GATEHOUSE SUBDIVISION - UNIT 4

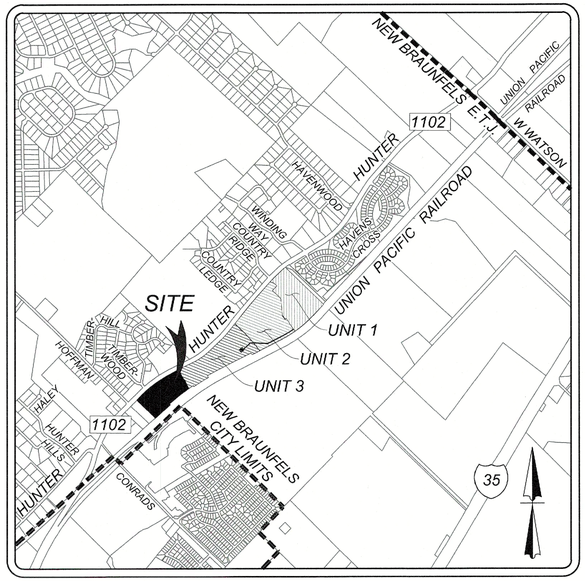
COMAL COUNTY, TEXAS

STREET, DRAINAGE, WATER, SANITARY SEWER & UTILITY IMPROVEMENTS

KYNDWOOD MUNICIPAL UTILITY DISTRICT (MUD)

_____
DISTRICT ENGINEER: KEN HEROY - JONES-HEROY ASSOCIATES, INC.

REVIEW OF THE PLANS BY THE DISTRICT IS LIMITED TO DISTRICT-OWNED FACILITIES, AND DOES NOT INDICATE A REVIEW OF THE ADEQUACY OF THE DESIGN FOR THE FACILITIES. IN APPROVING THESE PLANS, THE DISTRICT MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.



LOCATION MAP
N.T.S.

IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF COUNTY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, COMAL COUNTY MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

FEMA FLOODPLAIN
NO PORTION OF ANY RESIDENTIAL LOTS ON GATEHOUSE SUBDIVISION UNIT 4 ARE IN THE SPECIAL FLOOD HAZARD ZONE ACCORDING TO FEMA FLOOD MAP COMMUNITY PANELS NO. 48091C0290F AND NO. 48091C0295F, DATED SEPTEMBER 2, 2009.

EDWARDS AQUIFER
NO PORTION OF ANY LOTS ON GATEHOUSE SUBDIVISION UNIT 4 ARE LOCATED WITHIN EDWARDS CONTRIBUTING ZONE OR RECHARGE ZONE.
GATEHOUSE SUBDIVISION IS LOCATED WITHIN EDWARDS AQUIFER TRANSITION ZONE.

GAS UTILITY
GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE COUNTY FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.

SEQUENCE OF CONSTRUCTION:

CONSTRUCTION ACTIVITY WILL INCLUDE:

1. INSTALLATION OF TEMPORARY BMP's
2. SITE CLEARING AND GRUBBING ACTIVITIES FOR STREETS.
3. ROUGH SUBGRADE PREPARATION: EARTHWORK, GRADING, STREETS, EXCAVATION AND EMBANKMENT.
4. UTILITY TRENCHING AND INSTALLATION.
5. FINAL STREET PREPARATION, CURBING, AND PAVING ACTIVITIES.
6. HOME CONSTRUCTION.
7. SITE CLEAN UP AND REMOVAL OF TEMPORARY BMP's.

PERMITS OR APPROVALS MUST BE OBTAINED FROM THE FOLLOWING REGULATORY AGENCIES LISTED BELOW:

- **COMAL COUNTY**
- **NEW BRAUNFELS UTILITIES - ELECTRIC**
- **CRYSTAL CLEAR SPECIAL UTILITY DISTRICT - WATER & SEWER**

ANY REVISIONS REQUIRED PER THE REGULATORY AGENCIES THAT CHANGE THE CIVIL SITE PLANS MUST BE SUBMITTED TO COMAL COUNTY FOR ACCEPTANCE.

LEGAL DESCRIPTION
GATEHOUSE SUBDIVISION UNIT 4

A 17.14 ACRE TRACT OF LAND SITUATED IN THE NANCY KENNER LEAGUE SURVEY NO. 3 ABSTRACT 306 COMAL COUNTY, TEXAS AND BEING A PORTION OF THAT CALLED 96.044 ACRE TRACT OF LAND CONVEYED TO LENNAR HOMES OF TEXAS LAND & CONSTRUCTION LTD AND RECORDED IN DOC.# 202206011832 OF THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS.

DEVELOPER INFORMATION:
LENNAR HOMES OF TEXAS
100 NE LOOP 410, STE 1155
SAN ANTONIO, TEXAS 78216
PHONE: (210) 403-6282

KNOW ALL MEN BY THESE PRESENTS:

I, THE UNDERSIGNED, A. NICHOLAS REYNOLDS, A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS, HEREBY CERTIFY THAT PROPER ENGINEERING CONSIDERATION HAS BEEN GIVEN TO THESE PLANS AND ALL ENGINEERING ASPECTS ARE IN COMPLIANCE WITH CITY AND STATE ENGINEERING REGULATIONS AND LAWS.

REGISTERED PROFESSIONAL ENGINEER
P.E. REGISTRATION NO. 111666

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
3/14/25
P.E.

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: 1-14809
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: COVER SHEET

SHEET TITLE: COVER SHEET

SHEET NUMBER: 0.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Mar 13, 2025, 1:09pm User ID: tmiller
File: U:\Projects\314.x32\06 Design\Civil\COVER\COVER SHEET.dwg
Plotted on 24x36 (Landscape) by SHEET

Standard Construction Notes

1. Any deviation from the construction plans, drawings, or specifications for roads, drainage, or other improvements must have prior approval by the County Engineer. The engineer of record must request approval of any change in writing addressed to the County Engineer.

2. The most current editions of the City of New Braunfels Standard Details, City of San Antonio Standard Specifications and the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges shall be followed for all construction except as amended by the Comal County Subdivision Regulations.

3. Street subgrade and base density control shall be in accordance with the Comal County Subdivision Regulations.

4. All roadway compaction tests shall be the responsibilities of the Developer's Geo-technical Engineer. Each layer of material shall be compacted as specified and tested for density in accordance with the Comal County Subdivision Regulations.

5. All responsibility for the adequacy of these plans remains with the engineer of record. In accepting these plans, Comal County must rely upon the adequacy of the work of the engineer of record.

