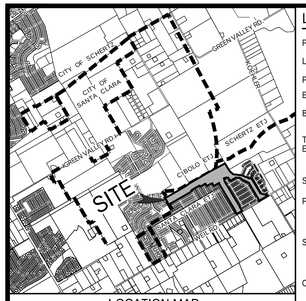
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LEGEND

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

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4. 15' R.O.W. RESERVATION

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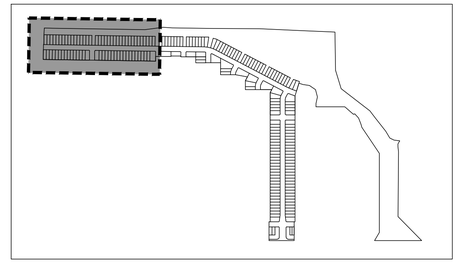
SHEET INDEX MAP

NOT TO SCALE



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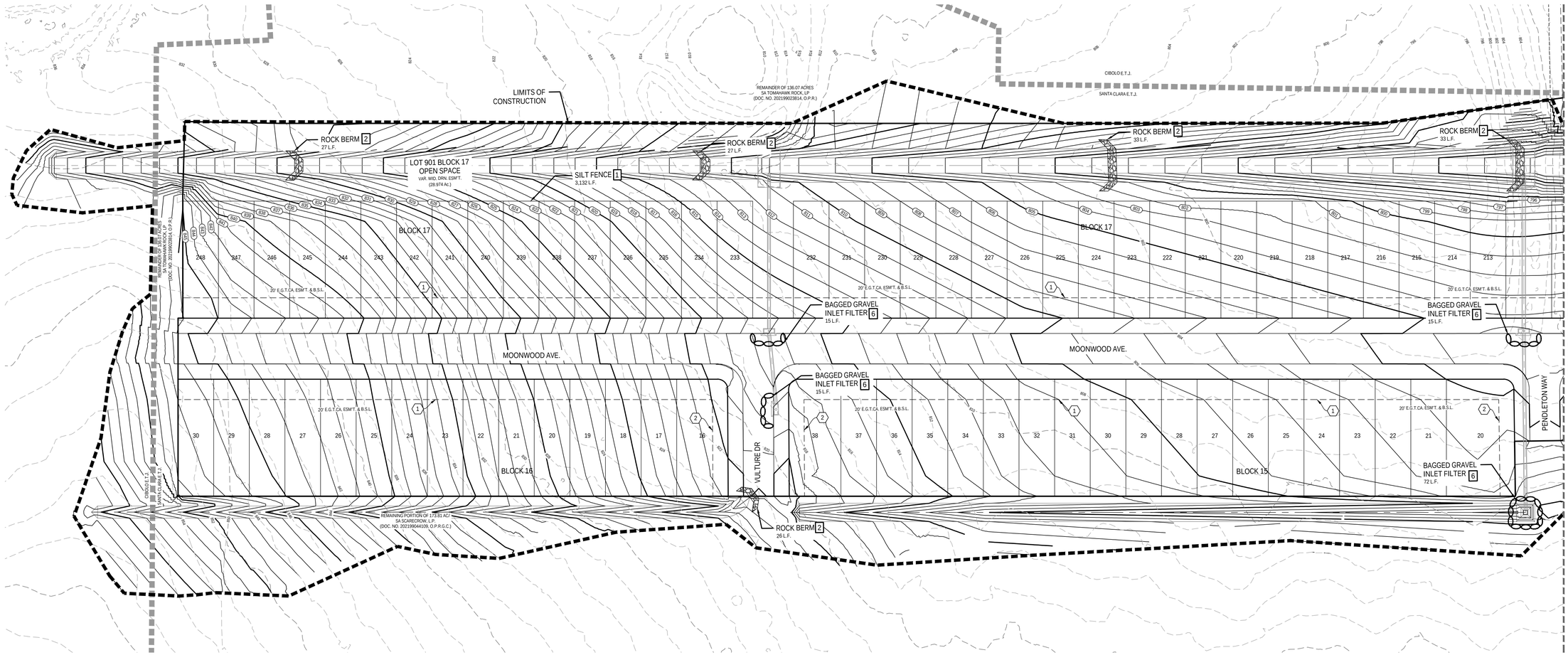

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GRACE VALLEY RANCH PHASE 6

STORMWATER POLLUTION PREVENTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C1.00

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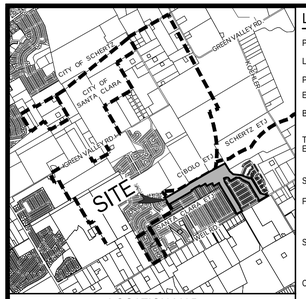

LOCATION MAP

N.T.S.

LEGEND

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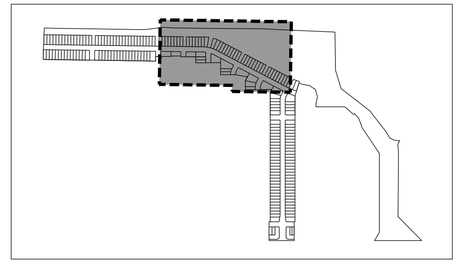

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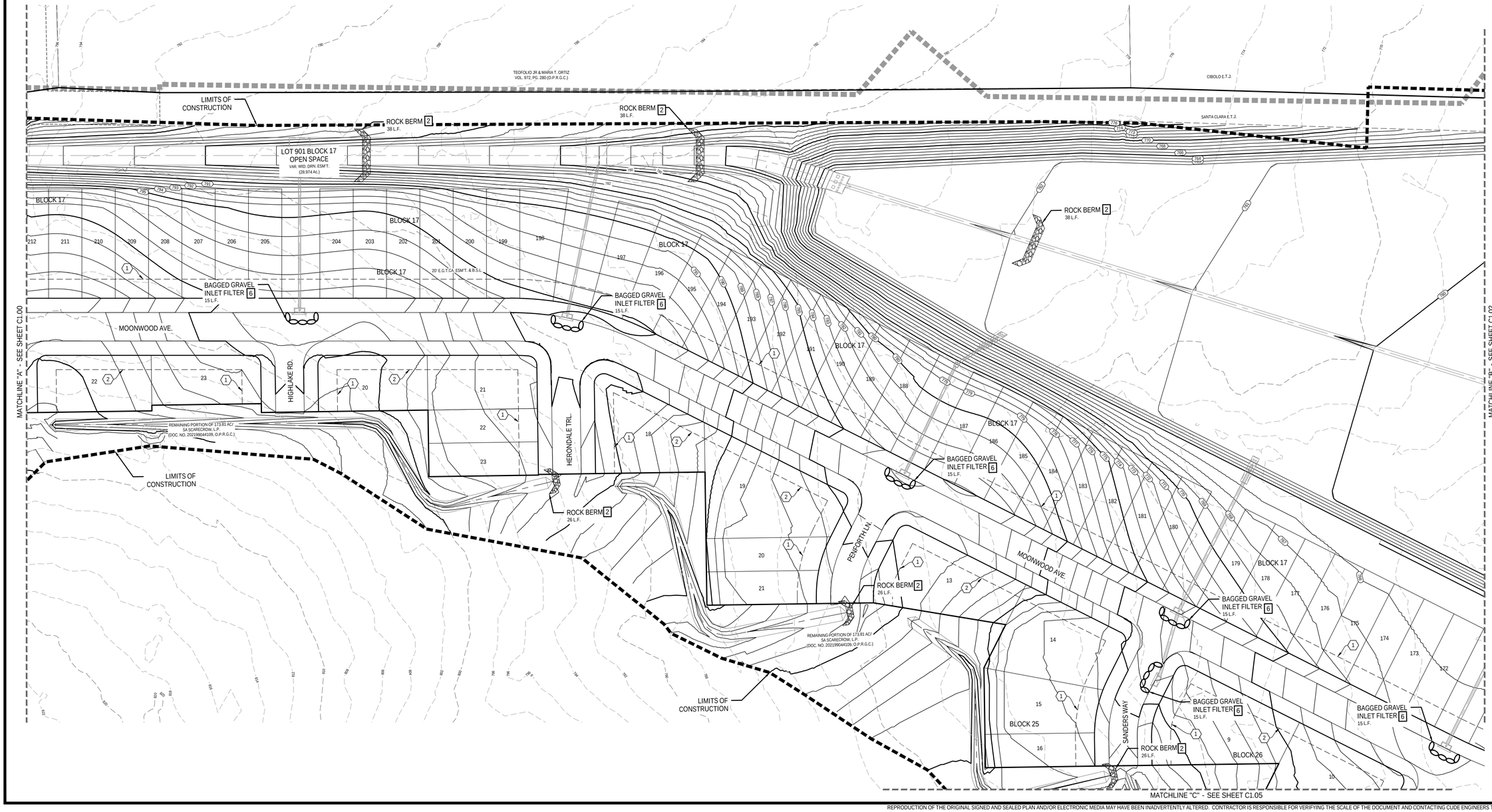

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GRACE VALLEY RANCH PHASE 6

STORMWATER POLLUTION PREVENTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C1.01

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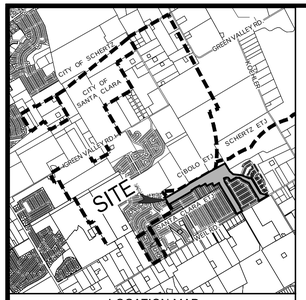

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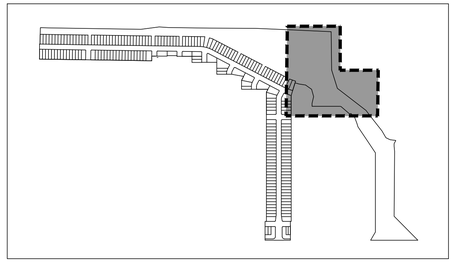

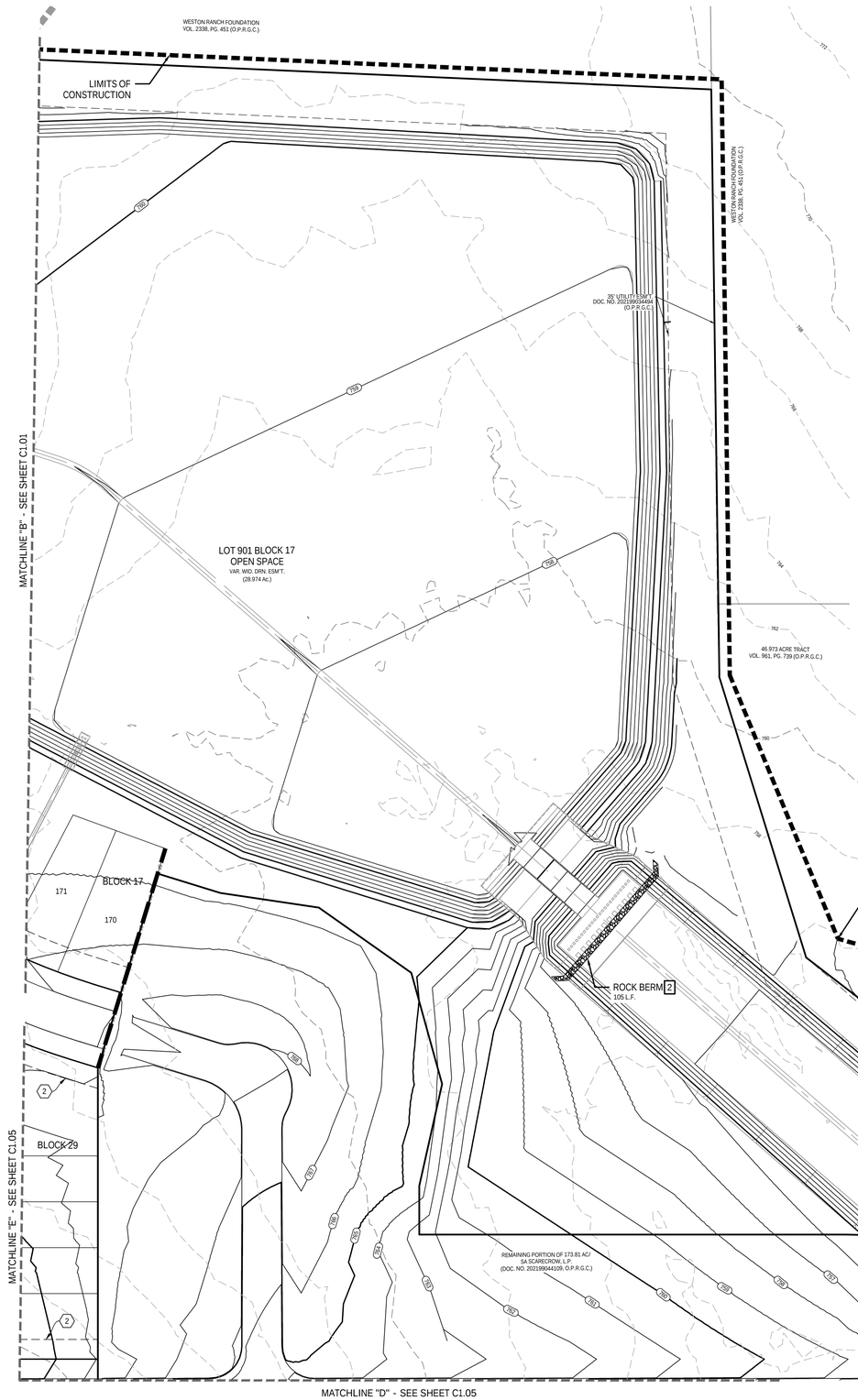

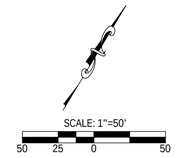

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GRACE VALLEY RANCH PHASE 6

STORMWATER POLLUTION PREVENTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C1.02

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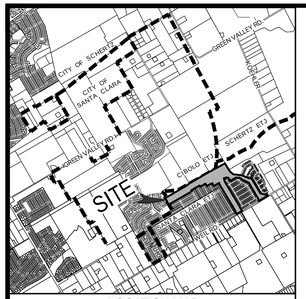

LOCATION MAP N.T.S.

LEGEND

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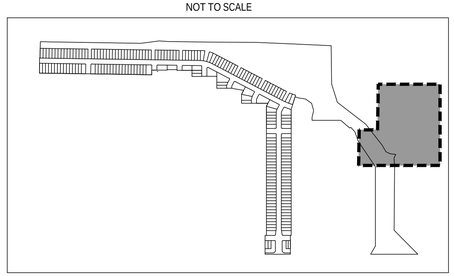

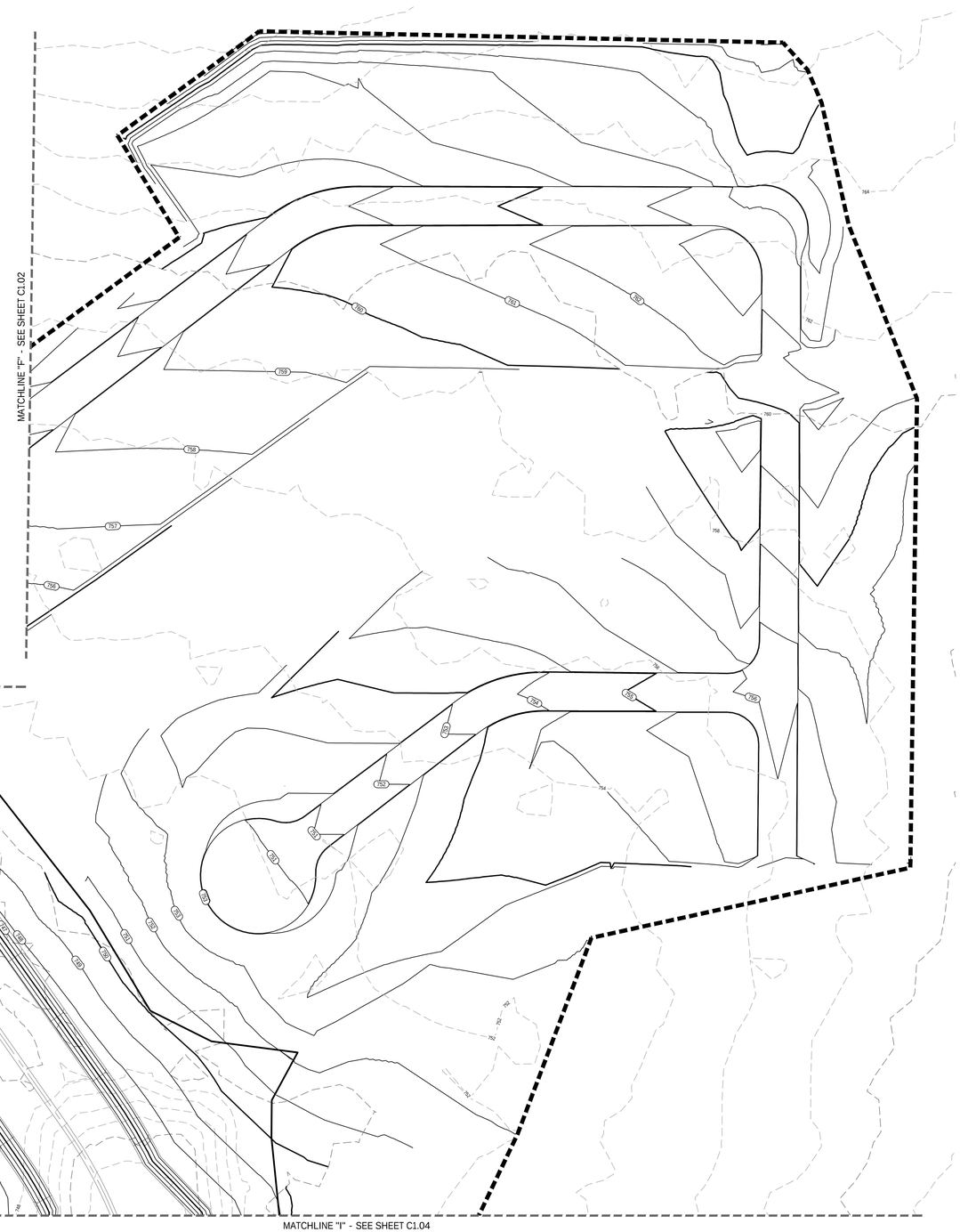

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GRACE VALLEY RANCH PHASE 6

STORMWATER POLLUTION PREVENTION PLAN

DATE 05/06/2025

PROJECT NO. 03499.008

DRAWN BY AG/BK/SG/RB/JF

CHECKED BY K.M.H.

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STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

05/06/2025

CUDE ENGINEERS
TBPE No. 455
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C1.03

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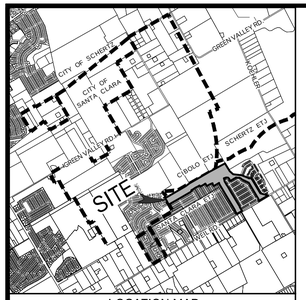

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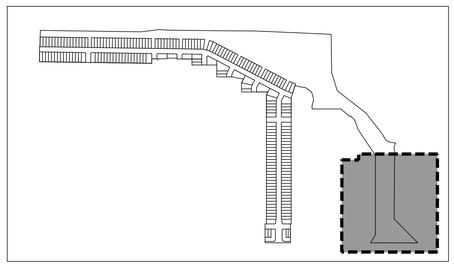

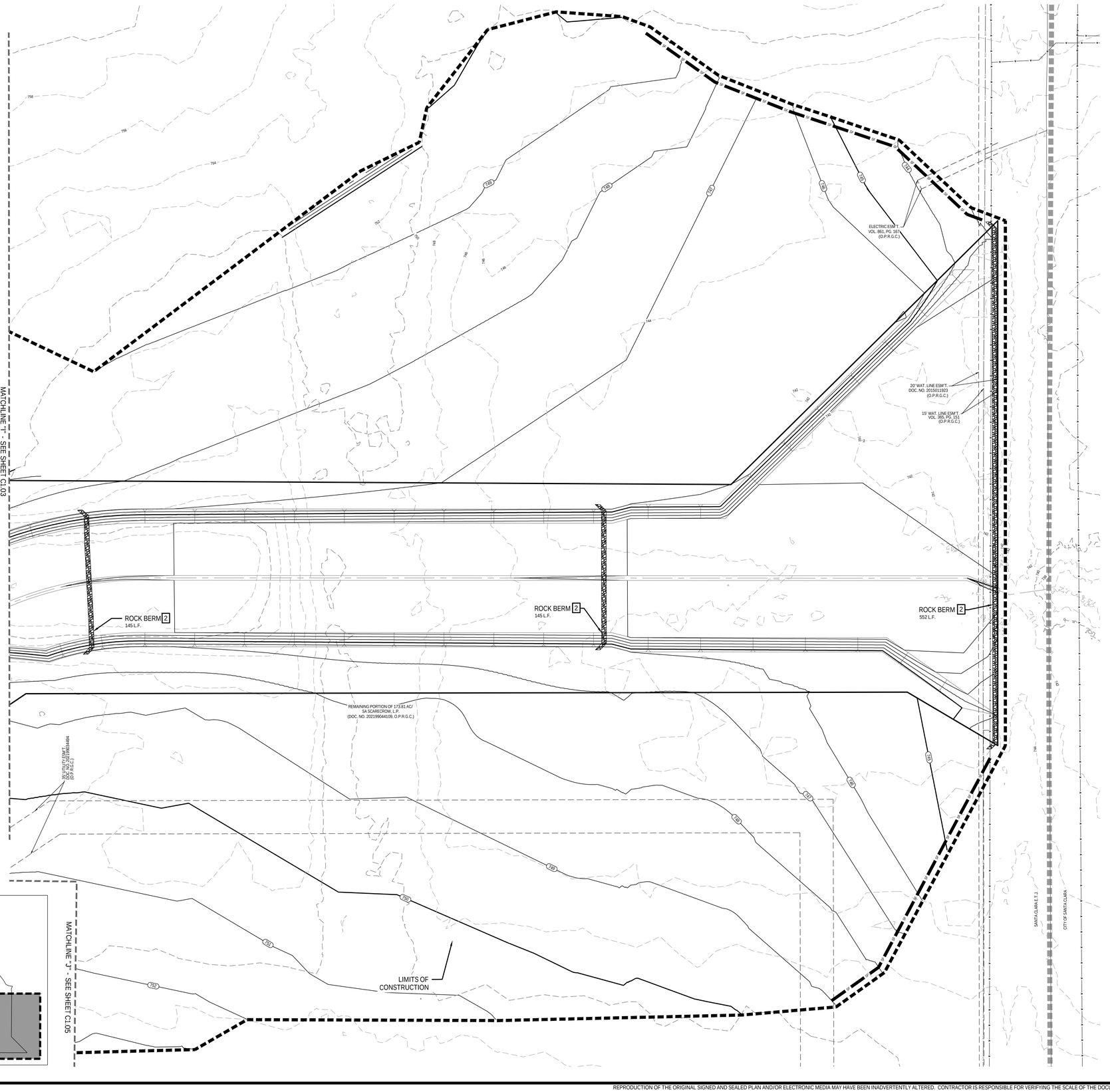

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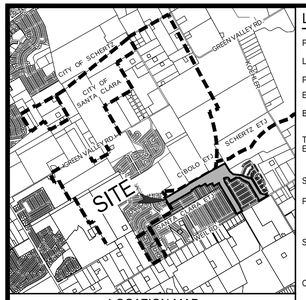

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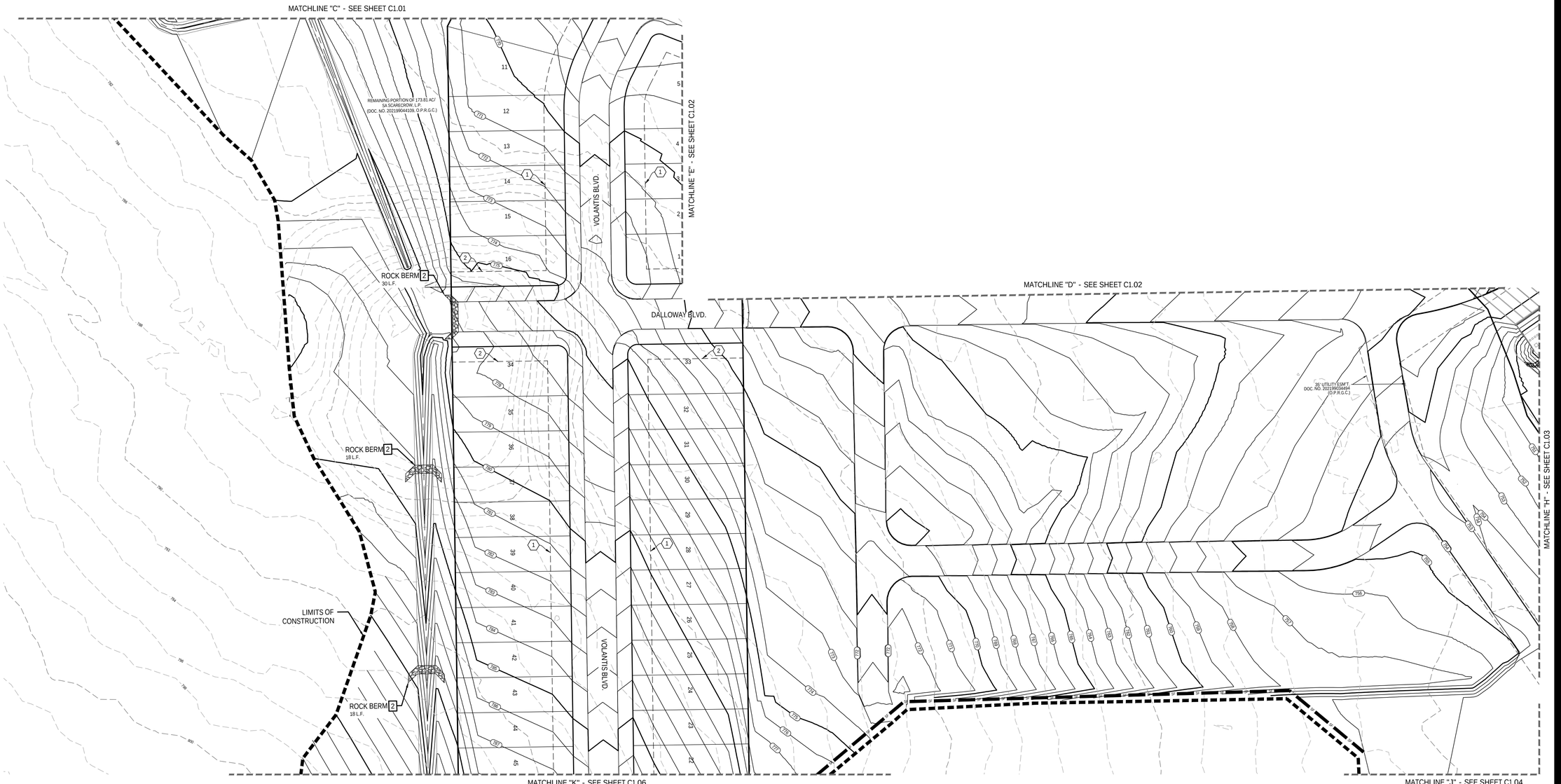
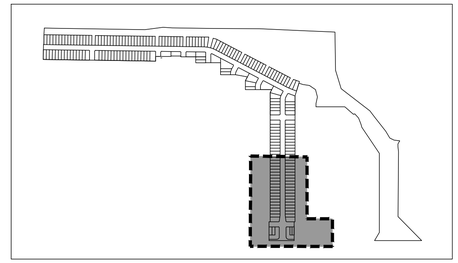
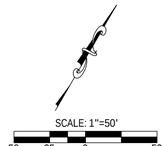
5. THE CITY INSPECTOR HAS THE AUTHORITY TO HAVE THE CONTRACTOR MODIFY THE EROSION CONTROLS AT THE DEVELOPER'S EXPENSE. THE DEVELOPER SHALL BE NOTIFIED OF THESE MODIFICATIONS PRIOR TO COMMENCEMENT OF MODIFICATIONS.



SHEET INDEX MAP

NOT TO SCALE





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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

STORMWATER POLLUTION PREVENTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C1.05

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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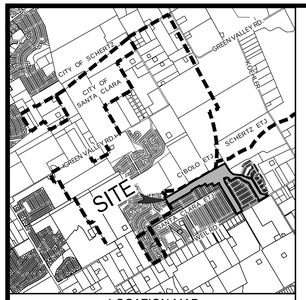

LOCATION MAP N.T.S.

LEGEND

- PROPERTY LINE
- LIMITS OF CONSTRUCTION
- PROPOSED CONTOURS 930
- EXISTING CONTOURS 930
- BMP ITEM NUMBER 1
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT
- SILT FENCE SF
- FLOW ARROW
- STAGING AREA
- CONCRETE WASHOUT PIT
- PROPOSED ROCK BERM
- BAGGED GRAVEL INLET FILTER
- EARTHEN 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. AREA OF SOIL DISTURBANCES INCLUDE STREET RIGHT-OF-WAYS, UTILITY EASEMENTS & LOTS.
3. THERE WILL NOT BE STORMWATER DISCHARGES INTO THE FEMA FLOOD PLAIN.
4. THE CONTRACTOR IS REQUIRED TO MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
5. 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.

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
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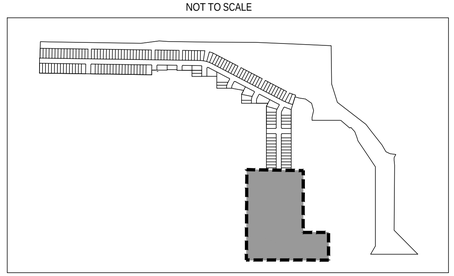
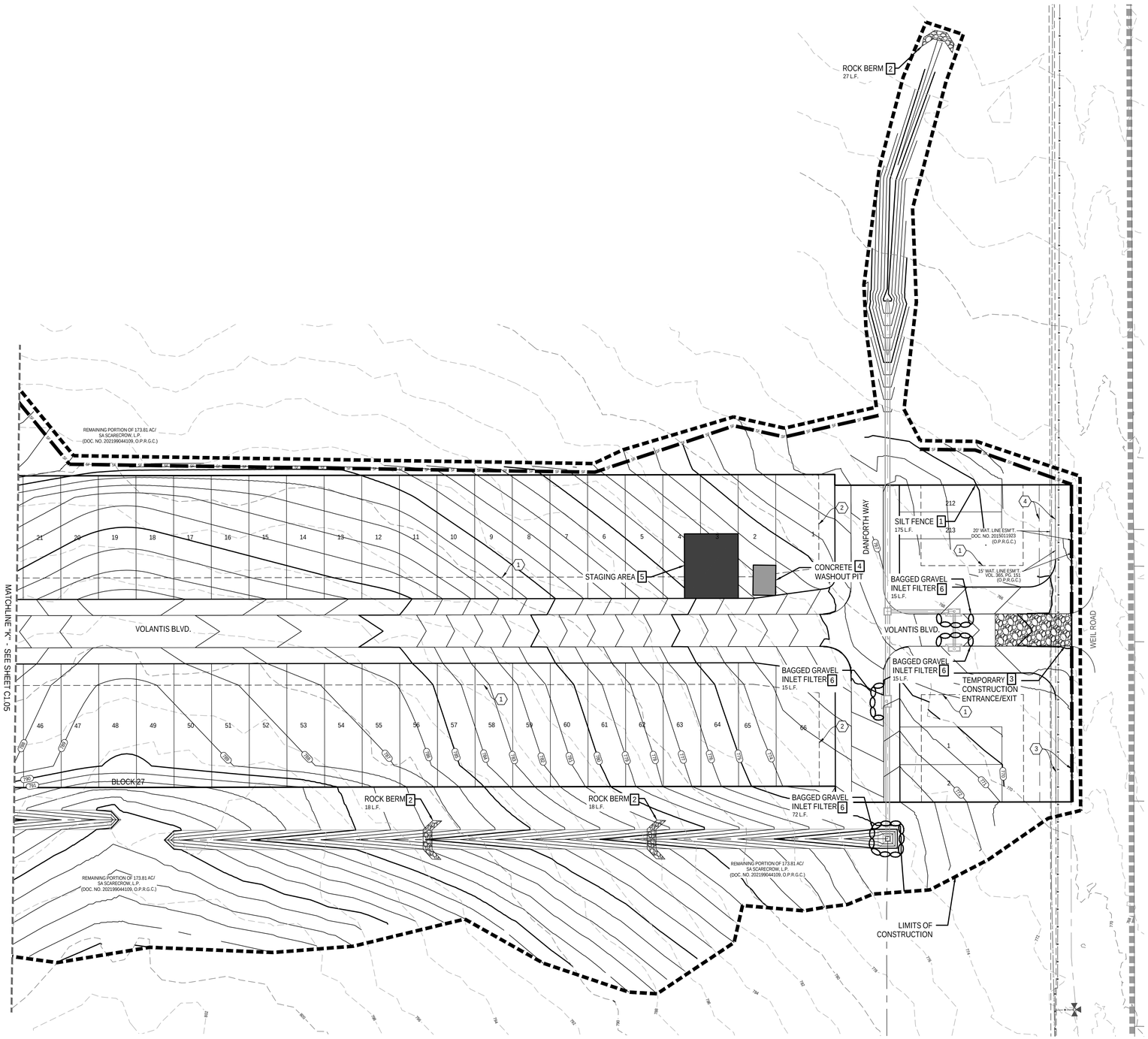
4. 15' R.O.W. RESERVATION

SHEET INDEX MAP

NOT TO SCALE





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GRACE VALLEY RANCH PHASE 6

STORMWATER POLLUTION PREVENTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

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TBPLS No. 10048500

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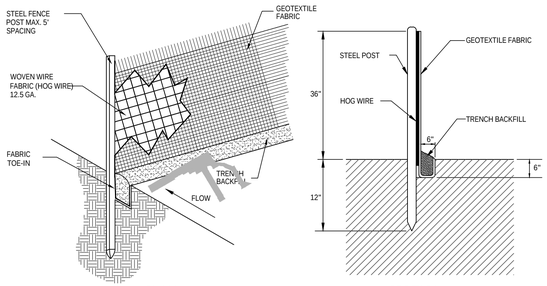
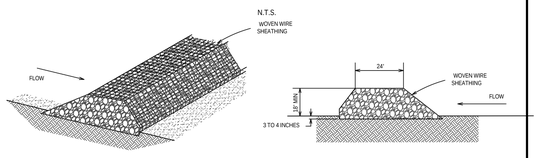


NOTES:

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 FEA 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

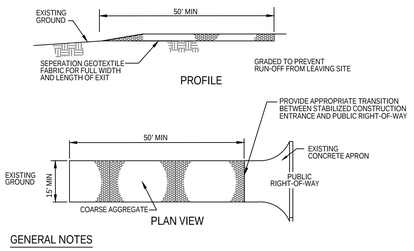


NOTES:

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.

2 ROCK BERM DETAIL

SCALE: NONE



GENERAL NOTES

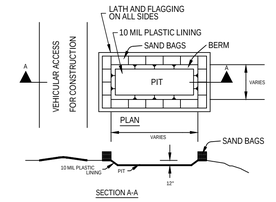
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A TRUCK WASHING AREA WHEN SHOWN 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.

3 TEMPORARY CONSTRUCTION ENTRANCE / EXIT

SCALE: NONE

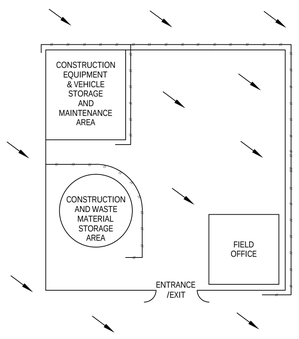


NOTES:

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.

4 CONCRETE TRUCK WASHOUT PIT

SCALE: NONE



LEGEND

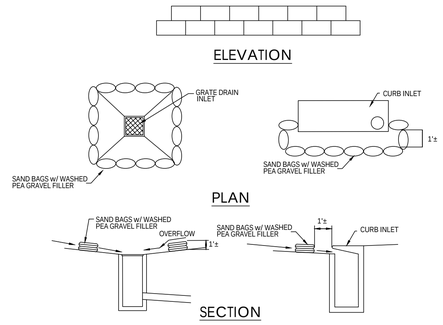
SILT FENCE

FLOW ARROWS

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

5 TYP. CONSTRUCTION STAGING AREA

SCALE: NONE

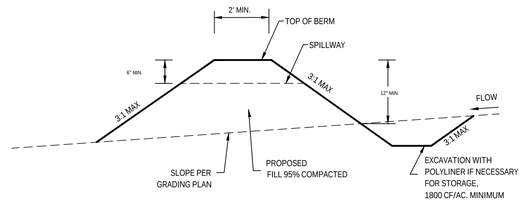


BAGGED GRAVEL INLET FILTER NOTES

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 ½" 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.

6 BAGGED GRAVEL INLET FILTER

SCALE: NONE



NOTE:

1. EARTHEN BERMS ARE TO SPAN ACROSS PROPOSED STREET SECTION (APPROX. 30-FEET WIDE) FROM CURB TO CURB.

7 EARTHEN BERM W/ POLYLINER AND SPILLWAY

SCALE: NONE

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GRACE VALLEY RANCH
PHASE 6

STORMWATER POLLUTION PREVENTION PLAN DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

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STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
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CUDE ENGINEERS
TBPE No. 455
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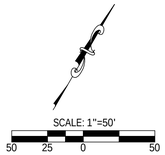


KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION

NOTE:

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

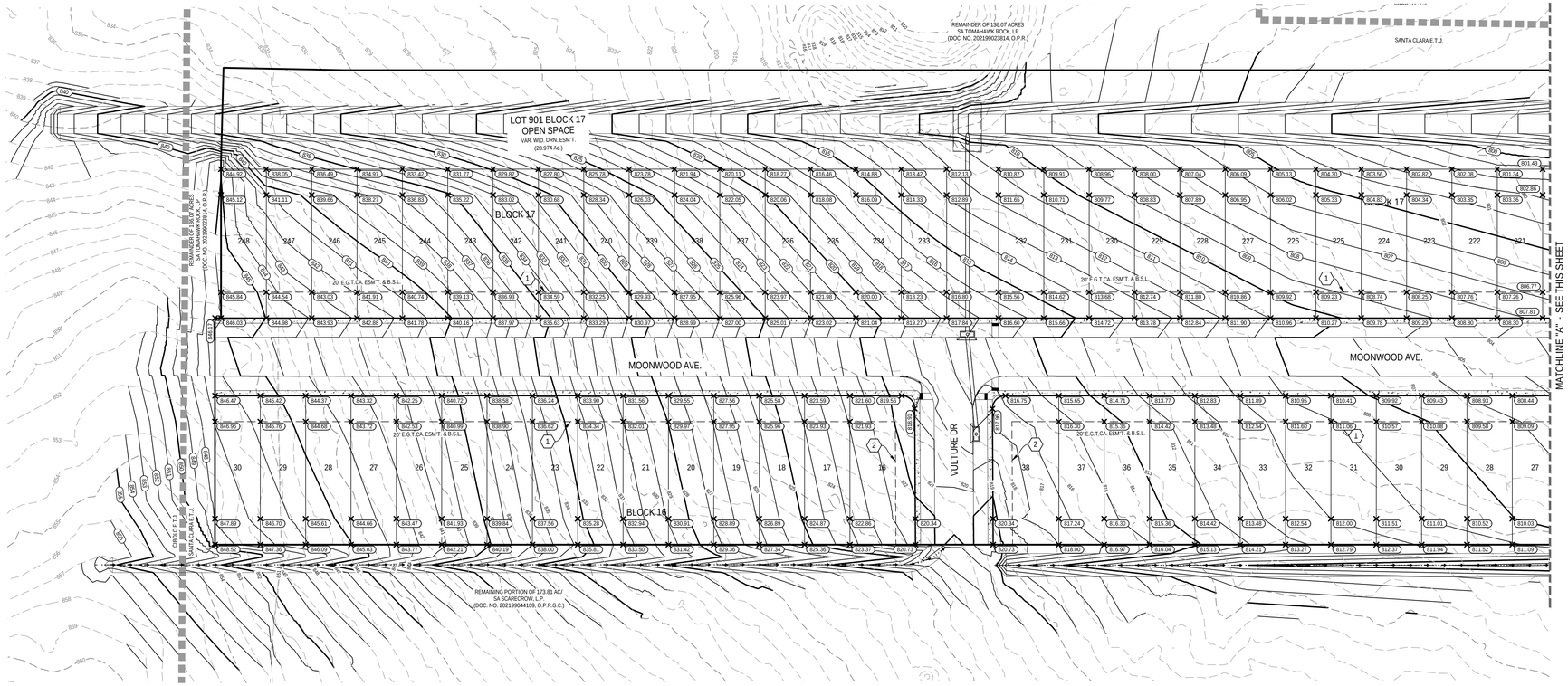
ALL ELEVATIONS AT FRONT PROPERTY LINE ARE 0.30' ABOVE CURB ELEVATION ON MINOR STREETS.

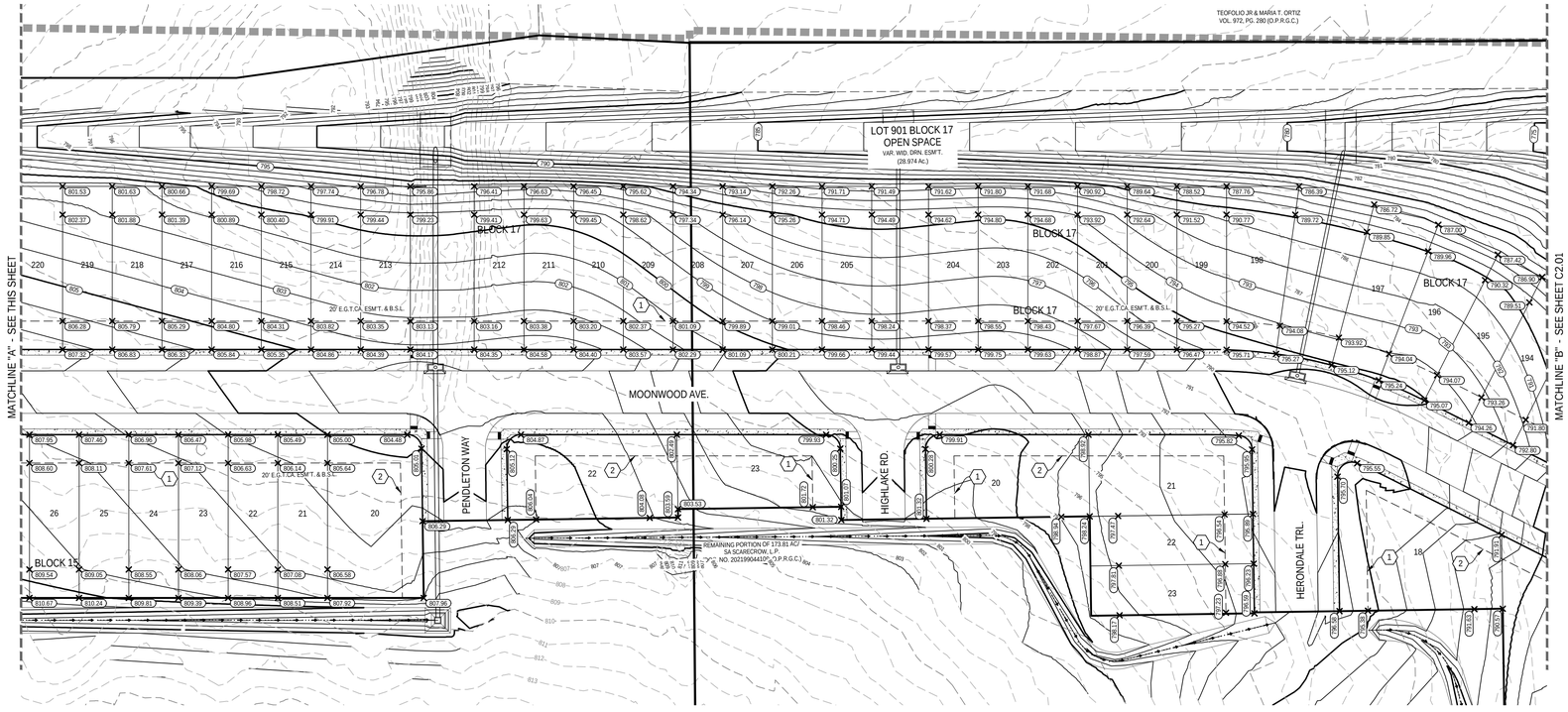
TYPICAL PAD SIZES ARE 80' x 30' ON MINOR STREETS.

CONTOURS SHOWN ON STREET ARE TOP OF STREET.

LEGEND

- PROPOSED CONTOUR — 1000
- EXISTING CONTOUR — 1000
- PROPOSED ELEVATION — (297.58)
- PROPOSED TOP OF WALL ELEVATION — (297.58 TW)
- PROPOSED BOTTOM OF WALL ELEVATION — (297.58 BW)
- EXISTING ELEVATION — 672.00E
- GRADE BREAK — GRADE BREAK
- BUILDING SETBACK
- SWALE
- RETAINING WALL
- KEYNOTE — 1





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GRACE VALLEY RANCH
PHASE 6

GRADING PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

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3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION

NOTE:

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

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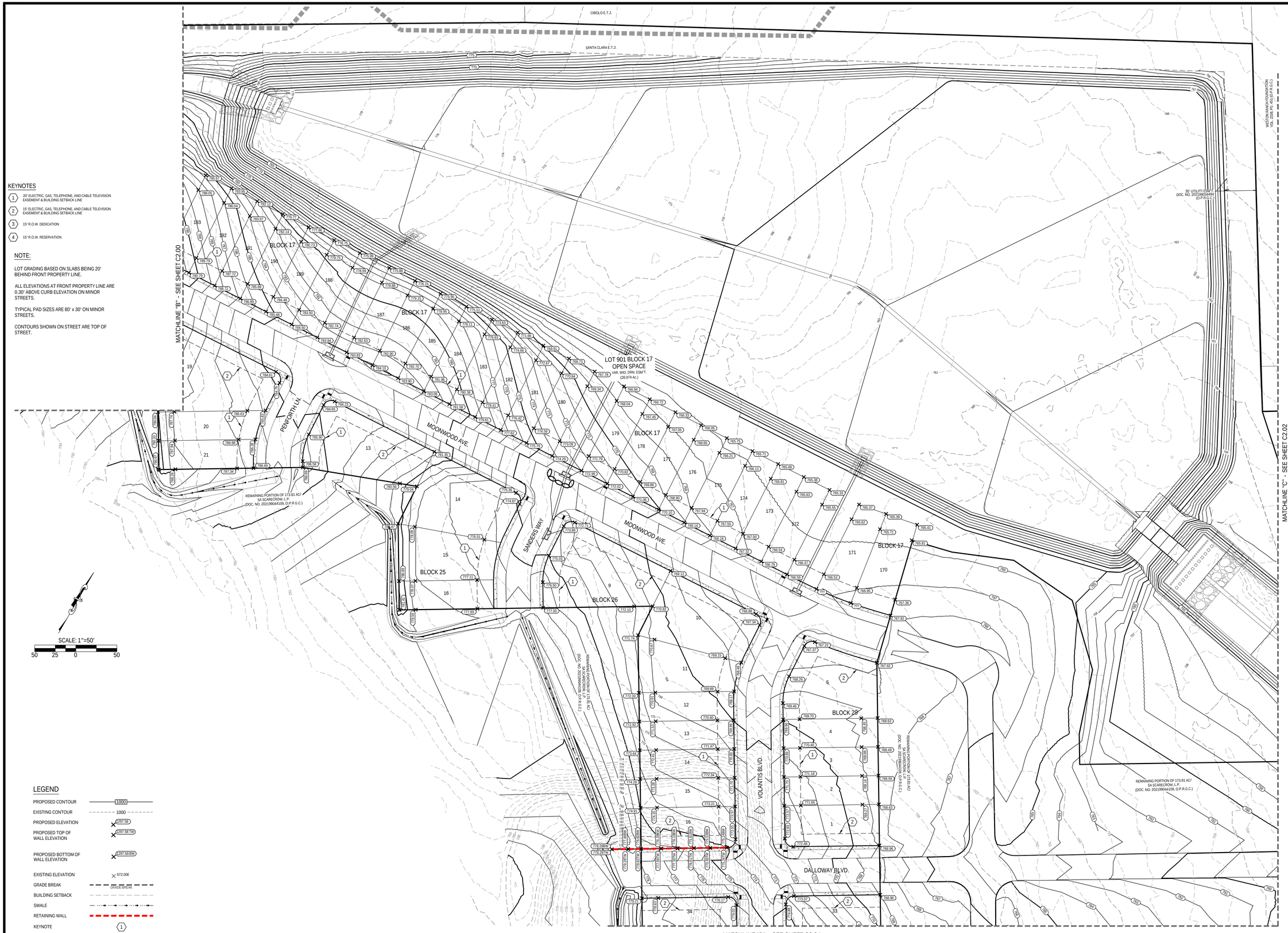

SCALE: 1"=50'
50 25 0 50

LEGEND

- PROPOSED CONTOUR — 1000
- EXISTING CONTOUR — 1000
- PROPOSED ELEVATION — 297.58
- PROPOSED TOP OF WALL ELEVATION — 297.58 TW
- PROPOSED BOTTOM OF WALL ELEVATION — 297.58 BW
- EXISTING ELEVATION — 672.00E
- GRADE BREAK — GRADE BREAK
- BUILDING SETBACK
- SWALE
- RETAINING WALL
- KEYNOTE — 1

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CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

GRADING PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C2.01

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

P:\03499\2000\1-Civil\4-Plans\GRADING\C2.01 GRAD.dwg 05/05/26 3:39pm rbarrera

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION

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- PROPOSED ELEVATION — 297.58
- PROPOSED TOP OF WALL ELEVATION — 297.58 TW
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- BUILDING SETBACK
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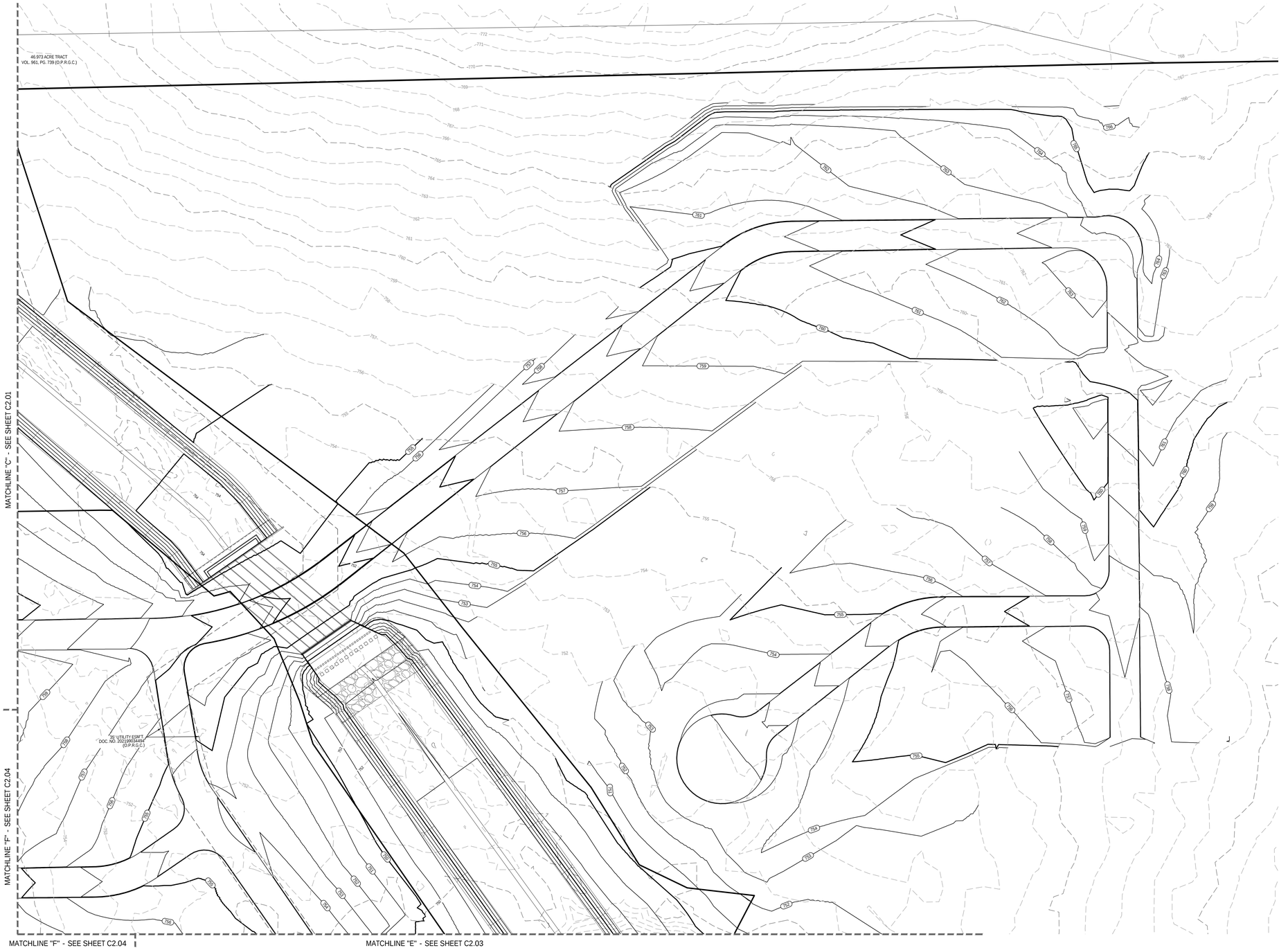
- RETAINING WALL
- KEYNOTE — 1



SCALE: 1"=50'
50 25 0 50

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GRACE VALLEY RANCH
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STATE OF TEXAS
KYLE M. HUDEK
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05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C2.02

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REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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50 25 0 50

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- BUILDING SETBACK
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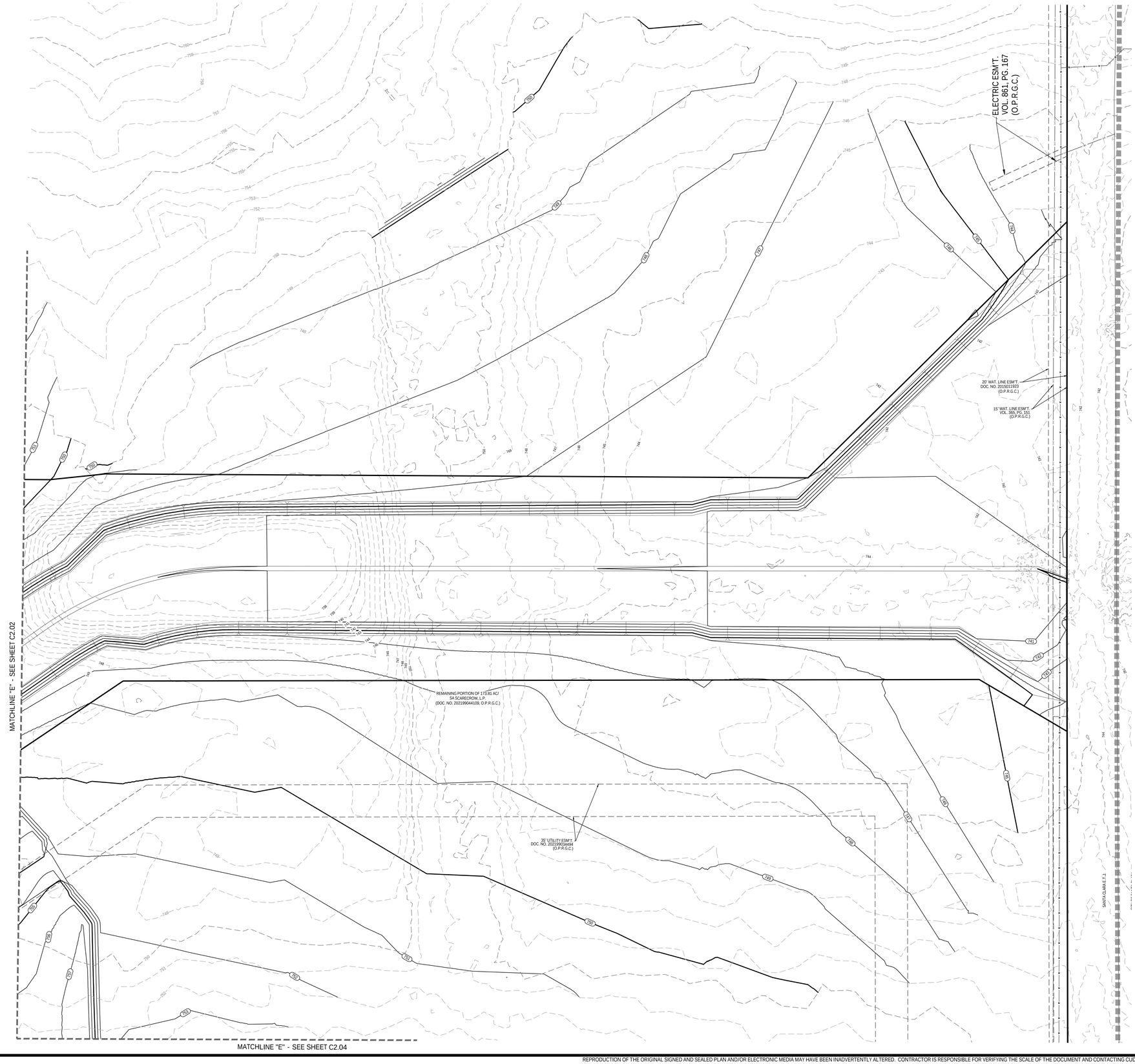
- KEYNOTE — 1



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C2.03

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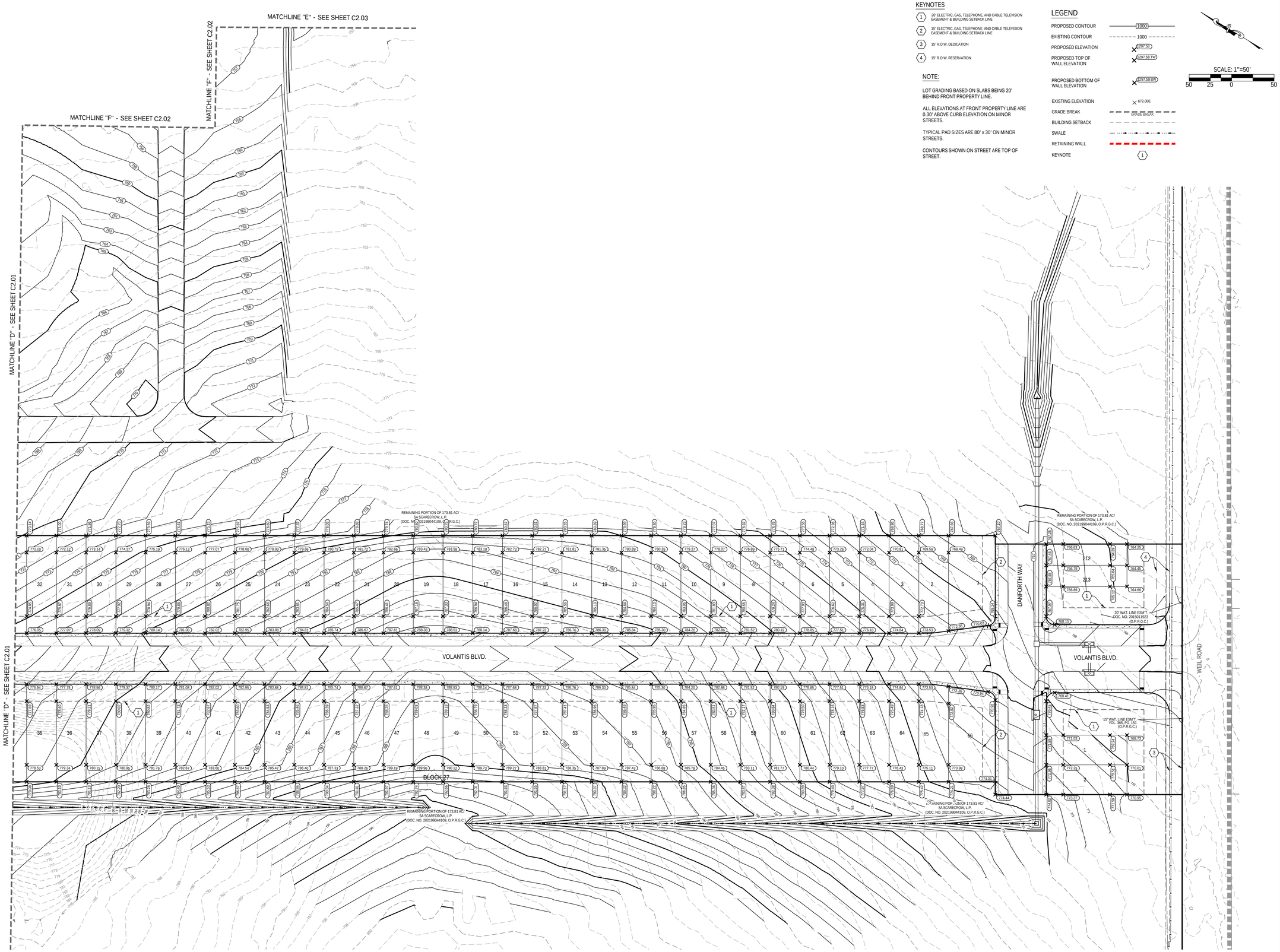

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C2.04

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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.

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.

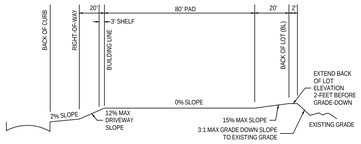
10. MOISTURE CONTENT

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

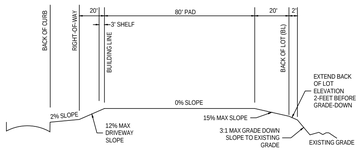
FIELD DENSITY TESTS SHALL BE PERFORMED ON LAYERS OF FILL WHEN THE FILL IS BEING PLACED AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE MAXIMUM FILL HEIGHT BETWEEN DENSITY TESTING SHALL BE EIGHTEEN INCHES (18"). ALL TESTING SHALL BE REQUESTED BY THE CONTRACTOR TO MEET THE CONTRACTOR'S CONSTRUCTION SCHEDULE. 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.



TYPICAL "A-LOT" GRADING DETAIL

(NOT TO SCALE)



TYPICAL "B-LOT" GRADING DETAIL

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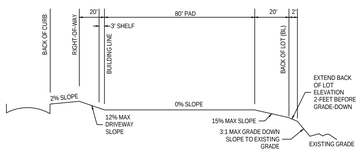

TYPICAL "C-LOT" GRADING DETAIL

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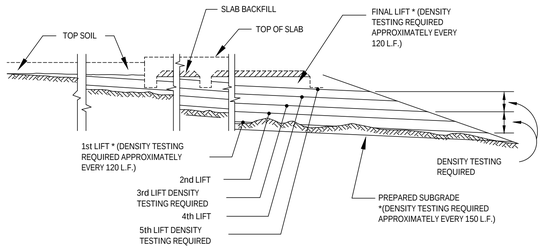

DENSITY TEST FREQUENCY

NOT TO SCALE

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GRACE VALLEY RANCH
PHASE 6

GRADING NOTES AND DETAILS

DATE
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PROJECT NO.
03499.008

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AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

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TBPE No. 455
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C2.D1

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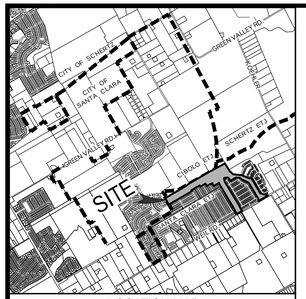

LOCATION MAP N.T.S.

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	
PROPOSED LIGHT POLE	
EXISTING OVERHEAD ELECTRIC	OHE
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T
BUILDING SETBACK LINE	B.S.L.

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DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT EXISTING UTILITIES ARE WITHIN THE SITE. 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 EMPLOYEES 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

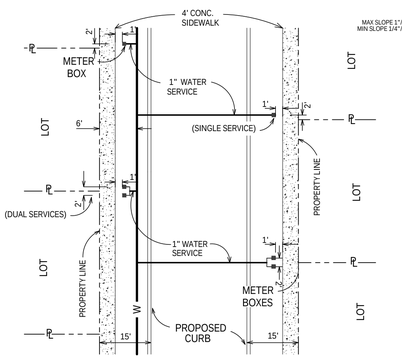
WATER METERS TO BE PLACED WITHIN RIGHT-OF-WAY TO AVOID CONFLICT WITH TRANSFORMERS/SECONDARY ENCLOSURE ELECTRIC SERVICE.

GVEC REQUIREMENTS FOR ELECTRIC UTILITY ROAD CROSSINGS

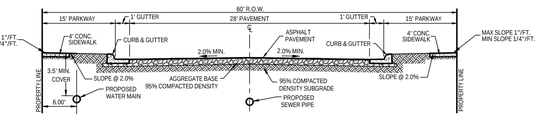
1. ONLY 2 ½ INCH SCHEDULE 40 GRAY ELECTRICAL CONDUIT IS TO BE USED AND IS TO BE SUPPLIED BY THE DEVELOPER. ALL JOINTS MUST BE GLUED.
2. ROAD CROSSINGS MUST BE INSTALLED 3 FT. BELOW FINAL SUB-GRADE OR 4 FT. FROM FINAL GRADE ON NON-WATER SIDE. WHEN ELECTRICAL CROSSINGS ARE REQUIRED TO CROSS WATER MAINS, THEY MUST BE 2 FT. BELOW OR 2 FT ABOVE WATER MAINS, BUT NOT LESS THAN 48 INCHES OF COVER BELOW FINAL GRADE (PIT SAND MAY BE REQUIRED BY SOME WATER UTILITIES).
3. ALL CONDUIT PIPES SHOULD BE LAID FLAT IN THE DITCH, SIDE BY SIDE, NOT STACKED OR TWISTED. IF MORE THAN TWO PIPES ARE IN A DITCH YOU MUST NUMBER THE INSIDE, BOTTOM OF EACH PIPE (EX: 1, 2, 3, ETC.)
4. ALL OTHER UTILITIES MUST MAINTAIN A MINIMUM OF 3 FT. OF SEPARATION FROM THE ELECTRICAL CROSSING DITCH.
5. NO OTHER UTILITY CROSSINGS SHOULD BE STUBBED OUT IN FRONT OF ELECTRICAL TRANSFORMERS OR SWITCHES.
6. NO OTHER UTILITIES ARE TO BE PLACED IN THE SAME DITCH AS THE ELECTRICAL CROSSING.
7. ALL CROSSINGS ARE TO BE INSTALLED AT THE PROPERTY LINE UNLESS THERE ARE WATER METERS EXISTING ON EACH SIDE OF THE PROPERTY LINE AT THE CROSSING LOCATION. AT LOCATIONS WHERE WATER METER CONFLICTS EXIST, THE ELECTRICAL CROSSING MUST BE MOVED 7' FROM THE PROPERTY LINE TO AVOID WATER METERS. ALL OTHER UTILITY CROSSINGS MUST BE LOCATED 3 FT. ON OPPOSITE SIDE OF PROPERTY LINE.
8. ALL CROSSINGS MUST BE INSPECTED BY A GVEC REPRESENTATIVE BEFORE THEY ARE BACKFILLED. PLEASE PROVIDE ONE WEEK NOTICE AS TO WHEN INSPECTIONS WILL BE NEEDED.
9. ALL UTILITY CONDUIT LOCATIONS SHALL BE PROVIDED ON A SEPARATE EXHIBIT THAT MUST BE REQUESTED BY THE CONTRACTOR TO THE ENGINEER.

*CONDUIT SLEEVE NOTE:

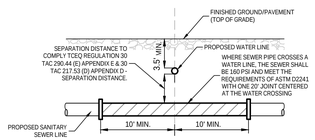
1. SLEEVE INSTALLATION TO BE COMPLETED IN ACCORDANCE TO GVEC ISSUED ELECTRICAL PLAN.



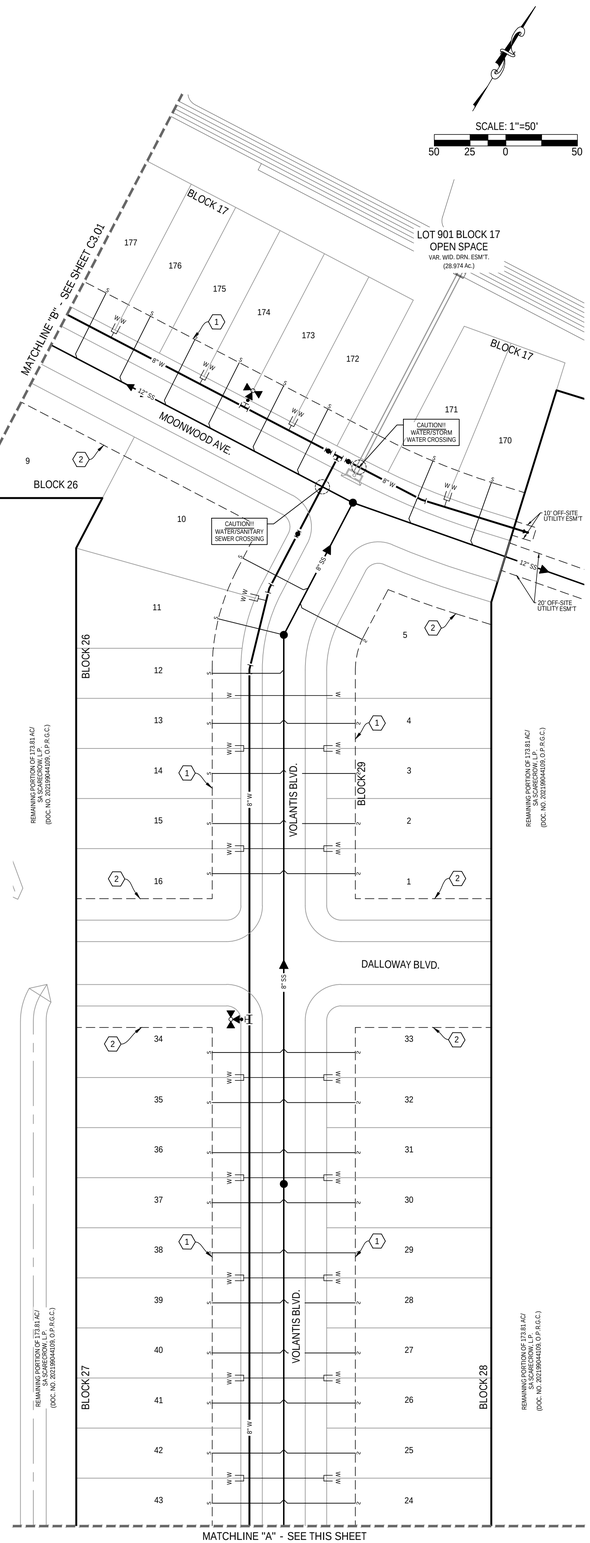
WATER METER BOX LOCATION (60' R.O.W.) N.T.S.



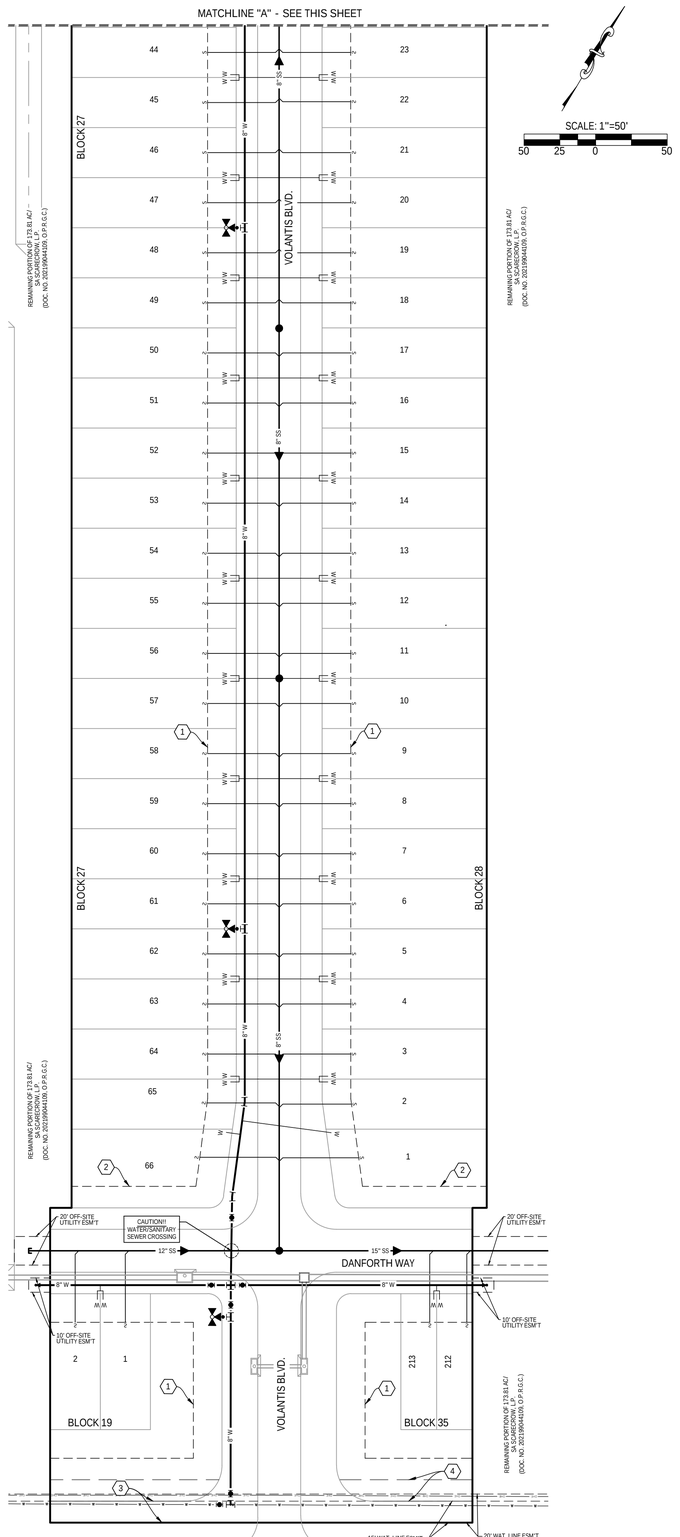
MINOR STREET CROSS-SECTION N.T.S.



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



MATCHLINE "A" - SEE THIS SHEET



CUDEENGINEERS.COM
CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P.(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

UTILITY PLAN

DATE 05/06/2025
PROJECT NO. 03499.008
DRAWN BY AG/BK/SG/RB/JF
CHECKED BY K.M.H.

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

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C3.00

P:\03499\2025\2 Civil\04 Files\AUTOCAD\ UTIL Eng 2025-05-06 & Apvd Issuance

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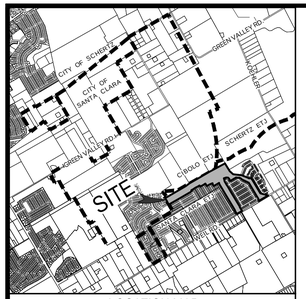

LOCATION MAP

N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

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	
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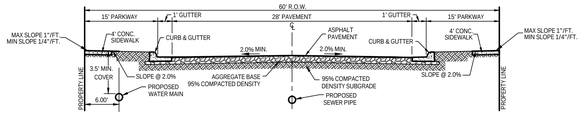
PROPOSED PERMANENT BLOWOFF	
PROPOSED LIGHT POLE	
EXISTING OVERHEAD ELECTRIC	OHE
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T
BUILDING SETBACK LINE	B.S.L.

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION



MINOR STREET CROSS-SECTION

N.T.S.

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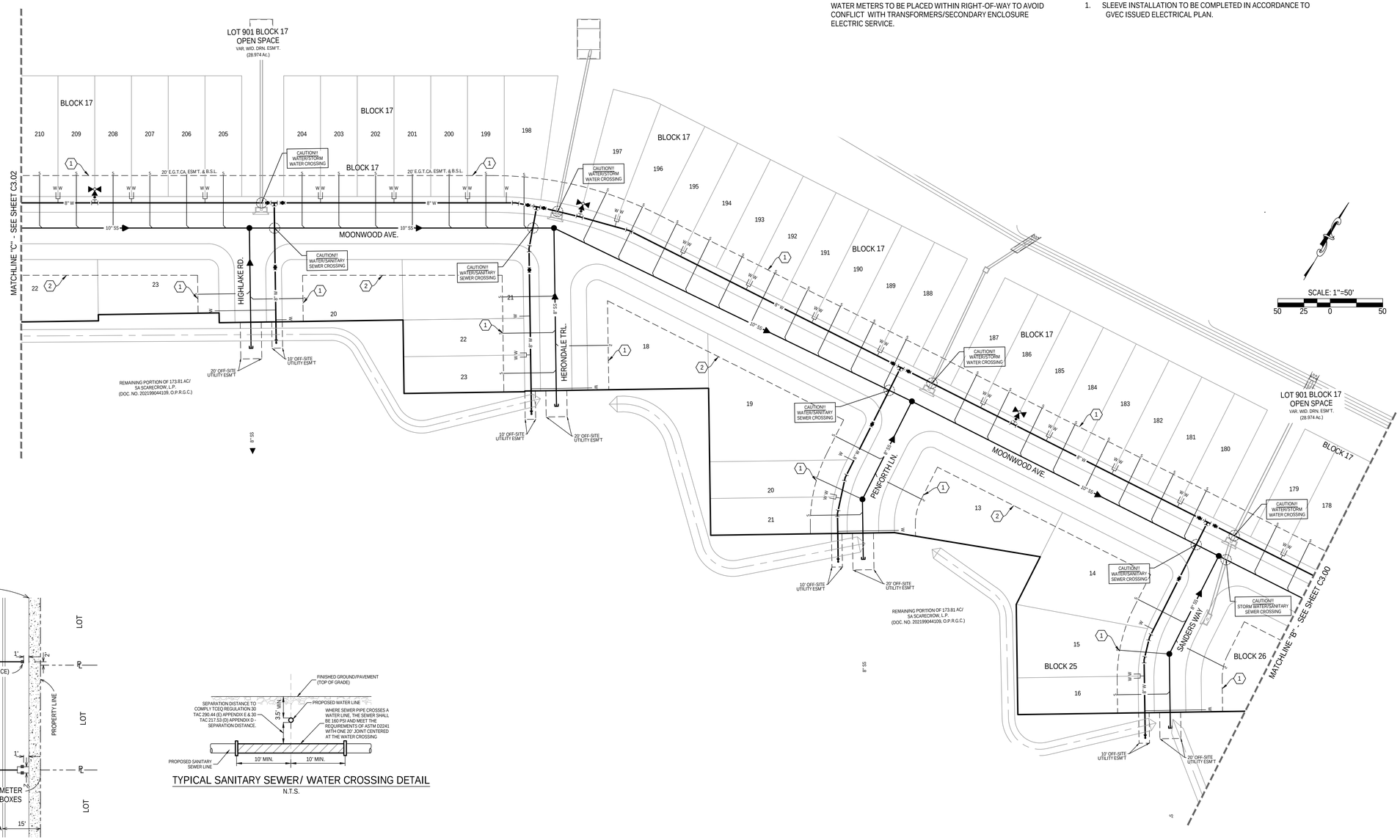

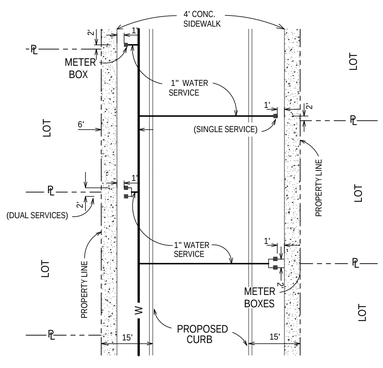

WATER METER BOX LOCATION (60' R.O.W.)

N.T.S.

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

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GRACE VALLEY RANCH PHASE 6

UTILITY PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C3.01

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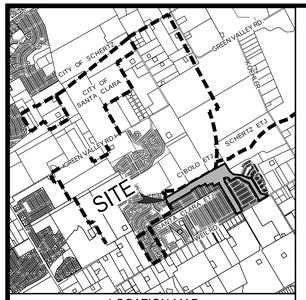

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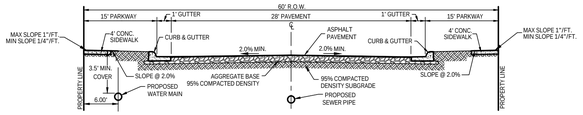

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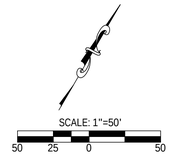
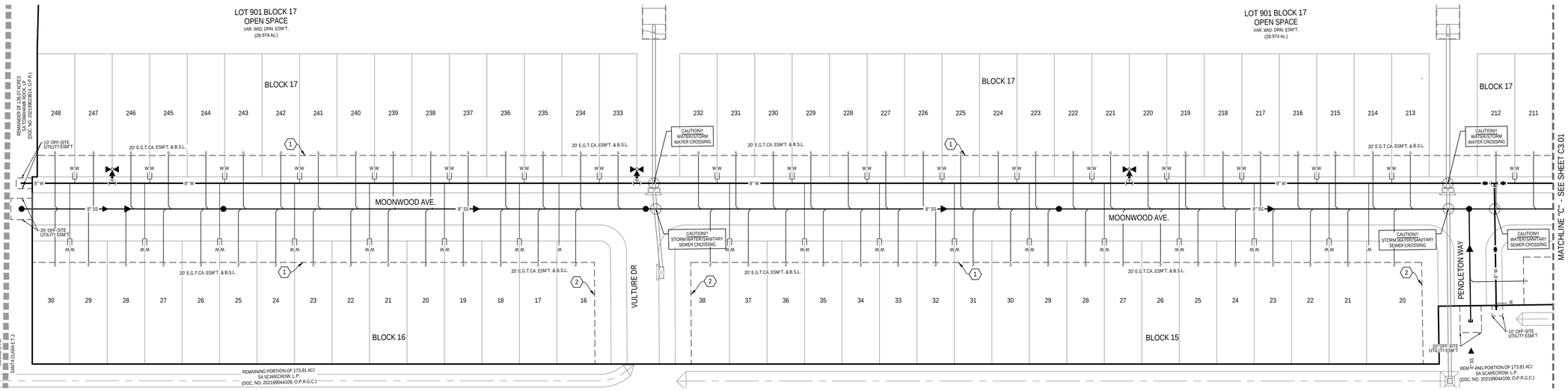
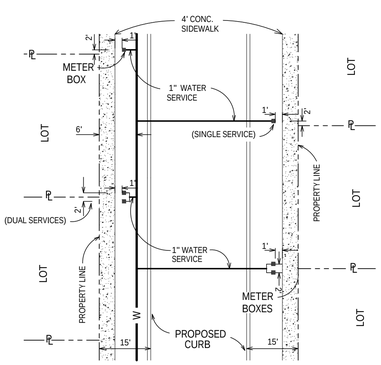
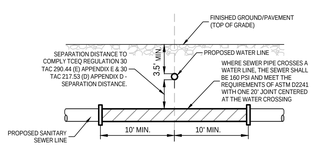






WATER METER BOX LOCATION (60' R.O.W.)

N.T.S.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

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GRACE VALLEY RANCH PHASE 6

UTILITY PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C3.02

P:\03499\03499.03\Civil Plans\Utility\ACAD\C3.02 UTIL.dwg 2025/05/06 8:50pm rbarrera

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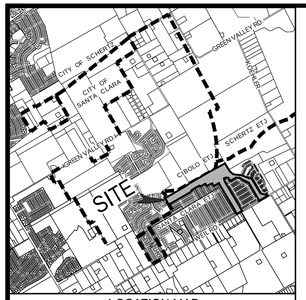

LOCATION MAP

N.T.S.

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ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.C.A. ESM'T
EXISTING MAJOR CONTOURS	850
EXISTING MINOR CONTOURS	857

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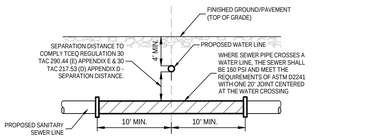

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

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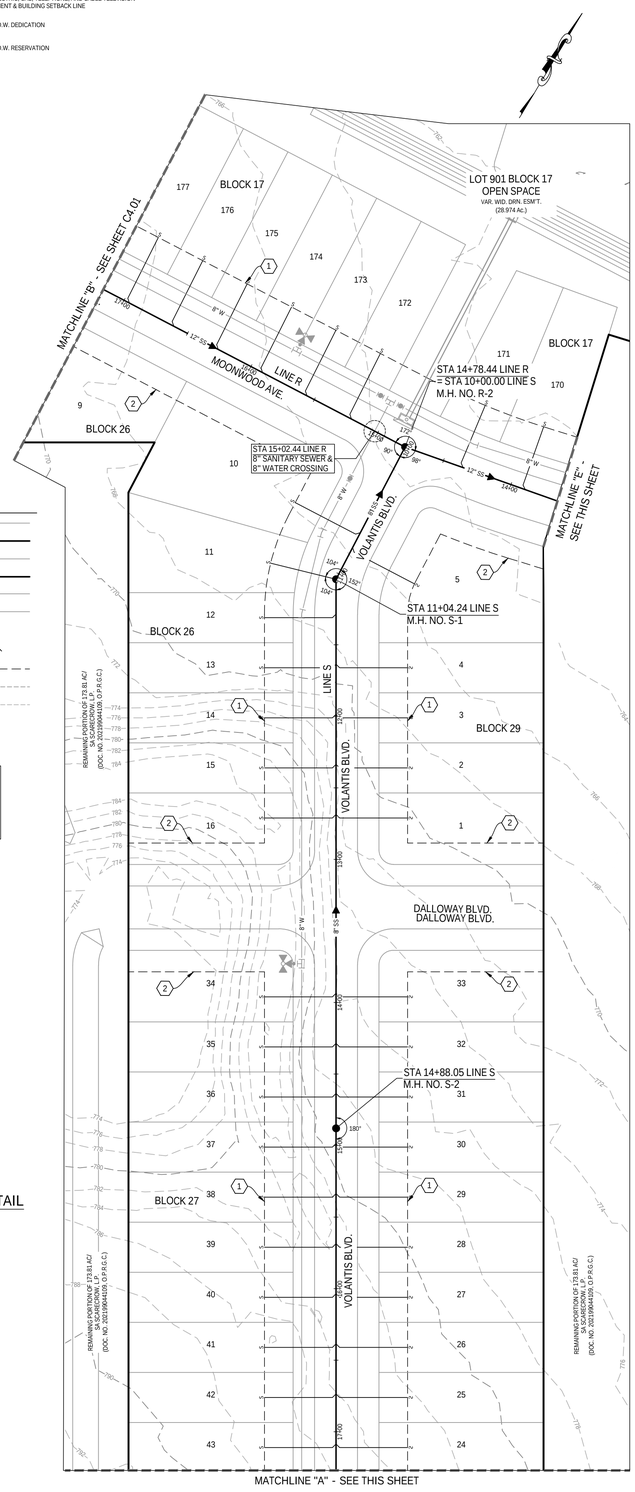

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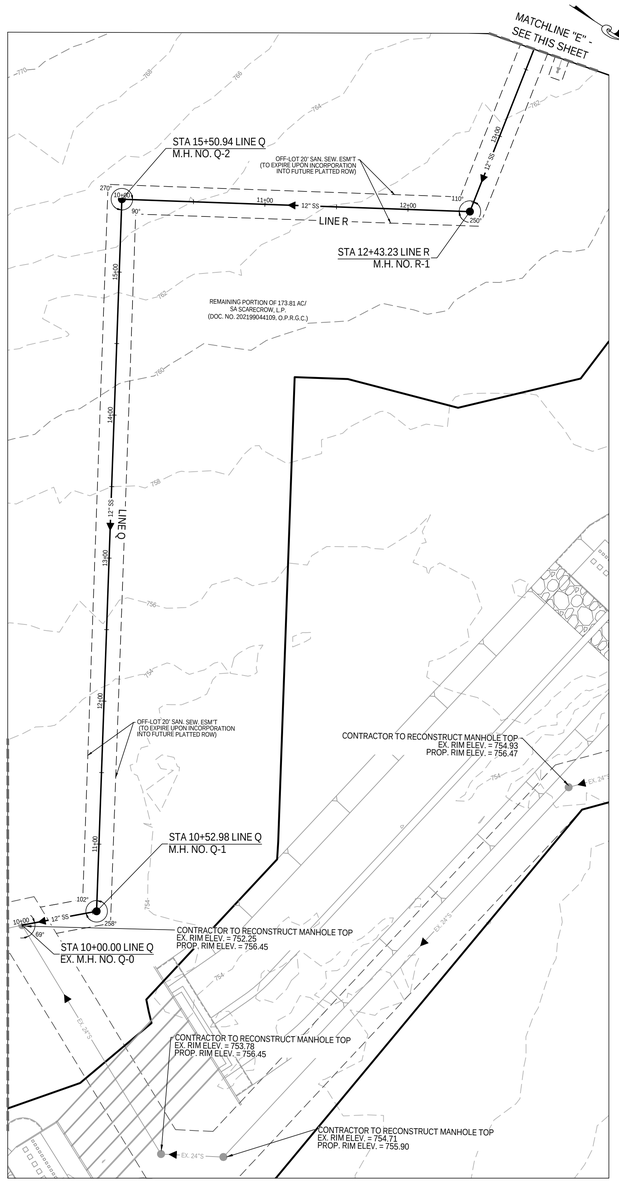

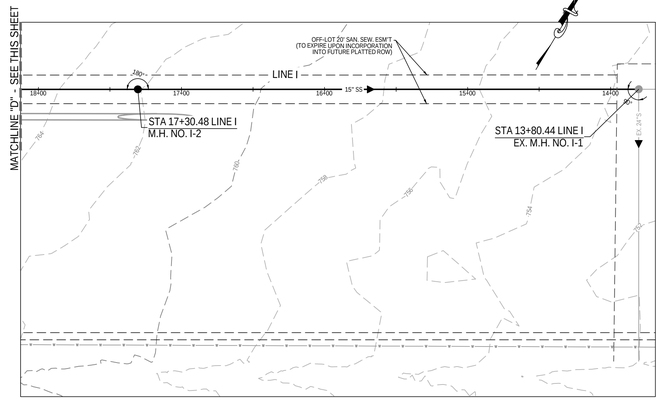

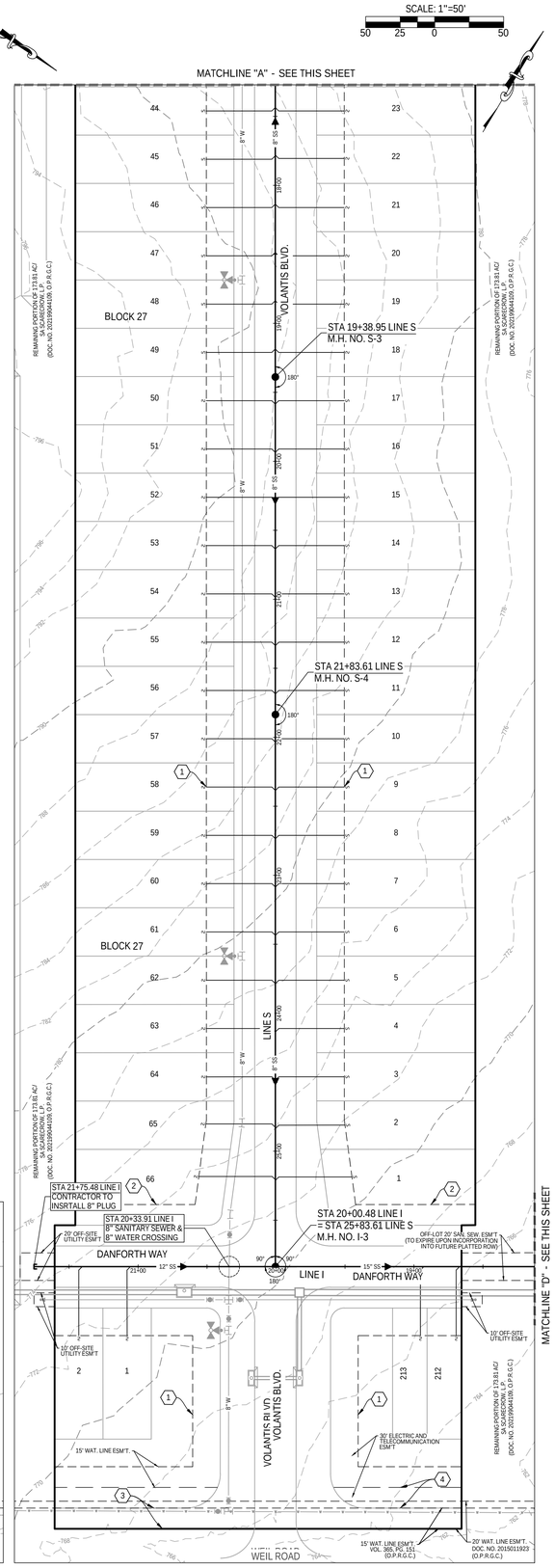

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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER MASTER PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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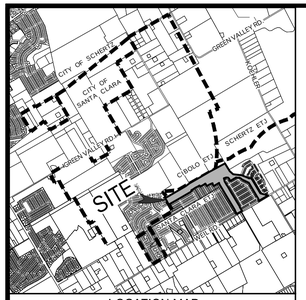
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.00

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



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
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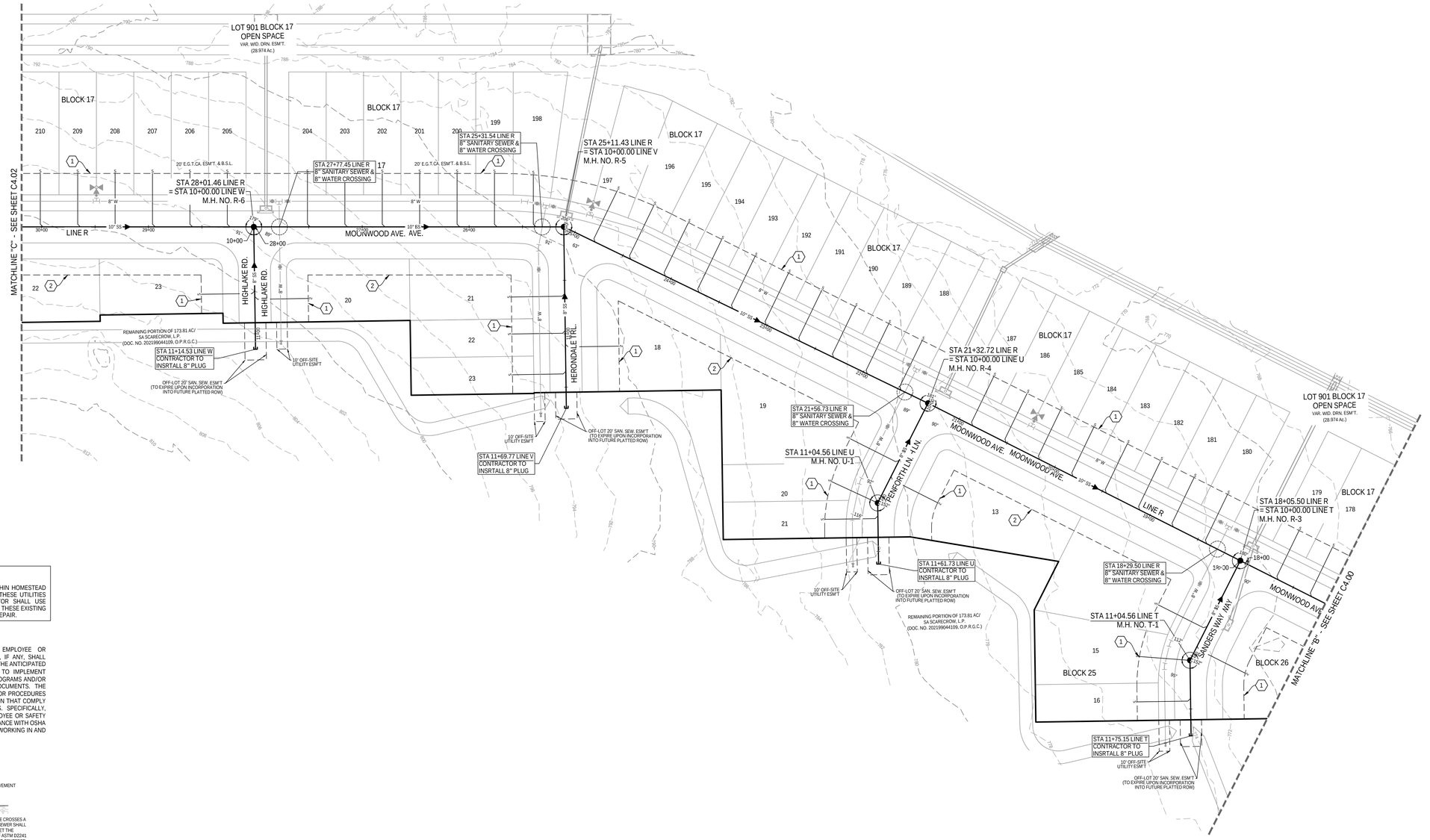
- PROPOSED STANDARD FIRE HYDRANT
- PROPOSED SANITARY SEWER LATERAL
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.CA. ESM'T.
- EXISTING MAJOR CONTOURS — 850
- EXISTING MINOR CONTOURS — 857

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE

SCALE: 1"=50'
50 25 0 50



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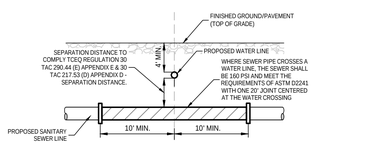

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

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San Antonio, Texas 78231
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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER MASTER PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.01

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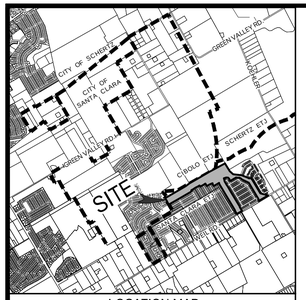

LOCATION MAP

N.T.S.

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KEYNOTES

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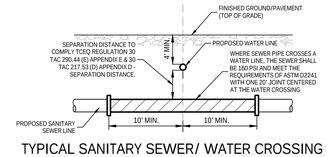
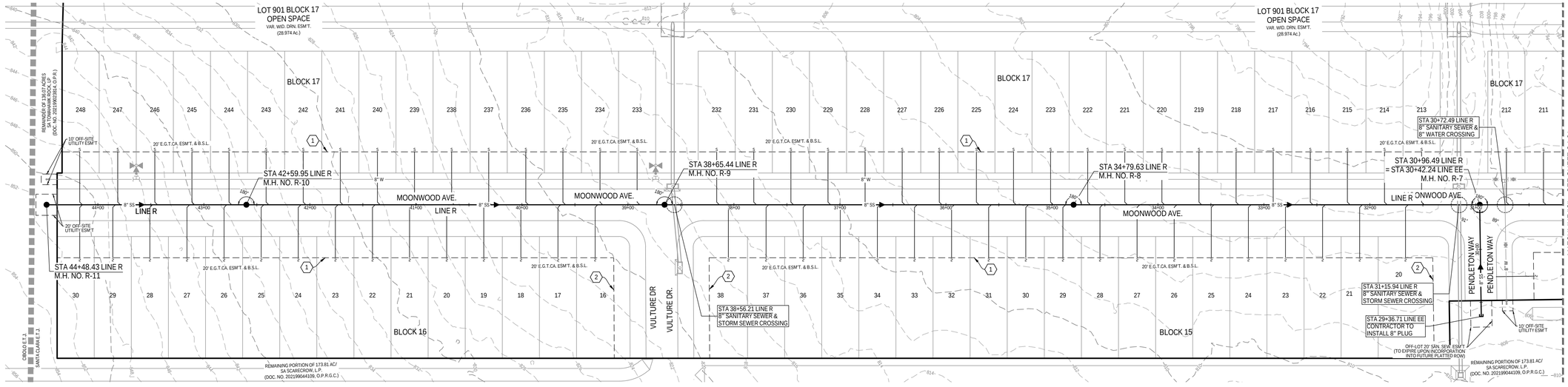


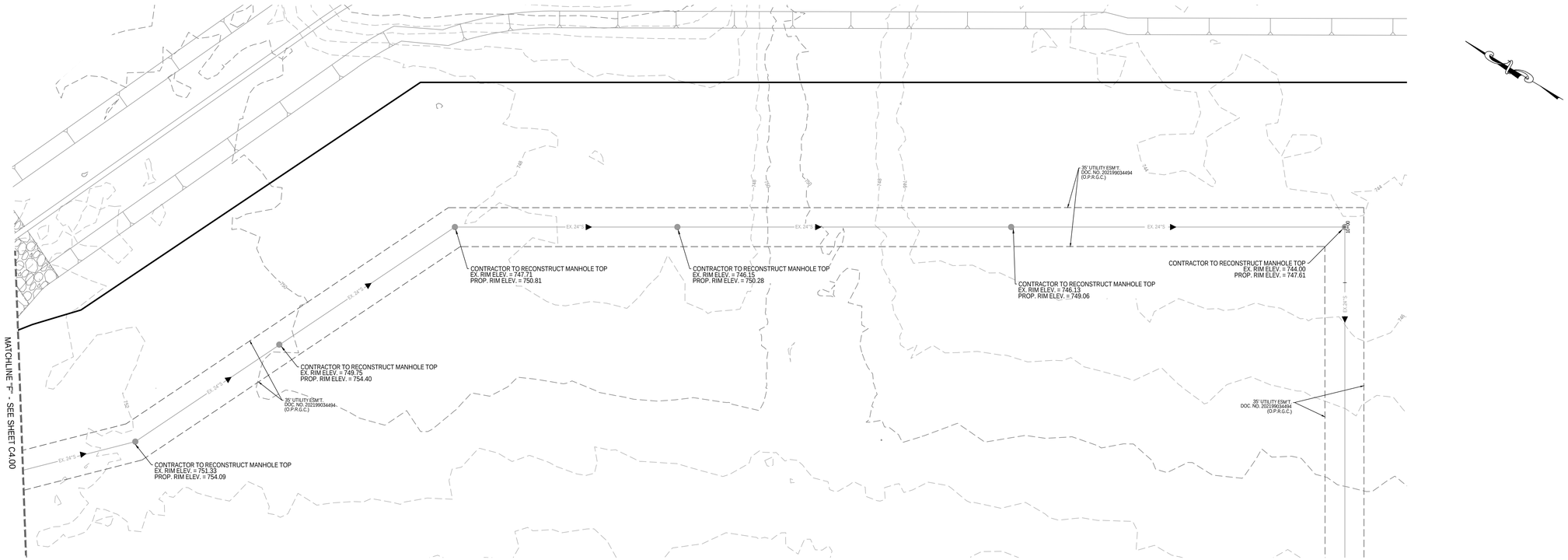
TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

SCALE: 1"=50'

50 25 0 50





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GRACE VALLEY RANCH PHASE 6

SANITARY SEWER MASTER PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.02

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KEYNOTES

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4. 15' R.O.W. RESERVATION

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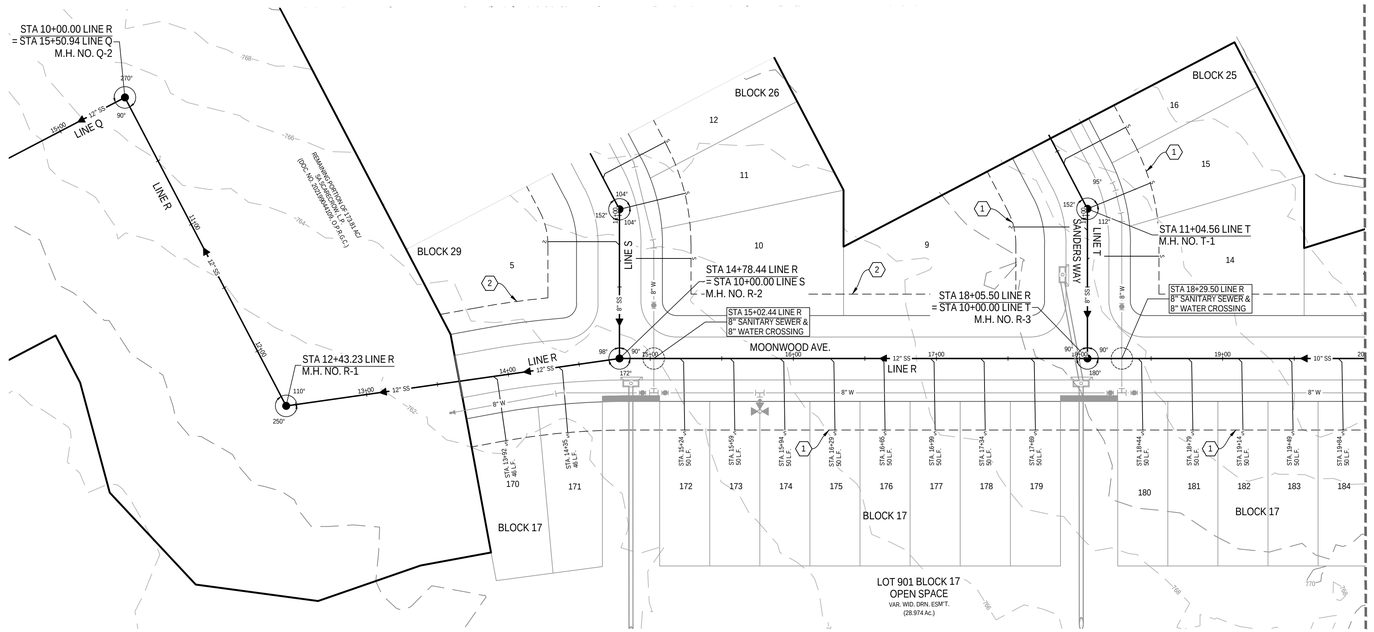

SCALE: 1"=50'

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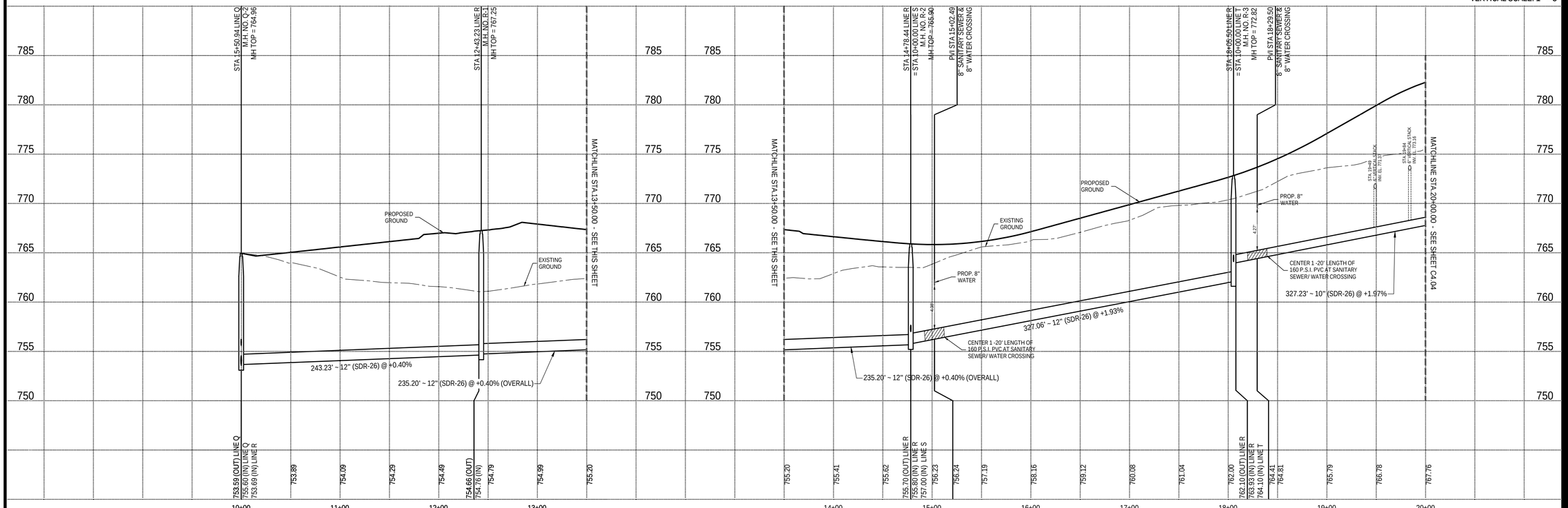
LINE "R"

STA. 10+00.00 TO STA. 20+00.00

VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE R

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.03

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KEYNOTES

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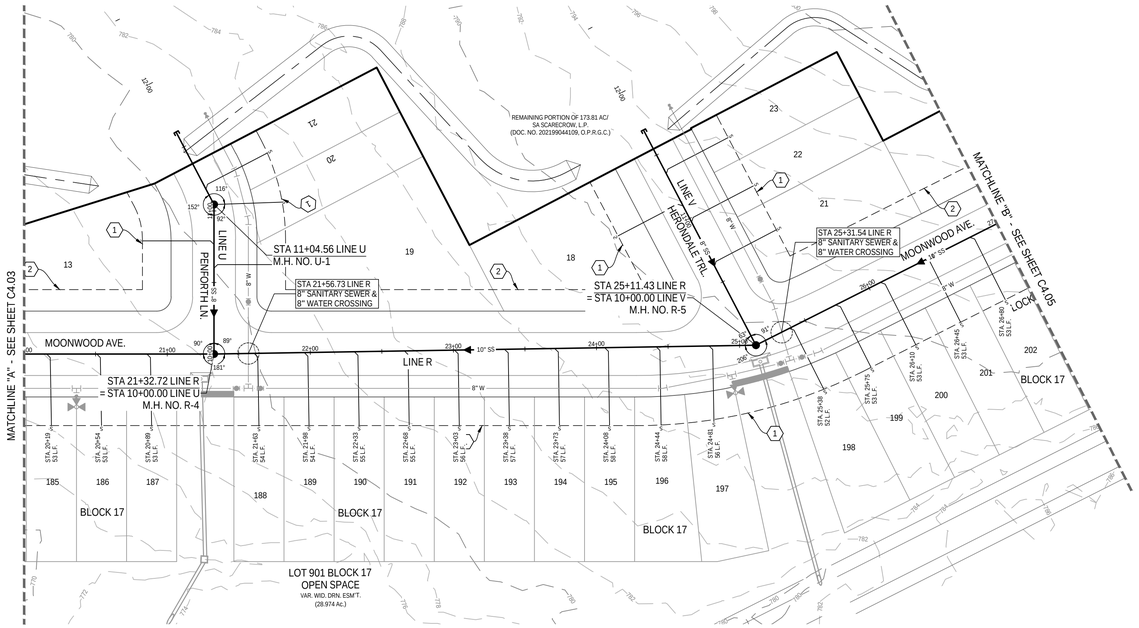

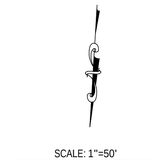

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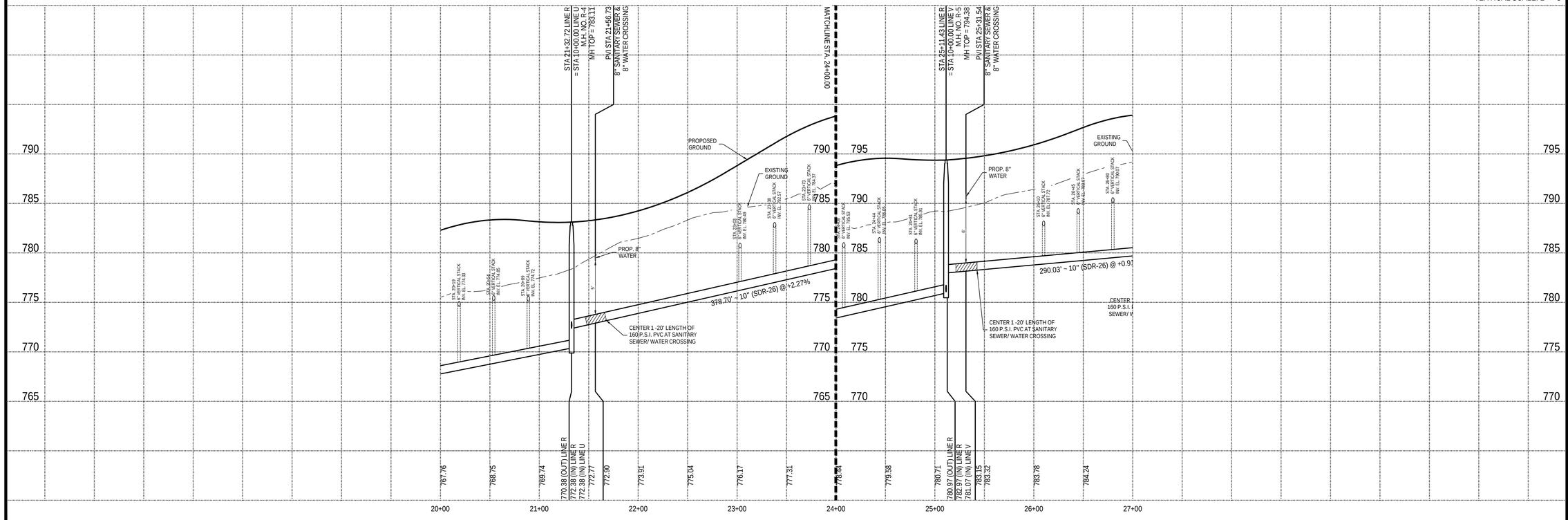
LINE "R"

STA. 20+00.00 TO STA. 27+00.00

VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE R

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.04

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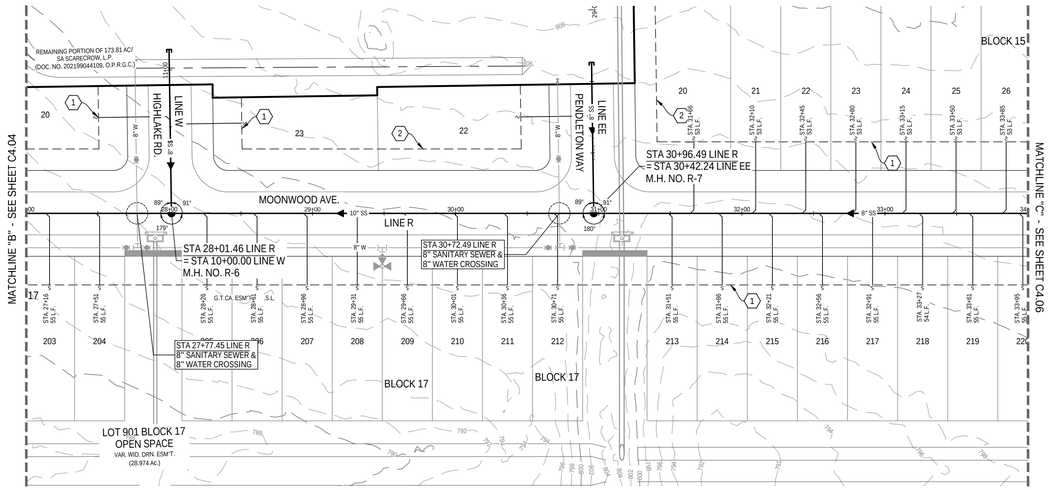

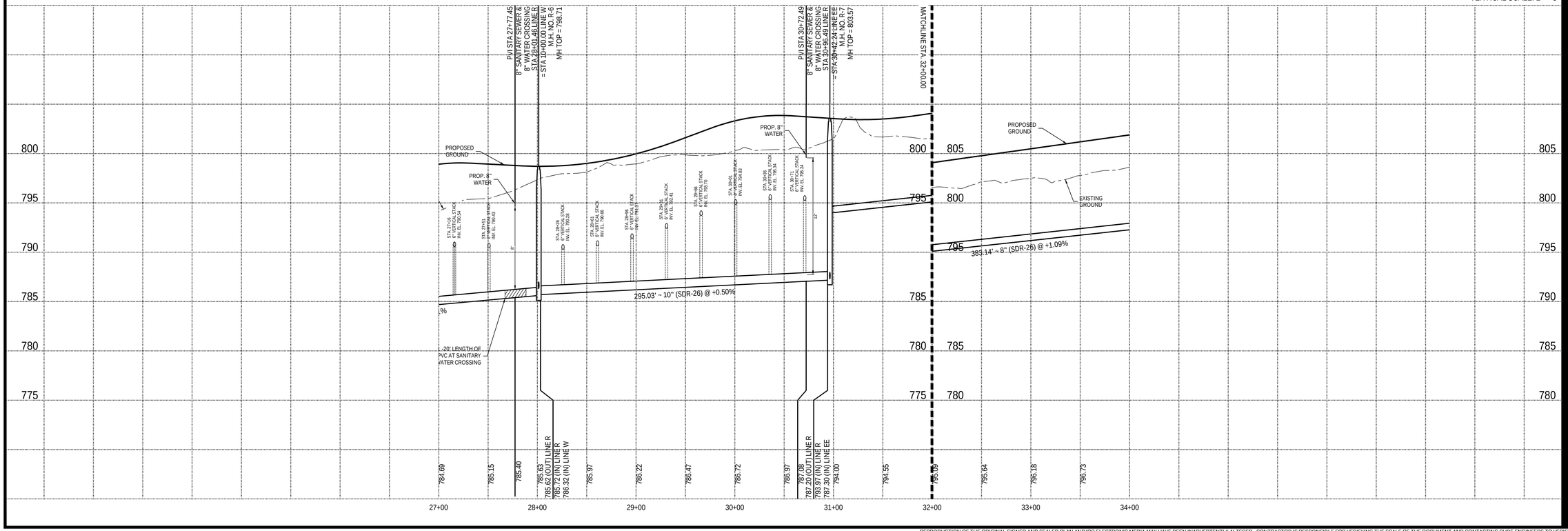

LINE "R"

STA. 27+00.00 TO STA. 34+00.00

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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE R

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
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138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

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TBPE No. 455
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C4.05

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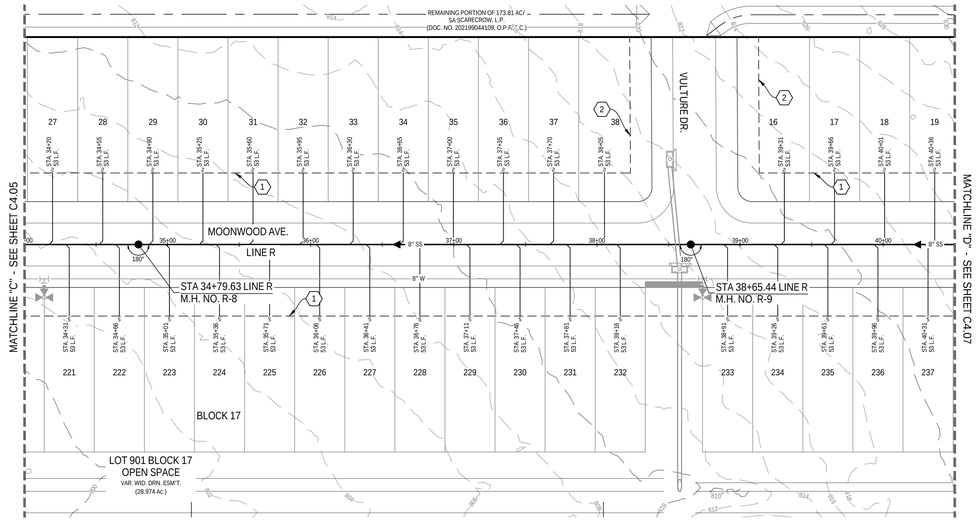
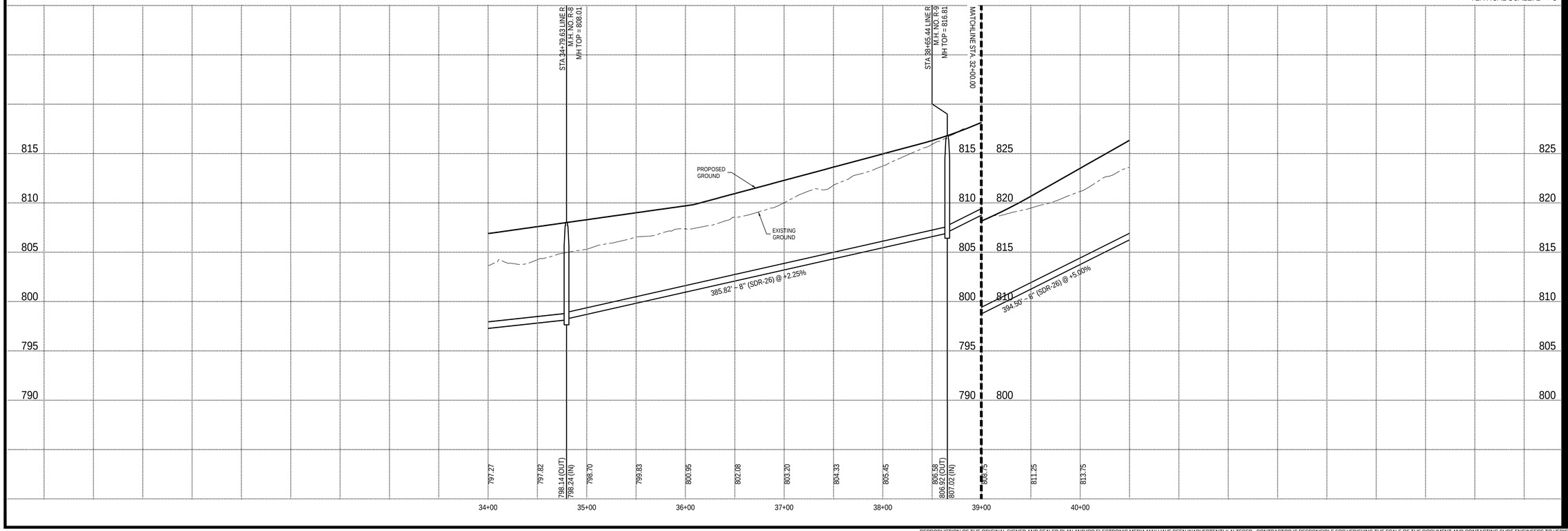


LINE "R"

STA. 34+00.00 TO STA. 40+50.00

VERTICAL SCALE: 1" = 5'



CAUTION!!!

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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.

SCALE: 1"=50'
50 25 0 50

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San Antonio, Texas 78231
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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE R

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.06

P:\03499\000\Civil\14 Sheets\03499_000_C4.06_SSP Ang Jeng 2025-05-06 8.dwg, 2025-05-06 8:34:01 AM, Ang Jeng
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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
- PROPOSED STANDARD FIRE HYDRANT
- PROPOSED SANITARY SEWER LATERAL
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.CA. ESMT
- EXISTING MAJOR CONTOURS — 850
- EXISTING MINOR CONTOURS — 857

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION

TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION!!!

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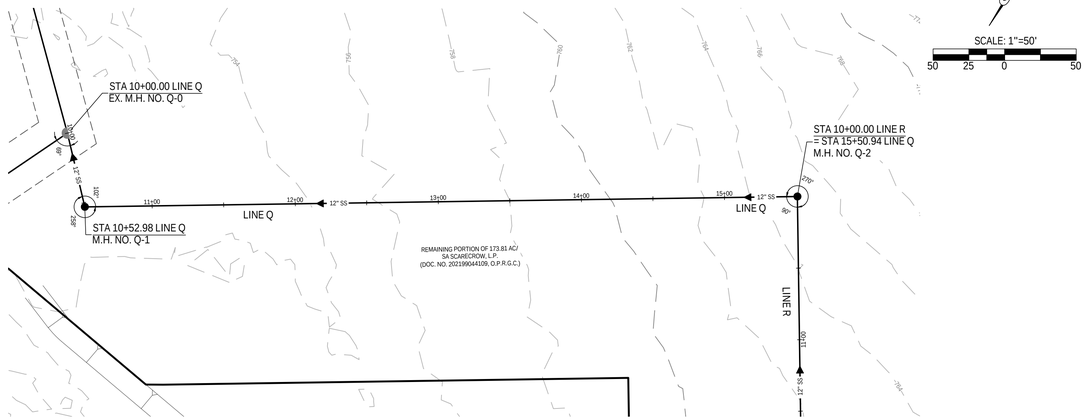
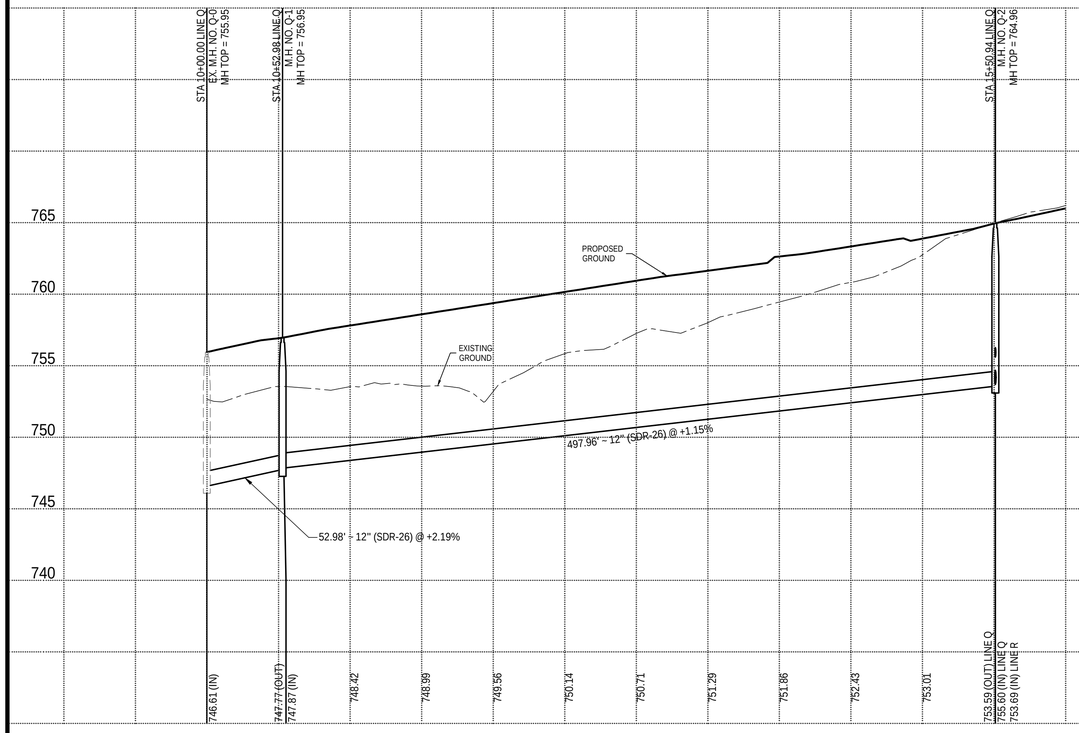
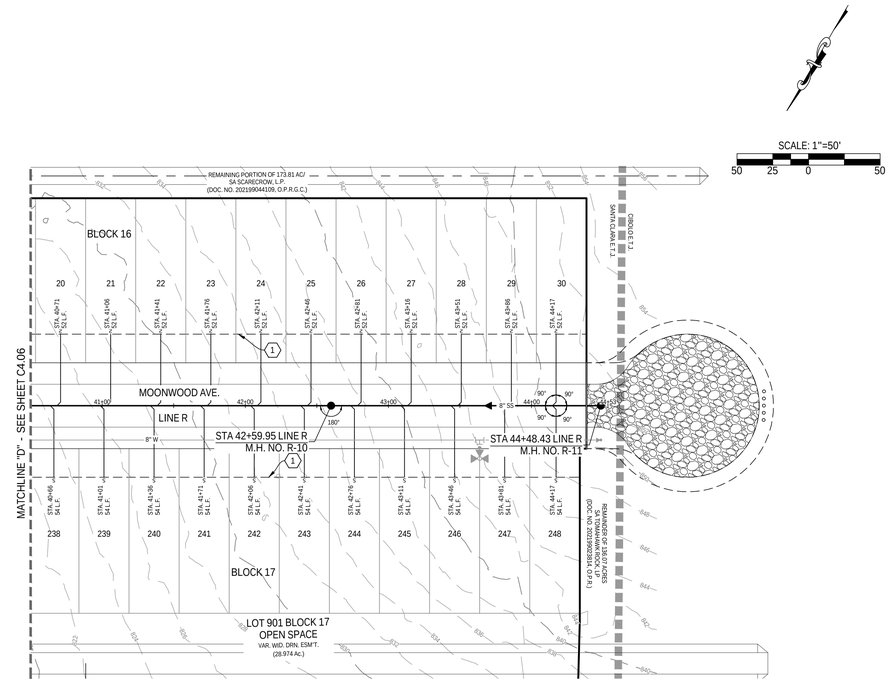


LINE "Q"

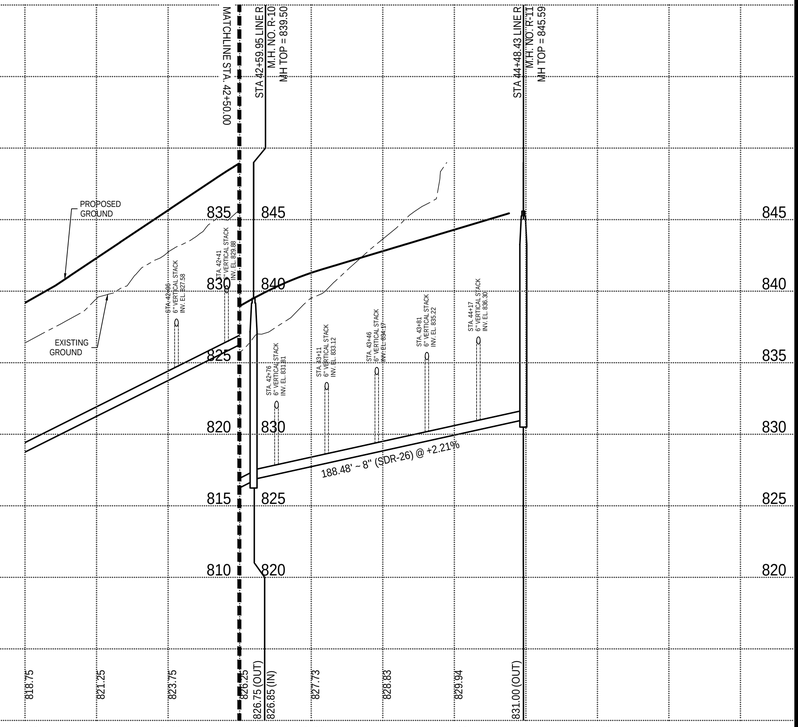
STA. 10+00.00 TO STA. 15+50.94





LINE "R"

STA. 40+50.00 TO STA. 44+53.00



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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINES Q & R

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.07

P:\03499\0005\CIVIL\4-Sheets\LAYOUT.DWG, 5/5/2025 8:54:04 AM, Andy Gray
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER MAIN — 8"SS
- EXISTING SANITARY SEWER MAIN — EX. 8" SS
- PROPOSED WATER MAIN — 8"W
- EXISTING WATER MAIN — EX. 8" W
- PROPOSED STANDARD FIRE HYDRANT
- PROPOSED STANDARD GATE VALVE
- PROPOSED PERMANENT BLOWOFF
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.CA. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- KEYNOTE — (1)

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
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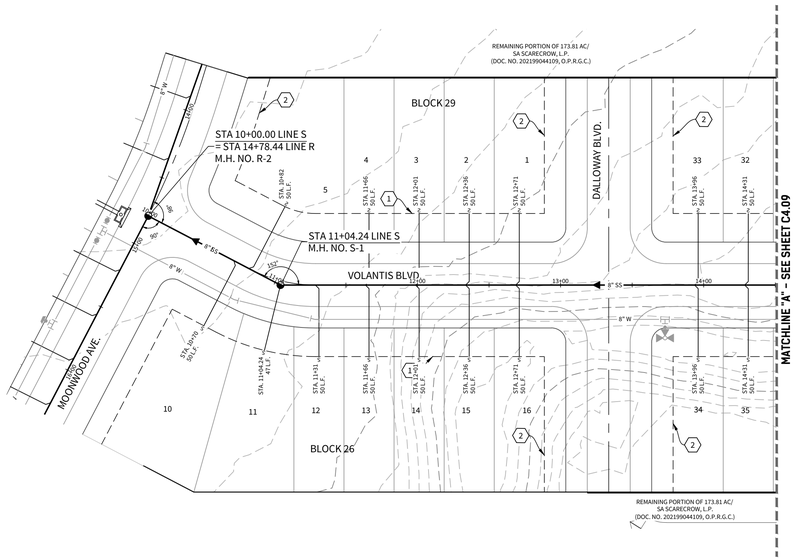
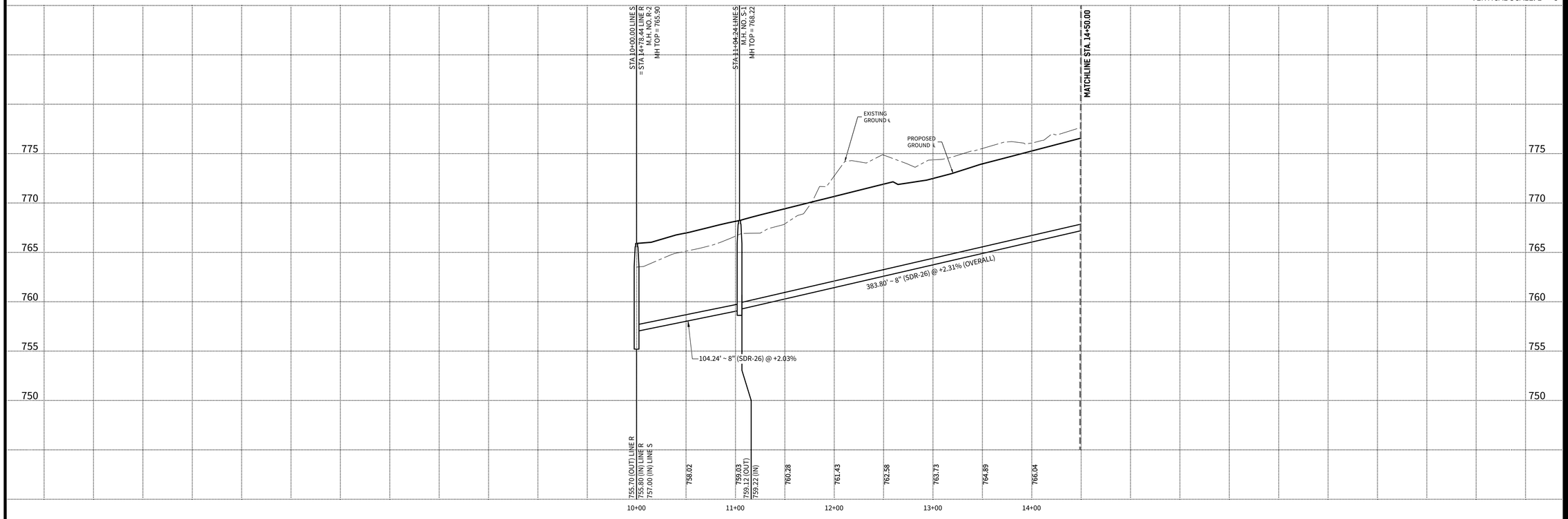
4. 15' R.O.W. RESERVATION



LINE "S"

STA. 10+00.00 TO STA. 14+50.00

VERTICAL SCALE: 1" = 5'



SCALE: 1"=50'

50 25 0 50

CAUTION!!!