6. It is the Contractor's responsibility to see that all temporary and permanent traffic control devices are properly installed and maintained in accordance with the latest edition of the Texas Manual on Uniform Traffic Control Devices. If, in the opinion of the engineering representative and the construction inspector, the barricades and signs do not conform to established standards or are incorrectly placed or are insufficient in quantity to protect the general public, the construction inspector shall have the option to stop operations until such time as the conditions are corrected. If the need arises, additional temporary traffic control devices may be ordered by the Engineering representative at the Contractor's expense.

7. A TxDOT Type II B-B blue reflective raised pavement marker shall be installed in the center of the roadway adjacent to all fire hydrants. In locations where longitudinal pavement markings are used, reflective raised pavement markers shall be installed on both approaches which front the hydrant. The raised pavement marker shall meet TxDOT material, epoxy and adhesive specifications.

8. **Groundwater**
It shall be the responsibility of the developer, contractor, subcontractors, builders, Geo-technical engineer, and project engineer to immediately notify the Office of the County Engineer and project engineer if the presence of groundwater within the site is evident. All construction activity, impacted by the discovery of groundwater, shall be suspended until the County Engineer grants a written approval of the groundwater mitigation plan.

9. **Finished Floor Elevations**
The elevation of the lowest floor shall be at least 10 inches above the finished grade of the surrounding ground, which shall be sloped in a fashion so as to direct stormwater away from the foundation. Properties adjacent to stormwater conveyance structures must have floor slab elevation or bottom of floor joists a minimum of one foot above the 100-year water flow elevation in the structures. Driveways serving houses on the downhill side of the street shall have a properly sized cross swale preventing runoff from entering the garage.

10. **Signing and Pavement Marking Plan Notes**
Comal County will install county road signs and invoice the owner. The contractor is to install pavement markings. All road signs and pavement markings shall be installed in accordance with the approved engineering plans. The County will inspect all signs at final inspection.

The contractor shall install all pavement markings in accordance with approved engineering plans. The contractor shall notify the County at least 24 hours prior to the installation of all sealer and final markings. The County will inspect all markings at final application.

11. **Seeding and Establishment of Vegetation within Earthen Channels, Stormwater Basins and Disturbed Areas**
Seeding for the purpose of establishing vegetation within constructed earthen channels, basins and disturbed areas shall be conducted in accordance with Item 164 (Seeding for Erosion Control of TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges manual. Only seed types and mixes specified for the San Antonio District (District 15 in Tables 1 and 2 under Item 164 shall be utilized. During the Cool Season (Sept 1-Nov 30, Cereal Rye and seed species specified for the San Antonio District in Table 3 may be used. For Cool Season seeding applications, cool season seed mixes shall be used in conjunction with seed mixes for the San Antonio District as specified in Table 1 and 2 under Item 164.

It may be deemed necessary to incorporate topsoil and soil amendments (i.e. compost/ fertilizer into existing soil in order to facilitate vegetation growth. Topsoil, compost and fertilizer additions shall be conducted according to Items 160, 161 and 166 of TxDOT's Standard Specifications manual, respectively.

Areas requiring permanent vegetation (earthen channels, ponds, etc.) are required to meet TxDOT Specifications for Item 160 Topsoil. Testing per Tex-128-E will be required at the County's request.

Watering may also be necessary to facilitate and expedite the sprouting and growth of vegetation. Item 168 of TXDOT's Standard Specifications manual shall be adhered to for vegetative watering.

12. Excess materials, equipment, fill, or spoils shall not be places within any designated flood plain.

REV. 01/2025

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WASTEWATER NOTES

1. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING THE WASTEWATER SYSTEM AT ALL TIMES DURING CONSTRUCTION.
2. A MINIMUM OF 8" WASTEWATER PIPE AND FITTINGS (P.V.C. SDR-26, ASTM, D3034, D-3212, F-477) ARE REQUIRED ON NEW INSTALLATION.
3. ALL RESIDENTIAL WASTEWATER SERVICE LATERALS SHALL BE EXTENDED TO THE PROPERTY LINE AND A CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE. SERVICES TO LOTS WILL EXTEND FOUR (4) FEET PAST THE UNDERGROUND ELECTRIC CONDUIT IF ELECTRIC IS INSTALLED IN THE FRONT EASEMENT. ALL SEWER CLEANOUTS THAT LEAD TO CCSUD MAINS SHALL BE INSTALLED WITH A PROTECTIVE UTILITY SHROUD AND PIVOTING MARKER POLE DURING TIME OF CONSTRUCTION.
4. PIPE BEDDING MATERIAL OF WASTEWATER MAINS SHALL BE COMPOSED OF WELL-GRADED, CRUSHED STONE, OR GRAVEL PER SECTION 01230 OF CCSUD'S SPECIFICATIONS.
5. SECONDARY AND GENERAL BACKFILL OF WASTEWATER MAINS SHALL BE APPROVED SOIL MATERIALS FOR BACKFILL AND FILL, FREE OF CLAY, ROCK, OR GRAVEL LARGER THAN 2-INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETABLE, AND OTHER ORGANIC MATTER AND DELETERIOUS MATERIALS, PREVIOUSLY EXCAVATED MATERIALS MEETING THESE REQUIREMENTS MAY BE USED FOR BACKFILL.
6. ALL WASTEWATER MAINS SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 30 TAC §217.53 (C) (2).
7. FOR WASTEWATER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL SHALL BE PLACED IN TWO LIFTS.
   a. THE FIRST LIFT SHALL BE SPREAD UNIFORMLY AND SIMULTANEOUSLY ON EACH SIDE AND UNDER THE SHOULDERS OF THE PIPE TO THE MID POINT OR SPRING LINE OF THE PIPE.
   b. THE SECOND LIFT SHALL BE PLACED TO A DEPTH AS SHOWN ON THE PIPE BACKFILL DETAIL. MAINS LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.
8. ALL MANHOLES MUST BE WATERTIGHT, EITHER MONOLITHIC, CAST-IN-PLACE CONCRETE STRUCTURES OR PREFABRICATED MANHOLES SPECIFICALLY APPROVED BY CCSUD. THE MANHOLES SHALL HAVE WATER-TIGHT RINGS AND COVERS, WHEREVER THEY ARE WITHIN THE 100 YEAR FLOODPLAIN, THE MANHOLE COVERS SHALL BE BOLTED. EVERY THIRD MANHOLE IN SEQUENCE SHALL HAVE AN ALTERNATE MEANS OF VENTING. 30 TAC §213.5 (C) (3) (A) AND 30 TAC §217.55 (C).
9. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS TWO INCHES (2") ABOVE SURROUNDING GROUND EXCEPT WHEN LOCATED IN PAVED AREA. IN PAVED AREAS, THE MANHOLE RING SHALL BE FLUSH WITH PAVEMENT.
10. ALL NEW MANHOLES, UNLESS APPROVED BY CCSUD, ARE TO HAVE COVERS WITH 32" OPENINGS.
11. WASTEWATER MAIN CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL 'BOOT TYPE" JOINT AS APPROVED BY CCSUD.
12. WASTEWATER MAINS SHALL BE TESTED FROM MANHOLE TO MANHOLE.
13. IN AREAS WHERE A NEW WASTEWATER MANHOLE IS TO BE CONSTRUCTED OVER AN EXISTING WASTEWATER SYSTEM, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TEST THE EXISTING MANHOLES BEFORE CONSTRUCTION. AFTER THE PROPOSED MANHOLE(S) HAS BEEN BUILT, THE CONTRACTOR SHALL RE-TEST THE EXISTING SYSTEM TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR. (NO SEPARATE PAY ITEM).
14. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN WASTEWATER LINES AND WATER LINES CANNOT BE MAINTAINED, THE INSTALLATION OF WASTEWATER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ. THE WASTEWATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC MEETING THE ASTM SPECIFICATION FOR BOTH PIPES AND JOINTS OF 160 PSI AND SHALL BE IN ACCORDANCE WITH 30 TAC § 217.53 (D) AND 30 TAC § 290.44 (E).
15. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE WASTEWATER LINES. THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
   a. PULL MANDREL
   b. PERFORM AIR TEST
   c. CLEANING OF ANY DEBRIS
   d. FLUSHING OF SYSTEM
   e. TV INSPECTION (WITHIN 72 HOURS OF FLUSHING)
16. A MINIMUM OF 3 FEET OF COVER IS TO BE MAINTAINED OVER THE WASTEWATER MAIN AND LATERALS AT SUBGRADE, OTHERWISE CONCRETE ENCASEMENT WILL BE REQUIRED.
17. TCEQ AND EPA REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF WASTEWATER COLLECTION SYSTEMS. DEVELOPER OR AUTHORIZED REPRESENTATIVE SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL AS NOTES ON THE PROJECT'S PLAN AND PROFILE SHEETS. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY CCSUD.
18. ALL MANHOLES NOT WITHIN PAVED STREETS SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER CCSUD DETAIL DRAWING #329.
19. ALL MANHOLES OVER THE EDWARDS AQUIFER RECHARGE ZONE SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER CCSUD DETAIL DRAWING #329.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS SHALL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY CCSUD INSPECTOR/TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT 400 LINEAR FEET AT A MINIMUM. PERMITS WILL NOT BE ACCEPTED AND FINALIZED BY CCSUD WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