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TRENCH EXCAVATION SAFETY PROTECTION

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San Antonio, Texas 78231
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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE S

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.08

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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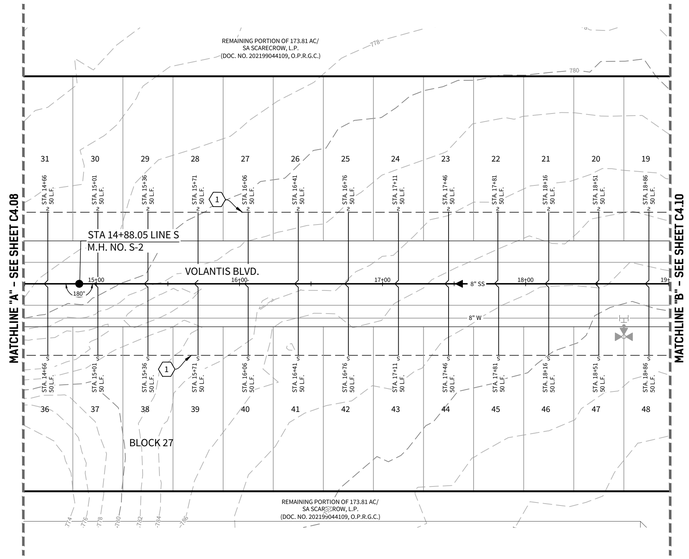
LEGEND

- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER MAIN — 8"SS
- EXISTING SANITARY SEWER MAIN — EX. 8" SS
- PROPOSED WATER MAIN — 8"W
- EXISTING WATER MAIN — EX. 8" W
- PROPOSED STANDARD FIRE HYDRANT
- PROPOSED STANDARD GATE VALVE
- PROPOSED PERMANENT BLOWOFF
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.CA. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- KEYNOTE — (1)

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION



SCALE: 1"=50'

50 25 0 50

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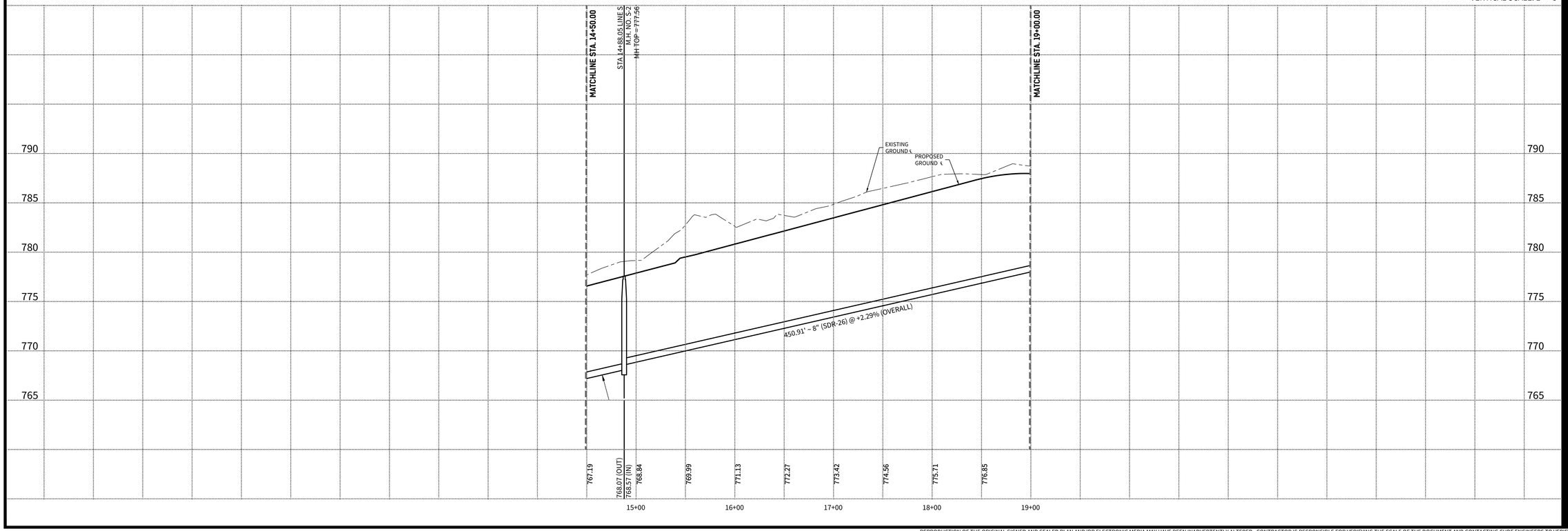
LINE "S"

STA. 14+50.00 TO STA. 19+00.00

VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE S

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.09

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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LEGEND

- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER MAIN — 8"SS
- EXISTING SANITARY SEWER MAIN — EX. 8" SS
- PROPOSED WATER MAIN — 8"W
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- PROPOSED STANDARD GATE VALVE
- PROPOSED PERMANENT BLOWOFF
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.C.A. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- KEYNOTE — (1)

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
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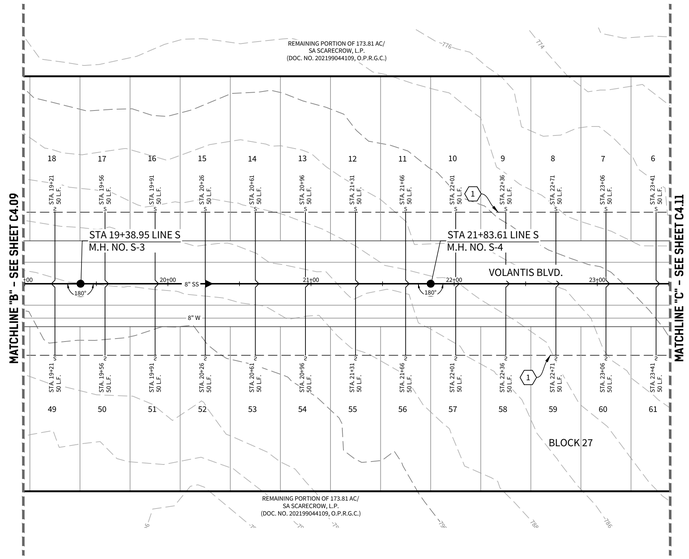
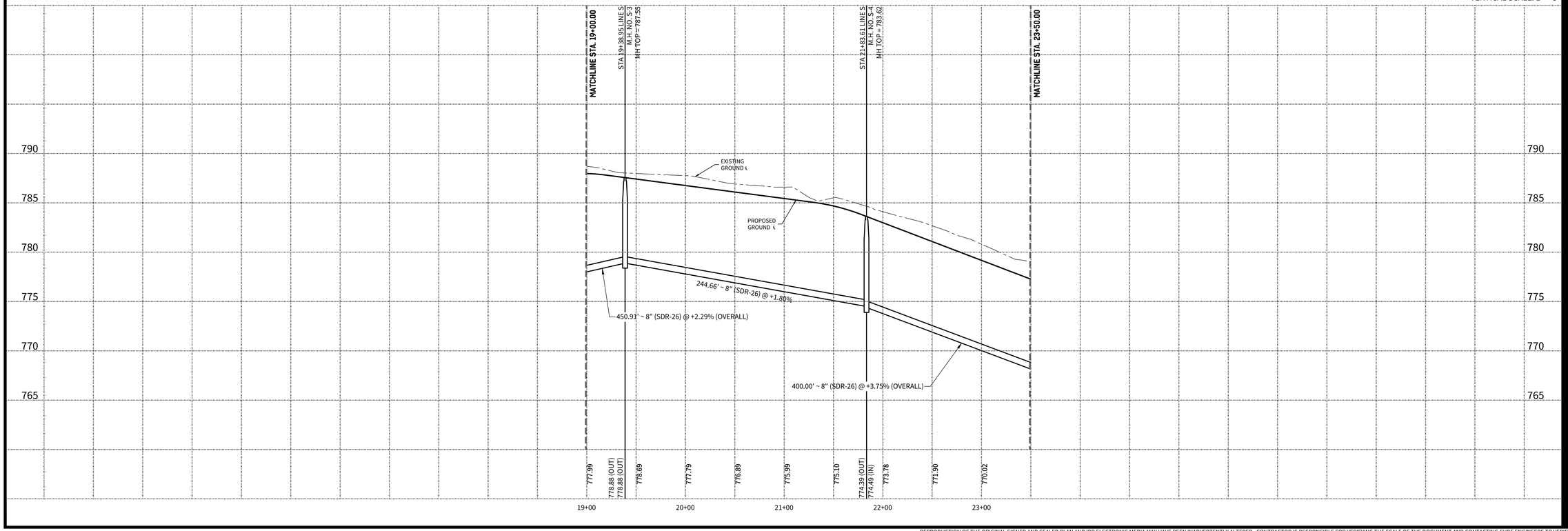


LINE "S"

STA. 19+00.00 TO STA. 23+50.00

VERTICAL SCALE: 1" = 5'



SCALE: 1"=50'

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CAUTION!!!

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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE S

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.10

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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LEGEND

- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER MAIN — 8"SS
- EXISTING SANITARY SEWER MAIN — EX. 8" SS
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- PROPOSED PERMANENT BLOWOFF
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.C.A. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- KEYNOTE — 1

KEYNOTES

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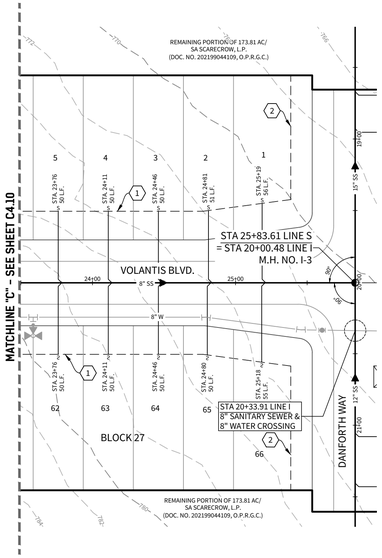

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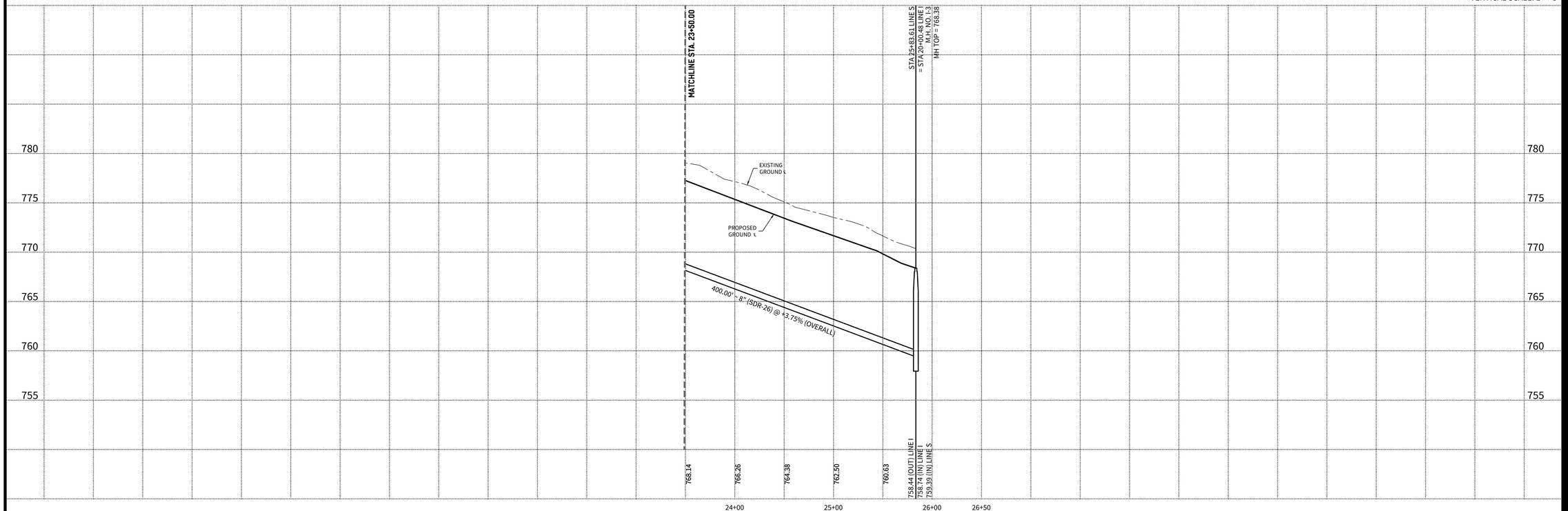
TRENCH EXCAVATION SAFETY PROTECTION

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 "S"

STA. 23+50.00 TO STA. 25+83.61

VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINE S

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.11

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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LEGEND

- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL — VS
- PROPOSED SANITARY SEWER MAIN — 8"SS
- EXISTING SANITARY SEWER MAIN — EX. 8" SS
- PROPOSED WATER MAIN — 8"W
- EXISTING WATER MAIN — EX. 8" W
- PROPOSED STANDARD FIRE HYDRANT
- PROPOSED STANDARD GATE VALVE
- PROPOSED PERMANENT BLOWOFF
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.C.A. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- KEYNOTE — (1)

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
3. 15' R.O.W. DEDICATION
4. 15' R.O.W. RESERVATION

CAUTION!!!

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TRENCH EXCAVATION SAFETY PROTECTION

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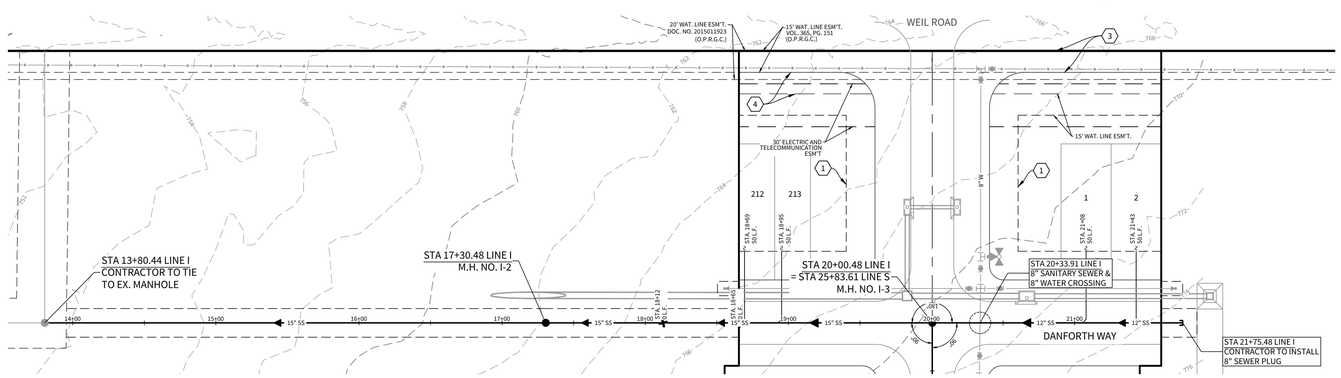
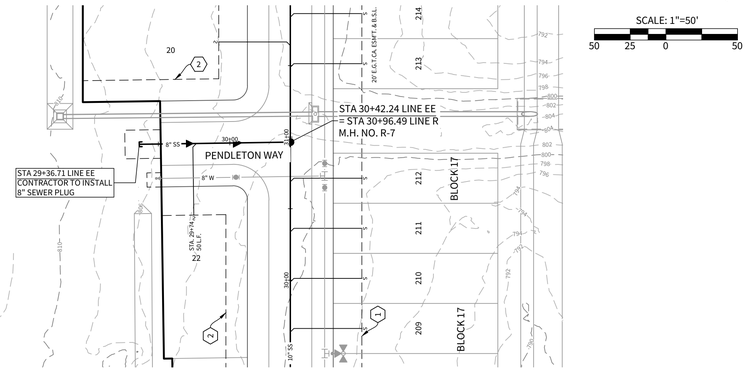
SCALE: 1"=50'
50 25 0 50





SCALE: 1"=50'
50 25 0 50

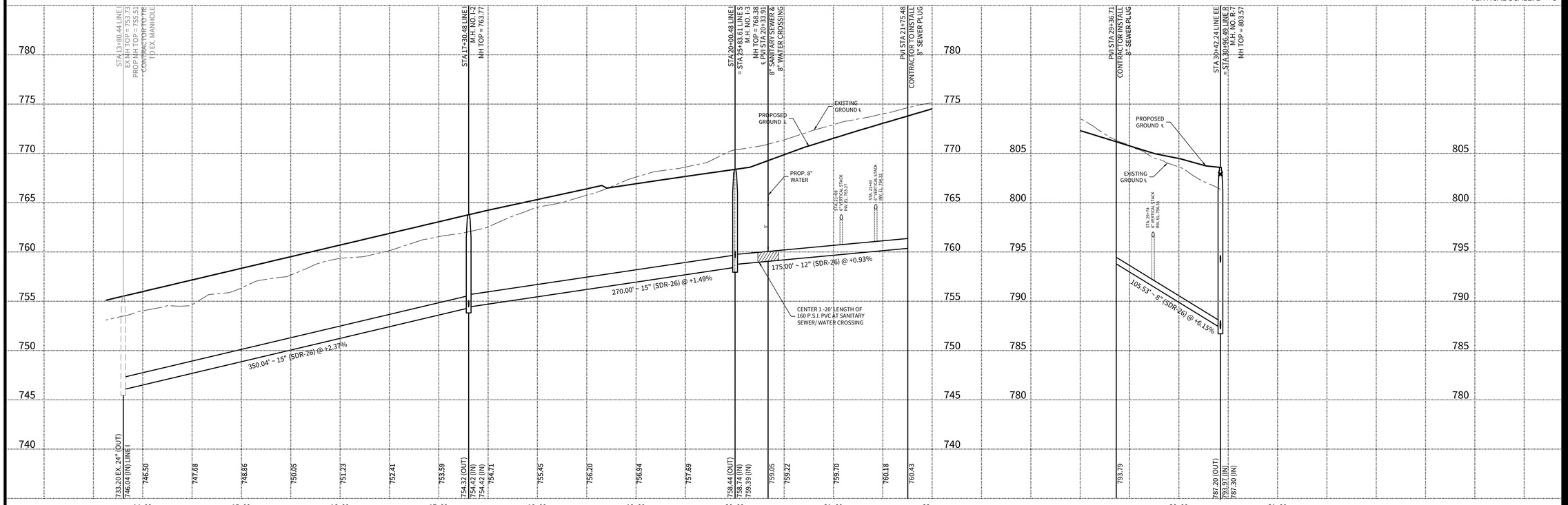
LINE "I"

STA. 13+80.44 TO STA. 21+75.48

LINE "EE"

STA. 29+36.71 TO STA. 30+42.24

VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINES I & EE

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.12

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

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- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER MAIN — 8"SS
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- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.C.A. ESM'T
- BUILDING SETBACK LINE — B.S.L.
- KEYNOTE (1)

KEYNOTES

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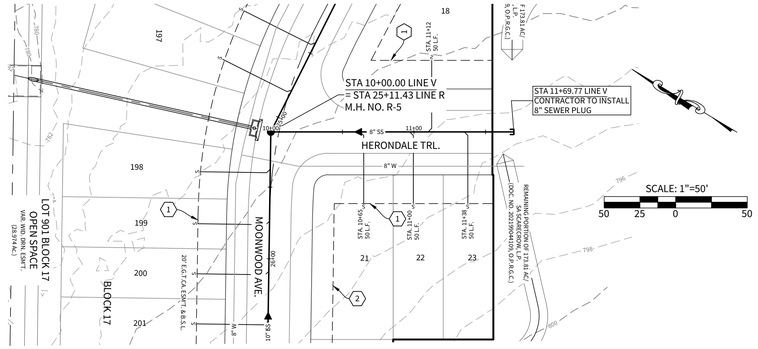
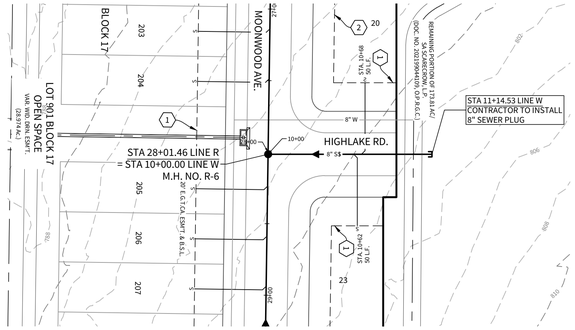


LINE "V"

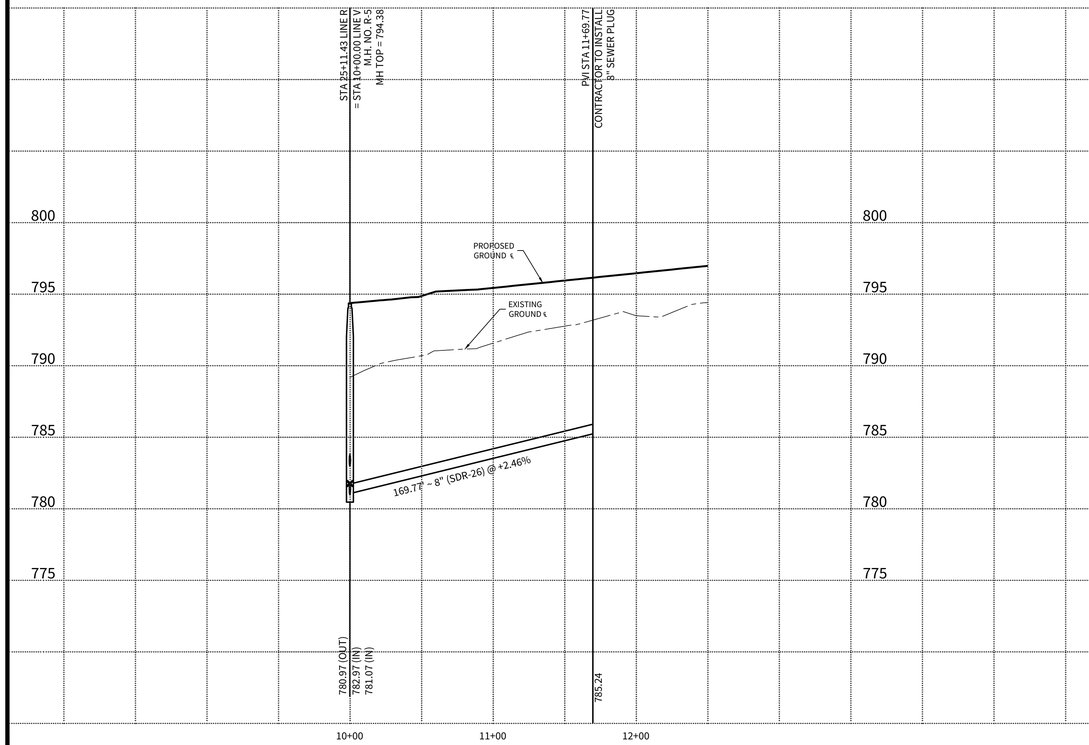
STA. 10+00.00 TO STA. 11+69.77

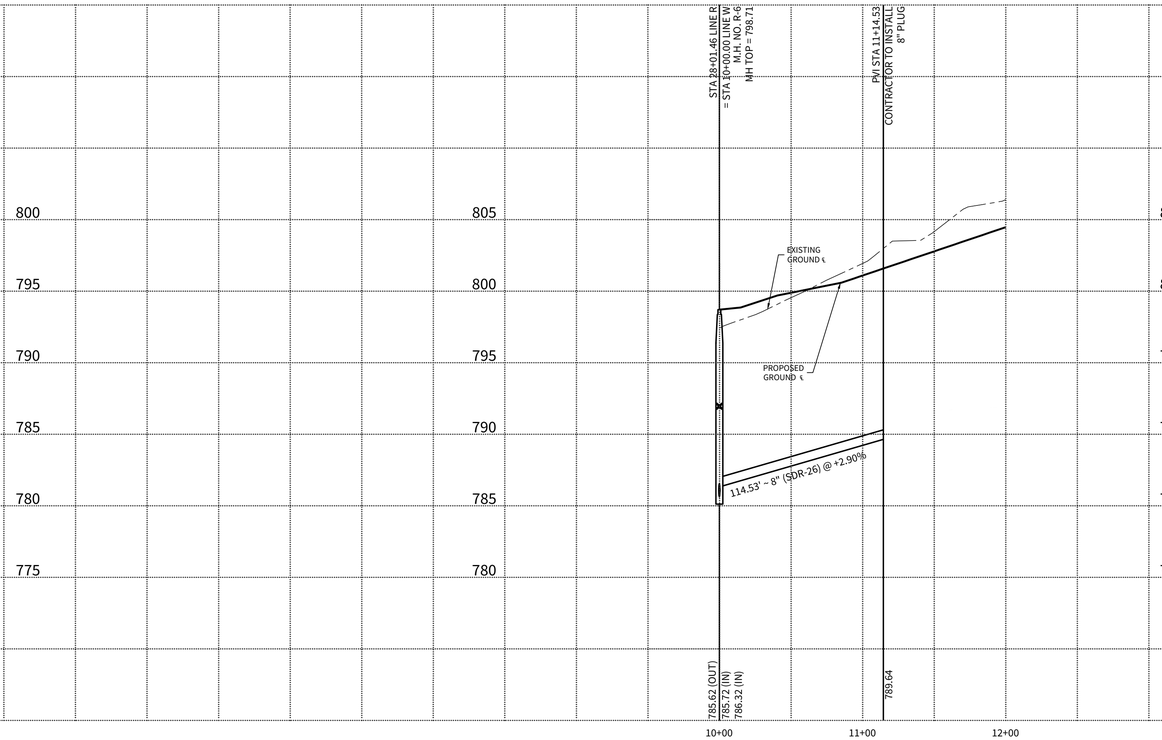


LINE "W"

STA. 10+00.00 TO STA. 11+14.53

VERTICAL SCALE: 1" = 5'





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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINES V & W

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.13

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LEGEND

- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER MAIN — 8"SS
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- KEYNOTE — (1)

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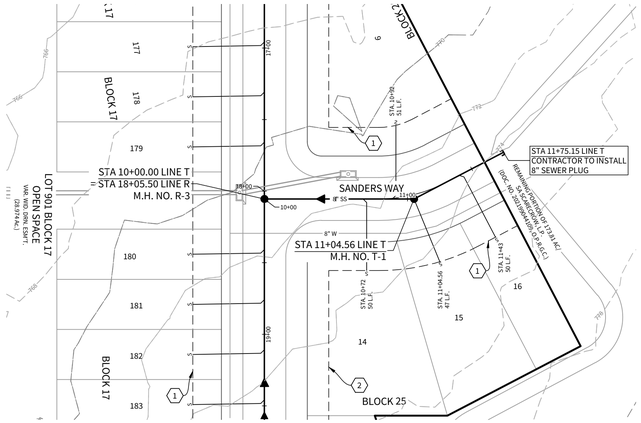
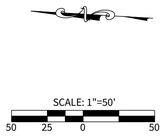
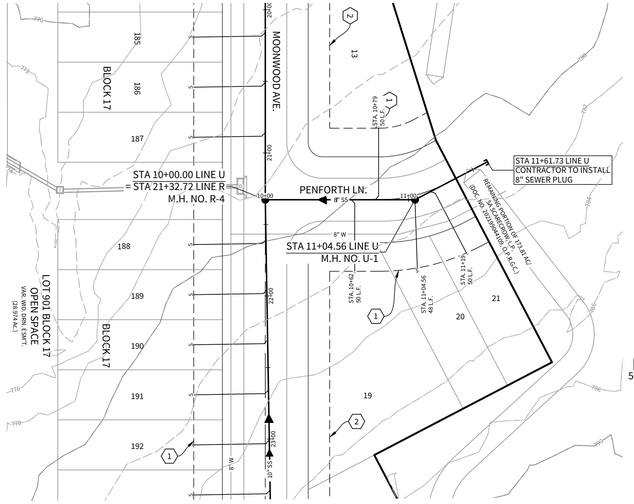
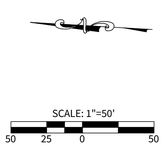




LINE "T"

STA. 10+00.00 TO STA. 11+75.15

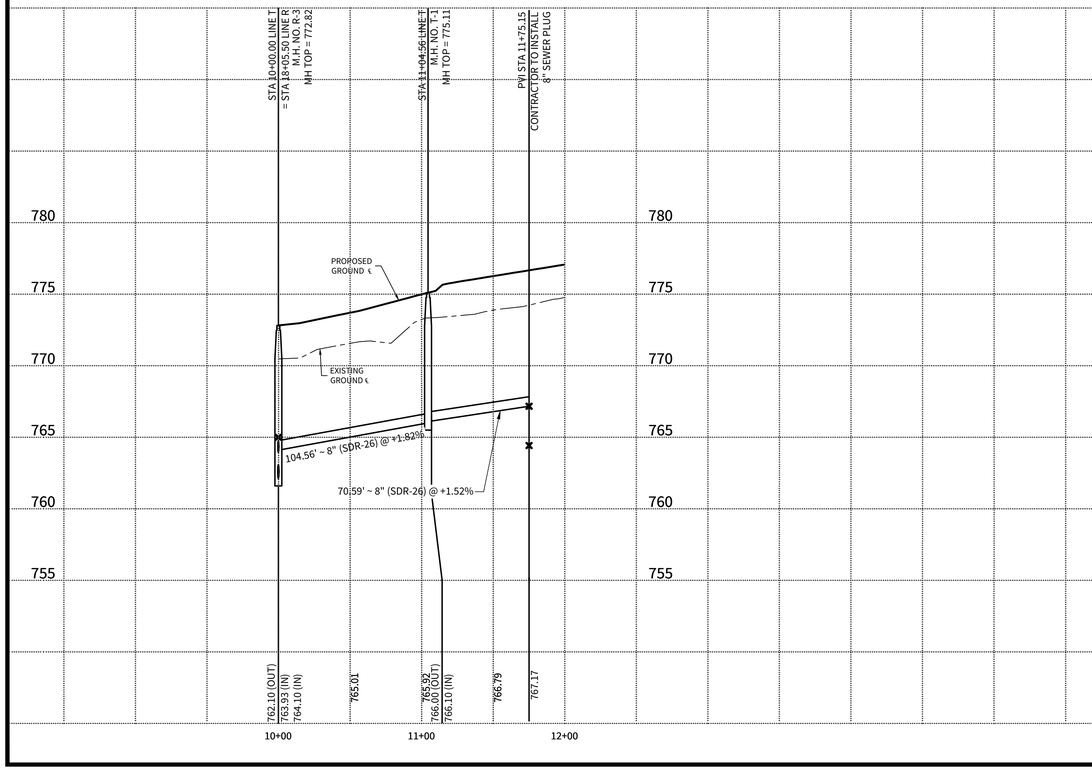


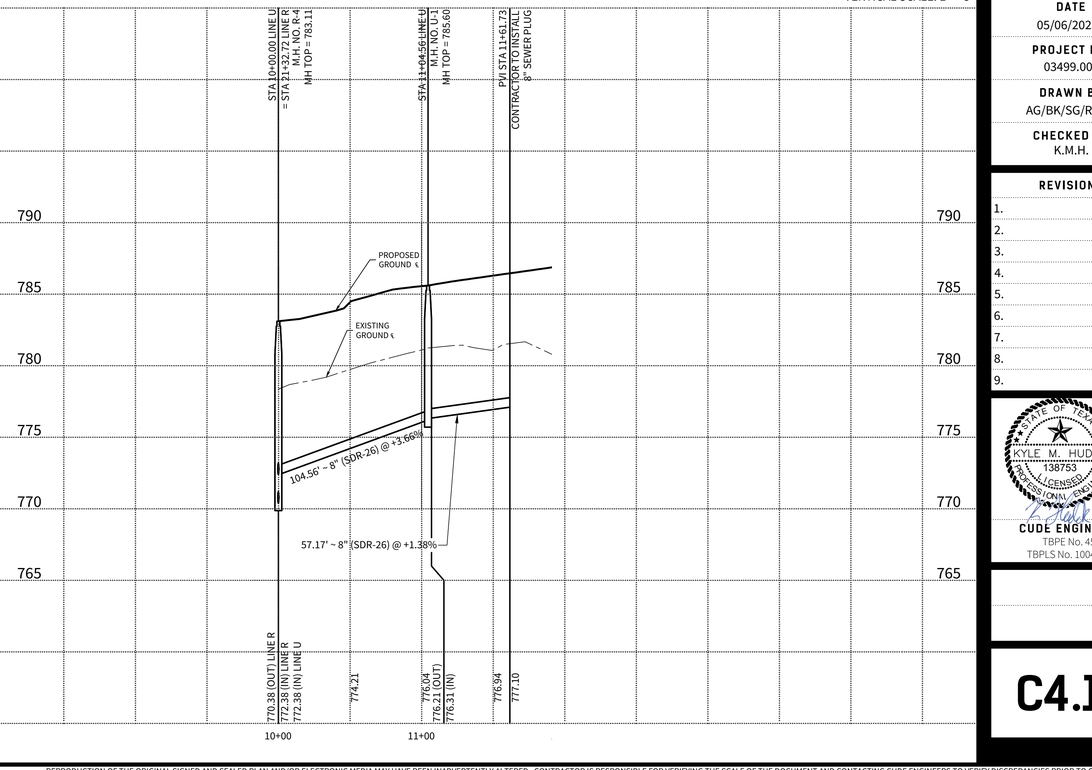


LINE "U"

STA. 10+00.00 TO STA. 11+61.73

VERTICAL SCALE: 1" = 5'





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CUDE ENGINEERS EST. 1980

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GRACE VALLEY RANCH
PHASE 6

SANITARY SEWER PLAN AND PROFILE - LINES T & U

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.14

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REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

GREEN VALLEY SPECIAL UTILITY DISTRICT SANITARY SEWER SYSTEM GENERAL NOTES:

THE STANDARD SPECIFICATIONS AND DRAWING (DD) ARE PROVIDED AS A TECHNICAL RESOURCE FOR ENGINEERING PROFESSIONALS FOR USE IN DESIGN AND CONSTRUCTION OF SEWER COLLECTION SYSTEMS PROJECTS MANAGED AND CONTRACTED BY THE GREEN VALLEY SPECIAL UTILITY DISTRICT (GVSUD)

GENERAL: THE OWNER, DEVELOPER, ENGINEERING FIRM SHALL SUBMIT TO THE GREEN VALLEY SPECIAL UTILITY DISTRICT (GVSUD) ENGINEER, FOR APPROVAL, TWO (2) COPIES OF ALL PLATES, PLANS AND PROFILES, PLUMBING LAYOUT, WHICH HAVE BEEN DESIGNED AND THE DRAWINGS SEALED BY A REGISTERED PROFESSIONAL ENGINEER. WHEN APPROVED, ONE (1) COPY WILL BE RETURNED TO THE OWNER, DEVELOPER, ENGINEERING FIRM, SO MARKED. THE OWNER WILL BE REQUIRED TO MAKE ALL CHANGES INDICATED BY THE GVSUD ENGINEER, AND RETURN WITH ALL CHANGES, CORRECTIONS, BACK TO GVSUD FOR APPROVAL.

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE GVSUD AND COMPLY WITH
   A. CURRENT GVSUD TECHNICAL SPECIFICATIONS FOR UTILITIES CONSTRUCTION.
   B. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ), FORMERLY TEXAS NATURAL RESOURCE CONSERVATION COMMISSION (TNRCC), DESIGN CRITERIA FOR SEWAGE SYSTEMS 31 TAC 317.1, 31 TAC 317.2 AND 31 TAC 317.3, 30 TAC & 213 40 TAC &217
2. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE GVSUD INSPECTIONS DIVISION AT (830)914-2330 OR (210)372-2228 - 48 HOURS PRIOR TO ANY EXCAVATION. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD BEFORE ANY EXCAVATION OR START OF PROJECT.
3. WORK SHALL NOT BE PERFORMED ON SATURDAYS, SUNDAYS OR HOLIDAYS BEFORE 7:30 A.M. OR AFTER 4:30 P.M., UNLESS PRIOR APPROVAL IS GRANTED BY THE GVSUD ENGINEER.
   A. THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES TO INCLUDE SURFACE LATERALS, SHOWN IN THESE PLANS ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO LOCATION (POT HOLE, VERIFY LOCATION, ELEVATIONS OF ALL UTILITY SERVICE LINES 48 HOURS PRIOR TO EXCAVATION AND TO PROTECT THE SAME DURING CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES OF EXISTING UTILITIES AND REPAIRS WILL BE AT THE CONTRACTORS EXPENSE.

EXISTING MANHOLES/SEWER

4. CONTRACTOR WILL MAINTAIN SERVICE TO ALL EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR WILL MARK, CLEAN ALL DEBRIS, GRAVEL, DIRT, ETC OUT OF MANHOLES AND ANY STOPPAGES CAUSED BY DEBRIS DURING CONSTRUCTION. CONTRACTOR WILL UNPLUG STOPPAGE AT CONTRACTORS EXPENSE. ANY DAMAGE TO EXISTING MANHOLES OR SEWER MAIN WILL BE CORRECTED AT THE CONTRACTORS EXPENSE. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT DAMAGE TO EXISTING OR NEW RINGS, COVERS, OR CONES FROM EQUIPMENT AND MATERIALS USED OR TAKEN THROUGH THE WORK AREA. IF AN EXISTING OR NEW MANHOLE COVER, RING, OR CONE IS DAMAGED BY THE CONTRACTOR IT SHALL BE REPLACED AS DIRECTED BY THE GVSUD INSPECTOR. MANHOLES WILL NEED TO BE RESEALED WITH THE GVSUD-APPROVED SEALING IF SEAL COATING IS BROKEN, CONTRACTOR WILL HAVE MANHOLE RECOATED. RESEAL ALL LEAKS AT CONTRACTORS EXPENSE.
   A. CONTRACTOR TO ENSURE ALL PLUGS USED TO PLUG SEWER LINES. WHILE TESTING THE PROJECT (SUCH AS AIR PLUGS, SCREW TYPE PLUGS, ETC.) ARE LABELED, MARKED OR TAGGED. PROJECT INSPECTOR WILL RECORD HOW MANY PLUGS ARE BEING USED, LOCATION AND I.D., WITHIN COLLECTION SYSTEM. CONTRACTOR WILL REPORT TO PROJECT INSPECTOR OF ANY LOST OR UNRESTRAINED PLUGS INTO SEWER COLLECTION SYSTEM.
   B. CONTRACTOR WILL BE HELD LIABLE FOR ANY DAMAGES TO SEWER COLLECTION SYSTEM STOPPAGES, OVER-FLOWS, BACKUP INTO HOMES CAUSED BY LOST RUN-AWAY SEWER PLUGS THAT WERE USED ON THAT PROJECT OR OUTFALL LINE WASTEWATER TREATMENT PLANTS.
   C. CONTRACTOR WILL ALSO BE RESPONSIBLE FOR ANY DAMAGE TO WASTEWATER TREATMENT APPARATUS, SUCH AS SCREW PUMPS, ETC. CAUSED BY LOST OF RUN-AWAY SEWER PLUGS. CONTRACTOR WILL BE HELD LIABLE FOR DAMAGES, AS WELL AS COST OF REPAIRS.
5. ALL WORK IN THE TEXAS HIGHWAY DEPARTMENT, BEXAR COUNTY, GUADALUPE COUNTY, AND CITY OF CIBOLO RIGHT OF WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.
6. ALL WORK IN PUBLIC STREETS SHALL BE COORDINATED WITH AND APPROVED BY THE BEXAR COUNTY OR GUADALUPE COUNTY PUBLIC WORKS DEPARTMENT TRAFFIC DIVISION AND STREET ENGINEER.
7. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.161, CITY PUBLIC SERVICE MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND VALVES THAT ARE IN THE PROTECTED AREAS.
8. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM THE COMPLETE INSTALLATION OF THE SANITARY SEWER LINES.
   THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
   A. PULL MANDREL - AFTER 30 DAYS OF INSTALLATION
   B. PERFORM AIR TEST
   C. PULL WIPER (AFTER STREET HAS BE ASPHALTED IN NEW SUBDIVISIONS)
   D. VACUUM TEST ALL MANHOLES AFTER THE PROJECT
   E. CCTV-ALL NEW LINE-PAN (TILL ALL SERVICE LATERALS TO 6"X6" CLEAN OUT. FLOOD ALL LINES BEFORE CCTV, SUMMITT VIDEO)
9. CONTRACTOR SHALL SUBMIT FIELD COPY PLANS AND PROFILES SHOWING AS-BUILT WORK AT END OF PROJECT. CCTV DVD AND COMPACTION DENSITY REPORTS FOR MAIN SEWER LINE AND ALL SERVICE LATERALS TRENCHES. WARRANTY LETTERS ON MATERIALS, WORKMANSHIP FOR 24 MONTHS AFTER FINAL ACCEPTANCE.
10. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS AT LEAST TWELVE (12) INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND EXCEPT WHEN LOCATED IN PAVED AREAS. IN PAVED AREAS THE MANHOLE RING SHALL BE FLUSH WITH THE PAVEMENT. ALL NEW INSTALLED MANHOLES WILL BE WITH A 30" INCH OPENING, MINIMUM, WITH THE GVSUD LOGO ON THE COVER. EVERY THIRD MANHOLE COVER WILL HAVE A "I" HOLE FOR A VENT
11. ALL MANHOLES SHALL BE WITH A 30" INCH OPENING, HAVE WATERTIGHT RING AND COVERS, WITH THE GVSUD LOGO. ON PRIVATE PROPERTY, MANHOLE RING AND COVER SHALL BE TYPICAL MANHOLE COVER WATER TIGHT.
    A. BEFORE BACK FILLING/COMPACTION/CONCRETE ENCASEMENT
       ALL MANHOLE JOINT SECTION RISERS, CONE SECTIONS AND GRADE RING SHALL BE WRAPPED. WITH GATOR WRAP SEALING SYSTEMS, BUTYL ADHESIVE SEALANT WITH A MINIMUM THICKNESS OF 30 MILS. INFI-SHIELD WRAPPED WITH RISER-WRAP SEALING SYSTEM, GATOR WRAP
       MATERIAL: RUBBER MEETS ASTM C923/MASTIC MEETS ASTM C 990 OR APPROVE BY THE GVSUD ENGINEER SUBSTITUTION ON OUTSIDE FOR I/I, GROUND WATER TABLE.
12. IF CONCRETE THROAT RINGS ARE TO BE INSTALLED, A MINIMUM OF TWO AND A MAXIMUM OF FOUR THROAT RINGS WILL BE USED AT EACH MANHOLE FOR ADJUSTMENT
13. INFILTRATION DISHES WILL BE REQUIRED IN MANHOLES WHERE APPLICABLE (I.E., SUCH AS LOW DRAINAGE AREAS) AND EVERY THIRD MANHOLE SHALL BE VENTED. 30" INCH MANHOLE COVER WITH 1" INCH HOLE CENTER OF COVER WHERE APPLICABLE.

Note: Manhole cover inserts shall be FRW industries, inc., "Inflow Protector-Cover" "Preco Industries Ltd.", "Sewer Guard", or approved equal, and shall be installed in strict accordance with the manufacturer's recommendations. The contractor shall be responsible for making the necessary field measurements for the manufacturer prior to construction.

   A. ALL MANHOLES MUST HAVE 350-400 FEET SPACING BETWEEN MANHOLES TO PROVIDE ACCESS TO SEWER LINES FOR CLEANING. ON THE GVSUD PUBLIC SEWER EASEMENT. A 16 FOOT GATE WITH LOCK WILL BE PROVIDED BY THE CONTRACTOR FOR ACCESS TO CLEANING AND MAINTAINING SEWER LINES.
   B. DROP MANHOLES SHALL BE REQUIRED WHEN THE INFLOW ELEVATION IS MORE THAN TWENTY-FOUR (24) INCHES ABOVE THE OUTFLOW ELEVATION. DROP SHALL BE LOCATED OUTSIDE THE MANHOLE WITH ITS FLOW LINE ELEVATION LOCATED BETWEEN THE CENTER LINE AND TOP OF SEWER LINE
14. ALL MANHOLES WILL BE CONCRETE ENCASEMENT 1 FOOT AROUND RING, 28-INCH DEEP AFTER GATOR WRAP SEALING SYSTEM HAS BEEN APPLIED.
15. NEW MANHOLE PROTECTIVE COATING, LINER IS FOR THE PURPOSE OF INFILTRATION BECAUSE OF HIGH WATER TABLE. APPLICATION PROCEDURES ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND PER THE FOLLOWING SPECIFICATIONS
   A. MANHOLE PROTECTIVE COATING: CONTRACTOR WILL BE RESPONSIBLE FOR MANHOLES ON PROJECT SAFETY ASSESSMENT: CONFINED SPACE ENTRY SET BY OCCUPATIONAL SAFETY AND HEALTH STANDARDS. 29 CFR 1910.146 APP E.
   B. THE CONTRACTOR, SHALL NOTIFY THE GVSUD UTILITIES INSPECTIONS DEPARTMENT WITH A MINIMUM OF 2 DAYS ADVANCE NOTICE OF THE START OF ANY FIELD SURFACE PREPARATION WORK OF COATING APPLICATION WORK OF MANHOLES.
   C. ALL NEW MANHOLES IN NEW DEVELOPMENTS SHALL BE 30" INCH OPENING, WATERTIGHT AND THE INTERIOR WALL COATED WITH A GVSUD APPROVED SEWER STRUCTURE FOR ALL MANHOLES, SEWERCOAT 2000 HR REGULAR, WITH THE REQUIRED ONE-INCH THICK APPLICATION.

APPROVED MATERIALS ARE AS FOLLOWS:
CEMENTITIOUS COATING WITH REQUIRED HALF-INCH THICK APPLICATION

- SEWPERCOAT 2000 HR REGULAR
- RIFRATTA HAC 100
- MAXIMUM CA PLUS

EPOXY COATING: WITH SPECIFIED THICKNESS APPLICATION

- AROMATIC POLYUREA SCP DROPLINER REQUIRED THICKNESS 125 MILS

   D. WARRANTY LETTER ON MANHOLE PROTECTIVE COATING FOR 10 YEARS AFTER FINAL ACCEPTANCE OF PROTECTIVE COATINGS CONTRACTOR IS NOT RELIEVED OF ITS RESPONSIBILITIES UNDER THE CONTRACT DOCUMENTS.
      i. ANY CONNECTIONS TO EXISTING MANHOLES WILL REQUIRE A 36-INCH CRADLE TO SUPPORT INCOMING PIPE. A RUBBER GASKET WILL ALSO BE REQUIRED (CENTERED AT MANHOLE WALL) WITH GROUTING AT INTERIOR AND EXTERIOR PENETRATIONS.
         PENETRATION INTO MANHOLE WILL BE CORE DRILLED. ANY DAMAGE EXITING THE MANHOLE WILL BE REPLACED AT CONTRACTOR'S EXPENSE. IF COATING SEAL IS BROKEN, THE MANHOLE WILL BE RECOATED WITH THE SAME MATERIALS. IF EXISTING SEWER MANHOLE SEAL COATING IS BROKEN, ALL OF MANHOLE WILL BE RELEASED WITH SAME MATERIALS AND ONE-INCH THICKNESS.
      ii. ANY AND ALL EXISTING MANHOLES WITHIN CONSTRUCTION PROJECT THAT TIE IN, ARE DONE BY CONTRACTOR TO STUB-OUT AGREEMENT, RECONSTRUCTION, OR LEAKING. MANHOLE WILL BE COAT SEALED AT CONTRACTOR'S EXPENSE.
      iii. MANHOLES WITH STUB-OUTS (8") INCH OR LARGER MUST BE LOCATED AT THE END OF ALL SEWER LINES THAT MAY BE EXTENDED IN THE FUTURE. MANHOLES PLACED AT THE END OF THE WASTEWATER COLLECTION SYSTEM PIPES THAT MAY BE EXTENDED IN THE FUTURE MUST INCLUDE STUB-OUTS WITH PLUGS.

PIPING

16. THE KIND AND DESCRIPTION OF THE PIPE CONDUIT IS SHOWN ON THE PLANS (IF PVC, SDR AND ASTMANSI DESIGNATION CLASS). AS SDR 26 PVC, ASTM D-3034 WITH A MINIMUM STIFFNESS OF 115 PSI TEXAS ADMINISTRATIVE CODE (TAC) RULES TO INCLUDE30 TAC & 213, OR ANY REVISIONS THERE TO APPLICABLE TCEQ, 30 TAC 7 217, FOR ALL NEW DEVELOPMENT.
17. THE USE OF ASBESTOS CEMENT PIPE WILL BE PROHIBITED UNDER THIS CONTRACT. ALL DUCTILE IRON PIPE USED IN THIS SYSTEM SHALL BE CEMENT LINED IN THE INTERIOR AND ASPHALTIC COATED EXTERIOR SURFACES. ALL CORROSION PROTECTION SHALL BE APPLIED AND INSTALLED IN SUCH A MANNER AS TO MAINTAIN A CONTINUOUSLY PROTECTED SURFACE AFTER FINAL PIPE INSTALLATION.
18. ALL PVC SEWER PIPE WITH OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH. MINIMUM PIPE STIFFNESS OF 150 PSI.
19. ALL SEWER PIPES SHALL HAVE COMPRESSION OR MECHANICAL JOINTS.
20. SEWER PIPE CONNECTIONS TO PRECAST MANHOLES SHALL BE APPROVED BY THE GVSUD. THIS CONNECTION SHALL USE FLEXIBLE "BOOT" TYPE CONNECTOR SUCH AS THE PSX POSITIVE SEAL SYSTEM OR ENGINEER APPROVED EQUAL AND COMPLY WITH ASTM C-923. SEWER PIPE CONNECTIONS TO MONOLITHIC MANHOLES WILL BE AS SHOWN ON THE STANDARD DETAIL SHEET. ANY CHANGES IN THESE METHODS MUST BE APPROVED BY GVSUD ENGINEER.
21. ALL PIPE TRENCHING, BEDDING AND BACKFILL SHALL BE DONE IN ACCORDANCE WITH APPROPRIATE ASTMANSI SPECIFICATIONS [REFERENCE 31 TAC 317.2(A)(5)(A); ASTMC-12 (ANSI A106.2) OR ASTM D-2321, (ANSI K65.1713]. ALL COMPACTION @ 98% DENSITY TESTS ACROSS THE BOARD, 1 RANDOM DENSITY TEST PER LIFT FOR EVERY 400 FEET.
   A. SAND MIGRATION, SEEPAGE PREVENTION COLLAR WHEN CHANGING THE INITIAL BACKFILL FROM SELECT INITIAL BACKFILL TO OPTIONAL SELECT INITIAL BACKFILL. A TWO (2) FOOT LONG CLASS D CONCRETE ENCASEMENT, EVERY 180 FEET ALONG PIPE AND 20 FEET FROM WALL OF MANHOLE IN EACH DIRECTION. NO EXTRA PAY ITEM.
   B. BEDDING SHALL CONSIST OF TXDOT-GRADE 4 (1 1/2"-1 5/8") COMMONLY KNOWN AS SEWER GRAVEL.
      i. THE BEDDING SHALL MEET THE FOLLOWING GRADATION:

a. 2"	100.0%
b. 1 ¾"	100.0%
c. 1 ½"	100.0%
d. 1"	52.6%
e. ¾"	10.7%
f. ⅜"	1.3%

   C. SEWER LINE LOCATION
      i. SEWER LINES SHALL BE SIZED AND EXTENDED THROUGH THE LIMITS OF A DEVELOPMENT TO SERVE ADJACENT PROPERTY, WITH MANHOLE AND STUB-OUT AT END OF SEWER LINE.
         a. IN PHASED CONSTRUCTION OF THOROUGHFARES, THE SEWER LINE SHALL BE EXTENDED THE ENTIRE LENGTH OF THE THOROUGHFARE BEING CONSTRUCTED.
      ii. NO PUBLIC SEWER LINE SHALL BE LOCATED NEARER THAN FIVE (5) FEET FROM ANY TREE.
      iii. SIZES AND GRADES FOR SANITARY SEWER SHALL BE AS REQUIRED BY THE GVSUD ENGINEER AND CONSIDERATION SHALL BE GIVE AS TO POSSIBLE EXTENSIONS FOR FUTURE DEVELOPMENT. NO SANITARY SEWERS, OTHER THAN LATERALS AND FORCE MAINS, SHALL BE LESS THAN EIGHT (8) INCH IN DIAMETER.
22. WHEN SEWER LATERALS ARE TO BE CONNECTED TO EXISTING SEWER MAINS AND NO STUB-OUT HAS BEEN EARLIER PROVIDED, THE CONNECTION MUST BE MADE WITH AN APPROVED SERVICE SADDLE AS PER 31 TAC 313.5(c)(7). NEW INVERT TO BE BUILT, SMOOTH CHANNEL FOR NEW PIPE/SLOPE AT 2% FLOW.
23. ALL RESIDENTIAL SERVICE LATERALS SHALL BE SOR 26 WITH RATING OF 115 PSI, BE EXTENDED TO THE PROPERTY LINE AT (6 X 6) CAPPED AND SEALED. ATTACH SEWER BURIAL TAPE TO THE END OF ALL SEWER LATERALS AND BRING UP TO THE GROUND LEVEL FOR MARKER (GREEN). (SEE HOUSE LATERALS DETAILS)
   AA. SEWER SERVICE LATERALS. THE SIZES AND LOCATIONS OF LATERALS SHALL BE DESIGNATED AS FOLLOWS UNLESS OTHERWISE DIRECTED BY THE GVSUD ENGINEER:
      i. IN GENERAL FOR SINGLE FAMILY DWELLING. THE LATERAL SIZE SHALL BE FOUR (4) INCH MINIMUM. HOUSE LATERALS SHALL BE IN STALL CENTER OF THE LOT AND SHALL HAVE A TEN(10) FOOT SEPARATION FROM THE WATER SERVICE. THE SERVICE SHALL THEN BE EXTENDED AT A FORTY-FIVE (45) DEGREE ANGLE TO FOUR (4) FEET ABOVE THE FINISHED GRADE AND CAPPED. USE SEWER BURIAL TAPE TO MARK ALL SEWER SERVICE LATERALS.
      ii. MULTIPLE UNITS, APARTMENTS, LOCAL RETAIL AND COMMERCIAL SIX (6) INCH MINIMUM, MANUFACTURING AND INDUSTRIAL - EIGHT (8) INCH MINIMUM, OR LARGER AS REQUIRED.

TRAPS AND INTERCEPTORS (FOG - TECQ)

UNIFORM PLUMBING CODE, CITY OF SAN ANTONIO BUILDING INSPECTIONS DEPARTMENT. ALL COMMERCIAL BUILDINGS WILL HAVE TRAPS (FOG-TECQ).

OIL SEPARATORS

WHICH INCLUDE OIL SEPARATOR-GASOLINE SERVICE STATIONS, CAR WASHES, GARAGES, DRY CLEANERS, CHEMICAL PLANTS, GAS PLANTS, HIDE PROCESSORS, TESTING LABORATORIES, OR ANY PLACE WHERE OIL OR SOLVENTS MAY BE INTRODUCED IN TO THE SANITARY SEWER SYSTEM. THE SIZING CRITERIA FOR OIL SEPARATORS SHALL BE BASED ON THE G.P.M. RATE OF ALL FIXTURES, APPLIANCE OR APPURTENANCE, DRAINING INTO SEWER SYSTEM.

SAND INTERCEPTORS

SAND INTERCEPTORS SHALL BE INSTALLED IN THE SEWER SYSTEM OF THE FOLLOWING ESTABLISHMENTS. GARAGES, CAR WASHES, SERVICE STATIONS, OR ANY PLACE OF BUSINESS WHERE HEAVY SOLIDS MAY BE INTRODUCED INTO THE SANITARY SEWER SYSTEM. THE SIZING CRITERIA FOR A SAND INTERCEPTOR SHALL BE BASED ON THE REQUIRED G.P.M. X 12 MINUTE RETENTION TIMES TO OBTAIN THE TANK SIZE IN GALLONS CAPACITY.

AUTOMATIC CAR WASHES

WITH HIGH PRESSURE SPRAYS AND/OR BRUSHES INSTALL A 50 G.P.M. INTERCEPTOR. MINIMUM, FOR A 4-BAY VEHICLE WASH, THE SIZE OF THE INTERCEPTOR SHALL INCREASE 10 G.P.M. FOR EACH ADDITIONAL WASH BAY OVER 4. SINGLE BAY OR PORTABLE WASHER TYPE VEHICLE WASHES SHALL INSTALL A 20 G.P.M. INTERCEPTOR MINIMUM.

NEUTRALIZING DEVICES

IN NO CASE SHALL CORROSIVE LIQUIDS, SPENT ACIDS, OR OTHER HARMFUL CHEMICALS WHICH MIGHT DESTROY OR INJURE A DRAIN, SEWER, SOIL, OR WASTE PIPE, OR WHICH MIGHT CREATE NOXIOUS OR TOXIC FUMES, DISCHARGE INTO THE SANITARY SEWER SYSTEM WITH OUT BEING THOROUGHLY NEUTRALIZED BY PASSING THROUGH AN INTERIOR AND EXTERIOR APPROVED NEUTRALIZING DEVICE. SUCH DEVICE SHALL BE PROVIDED WITH A SUFFICIENT INTAKE OF NEUTRALIZING MEDIUM. CONSISTING OF LIMESTONE OR MARBLE CHIPS, SO AS THE MAKE ITS CONTENTS NON-INJURIOUS BEFORE BEING DISCHARGED INTO THE SANITARY SEWER SYSTEM.

LINT TRAPS

PUBLIC AND PRIVATE WASHATERIAS AND COMMERCIAL LAUNDRIES, SHALL INSTALL A LINT TRAP EQUIPPED WITH A CONVENIENTLY LOCATED AND EASILY REMOVABLE WIRE BASKET OR OTHER SIMILAR DEVICE THAT WILL PREVENT THE STRINGS, RAGS, BUTTONS, OR OTHER PROHIBITED MATERIAL FROM ENTERING THE SANITARY SEWER SYSTEM. THE BASKET OR OTHER SIMILAR DEVICE SHALL PREVENT PASSAGE TO THE SANITARY SEWER SYSTEM OF SOLIDS GREATER THAN 1/2" INCH DIAMETER. THE LINT TRAP SIZE SHALL BE BASED ON THE TOTAL G.P.M. OF ALL FIXTURES, APPLIANCES AND APPURTENANCES DRAINING TO IT IN LIEU OF A LINT TRAP, A LINT INTERCEPTOR MAY BE INSTALL. THE INTERCEPTOR SHALL BE SIZED AND DESIGNED BY A TEXAS REGISTERED ENGINEER WITH HIS SEAL AND SIGNATURE ON THE DRAWINGS.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		SANITARY SEWER SYSTEM GENERAL NOTES (1 OF 2)
REVISED: OCTOBER 2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. G-1

SILVER RECOVERY UNITS

SILVER RECOVERY UNITS SHALL BE INSTALLED IN WASTE LINES(S) LEADING FROM X-RAY PROCESSING, PHOTOGRAPHIC PROCESSING, AND/OR ANY PROCEDURES IN ESTABLISHMENT SUCH AS MEDICAL LABS, DENTAL LABS, PHOTO FINISHERS, PRINTERS, GRAPHIC ARTS PRODUCTION FACILITIES, HOSPITAL FACILITIES, VETERINARY HOSPITALS, OR OTHER ESTABLISHMENTS WHERE SILVER MAY BE INTRODUCED INTO THE SANITARY SEWER SYSTEM.

SOLID INTERCEPTORS

SOLIDS INTERCEPTORS SHALL BE INSTALLED WHEN PRE-TREATMENT OF WASTE STREAMS IS NECESSARY TO PREVENT SOLIDS GREATER THAN ½" IN DIAMETER, WHICH MAY CAUSE LINE STOPPAGE FROM ENTERING THE SANITARY SEWER SYSTEM.

INTERCEPTORS

   a. INTERCEPTORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE GVSUD CONSISTING OF A MINIMUM OF TWO COMPARTMENTS WITH FITTINGS DESIGNED FOR GREASE RETENTION AND PROVIDE FOR A MINIMUM OF TWELVE (12) MINUTES RETENTION
   b. THERE SHALL BE AN ADEQUATE NUMBER OF MANHOLES TO PROVIDE ACCESS FOR CLEANING ALL AREAS OF AN INTERCEPTOR, ONE MANHOLE PER TRAP COMPARTMENT. MANHOLE COVERS SHALL BE GAS TIGHT IN CONSTRUCTION HAVING A MINIMUM OPENING DIMENSION OF 20 INCHES (0.5 M).
   c. IN AREAS WHERE TRAFFIC MAY EXIST THE INTERCEPTOR SHALL BE DESIGNED TO HAVE ADEQUATE REINFORCEMENT AND COVER.
   d. ALL INTERCEPTORS SHALL HAVE THE SIZE OF THE INTERCEPTOR (IN GALLON PER MINUTE OR GALLON CAPACITY) PERMANENTLY AFFIXED TO THE DEVICE.
   e. ALL CONCRETE UTILIZED IN THE CONSTRUCTION OF INTERCEPTOR SHALL HAVE A MINIMUM STRENGTH OF 3000 PSI.
   f. AN EFFLUENT SAMPLING WELL ON ALL INTERCEPTORS SHALL BE REQUIRED. THE SAMPLE WELL SHALL HAVE A RISER A MINIMUM OF 6" INCHES IN DIAMETER AND SHALL BE INSTALLED AFTER THE CONFLUENCE OF ALL WASTE STREAMS FROM THE FACILITY AND PRIOR TO DISCHARGING INTO SANITARY SEWER COLLECTION SYSTEM. THE WELL SHALL BE PERPENDICULAR TO THE EFFLUENT LATERAL TO ALLOW VISUAL OBSERVATION OF THE FLOW STREAM AND PROVIDE FOR SAMPLING OF WASTEWATER.

WATERTIGHT TESTING (24 HOURS)

   g. ALL INTERCEPTORS SHALL BE WATER TESTED OUT AT JOB SITE AFTER BEING INSTALLED (PLUG BOTH ENDS AND FILL TO TOP OF INTERCEPTOR). INTERCEPTOR SHALL SHOW NO LEAKAGE FROM SECTION SEAMS, PINHOLES, OR OTHER IMPERFECTIONS. ANY LEAKAGE IS CAUSE FOR REJECTION. WHEN LEAKAGE OCCURS, ADDITIONAL WATER TESTING SHALL BE MADE. AFTER CORRECTING MEASURE TEST, REPORTS SHALL SHOW TOTAL NUMBER OF INTERCEPTORS TESTED, WHEN LEAKAGE OCCURS, CORRECTIVE MEASURES TAKEN SHALL BE REPORTED BY GVSUD INSPECTORS. GVSUD INSPECTORS SHALL RECORD IN DAILY LOG WITH PROJECT NAME, DATE IT WAS TESTED AND COMPLETED.

B. MANHOLES WILL BE REQUIRED ON SIX (6) INCH AND LARGER LATERALS WHERE THEY CONNECT TO THE MAIN.
   a. LATERALS WILL NOT BE ATTACHED TO SEWER MAINS THAT ARE DEEPER THAN TWELVE (12) FEET.
   b. FITTINGS ARE NOT PERMITTED ON LATERALS BETWEEN THE WYE AND THE PROPERTY LINE.
   c. DEEP CUT OR DROP CONNECTIONS SHALL NOT BE PERMITTED.
   d. A MINIMUM OF ONE (1) LATERAL PER BUILDING SHALL BE REQUIRED. ALSO, A MINIMUM OF ONE (1) LATERAL PER RESIDENTIAL LOT SHALL BE REQUIRED. DUPLEXES SHALL HAVE TWO (2) LATERALS THAT SHALL BE INDEPENDENTLY ATTACHED TO THE MAIN.
   e. ALL SEWER LATERAL CROSSING WATER MAINS SHALL CONFORM TO THE REQUIREMENTS OF THE TCEQ CHAPTER 317 (DESIGN CRITERIA FOR SEWERAGE SYSTEMS) LATEST REVISION, SDR 26 150 PSI, OR DUCTILE IRON PIPE, CONCRETE ENCASEMENT.

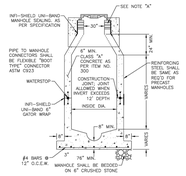
24. WHERE REQUIRED CONCRETE ENCASEMENT SHALL BE PLACED FOR FULL WIDTH OF THE TRENCH TO A PLAIN SIX (6) INCHES ABOVE THE TOP OF THE PIPE WITH PAY UNITS AS SHOWN ON THE STANDARD DETAILS SHEET.
25. A MINIMUM OF FOUR (4) FEET OF COVER IS TO BE MAINTAINED OVER THE SANITARY SEWER MAIN AND LATERALS AT GRADE, OTHERWISE CONCRETE ENCASEMENT IS REQUIRED.
26. WHERE POROUS MATERIAL , INCLUDING "SUBGRADE FILLER" IS USED FOR BACKFILL IN THE BEDDING AND INITIAL BACKFILL ZONES, SEEPAGE RETAINERS ARE REQUIRED AT AN APPROXIMATE OF 180 FEET. RETAINERS SHALL CONSIST OF CLASS "D" CONCRETE ENCASEMENT. THE RETAINERS SHALL EXTEND FROM THE BOTTOM OF THE TRENCH TO THE TOP OF THE GRANULAR MATERIAL FOR THE ENTIRE TRENCH WIDTH. ENCASEMENT SHALL BE 24 INCHES LONG. NO EXTRA PAY ITEM

BLASTING

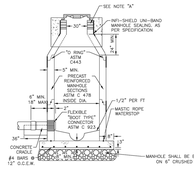
27. WHEN ALLOWABLE, BLASTING SHALL BE PREFORMED IN ACCORDANCE WITH THE ABOVE CRITERIA ESTABLISHED BY THE NATIONAL FIRE PROTECTON ASSOCIATON 312 TAC 313.5(C) (6).
28. BLASTING SEWER LINE EXCAVATION MUST BE DONE IN SUCH A MANNER AS TO MINIMIZE THE FRACTURING OF ROCK BEYOND THE REQUIRED EXCAVATION. THE CONTRACTOR SHALL CONSIDER THE ELEVATION OF THE EXISTING SANITARY SEWER MAIN IN RELATION TO THE BLASTING CHARGE AND RELATIVE DIRECTION OF EXISTING AND PROPOSED TRENCHES. BLASTING WITHIN SUCH AREAS SHALL BE ACCOMPLISHED ONLY BY QUALIFIED BLASTING CONTRACTORS WHO HOLD BLASTING LICENSES FROM A QUALIFIED AGENCY SUCH AS THE SAN ANTONIO FIRE DEPARTMENT IN BEXAR COUNTY. ANY DAMAGE TO EXISTING SANITARY SEWERS RESULTING FROM BLASTING SHALL BE REPAIRED AND RESTORED BY THE CONTRACTOR AT HIS OWN EXPENSE.
29. NO BLASTING SHALL BE PERFORMED WITHIN 75 FEET OF EXISTING UTILITIES.

TESTING

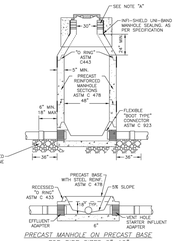
30. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH THE FOLLOWING:
   A. 317.2(A)(5)(B) DEFLECTION TEST FOR FLEXIBLE AND SEMI-RIGID PIPE CONDUCTED AFTER FINAL BACKFILL AS BEEN IN PLACE AT LEAST 30 DAYS.
   B. 317.2(A)(4)(A & (B) OR GVSUD SPECIFICATIONS INFILTRATION AND OR EXFILTRATION AND OR LOW-PRESSURE AIR TEST.
   C. 313.5(C)(10)(C) OR GVSUD SPECIFICATIONS: ALL MANHOLES AND WET WELLS MUST BE TESTED SEPARATELY AND INDEPENDENTLY OF THE COLLECTION LINES.
   D. IN THE EVENT THAT TESTING REQUIREMENTS CONFLICT, THE LATEST TCEQ DESIGN CRITERIA SHALL BE USED.
31. SEWER LINES SHALL BE TESTED FROM MANHOLE TO MANHOLE.
32. SANITARY SEWER CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WHICH REQUIRE PENETRATION INTO MANHOLE WILL BE CORE DRILLED. ANY DAMAGE TO EXISTING MANHOLE WILL BE REPLACED AT CONTRACTORS EXPENSE AND WILL REQUIRE SUCCESSFUL TESTING OF THE EXISTING MANHOLE IN ACCORDANCE WITH THE GVSUD SPECIFICATIONS. HANG A GOLF BALL IN FRONT OF CAMERA, PIPE GRADE IS OUT OF TOLERANCE IF GOLF BALL BECOMES 50% SUBMERGED.
33. AFTER CONSTRUCTION, TESTING WILL BE DONE BY PANITLT TV CAMERA BY THE CONTRACTOR AND OBSERVED BY INSPECTOR. WASTEWATER ENGINEERING PERSONNEL AND CONTRACTOR AS CAMERA IS RUN THROUGH THE LINES. PANITLT ALL 8" SERVICE LATERALS TO 6"X6" STUB-OUT. VIDEOS MUST INCLUDE SUBDIVISION NAME, MANHOLE NUMBER, SERVICE LATERAL STATION NUMBER, FLOW DIRECTION, LOCATION ANY ABNORMALITIES, SUCH AS BROKEN PIPE OR MISALIGNED, JOINT, GRAVEL, DIRT. MUST BE CLEANED OUT, REPLACE AT CONTRACTOR'S EXPENSE. NEW SEWER SYSTEM WILL BE FLOODED WITH H20 BEFORE BEING TV. ALL SEWER LINES MUST BE PRESSURE CLEANED TO INCLUDE SERVICE LATERALS 6" INCH TO STUB-OUT. ALL VIDEOS SHALL BE SUBMITTED IN DVD FORMAT WITH WRITTEN REPORTS.
34. A COPY OF ALL TESTING REPORTS INCLUDING BACKFILL COMPACTION TESTS SHALL BE FORWARDED TO GVSUD.
   A. DENSITY TEST WILL BE REQUIRED ON ALL SANITARY SEWER TRENCHES INCLUDING SERVICE LATERALS. SERVICE LATERALS TO BE CHOSEN RANDOMLY BY FIELD INSPECTOR. DENSITIES ON SERVICE LATERAL SHALL NOT EXCEED 25% OF TOTAL



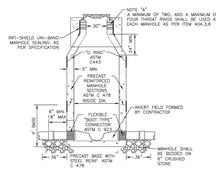
CAST-IN-PLACE MANHOLE



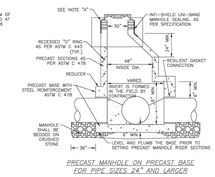
PRECAST MANHOLE ON CAST-IN-PLACE BASE



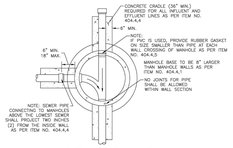
PRECAST MANHOLE ON PRECAST BASE FOR PIPE SIZES 8"-12"



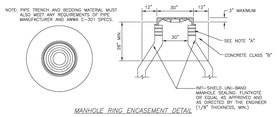
PRECAST MANHOLE ON PRECAST BASE FOR PIPE SIZES 15"-24"



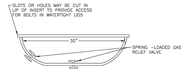
PRECAST MANHOLE ON PRECAST BASE FOR PIPE SIZES 24" AND LARGER



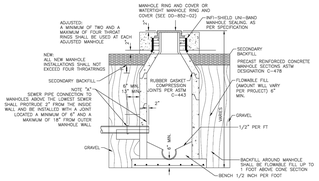
CAST-IN-PLACE MANHOLE BASE PLAN



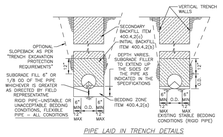
MANHOLE RING ENCASEMENT DETAIL



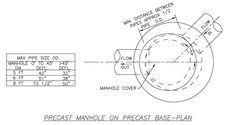
WATERTIGHT MANHOLE INSERT DETAIL



PRECAST MANHOLE ON PRECAST BASE

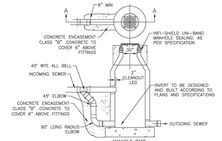


PIPE LAID IN TRENCH DETAILS

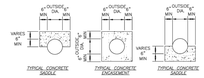


MAX PIPE SIZE OD	
MANHOLE "D" TO 48"	24"
OVER 48"	DIA. -24"
2'-11"	21" - 30"
8'-11"	73 1/2" - 90"

PRECAST MANHOLE ON PRECAST BASE-PLAN



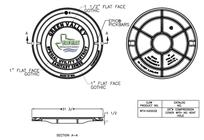
OUTSIDE DROP MANHOLE



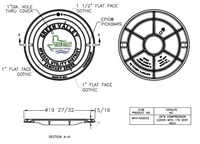
TYPICAL CONCRETE CRADLE | TYPICAL CONCRETE ENCASEMENT | TYPICAL CONCRETE SADDLE

VENT HOLE DETAIL SECTION A — A

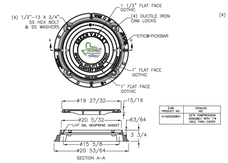
GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		SANITARY SEWER SYSTEM STANDARD DETAILS (1 OF 2)	
	REVISED: OCTOBER 2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. S-1



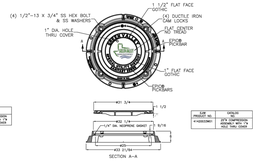
COMPRESSION COVER WITH NO HOLE



COMPRESSION COVER WITH HOLE

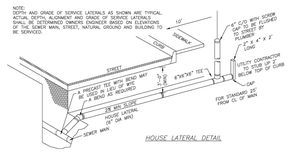


COMPRESSION ASSEMBLY WITH NO HOLE

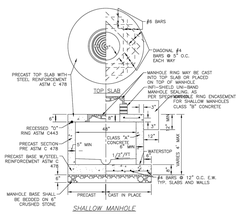


COMPRESSION ASSEMBLY WITH HOLE

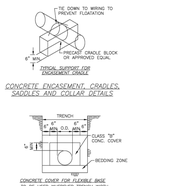
NOTE:
DEPTH AND GRADE OF SERVICE LATERALS AS SHOWN ARE TYPICAL. THE EXACT DEPTH AND GRADE OF SERVICE LATERALS SHALL BE DETERMINED BY OWNER'S ENGINEER BASED ON ELEVATIONS OF THE SEWER MAIN, STREET, NATURAL GROUND AND BUILDING TO BE SERVICED.



HOUSE LATERAL DETAIL

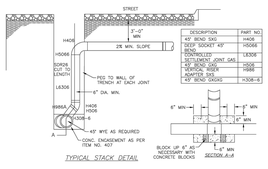


SHALLOW MANHOLE



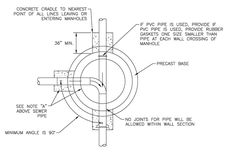
CONCRETE ENCASEMENT, CRADLES, SADDLES AND COLLAR DETAILS

CONCRETE COVER FOR FLEXIBLE BASE
TO BE USED WHEREVER TRENCH WIDTH IS GREATER THAN 2' PLUS O.D.



	DESCRIPTION	PART NO.
	45° WYE SIX INCH	H406
	DEEP SOCKET 45° SEWER CONNECTION	H5066
	6" SDR 26 JOINT GAS AND WATER	L6306
	90° SEWER CLEANOUT VERTICAL RISER	H566
	6" SEWER STOPPER	=S36-S

TYPICAL STACK DETAIL



MANHOLE FLOOR PLAN

SANITARY SEWER GENERAL NOTES

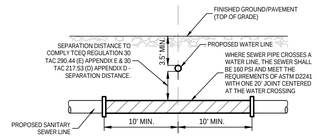
ALL NEW EXISTING SANITARY SEWER MAINS AND MANHOLES IN THIS PROJECT ARE TO REMAIN ACTIVE AND SHALL BE PROTECTED BY THE CONTRACTOR. ALL LINES AND MANHOLES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER AND TO GVSUD'S UTILITY INSPECTIONS AT (210)372-2223 PRIOR TO ENCASING.

THE EXISTING CONDITIONS OF SEWER MAINS AND MANHOLES HAVE BEEN DOCUMENTED BY GVSUD. A PRE-/POSTCONSTRUCTION VIDEO OF THE LINES AND PHYSICAL SURVEY OF THE MANHOLES WILL BE USED TO DETERMINE THE CONTRACTOR'S RESPONSIBILITY FOR REPAIRS. IF THE PRE-CONSTRUCTION INSPECTION WORK SHOWS PORTIONS OF SANITARY SEWER MAINS OR MANHOLES DAMAGED BY THE CONTRACTOR, THE CONTRACTOR SHALL REPAIR THE DAMAGE AT NO COST TO THE OWNER EXPENSE, TO THE APPROVAL OF GVSUD'S INSPECTORS OR ENGINEER.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		SANITARY SEWER SYSTEM STANDARD DETAILS (2 OF 2)	
	REVISED: OCTOBER 2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. S-2

ENGINEER SANITARY SEWER GENERAL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY FENCING THAT IS REMOVED OR DAMAGED DURING CONSTRUCTION TO EXISTING OR BETTER CONDITION.
2. CONTRACTOR IS TO NOTIFY ENGINEER OF ANY DISCREPANCIES OR UTILITY CONFLICTS.
3. CONTRACTOR SHALL REFERENCE TREE PLAN AND PRIVATE GRADING PLAN FOR CLEARING AND GRADING LIMITS.
4. CONTRACTOR SHALL REVEGETATE ALL DISTURBED AREAS WITHIN EASEMENT LIMITS UPON COMPLETION OF INFRASTRUCTURE



TYPICAL SANITARY SEWER/ WATER CROSSING 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.

TCEQ - 30 TAC290.44(e)

(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.

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

SANITARY SEWER GENERAL NOTES AND STANDARD DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

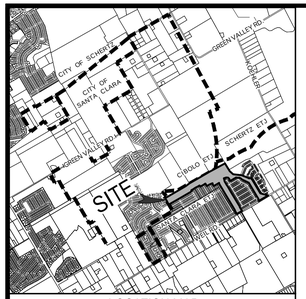
REVISIONS
1.
2.
3.
4.
5.
6.
7.
8.
9.

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C4.D2

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LOCATION MAP

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
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.C.A. ESM'T

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
4. 1 - 2" BLOWOFF ASSEMBLY (PERM.)
   SEE G.V.S.U.D. STD. DTL. No. W-28 (SHEET C5.02)
   1 - 8" M.J. x 2" THR. DI. ECCENTRIC REDUCER (PERM.)
5. AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 8" WATER MAIN INTO EXIST. 6" WATER MAIN. CUT AS REQUIRED.

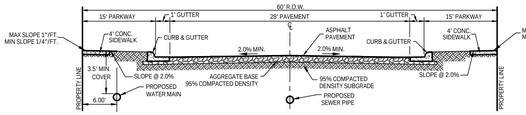
   8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY GVSUD
6. 1 - 6" x 8" CUT-IN TEE, M.J.
   1 - 2" BLOWOFF ASSEMBLY (TEMP.)
   1 - 8" M.J. x 2" THR. DI. ECCENTRIC REDUCER (TEMP.)
   1 - 8" GATE VALVE, M.J.
   1 - 6" GATE VALVE, M.J.
   2 - 6" VALVE BOX, COMPLETE
6. 1 - 8" x 6" TEE, M.J., 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 G.V.S.U.D. STANDARD DTL. No. W-22 (SHEET C5.02)

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

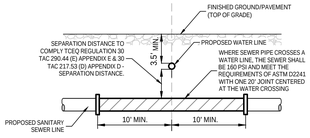


MINOR STREET CROSS-SECTION

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 EMPLOYEES 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.

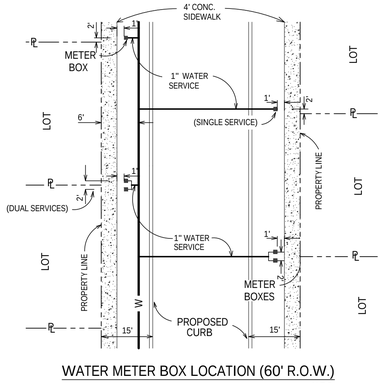


TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

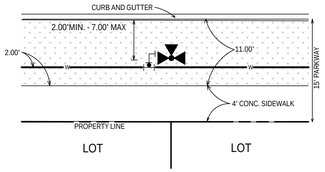
CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT EXISTING UTILITIES ARE WITHIN THE SITE. 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.



WATER METER BOX LOCATION (60' R.O.W.)

N.T.S.



LOCAL RESIDENTIAL FIRE HYDRANT DETAIL (4' SIDEWALK)

N.T.S.

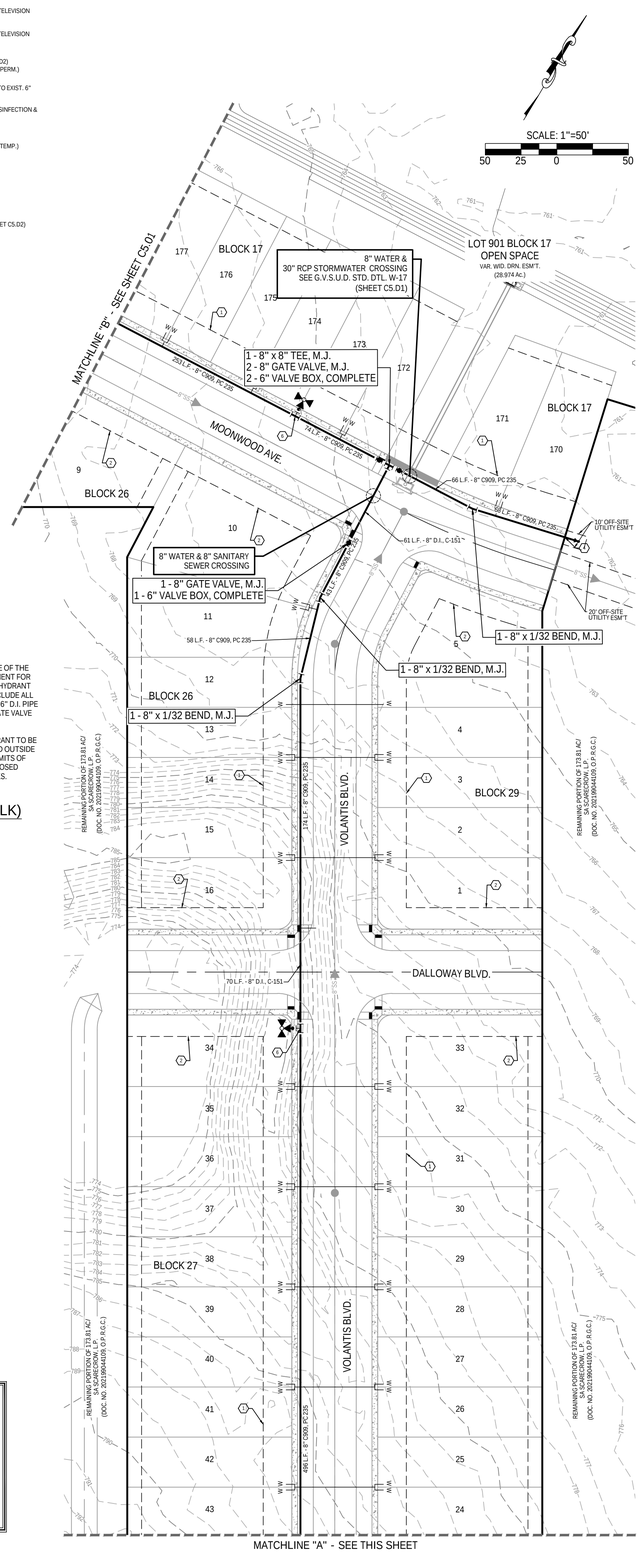
NOTE:

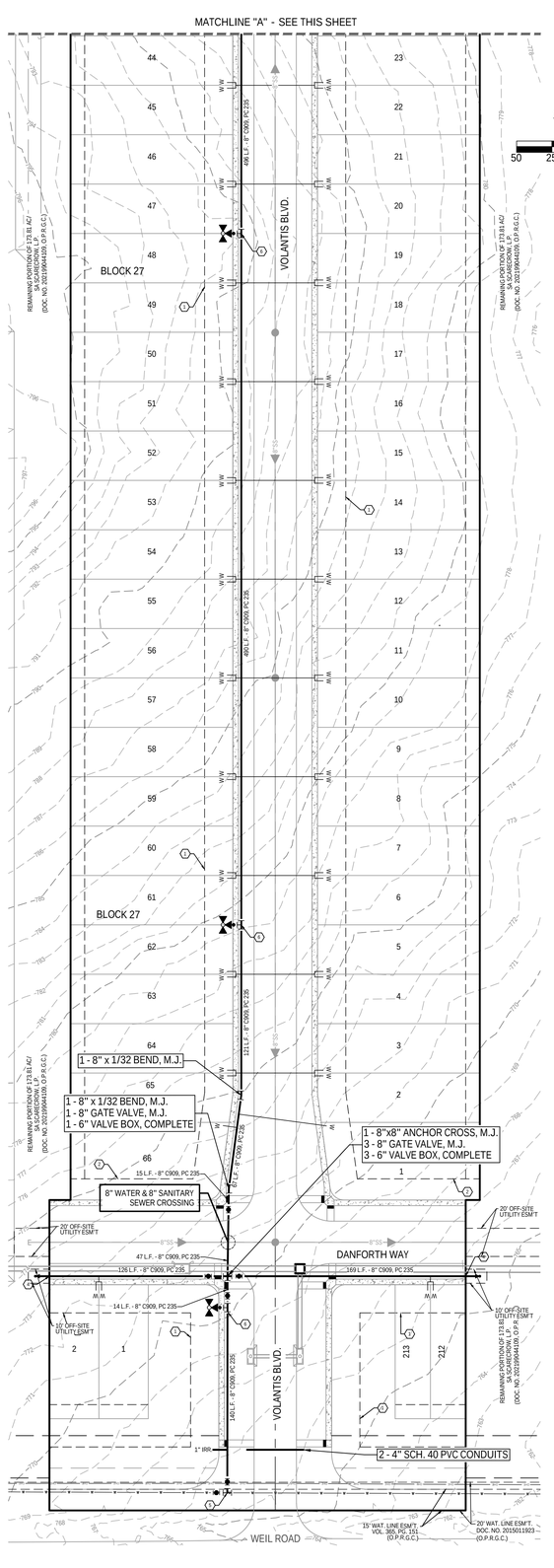
1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

NOTES:

1. LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER LOCATION SHALL HAVE WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.
2. DISINFECTION SHALL BE BY MACHINE CHLORINATION.
3. CONTRACTOR TO UTILIZE APPROVED WATER LINE STOPS AND/OR MUELLER INSERTION-VALVES TO MINIMIZE WATER OUTAGES AS REQUIRED BY GVSUD DURING CONSTRUCTION.
4. MOISTURE DENSITY COMPACTION TESTING FREQUENCY- WATER MAIN TRENCHES REQUIRED EVERY 300 L.F. FOR EACH VERTICAL FOOT OF COMPACTED BACKFILL. SERVICES RANDOMLY SELECTED AS REQUIRED BY GVSUD INSPECTOR.
5. ALL TESTING AND TEST REPORTS SHALL BE COORDINATED WITH GVSUD INSPECTOR BY THE CONTRACTOR.
6. ALL DUCTILE IRON PIPE TO BE AMERICAN, ZINC COATED, AWWA/ANSI C-151

Developer's Name	LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.
Developer's Address	100 NE LOOP 410, SUITE 1155
City SAN ANTONIO	State TEXAS Zip 78216
Phone # (210) 403-6200	Fax #
Block Map # N/A	Total EDU's 210 Total Acreage 60.610
Total Linear Footage of Pipe	8" W - 5,960.91 L.F. Plat No. N/A
Meter Size	210 - ⅝" METER 1 - 1" IRRIGATION METER
Number of Lots 210	Job No. N/A





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CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

WATER DISTRIBUTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C5.00

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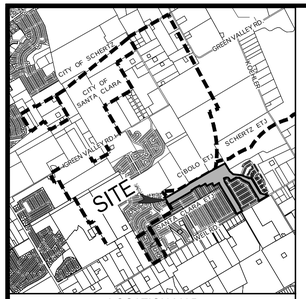
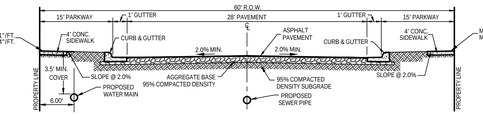


LOCATION MAP

N.T.S.

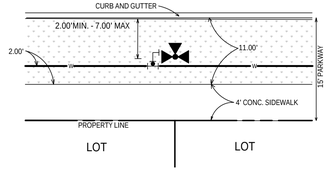
LEGEND

- 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
- ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT — E.G.T.CA. ESM'T



MINOR STREET CROSS-SECTION

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.

LOCAL RESIDENTIAL FIRE HYDRANT DETAIL (4' SIDEWALK)

N.T.S.

NOTES:

1. LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER LOCATION SHALL HAVE WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.
2. DISINFECTION SHALL BE BY MACHINE CHLORINATION.
3. CONTRACTOR TO UTILIZE APPROVED WATER LINE STOPS AND/OR MUELLER INSERTION-VALVES TO MINIMIZE WATER OUTAGES AS REQUIRED BY GVSUD DURING CONSTRUCTION.
4. MOISTURE DENSITY COMPACTION TESTING FREQUENCY- WATER MAIN TRENCHES REQUIRED EVERY 300 L.F. FOR EACH VERTICAL FOOT OF COMPACTED BACKFILL. SERVICES RANDOMLY SELECTED AS REQUIRED BY GVSUD INSPECTOR.
5. ALL TESTING AND TEST REPORTS SHALL BE COORDINATED WITH GVSUD INSPECTOR BY THE CONTRACTOR.
6. ALL DUCTILE IRON PIPE TO BE AMERICAN, ZINC COATED, AWWA/ANSI C-151

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

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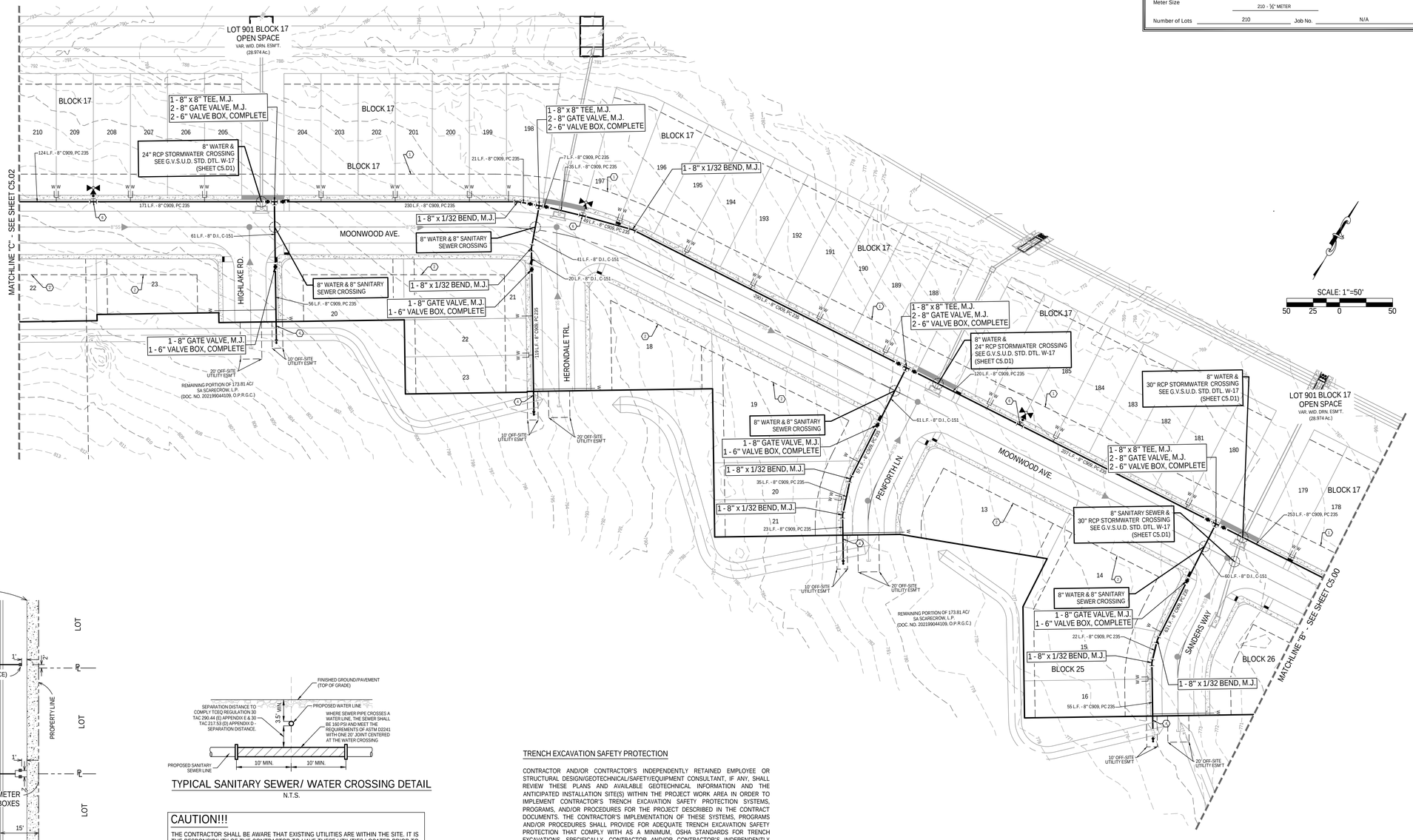
Developer's Address	100 NE LOOP 410, SUITE 1155
City	SAN ANTONIO State TEXAS Zip 78216
Phone #	(210) 403-6200 Fax #
Block Map #	N/A Total EDU's 210 Total Acreage 60.610
Total Linear Footage of Pipe	8" W - 5,960.91 L.F. Plat No. N/A
Meter Size	210 - ⅝" METER
Number of Lots	210 Job No. N/A

KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
4. 1 - 2" BLOWOFF ASSEMBLY (PERM.) SEE G.V.S.U.D. STD. DTL. No. W-28 (SHEET C5.02) 1 - 8" M.J. x 2" THR. DI. ECCENTRIC REDUCER (PERM.)
5. AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 8" WATER MAIN INTO EXIST. 6" WATER MAIN. CUT AS REQUIRED.

   8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY GVSUD

   1 - 6" x 8" CUT-IN TEE, M.J.
   1 - 2" BLOWOFF ASSEMBLY (TEMP.)
   1 - 8" M.J. x 2" THR. DI. ECCENTRIC REDUCER (TEMP.)
   1 - 8" GATE VALVE, M.J.
   1 - 8" GATE VALVE, M.J.
   2 - 6" VALVE BOX, COMPLETE
6. 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 G.V.S.U.D. STANDARD DTL. No. W-22 (SHEET C5.02)



SCALE: 1"=50'

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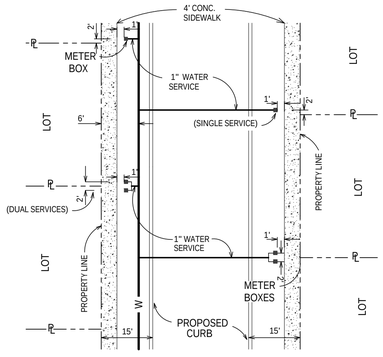

WATER METER BOX LOCATION (60' R.O.W.)

N.T.S.

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

CAUTION!!!

THE CONTRACTOR SHALL BE AWARE THAT EXISTING UTILITIES ARE WITHIN THE SITE. 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 EMPLOYEES 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.

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GRACE VALLEY RANCH PHASE 6

WATER DISTRIBUTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
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REVISIONS

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STATE OF TEXAS
KYLE M. HUDEK
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05/06/2025

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TBPE No. 455
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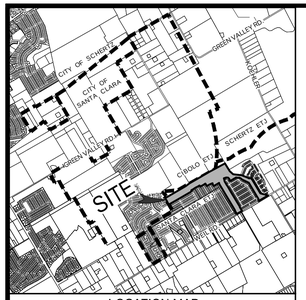

LOCATION MAP

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	
ELECTRIC, GAS, TELEPHONE, & CABLE T.V. EASEMENT	E.G.T.CA. ESM'T

DEVELOPER:

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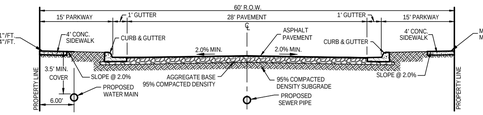
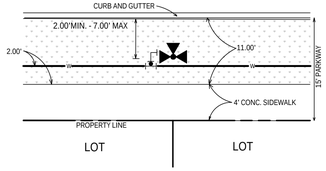


MINOR STREET CROSS-SECTION

N.T.S.



LOCAL RESIDENTIAL FIRE HYDRANT DETAIL (4' SIDEWALK)

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.

NOTES:

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SCALE: 1"=50'

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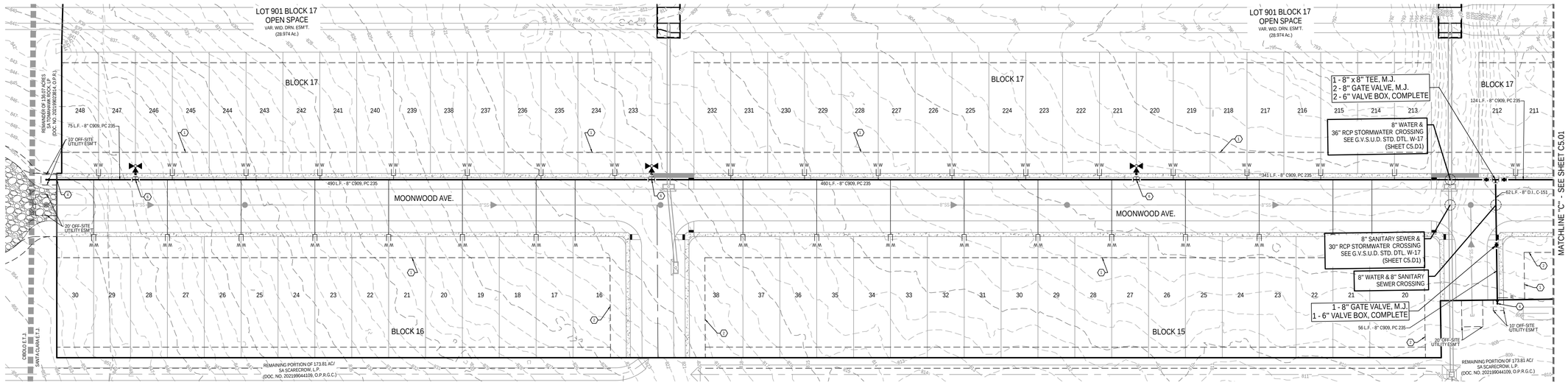
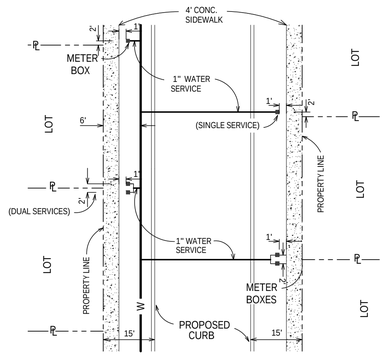
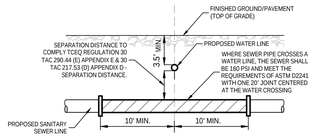




WATER METER BOX LOCATION (60' R.O.W.)

N.T.S.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

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KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 15' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
4. 1 - 2" BLOWOFF ASSEMBLY (PERM.) SEE G.V.S.U.D. STD. DTL. No. W-28 (SHEET C5.02) 1 - 8" M.J. x 2" THR. DI. ECCENTRIC REDUCER (PERM.)
5. AFTER RELEASED FOR SERVICE, CONTRACTOR TO TIE NEW 8" WATER MAIN INTO EXIST. 6" WATER MAIN, CUT AS REQUIRED.
   8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY GVSUD
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6. 1 - 8" x 6" TEE, M.J., ANCHOR
   1 - 6" x 114 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 G.V.S.U.D. STANDARD DTL. No. W-22 (SHEET C5.02)

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Developer's Name	LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.		
Developer's Address	100 NE LOOP 410, SUITE 1155		
City	SAN ANTONIO	State TEXAS	Zip 78216
Phone #	(210) 403-6200	Fax #	
Block Map #	N/A	Total EDU's 210	Total Acreage 60.610
Total Linear Footage of Pipe	8" W - 5,960.91 L.F.	Plat No.	N/A
Meter Size	210 - ⅝" METER		
Number of Lots	210	Job No.	N/A

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GRACE VALLEY RANCH
PHASE 6

WATER DISTRIBUTION PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

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STATE OF TEXAS
KYLE M. HUDEK
138753
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05/06/2025

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TBPE No. 455
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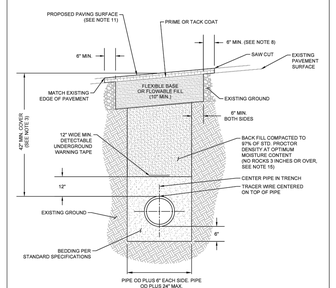
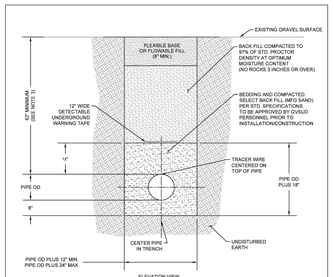


GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		TRENCH DETAIL FOR PAVED AREAS (1 OF 2)	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-1

NOTES:

1. ALL WASTEWATER PVC PIPING SHALL BE GREEN IN COLOR. NO WATER DESIGNATED PIPE SHALL BE USED IN WASTEWATER WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
2. ALL WATER PIPING SHALL HAVE A MINIMUM PRESSURE CLASS OF 235 PSI WATER PVC PIPING SHALL BE BLUE IN COLOR.
3. ALL WATER LINES AND WASTEWATER FORCEMAIN SHALL HAVE 42 INCH MINIMUM COVER AND 72 INCH MAXIMUM COVER. WASTEWATER GRAVITY LINES SHALL HAVE 42 INCHES MINIMUM COVER AND 15 FOOT MAXIMUM COVER.
4. GENERAL CONTRACTOR SHALL CONTACT THE APPROPRIATE STREET OWNER AND PROCESS, POST FISCAL SURETY, AND HAVE STREET CUT PERMIT ISSUED IN THEIR NAME.
5. CONTRACTOR TO REPAIR PAVED AREA TO STREET OWNER'S ROAD STANDARDS FOR ALL DISTURBED AREA. GREEN VALLEY SPECIAL UTILITY DISTRICT PAYS FOR QUANTITY OF REPAIR SHOWN IN DETAIL.
6. CONTRACTOR SHALL NOT EXCEED THE MAXIMUM TRENCH ALLOWED AS INDICATED IN THE PLANS AND SPECIFICATIONS.
7. THE EXISTING PAVED SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE, A MINIMUM OF 12 INCHES WIDER THAN UNDISTURBED SIDES OF THE TRENCH AND SYMMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
8. ANY CONCRETE PAVING SHALL BE CUT 6 INCHES WIDER THAN UNDISTURBED SIDES OF EXCAVATION.
9. IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, THE SURFACE SHALL BE MAINTAINED LEVEL WITH ADJACENT RIDING SURFACE WITH TEMPORARY COLD MIX ASPHALT CONCRETE OR TEMPORARY HOT MIXED ASPHALT CONCRETE. TEMPORARY MIX SHALL BE PLACED OVER FLEXIBLE BASE.
10. FLEXIBLE BASE SHALL BE REPLACED IN KIND WITH BASE AND PAVEMENT THICKNESS WITH BASE EQUAL TO EXISTING BASE THICKNESS PLUS 3 INCHES, BUT IN NO CASE LESS THAN 10 INCHES.
11. DAMAGED PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH A MINIMUM OF 2 INCHES HOT MIXED ASPHALT CONCRETE AND A BASE OF 10 INCHES OR A THICKNESS MATCHING EXISTING, WHICHEVER IS GREATER.
12. TACK COAT ALL EXPOSED EDGES AND SURFACES.
13. TYPE AND THICKNESS OF PROPOSED PAVING SURFACE SHALL BE AS FOLLOWS:
    - TWO COURSE SURFACE TREATMENT: SHALL MATCH EXISTING SURFACE AND SHALL BE IN ACCORDANCE WITH SPECIFICATION 02725.
    - ASPHALT PAVING: SHALL BE IN ACCORDANCE WITH SPECIFICATION 02740. HOT MIXED ASPHALT CONCRETE PAVING SHALL BE PLACED IN TWO COURSES WITH THE FIRST COURSE HAVING A THICKNESS OVER 2 INCHES AND UP TO 3 INCHES. LIFT THICKNESS SHALL NOT BE MORE THAN 3 INCHES.
14. DETECTABLE UNDERGROUND WARNING TAPE SHALL BE PLACED DIRECTLY ABOVE THE CENTERLINE OF THE PIPE AND ABOVE BEDDING, IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. THE TAPE SHALL CONFORM TO THE SPECIFICATIONS AND COLOR CODED IN ACCORDANCE WITH APWA UNIFORM COLOR CODE. THE DETECTABLE UNDERGROUND WARNING TAPE SHALL CONFORM TO THE SPECIFICATIONS AND COLOR CODED IN ACCORDANCE WITH THE AMERICAN PUBLIC WORKS ASSOCIATION UNIFORM COLOR CODE.
15. PIPE BEDDING SHALL BE PLACED BEFORE PIPING IS LAID, UP TO BOTTOM OF PIPE, AND COMPACTED TO 97% STANDARD PROCTOR DENSITY.
16. PLACE PIPE BEDDING IN 12 INCH LIFTS AFTER PIPE IS LAID TO 12 INCHES ABOVE THE PIPE.
17. SELECT BACKFILL MATERIAL PLACED TO REQUIRED HEIGHT IN 6 INCH LIFTS.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		TRENCH DETAIL FOR PAVED AREAS (2 OF 2)	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-1

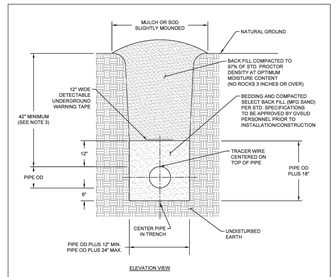


ELEVATION VIEW

NOTES:

1. ALL WASTEWATER PVC PIPING SHALL BE GREEN IN COLOR. NO WATER DESIGNATED PIPE WILL BE USED IN WASTEWATER.
2. ALL WATER PIPING SHALL HAVE A MINIMUM PRESSURE CLASS OF 235 PSI WATER PVC PIPING SHALL BE COLOR CODED BLUE.
3. ALL WATER LINES AND WASTEWATER FORCEMAIN SHALL HAVE 42 INCHES MINIMUM COVER AND 72 INCHES MAXIMUM COVER. WASTEWATER GRAVITY LINES SHALL HAVE 42 INCHES MINIMUM COVER AND 15 FEET MAXIMUM COVER.
4. CONTRACTOR SHALL NOT EXCEED THE MAXIMUM TRENCH ALLOWED AS INDICATED IN THE PLANS AND SPECIFICATIONS.
5. DETECTABLE UNDERGROUND WARNING TAPE SHALL BE PLACED DIRECTLY ABOVE THE CENTERLINE OF THE PIPE AND ABOVE BEDDING, IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. THE TAPE SHALL CONFORM TO THE SPECIFICATIONS AND COLOR CODED IN ACCORDANCE WITH APWA UNIFORM COLOR CODE.
6. PIPE BEDDING PLACED BEFORE PIPING IS LAID UP TO BOTTOM OF PIPE COMPACTED TO 95% ASHTO DENSITY.
7. PLACE IN 12 INCH LIFTS AFTER PIPE IS LAID TO 12 INCHES ABOVE THE PIPE.
8. SELECT BACKFILL MATERIAL PLACED TO REQUIRED HEIGHT IN 6 INCH LIFTS.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		TRENCH DETAIL FOR GRAVEL SURFACED AREAS	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-2

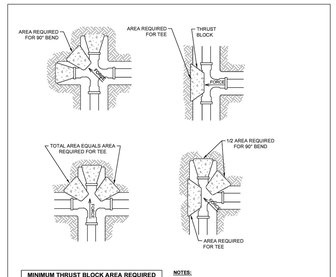


ELEVATION VIEW

NOTES:

1. ALL WASTEWATER PVC PIPING SHALL BE GREEN IN COLOR. NO WATER DESIGNATED PIPE WILL BE USED IN WASTEWATER.
2. ALL WATER PIPING SHALL HAVE A MINIMUM PRESSURE CLASS OF 235 PSI WATER PVC PIPING SHALL BE COLOR CODED BLUE.
3. ALL WATER LINES AND WASTEWATER FORCEMAIN SHALL HAVE 42 INCHES MINIMUM COVER AND 72 INCHES MAXIMUM COVER. WASTEWATER GRAVITY LINES SHALL HAVE 42 INCHES MINIMUM COVER AND 15 FEET MAXIMUM COVER.
4. CONTRACTOR SHALL NOT EXCEED THE MAXIMUM TRENCH ALLOWED AS INDICATED IN THE PLANS AND SPECIFICATIONS.
5. DETECTABLE UNDERGROUND WARNING TAPE SHALL BE PLACED DIRECTLY ABOVE THE CENTERLINE OF THE PIPE AND ABOVE BEDDING, IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. THE TAPE SHALL CONFORM TO THE SPECIFICATIONS AND COLOR CODED IN ACCORDANCE WITH APWA UNIFORM COLOR CODE.
6. PIPE BEDDING PLACED BEFORE PIPING IS LAID UP TO BOTTOM OF PIPE COMPACTED TO 95% ASHTO DENSITY.
7. PLACE IN 12 INCH LIFTS AFTER PIPE IS LAID TO 12 INCHES ABOVE THE PIPE.
8. SELECT BACKFILL MATERIAL PLACED TO REQUIRED HEIGHT IN 6 INCH LIFTS.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		TRENCH DETAIL FOR NON-PAVED AREAS	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-3

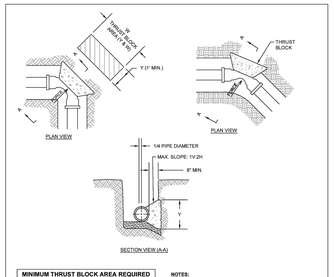


MINIMUM THRUST BLOCK AREA REQUIRED (Y AND W)		
PIPE SIZE	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° AND 22.5° BENDS
4" & LESS	3 SQ. FEET	3 SQ. FEET
6"	4 SQ. FEET	3 SQ. FEET
8"	6 SQ. FEET	3 SQ. FEET
10"	9 SQ. FEET	5 SQ. FEET
12"	13 SQ. FEET	7 SQ. FEET
16"	23 SQ. FEET	12 SQ. FEET
18"	29 SQ. FEET	15 SQ. FEET

NOTES:

1. TABLE IS BASED ON SOILS WITH A MINIMUM BEARING CAPACITY OF 3,000 PSF. IF CONDITIONS ARE FOUND TO REDUCE SOIL BEARING IN LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPE LARGER THAN 18 INCHES SHALL BE RESTRAINED.
3. THRUST BLOCKS SHALL EXTEND TO UNDISTURBED GROUND. CONCRETE SHALL BE CLASS "C" MIN. 2,500 PSI.
4. FITTINGS SHALL BE DUCTILE IRON MECHANICAL JOINT WITH A MINIMUM PRESSURE RATING OF 250 PSI AND SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AWWA A21.10/C110 OR A21.53/C153.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		CONCRETE THRUST BLOCKING (1 OF 2)	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-4

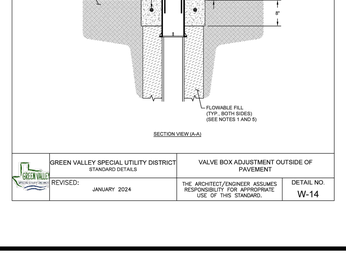


MINIMUM THRUST BLOCK AREA REQUIRED (Y AND W)		
PIPE SIZE	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° AND 22.5° BENDS
4" & LESS	3 SQ. FEET	3 SQ. FEET
6"	4 SQ. FEET	3 SQ. FEET
8"	6 SQ. FEET	3 SQ. FEET
10"	9 SQ. FEET	5 SQ. FEET
12"	13 SQ. FEET	7 SQ. FEET
16"	23 SQ. FEET	12 SQ. FEET
18"	29 SQ. FEET	15 SQ. FEET

NOTES:

1. TABLE IS BASED ON SOILS WITH A MINIMUM BEARING CAPACITY OF 3,000 PSF. IF CONDITIONS ARE FOUND TO REDUCE SOIL BEARING IN LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPE LARGER THAN 18 INCHES SHALL BE RESTRAINED.
3. THRUST BLOCKS SHALL EXTEND TO UNDISTURBED GROUND. CONCRETE SHALL BE CLASS "C" MIN. 2,500 PSI.
4. FITTINGS SHALL BE DUCTILE IRON MECHANICAL JOINT WITH A MINIMUM PRESSURE RATING OF 250 PSI AND SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AWWA A21.10/C110 OR A21.53/C153.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		CONCRETE THRUST BLOCKING (2 OF 2)	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-4

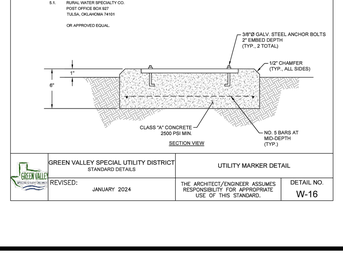


NOTE:
NUMBER OF RUNNERS AND CONFIGURATION TO COMPLY WITH TCEQ RULES AND REGULATIONS

NOTES:

1. TCEQ RULES AND REGULATIONS ON SANITARY SEWER, STORM SEWER AND WATER MAIN CROSSING AND SEPARATIONS WILL BE STRICTLY ENFORCED TO TAC, CHAPTER 290, SUBCHAPTER D.
2. ALL PIPE IN ENCASEMENT PIPE SHALL BE RESTRAINED AT JOINTS FOR ENTIRE LENGTH OF THE ENCASEMENT PIPE PLUS 18 FEET ON EACH SIDE.
3. AT ANY GREEN CROSSING OR DRAINAGE DITCH THE PIPE SHALL BE ENCASED IN STEEL PIPE AND HAVE A MINIMUM OF 3 FEET OF COVER FROM THE BOTTOM OF THE DRENCH/STREAM.
4. AT ANY ROADWAY CROSSING THE MAIN SHALL BE STEEL ENCASED AND HAVE A MINIMUM OF 5 FEET OF COVER FROM THE BOTTOM OF THE MAIN MATERIAL.
5. BORE SHALL HAVE SUFFICIENT ROOM FOR 2" PVC O.D. (MIN) FOR FORCE GROUTING AS REQUIRED.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		ENCASEMENT DETAIL WITH ENCASEMENT SPACERS	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-6



ROADWAY BORE DETAIL

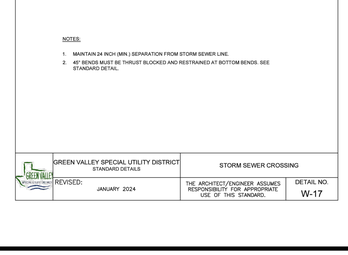
NOTES:

1. ALL PIPE IN ENCASEMENT PIPE SHALL BE RESTRAINED WITH AN APPROVED METHOD FOR ENTIRE LENGTH OF THE ENCASEMENT PIPE PLUS 18 FEET ON EACH SIDE.
2. FOR A PIPE 20 FEET IN LENGTH, A MINIMUM OF 4 SPACERS ARE REQUIRED. FOR A PIPE 13 FEET IN LENGTH, A MINIMUM OF 3 SPACERS ARE REQUIRED.
3. FOR ENCASED PIPE LOCATED IN PROXIMITY TO SANITARY SEWERS, SPACERS SHALL CONFORM TO TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290, SUBCHAPTER D.
4. AT ANY ROADWAY CROSSING THE PIPE SHALL BE STEEL ENCASED AND HAVE A MINIMUM OF 5 FEET OF COVER FROM THE BOTTOM OF THE BASE MATERIAL.
5. FOR ROAD WAY CROSSINGS, THE ENDS OF THE CASING PIPE SHALL EXTEND TO THE RIGHT OF WAY LINES.
6. ALL PIPE FITTINGS, VALVES, AND APPURTENANCES SHALL MATCH OR EXCEED CLASS RATING OF PIPE AS SHOWN ON THE PLANS.
7. SEE ENCASEMENT DETAIL WITH ENCASEMENT SPACER DETAIL W-6.
8. DUCTILE IRON PIPE,AMERICAN ZINC COATED ANNNAWWS C-151 MAY BE USED IN LIEU OF STEEL CASING WHEN APPROVED BY GVSUD.

WATER LINE IN ENCASEMENT PIPE

WATER LINE SIZE (INCHES)	NOM. DIA. STEEL (INCHES)	ENCASEMENT PIPE THICKNESS (INCHES)	PIPE WEIGHT (LBS./F.T.)
6	18	0.375	70.59
8	24	0.375	94.62
12	24	0.375	94.62
16	30	0.375	118.65
20	36	0.438	166.19
24	42	0.438	194.02
30	48	0.50	259.02
36	54	0.50	291.07

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		INSTALLATION OF PIPE IN STEEL ENCASEMENT UNDER ROADS	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-7



STREAM / STORM SEWER DETAIL

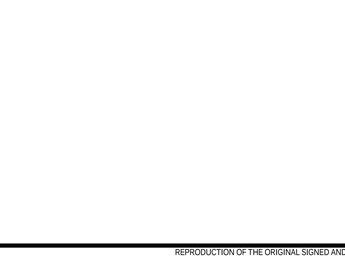
NOTES:

1. ALL PIPE IN ENCASEMENT PIPE SHALL BE RESTRAINED WITH AN APPROVED METHOD FOR ENTIRE LENGTH OF THE ENCASEMENT PIPE PLUS 18 FEET ON EACH SIDE.
2. FOR A PIPE 20 FEET IN LENGTH, A MINIMUM OF 4 SPACERS ARE REQUIRED. FOR A PIPE 13 FEET IN LENGTH, A MINIMUM OF 3 SPACERS ARE REQUIRED.
3. FOR ENCASED PIPE LOCATED IN PROXIMITY TO SANITARY SEWERS, SPACERS SHALL CONFORM TO TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290, SUBCHAPTER D.
4. AT ANY CREEK CROSSING OR DRAINAGE DITCH THE PIPE SHALL BE STEEL ENCASED AND HAVE A MINIMUM OF 3 FEET OF COVER FROM THE BOTTOM OF THE CREEK/STREAM.
5. SEE ENCASEMENT DETAIL WITH ENCASEMENT SPACER DETAIL W-6.
6. ANNULAR SPACE TO BE FILLED WITH SAND-CEMENT SLURRY.
7. MINIMUM DEPTH BETWEEN CASING PIPE AND BOX CULVERTS OR STORM SEWER PIPE IS 2 FEET.

WATER LINE IN ENCASEMENT PIPE

WATER LINE SIZE (INCHES)	NOM. DIA. STEEL (INCHES)	ENCASEMENT PIPE THICKNESS (INCHES)	PIPE WEIGHT (LBS./F.T.)
6	18	0.375	70.59
8	24	0.375	94.62
12	24	0.375	94.62
16	30	0.375	118.65
20	36	0.438	166.19
24	42	0.438	194.02
30	48	0.50	259.02
36	54	0.50	291.07

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		INSTALLATION OF PIPE IN STEEL ENCASEMENT UNDER STREAMS / STORM SEWERS	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-8



TYPICAL SECTION

NOTES:

1. MAINTAIN A MINIMUM 5 FOOT HORIZONTAL AND 2 FOOT VERTICAL SEPARATION FROM BETWEEN UTILITIES AND WATER AND WASTEWATER PIPES AND SERVICES. GAS, ELECTRIC, CABLE, ETC. TO BE LOCATED OPPOSITE SIDES OF PROPERTIES.
2. UTILITY CROSSINGS SEPARATED BY LESS THAN 5 FEET SHALL BE ENCASED WITH A MINIMUM OF 6 INCHES OF CONCRETE.
3. SPECIFICATIONS: BEDDING MATERIAL MUST BE APPROVED BY AUTHORIZED GVSUD PERSONNEL, BEFORE START OF JOB.
4. AT ANY CREEK CROSSING OR DRAINAGE DITCH THE MAIN SHALL BE ENCASED WITH STEEL PIPE AND/OR 6 INCHES CONCRETE ENCASEMENT TO WITHIN 10 FEET OUTSIDE OF CREEK OR DRAINAGE DITCH AREA.
5. PIPE JOINTS SHALL BE AT LEAST 5 FEET HORIZONTALLY FROM CROSSINGS.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		UTILITIES CROSSING DETAIL	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-10

NOTES:

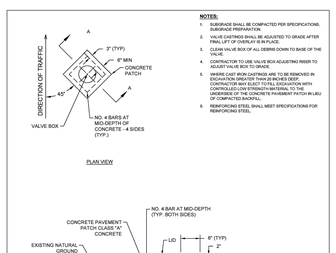
1. MEUD 2 1/2 INCH X 2 INCH DEEP SOCKET TO 1 INCH DOCKDALE 4G ROUND STEM EXTENSION AND ON OPERATING NUT. FOR PIPE EXTENSIONS OVER 10 FEET, STEM EXTENSION SHALL BE A SCHEDULE 80 PIPE.
2. VALVE EXTENSIONS ARE REQUIRED ON ALL VALVES THAT EXCEED 3 FEET DEEP FROM FINISHED GRADE. VALVE EXTENSIONS SHALL BE PLACED SUCH THAT THE EXTENSION NUT IS BETWEEN 18 TO 24 INCHES FROM FINISHED GRADE.
3. CONCRETE COLLARS TO BE INSTALLED ON ALL VALVE BOXES LOCATED OUTSIDE PAVEMENT. SEE APPROPRIATE VALVE BOX ADJUSTMENT DETAILS.
4. GATE VALVES SHALL BE MUELLER TYPE OR APPROVED EQUAL.
5. FOR VALVE DEEPER THAN 6 FEET, ADD EXTENSION.
6. VALVE TURNS UNDERNEATH CAP.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		NON-RISING STEM VERTICAL GATE VALVE WITH BOX ASSEMBLY	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-11

NOTES:

1. VALVE BOX COVER SHALL BE EJ GROUP, INC. STI VALVE BOX COVER PRODUCT NUMBER 3317011, OR APPROVED EQUIVALENT WITH GVSUD LOGO.
2. TYPICAL FILLET IS 5/16 INCH RADIUS.
3. LETTERING SHALL BE 3/4 INCH SHARP FACE GOTHIC AND LOCATED AS SHOWN.
4. LID REQUIRES TWO (2) PICK SLOTS.
5. THE MANUFACTURER'S IDENTIFICATION, CASTING NUMBER, AND THE COUNTRY WHERE CAST, SHALL BE DISTINCTLY CAST ONTO EACH LID.
6. DRAFT AND SHRINKAGE ALLOWANCE SHALL BE IN ACCORDANCE WITH NORMAL FOUNDRY PRACTICE.
7. FINISH BY REMOVING FINS AND FLASHING AND PAINT WITH BLACK ASPHALT COATING.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		VALVE BOX CASTING LID	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-12

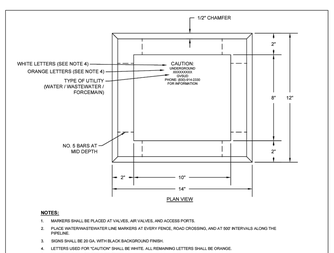


SECTION VIEW (A-A)

NOTES:

1. SUBGRADE SHALL BE COMPACTED PER SPECIFICATIONS. SUBGRADE PREPARATION.
2. VALVE CASTINGS SHALL BE ADJUSTED TO GRADE AFTER PAVING BY THE PAVING CONTRACTOR.
3. CLEAN VALVE BOX OF ALL DEBRIS DOWN TO BASE OF THE VALVE.
4. CONTRACTOR TO USE VALVE BOX ADJUSTING RISER TO ADJUST VALVE BOX TO GRADE.
5. WHERE CAST IRON CASTINGS ARE TO BE REMOVED IN EXCAVATION GREATER THAN 20 INCHES DEEP, BACKFILL SHALL BE REPLACED IN LIFTS COMPACTED WITH CONTROLLED LOW STRENGTH MATERIAL TO THE UNDERSIDE OF THE CONCRETE PAVEMENT PATCH IN LIEU OF COMPACTED BACKFILL.
6. REINFORCING STEEL SHALL MEET SPECIFICATIONS FOR REINFORCING STEEL.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		VALVE BOX ADJUSTMENT OUTSIDE OF PAVEMENT	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-14

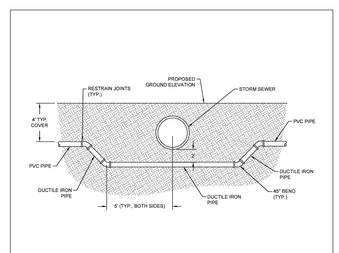


SECTION VIEW

NOTES:

1. MARKERS SHALL BE PLACED AT VALVES, AIR VALVES, AND ACCESS PORTS.
2. PLACE WATER/WASTEWATER LINE MARKERS AT EVERY FENCE, ROAD CROSSING, AND AT 600' INTERVALS ALONG THE PIPELINE.
3. SIGNS SHALL BE 20 GA. WITH BLACK BACKGROUND FINISH.
4. LETTERS USED FOR "CAUTION" SHALL BE WHITE. ALL REMAINING LETTERS SHALL BE ORANGE.
5. MARKERS SHALL BE OBTAINED FROM:
   5.1. RURAL WATER SPECIALTY CO. POST OFFICE BOX 827 TULSA, OKLAHOMA 74101
   OR APPROVED EQUAL.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		UTILITY MARKER DETAIL	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-16



NOTES:

1. MAINTAIN 24 INCH (MIN.) SEPARATION FROM STORM SEWER LINE.
2. 45° BENDS MUST BE THRUST BLOCKED AND RESTRAINED AT BOTTOM BENDS. SEE STANDARD DETAIL.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		STORM SEWER CROSSING	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIB

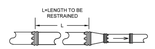
RESTRAINED LENGTH FOR BENDS

PIPE SIZE (INCHES)	BEND ANGLE (DEG)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 PSI
6	90	23
6	45	9
6	22.5	5
6	11.25	2
8	90	30
8	45	12
8	22.5	6
8	11.25	3
12	90	43
12	45	18
12	22.5	8
12	11.25	4
16	90	63
16	45	25
16	22.5	13
16	11.25	7
24	90	85
24	45	35
24	22.5	17
24	11.25	9

NOTES:

1. RESTRAINED LENGTH CALCULATIONS FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.
2. THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BASED UPON THE CONDITIONS ENCOUNTERED DURING INSTALLATION.
3. CONTRACTOR SHALL RESTRAIN ALL JOINTS WITHIN THE REQUIRED RESTRAINT DISTANCE PLUS THE NEXT JOINT OUTSIDE THE REQUIRED RESTRAINT DISTANCE.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		BEND RESTRAINED LENGTH DESIGN	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-18



RESTRAINED LENGTH FOR REDUCERS

PIPE SIZE (INCHES)	SMALL SIZE (INCHES)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 PSI
6	4	30
8	4	55
8	6	32
12	4	95
12	6	80
12	8	58
16	4	131
16	6	120
16	8	104
16	12	60
24	16	110

NOTES:

1. RESTRAINED LENGTH CALCULATIONS FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.
2. THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BASED UPON THE CONDITIONS ENCOUNTERED DURING INSTALLATION.
3. CONTRACTOR SHALL RESTRAIN ALL JOINTS WITHIN THE REQUIRED RESTRAINT DISTANCE PLUS THE NEXT JOINT OUTSIDE THE REQUIRED RESTRAINT DISTANCE.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		REDUCER RESTRAINED LENGTH DESIGN	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-19

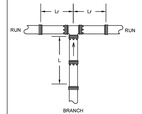
RESTRAINED LENGTH FOR DEAD ENDS/INLINE VALVES

PIPE SIZE (INCHES)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 PSI
4	42
6	59
8	77
12	109
16	142
24	202

NOTES:

1. RESTRAINED LENGTH CALCULATIONS FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.
2. THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BASED UPON THE CONDITIONS ENCOUNTERED DURING INSTALLATION.
3. CONTRACTOR SHALL RESTRAIN ALL JOINTS WITHIN THE REQUIRED RESTRAINT DISTANCE PLUS THE NEXT JOINT OUTSIDE THE REQUIRED RESTRAINT DISTANCE.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		VALVE AND DEAD END RESTRAINED LENGTH DESIGN	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-20



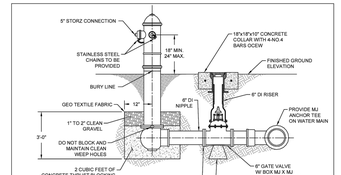
RESTRAINED LENGTH FOR TEES

PIPE SIZE (INCHES)	BRANCH SIZE (INCHES)	LENGTH OF RUN (FEET)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 PSI
6	4	0	42
6	4	5	7
6	4	10	1
6	6	0	59
6	6	5	33
6	6	10	1
8	4	0	42
8	4	5	1
8	6	0	59
8	6	5	28
8	6	10	1
8	8	0	77
8	8	5	53
8	8	10	30
8	8	15	8
12	4	0	42
12	4	5	1
12	6	0	59
12	6	5	13
12	6	10	1
12	8	0	77
12	8	5	42
12	8	10	7
12	8	15	1
12	12	0	109
12	12	5	86
12	12	10	63
12	12	15	39
16	4	0	42
16	4	5	1
16	6	0	59
16	6	5	1
16	8	0	79
16	8	5	39
16	8	10	1
16	12	0	110
16	12	5	84
16	12	10	59
16	12	15	33
16	12	20	7
16	16	0	142
16	16	5	123
16	16	10	104
16	16	15	85
16	16	20	65
24	24	5	169
24	24	10	136
24	24	15	103
24	24	20	70

NOTES:

1. HYDRANT ASSEMBLY INCLUDES FIRE HYDRANT, VALVE, DR. D FITTINGS, ANCHOR RESTRAINERS, AND PIPE TO DISTRIBUTION SYSTEM
2. FIRE HYDRANTS SHALL HAVE A MINIMUM OF 3 FEET OF CLEARANCE SURROUNDING HYDRANT.
3. HYDRANTS SHALL BE A MINIMUM DISTANCE OF 3 FEET BEHIND THE CURB OR 5 FEET FROM THE R.O.W. UNDER NO CIRCUMSTANCES SHALL VALVES OR HYDRANTS BE PLACED IN A CURB OR SIDEWALK. IN AREAS WITHOUT CURBS OR SIDEWALKS, HYDRANT SHALL BE PLACED 3-5 FEET FROM THE DISTRIBUTION SYSTEM.
4. FOR BURY DEPTHS GREATER THAN 5 FEET, ONE BARREL EXTENSION NOT EXCEEDING 5 FEET IN LENGTH SHALL BE INSTALLED DIRECTLY BELOW THE FIRE HYDRANT.
5. 1 CU FOOT (MIN) OF CRUSHED STONE OR GRAVEL SHALL BE PLACED AROUND WEEP HOLE FOR A RADIUS OF 12 INCHES AND EXTEND 12 INCHES ABOVE THE OUTLET.
6. VALVE, DUCTILE IRON PIPE, AND STANDARD FIRE HYDRANT SYSTEM SHALL BE RESTRAINT JOINT CONTINUOUSLY TOGETHER.
7. FIRE HYDRANT SHALL BE 6 INCH (5) WAY HYDRANT WITH BREAK AWAY BOLTS (SWOC TYPED) PROVIDED WITH STORZ CONNECTION. DEPTH OF BURY SHALL BE 42 INCHES MINIMUM. FIRE HYDRANTS MUST BE SET PLUMB. HOSE CONNECTION MUST FACE ROADWAY.
8. HYDRANT ASSEMBLY SHALL BE RESTRAINED FROM TEE TO HYDRANT.
9. IN THE CITY OF CIBOLO'S CITY LIMITS, FIRE HYDRANTS SHALL BE MUELLER TYPE AND SHALL BE 1 FOOT MINIMUM AND 7 FEET MAXIMUM FROM THE BACK OF CURB.
10. HYDRANTS UPPER BARREL SHALL BE FACTORY PAINTED RED WITH BONNET AND CAPS COATED PER CURRENT NFPA 291 STANDARDS.
11. HYDRANTS LOCATED IN RURAL AREAS SHALL HAVE 8' TALL POLLARD WATER FLEXPLAS #PP88052.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		TEE RESTRAINED LENGTH DESIGN	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-21



NOTES:

1. HYDRANT ASSEMBLY INCLUDES FIRE HYDRANT, VALVE, DR. D FITTINGS, ANCHOR RESTRAINERS, AND PIPE TO DISTRIBUTION SYSTEM
2. FIRE HYDRANTS SHALL HAVE A MINIMUM OF 3 FEET OF CLEARANCE SURROUNDING HYDRANT.
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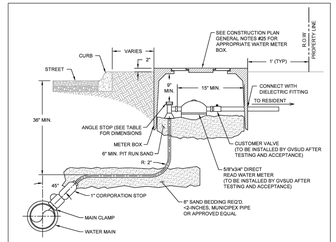
11. HYDRANTS LOCATED IN RURAL AREAS SHALL HAVE 8' TALL POLLARD WATER FLEXPLAS #PP88052.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		STANDARD HYDRANT ASSEMBLY INSTALLATION	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-22



MAIN SIZE	METER SIZE	MAIN SADDLE	CORPORATION	ANGLE STOP
<12"	5/8" OR 3/4"	S-91804 IP	H-15028 IP 1"	B-24259N: 1"x 3/4"
<12"	1"	S-91804 IP	H-15028 IP 1"	B-24258N: 1"X1"

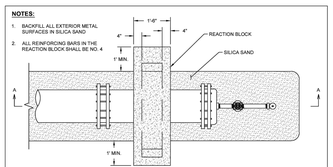
NOTES:

1. FITTINGS SHALL BE MUELLER OR APPROVED EQUAL
2. A TRACER WIRE SHALL BE INSTALLED ON THE SERVICE LINE TAPED AT 10-INCH INCREMENTS

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		STANDARD SERVICE CONNECTION	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-23

NOTES:

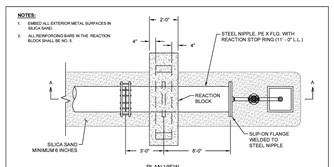
1. BACKFILL ALL EXTERIOR METAL SURFACES IN SILICA SAND
2. ALL REINFORCING BARS IN THE REACTION BLOCK SHALL BE NO. 4



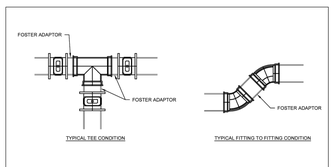
GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		2" TEMPORARY BLOW-OFF ASSEMBLY ON 12" TO 16" MAINS	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-25

NOTES:

1. EMBED ALL EXTERIOR METAL SURFACES IN SILICA SAND
2. ALL REINFORCING BARS IN THE REACTION BLOCK SHALL BE NO. 5



GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		2" & 4" PERMANENT URBAN BLOW-OFF ASSEMBLY	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-28



NOTE:

1. FOSTER ADAPTORS, OR APPROVED EQUAL, REQUIRED AT ALL FITTING TO FITTING CONNECTIONS AND FITTING TO VALVE CONNECTIONS.
2. ANCHOR COUPLINGS MAY BE SUBSTITUTED FOR FOSTER ADAPTORS AT GVSUD'S DISCRETION.