REV. 01/2025

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WATER MAIN NOTES

1. CONSTRUCTION OF ALL CCSUD WATER UTILITY INFRASTRUCTURE MUST ADHERE TO CCSUD'S TECHNICAL SPECIFICATIONS, DETAILS AND APPROVED EQUIPMENT LIST.
2. REMOVE ONLY VEGETATION, TREES, STUMPS, RUBBISH, AND OTHER MATERIAL NECESSARY FOR CONSTRUCTION AND DISPOSE OF OFF SITE.
3. THE CONNECTION LOCATIONS LISTED IN THE PLANS ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL FIELD LOCATE EXISTING WATER MAIN LOCATIONS AT ALL TIE-IN LOCATIONS TO VERIFY SIZE, ELEVATION, AND MATERIAL PRIOR TO ORDERING MATERIALS FOR CONNECTION.
4. THE CONTRACTOR SHALL MAINTAIN MINIMUM SEPARATION BETWEEN UTILITIES PER TCEQ STANDARDS.
5. UNLESS OTHERWISE SPECIFIED, ALL PVC WATER MAINS SHALL BE C900/C905 DR 18, COLORED BLUE.
6. ALL DUCTILE IRON WATER MAINS SHALL BE PRESSURE CLASS CONFORMING TO AWWA C151 AND CEMENT LINED.
7. WATER MAINS SHALL BE RESTRAINED WITH RESTRAINT LENGTHS OF FITTINGS SHOWN IN PLANS. THRUST BLOCKING IS REQUIRED AT ALL FITTINGS AND BENDS IN ACCORDANCE WITH THE THRUST BLOCKING DETAIL PROVIDED AND SPECIFICATION SECTION 02669 - JOINT RESTRAINTS AND THRUST BLOCKING.
8. LOCATIONS OF COMBINATION AIR VALVES SHOWN ARE APPROXIMATE. INSTALL AIR RELEASE VALVES AT THE HIGH POINT IN THE WATER MAIN FOR THE LOCATIONS GIVEN.
9. THE CONTRACTOR SHALL COORDINATE PRESSURE TESTING OF NEW WATER MAINS WITH OWNER AND ENGINEER AT LEAST TWO BUSINESS DAYS PRIOR. PRESSURE TESTING REQUIREMENTS ARE INCLUDED IN THE SPECIFICATIONS.
10. ALL WATER MAINS SHALL BE DISINFECTED PER AWWA AND TCEQ STANDARDS.
11. THE OWNER SHALL SUPPLY ALL WATER NEEDED FOR CONSTRUCTION TESTING AND DISINFECTION. THE CONTRACTOR SHALL NOT BE REQUIRED TO PAY FOR THIS WATER.
12. UNLESS NOTED OTHERWISE, ALL WATER MAIN P.I.'S SHALL BE ACHIEVED USING THE WATER MAIN MANUFACTURER'S ALLOWABLE JOINT DEFLECTION
13. WATER MAINS, FIRE HYDRANTS, APPURTENANCES, AND VALVES THAT ARE ABANDONED SHALL BE CUT AND PLUGGED PER SPECIFICATION SECTION 02950 - ABANDONMENT OF WATER INFRASTRUCTURE.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY CCSUD INSPECTOR/TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT 400 LINEAR FEET AT A MINIMUM. PERMITS WILL NOT BE ACCEPTED AND FINALIZED BY CCSUD WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

"TxDOT CONSTRUCTION GENERAL NOTES"

1. "The design and construction will provide for preserving all existing features in or near the State Right Of Way being affected by the widening. This includes but is not limited to, existing driveway gate set-backs, relocation of electronic private property gates, mailbox turnouts, mail boxes and supports, cattle guards, roadway signing, existing rip-rap or other permanent erosion control features, diversionary berms, swales, ditches, amount and configuration of driveway flares and driveway centerline profile, metal beam guard fence and end treatments, etc.. Existing driveway culverts and safety end treatments if effected by roadway widening will be reconstructed to preserve existing front slope rates. The coordination of items that effect existing private property access, mail delivery, etc. is the responsibility of the developer. The written concurrence of any effected property owners for construction effecting their driveways or mailbox turnouts must be obtained and provided TxDOT prior to TxDOT driveway permits being issued."