GREEN VALLEY SPECIAL UTILITY DISTRICT STANDARD DETAILS		MECHANICAL JOINT ADAPTOR DETAIL	
REVISED:	JANUARY 2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	DETAIL NO. W-31

GVSUD CONSTRUCTION PLAN GENERAL NOTES

1. ALL WORKMANSHIP AND MATERIALS FOR THE WATER SYSTEM SHALL CONFORM TO THE WATER STANDARDS AND DESIGN CRITERIA OF GREEN VALLEY SPECIAL UTILITY DISTRICT (GVSUD).
2. PVC MAINS 12-INCHES AND BELOW SHALL CONFORM TO AWWA C-909 PRESSURE CLASS 235 OR ABOVE DEPENDING ON SYSTEM PRESSURES. PVC MAIN GREATER THAN 12 INCHES SHALL CONFORM TO AWWA C-900 OR 18 OR ABOVE DEPENDING ON SYSTEM PRESSURES. WATER MAINS SHALL HAVE AN ABSOLUTE MINIMUM DEPTH OF 5-FEET BELOW ROADWAY LEVEL AND 42-INCHES IN ALL OTHER AREAS.
3. ALL WATER MAIN DUCTILE IRON FITTINGS SHALL BE MECHANICAL JOINT AND CONFORM TO ANSI/AWWA C-153 OR C-110. ALL BOLTS SHALL HAVE KOPR KOTE OR APPROVED EQUAL ANTI-SEIZE CORROSION RESISTANT COATING. VALVES SHALL BE ATTACHED TO TEES BY FOSTER ADAPTOR OR ANCHOR NIPPLE. FOSTER ADAPTER, ANCHOR NIPPLE, OR FORD UNI-FLANGE RETAINER GLANDS AND THRUST BLOCKS SHALL BE USED ON ALL FITTINGS AND VALVES.
4. TRACER WIRE SHALL BE INSTALLED ON ALL PIPELINES INCLUDING SERVICE LINES AND BROUGHT INTO VALVE AND METER BOXES FOR LOCATING PURPOSES. INSULATED WATER PROOF CONNECTORS SHALL BE USED TO SPLICE WIRES TOGETHER. A 12-INCH-WIDE DETECTABLE METAL TAPE SHALL BE PLACED ABOVE BEDDING INITIAL BACKFILL.
5. EXCEEDING MAXIMUM DEFLECTION IS PROHIBITED. THE ANGULAR DEFLECTION AT BELL-SPIGOT JOINTS SHOULD NOT EXCEED ONE (1) DEGREE. THIS WILL PRODUCE A 4-INCH OFFSET FOR EVERY 20-FOOT SECTION OF PIPE. JOINT DEFLECTION IS ACHIEVED AFTER THE JOINT IS ASSEMBLED IN STRAIGHT ALIGNMENT AND DEFLECTED TO THE REFERENCE MARK. THE BELL SHOULD BE BRACED TO ALLOW THE FREE END TO MOVE LATERALLY UNDER STEADY PRESSURE USING A PRY BAR OR OTHER SUITABLE MEANS. CARE SHOULD BE TAKEN NOT TO EXCEED THE MAXIMUM DEFLECTION ALLOWED OR TO DAMAGE THE PIPE WITH MACHINERY. ABRUPT CHANGES IN DIRECTION SHALL BE ACCOMPLISHED WITH FITTINGS.
6. OVER STRESSING THE BELL BY OVER INSERTING THE JOINTS, OVERBELLING, AND PASSING THE INSERTION REFERENCE MARK IS PROHIBITED AND WILL REQUIRE REMOVAL AND REINSTALLATION.
7. STANDARD FIRE HYDRANT SHALL INCLUDE HYDRANT, 6-INCH RESILIENT GATE VALVE AND BOX, ANCHOR FITTINGS, DUCTILE IRON PIPE, AND ALL APPURTENANCES. HYDRANTS SHALL BE LIMITED TO THOSE MANUFACTURED BY MUELLER, AVK, AMERICAN FLOW, CLOW, OR EAST JORDAN. ONLY MUELLER HYDRANTS AND EJ SHALL BE USED IN CITY OF CIBOLO'S JURISDICTION. HYDRANT UPPER BARREL SHALL BE FACTORY PAINTED RED. HYDRANTS SHALL HAVE A STORTZ CONNECTION ON STEAMER NOZZLE. FITTINGS FOR PLUG SHALL BE FULLY RESTRAINED AND TIED TO VALVE.

GVSUD CONSTRUCTION PLAN GENERAL NOTES

8. VALVES SHALL BE AWWA APPROVED RESILIENT WEDGE SEATED GATE VALVE, OPEN LEFT, AND LIMITED TO THOSE MANUFACTURED BY MUELLER, AVK, AMERICAN FLOW, CLOW, OR EAST JORDAN.
9. VALVES ARE PROHIBITED IN ADA RAMPS, CURBS, AND ROADWAYS. VALVES ARE PROHIBITED IN SIDEWALKS IN CITY OF NEW BRAUNFELS.
10. METER BOXES ARE PROHIBITED IN ANY SIDEWALKS, DRIVEWAYS, OR ROADWAYS.
11. SMALL SERVICE TAPS SHALL BE EITHER 1-INCH OR 2 INCH AND SHALL BE REHAU MUNICIPEX WITH CTS 200 PSI PLASTIC INSERT. SMALL SERVICE TAPS TO BE MADE WITH SINGLE BRASS STRAP TAPPING SADDLE WITH IRON PIPE THREADS. EXCEPTION: IF LOCATED WITHIN CITY OF CIBOLO- SERVICE TAPS TO BE MADE WITH DOUBLE STAINLESS STRAP EPOXY COATING SADDLES WITH IRON PIPE THREADS.
12. CASING REQUIRED FOR ALL LONG SMALL SERVICES. 1 INCH SERVICE REQUIRES 3 INCH CASING AND 2 INCH SERVICE REQUIRES 4 INCH CASING. CASING SHALL BE PVC SCHEDULE 40 OR APPROVED EQUAL.
13. SINGLE 5/8" & ¾" METER BOXES SHALL BE DFW08C 16" X 11". DUAL 5/8" & ¾" METER BOXES SHALL BE DFW38C 17" X 15". 1-INCH METER BOXES SHALL BE DFW55C-14-1A 15 1/4" X 30 3/8". ALL METER BOXES SHALL BE PLASTIC WITH LIDS HAVING REBAR, ARM, AND KNOCKOUT.
14. THE FORD U BRANCH IS TO BE USED ON ALL DUAL SERVICES (U48-43Q) WITH THE 5/8" X 3/4" FEMALE THREAD ANGLE HEAD. ALL OTHER ANGLE HEADS WILL BE THE FORD Q NUT. ALL CORPORATION STOPS WILL BE IPS X Q NUT. ALL BRASS VALVES TO BE 'BALL' TYPE MINIMUM 200 PSI PRESSURE RATING. "CC" THREADED CORPORATION STOPS PROHIBITED.
15. TAPPING MACHINES UTILIZED FOR INSTALLING ANY TYPE OF TAP 1-INCH TO 2-INCHES WILL BE OF THE PURGE TYPE, WHICH AT THE TIME OF TAPPING SHALL EXPEL ALL CHIPS AND RESIDUE TO ATMOSPHERE THROUGH AN APPROPRIATE OUTLET AND/OR BE ABLE TO RETAIN THE COUPON.
16. ALL WATER MAIN, PIPE, CASINGS, FITTINGS, AND VALVES SHALL BE LAID IN MANUFACTURED SAND EMBEDMENT PER DETAILS. THE SAND SHALL FULLY ENCASE ALL PIPES, INCLUDING FITTINGS AND VALVES, BY A MINIMUM OF 12-INCHES. ALL FITTINGS AND VALVES ARE TO RECEIVE THRUST BLOCKING, FOSTER ADAPTER, ANCHOR NIPPLE, FORD UNI-FLANGE RETAINER GLAND JOINT RESTRAINTS, AND BELL JOINT RESTRAINTS WHEN SPECIFIED BY GVSUD OR THE DISTRICT'S ENGINEER.
17. CONTRACTOR TO CURB CUT V'S FOR VALVES AND X'S FOR METERS.
18. PRIOR TO CONSTRUCTION OF THE SEWER AND WATER MAINS, ALL R.O.W. ROADWAYS AND PARKWAY SHALL HAVE REFERENCE SURVEY STAKING AND BE EXCAVATED OR PROPERLY FILLED TO SUB-GRADE ELEVATION.

GVSUD CONSTRUCTION PLAN GENERAL NOTES

19. SURVEY STAKING OFFSETS ARE REQUIRED FOR ALL WATER MAIN AND APPURTENANCES.
20. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES INDICATED ON THE PLANS ARE TAKEN FROM AVAILABLE RECORDS AND ARE NOT GUARANTEED. CONTRACTOR SHALL INVESTIGATE AND FIELD VERIFY UTILITY LOCATIONS A MINIMUM OF 300 LF AHEAD OF CROSSING AND TIE-IN LOCATIONS. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO AND FOR MAINTENANCE PROTECTION OF THE EXISTING UTILITIES, WHETHER THEY ARE SHOWN ON THE PLANS OR NOT.
21. ALL WASTEWATER PIPES CROSSING THE POTABLE WATER DISTRIBUTION SYSTEM WILL BE HELD IN STRICT ACCORDANCE WITH TCEQ RULES AND REGULATIONS. PROPOSED SUB-GRADE LIMITS AND DIMENSIONS MUST BE SHOWN ON THE PLANS, AND CONSTRUCTION PROCEDURES WILL BE INSPECTED TO VERIFY COMPLIANCE WITH TCEQ 290.44(E).
22. OTHER UTILITIES SHALL NOT BE LOCATED CLOSER THAN 3-FEET TO WATER MAINS.
23. THE GREEN VALLEY INSPECTOR SHALL BE NOTIFIED AT LEAST FORTY-EIGHT HOURS PRIOR TO BACK FILLING OR TESTING.
24. A FIELD PRE-CONSTRUCTION MEETING SHALL BE HELD BEFORE CONSTRUCTION BEGINS AND MATERIAL SHALL BE AVAILABLE ON-SITE FOR INSPECTION.
25. CONTRACTOR SHALL CHLORINATE NEW MAINS PER TCEQ AND ANSI/AWWA C651 AND DECHLORINATE DURING FLUSHING PER ANSI/AWWA C655; THE CONTRACTOR SHALL COORDINATE WITH THE GVSUD INSPECTOR TO WITNESS CHLORINATING AND PRESSURE TESTING OF NEW MAINS. ALL TEST RESULTS MUST BE PROVIDED TO GVSUD.
26. OPERATION OF EXISTING VALVES IN THE GVSUD WATER DISTRIBUTION SYSTEM SHALL ONLY BE AS APPROVED BY GVSUD AND IN THE PRESENCE OF GVSUD PERSONNEL. THE CONTRACTOR SHALL NOTIFY GVSUD WHEN A VALVE NEEDS TO BE OPERATED AND MAY ONLY OPERATE A VALVE IN THE PRESENCE OF THE GVSUD INSPECTOR.
27. NEW WATER MAINS AND APPURTENANCES SHALL PASS PRESSURE TESTING AND PASS THE MINIMUM PUBLIC HEALTH STANDARDS FOR BACTERIOLOGICAL QUALITY TESTING PRIOR TO ANY TIE IN TO THE EXISTING GVSUD WATER SYSTEM AS REQUIRED BY TCEQ AND ANSI/AWWA.
28. HYDROSTATIC PRESSURE TESTING SHALL BE EVERY 200 LF (MAX) OF LINE OR AS APPROVED BY THE ENGINEER. ALL ERRORS OF WORKMANSHIP SHALL BE CORRECTED IMMEDIATELY. ALL PARTS OF THE PIPELINE SHALL BE BACKFILLED AND BRACED SUFFICIENTLY TO PREVENT MOVEMENT UNDER PRESSURE.
29. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH AND CONFINED SPACE ENTRY SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION AND ALL RELATED WORK. ANY

GVSUD CONSTRUCTION PLAN GENERAL NOTES

TRENCH PROTECTION SAFETY VIOLATION WILL BE DOCUMENTED AND WILL RESULT IN AN IMMEDIATE WORK STOPPAGE BY THE GVSUD INSPECTOR AT MINUMUM UNTIL THE NEXT WORKDAY.

30. CONTRACTOR MUST PROTECT ALL UNATTENDED TRENCHES AND EXCAVATIONS WITH TEMPORARY FENCING.
31. NO TREES MAY BE PLANTED IN THE AREAS DESIGNATED AS WATER OR UTILITY EASEMENTS, OR AREAS WHERE WATER MAINS AND WATER SERVICE CROSSINGS EXIST OR ARE PLANNED TO BE CONSTRUCTED.
32. ALL GARBAGE OR SPOIL MATERIAL FROM THE WORK SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.
33. CONTRACTOR SHALL PROVIDE "AS-BUILT" WATER LINE PLANS AT THE PRELIMINARY WALK THRU FOR THE GVSUD INSPECTOR AND ENGINEER. THE PLANS SHALL LIST MATERIAL MANUFACTURERS, LINE LENGTH FROM FITTING TO FITTING, AND TAP LOCATIONS.
34. GPS FILES SHALL BE PROVIDED BY THE CONTRACTOR TO THE ENGINEER AND GVSUD INSPECTOR FOR THE PLAN OF RECORD. CONTRACTOR SHALL PROVIDE AN ASCII COMMA DELIMITED OR EXCEL FILE CONTAINING THREE-DIMENSIONAL GPS SURVEY POINTS WITH FOUR (4) DECIMAL PLACES OF PRECISION, LESS THAN FOUR (4) INCHES OF HORIZONTAL POSITION ACCURACY, AND LESS THAN EIGHT (8) INCHES OF VERTICAL POSITION ACCURACY. POINTS SHALL BE PROVIDED FOR A MINIMUM OF THREE (3) CONTROL POINTS AND ALL FITTINGS, APPURTENANCES, ENCASEMENTS, VAULTS, AND TANKS. THE ENGINEER SHALL FURNISH PLAN OF RECORD DRAWINGS TO GVSUD FOR APPROVAL HAVING FINAL MEASUREMENTS AND THAT MATCH THE GPS 'X', 'Y', AND 'Z' COORDINATES.
35. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH ALL THE INFORMATION AS REQUIRED SO THAT THE ENGINEER CAN SUPPLY GVSUD THE GIS PACKAGE FOR APPROVAL.
36. A FINAL WALK THRU FOR FINAL FIELD ACCPETANCE WILL BE SCHEDULED WITH THE CONTRACTOR AFTER THE PRELIMINARY WALK THRU PUNCH LIST ITEMS HAVE BEEN COMPLETED AND AFTER THE GIS PACKAGE IS APPROVED AND ACCEPTED BY GVSUD.
37.

LOCATION MAP

N.T.S.

LEGEND

= UNIT BOUNDARY
= DRAINAGE BOUNDARY
= SHEET FLOW Tc LINE
= SHALLOW CONCENTRATED Tc LINE
= CONCENTRATED Tc LINE
= ACCUMULATION POINT

SCALE: 1"=300'

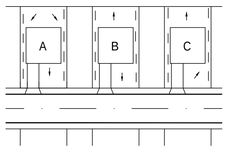
300 150 0 300

DEVELOPER:

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

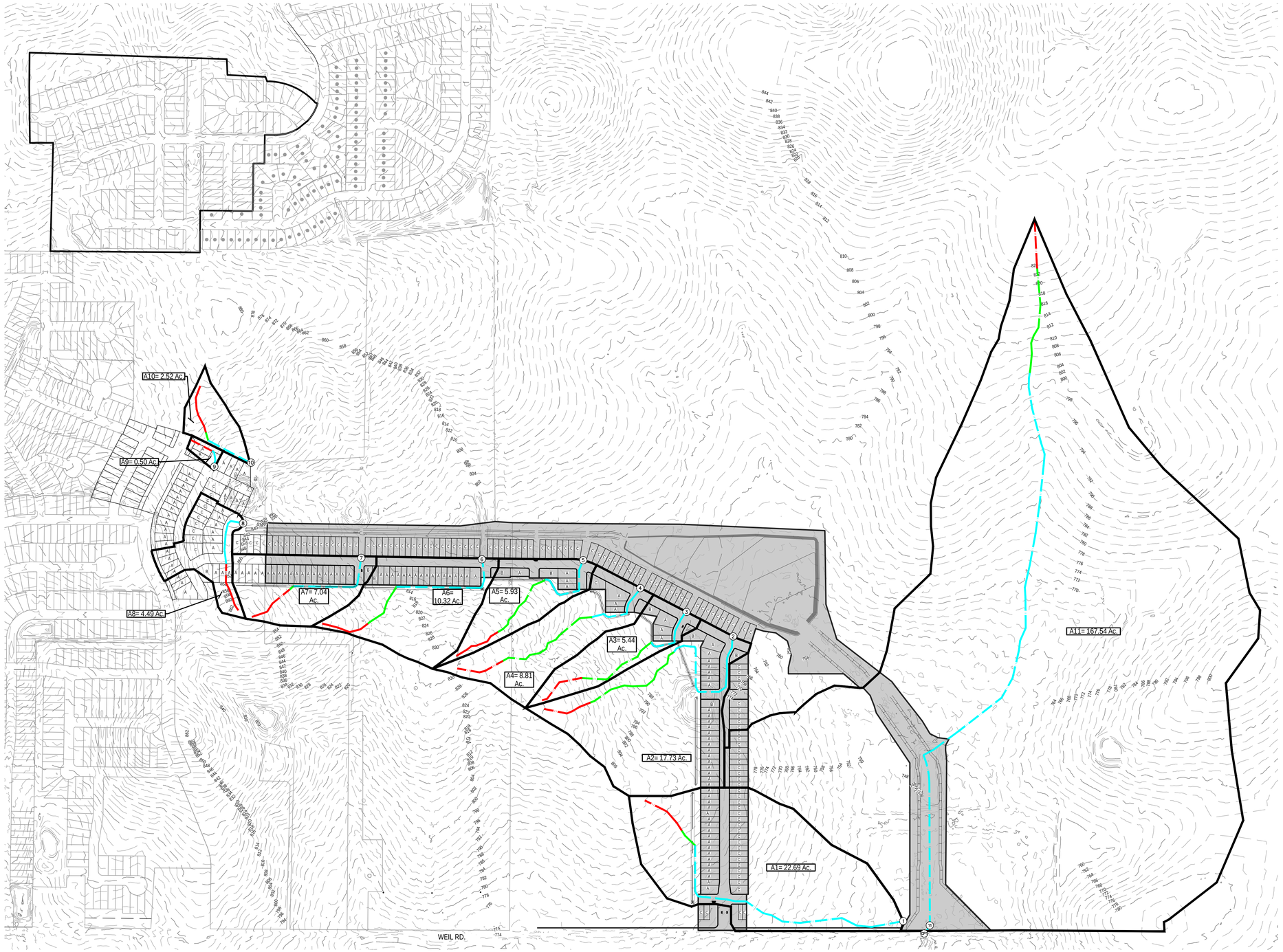
CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112



TYPICAL LOT SITE PLAN

N.T.S.



CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

OVERALL DRAINAGE MASTER PLAN - PROPOSED CONDITIONS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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9.

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.00

P:\03499\2025\2.Design\4.Engineering\DRAINAGE\DRAINAGE_PLANS\P-Prop 05/05/2025 8:57pm mseeley

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LOCATION MAP

N.T.S.

LEGEND

= UNIT BOUNDARY
= DRAINAGE BOUNDARY
= SHEET FLOW Tc LINE
= SHALLOW CONCENTRATED Tc LINE
= CONCENTRATED Tc LINE
= ACCUMULATION POINT

SCALE: 1"=300'

300 150 0 300

DEVELOPER:

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CONTACT PERSON: RICHARD MOTT
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216
TEL: (210) 403-6200

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

TYPICAL LOT SITE PLAN

N.T.S.

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

OVERALL DRAINAGE MASTER PLAN - ULTIMATE CONDITIONS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS

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9.

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.01

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REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LOCATION MAP N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

PROPOSED CONDITIONS

Project Name: Ann Austin Phase 1A — **Preci** — **PA2**
Calculation Summary for Time of Concentrations & Ultimate Flow

HYDROLOGY						Sheet Flow Tc Compuations						Shallow Conc. Tc Compuations					Concentrated Tc Computations			Overall	INTENSITY			Q FLOW			
Drainage Shed	Shed Area (Ac.)	AREA OF ACCUMULATION (Ac.)	C (5-YR)	C (25-YR)	C (100-YR)	*Length < 300'*	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	*Length < 650'*	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	Drainage Shed
A1	22.69	=A1	0.40	0.47	0.54	*300.00*	N	804.00	793.59	3.47%	18.00	*332.33*	N	788.41	1.56%	2.75	*1618.07*	5	5.39	26.00	4.10	5.70	7.17	36.83	60.70	88.11	A1
A2	17.73	=A2	0.40	0.47	0.54	*300.00*	N	820.00	808.78	3.74%	18.00	*650.00*	N	775.58	5.11%	2.96	*898.51*	5	3.00	23.00	4.42	6.15	7.74	31.04	51.21	74.36	A2
A3	5.44	=A3	0.40	0.47	0.55	*300.00*	N	820.00	807.46	4.18%	17.82	*511.53*	N	778.12	5.73%	2.20	*346.16*	5	1.15	21.00	4.63	6.45	8.13	10.03	16.59	24.11	A3
A4	8.81	=A4	0.39	0.46	0.53	*300.00*	N	830.00	822.95	2.35%	19.30	*650.00*	N	789.08	5.21%	2.93	*405.54*	5	1.35	23.00	4.42	6.15	7.74	15.02	24.67	35.93	A4
A5	5.93	=A5	0.41	0.49	0.56	*300.00*	N	830.00	821.09	2.97%	18.06	*448.35*	N	800.99	4.48%	2.18	*447.29*	5	1.49	21.00	4.63	6.45	8.13	11.23	18.64	27.02	A5
A6	10.32	=A6	0.40	0.48	0.55	*300.00*	N	840.00	826.78	4.41%	17.59	*296.20*	N	814.34	4.20%	1.49	*691.60*	5	2.31	21.00	4.63	6.45	8.13	19.32	32.01	46.45	A6
A7	7.04	=A7	0.44	0.53	0.60	*300.00*	N	862.71	844.30	6.14%	16.00	*29.98*	N	842.12	7.26%	0.11	*558.31*	5	1.86	17.00	5.05	7.04	8.89	15.55	26.10	37.64	A7
A8	4.49	=A8	0.50	0.61	0.69	*300.00*	N	862.76	848.68	4.70%	17.31						*346.91*	5	1.16	18.00	4.94	6.89	8.70	11.04	18.86	26.89	A8
A9	0.50	=A9	0.52	0.64	0.72	*142.70*	N	859.90	850.52								*105.21*	5	0.35	11.00	6.08	8.56	10.89	1.58	2.74	3.92	A9
A10	2.52	=A10	0.36	0.42	0.49	*300.00*	N	870.00	856.67	4.44%	17.56	*50.29*	N	854.00	5.30%	0.22	*287.64*	5	0.96	18.00	4.94	6.89	8.70	4.48	7.29	10.74	A10
A11	167.54	=A11	0.36	0.42	0.49	*300.00*	N	825.00	823.36	0.55%	20.00	*650.00*	N	802.31	3.24%	3.72	*3706.59*	5	12.36	36.00	3.43	4.77	5.99	206.88	335.65	491.75	A11
CP1	190.23	=A1+A11	0.36	0.42	0.49	*300.00*	N	825.00	823.36	0.55%	20.00	*650.00*	N	802.31	3.24%	3.72	*3706.59*	5	12.36	36.00	3.43	4.77	5.99	234.90	381.11	558.34	CP1

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GRACE VALLEY RANCH
PHASE 6

OVERALL DRAINAGE MASTER PLAN CALCULATIONS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.02

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ULTIMATE CONDITIONS

Project Name: Ann Austin Phase 1A — **Preci** — **PA2**
Calculation Summary for Time of Concentrations & Ultimate Flow

HYDROLOGY						Sheet Flow Tc Compuations						Shallow Conc. Tc Compuations					Concentrated Tc Computations			Overall	INTENSITY			Q FLOW			
Drainage Shed	Shed Area (Ac.)	AREA OF ACCUMULATION (Ac.)	C (5-YR)	C (25-YR)	C (100-YR)	*Length < 300'*	Paved (Y or N)	Upstream Elev.	Downstream Elev	Slope	Time of Concentration	*Length < 650'*	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	Drainage Shed
OS-A1	224.39	=OS-A1	0.38	0.45	0.53	*300.00*	N	897.15	885.41	3.91%	18.00	*154.58*	N	872.88	8.10%	0.56	*5993.79*	5	19.98	38.00	3.34	4.66	5.85	288.14	474.35	689.38	OS-A1
OS-A2	12.15	=OS-A2	0.38	0.44	0.51	*300.00*	N	794.00	783.69	3.44%	18.00	*650.00*	N	763.67	3.08%	3.83	*766.33*	5	2.55	24.00	4.31	6.00	7.55	19.72	32.28	47.14	OS-A2
OS-A3	11.22	=OS-A3	0.36	0.42	0.49	*300.00*	N	795.01	785.81	3.06%	18.00	*542.48*	N	766.45	3.57%	2.95	*909.33*	5	3.03	23.00	4.42	6.15	7.74	17.85	28.98	42.55	OS-A3
OS-A4	34.79	=OS-A4	0.36	0.42	0.49	*300.00*	N	825.00	823.36	0.55%	20.00	*650.00*	N	802.31	3.24%	3.72	*1777.70*	5	5.93	29.00	3.79	5.26	6.60	47.47	76.86	112.51	OS-A4
OS-A5	29.13	=OS-A5	0.36	0.42	0.49	*300.00*	N	800.00	791.22	2.93%	18.15	*650.00*	N	770.00	3.26%	3.70	*613.23*	5	2.04	23.00	4.42	6.15	7.74	46.35	75.24	110.48	OS-A5
OS-A6	8.69	=OS-A6	0.37	0.43	0.50	*300.00*	N	796.00	789.17	2.28%	19.44	*650.00*	N	759.28	4.60%	3.11	*106.98*	5	0.36	22.00	4.52	6.30	7.94	14.43	23.55	34.54	OS-A6
OS-A7	22.14	=OS-A7	0.36	0.42	0.49	*300.00*	N	800.00	791.39	2.87%	18.26	*650.00*	N	772.70	2.88%	3.97	*1061.30*	5	3.54	25.00	4.21	5.85	7.36	33.56	54.40	79.85	OS-A7
OS-A8	6.26	=OS-A8	0.36	0.42	0.49	*300.00*	N	780.00	766.05	4.65%	17.35	*396.93*	N	750.38	3.95%	2.06	*53.72*	5	0.18	19.00	4.84	6.75	8.51	10.91	17.75	26.10	OS-A8
OS-A9	2.44	=OS-A9	0.36	0.42	0.49	*300.00*	N	778.00	761.74	5.42%	16.58	*313.28*	N	749.24	3.99%	1.62	*39.09*	5	0.13	18.00	4.94	6.89	8.70	4.34	7.06	10.40	OS-A9
OS-A10	1.91	=OS-A10	0.36	0.42	0.49	*300.00*	N	784.00	779.12	1.63%	20.00	*496.67*	N	749.01	6.06%	2.08	*27.57*	5	0.09	22.00	4.52	6.30	7.94	3.11	5.05	7.43	OS-A10
OS-A11	10.63	=OS-A11	0.41	0.48	0.56	*300.00*	N	825.32	816.44	2.96%	18.08	*650.00*	N	788.23	4.34%	3.21	*240.56*	5	0.80	22.00	4.52	6.30	7.94	19.56	32.46	47.07	OS-A11
OS-A12	12.63	=OS-A12	0.38	0.44	0.52	*300.00*	N	830.75	821.51	3.08%	18.00	*650.00*	N	794.89	4.10%	3.32	*723.72*	5	2.41	23.00	4.42	6.15	7.74	21.08	34.50	50.38	OS-A12
A1	4.47	=A1	0.45	0.55	0.62	*93.80*	N	766.40	764.63	1.89%	13.22						*948.00*	5	3.16	16.00	5.15	7.19	9.08	10.43	17.62	25.33	A1
A2	4.10	=A2	0.43	0.52	0.59	*124.33*	N	763.00	760.16	2.28%	13.65						*686.68*	5	2.29	15.00	5.26	7.34	9.27	9.28	15.54	22.46	A2
A3	2.48	=A3	0.52	0.64	0.72	*75.00*	N	758.85	757.45	1.86%	13.27						*473.63*	5	1.58	14.00	5.46	7.64	9.68	7.04	12.13	17.28	A3
A4	6.45	=A4	0.50	0.62	0.70	*156.41*	N	757.14	755.00	1.37%	17.08						*623.26*	5	2.08	19.00	4.84	6.75	8.51	15.73	26.91	38.26	A4
A5	3.79	=A5	0.50	0.62	0.70	*133.26*	N	756.26	753.26	2.25%	14.17						*511.42*	5	1.70	15.00	5.26	7.34	9.27	10.07	17.23	24.53	A5
A6	1.54	=A6	0.51	0.63	0.71	*132.58*	N	750.19	748.42	1.33%	15.96						*268.45*	5	0.89	16.00	5.15	7.19	9.08	4.05	6.94	9.87	A6
A7	7.21	=A7	0.52	0.64	0.72	*212.50*	N	786.67	774.47	5.74%	14.16						*806.55*	5	2.69	16.00	5.15	7.19	9.08	19.31	33.18	47.14	A7
A8	4.64	=A8	0.52	0.64	0.72	*211.23*	N	786.76	777.90	4.19%	15.37						*976.26*	5	3.25	18.00	4.94	6.89	8.70	11.92	20.46	29.06	A8
A9	3.19	=A9	0.52	0.64	0.72	*95.00*	N	780.30	778.04	2.38%	12.25						*796.20*	5	2.65	14.00	5.46	7.64	9.68	9.06	15.60	22.23	A9
A10	6.18	=A10	0.52	0.64	0.72	*215.64*	N	785.30	776.44	4.11%	15.68						*951.51*	5	3.17	18.00	4.94	6.89	8.70	15.88	27.25	38.71	A10
A11	5.03	=A11	0.52	0.64	0.72	*211.07*	N	777.52	769.96	3.58%	15.74						*974.26*	5	3.25	18.00	4.94	6.89	8.70	12.92	22.18	31.51	A11
A12	4.58	=A12	0.52	0.64	0.72	*297.19*	N	799.49	785.84	4.59%	17.27						*523.17*	5	1.74	19.00	4.84	6.75	8.51	11.53	19.79	28.06	A12
A13	7.30	=A13	0.52	0.64	0.72	*230.00*	N	800.46	788.38	5.25%	14.87						*877.48*	5	2.92	17.00	5.05	7.04	8.89	19.17	32.89	46.73	A13
A14	6.54	=A14	0.52	0.64	0.72	*230.00*	N	805.31	799.85	2.37%	17.50						*1107.28*	5	3.69	21.00	4.63	6.45	8.13	15.75	27.00	38.28	A14
A15	4.92	=A15	0.52	0.64	0.72	*212.34*	N	805.00	800.11	2.30%	16.77						*724.75*	5	2.42	19.00	4.84	6.75	8.51	12.38	21.25	30.15	A15
A16	1.67	=A16	0.52	0.64	0.72	*67.50*	N	806.81	805.79	1.50%	13.99						*711.97*	5	2.37	16.00	5.15	7.19	9.08	4.47	7.68	10.92	A16
A17	7.24	=A17	0.52	0.64	0.72	*207.09*	N	807.29	803.86	1.65%	17.94						*1167.72*	5	3.89	21.00	4.63	6.45	8.13	17.43	29.89	42.38	A17
A18	5.80	=A18	0.52	0.64	0.72	*222.62*	N	806.00	793.22	5.74%	14.36						*594.41*	5	1.98	16.00	5.15	7.19	9.08	15.53	26.69	37.92	A18
A19	7.23	=A19	0.52	0.64	0.72	*240.00*	N	818.40	811.28	2.97%	17.07						*1133.27*	5	3.78	20.00	4.73	6.60	8.32	17.78	30.54	43.31	A19
A20	5.81	=A20	0.52	0.64	0.72	*230.00*	N	817.79	807.30	4.56%	15.44						*764.57*	5	2.55	17.00	5.05	7.04	8.89	15.26	26.18	37.19	A20
A21	5.56	=A21	0.52	0.64	0.72	*227.71*	N	823.72	818.56	2.27%	17.39						*784.91*	5	2.62	20.00	4.73	6.60	8.32	13.68	23.49	33.31	A21
A22	4.78	=A22	0.52	0.64	0.72	*138.72*	N	823.40	821.02	1.71%	15.51						*785.03*	5	2.62	18.00	4.94	6.89	8.70	12.28	21.08	29.94	A22
A23	5.33	=A23	0.52	0.64	0.72	*230.00*	N	796.00	790.55	2.37%	17.50						*526.50*	5	1.76	19.00	4.84	6.75	8.51	13.41	23.03	32.66	A23
A24	4.98	=A24	0.52	0.64	0.72	*240.00*	N	798.20	788.96	3.85%	16.15						*378.61*	5	1.26	17.00	5.05	7.04	8.89	13.08	22.44	31.88	A24
A25	9.29	=A25	0.52	0.64	0.72	*172.13*	N	830.48	827.74	1.59%	16.75						*1092.14*	5	3.64	20.00	4.73	6.60	8.32	22.85	39.24	55.65	A25
A26	6.36	=A26	0.52	0.64	0.72	*230.00*	N	820.63	814.71	2.58%	17.35						*659.42*	5	2.20	19.00	4.84	6.75	8.51	16.01	27.48	38.97	A26
A27	4.74	=A27	0.52	0.64	0.72	*245.00*	N	826.41	819.23	2.93%	17.14						*501.60*	5	1.67	18.00	4.94	6.89	8.70	12.18	20.90	29.69	A27
A28	5.68	=A28	0.52	0.64	0.72	*197.76*	N	829.34	824.64	2.38%	16.22						*422.10*	5	1.41	17.00	5.05	7.04	8.89	14.92	25.59	36.36	A28
A29	9.16	=A29	0.52	0.64	0.72	*177.21*	N	830.22	828.00	1.25%	17.93						*1511.81*	5	5.04	22.00	4.52	6.30	7.94	21.53	36.93	52.37	A29
A30	6.80	=A30	0.46	0.56	0.64	*156.38*	N	818.00	808.94	5.80%	12.82						*778.12*	5	2.59	15.00	5.26	7.34	9.27	16.57	28.05	40.25	A30
A31	8.36	=A31	0.49	0.60	0.68	*168.58*	N	825.29	815.51	5.80%	13.08						*1233.96*	5	4.11	17.00	5.05	7.04	8.89	20.66	35.18	50.23	A31
A32	5.68	=A32	0.42	0.51	0.58	*240.79*	N	846.31	840.00	2.62%	17.76						*1018.09*	5	3.39	21.00	4.63	6.45	8.13	11.16	18.63	26.90	A32
A33	6.68	=A33	0.52	0.64	0.72	*135.61*	N	849.87	845.14	3.49%	12.89						*1143.38*	5	3.81	16.00	5.15	7.19	9.08	17.89	30.74	43.67	A33
A34	6.71	=A34	0.51	0.63	0.71	*240.00*	N	849.61	846.08	1.47%	20.00						*578.77*	5	1.93	21.00	4.63	6.45	8.13	15.85	27.11	38.50	A34
A35	7.93	=A35	0.52	0.64	0.72	*143.68*	N	870.00	856.76	9.21%	11.14						*1362.99*	5	4.54	15.00	5.26	7.34	9.27	21.69	37.25	52.93	A35
A36	3.82	=A36	0.52	0.64	0.72	*134.64*	N	873.00	862.72	7.63%	10.83						*626.93*	5	2.09	12.00	5.87	8.25	10.49	11.66	20.17	28.85	A36
A37	7.20	=A37	0.52	0.64	0.72	*229.71*	N	857.95	849.73	3.58%	16.20						*798.91*	5	2.66	18.00	4.94	6.89	8.70	18.50	31.75	45.10	A37
A38	8.21	=A38	0.52	0.64	0.72	*144.96*	N	880.25	877.33	2.02%	14.98						*1545.55*	5	5.15	20.00	4.73	6.60	8.32	20.19	34.68	49.18	A38
A39	3.50	=A39	0.50	0.62	0.70	*115.00*	N	872.36	869.64	2.37%	13.01						*646.37*	5	2.15	15.00	5.26	7.34	9.27	9.29	15.89	22.63	A39
A40	6.43	=A40	0.51	0.63	0.71	*230.00*	N	880.00	872.14	3.42%	16.29						*946.85*	5	3.16	19.00	4.84	6.75	8.51	15.89	27.23	38.67	A40
A41	9.20	=A41	0.52	0.64	0.72	*230.00*	N	878.47	871.78	2.91%	16.68						*1359.12*	5	4.53	21.00	4.63	6.45	8.13	22.15	37.98	53.85	A41
A42	9.24	=A42	0.52	0.64	0.72	*230.00*	N	872.08	864.00	3.51%	16.24						*1210.50*	5	4.04	20.00	4.73	6.60	8.32	22.73	39.03	55.35	A42
A43	6.82	=A43	0.52	0.64	0.72	*212.38*	N	863.91	859.03	2.30%	16.77						*1208.80*	5	4.03	20.00	4.73	6.60	8.32	16.77	28.81	40.85	A43
A44	8.44	=A44	0.52	0.64	0.72	*230.00*	N	859.42	850.71	3.79%	16.11						*1253.16*	5	4.18	20.00	4.73	6.60	8.32	20.76	35.65	50.56	A44
A45	8.68	=A45	0.52	0.64	0.72	*230.00*	N	851.27	839.83	4.97%	15.03						*1295.78*	5	4.32	19.00	4.84	6.75	8.51	21.85	37.50	53.18	A45
A46	5.06	=A46	0.48	0.58	0.66	*162.06*	N	848.28	845.78	1.54%	16.84						*698.18*	5	2.33	19.00	4.84	6.75	8.51	11.69	19.85	28.36	A46
A47	5.55	=A47	0.48	0.59	0.66	*145.59*	N	817.11	814.00	2.13%	14.81						*725.71*	5	2.42	17.00	5.05	7.04	8.89	13.49	22.92	32.77	A47
*CP1	344.21	=OS-A1+CP20+A14+A17+A18	0.43	0.51	0.59	*300.00*	N	897.15	885.41	3.91%	18.00	*154.58*	N	864.42	13.58%	0.43	*5993.79*	5	19.98	38.00	3.34	4.66	5.85	490.41	820.51	1179.38	*CP1
*CP2	372.05	=OS-A2 + OS-A3 + A1 + CP1	0.42	0.51	0.58	*300.00*	N	897.15	885.41	3.91%	18.00	*154.58*	N	856.76	18.53%	0.37	*6515.50*	5	21.72	40.00	3.26	4.54	5.71	513.36	856.33	1234.12	*CP2
CP3	76.71	=A2 + CP22	0.74	0.91	1.02	*300.00*	N	825.00	823.36	0.55%	20.00	*650.00*	N	802.31	3.24%	3.72	*2589.84*	5	8.63	32.00	3.60	5.00	6.27	204.88	347.40	492.78	CP3
CP4	30.84	=OS-A7 + OS-A8 + OS-A9	0.36	0.42	0.49	*300.00*	N	800.00	791.39	2.87%	18.26	*650.00*	N	772.70	2.88%	3.97	*1061.30*	5	3.54	25.00	4.21	5.85	7.36	46.74	75.77	111.22	CP4
CP5	34.63	=A5+CP4	0.38	0.44	0.51	*300.00*	N	800.00	791.39	2.87%	18.26	*650.00*	N	772.70	2.88%	3.97	*1447.58*	5	4.83	27.00	4.00	5.56	6.98	52.06	85.07	123.95	CP5
CP6	8.90	=A16+A19	0.52	0.64	0.72	*240.00*	N	818.40	811.28	2.97%	17.07						*1440.11*	5	4.80	21.00	4.63	6.45	8.13	21.43	36.74	52.10	CP6
CP7	13.82	=A15+CP6	0.52	0.64	0.72	*240.00*	N	818.40	811.28	2.97%	17.07						*1742.66*	5	5.81	22.00	4.52	6.30	7.94	32.48	55.72	79.01	CP7
CP8	18.40	=A12+CP7	0.52	0.64	0.72	*240.00*	N	818.40	811.28	2.97%	17.07						*1959.18*	5	6.53	23.00	4.42	6.15	7.74	42.29	72.42	102.54	CP8
CP9	23.43	=A11+CP8	0.52	0.64	0.72	*240.00*	N	818.40	811.28	2.97%	17.07						*3069.04*	5	10.23	27.00	4.00	5.56	6.98	48.73	83.37	117.75	CP9
CP10	10.11	=A22+A23	0.52	0.64	0.72	*138.72*	N	823.40	821.02	1.71%	15.51						*1343.95*	5	4.48	19.00	4.84	6.75	8.51	25.44	43.68	61.95	CP10
CP11	14.27	=A24+A25	0.52	0.64	0.72	*172.13*	N	830.48	827.74	1.59%	16.75						*1474.05*	5	4.91	21.00	4.63	6.45	8.13	34.36	58.91	83.53	CP11
CP12	20.32	=A28+A34+A35	0.52	0.64	0.72	*240.00*	N	849.61	846.08	1.47%	20.00						*878.01*	5	2.93	22.00	4.52	6.30	7.94	47.76	81.93	116.17	CP12
CP13	17.52	=A29+A31	0.51	0.62	0.70	*177.21*	N	830.22	828.00	1.25%	17.93						*1511.81*	5	5.04	22.00	4.52	6.30	7.94	40.02	68.42	97.23	CP13
CP14	27.12	=A30+CP12	0.51	0.62	0.70	*240.00*	N	849.61	846.08	1.47%	20.00						*1725.42*	5	5.75	25.00	4.21	5.85	7.36	57.75	98.44	139.63	CP14
CP15	11.10	=A26+A27	0.52	0.64	0.72	*245.00*	N	826.41	819.23	2.93%	17.14						*858.69*	5	2.86	20.00	4.73	6.60	8.32	27.30	46.89	66.49	CP15
CP16	18.14	=A38+A39+A40	0.51	0.63	0.71	*144.96*	N	880.25	877.33	2.02%	14.98						*1545.55*	5	5.15	20.00	4.73	6.60	8.32	44.08	75.59	107.30	CP16
CP17	27.38	=A42+CP16	0.52	0.63	0.71	*144.96*	N	880.25	877.33	2.02%	14.98						*1776.09*	5	5.92	20.00	4.73	6.60	8.32	66.80	114.62	162.65	CP17
CP18	36.26	=A36+A46+CP17	0.51	0.63	0.71	*144.96*	N	880.25	877.33	2.02%	14.98						*2171.10*	5	7.24	22.00	4.52	6.30	7.94	83.73	143.34	203.52	CP18
CP19	72.95	=A37+A43+A44+A45+A47+CP18	0.51	0.63	0.71	*144.96*	N	880.25	877.33	2.02%	14.98						*2924.55*	5	9.75	24.00	4.31	6.00	7.55	161.14	275.63	390.63	CP19
CP20	100.24	=OS-A11 + A21+CP15+CP19	0.50	0.62	0.69	*144.96*	N	880.25	877.33	2.02%	14.98						*3525.20*	5	11.75	26.00	4.10	5.70	7.17	206.55	351.99	499.48	CP20
CP21	112.87	=OS-A12 + CP20	0.49	0.60	0.67	*144.96*	N	880.25	877.33	2.02%	14.98						*3982.02*	5	13.27	28.00	3.89	5.41	6.79	214.52	364.43	517.20	CP21
CP22	72.61	=OS-A4 + OS-A5 + OS-A6	0.79	0.96	1.09	*300.00*	N	825.00	823.36	0.55%	20.00	*650.00*	N	802.31	3.24%	3.72	*1777.70*	5	5.93	29.00	3.79	5.26	6.60	216.69	367.22	521.14	CP22

* DENOTES DRAINAGE AREA ANALYZED USING THE SCS HYDROLOGY METHOD DUE TO DRAINAGE AREA SIZE AND DETENTION CONSIDERATIONS. ALL HYDRAULIC CALCULATIONS FOR DRAINAGE STRUCTURES ASSOCIATED WITH THESE DRAINAGE AREAS SHOULD BE DERIVED FROM THE SCS METHOD HYDROLOGY CHART FOUND ON PAGE C6.04.

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GRACE VALLEY RANCH
PHASE 6

OVERALL DRAINAGE MASTER PLAN CALCULATIONS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.03

P:\03499\2025.2\WG\14 Drawn\UA\UA-C6.03_Drainage Area 05/05/2025 3:56pm mwarren

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

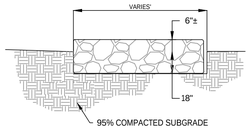
EARTHEN CHANNEL

CONCRETE RIP-RAP

8"X12" ROCK RUBBLE

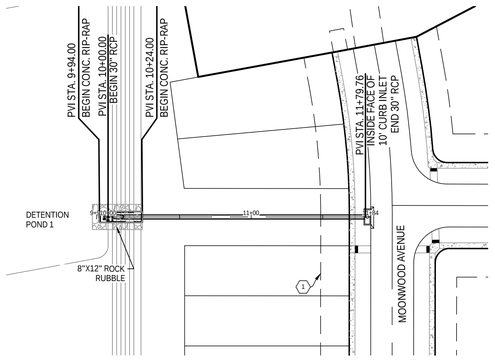
KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 10' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE



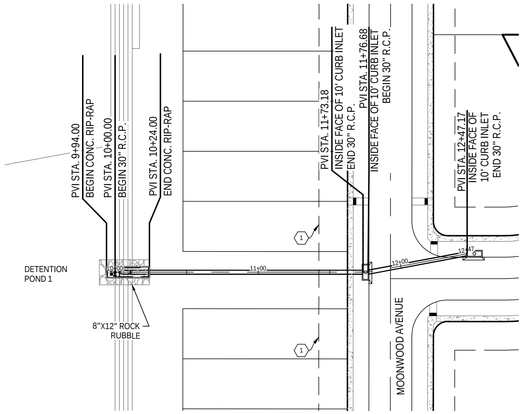
8"X12" ROCK RUBBLE DETAIL

N.T.S.



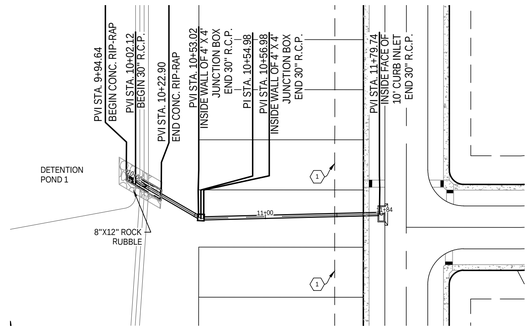
DRAIN 1A-1

STA. 9+92.00 TO STA. 11+83.53



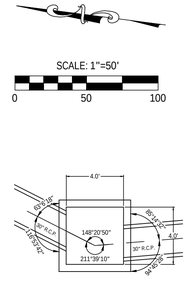
DRAIN 1A-2

STA. 9+92.00 TO STA. 12+47.17



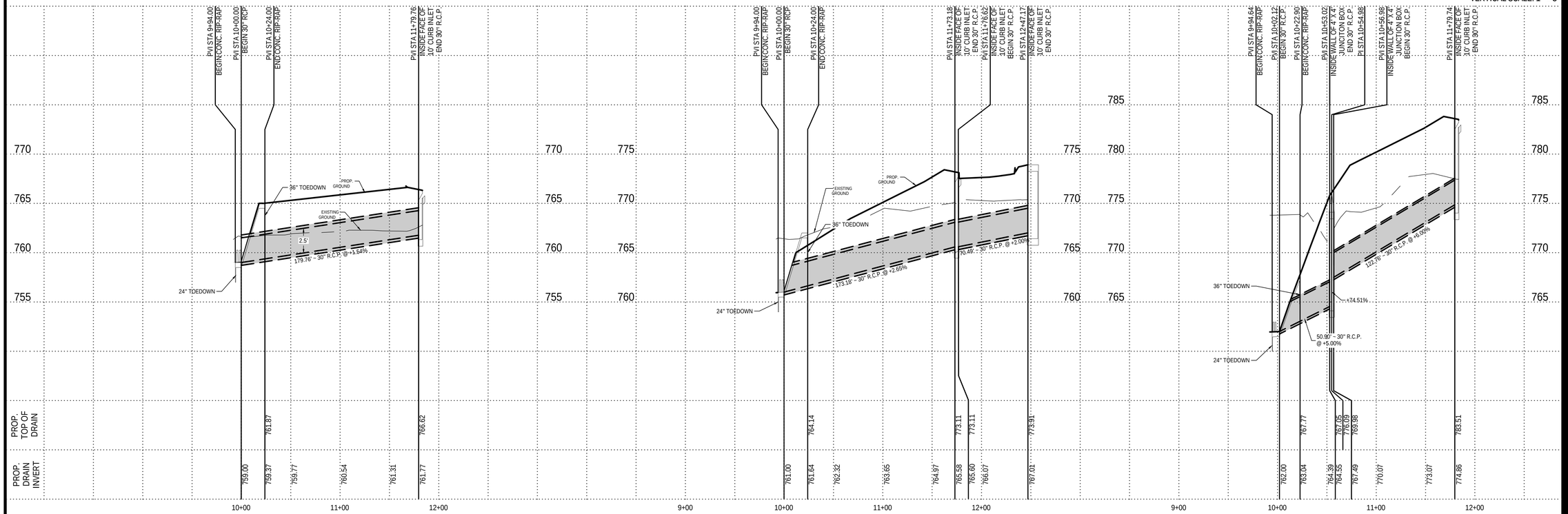
DRAIN 1A-3

STA. 9+92.33 TO STA. 11+83.52



4' X 4' JUNCTION BOX
'1A-3' DETAIL
SCALE: 1"=5'

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



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - DRAIN '1A 1,2,3'

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

PLAT NO.
XX-XXXXXXXX

SAWS JOB NO.
XX-XXXX

C6.04

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

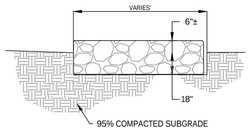
EARTHEN CHANNEL

CONCRETE RIP-RAP

8"X12" ROCK RUBBLE

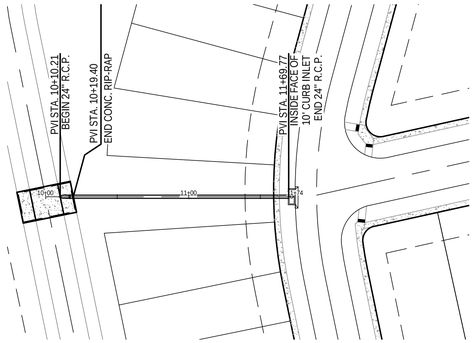
KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 10' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE



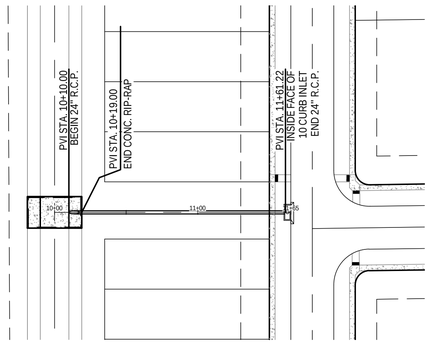
8"X12" ROCK RUBBLE DETAIL

N.T.S.



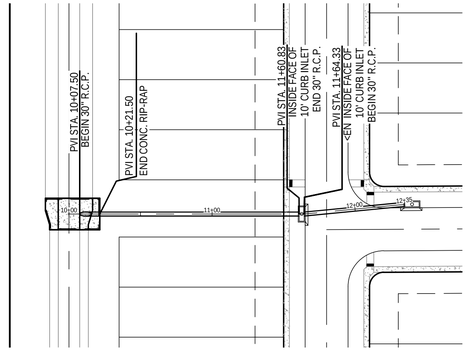
DRAIN 1A-4

STA. 10+00.00 TO STA. 11+74.31



DRAIN 1A-5

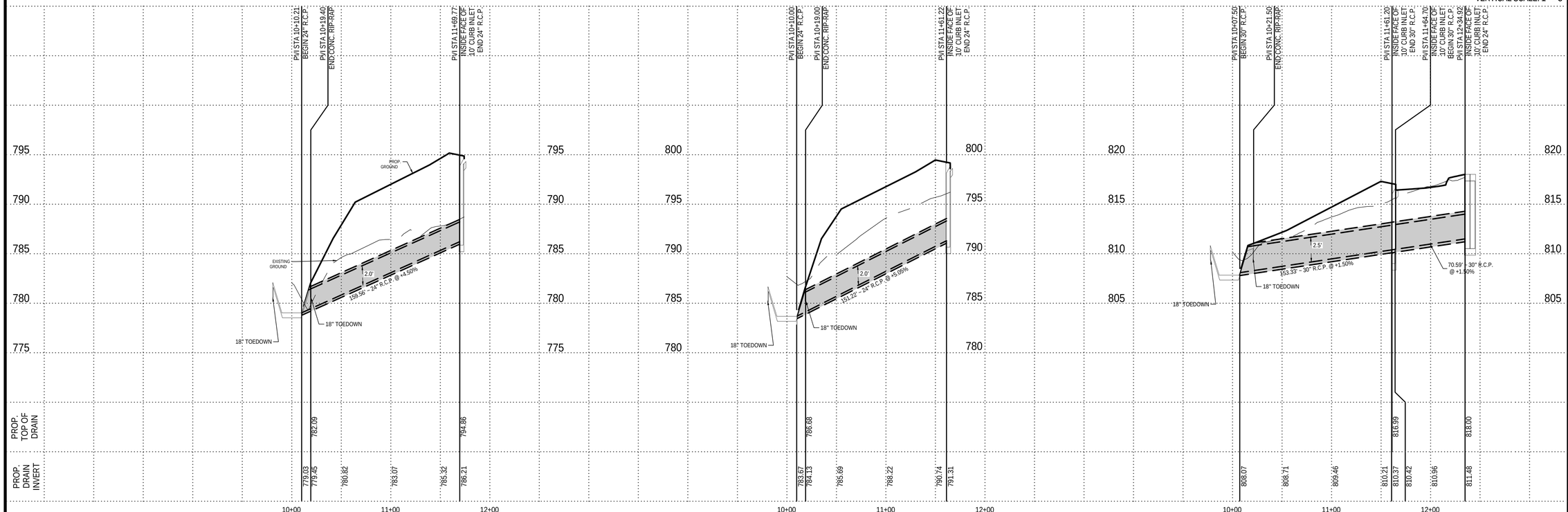
STA. 10+00.00 TO STA. 11+65.10



DRAIN 1A-7

STA. 10+00.00 TO STA. 12+34.91

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



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - DRAIN '1A 4,5,7'

DATE
05/06/2025

PROJECT NO.
03499.008

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REVISIONS
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C6.05

© 03499\Docs\Civil\Exhibits\GRADING\Grading Exhibits\Drainage Plan & Profile\Drainage Plan & Profile - Drain 1A 4,5,7.dwg, 5/6/2025 8:56:00 AM, Kristin Stephens

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

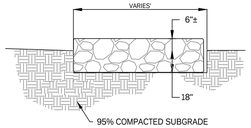
EARTHEN CHANNEL

CONCRETE RIP-RAP

8"X12" ROCK RUBBLE

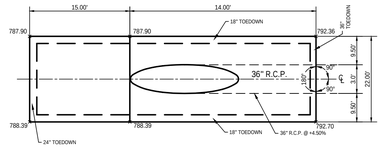
KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 10' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE



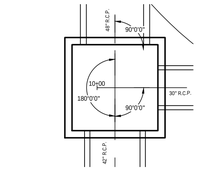
8"X12" ROCK RUBBLE DETAIL

N.T.S.



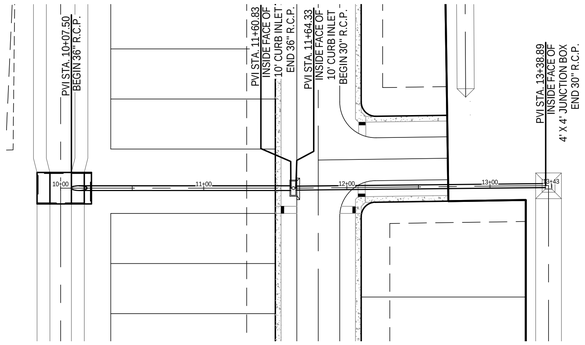
DRAIN '1A-6' OUTFALL DETAIL

(N.T.S.)



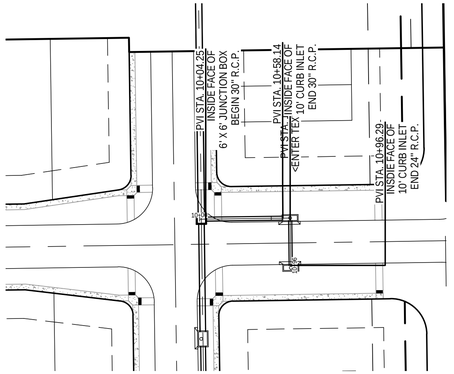
4' X 4' JUNCTION BOX
'1A-9' DETAIL

SCALE: 1"=5'



DRAIN 1A-6

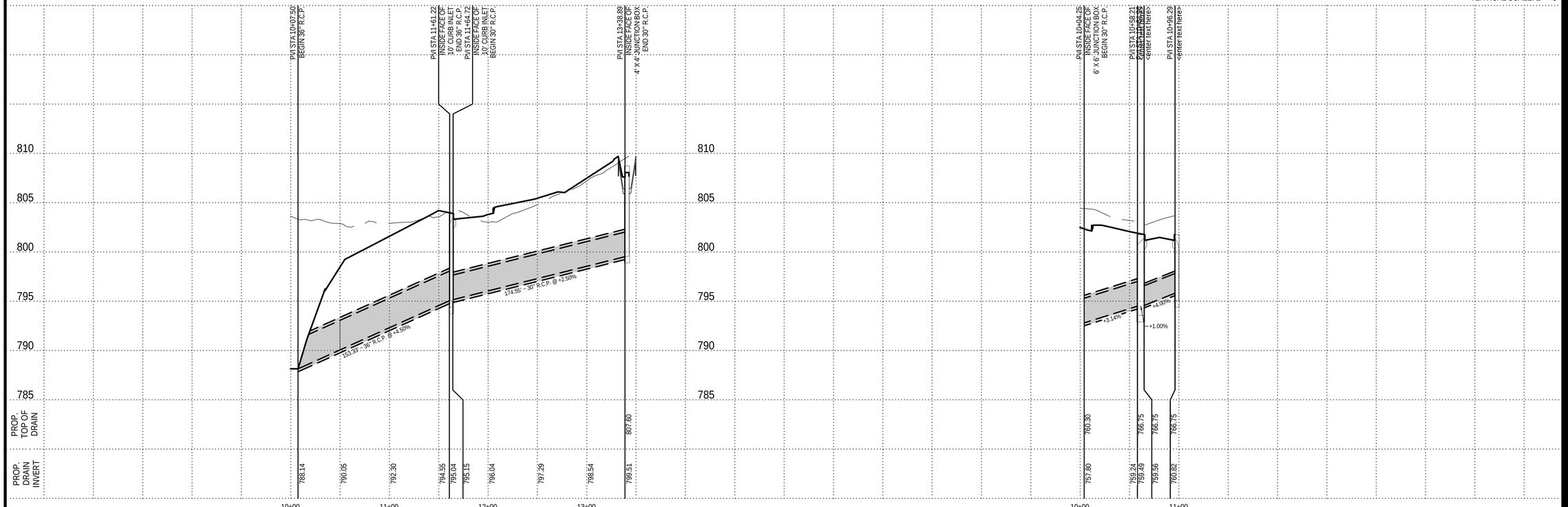
STA. 10+00.00 TO STA. 13+42.86



DRAIN 1A-9

STA. 10+00.00 TO STA. 10+96.29

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



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - DRAIN '1A-6'

DATE
05/06/2025

PROJECT NO.
03499.008

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

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C6.06

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LEGEND

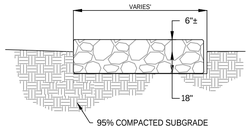
EARTHEN CHANNEL

CONCRETE RIP-RAP

8"X12" ROCK RUBBLE

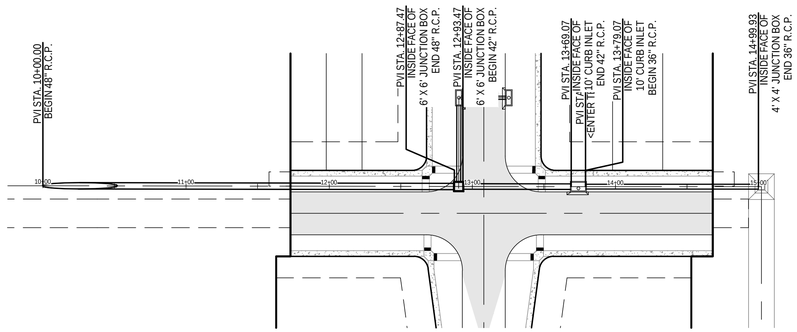
KEYNOTES

1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 10' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE



8"X12" ROCK RUBBLE DETAIL

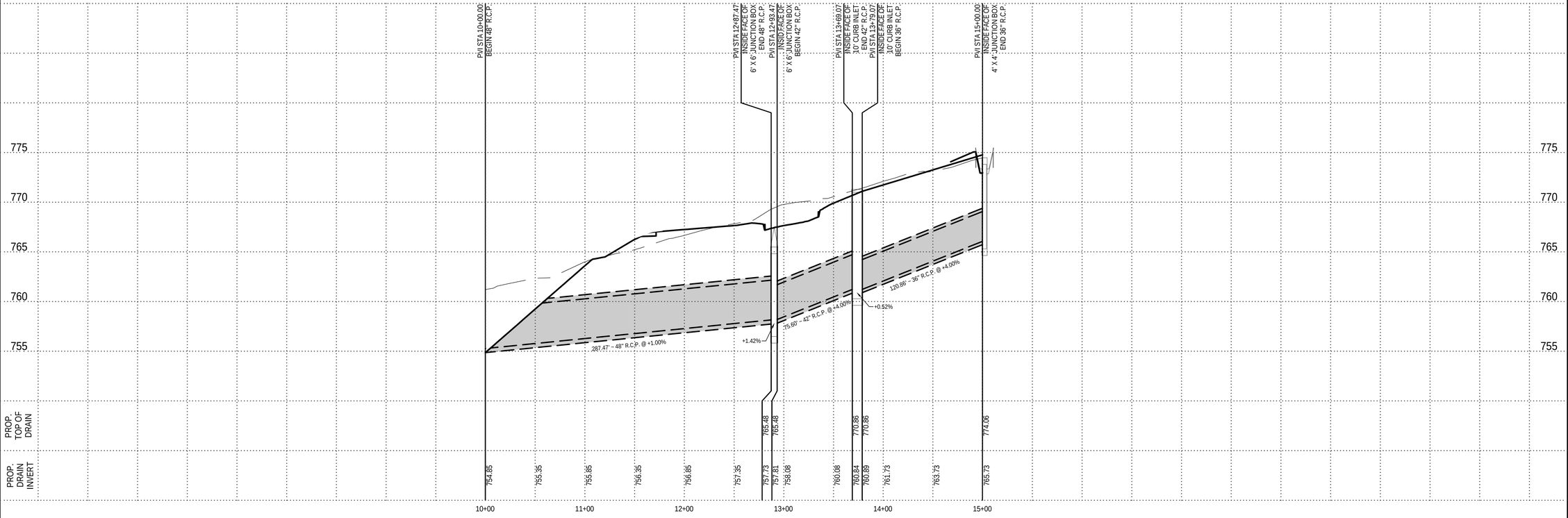
N.T.S.