2. "For work in State Right Of Way, the developer is responsible for coordination of, obtaining permits for, and complying with any and all state and federal regulatory agencies and all applicable laws, rules and regulations pertaining to the regulation of drainage, preservation of cultural resources, natural resources and the environment. The developer is responsible for determining if the project is in an environmentally sensitive area such as within the recharge or contributing zone of protected aquifers, and act in accordance with all resource agency regulations."

If TxDOT has a CZP or WPAP on file with TCEQ, the developer is responsible for amending TxDOT's permit, obtaining TCEQ approval and providing TxDOT with the approved amended permit. The amended permit will address the relocation of any TxDOT permanent BMP's including vegetative filter strips that may be impacted by work done within TxDOT ROW. "

If TxDOT does not have a CZP or WPAP on file with TCEQ, any permanent BMP's including vegetative filter strips, that may be required in order to treat additional impervious cover placed in TxDOT ROW will be located in private property and the developer will provide TxDOT with evidence of TCEQ approval of the additional impervious cover."

The developer may not operate under resource agency environmental clearance of a previous or ongoing TxDOT project, but will be required to obtain separate resource/environmental agency clearance."

3. "If waste areas or material source areas result from this project, the Contractor is reminded to follow the requirements of the Texas Aggregate Quarry and Pit Safety Act. In addition, it is requested that these areas not be visible from any highway on the State system."

3.5. "Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered uncamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface traffic signs so that they will not reappear in public as signs."

4. "Any trees existing within State Right Of Way are the natural resources of the State and will be protected. In the event that trees must be removed, TxDOT written permission will be received in advance and will identify the specific trees by species, diameter and location to be removed. The developer will be fined for any unpermitted removal of trees."

4.5. "In the event that there are areas of public ROW dedication resulting from the platting process, the area within the public ROW dedication does not pass into TxDOT ownership as a result of platting. However, the developer will remove any old fencing, gates and unsightly vegetation within the area of the ROW dedication, leaving it in an aesthetically pleasing condition. The Area of ROW dedication will not be mowed or otherwise maintained by TxDOT. Prior to removal of trees in the area of ROW dedication, the trees will first be evaluated in accordance with the requirements of local tree protection ordinances and the written concurrence of the local jurisdiction will be provided to TxDOT."

5. "The developer will maintain at the project site, and make available upon request, copies of all approved environmental plans and permits relating to work in State Right Of Way."

6. "Prior to beginning grading activity the contractor will set and maintain roadway stationing, control points, marks, stakes to establish lines, slopes, grades and centerlines."

7. "Any slopes in State Right Of Way which become steeper than 3:1 as a result of the work will be treated with 4" thick reinforced concrete riprap and be treated with metal beam guard fence. This may entail additional rip-rap beyond that shown in the plans."

7.5. "Unless otherwise shown on the plans, where existing concrete rip-rap is removed, modified or extended, the portion to be removed will be neatly saw-cut prior to removal and the new rip-rap will be formed to match the existing lines and grades of the existing rip-rap and will be doweled into the existing rip-rap with #3 bars on 12" centers. The dowel bars will be epoxied in place with epoxy meeting TxDOT requirements. The minimum embedment length is 9 inches. This applies to any type of concrete rip-rap including metal beam guard fence or cable barrier mow strips. "

8. "DUANE HOFFERICHTER (830) 609-0707 NEW BRAUNFELS, TRAVIS YOUNG (830) 303-0130 SEGUIN, CHAD LUX (830) 816-2430 BOERNE, MARK ANDREWS (830) 393-3144 FLORESVILLE, TXDOT MAINTENANCE OFFICE WILL BE CONTACTED BY THE CONTRACTOR 48 HOURS PRIOR TO WORK OCCURRING IN STATE RIGHT OF WAY."

9. "State Right Of Way will not be used as an area for contractor parking or for staging the receipt of materials or equipment."

10. "Traffic control and construction barricades will meet the requirements of the Texas MUTCD."

11. "The contractor will provide advance notification to the engineer of impending/upcoming lane closures for all temporary and/or permanent lane, ramp, connector, frontage, shoulder, median crossover, etc. closures or detours."

12. "Access to adjoining property must be maintained at all times."

13. "Unless otherwise noted in the plans and/or as directed by the area engineer or maintenance supervisor, daily lane closures shall be limited according to the following restrictions:

Nighttime: Maintenance Supervisor and/or Area engineer approval required. (with uniformed off duty law enforcement officers).

Weekend Closures: Maintenance Supervisor and/or Area engineer approval required."

14. "No lane closures or roadway closures will be permitted for the following key dates and/or special events:

Between December 15 and January 1.
Wednesday before Thanksgiving thru the Sunday after Thanksgiving.
Saturday and Sunday before Memorial Day and Labor Day.
Saturday or Sunday when July 4 falls on a Friday or Monday."

15. "At no time will the roadway travel way be blocked"

16. "Lane closures will only be permitted with 48 hour prior approval of the TxDOT Maintenance Supervisor. Lane closures will be permitted only between 9:00 a.m. and 4:00 p.m. Monday through Friday."

16.5. "For lane closures on two-lane two-way roadways, including during pilot car operations, flaggers will be placed at the beginning and end of the work zone as well as at each individual driveway and side road intersection within the limits of the work zone and extending for a minimum of the beginning of advanced warning signs either end of the work zone to control, warn and direct side road and driveway traffic of the change in traffic operations. Whenever one way traffic control is accomplished by traffic signals work zone flaggers will be similarly stationed at each individual driveway and side road intersection within the limits of the work zone and extending for a minimum of the beginning of the advanced warning signs either end of the work zone. All flaggers will be in constant radio contact."

17. "A minimum 3:1 (H:V) temporary safety slope of stable compacted material will be required adjacent to the State highway edge of pavement at all times during non working hours."

18. "Only one side of the roadway will be open to construction at a time. Work will be completed and pavement edges backfilled on one side of the road before work will begin on the opposite side of the roadway.

19. "All milling, paving and seal coat operations shall proceed in the direction of traffic."

20. "Any pavement edge drop-offs between 1 and 2 inches in height will have CW 8-11 warning signs. Any pavement edge drop-off 2 inches or greater will have a 3:1 compacted safety slope and CW 8-9a or CW 8-11 signs plus channelizing devices. Pavement edges will be shouldered up with compacted embankment material and 4 inches of topsoil as soon as possible after paving is completed on the side of the road being widened."

21. "Proof rolling of subgrade is required and shall be witnessed by TxDOT prior to placement of pavement structure unless otherwise approved by the TxDOT Maintenance Supervisor. The requirement for proof-rolling of subgrade is not superseded by any other requirements including those of any Geotechnical Report. "

22. "All Flexible Base will have a minimum Plasticity Index of 4."

23. "All courses of asphaltic concrete pavement (regardless of type) will be placed with a asphalt paving equipment meeting the requirements of TxDOT Item 320, "Equipment for Asphalt Concrete Pavement", unless otherwise approved by the Maintenance Supervisor."

24. "All surface aggregates will meet the requirements of TxDOT friction classification "B" and will meet PG Binder grade 70-22."

25. "All surface Asphalt Concrete Pavement will be under-sealed with a One Course Surface Treatment."

26. "All Asphaltic Concrete Pavement used in base courses will be Type "A" or "B" and will meet PG binder grade 64-22."

27. "All pavement widening including shoulders will match the existing pavement cross slope."

28. "All pavement markings will be Type I thermoplastic (100 mil) with under-seal meeting the requirements of TxDOT Item 666, Reflectorized Pavement Markings. The contractor will place guide marks in accordance with Item 666 and will make arrangements for TxDOT inspection of the pavement marking layout prior to placement of striping. Equipment used for the placement of striping will meet the production requirements of Item 666 unless otherwise approved in advance by the TxDOT Maintenance Supervisor."

29. "Existing pavement markings that conflict with proposed pavement markings will be lightly ground in a manner that does not damage the pavement surface, to remove any pavement marking accumulation, and will be covered with a strip seal of 18" minimum width, consisting of precoated grade 5, friction class B aggregate."

30. "All materials and construction methods used in State Right Of Way will meet TxDOT specifications. This supersedes all other specifications in the plans."

31. "All turn lane concrete pavement in state ROW will meet the requirements of TxDOT Item 360 Class P concrete and will be batched at concrete plants having a current approved mix design. Class P concrete shall have 7 and 28 day compressive strength of 3200 psi and 4400 psi respectively."

32. "When widening existing concrete pavements, joints in the new pavement will match joints in existing pavement and curb."

33. "The contractor is responsible for ensuring that TxDOT approved materials, mix designs, approved sources and products are used for all work in state ROW. The contractor will arrange for the services of a qualified testing laboratory for all items requiring testing and will notify TxDOT of any discrepancies between test results and TxDOT specs in a timely manner. The contractor will provide to TxDOT invoices and testing results as soon they are available. Failure to do this will result in rejection of the work."

34. "Sawing of contraction/construction joints in concrete pavement will be accomplished as soon as personnel can walk on the concrete without damaging the surface regardless of time of day or weather conditions. Stand-by power driven concrete saws will be provided during the sawing operation. Curing compound will be re-applied to the sawed joint immediately upon sawing the joint."

35. "Guardrail SGT's will be type 3 unless otherwise approved by the TxDOT Maintenance Supervisor. Guardrail mow strip placed adjacent to other concrete rip-rap will be separated by a formed construction joint."

36. "Any concrete curb to be removed will be saw-cut at the limits of removal and be removed entirely. Slicing the top portion of the curb off and leaving remaining portion of curb in place is unacceptable. "

37. "Any damage to TxDOT facilities will be repaired at no expense to the State, to TxDOT's satisfaction."

38. "Sidewalks placed in the highway right-of-way will be a minimum width of five feet or comply with the more stringent width as required by city ordinance and will meet all other requirements of the Americans with Disabilities Act. Pedestrian ramps will be provided at street and driveway intersections as shown on the current State Standard for Pedestrian Facilities. Color contrast and texturing of pedestrian ramps will be place at street intersection ramps only as shown on the current State Standard for Pedestrian Facilities. Pedestrian ramps at driveway intersections will not receive any color contrast or texturing. Metal plating for sidewalk bridges will match the typical width of the approach sidewalk. His may result in a width that is greater than shown in the standard details included in the plans."

39. "The contractor will use Best Management Practices (BMP's) to minimize erosion and sedimentation in the State Right Of Way resulting from the proposed construction. Re-vegetation of disturbed areas will be completed in accordance with TxDOT Standard Specifications. Permanent vegetative cover must achieve 70% coverage prior to project acceptance. Soil Retention Blankets may be required to prevent erosion of topsoil prior to vegetation re-establishment"

40. "Prior to seeding or re-vegetation the front slopes will be shouldered up with topsoil to eliminate any pavement edge drop-off."

41. "Mud tracked onto the roadway from the site will be immediately removed to the satisfaction of TxDOT."

42. "It will be the developer/owner's responsibility to clean out, to the state's satisfaction, any drainage structure or storm sewer system that becomes silted as a result of their operations."

43. "The adjustment of any utilities in State Right Of Way or adjacent private easement will be the responsibility of the developer/owner's."

44. "The contractor is responsible for placing and maintaining existing signs on TxDOT approved temporary mounts until permanent signs are placed."

45. "The final placement of permanent signs will be coordinated prior to placement with the local TxDOT Maintenance Supervisor."

46 "For work within the State Right Of Way where removal of materials or debris within the construction limits and not incorporated in the finished roadway section of right of way, will be disposed of in a manner acceptable to the Maintenance Supervisor at no expense to the State. Materials that are not determined to be salvageable by the Maintenance Supervisor become the property of the Contractor for proper disposal at their expense. Materials determined to be salvageable will be returned to the State and delivered to the location as determined by the Maintenance Supervisor."

47. "Regardless of errors and omissions in information provided in the plans or cross-sections the permitee is responsible for providing for positive drainage outfalls within and off the limits of the project."

48. (**For Work in City of New Braunfels**) "All traffic signals on the state highway system within the New Braunfels city limits, with the exception of signals on IH 35, are the responsibility of the City of New Braunfels and the City of New Braunfels will perform construction inspection. Contact Garry Ford, P.E. at (830) 221-4645, 48 hours prior to the need for any inspections. Also when non-traffic signal work is being performed within 400 feet of an existing signalized intersection, flashing beacon or school zone flasher or other type of signal; if within the City of New Braunfels area of responsibility contact Garry Ford, P.E. to determine/verify the location of loop detectors, conduit, ground-boxes, etc. For all other locations, contact TxDOT representative, Mike Garza, at (210) 615-6028, e-mail is Mike.Garza@txdot.gov. The contractor is responsible for repair or replacement of any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work. When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations."