DRAIN 1A-8

STA. 10+00.00 TO STA. 15+00.01

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



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - DRAIN '1A-8''

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

PLAT NO.
XX-XXXXXXXX

SAWS JOB NO.
XX-XXXX

C6.07

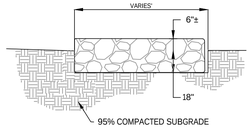
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

EARTHEN CHANNEL

CONCRETE RIP-RAP

TURF REINFORCEMENT MAT

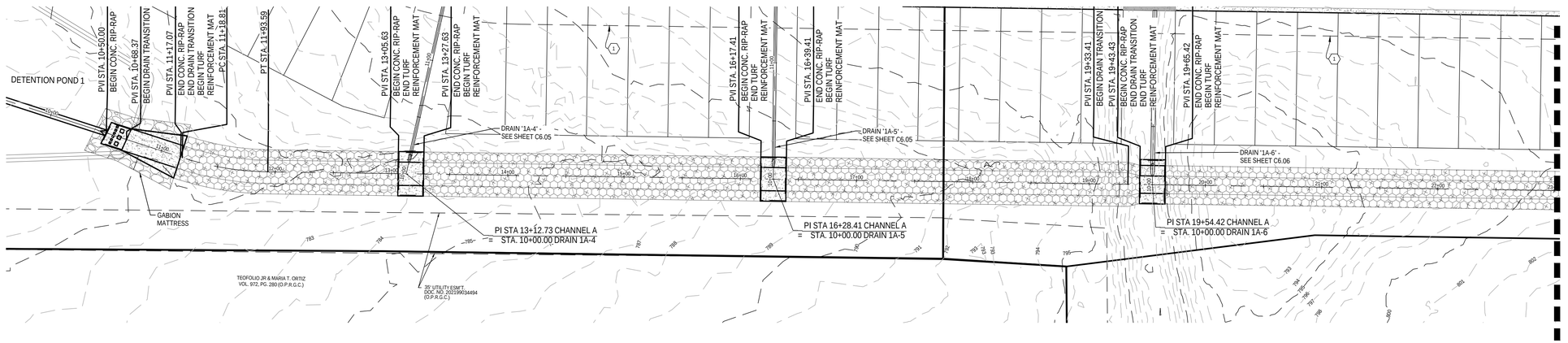


8"X12" ROCK RUBBLE DETAIL

N.T.S.

KEYNOTES

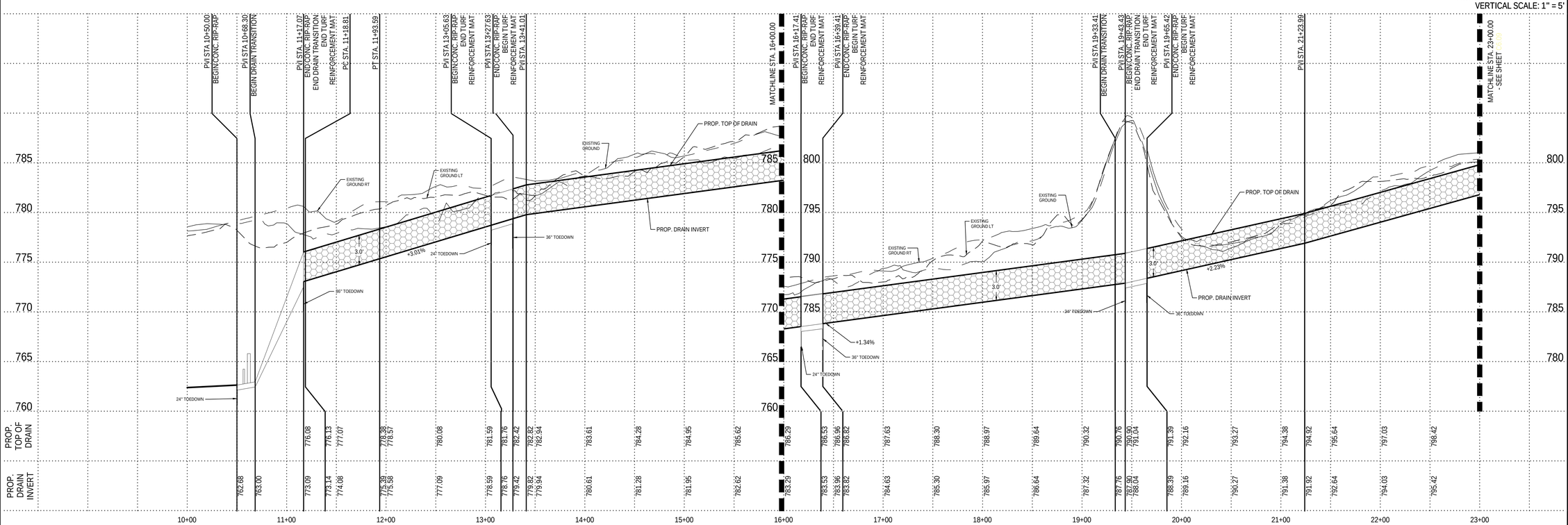
1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 10' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE



CHANNEL "A"

STA. 10+50.00 TO STA. 23+00.00

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



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SCALE: 1"=50'
50 25 0 50

GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE -CHANNEL A

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.08

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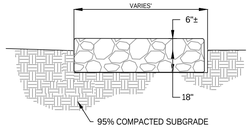
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

EARTHEN CHANNEL

CONCRETE RIP-RAP

TURF REINFORCEMENT MAT

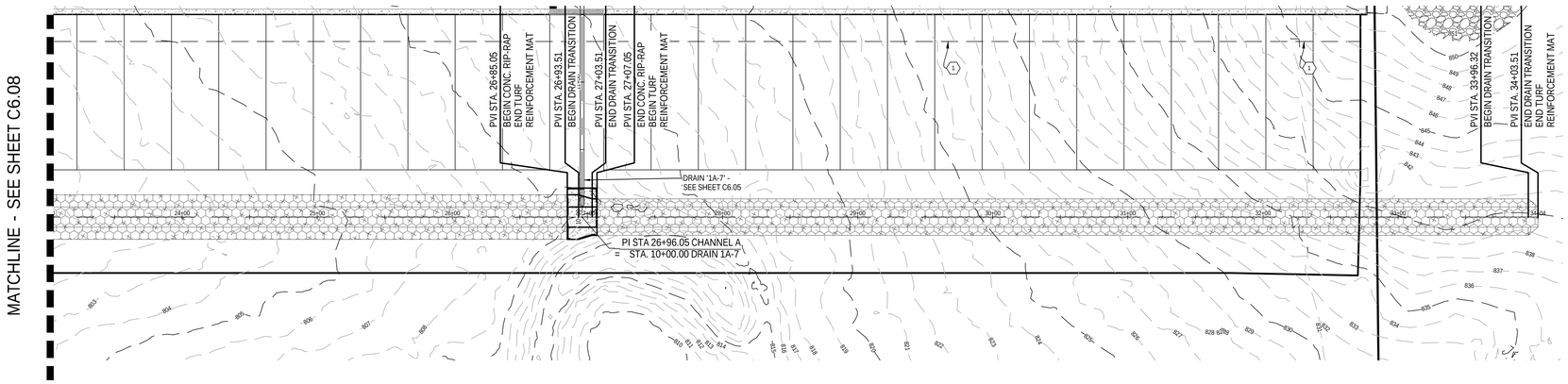


8"X12" ROCK RUBBLE DETAIL

N.T.S.

KEYNOTES

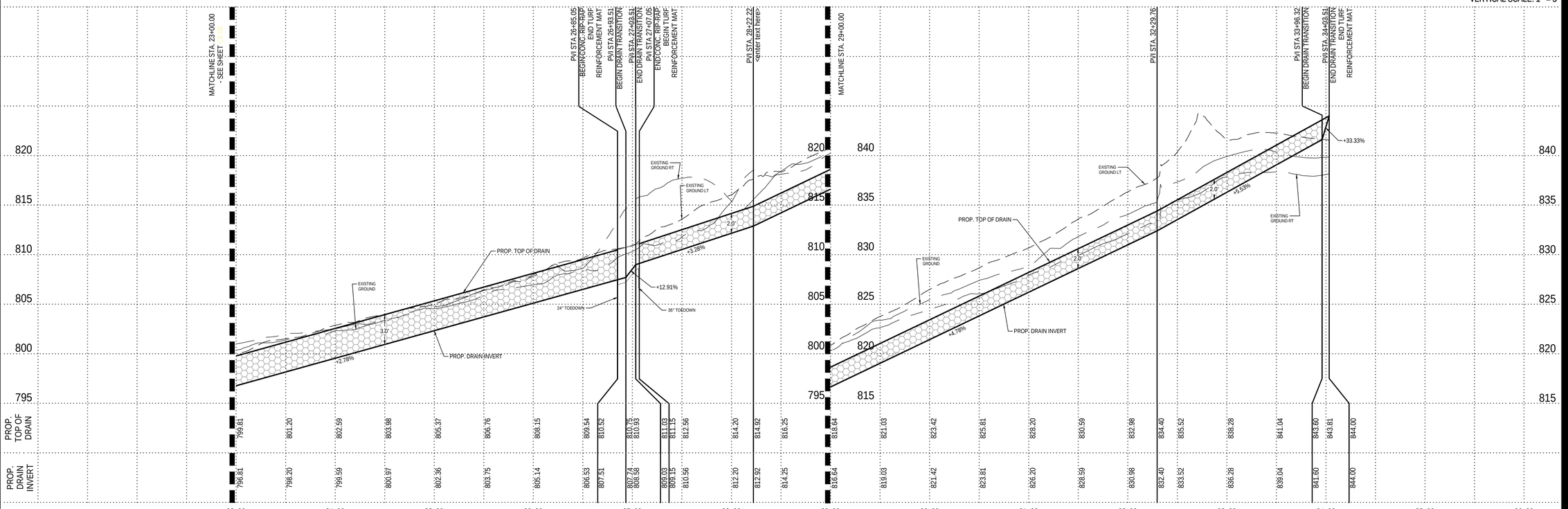
1. 20' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE
2. 10' ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION EASEMENT & BUILDING SETBACK LINE



CHANNEL "A"

STA. 23+00.00 TO STA. 34+03.51

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



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE -CHANNEL A

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.09

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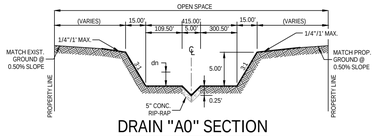
LEGEND

EARTHEN CHANNEL

CONCRETE RIP-RAP

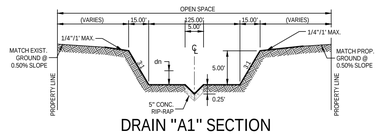
TURF REINFORCEMENT MAT



DRAIN "A0" SECTION

STA 11+48.60

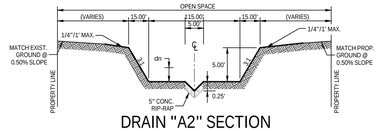
(N.T.S.)



DRAIN "A1" SECTION

STA 13+88.90 TO STA 14+88.00

(N.T.S.)



DRAIN "A2" SECTION

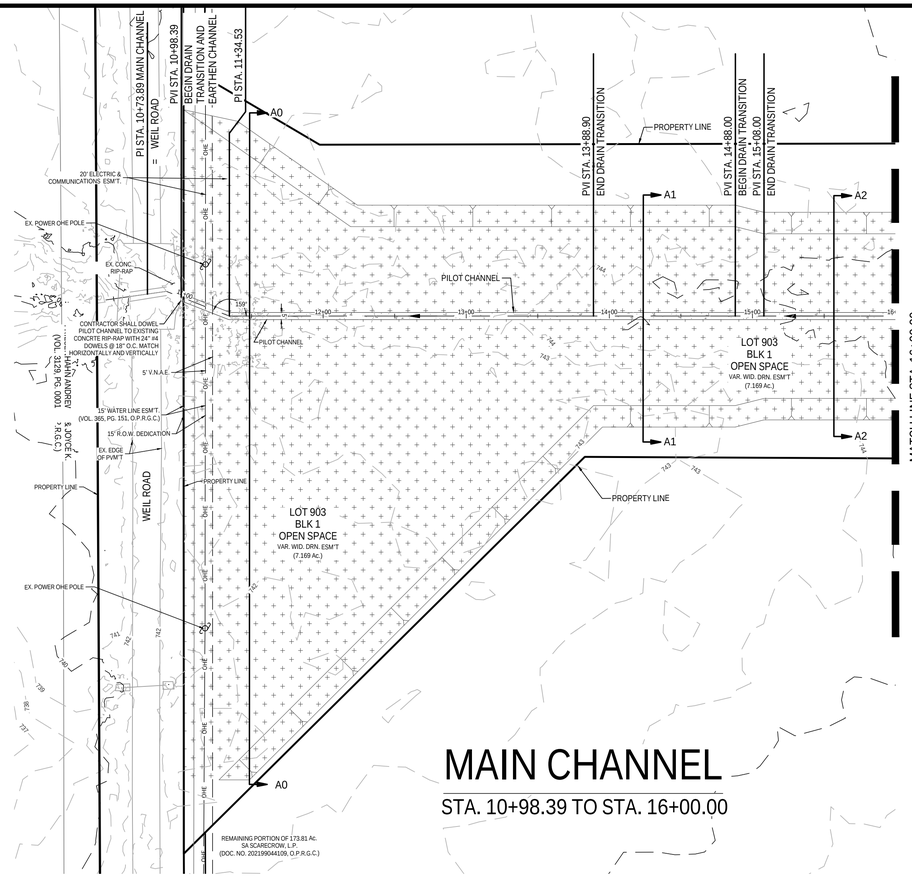
STA 15+08.00 TO STA 21+24.90

(N.T.S.)

MAIN CHANNEL HYDRAULIC SUMMARY			
SECTION	"A0"	"A1"	"A2"
STATION	11+48.60	13+88.90 - 14+88.00	15+08.00 - 21+24.90
Q_{100} (cfs)	3011.00	3011.00	2816.10
n	0.034	0.034	0.034
S (%)	0.21	0.21	0.21
D (ft)	5.00	5.00	5.00
d_n (ft)	2.44	4.64	4.67
V (fps)	3.26	4.96	4.96

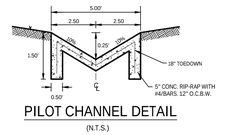
NOTES:

1. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SANTA CLARA & GUADALUPE COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING, AND WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
2. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.



MAIN CHANNEL

STA. 10+98.39 TO STA. 16+00.00

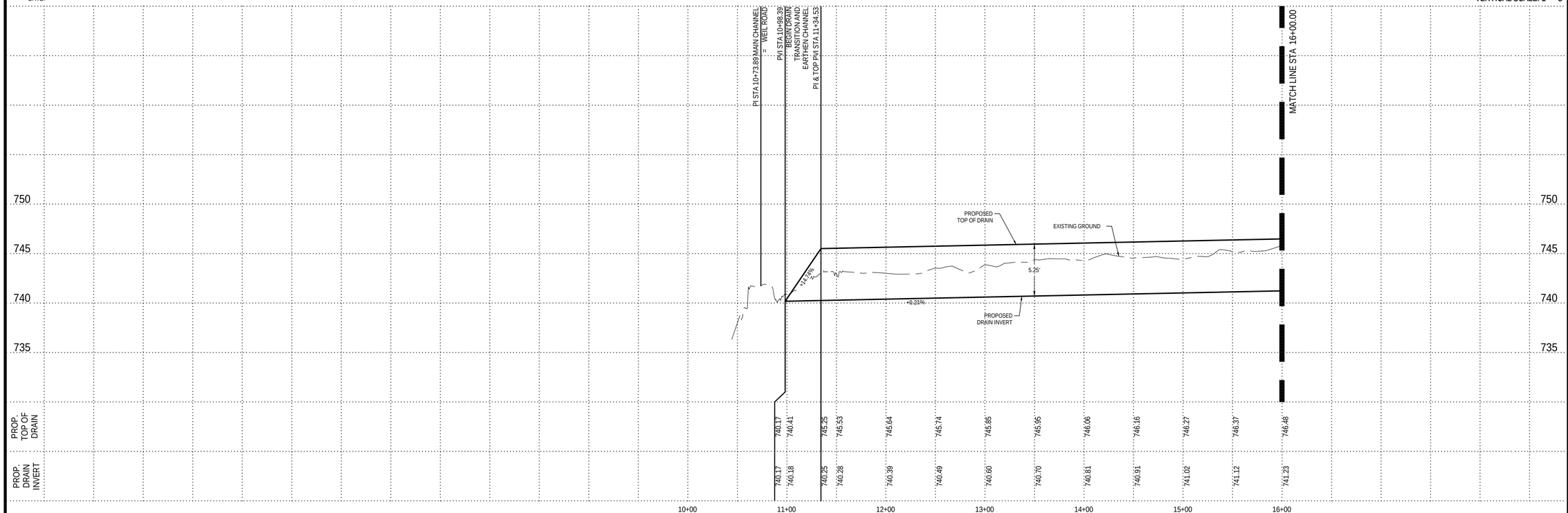


PILOT CHANNEL DETAIL

(N.T.S.)

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - MAIN CHANNEL

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.10

P:\03499\2025\2.Civil\4.Plans\AUTOCAD\C6.10 PLDrwg Tab: Dwg 2025/05/05 9:04pm rbarrera

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

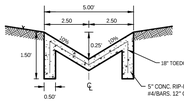
EARTHEN CHANNEL

CONCRETE RIP-RAP

TURF REINFORCEMENT MAT

NOTES:

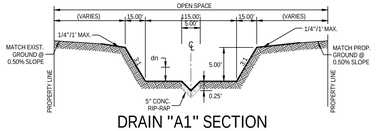
1. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SANTA CLARA & GUADALUPE COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING, AND WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
2. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.



PILOT CHANNEL DETAIL

(N.T.S.)

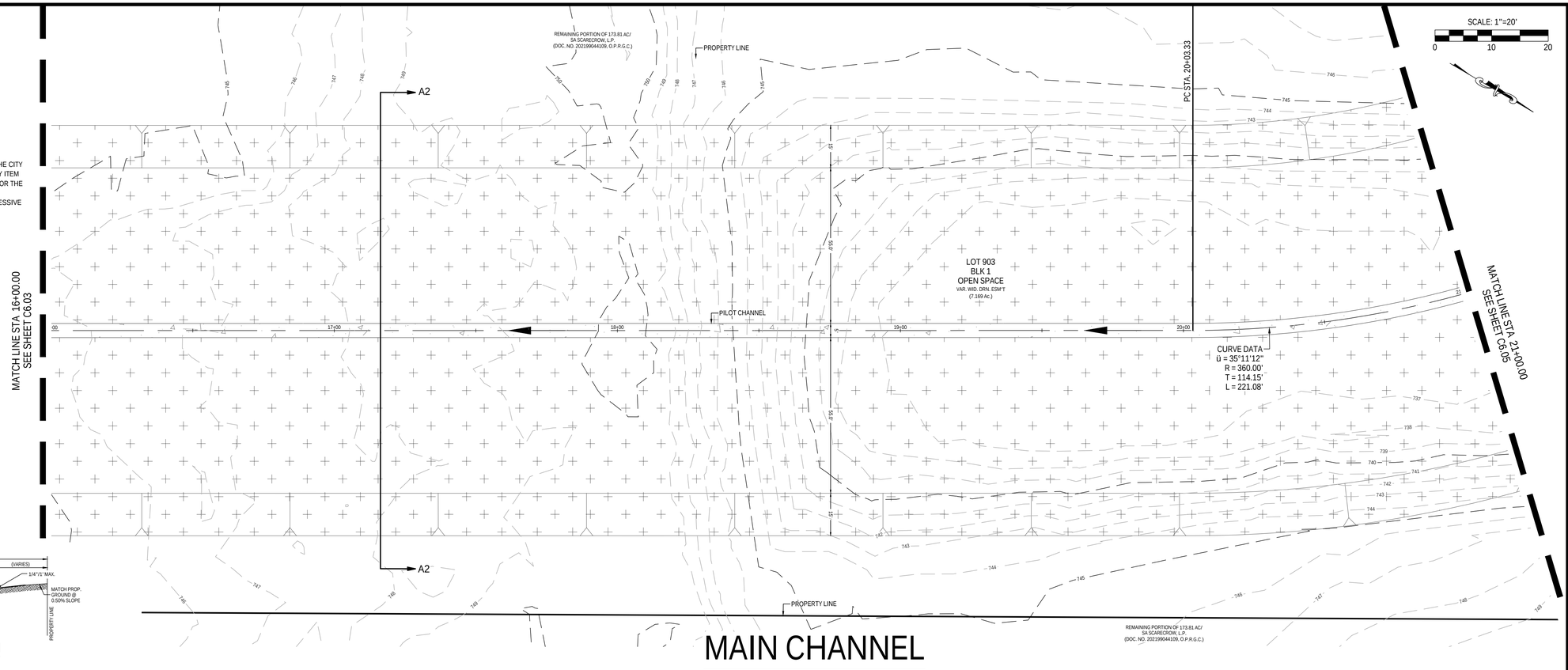
MAIN CHANNEL HYDRAULIC SUMMARY	
SECTION	"A2"
STATION	15+08.00 - 21+24.90
Q_{100} (cfs)	2816.10
n	0.034
S (%)	0.21
D (ft)	5.00
d_n (ft)	4.67
V (fps)	4.96



DRAIN "A1" SECTION

STA 15+08.00 TO STA 21+24.90

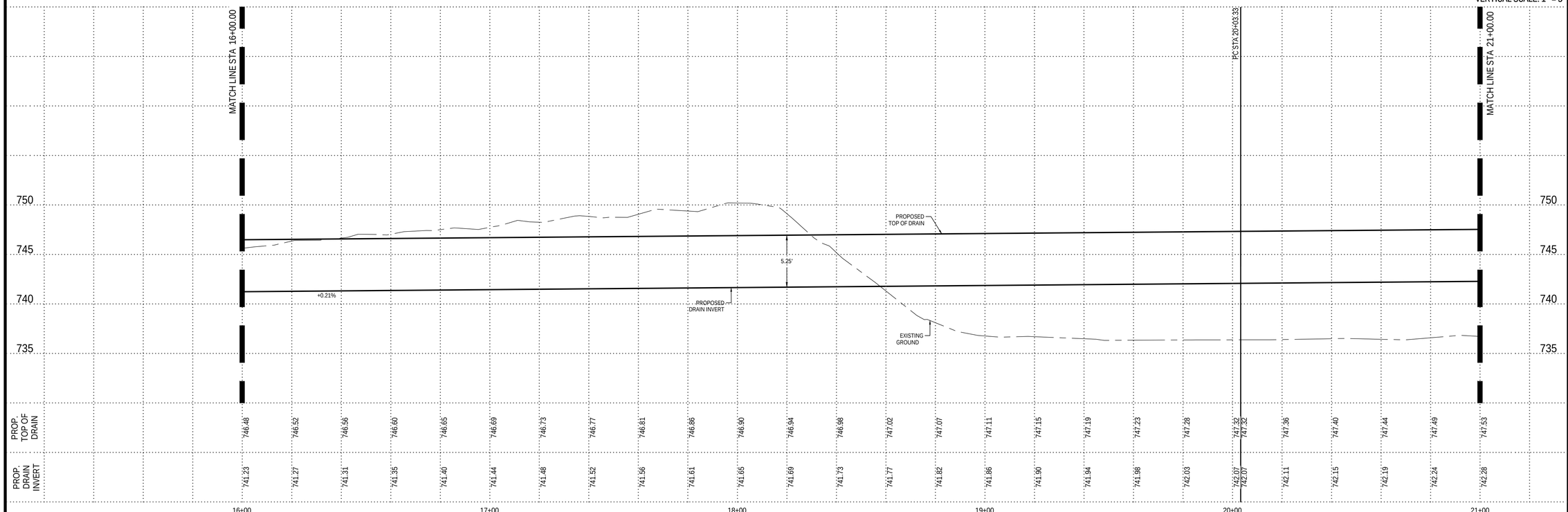
(N.T.S.)



MAIN CHANNEL

STA. 16+00.00 TO STA. 21+00.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - MAIN CHANNEL

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

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REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

LEGEND

EARTHEN CHANNEL

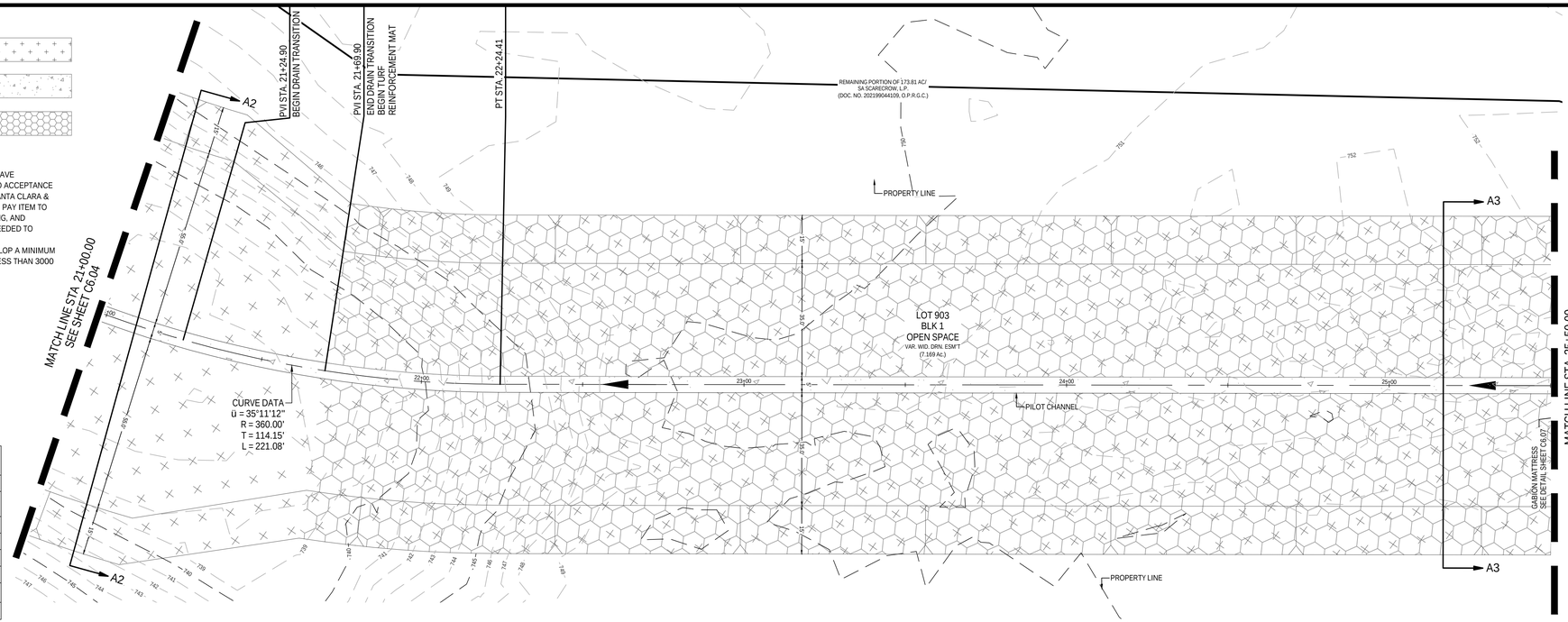
CONCRETE RIP-RAP

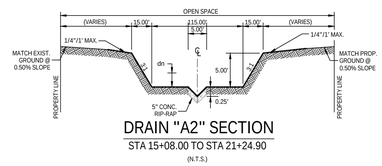
TURF REINFORCEMENT MAT

NOTES:

1. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SANTA CLARA & GUADALUPE COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING, AND WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
2. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

MAIN CHANNEL HYDRAULIC SUMMARY		
SECTION	"A2"	"A3"
STATION	15+08.00 - 21+24.90	21+69.90 - 25+99.68
Q_{100} (cfs)	2816.10	2541.90
n	0.034	0.034
S (%)	0.21	0.37
D (ft)	5.00	5.00
d_n (ft)	4.67	4.70
V (fps)	4.96	6.46

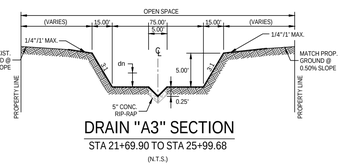




DRAIN "A2" SECTION

STA 15+08.00 TO STA 21+24.90

(N.T.S.)



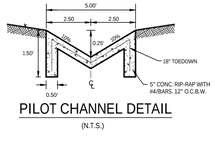
DRAIN "A3" SECTION

STA 21+69.90 TO STA 25+99.68

(N.T.S.)

MAIN CHANNEL

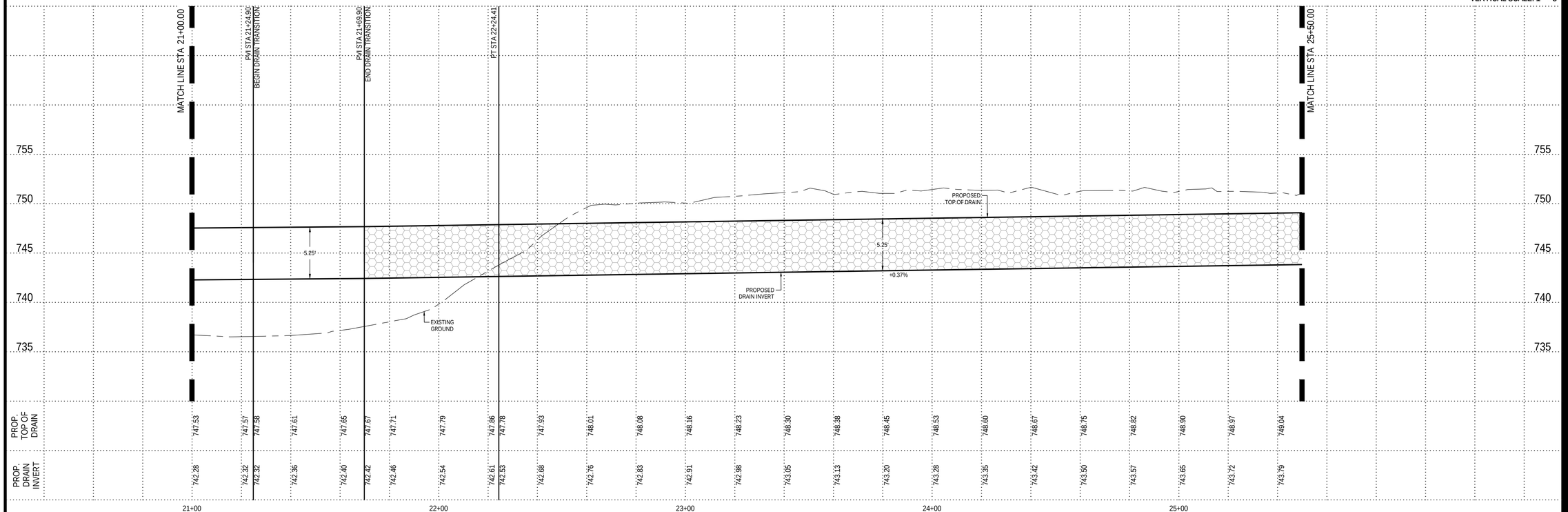
STA. 21+00.00 TO STA. 25+50.00



PILOT CHANNEL DETAIL

(N.T.S.)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - MAIN CHANNEL

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER

05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

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DRAIN "A3.5" SECTION

(N.T.S.)

PILOT CHANNEL DETAIL

(N.T.S.)

3' x 3' x 3' BAFFLE BLOCK REINFORCEMENT

(N.T.S.)

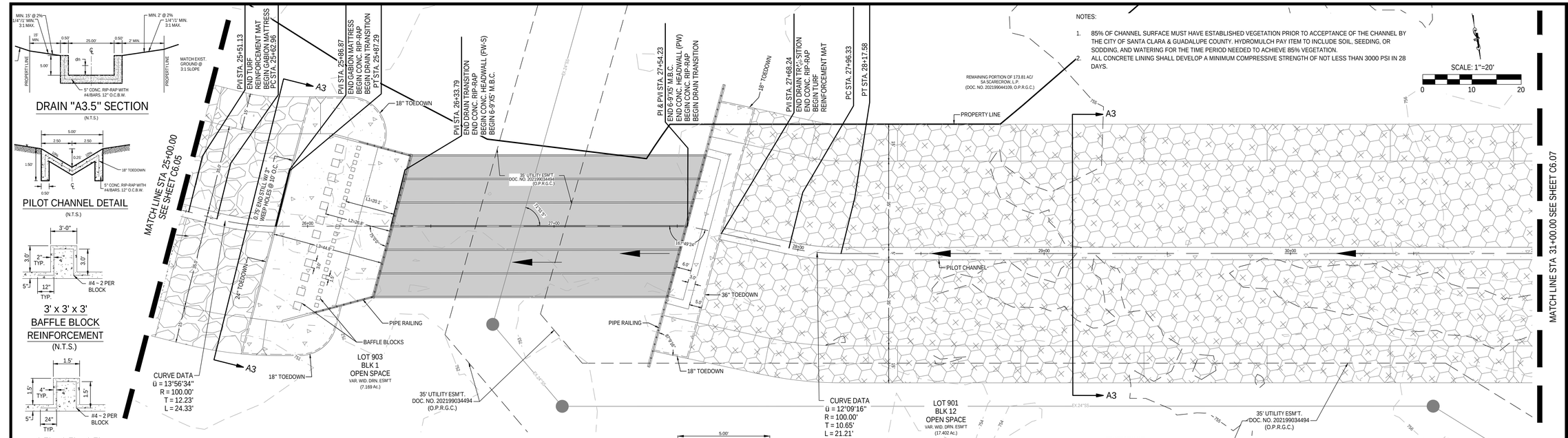
1.5' x 1.5' x 1.5' BAFFLE BLOCK REINFORCEMENT

(N.T.S.)

LEGEND

- EARTHEN CHANNEL
- CONCRETE RIP-RAP
- TURF REINFORCEMENT MAT
- GABION MATTRESS

MAIN CHANNEL HYDRAULIC SUMMARY				
SECTION	"A3"	"A3.5"	"A4"	"A3"
STATION	21+69.90 - 25+94.68	26+42.54 - 26+47.84	26+84.89 - 27+21.76	27+21.76 - 31+87.08
Q_{100} (cfs)	2541.90	2042.80	2042.80	2042.80
n	0.034	0.015	0.015	0.032
S (%)	0.37	1.00	1.50	0.50
D (ft)	5.00	5.00	4.00	5.00
d_n (ft)	4.70	3.96	3.47	3.81
V (fps)	6.46	20.63	23.55	7.28
Bw (ft)	----	25.00	25.00	----



NOTES:

1. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SANTA CLARA & GUADALUPE COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING, AND WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
2. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

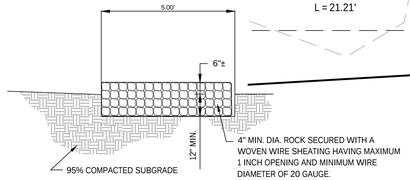
SCALE: 1"=20'

0 10 20

BAFFLE BLOCK CALCULATIONS

Results:

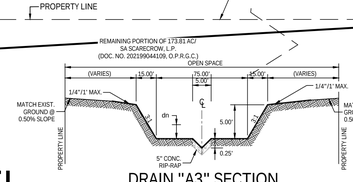
Shape:	Rectangular	L1	8.917 ft
Flow	2042.80 ft³/s	L2	17.833 ft
Velocity (Vo)	20.63 ft/s	L3	24.048 ft
Depth (Yo)	3.96 ft	Outlet velocity (VB)	9.344 ft/s
Reference depth	3.960 ft	H1	1.981 ft
Froude (Fr)	1.827	H2	3.963 ft
Span	25 ft	W/B	75.000 ft
Tailwater depth (TW)	2.43 ft	Critical depth (Yc)	2.810 ft
Basin width	75 ft	Outlet depth (YB)	2.810 ft
L2/B2	4.5		



NOTE: GABION MATTRESS TO BE FREE OF GEO- TEXTILE FABRIC LINING.

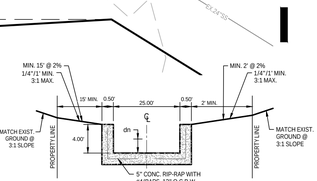
GABION STYLE ROCK EROSION CONTROL MATTRESS DETAIL

N.T.S.



DRAIN "A3" SECTION

(N.T.S.)



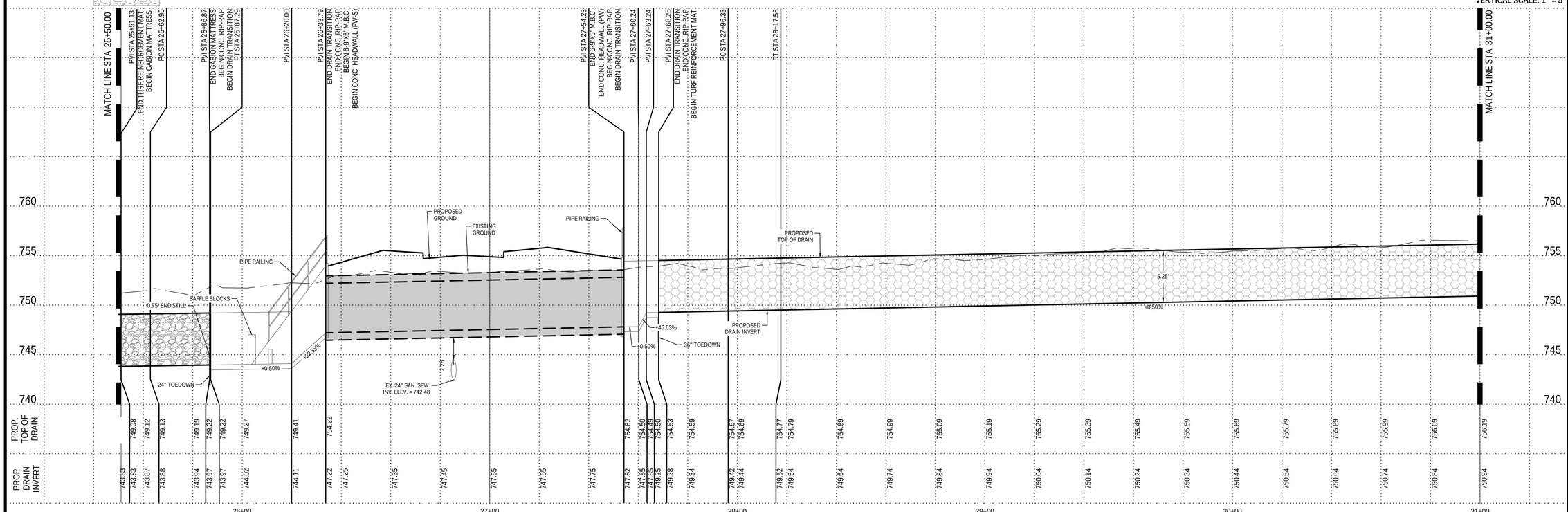
DRAIN "A4" SECTION

(N.T.S.)

MAIN CHANNEL

STA. 25+50.00 TO STA. 31+00.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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GRACE VALLEY RANCH
PHASE 6

DRAINAGE PLAN & PROFILE - MAIN CHANNEL

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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2.
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7.
8.
9.

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.13

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

P:\03499\000\2-DWG\xf-Plans\03499_DRAIN MAP.dwg 05/05/2025 8:56am rbarrera

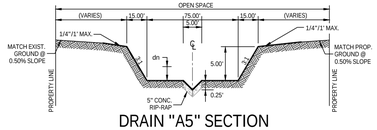
LEGEND

EARTHEN CHANNEL

CONCRETE RIP-RAP

TURF REINFORCEMENT MAT

GABION MATTRESS



DRAIN "A5" SECTION

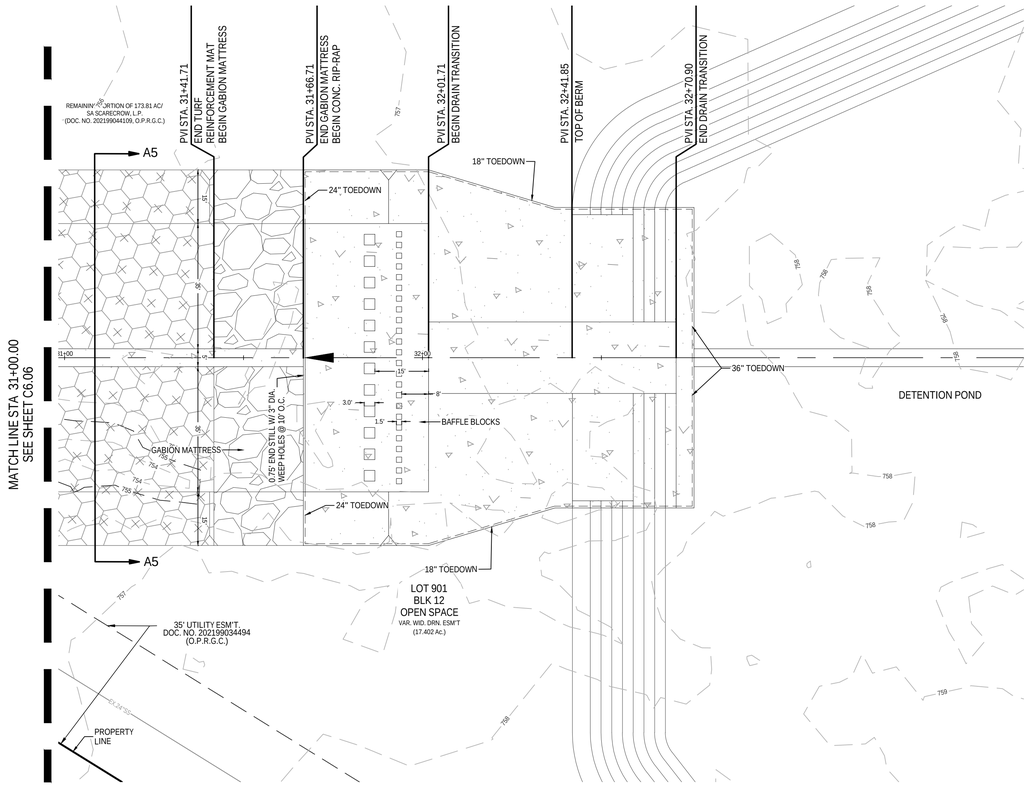
STA 127+51.76 TO STA 32+98.02

(N.T.S.)

MAIN CHANNEL HYDRAULIC SUMMARY	
SECTION	"A5"
STATION	27+51.76 - 31+87.08
Q_{100} (cfs)	2042.80
n	0.032
S (%)	0.50
D (ft)	5.00
d_n (ft)	3.81
V (fps)	7.28

NOTES:

1. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SANTA CLARA & GUADALUPE COUNTY. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING, AND WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
2. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.



LOCATION MAP

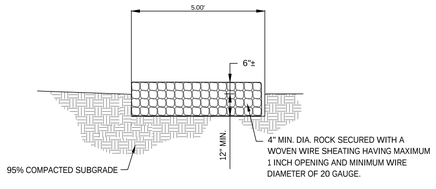
N.T.S.

LEGEND:

- 770 = EXISTING CONTOUR
- 770 = PROPOSED CONTOUR
- = BOUNDARY LINE
- X.XX% = PROPOSED FLOW ARROW
- = POND FLOW LINE
- = EARTHEN
- = CONCRETE RIP-RAP
- = GABION MATTRESS

NOTES:

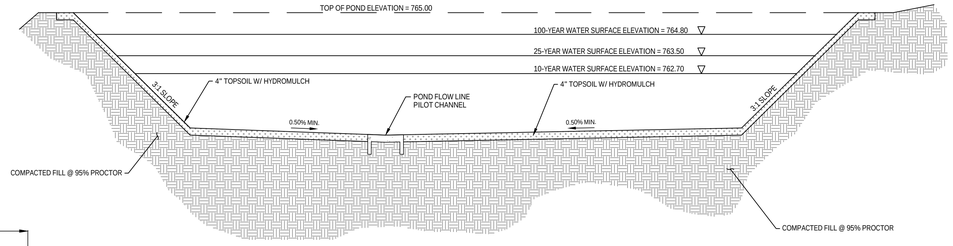
1. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.
2. 85% OF CHANNEL & DETENTION POND SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF SANTA CLARA. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.



NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.

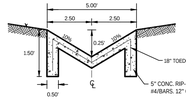
GABION STYLE ROCK EROSION CONTROL MATTRESS DETAIL

N.T.S.



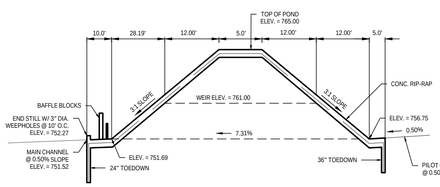
SECTION "A-A"

N.T.S.



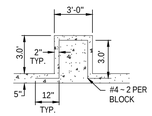
PILOT CHANNEL DETAIL

(N.T.S.)



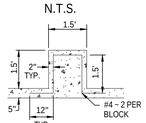
SECTION "B-B"

N.T.S.



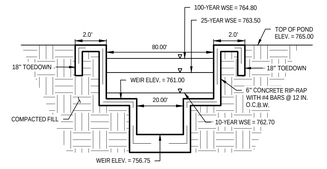
3' x 3' x 3' BAFFLE BLOCK REINFORCEMENT

(N.T.S.)



1.5' x 1.5' x 1.5' BAFFLE BLOCK REINFORCEMENT

(N.T.S.)

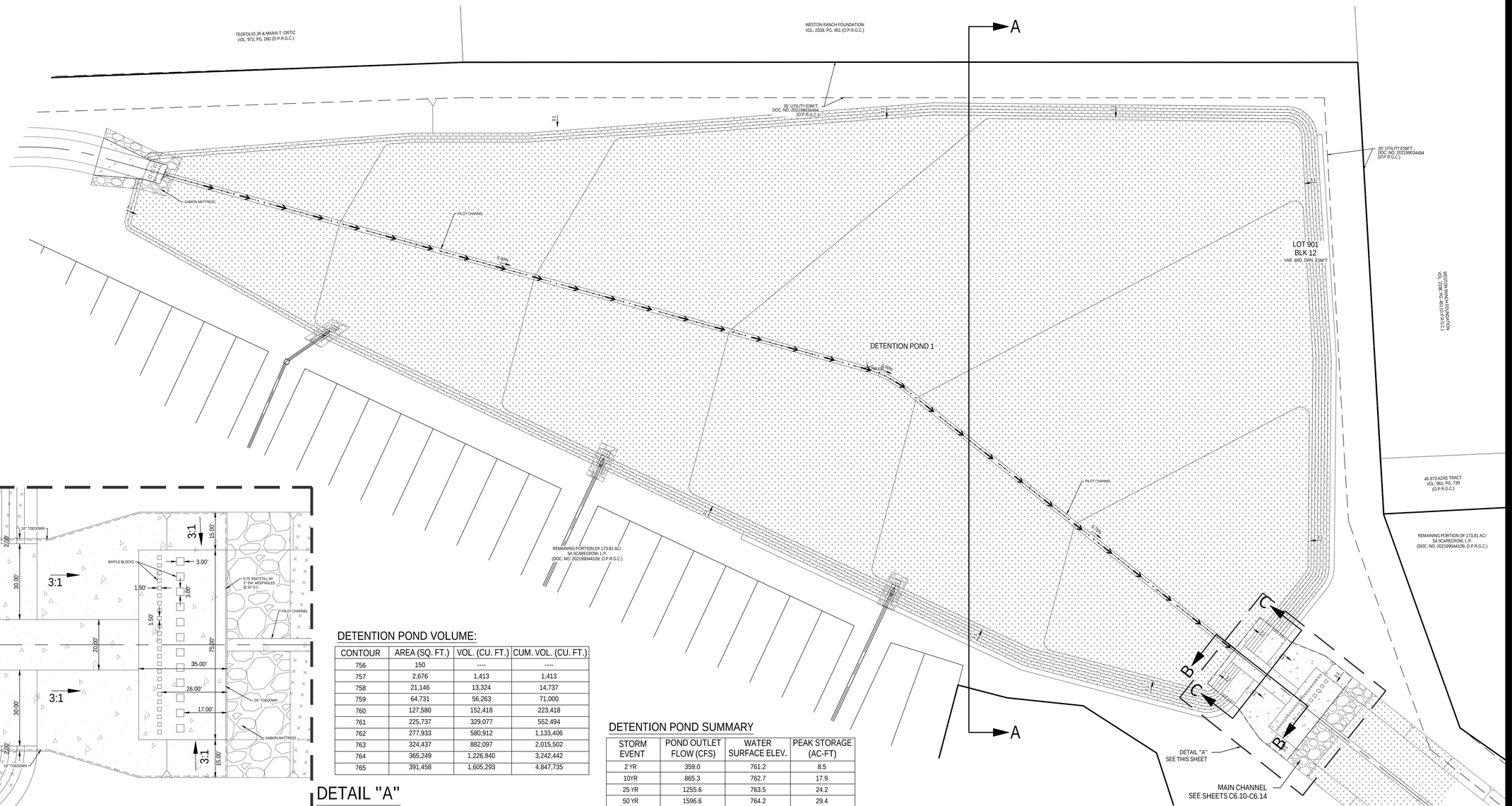


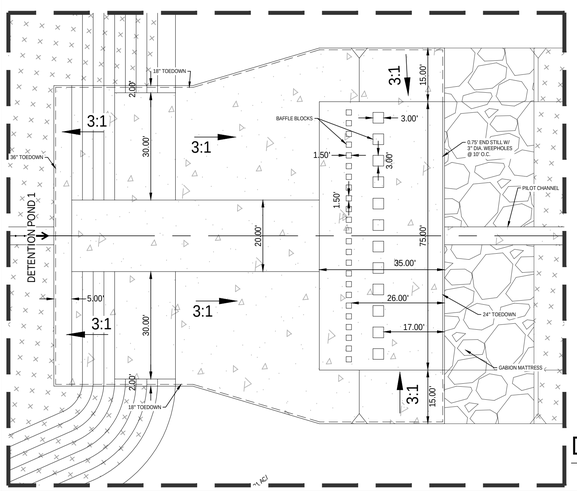
NOTE: CONTRACTOR TO INSTALL 3" DIA. WEEP HOLES @ 10' O.C.

SECTION "C-C"

N.T.S.

DETENTION POND 2 - PLAN VIEW





DETAIL "A"

SCALE: 1" = 20'

DETENTION POND VOLUME:

CONTOUR	AREA (SQ. FT.)	VOL. (CU. FT.)	CUM. VOL. (CU. FT.)
756	150	----	----
757	2,676	1,413	1,413
758	21,146	13,324	14,737
759	64,731	56,263	71,000
760	127,580	152,418	223,418
761	225,737	329,077	552,494
762	277,933	580,912	1,133,406
763	324,437	882,097	2,015,502
764	365,249	1,226,940	3,242,442
765	391,458	1,605,293	4,847,735

DETENTION POND SUMMARY

STORM EVENT	POND OUTLET FLOW (CFS)	WATER SURFACE ELEV.	PEAK STORAGE (AC-FT)
2 YR	359.0	761.2	8.5
10YR	865.3	762.7	17.9
25 YR	1255.6	763.5	24.2
50 YR	1596.6	764.2	29.4
100 YR	1983.1	764.8	35.2

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GRACE VALLEY RANCH
PHASE 6

DETENTION POND 1

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
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CHECKED BY
K.M.H.

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9.

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.15

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P:\03499\000\03-ENG\04-Plans\01-ASCAD\11_DETN Pond.dwg 2025/05/06 9:56pm rbarrera

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DATE:
FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities per Ft of wing (2-wings) ④		Estimated Quantities per Ft of Toewall (1-toewall)
					Bars J1		Bars J2				
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-0"	6'-0"	2'-0"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
RS	#5	3	~
RL	#5	3	~
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"

BARS D1

BARS D2

WING DIMENSION FORMULAS:
(All values are in feet.)

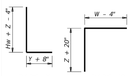
Hw = H + T + C
Lw = (Hw) (SL) + cosine (θ) for Type PW-1
= (Hw - 1) (SL) + cosine (θ) for Type PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) + cosine (θ) for Type PW-2 and Hw < 4'

For cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] + cosine (θ)

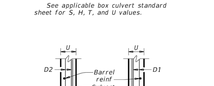
For precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] + cosine (θ)
Total Wingwall Area (two wings – SF) = (2)Hw(Lw) for Type PW-1
= (2)Hw(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'
= (2)Hw(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio. (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

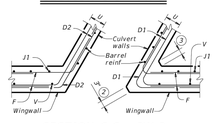
See applicable box culvert standard sheet for S, N, T, and U values.



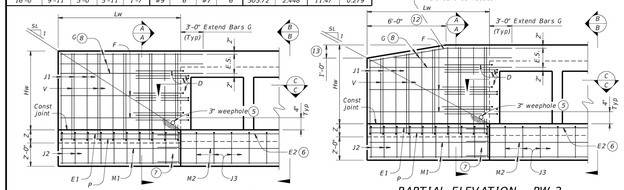
BARS J1 BARS J2 BARS J3 BARS V



SECTION C-C - PW-1

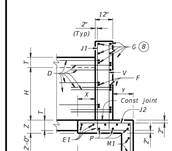


SECTION C-C - PW-2

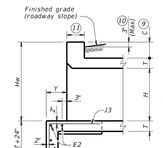


PARTIAL ELEVATION - PW-1

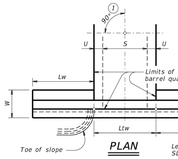
PARTIAL ELEVATION - PW-2



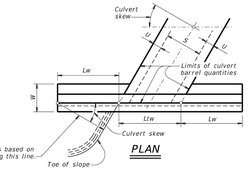
SECTION A-A
(Showing wing reinforcement.)



SECTION B-B
(Showing wing reinforcement.)



DETAILS FOR NON-SKEWED BOX CULVERTS
PLAN



DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° skew.)
PLAN

1. Skew = 0°
2. At discharge end, chamfer may be 3/4" minimum.
3. For 15° skew – 1"
   For 30° skew – 2"
   For 45° skew – 3"
4. Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5. Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E2 1'-6" minimum into the wingwall footing.
7. Lap Bars M1 1'-6" minimum with Bars M2.
8. Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
9. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
12. 3'-0" for Hw < 4'.
13. 6" for Hw < 4'.

DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation | Bridge Division Standard

CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE: CD-PW-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities per Ft of wing length (2-wings) ④	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	1'-0"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-3"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
DL	#5	~	1'-0"
DS	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
RS	#5	3	~
RL	#5	3	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C - 0.250'
A = (Hw - 0.333')(SL)
B = (A) (Tangent (θ + 15°))
Lw = (A) + (cosine (θ + 15°))

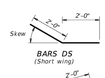
For cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] + cosine θ

For precast culverts:
Ltw = [(N) (2U + S) + (N + 1) (0.5')] + cosine θ

Total wingwall area (two wings – SF) = 0.5 (Hw + 0.333') (Lw + A)

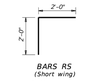
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
A = Length of short wingwalls
Lw = Length of long wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
θ = Culvert skew

See applicable box culvert standard sheet for H, S, T, and U values.

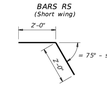


BARS DS (Short wing)

BARS DL (Long wing)



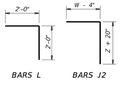
BARS RS (Short wing)



BARS RL (Long wing)

BARS J1

BARS V



BARS L

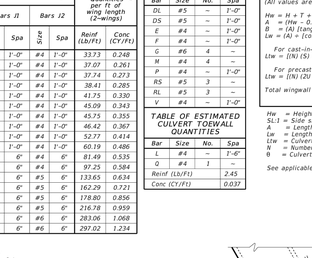
BARS J2

1. Extend Bars P 3'-0" minimum into bottom slab of box culvert.
2. Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by 0.5 x (A + Lw).
4. Recommended values of slide slope are: 2:1, 3:1, 4:1, and 6:1.
5. When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
6. At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
7. Applicable values of skew are: 15°, 30°, and 45°.
8. Typical wingwall angle for all skews.
9. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

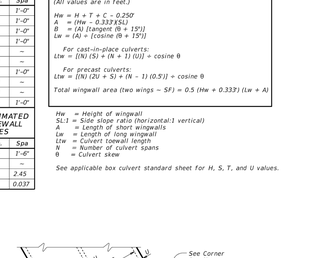
    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

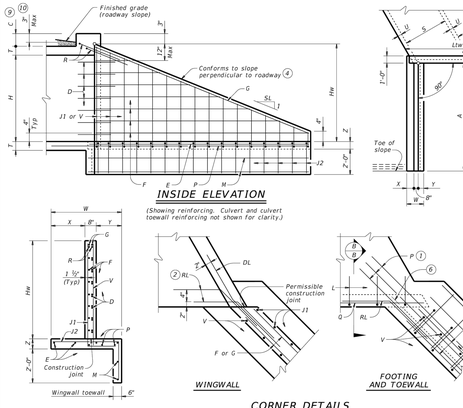
GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.



INSIDE ELEVATION
(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)



PLAN
(Showing dimensions and 30° skew.)



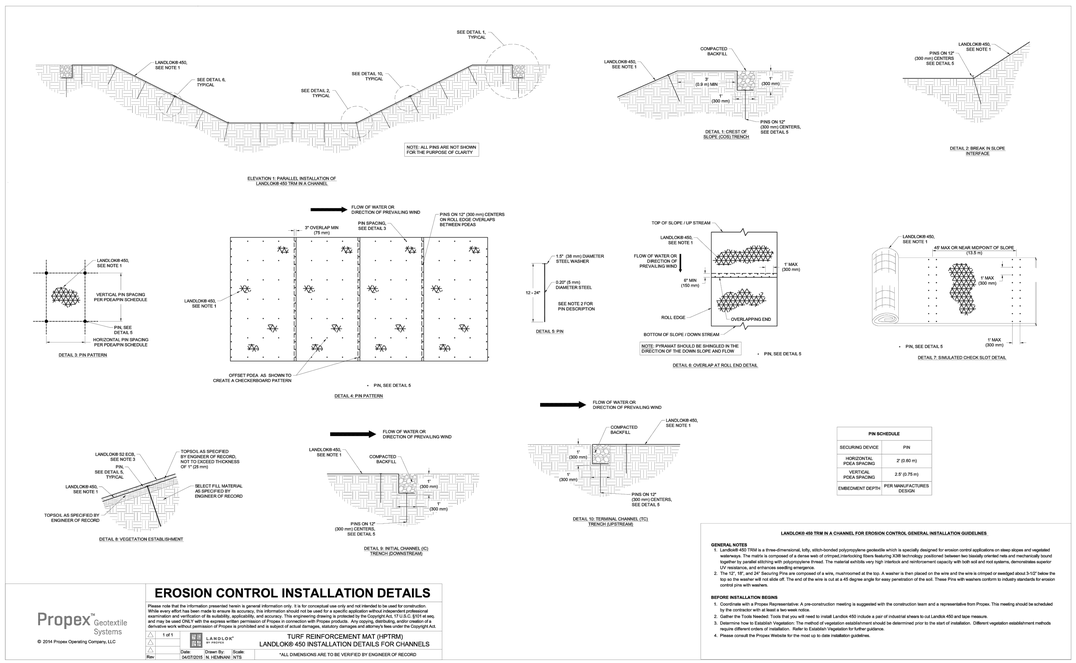
SECTION A-A
WINGWALL
CORNER DETAILS
(Culvert and culvert toewall reinforcing not shown for clarity.)
FOOTING AND TOEWALL
SECTION B-B
5

Texas Department of Transportation | Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS

FW-S

FILE: CD-FWS-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.



PIN SCHEDULE	
SEQURING DEVICE	PIN
HORIZONTAL PDEA SPACING	2' (0.60 m)
VERTICAL PDEA SPACING	1.5' (0.75 m)
EMBEDMENT DEPTH	PER MANUFACTURES DESIGN

LANDLOK® 450 TRM IN A CHANNEL FOR EROSION CONTROL GENERAL INSTALLATION GUIDELINES

GENERAL NOTES
1. Landlok® 450 TRM is a three-dimensional, tufty, stitch-bonded polypropylene geotextile which is specially designed for erosion control applications on steep slopes and vegetated waterways. The matrix is composed of a dense web of crimped,interlocking fibers featuring X3® technology positioned between two biaxially oriented nets and mechanically bound together by parallel stitching with polypropylene thread. The material exhibits very high interlock and reinforcement capacity with both soil and root systems, demonstrates superior UV resistance, and enhances seedling emergence.
2. The 12", 9", and 24" Securing Pins are composed of a wire, mushroomed at the top. A washer is then placed on the wire and the wire is crimped or swedged about 3-1/2" below the top so the washer will not slide off. The end of the wire is cut at a 45 degree angle for easy penetration of the soil. These Pins with washers conform to industry standards for erosion control pins with washers.

BEFORE INSTALLATION BEGINS
1. Coordinate with a Propex Representative. A pre-construction meeting is suggested with the construction team and a representative from Propex. This meeting should be scheduled by the contractor with at least a two week notice.
2. Gather the Tools Needed: Tools that you will need to install Landlok 450 include a pair of industrial shears to cut Landlok 450 and tape measure.
3. Determine how to Establish Vegetation: The method of vegetation establishment should be determined prior to the start of installation. Different vegetation establishment methods require different orders of installation. Refer to Establish Vegetation for further guidance.
4. Please consult the Propex Website for the most up to date installation guidelines.

Propex™ Geotextile Systems
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EROSION CONTROL INSTALLATION DETAILS

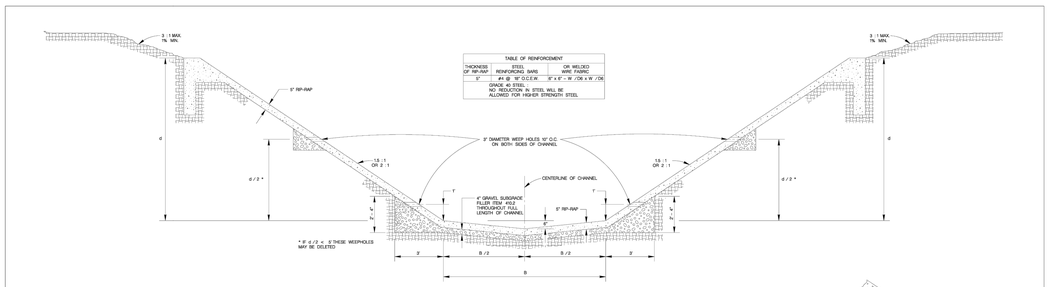
Please note that the information presented herein is general information only. It is for conceptual use only and not intended to be used for construction. While every effort has been made to ensure its accuracy, this information should not be used for a specific application without independent professional assessment of its suitability for the intended use. Propex does not assume any liability arising out of any such use of this information. This drawing is copyrighted and may be used ONLY with the express written permission of Propex in connection with Propex products. Any copying, distributing, and/or creation of a derivative work without permission of Propex is prohibited and is subject of actual damages, statutory damages and attorney's fees under the Copyright Act.

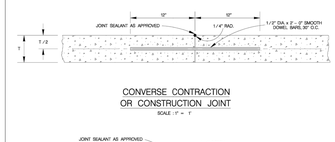
Rev	Date	Drawn By	Scale
1 of 1	04/07/2015	N. HERMAN	NTS

LANDLOK® 450 TRM

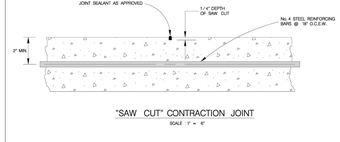
TURF REINFORCEMENT MAT (rRTRM)
LANDLOK® 450 INSTALLATION DETAILS FOR CHANNELS

*ALL DIMENSIONS ARE TO BE VERIFIED BY ENGINEER OF RECORD

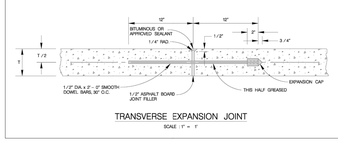




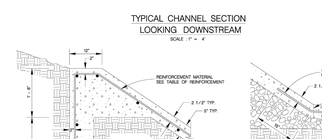
CONVERSE CONTRACTION OR CONSTRUCTION JOINT
SCALE : 1" = 1'



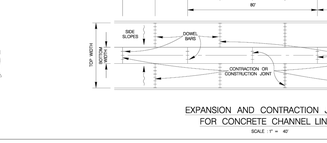
"SAW CUT" CONTRACTION JOINT
SCALE : 1" = 4"



TRANSVERSE EXPANSION JOINT
SCALE : 1" = 1'



WEEP HOLES DETAILS FOR SIDE SLOPES
SCALE : 1" = 2'



EXPANSION AND CONTRACTION JOINTS FOR CONCRETE CHANNEL LINING
SCALE : 1" = 40'

GENERAL NOTES
1. CONCRETE FOR CHANNEL RIP-RAP SHALL BE CLASS "A" 3000 P.S.I.
2. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS UNLESS OTHERWISE SHOWN.
3. ALL REINFORCEMENT STEEL SHALL MEET ASTM DESIGNATIONS AS CALLED FOR IN THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
4. NEW RIP-RAP SHOULD BE ATTACHED TO EXISTING RIP-RAP BY NO.4 BARS DOWELED 6" INTO EXISTING RIP-RAP. THESE BARS ARE TO BE SPACED 18" O.C. AND HAVE A LENGTH OF 18".