49. (**For areas other than City of New Braunfels**) "When non-traffic signal work is being performed within 400 feet of an existing signalized intersection, flashing beacon or school zone flasher or other type of signal, contact TxDOT representative, Mike Garza, at (210) 615-6028, e-mail is Mike.Garza@txdot.gov. The contractor is responsible for repair or replacement of any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, TxDOT reserves the right to perform the repair or replacement work and the Contractor will be billed for this work. When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations."

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ORGANIZED SEWAGE COLLECTION SYSTEM (SCS)
GENERAL CONSTRUCTION NOTES

1. *THIS ORGANIZED SEWAGE COLLECTION SYSTEM (SCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C) AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.*
2. *ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS MUST BE REQUIRED TO KEEP ON-SITE COPIES OF THE PLAN AND THE APPROVAL LETTER.*
3. *A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:*
   - *THE NAME OF THE APPROVED PROJECT;*
   - *THE ACTIVITY START DATE; AND*
   - *THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.*
4. *ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED SCS APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF AN SCS APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.*
5. *PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.*
6. *IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERED. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING AND THE APPLICANT MUST SUBMIT A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT CONTINUE UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.*
7. *SEWER LINES LOCATED WITHIN OR CROSSING THE 5-YEAR FLOODPLAIN OF A DRAINAGE WAY WILL BE PROTECTED FROM INUNDATION AND STREAM VELOCITIES WHICH COULD CAUSE EROSION AND SCOURING OF BACKFILL. THE TRENCH MUST BE CAPPED WITH CONCRETE TO PREVENT SCOURING OF BACKFILL, OR THE SEWER LINES MUST BE ENCASED IN CONCRETE. ALL CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES.*
8. *BLASTING PROCEDURES FOR PROTECTION OF EXISTING SEWER LINES AND OTHER UTILITIES WILL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION CRITERIA. SAND IS NOT ALLOWED AS BEDDING OR BACKFILL IN TRENCHES THAT HAVE BEEN BLASTED. IF ANY EXISTING SEWER LINES ARE DAMAGED, THE LINES MUST BE REPAIRED AND RETESTED.*
9. *ALL MANHOLES CONSTRUCTED OR REHABILITATED ON THIS PROJECT MUST HAVE WATERTIGHT SIZE ON SIZE RESILIENT CONNECTORS ALLOWING FOR DIFFERENTIAL SETTLEMENT. IF MANHOLES ARE CONSTRUCTED WITHIN THE 100-YEAR FLOODPLAIN, THE COVER MUST HAVE A GASKET AND BE BOLTED TO THE RING. WHERE GASKETED MANHOLE COVERS ARE REQUIRED FOR MORE THAN THREE MANHOLES IN SEQUENCE OR FOR MORE THAN 1500 FEET, ALTERNATE MEANS OF VENTING WILL BE PROVIDED. BRICKS ARE NOT AN ACCEPTABLE CONSTRUCTION MATERIAL FOR ANY PORTION OF THE MANHOLE.*

   THE DIAMETER OF THE MANHOLES MUST BE A MINIMUM OF FOUR FEET AND THE MANHOLE FOR ENTRY MUST HAVE A MINIMUM CLEAR OPENING DIAMETER OF 30 INCHES. THESE DIMENSIONS AND OTHER DETAILS SHOWING COMPLIANCE WITH THE COMMISSION'S RULES CONCERNING MANHOLES AND SEWER LINE/MANHOLE INVERTS DESCRIBED IN 30 TAC §217.55 ARE INCLUDED ON PLAN SHEET 3.0 OF 3.0.

   IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.
10. *WHERE WATER LINES AND NEW SEWER LINE ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES, OR WATER LINES NEXT TO MANHOLES) THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).*
11. *WHERE SEWERS LINES DEVIATE FROM STRAIGHT ALIGNMENT AND UNIFORM GRADE ALL CURVATURE OF SEWER PIPE MUST BE ACHIEVED BY THE FOLLOWING PROCEDURE WHICH IS RECOMMENDED BY THE PIPE MANUFACTURER: NOT ALLOWED*

   *IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFL

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 SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!!
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

DRY UTILITY CONDUIT NOTE!:
CONDUIT LOCATIONS SHOW ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYOR'S PLAN.

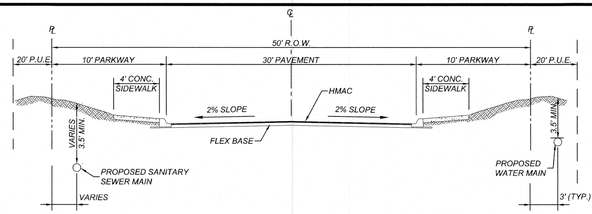
JOINT RESTRAINT NOTE:
CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOINT RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL INSURE THAT ALL TEES, BENDS, VALVES, ETC. HAVE A MINIMUM OF 5 FT OF PIPE WITH NO JOINTS ON EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED USING EBAA IRON'S RESTRAINT LENGTH CALCULATOR. THERE WILL BE NO SEPARATE PAY ITEM FOR RETAINER GLANDS AND OTHER JOINT RESTRAINING HARNESS AND GASKETS, BUT SHALL BE SUBSIDIARY TO THE UNIT COST PER LINEAL FOOT OF PIPE INSTALLED.

COMPACTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY CRYSTAL CLEAR SPECIAL UTILITY DISTRICT INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS WILL NOT BE ACCEPTED AND FINALIZED BY CRYSTAL CLEAR SPECIAL UTILITY DISTRICT WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

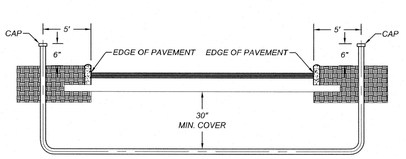
MISCELLANEOUS NOTE:
1. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
2. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
3. ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.

UTILITY TRENCH COMPACTION (STREET PAVEMENT / SIDEWALK):
ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE COMAL COUNTY STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE COMAL COUNTY STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE COMAL COUNTY INSPECTOR.

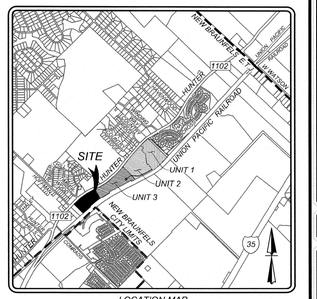
GENERAL NOTE:
1. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND COUNTY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO COUNTY PRIOR TO UTILITY INSTALLATION.



TYPICAL 50' STREET SECTION
NOT-TO-SCALE



CONDUIT DETAIL
NOT TO SCALE
*PVC SCHEDULE 80 CONDUIT
SEE PLAN SHEETS FOR SIZE LOCATION AND NUMBER OF CONDUITS



LOCATION MAP
N.T.S.

NBU AS-BUILT REQUIREMENTS:

NBU REQUIRES GPS POINTS FOR CERTAIN WATER, WASTEWATER AND ELECTRIC IMPROVEMENTS. SOME OF THIS INFORMATION/DATA MUST BE PERFORMED DURING CONSTRUCTION, PRIOR TO BACKFILLING OPERATIONS. CONTRACTOR SHALL COORDINATE WITH NBU INSPECTOR TO VERIFY ANY ADDITIONAL ITEMS NOT SHOWN BELOW THAT NEED TO BE GPS LOCATED AND THE SURVEY/ DELIVERY REQUIREMENTS REGARDING THIS INFORMATION.

ELECTRIC:
1. POLES
2. TRANSFORMERS, BOTH ABOVE AND UNDERGROUND (FRONT LOCK)
3. PULL BOXES
4. STREET LIGHTS

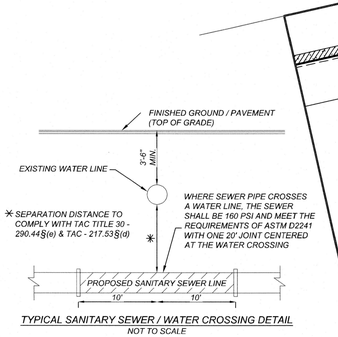
SEE NBU'S "CAD/GPS DELIVERABLES" ON NBU WEBSITE AT NBUTEXAS.COM FOR COMPLETE DETAILS AND REQUIREMENTS

CONDUIT NOTES:
1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 36 INCHES BELOW FINISHED GRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. ALL CONDUITS SLEEVES TO BE USED FOR ELECTRIC, GAS, TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATION INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS.

NOTE:
- CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH NBU FACILITY AT ALL STREETS AND DRAIN CROSSING. CONSTRUCTION SLEEVES MUST ALSO BE LOCATED FOR NBU CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE FINAL ELECTRIC PROVIDER'S DESIGN AND SPECIFICATION.
- CONTRACTOR TO CONTACT ENGINEER FOR APPROPRIATE NUMBER AND SIZE OF CONDUITS FOR TELECOMMUNICATIONS
- CONTRACTOR TO CONTACT ENGINEER FOR ELECTRICAL PLANS
- CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
- CONDUITS SHALL BE PVC WITH 30 INCHES OF MINIMUM COVER FROM STREET SUBGRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
- ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE
- ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATION INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND INSTALLING CONDUIT SLEEVES FOR EACH DRAIN CROSSING PRIOR TO THE INSTALLATION OF EACH DRAIN.

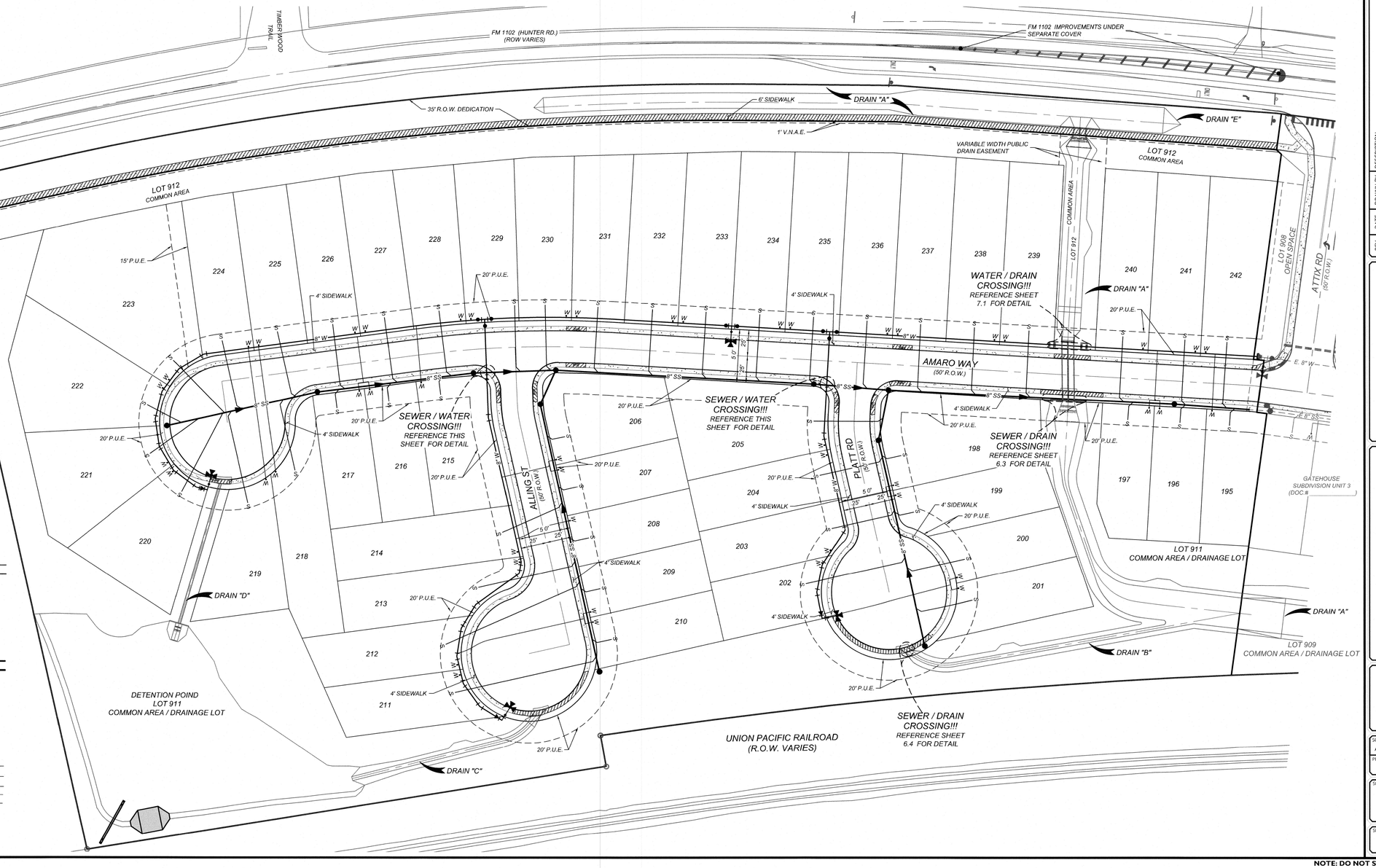
NOTE:
SEWER SERVICE LATERALS OVER 100-FT IN LENGTH SHALL BE TESTED FOR INFILTRATION AND EXFILTRATION PER CCSUD STANDARD SPECIFICATION 03410.