MAY 2009
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPICAL CONCRETE CHANNEL RIP-RAP STANDARDS

☐ % SUBMITTAL PROJECT NO.: DATE:
DRWN. BY: VASQUEZ CHKD. BY: CHKD. BY: SHEET NO.: OF

CUDEENGINEERS.COM

CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6
EROSION CONTROL AND CONCRETE HEADWALL DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.D1

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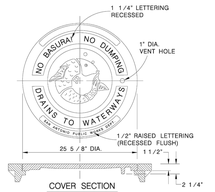
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



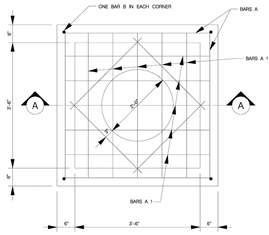
COVER SECTION

MANHOLE LID & RING DETAIL

SCALE: 1 : 16

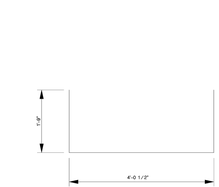
NOTES FOR MANHOLE LID AND RING

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.



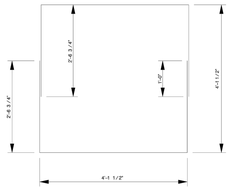
TOP SLAB PLAN VIEW

SCALE: 1" = 2' - 0"



BARS A

SCALE: 1" = 2' - 0"



BARS C

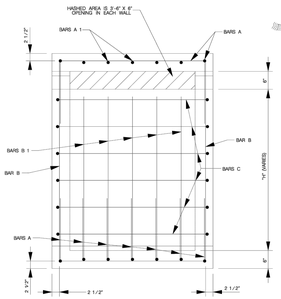
SCALE: 1" = 2' - 0"

ESTIMATED QUANTITIES FOR "H" = 4'-6"					
REINFORCING STEEL					
BAR	NO.	SIZE	SPACE	LENGTH	WEIGHT
A	18	4	8" +/–	7'-6 1/2"	79
A 1	10	4	8" +/–	4'-0 1/2"	27
B	4	4	AS SHOWN	5'-7"	15
B 1	20	4	8" +/–	4'-7"	61
C	12	4	9" +/–	18'-6"	148
J	4	4	AS SHOWN	2'-8"	6
TOTAL REINFORCING STEEL					336 Lbs. *
CLASS A CONCRETE					2.10 CY *

* FOR CONTRACTOR'S INFORMATION ONLY.
QUANTITIES VARY WITH "H".
SEE INLET & MANHOLE SUMMARY SHEETS FOR "H".

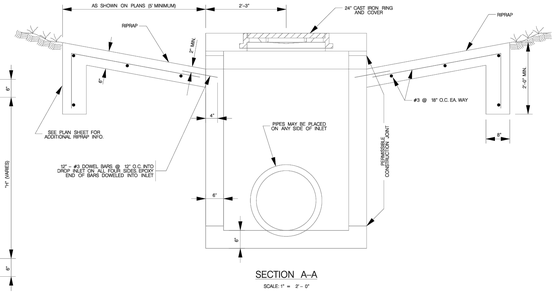
GENERAL NOTES:

1. ALL BARS INTERCEPTING THE RING AND COVER OPENING AND PIPE OPENINGS. SHALL BE FIELD CUT
2. CONCRETE SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
3. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
4. ALL EXPOSED CORNERS SHALL HAVE 3/4" CHAMFER
5. PAYMENT FOR ALL EXCAVATION, BACKFILLING, CONCRETE, REINFORCING STEEL, RING, AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".



SIDE VIEW WALL

SCALE: 1" = 2' - 0"



SECTION A–A

SCALE: 1" = 2' - 0"

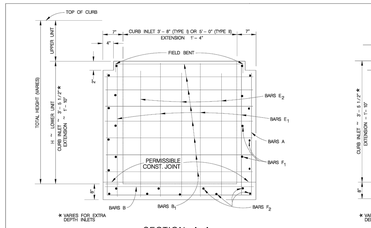
JANUARY 2005

CITY OF SAN ANTONIO

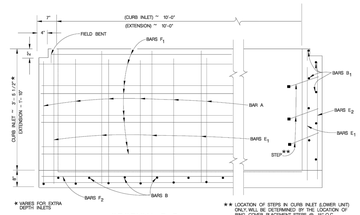
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

4–WAY INLET STANDARDS

% SUBMITTAL	PROJECT NO.:	DATE:
DRAWN BY: M. BARRERA, P.E.	DSGN. BY:	CHKD. BY:	SHEET NO.: ___OF___



SECTION A–A



SECTION B–B

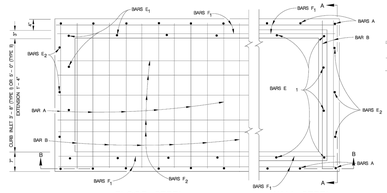
REINFORCING STEEL

LOWER UNIT 10' X 3' – 8" (TYPE I)

BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	4'-4"
B_1	VARIES	#4	12"	4'-4"
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)

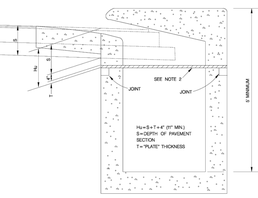
BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	5'-10"
B_1	VARIES	#4	12"	5'-10"
E_1	22	#4	18"±	VARIES
E_2	8	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'-10"
F_2	11	#4	----	10'-10"



FLOOR STEEL

WALL STEEL

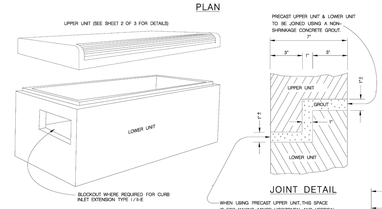
PLAN



PHASE CONSTRUCTION

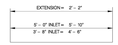
NOTES FOR PHASE CONSTRUCTION: (WHEN DIRECTED BY THE ENGINEER)

1. THE CURB INLET AND EXTENSION SHALL BE CONSTRUCTED TO A DEPTH "Hu" BELOW THE INLET AND EXTENSION GUTTER LINE ELEVATION.
2. CAP THE CURB INLET AND EXTENSION WITH A STEEL PLATE APPROVED BY THE ENGINEER AND CONSTRUCT THE ROADWAY OVER THE PLATE.
3. AFTER THE ROADWAY IS COMPLETED, BUT PRIOR TO THE FINAL HMAC OVERLAY, SAW CUT THE PAVEMENT, REMOVE THE PLATE AND COMPLETE THE UPPER PORTION OF THE CURB INLET AND / OR EXTENSION.



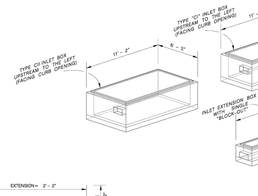
JOINT DETAIL

WHEN USING PRECAST UPPER UNIT, THIS SPACE IS FOR MAKING MINOR HORIZONTAL AND VERTICAL ADJUSTMENTS TO ACCOMODATE A FIT BETWEEN THE UPPER AND LOWER UNIT THAT ALLOWS FOR A MATCH LINE AND GRADE BETWEEN THE ROADWAY CURB AND THE UPPER UNIT OF THE INLET.



BARS A

(LOWER UNIT)



CONCRETE INLET BOX CONFIGURATIONS (LOWER UNITS)

MAY 2009

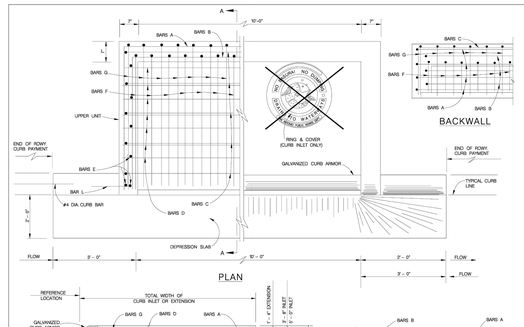
CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 1 OF 3

% SUBMITTAL	PROJECT NO.:	DATE:
DRAWN BY: V. VASQUEZ	DSGN. BY: L.E. MALTOS, P.E.	CHKD. BY: R.S. HOSSENI, P.E.	SHEET NO.: ___OF___



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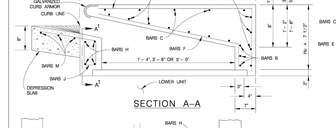
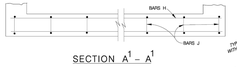
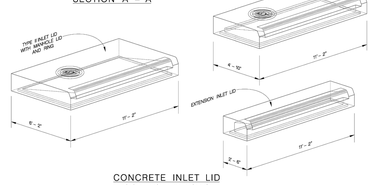
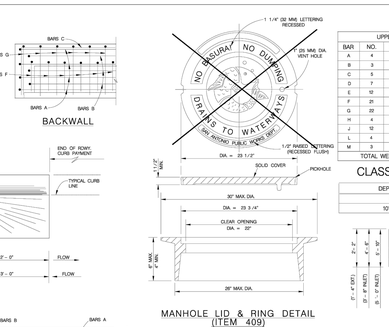


SECTION A–A

SECTION A1 – A1



CONCRETE INLET LID CONFIGURATIONS (UPPER UNITS)



END WALL

MANHOLE LID & RING DETAIL (ITEM 409)

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.

SEE SHEET 1 OF 3 FOR GENERAL NOTES.

REINFORCING STEEL (FOR Hu = 11")

UPPER UNIT 10' X 3'-6" (TYPE I)

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	18'-10"	53
B	3	#4	----	18'-10"	38
G	5	#4	10"	13'-2"	44
D	7	#4	8"	10'-10"	51
E	12	#4	11"	1'-2"	9
F	21	#6	8"	4'-8"	147
G	22	#6	8"	5'-8"	187
H	4	#4	----	10'-10"	29
J	12	#4	12"	2'-8"	28
L	4	#4	----	2'-0"	5
M	3	#4	----	14'-8"	29
TOTAL WEIGHT					620 LBS.

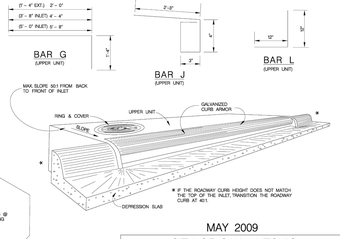
UPPER UNIT 10' X 5' (TYPE II)

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"	2'-8"	28
L	4	#4	----	2'-0"	5
M	3	#4	----	14'-8"	29
TOTAL WEIGHT					759 LBS.

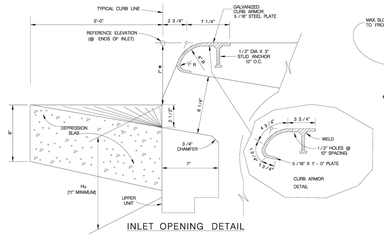
CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

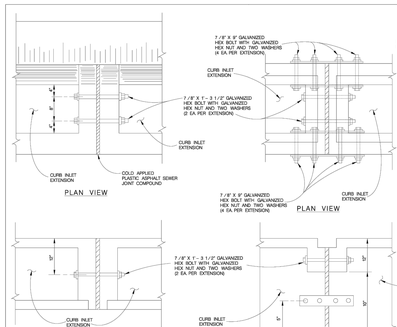
UPPER UNIT (ONLY)	C.Y.
10' X 3'-6" CURB INLET	1.9
10' X 5'-0" CURB INLET	2.7
10' EXTENSION	1.0

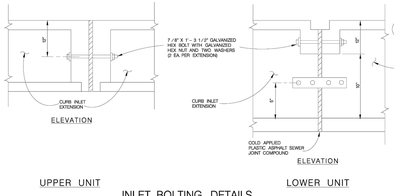


MANHOLE LID & RING DETAIL (ITEM 409)



INLET OPENING DETAIL



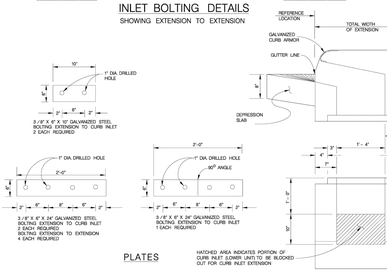


UPPER UNIT

LOWER UNIT

INLET BOLTING DETAILS

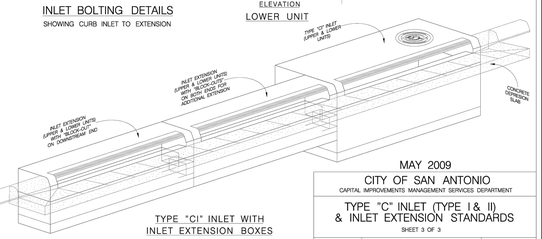
SHOWING EXTENSION TO EXTENSION



SECTION A–A CURB INLET EXTENSION TYPE E

INLET BOLTING DETAILS

SHOWING CURB INLET TO EXTENSION



TYPE "CI" INLET WITH INLET EXTENSION BOXES

UPPER UNIT EXTENSION (FOR Hu = 11")				
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	18'-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'-1"	93
G	22	#6	6"	3'-4"	110
H	4	#4	----	10'-10"	29
J	12	#4	12"	2'-8"	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	11	#4	12"	6'– 2"	49
B	11	#4	12"	3'– 2"	16
B_1	3	#4	12"	3'– 2"	4
E_1	16	#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

% SUBMITTAL	PROJECT NO.:	DATE:
DRAWN BY: V. VASQUEZ	DSGN. BY: L.E. MALTOS, P.E.	CHKD. BY: R.S. HOSSENI, P.E.	SHEET NO.: ___OF___

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6

INLET DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

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

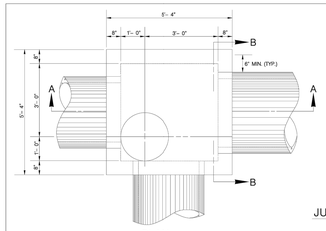
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

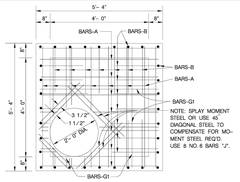
C6.D2

P:\03499\000\CAD\Exhibits\03499_Inlet Details.dwg, 5/6/2025 6:26:56 PM, Adobe PDF

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



PLAN



PLAN

JUNCTION BOX TOP SLAB SHOWING STEEL

BARS-B

BARS-C

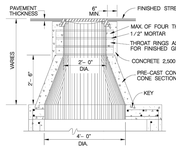
SCHEDULE FOR REINFORCING STEEL						
SHAPE	BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
STRAIGHT	A	16	4	9" O.C.	5'- 1"	54
	B	32	5	8" O.C.	6'- 10"	228
	C	32	5	8" O.C.	4'- 3"	142
STRAIGHT	D	16	4	9" O.C.	5'- 1"	54
STRAIGHT	E	16	3	12" O.C.	3'-11"	24
STRAIGHT	G	16	4	12" O.C.	5'-1"	54
STRAIGHT	G_1	8	4	AS SHOWN	5'-1"	27
STRAIGHT	H	20	3	12" O.C.	4'-5"	33
STRAIGHT	J	8	6	3 1/2"	2'- 10"	34
					TOTAL	650 LBS.

A — 4"X 4"X 4"J.B. NO. 1 & 4

CLASS "A" CONCRETE– 3.43 CU. YDS.
(DOES NOT EXCLUDE MANHOLE OPENINGS OR PIPE OPENING)

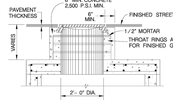
★ NOTE: BAR SIZE AND SPACING BASED ON SPANS AS SHOWN – ANY REVISIONS TO THESE SPANS SHALL INCLUDE A RE-DESIGN ON STEEL REQ'D.

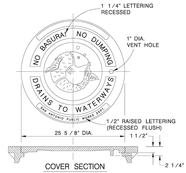
1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A," 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3 /4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM. A-15, THE DEFORMATION SHALL CONFORM TO ASTM A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD–CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (2,500 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).
8. PAYMENT FOR ALL EXCAVATION, BACKFILLING, CONCRETE, REINFORCING STEEL, VERTICAL STACK RING AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 – "STORM SEWER JUNCTION BOXES AND INLETS".



VARIATION OF VERTICAL STACK

VERTICAL STACK DESIGN SHALL BE GOVERNED BY THE DEPTH OF THE TOP OF THE JUNCTION BOX BELOW THE FINISHED STREET GRADE.





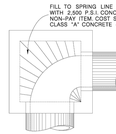
COVER SECTION

MANHOLE LID & RING DETAIL

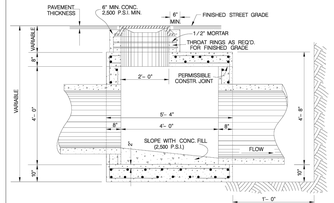
SCALE: 1 : 16

NOTES FOR MANHOLE LID AND RING

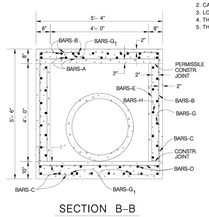
1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT.".
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.



CURVED DEFLECTOR DETAIL



SECTION A–A



SECTION B–B

JANUARY 2005

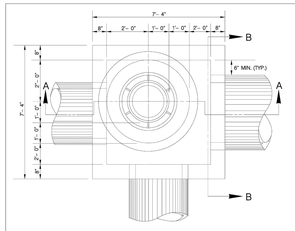
CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

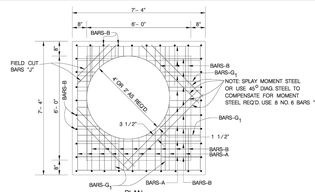
4'x4'x4' JUNCTION BOX STANDARDS

___% SUBMITTAL PROJECT NO.:_____ DATE:_____

DRWN. BY:_____ DSGN BY:_____ CHKD. BY:_____ SHEET NO.____OF___

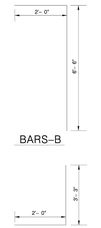


PLAN



PLAN

JUNCTION BOX TOP SLAB SHOWING STEEL



BARS–B

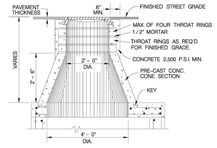
BARS–C

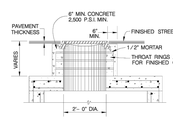
SCHEDULE FOR REINFORCING STEEL						
SHAPE	BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
STRAIGHT	A	21	4	9" O.C.	7'– 1"	99
	B	46	5	8" O.C.	8'– 8"	408
	C	46	5	8" O.C.	5'– 3"	252
STRAIGHT	D	21	4	9" O.C.	7'– 1"	99
STRAIGHT	E	28	3	12" O.C.	5'– 11"	62
STRAIGHT	G	20	4	12" O.C.	7'– 1"	95
STRAIGHT	G_1	8	4	AS SHOWN	6'– 1"	33
STRAIGHT	H	27	3	12" O.C.	7'– 1"	72
STRAIGHT	J	8	6	3 1 / 2" O.C.	4'– 11"	59
					TOTAL	1,179 LBS.

CLASS "A" CONCRETE – 6.94 CU. YDS.
(DOES NOT EXCLUDE MANHOLE OPENINGS OR PIPE OPENING)

★ NOTE: BAR SIZE AND SPACING BASED ON SPANS AS SHOWN – ANY REVISIONS TO THESE SPANS SHALL INCLUDE A RE–DESIGN ON STEEL REQ'D.

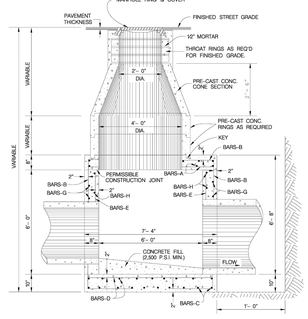
1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A" 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3 /4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM A–15, THE DEFORMATION SHALL CONFORM TO ASTM A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD–CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (2,500 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).
8. PAYMENT FOR ALL EXCAVATION, BACKFILLING, CONCRETE, REINFORCING STEEL, VERTICAL STACK RING AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 – "STORM SEWER JUNCTION BOXES AND INLETS".



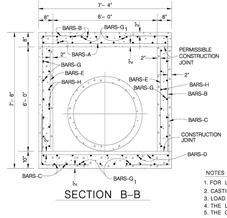


VARIATION OF VERTICAL STACK

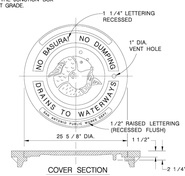
VERTICAL STACK DESIGN SHALL BE GOVERNED BY THE DEPTH OF THE TOP OF THE JUNCTION BOX BELOW THE FINISHED STREET GRADE.



SECTION A–A



SECTION B–B



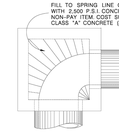
COVER SECTION

MANHOLE LID & RING DETAIL

SCALE: 1 : 16

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.



CURVED DEFLECTOR DETAIL

JANUARY 2005

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

6'x6'x6' JUNCTION BOX STANDARDS

___% SUBMITTAL PROJECT NO.:_____ DATE:_____

DRWN. BY:_____ DSGN BY:_____ CHKD. BY:_____ SHEET NO.____OF___

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6

JUNCTION BOX DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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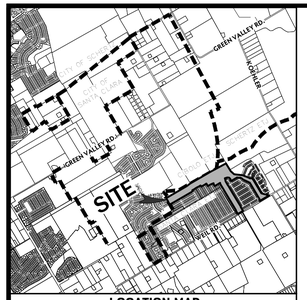
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C6.D3

P:\03499\005\CAD\LA Sheets\JUNCTION BOX DETAILS.dwg 5/05/2025 8:26pm rbarrera

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LOCATION MAP N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

LEGEND

- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
- XXX.XX - TOP OF CURB SPOT ELEVATION
- DRIVEWAY
- XXX.XX - PAVEMENT ELEVATION

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

TxDOT TYPE "10" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED.
(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

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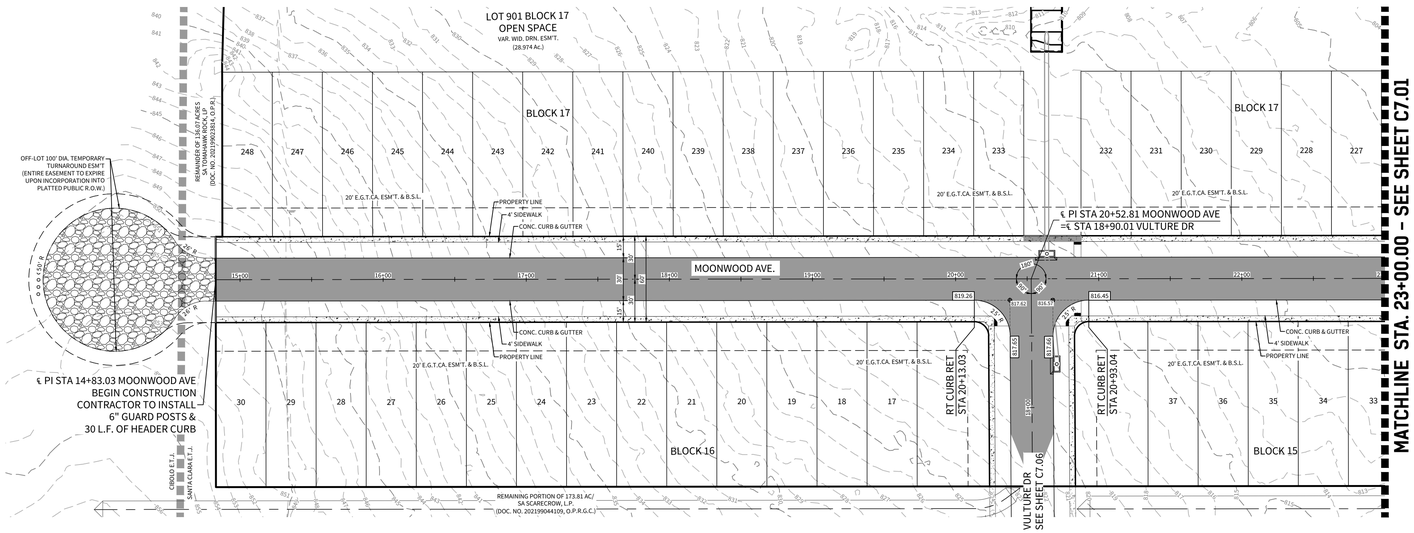
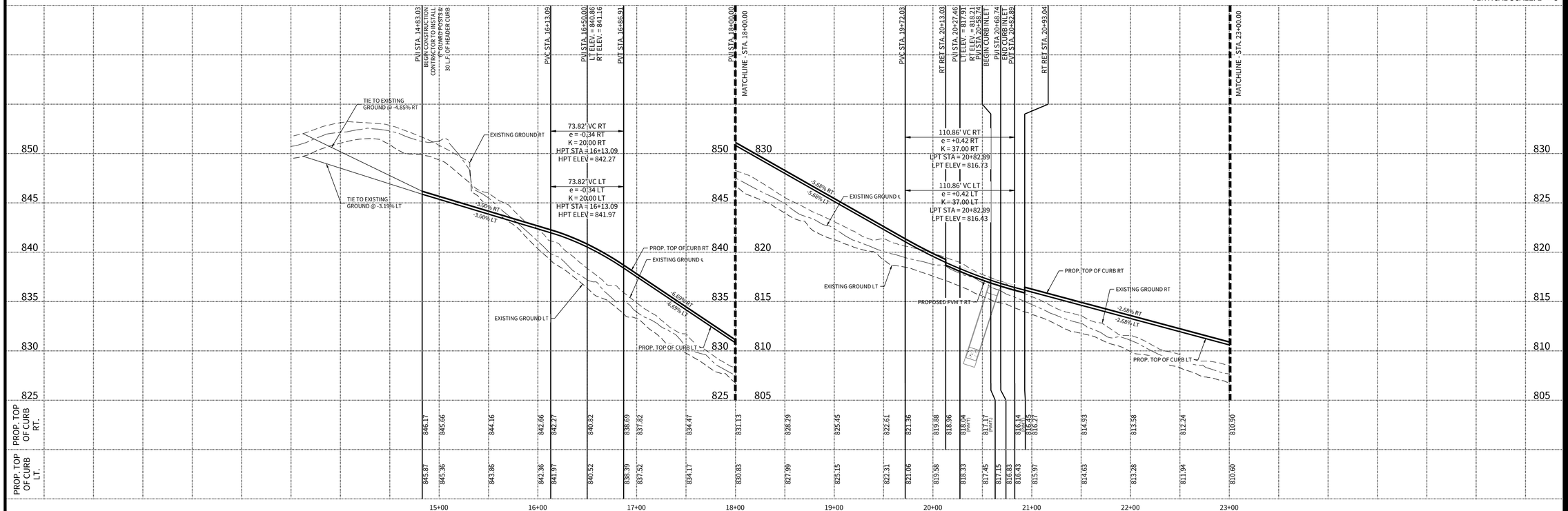


MOONWOOD AVENUE

STA. 14+83.03 TO STA. 23+00.00

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



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GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - MOONWOOD AVENUE

SCALE: 1"=50'
50 25 0 50

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.00

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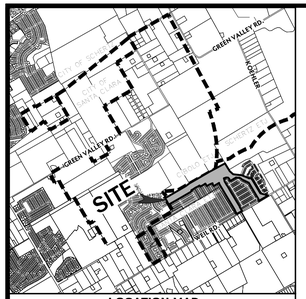

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SAN ANTONIO, TX 78231
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FAX: (210) 523-7112

LEGEND

- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
- XXX.XX - TOP OF CURB SPOT ELEVATION
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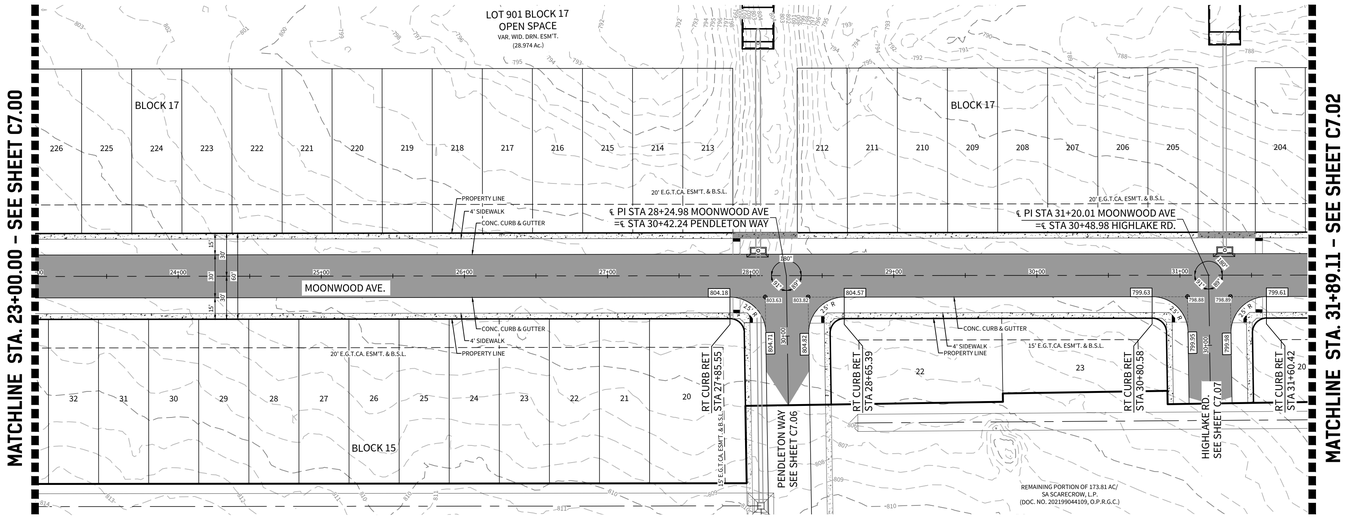
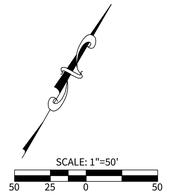
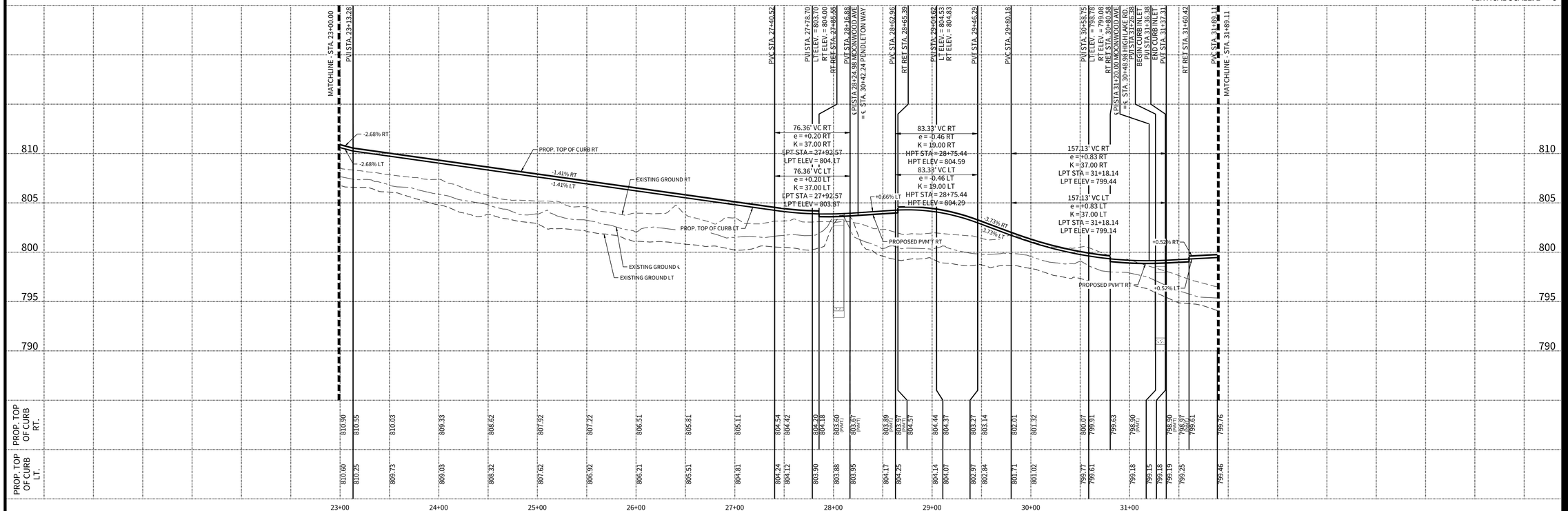




MOONWOOD AVENUE

STA. 23+00.00 TO STA. 31+89.11

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



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GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - MOONWOOD AVENUE

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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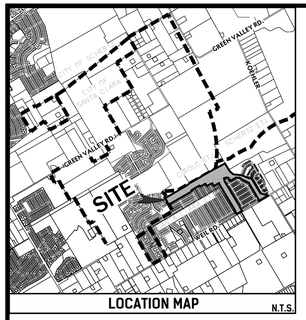
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.01

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



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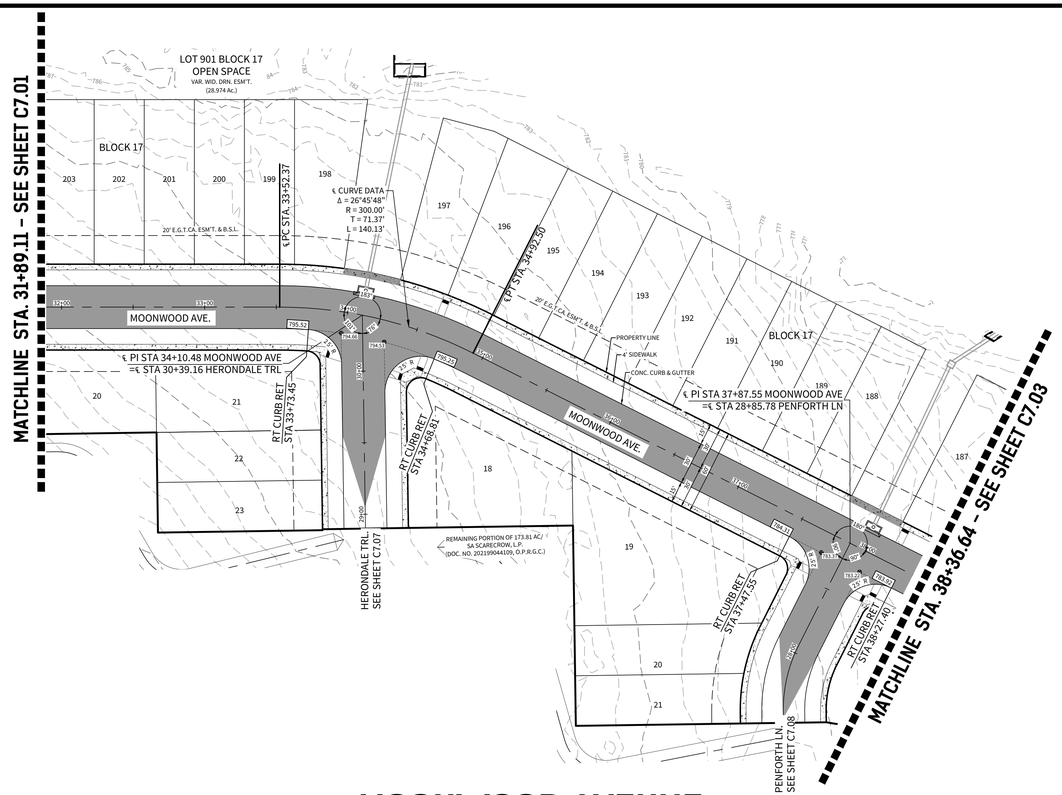
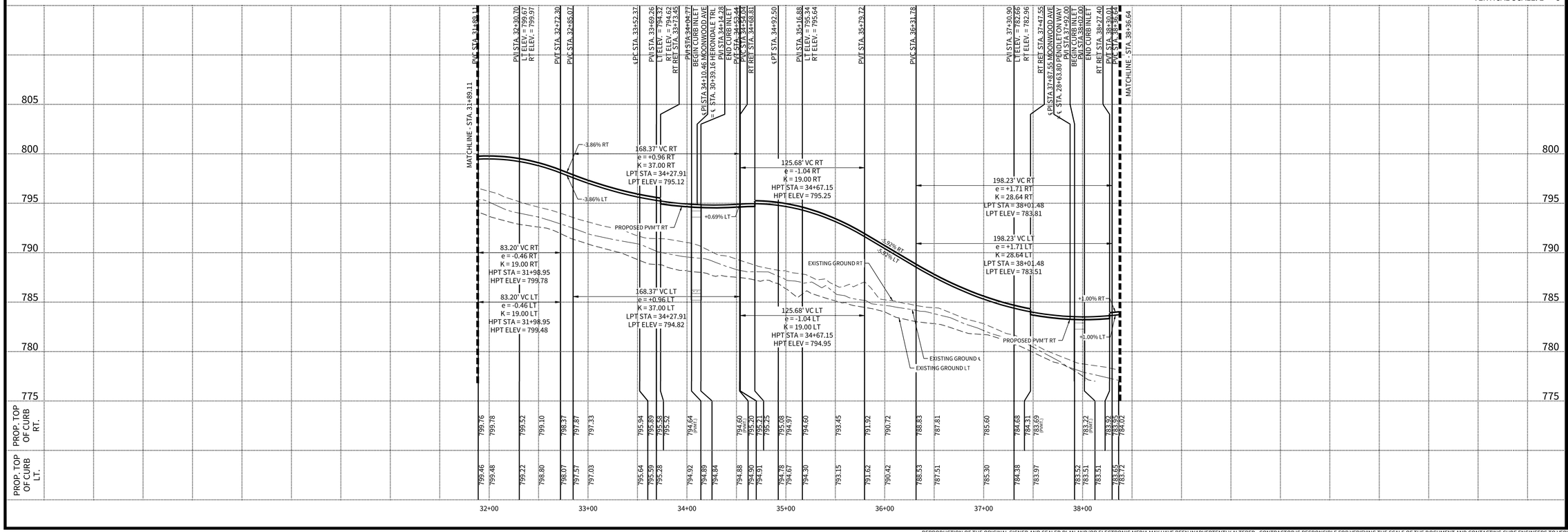
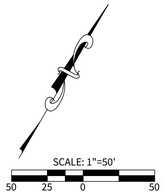


MOONWOOD AVENUE

STA. 31+89.11 TO STA. 38+36.64

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





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San Antonio, Texas 78231
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GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - MOONWOOD AVENUE

DATE 05/06/2025
PROJECT NO. 03499.008
DRAWN BY AG/BK/SG/RB/JF
CHECKED BY K.M.H.

REVISIONS
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CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.02

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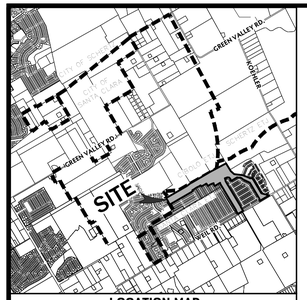
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



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LEGEND

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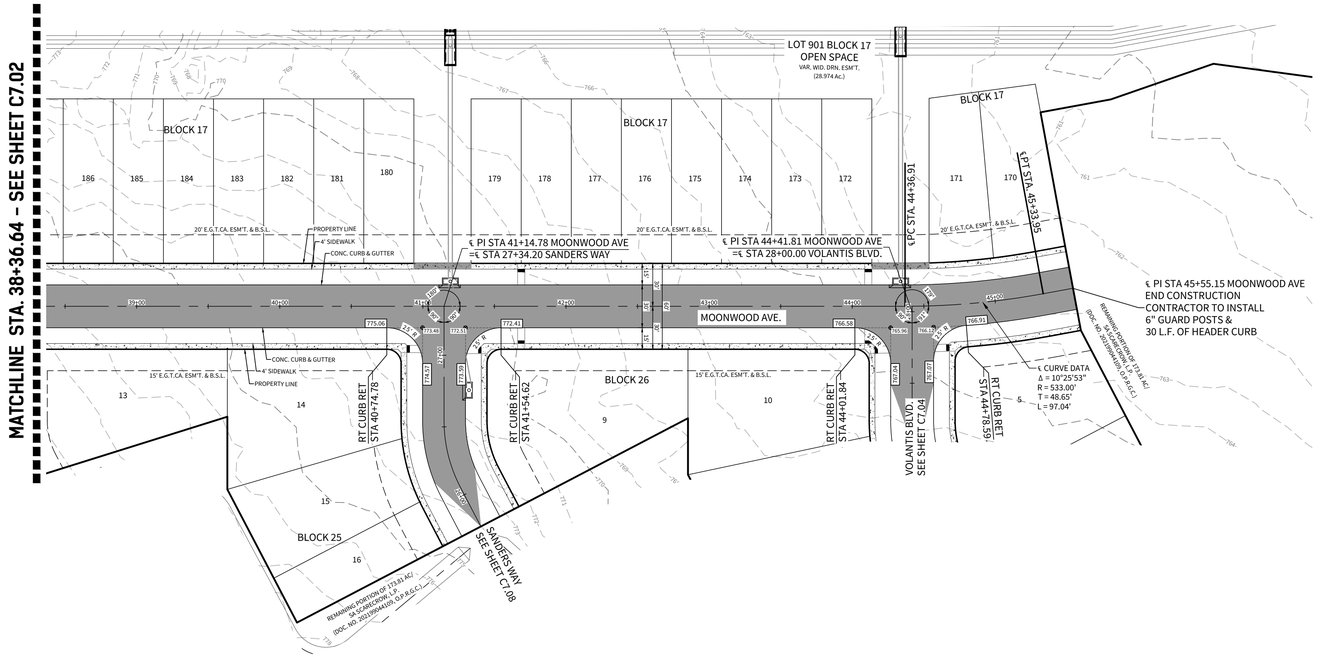
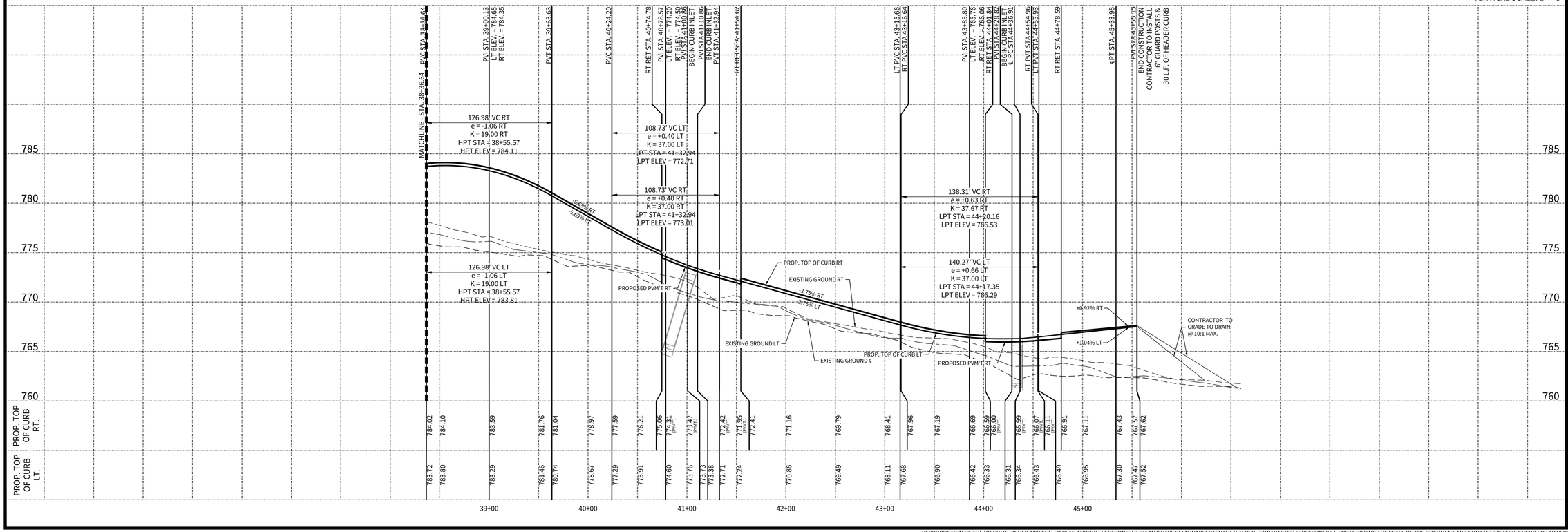


SCALE: 1"=50'
50 25 0 50

MOONWOOD AVENUE

STA. 38+36.64 TO STA. 45+55.15

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



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San Antonio, Texas 78231
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GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - MOONWOOD AVENUE

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.03

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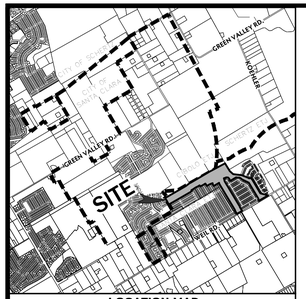
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LOCATION MAP N.T.S.

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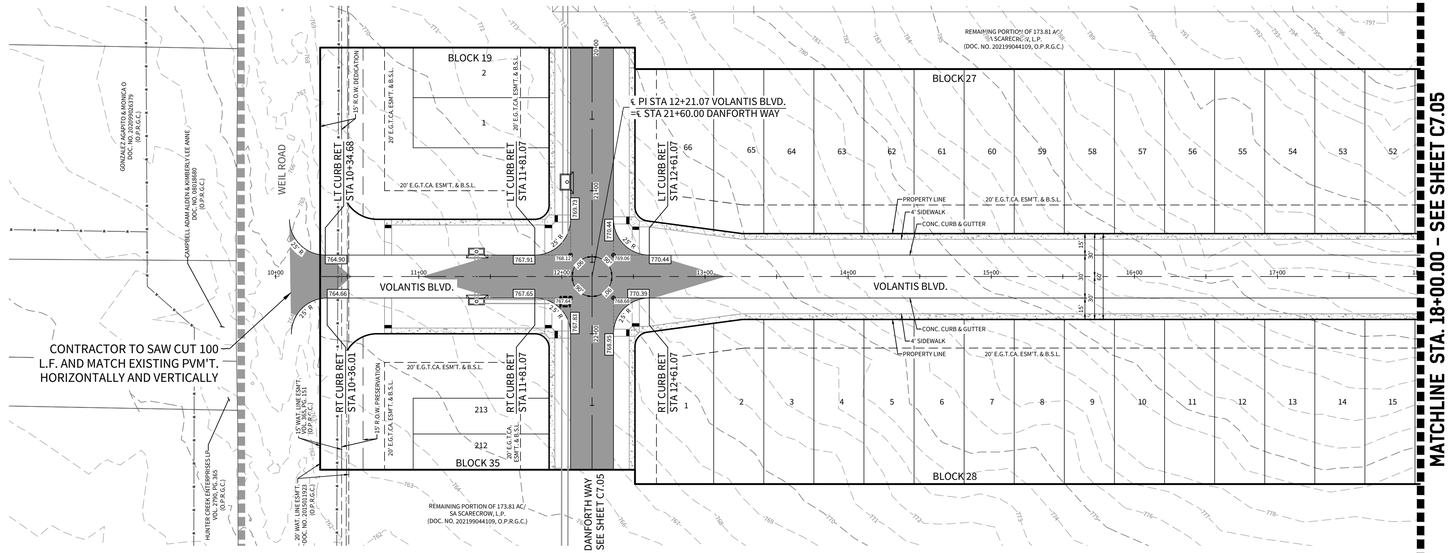
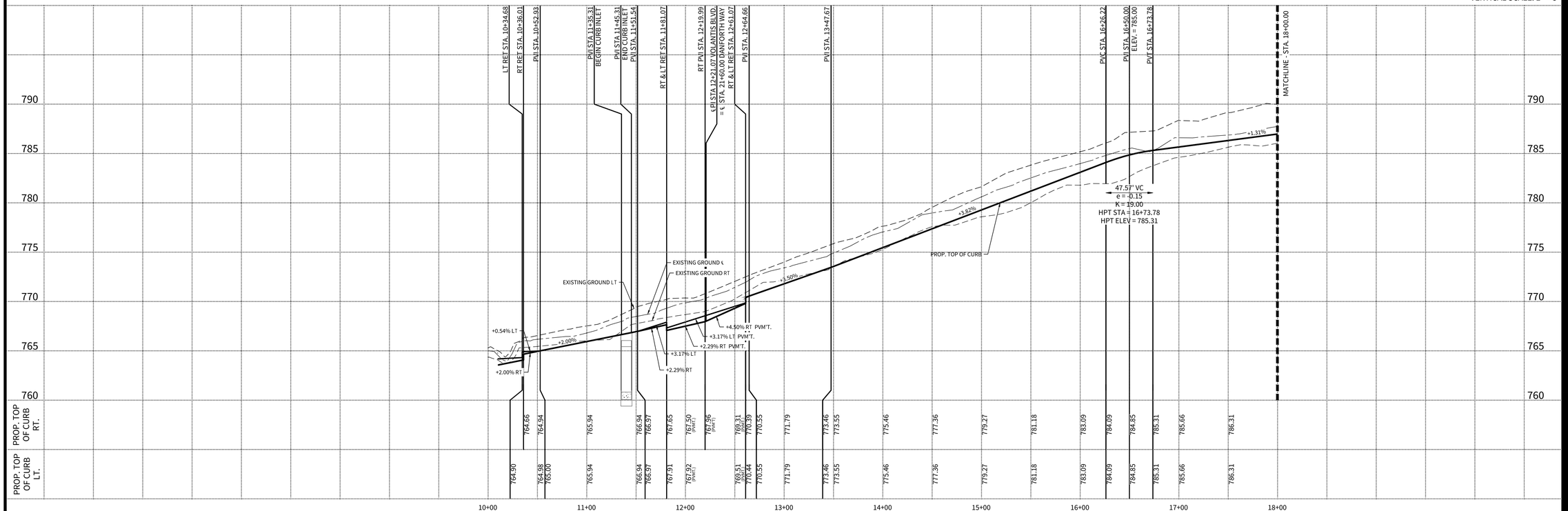


VOLANTIS BOULEVARD

STA. 10+00.00 TO STA. 18+00.00

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



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GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - VOLANTIS BOULEVARD

DATE 05/06/2025
PROJECT NO. 03499.008
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CHECKED BY K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.04

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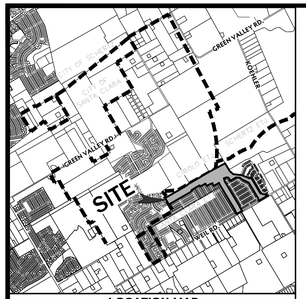


LOCATION MAP N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

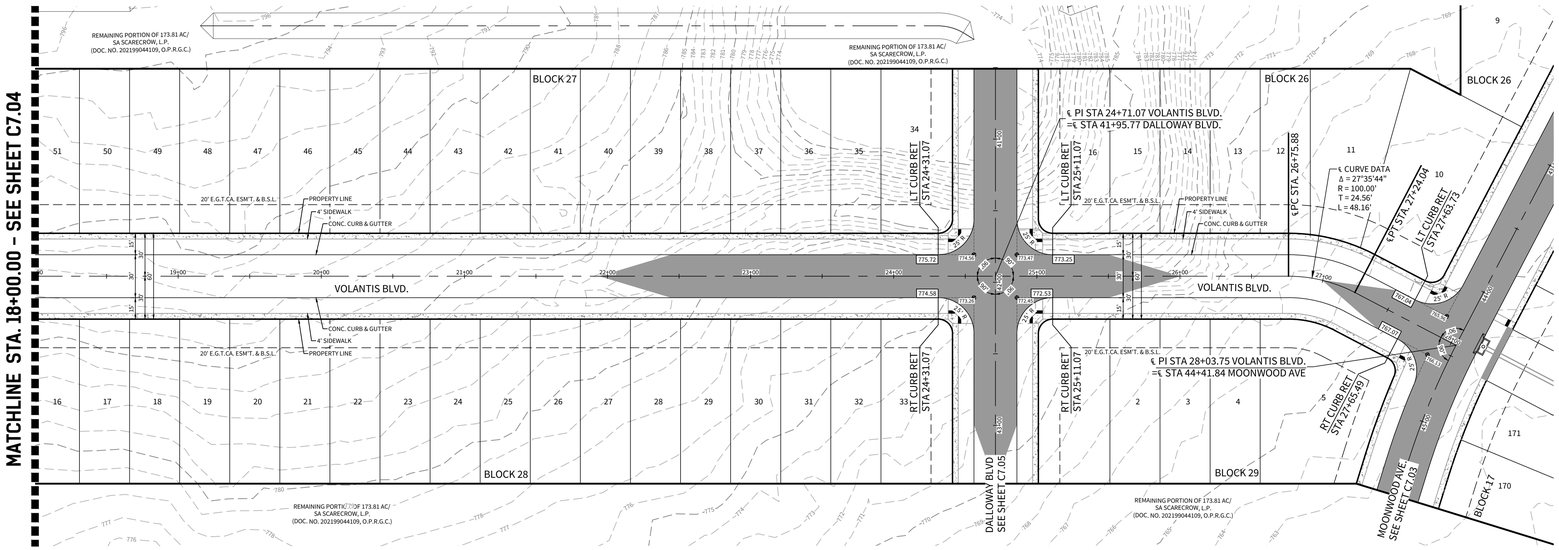
LEGEND

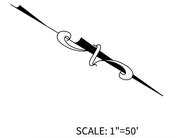
- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
- XXX.XX - TOP OF CURB SPOT ELEVATION
- DRIVEWAY
- XXX.XX - PAVEMENT ELEVATION

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

TxDOT TYPE "10" WHEEL CHAIR RAMPS ARE INDICATED THUS " " UNLESS OTHERWISE NOTED.
(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS . DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY.



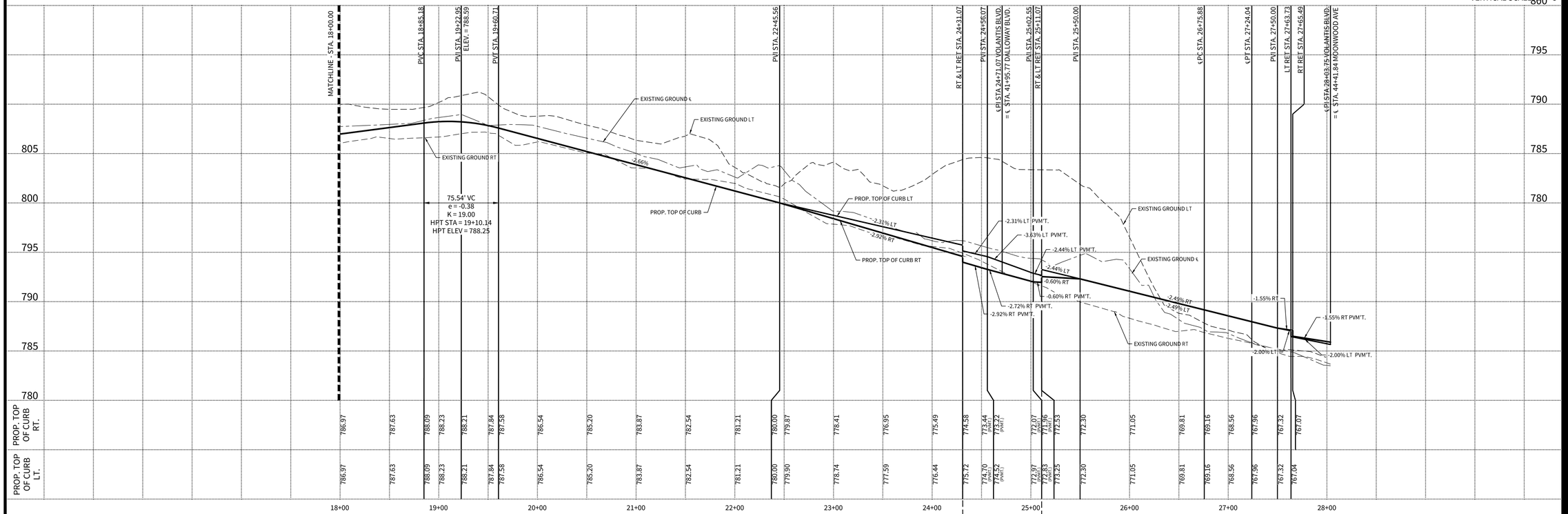


VOLANTIS BOULEVARD

STA. 18+00.00 TO STA. 27+65.49

805

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



REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

CUDEENGINEERS.COM

CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - VOLANTIS BOULEVARD

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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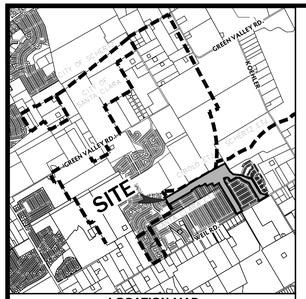
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.05

P:\03499\05\01 DWG\4 Sheets\03A1C7.04_STP-VOLANTIS BOULEVARD.dwg 2025/05/06 8:43pm mmorris



LOCATION MAP N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

LEGEND

- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
- XXX.XX - TOP OF CURB SPOT ELEVATION
- DRIVEWAY
- XXX.XX - PAVEMENT ELEVATION

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

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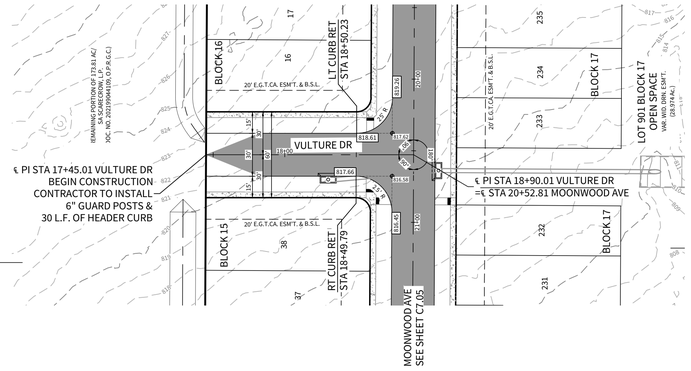
(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS . DETECTABLE WARNING PAVER WITH TRUNCATED DOMES ONLY.

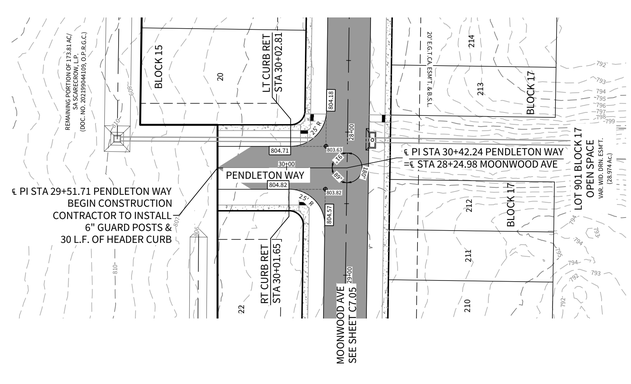
SCALE: 1"=50'
50 25 0 50



VULTURE DR

STA. 17+45.00 TO STA. 18+90.01

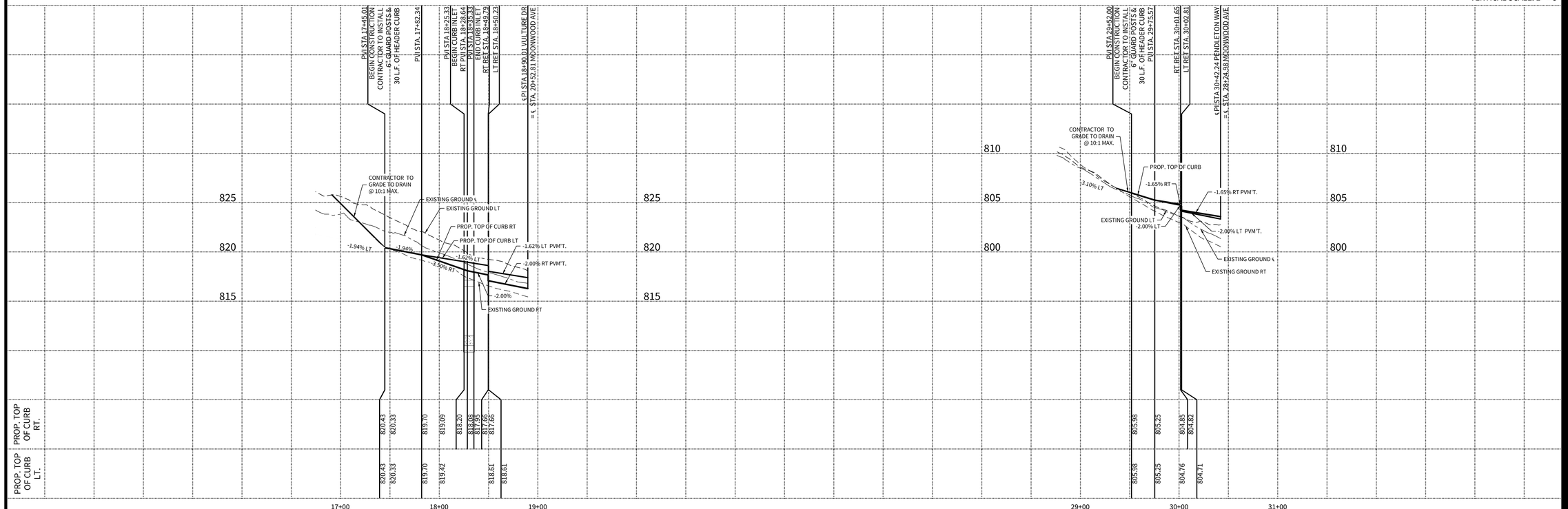
SCALE: 1"=50'
50 25 0 50



PENDLETON WAY

STA. 29+51.71 TO STA. 30+42.24

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



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CUDE ENGINEERS EST. 1980
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6

STREET PLAN & PROFILE - VULTURE DR & PENDLETON WAY

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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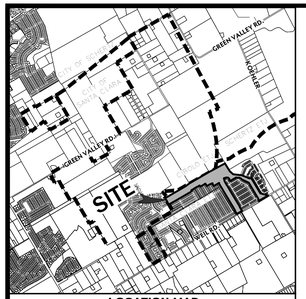
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.06

P:\03499\000.0 ENGR\4 Sheets\DATA\C7.06 - STP-VULTURE DR_PENDLETON WAY.dwg 2025/05/06 4:47pm mmina

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LOCATION MAP N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

LEGEND

- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
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- XXX.XX - PAVEMENT ELEVATION

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

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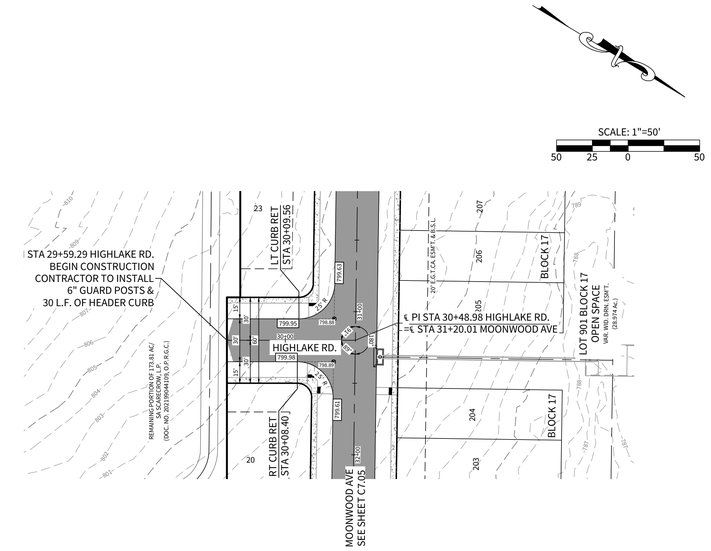
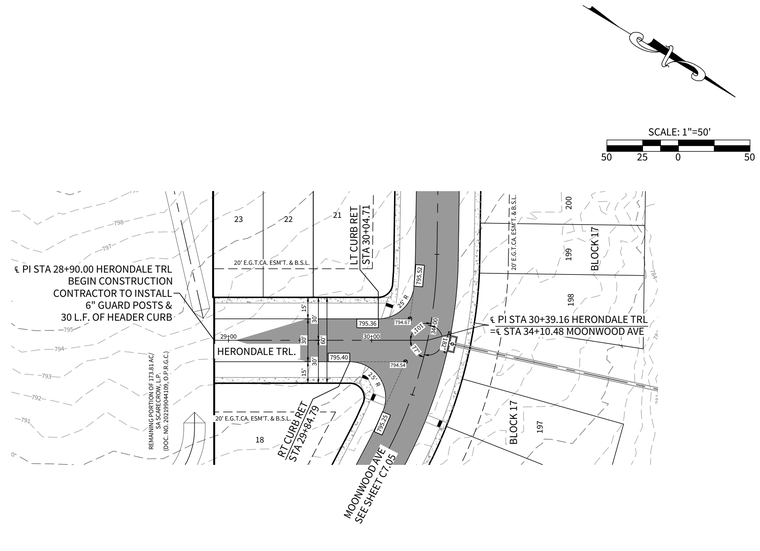


HIGHLAKE ROAD

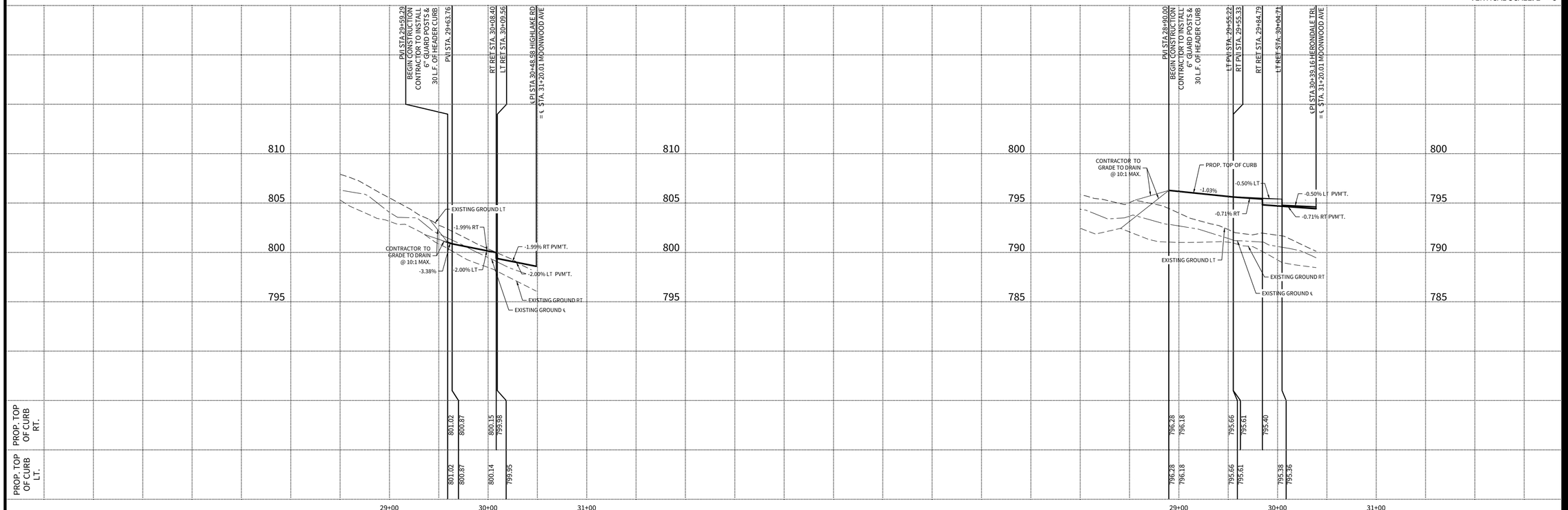
STA. 29+59.29 TO STA. 30+48.98



HERONDALE TRAIL

STA. 28+90.00 TO STA. 30+39.16

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



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CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - HIGHLAKE RD & HERONDALE TRL

DATE 05/06/2025
PROJECT NO. 03499.008
DRAWN BY AG/BK/SG/RB/JF
CHECKED BY K.M.H.

REVISIONS
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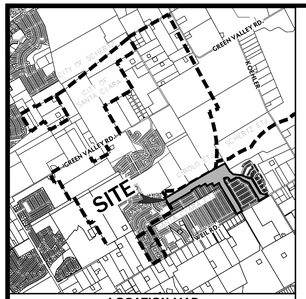
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.07

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LOCATION MAP N.T.S.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

LEGEND

- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
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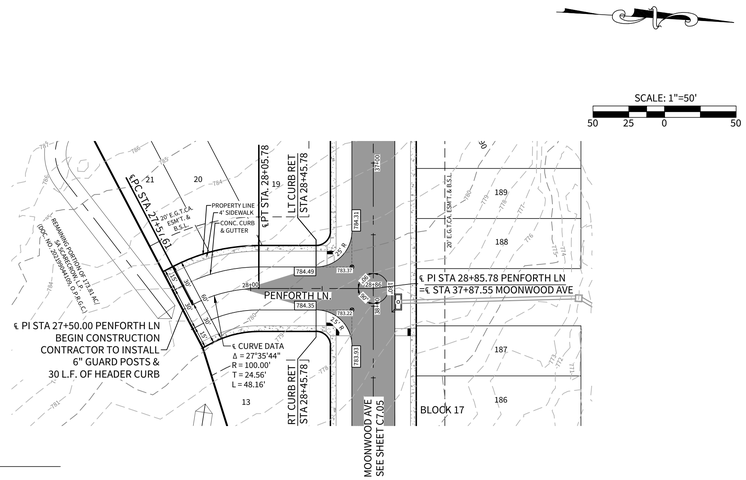
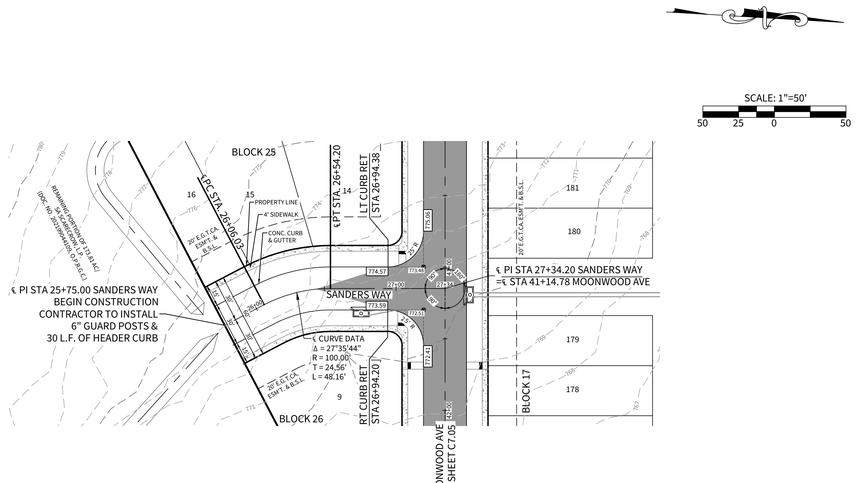




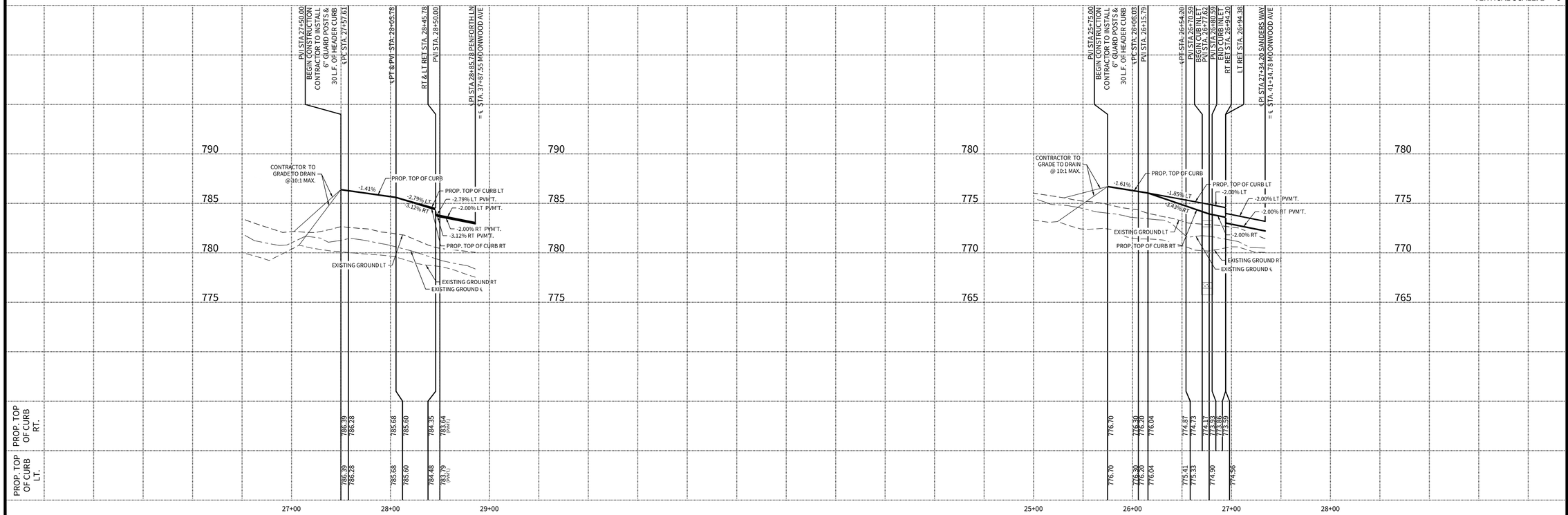
PENFORTH LANE

STA. 27+50.00 TO STA. 28+85.78

SANDERS WAY

STA. 25+75.00 TO STA. 27+34.20

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 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - PENFORTH LN & SANDERS WAY

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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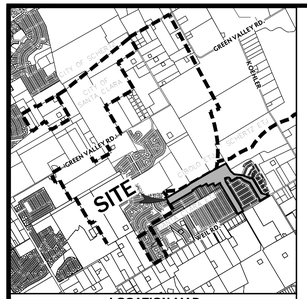
STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.08

P:\03499\0005.2\DWG\4-Sheets\03XUCC.DB, STP FENFORTH LN, SANDERS WAY, Aug 2025/05/06 5:03pm mmiska

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



LOCATION MAP N.T.S.

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LEGEND

- SIDEWALK CONSTRUCTED WITH INFRASTRUCTURE
- STREET WASHOUT (SEE DETAIL SHEET C7.D1)
- STREET CENTERLINE
- EXISTING CONTOURS
- XXX.XX - TOP OF CURB SPOT ELEVATION
- DRIVEWAY
- XXX.XX - PAVEMENT ELEVATION

(SEE DETAIL SHEET C7.D1) FOR ADA RAMPS AT SIDEWALK INTERSECTIONS

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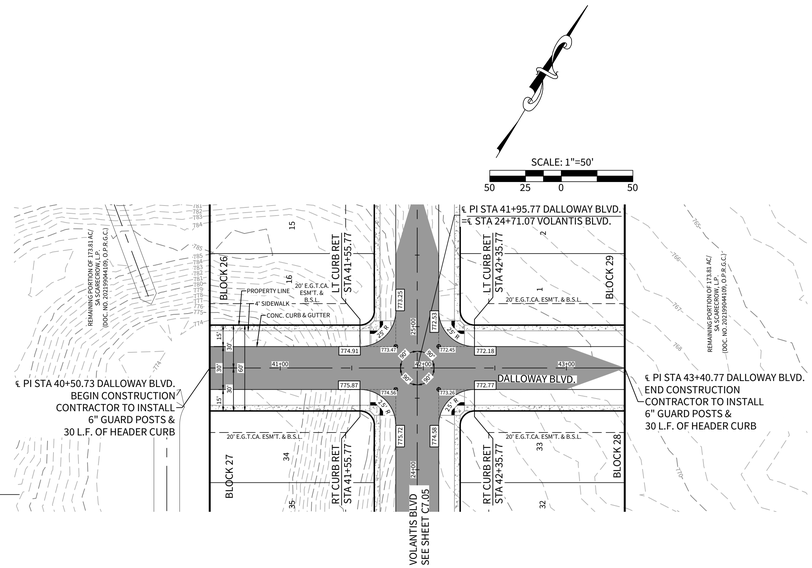
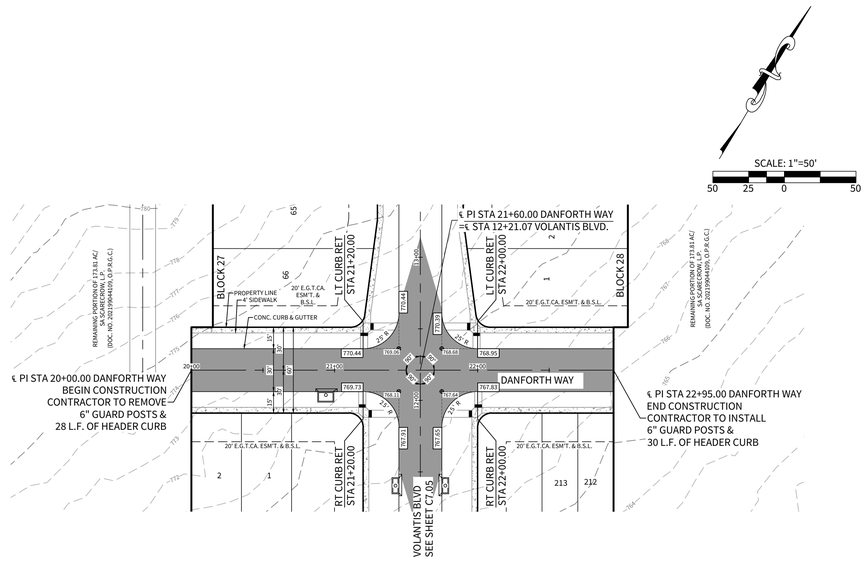


DALLOWAY BLVD

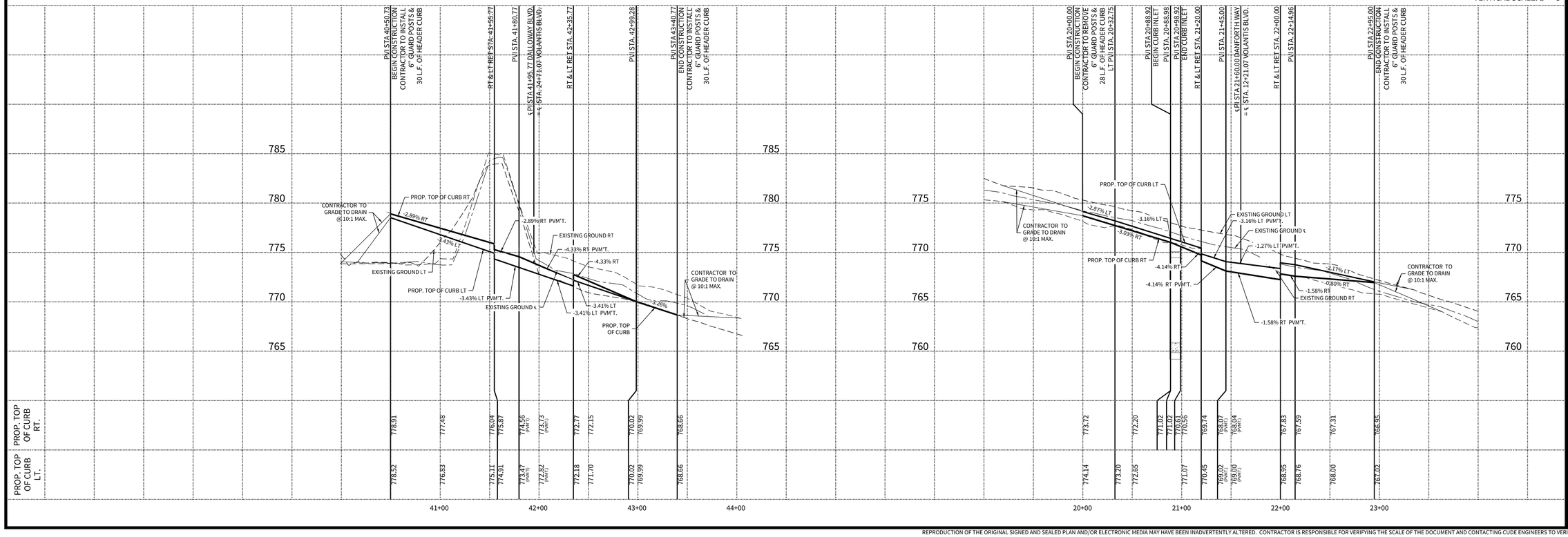
STA. 40+50.73 TO STA. 43+40.77



DANFORTH WAY

STA. 20+00.00 TO STA. 22+95.00

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



CUDEENGINEERS.COM

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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

STREET PLAN & PROFILE - DALLOWAY BLVD & DANFORTH WAY

DATE 05/06/2025
PROJECT NO. 03499.008
DRAWN BY AG/BK/SG/RB/JF
CHECKED BY K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.09

P:\03499\005.2 DWG\4 Sheet\03499_STP DALLOWAY BLVD_DANFORTH WAY.dwg 2025/05/05 4:45pm mmiska

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STREET PAVEMENT DESIGN OPTIONS (TTL , INC. - 00240902004.00)

1. PAVEMENT SECTION REQUIRED IS TO BE DETERMINED BY GEOTECHNICAL ENGINEER ON-SITE.

SUBGRADE NOTES (*):

- THE SUBGRADE WILL BE PROOF ROLLED TO IDENTIFY SOFT AREAS BEFORE STABILIZATION.
- THE SUBGRADE PLASTICITY INDEX VALUE IS EXPECTED TO BE GREATER THAN 20. SUBGRADE LIME STABILIZATION IS NEEDED.
- UNDERCUT SOFT, WEAK, AND UNSTABLE SOILS BY EXCAVATING BELOW SUBGRADE LEVEL TO EXPOSE STABLE SOILS. THE EXCAVATED SOIL CAN BE USED TO RESTORE THE EXCAVATION SUBGRADE, PROVIDED THAT THE SOILS ARE RELATIVELY FREE AND CLEAN OF DELETERIOUS MATERIAL AND MATERIALS EXCEEDING 3 INCHES IN MAXIMUM DIMENSION. THE EXCAVATED SOIL, OR IMPORTED FILL SOIL, SHALL BE PLACED IN MAXIMUM 6-INCH COMPACTED LIFTS. EACH LIFT OF SOIL SHALL BE MOISTURE CONDITIONED BETWEEN PLUS OR MINUS TWO (±2) PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH THE STANDARD COMPACTION EFFORT (ASTM D 698). IF UNDERCUTTING DEEPER THAN ABOUT 3 FEET IS NEEDED, CONTACT TTL, INC.
- SOIL SUBGRADE AREAS REQUIRING FILL PLACEMENT SHOULD BE SCARIFIED TO A DEPTH OF ABOUT EIGHT (8) INCHES AND MOISTURE CONDITIONED BETWEEN PLUS OR MINUS TWO (±2) POINTS OF THE OPTIMUM MOISTURE CONTENT. THE MOISTURE CONDITIONED SUBGRADE SHOULD THEN BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH THE STANDARD COMPACTION EFFORT (ASTM D 6998). THE SUBGRADE SHOULD BE MOISTURE CONDITIONED JUST PRIOR TO FILL PLACEMENT SO THE SUBGRADE MAINTAINS ITS COMPACTION MOISTURE LEVELS AND DOES NOT DRY OUT.
- ON-SITE SOILS (GENERAL FILL), SELECT FILL OR GRANULAR FILL SOIL SHOULD BE PLACED TO ACHIEVE THE DESIRED ELEVATION.

GENERAL NOTES (**)

- INPUT PARAMETERS ARE SHOWN IN TABLE NO. 6. PLEASE CALL US TO PROVIDE PAVEMENT RECOMMENDATIONS, IF NEEDED, FOR DIFFERENT INPUT VALUES.
- IF REPETITIVE TRUCK OR HEAVY TRUCK TRAFFIC IS ANTICIPATED, PLEASE CONTACT US FOR REVISED PAVEMENT RECOMMENDATIONS.
- PAVEMENT SECTION RECOMMENDATIONS ARE BASED ON A CBR VALUE OF 2.0. THE PAVEMENT RECOMMENDATIONS PRESENTED ABOVE ARE NOT BASED ON THE SHRINK / SWELL CHARACTERISTICS OF THE UNDERLYING SOILS. IF WATER IS ALLOWED TO GET UNDERNEATH THE ASPHALT / CONCRETE OR IF MOISTURE CONTENT OF THE BASE OR SUBGRADE CHANGES SIGNIFICANTLY, THEN PAVEMENT DISTRESS WILL OCCUR. MOISTURE PENETRATION UNDERNEATH THE ASPHALT PAVEMENT SURFACE WILL BE REDUCED BY USING DEEPER CURBS; CURBS EXTENDING A MINIMUM OF 3 INCHES INTO BASE.

SUBGRADE VERIFICATION:

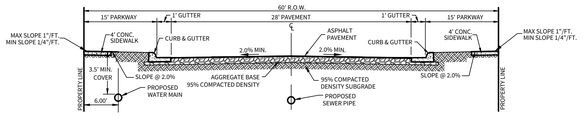
- AT THE TIME OF CONSTRUCTION, THE FINAL PAVEMENT SUBGRADE WILL BE OBSERVED AND VERIFIED BY A REPRESENTATIVE OF TTL, INC.

PRIME COAT:

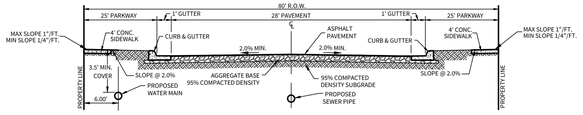
- THE PRIME COAT SHOULD CONSIST OF SEALING THE BASE WITH AN OIL SUCH AS MC-30 OR AE-P ASPHALT CEMENT. THE PRIME COAT SHOULD BE APPLIED AT A RATE NOT TO EXCEED 0.35 GALLONS PER SQUARE YARD WITH MATERIALS WHICH MEET TXDOT ITEM 300. THE PRIME COAT WILL HELP TO MINIMIZE PENETRATION OF RAINFALL AND OTHER MOISTURE THAT PENETRATES THE BASE.

TACK COAT:

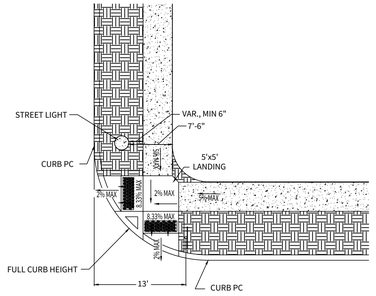
- THE ASPHALTIC MATERIAL USED FOR TACK COAT SHALL MEET THE REQUIREMENTS FOR “ASPHALT CEMENT”, “CUT-BACK ASPHALT” OR “EMULSIFIED ASPHALT” IN ITEM NO. 300, “ASPHALTS, OILS AND EMULSIONS” OF THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS. THE ASPHALTIC MATERIAL USED FOR TACK COAT SHALL BE THE TYPE OR GRADE SHOWN IN THE REFERRING SPECIFICATION, OR ON THE PLANS, OR AS DIRECTED/APPROVED BY THE ENGINEER.



MINOR ACCESS STREET CROSS-SECTION
N.T.S.



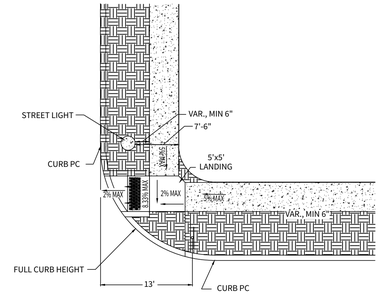
SECONDARY COLLECTOR STREET CROSS-SECTION
N.T.S.



ADA RAMP INTERSECTION LAYOUT DETAIL
(TYPE 10 DIRECTIONAL RAMPS)
N.T.S.

NOTES:

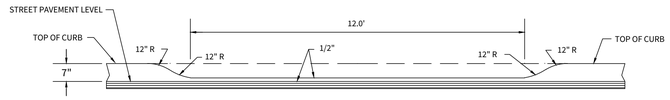
1. STREET LIGHTS SHALL BE INSTALLED 7.5' WITHIN R.O.W. AND A MINIMUM DISTANCE OF 6" FROM THE PROPOSED SIDEWALK.



ADA RAMP INTERSECTION LAYOUT DETAIL
(TYPE 10 DIRECTIONAL RAMPS – SINGLE DIRECTION)
N.T.S.

NOTES:

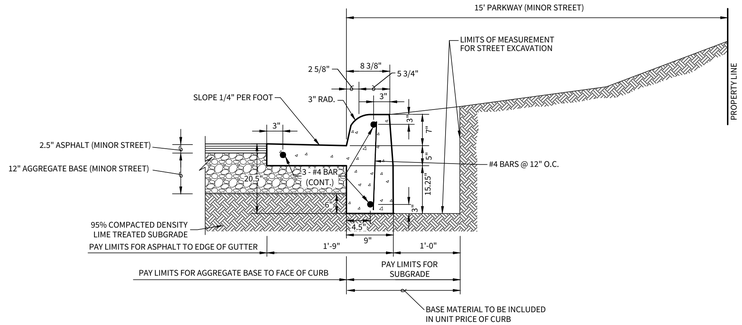
1. STREET LIGHTS SHALL BE INSTALLED 7.5' WITHIN R.O.W. AND A MINIMUM DISTANCE OF 6" FROM THE PROPOSED SIDEWALK.



TYPICAL DRIVEWAY CUT SECTION

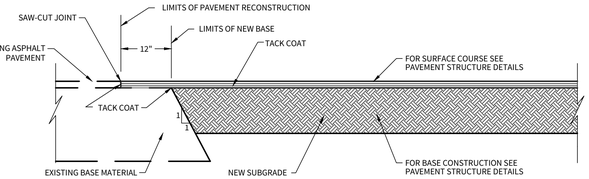
STREET TYPE	HMAC TYPE "D"	FLEX BASE (TY A OR B GR 2)	LIME SUBGRADE	STRUCTURAL NUMBER
MINOR ACCESS	2.5"	12"	6" (24 LB/SY)	3.26

STREET PAVEMENT DESIGN



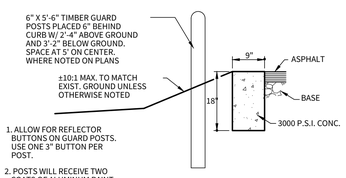
MINOR ACCESS STREET - CURB & GUTTER DETAIL

N.T.S.



WASHOUT CROWN TRANSITION DETAIL

N.T.S.

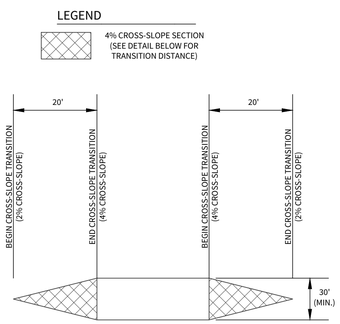


HEADER CURB DETAIL

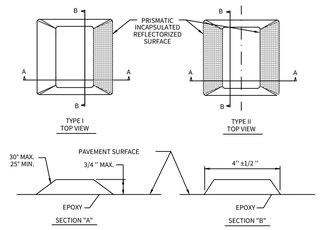
N.T.S.

PAVEMENT JUNCTION DETAILS

N.T.S.



CROSS-SLOPE TRANSITION DETAIL



1) REFLECTORIZED BLUE - FIRE HYDRANT

2) ADHENSIVE SHALL BE APPLIED IN SUFFICIENT TO ENSURE THE FOLLOWING:
   a) 100 PERCENT OF THE BONDING AREA OF RAISED PAVEMENT MARKERS SHALL BE IN CONTACT WITH THE ADHESIVE.
   b) RAISED PAVEMENT MARKERS SHALL NOT BE IN CONTACT WITH THE PAVEMENT SURFACE, BUT SHALL BE SEATED ON A CONTINUOUS LAYER OF ADHESIVE.
   c) BITUMINOUS ADHESIVE FOR MARKERS ON BITUMIOUS PAVEMENTS. EPOXY ADHENSIVE FOR MARKERS ON PORTLAND CEMENT CONCRETE PAVEMENTS. EPOXY ADHESIVE SHALL BE MACHINE MIXED.

3) RAISED PAVEMENT MARKERS SHALL BE FREE OF RUST, SCALE, DIRT, OIL, GREASE, MOISTURE, OR CONTAMINATES WHICH MIGHT ADVERSELY AFFECT THE ADHESIVE BOND. ADHESIVE OR ANY OTHER MATERIAL THAT IMPAIRS THE FUNCTIONAL REFLECTIVITY WILL NOT BE ACCEPTABLE.

4) PLACEMENT OF RAISED PAVEMENT MARKERS SHALL BE 4 FEET OFF STREET CENTELINE TOWARD ITEM MARKED.

PAVEMENT REFLECTORS DETAIL

N.T.S.

CUDEENGINEERS.COM

CUDE ENGINEERS EST. 1980

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

STANDARD STREET DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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9.

STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.D1

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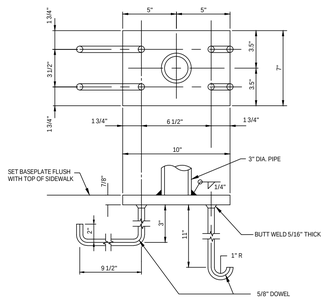
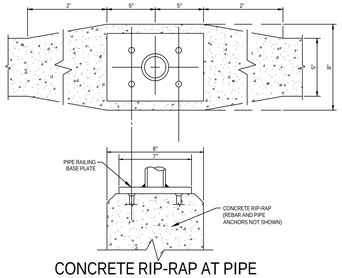
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



PIPE ANCHORAGE DETAILS

N.T.S.

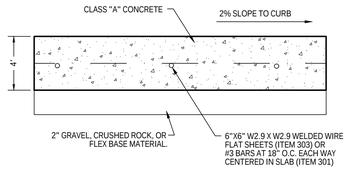


CONCRETE RIP-RAP AT PIPE RAILING BASE PLATE DETAIL

N.T.S.

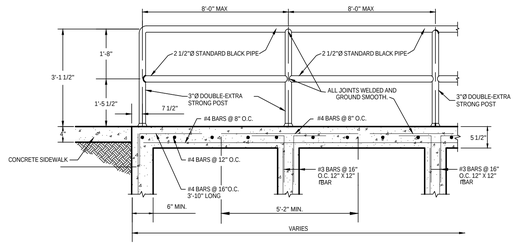
NOTES:

1) CONTRACTOR TO FLARE CONCRETE RIP-RAP TO 8' AT PROPOSED PIPE RAILING BASE PLATE LOCATIONS.



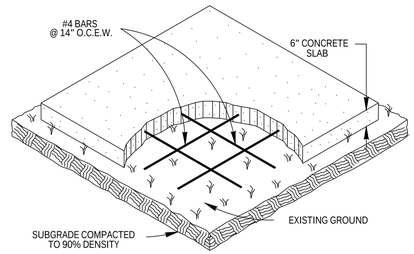
CONCRETE SIDEWALK

N.T.S.



TYPICAL SIDEWALK BRIDGE SECTION AND SIDEWALK PIPE RAILING

N.T.S.



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

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6

STANDARD STREET DETAILS

DATE
05/06/2025

PROJECT NO.
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STATE OF TEXAS
KYLE M. HUDEK
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LICENSED
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TBPE No. 455
TBPLS No. 10048500

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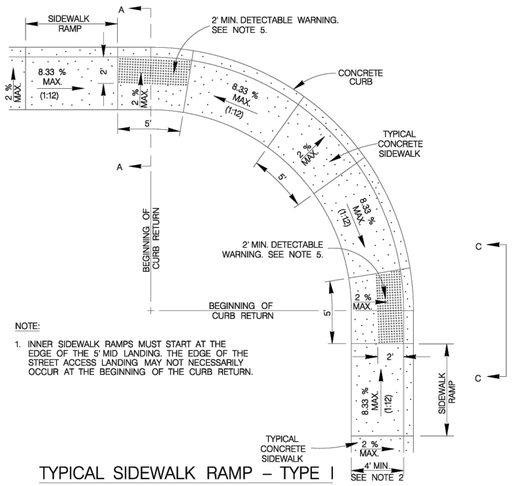
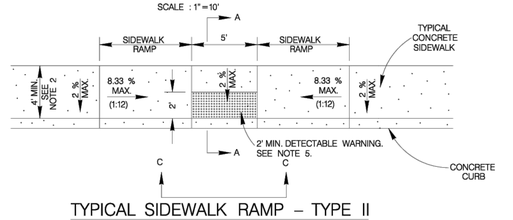


NOTE:

1. INNER SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' MID LANDING. THE EDGE OF THE STREET ACCESS LANDING MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.

TYPICAL SIDEWALK RAMP – TYPE I

SIDEWALK ABUTS THE CURB
SCALE : 1" = 10'

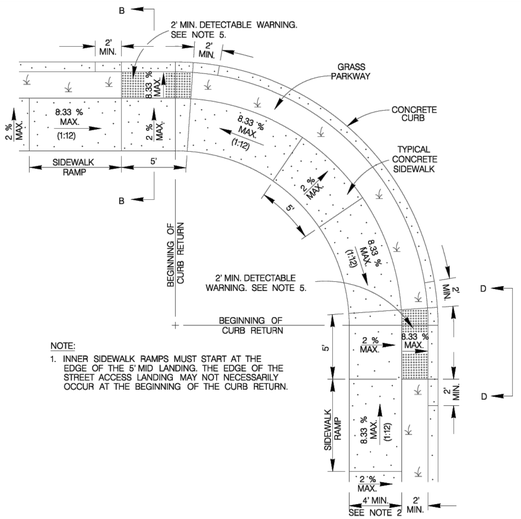


TYPICAL SIDEWALK RAMP – TYPE II

USED AT TEE INTERSECTIONS WHERE SIDEWALK ABUTS CURB
SCALE : 1" = 10'

GENERAL NOTES

1. WHEN POSSIBLE SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MININMUM OF 1 FOOT BUFFER. DEVIATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. 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 2' FROM THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' 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.
4. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
5. ALL CURB-RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING 24 INCHES DEEP (IN THE DIRECTION OF PEDESTRIAN TRAVEL) AND EXTENDING THE FULL WIDTH OF THE CURB RAMP OR LANDING. THE DETECTABLE WARNING SHALL CONSIST OF RAISED TRUNCATED DOMES, ALIGNED IN A GRID PATTERN WITH A DIAMETER OF A NOMINAL 0.9 INCHES (23 MM), A HEIGHT OF NOMINAL 0.2 INCHES (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES (60 MM). THE DETECTABLE WARNING SURFACE SHALL BE A CAST-IN-PLACE TILE CONFORMING TO THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS OR PAVERS CONFORMING TO TXDOT STANDARD PED-05, PEDESTRIAN FACILITIES.
6. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
7. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 – CONCRETE CURB, GUTTER, AND CONCRETE CURB AND GUTTER" AND / OR "502 – CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH FINISHED.
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.
11. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
12. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6" x 6" – W2.9 x W2.9 WIRE MESH.
13. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY. ANY SIDEWALK CONSTRUCTION THAT DEVIATES FROM THE NATURAL GRADE OF THE ROADWAY TO CREATE A GRADE STEEPER THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS AND RESTING PLATFORMS TO BE CONSTRUCTED IN ACCORDANCE WITH ADA AND TAS STANDARDS.
14. SIDEWALK CROSS GRADE SHALL HAVE A MAXIMUM SLOPE OF 2%. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
15. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE SHALL BE DEFINED AS THE ALGEBRAIC DIFFERENCE OF THE ADJACENT SURFACE SLOPES. IN THE CASE OF A STREET ACCESS RAMP DESIGNED AT THE 8.33% MAXIMUM SLOPE, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN 2.67% (I.E. 8.33–(–2.67) = 11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 5%.
16. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11%, A LEVELING STRIP, 2 FEET IN LENGTH, SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
17. ADA COMPLIANCE IN ALTERATIONS INCLUDE ONLY THAT WORK WITHIN THE LIMITS, BOUNDARIES OR SCOPE OF A PLANNED PROJECT.



NOTE:

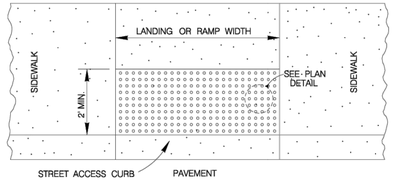
1. INNER SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' MID LANDING. THE EDGE OF THE STREET ACCESS LANDING MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.

TYPICAL SIDEWALK RAMP – TYPE III

SIDEWALK SEPARATED FROM CURB
SCALE : 1" = 10'

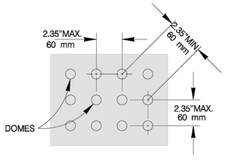
TYPICAL SIDEWALK RAMP – TYPE IV

USED AT TEE INTERSECTIONS WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1" = 10'



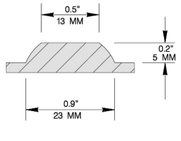
DETECTABLE WARNING SURFACE

SCALE : 1" = 4'



PLAN DETAIL

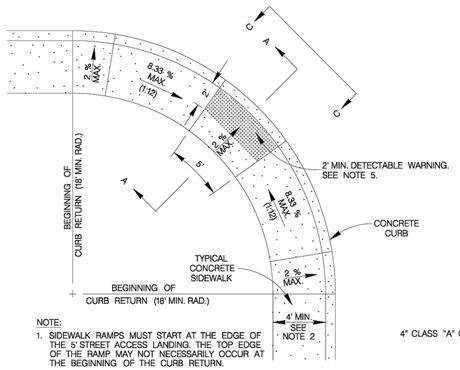
NO SCALE



DOME SECTION

NO SCALE

NOTE:
STAMPED CONCRETE TRUNCATED DOMES WILL NOT BE ALLOWED TO BE USED FOR DETECTABLE WARNING ON WHEELCHAIR RAMPS. CONTRACTOR MUST SUBMIT TRUNCATED DOME INFORMATION THAT IS TO BE USED ON WHEELCHAIR RAMPS TO THE PROJECT MANAGER FOR APPROVAL AT LEAST 30 DAYS PRIOR TO INSTALLATION.

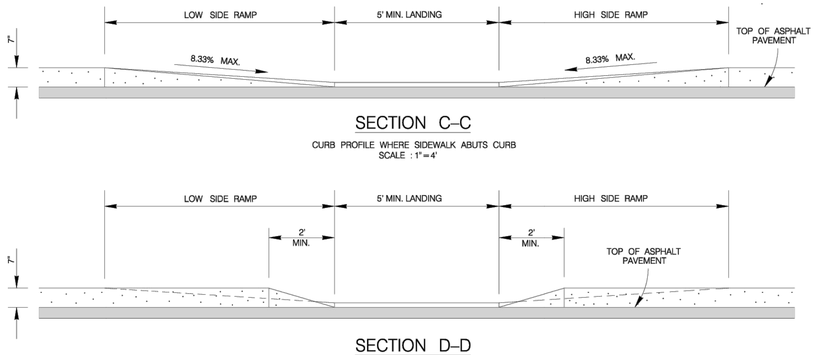


NOTE:

1. SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' STREET ACCESS LANDING. THE TOP EDGE OF THE RAMP MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.
2. TYPE V RAMPS MUST HAVE 18' MIN. RADIUS.

TYPICAL SIDEWALK RAMP – TYPE V

SIDEWALK ABUTS CURB
SCALE : 1" = 10'

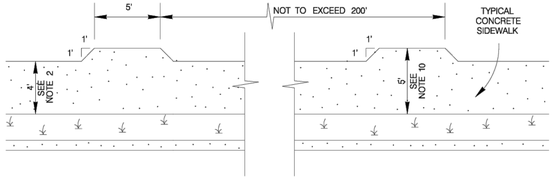


SECTION C–C

CURB PROFILE WHERE SIDEWALK ABUTS CURB
SCALE : 1" = 4'

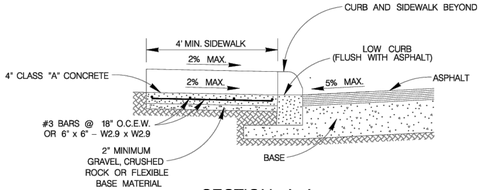
SECTION D–D

CURB PROFILE WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1" = 4'



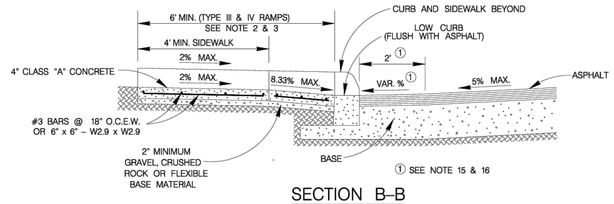
SIDEWALK PASSING SPACE

SCALE : 1" = 10'



SECTION A–A

SCALE : 1" = 4'



SECTION B–B

SCALE : 1" = 4'

TABLE 1 (SEE NOTE 4)		
GUTTER SLOPE	SIDEWALK RAMP LENGTH (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'–6"	7'–2"
2%	5'–0"	8'–4"
3%	4'–6"	10'–0"
4%	4'–2"	12'–6"
5%	3'–10"	16'–8"

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

____% SUBMITTAL	PROJECT NO.:_____	DATE:_____
DRWN. BY: V. VASQUEZ	DSGN. BY:_____	CHKD. BY: R.S. HOSSEINI, P.E.	SHEET NO.:____OF____

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
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P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6

WHEELCHAIR RAMP DETAILS

DATE
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PROJECT NO.
03499.008

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AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
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C7.D3

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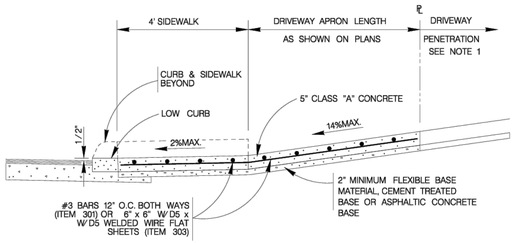
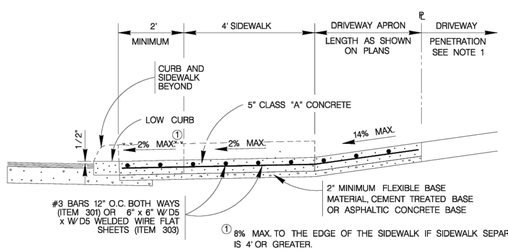


TYPICAL RESIDENTIAL DRIVEWAY SECTION

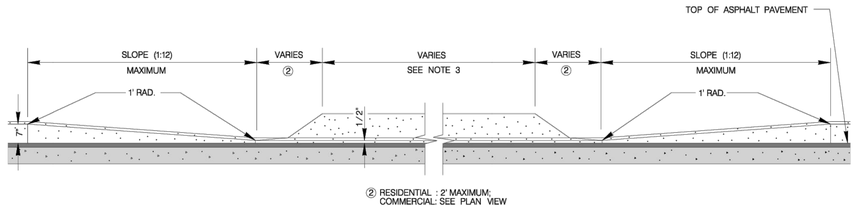
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

TYPICAL RESIDENTIAL DRIVEWAY SECTION

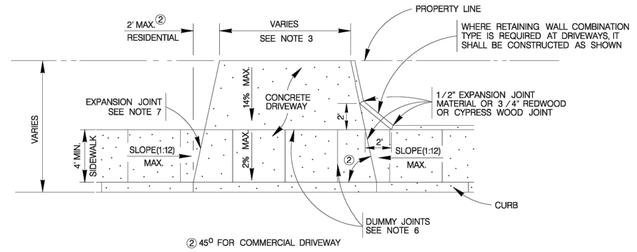
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



② RESIDENTIAL : 2' MAXIMUM; COMMERCIAL: SEE PLAN VIEW

CURB PROFILE AT DRIVEWAY

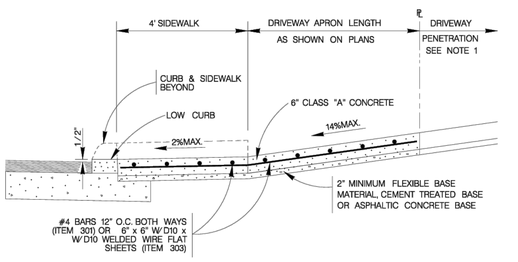
WITH SIDEWALK ABUTTING CURB



② 45° FOR COMMERCIAL DRIVEWAY

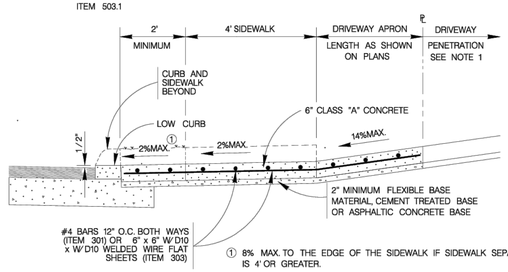
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



TYPICAL COMMERCIAL DRIVEWAY SECTION

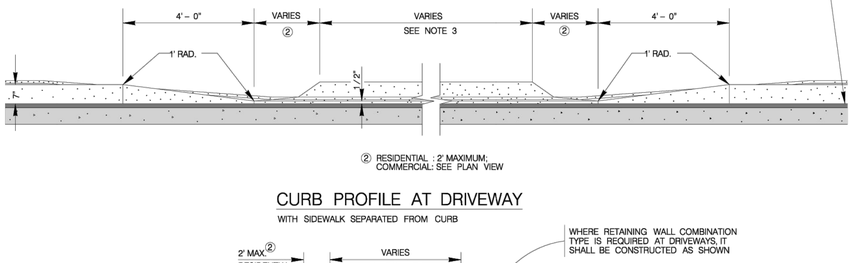
WITH SIDEWALK ABUTTING CURB
ITEM 503.2



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

TYPICAL COMMERCIAL DRIVEWAY SECTION

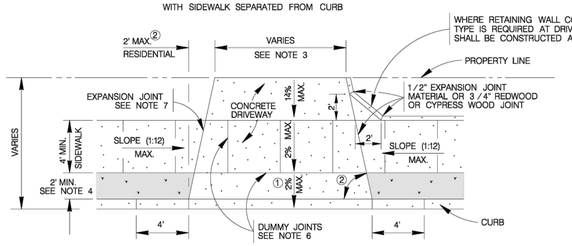
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2



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

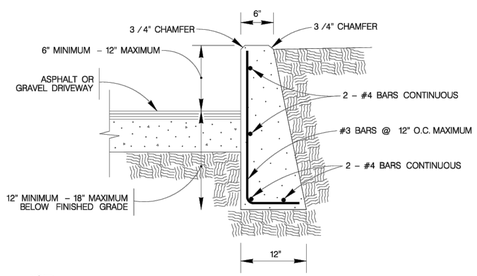
WITH SIDEWALK SEPARATED FROM CURB

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 2' 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 2' 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

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 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6

CONCRETE DRIVEWAY DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C7.D4

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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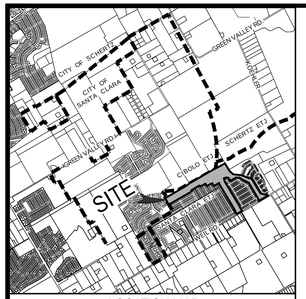


LOCATION MAP N.T.S.

NOTE:

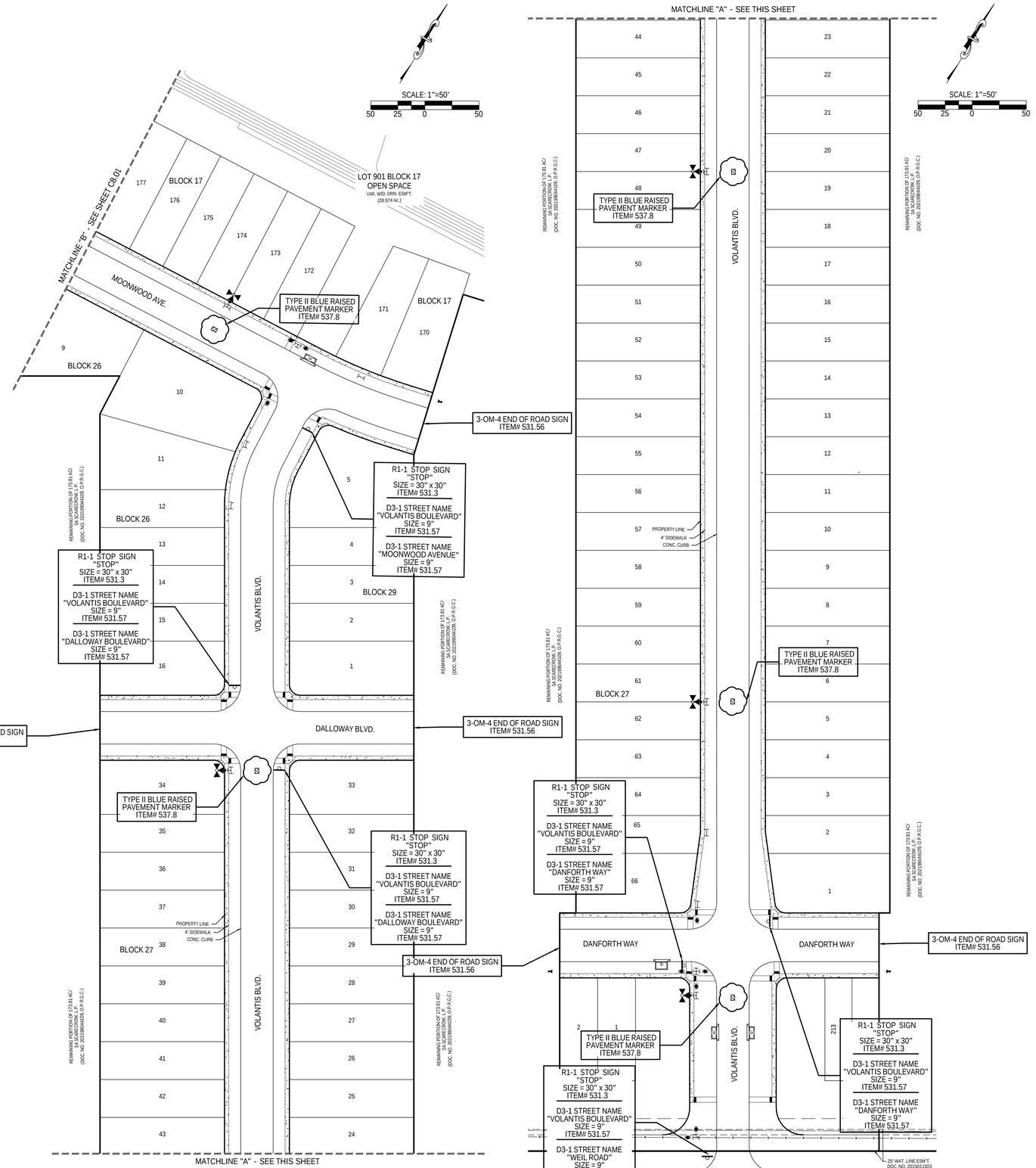
CONTRACTOR TO COORDINATE SIGN PLACEMENT WITH SIDEWALK/ADA RAMP CONSTRUCTION TO AVOID ANY POSSIBLE CONFLICTS.

DEVELOPER:

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

CIVIL ENGINEER:

CUDE ENGINEERS
CONTACT PERSON: CHRIS J. CHAFFEE, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112



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CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P.(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

TRAFFIC SIGNAGE PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C8.00

P:\03499\003-SWDv\Plan\XLAG\C8.00_Traf_Sig_Plan.dwg 2025/05/06 4:13pm bbarrios

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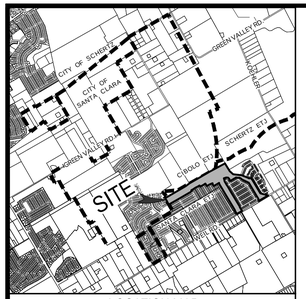

LOCATION MAP N.T.S.

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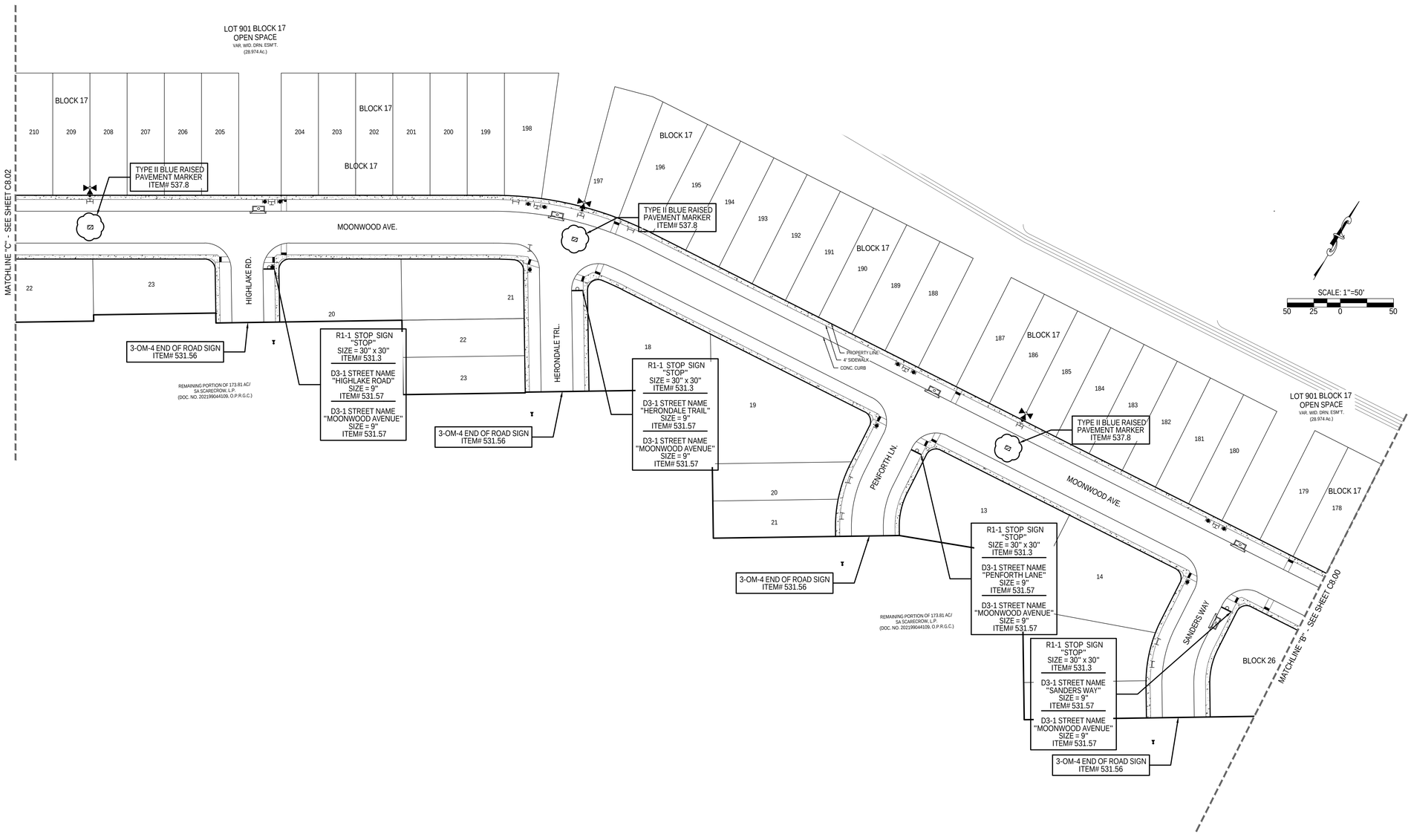

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GRACE VALLEY RANCH PHASE 6

TRAFFIC SIGNAGE PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C8.01

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

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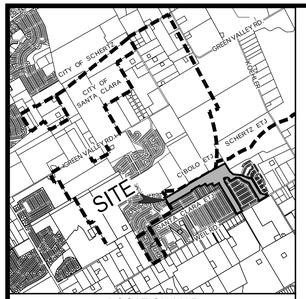

LOCATION MAP N.T.S.

NOTE:

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TEL: (210) 681-2951
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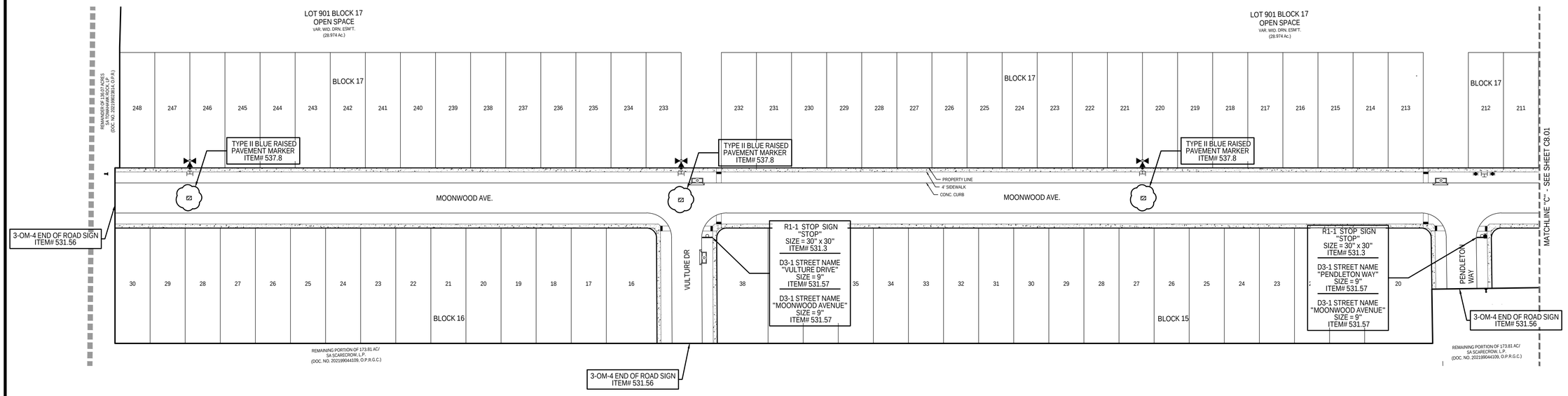
SCALE: 1"=50'
50 25 0 50



CUDEENGINEERS.COM

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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH PHASE 6

TRAFFIC SIGNAGE PLAN

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C8.02

P:\03499\000\2-Docs\Final Plans\03499_TRAF.dwg 2025/05/06 Adam Ramirez

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DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind of this standard is made by the Texas Department of Transportation for any purpose whatsoever. The Department assumes no responsibility for the use of this standard by other persons or for incorrect results or damages resulting from its use.

DATE:
FILE:

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10SMS = 10 SMS Tubing (see SMD(SLIP-1) to (SLIP-3))
- SCH = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

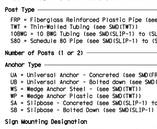
Number of Posts (1 or 2)

Anchor Type
- UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
- UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
- WS = Wedge Anchor Steel - (see SMD(TWT))
- WP = Wedge Anchor Plastic (see SMD(TWT))
- SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab. "Plate" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))

IF REQUIRED
- (EX) or (EXT) = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
- EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

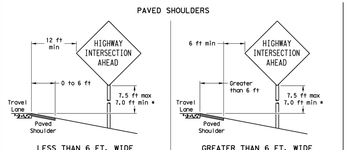
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel pathsl.

SIGN LOCATION

PAVED SHOULDERS



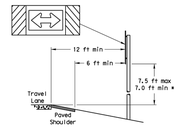
LESS THAN 6 FT. WIDE

When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.

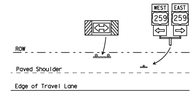
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

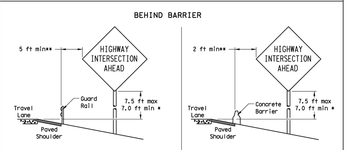
T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL

BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

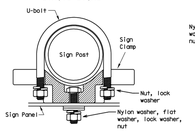
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

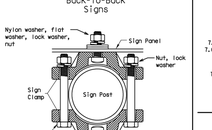
The website address is: http://www.txdot.gov/publications/traffic.htm

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



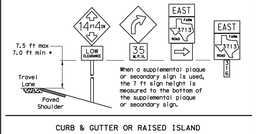
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

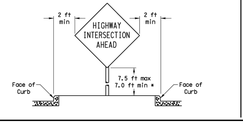
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



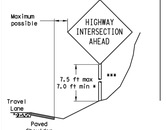
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, fences, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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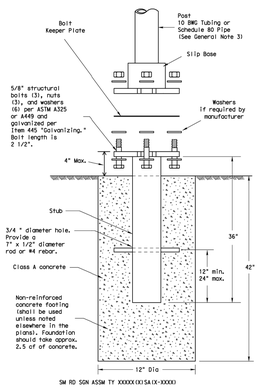
26A

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

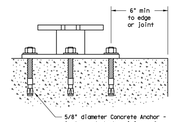
1. Slip base shall be permanently marked to indicate manufacturer. Methods, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post within this system shall conform to the following specifications:
   10 SMS Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   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
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For preacoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the followings:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
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. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the traveleay (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the traveleay. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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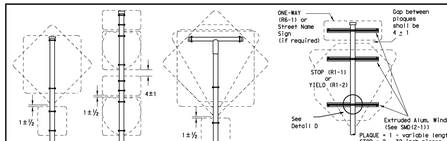
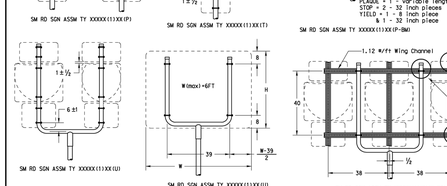
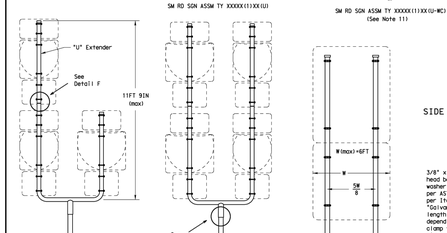
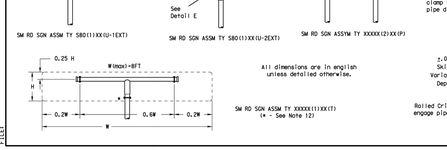
26B



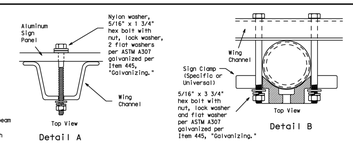


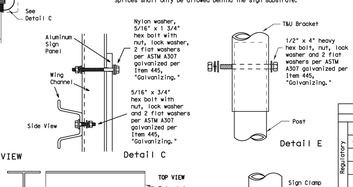




SM RD SGN ASSM TY XXXXX(1)XX(T)
(+ See Note 12)

All dimensions are in english unless detailed otherwise.





FRICTION CAP DETAIL

Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp crevices or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 SMS	1	16 SF
10 SMS	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 SMS where a sign height is abnormally high due to its location.
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 plow, 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. Additional route markers may be added vertically, provided that the total sign height does not exceed the maximum allowable mount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10SMS(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10SMS(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10SMS(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY SB01(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY SB01(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-2)-08

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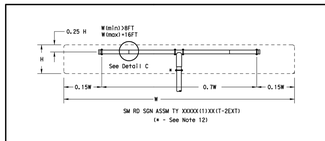
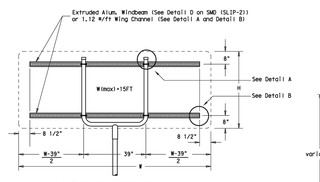
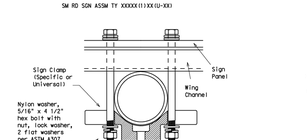
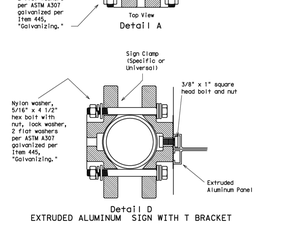
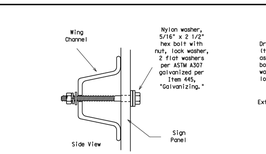
26C

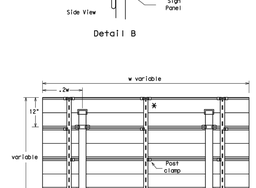




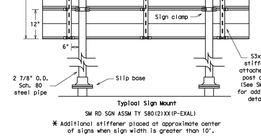


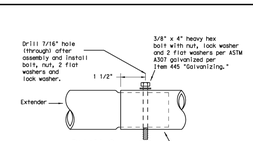


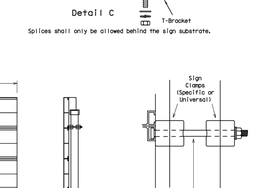


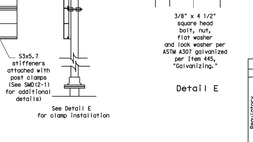


✱ additional stiffener placed at approximate center of signs when sign width is greater than 10'.









GENERAL NOTES:

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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.
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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 plow, 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 10SMS(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10SMS(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10SMS(1)XX(P-BM)
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	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

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CUDEENGINEERS.COM
CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

GRACE VALLEY RANCH
PHASE 6
TXDOT SIGN MOUNTING DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C8.D1

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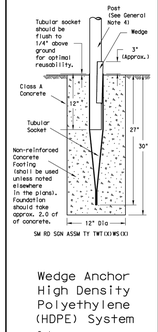
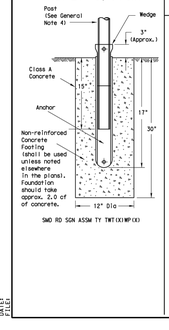
Wedge Anchor Steel System



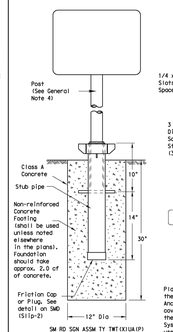
SMD RD SGN ASSM TY TWT(XX)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System



SMD RD SGN ASSM TY TWT(XX)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



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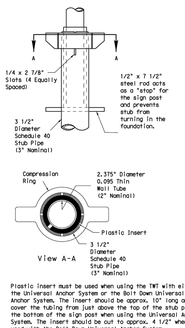
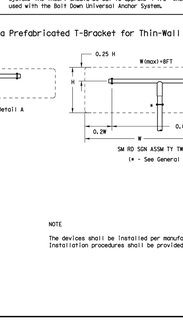
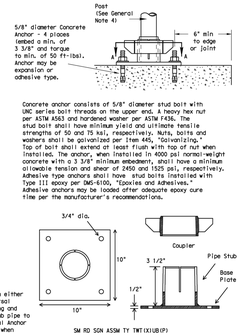




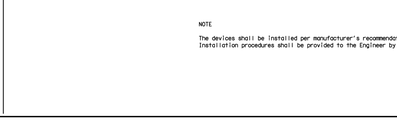
View A-A



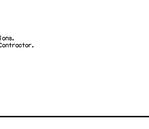
SM RD SGN ASSM TY TWT(XX)UB(P)

Plastic Insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the slip post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



SM RD SGN ASSM TY TWT(XX)XX(T)
(* - See General Note 6)



Detail A

NOTE
The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

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 GMG 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 GMG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be YIELAS Gr 55 per ASTM A1031 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), repair 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(SIGN) 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. Place concrete into hole until it is approximately flush with the ground.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the surrounding ground.
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 1 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(SIGN) 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

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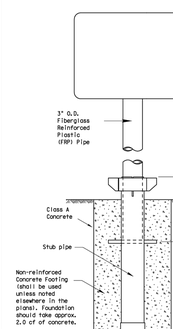
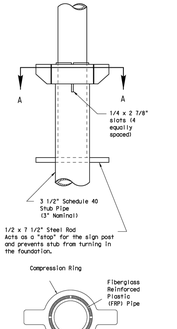
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post

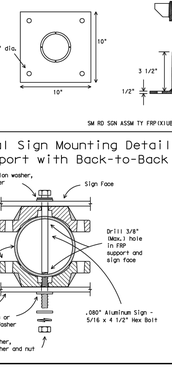


SM RD SGN ASSM TY FRP(XX)UA(P)



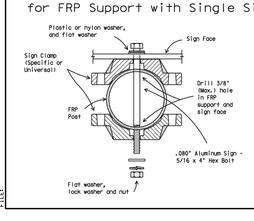
View A-A

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(XX)UB(P)

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs

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 detailed 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(SIGN) 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 should 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

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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

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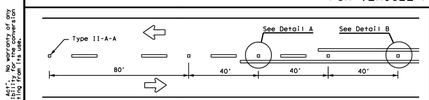
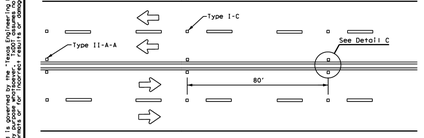
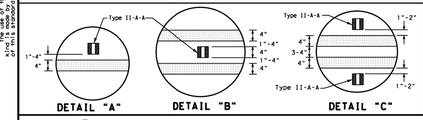
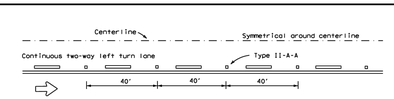


CENTERLINE FOR ALL TWO LANE ROADWAYS

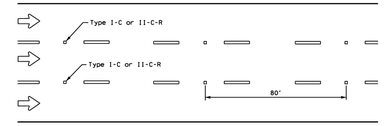


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



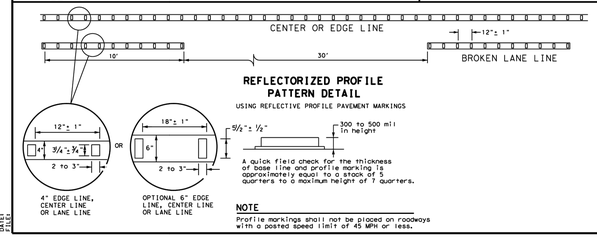


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

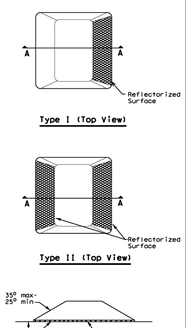


NOTE
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



RAISED PAVEMENT MARKERS

Texas Department of Transportation	Traffic Safety Division Standard
POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20	

FILE: pm2-20.dgn	DW:	CK:	DW:	CK:
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San Antonio, Texas 78231
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GRACE VALLEY RANCH
PHASE 6

TXDOT SIGN MOUNTING DETAILS

DATE
05/06/2025

PROJECT NO.
03499.008

DRAWN BY
AG/BK/SG/RB/JF

CHECKED BY
K.M.H.

REVISIONS
1.
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STATE OF TEXAS
KYLE M. HUDEK
138753
LICENSED
PROFESSIONAL ENGINEER
05/06/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

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