SCALE : 1"=50'
0' 50' 150'
100'



TYPICAL SANITARY SEWER / WATER CROSSING DETAIL
NOT TO SCALE

MARY ALICE MENDEZ
(DOC.# 202306004485)



LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED WATER SERVICE & METER BOX	W 3/4" IRR
PROPOSED WATER 3/4" IRRIGATION SERVICE & W/ 3/4" WATER METER & METER BOX	
PROPOSED FIRE HYDRANT	
PUBLIC UTILITY EASEMENT	P.U.E.
VEHICULAR NON-ACCESS EASEMENT	V.N.A.E.
RIGHT OF WAY	R.O.W.
PROPOSED 8" SANITARY SEWER MAIN	8"SS
PROPOSED 8" SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER LATERAL	
PROPOSED STREET LIGHT POLE (SUBJECT TO APPROVAL)	
PROPOSED TEE & WATER VALVE	
PROPOSED SIDEWALK	
DEVELOPER INSTALLED SIDEWALK	
EXISTING WATER VALVE	
EXISTING FIRE HYDRANT	
EXISTING WATER MAIN	E. 8" W
EXISTING SANITARY SEWER MAIN	E. 8"SS
EXISTING SANITARY SEWER MANHOLE	
EXISTING NATURAL GAS LINE	G
EXISTING OVERHEAD UTILITY LINE	OHE
EXISTING POWER POLE	PP

Date: Feb 10, 2025, 8:52am User ID: nwolden
File: U:\Projects\3145206_OU_UTILITIES\OU_3145206.dwg
\Design\CIVIL\UTILITIES\OU_3145206.dwg LAYOUT: OVERALL UTILITY PLAN By: NWolden

Colliers Engineering & Design
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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
2/13/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4
CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave, Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-1909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: OU_3145206

SHEET TITLE: *OVERALL UTILITY PLAN*

SHEET NUMBER: *1.0*

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

LEGEND

DA 1
1.0 ACRES — WATERSHED IDENTIFIER
AREA (ACRES)

WATERSHED BOUNDARY

FLOW PATH

717 EXISTING CONTOURS

FLOW ARROW

1 ANALYSIS POINT

PROPOSED SITE

SCALE : 1" = 200'
0' 200' 600'
400'

RUNOFF CALCULATIONS COMPARISON - SCS METHOD

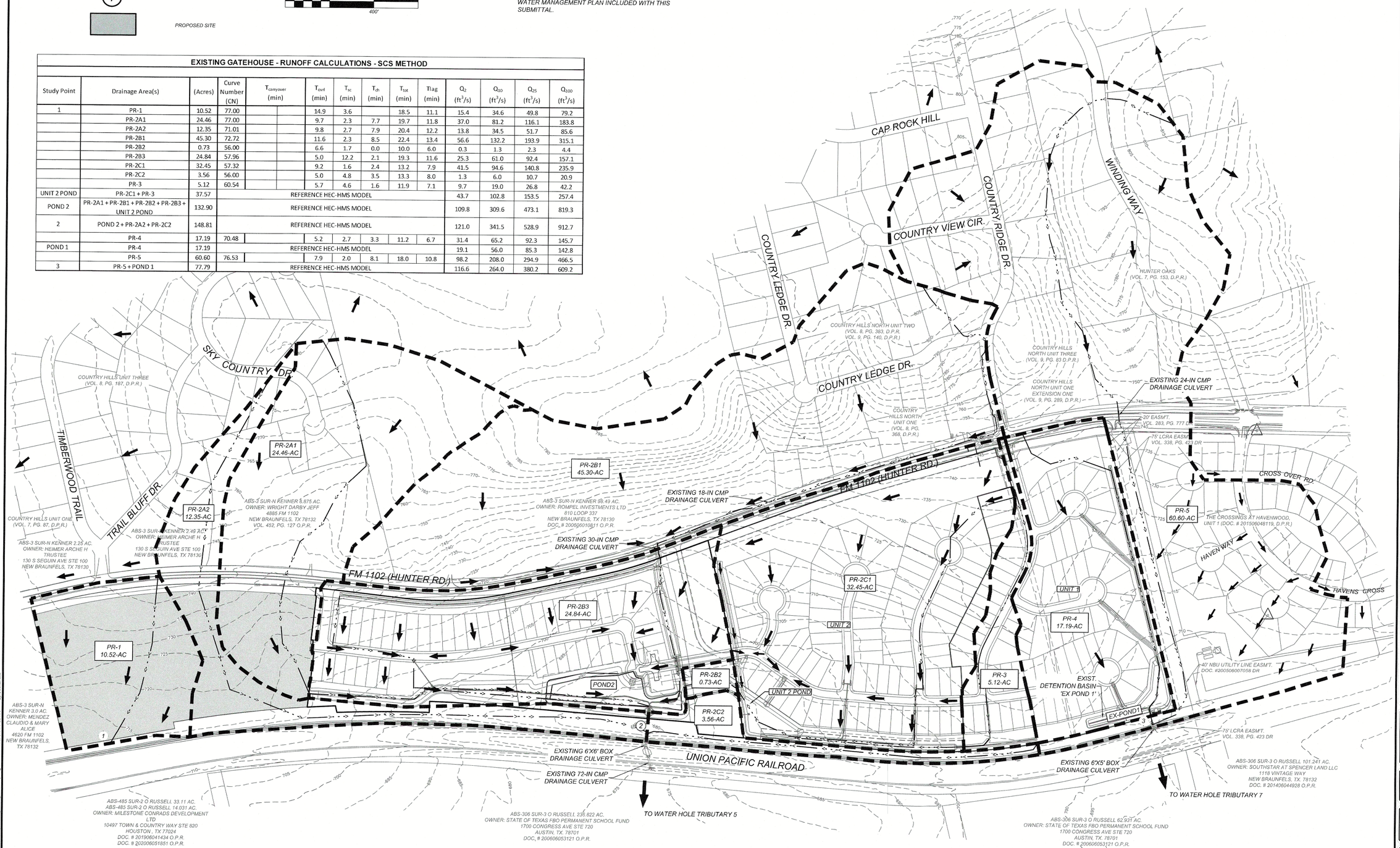
Study Point	STORM FREQUENCY	*PRE-DEV EXISTING CONDITIONS (CFS)	EXISTING CONDITIONS (CFS)
2	Q_2	133.63	121.0
	Q_{10}	365.36	341.5
	Q_{25}	563.49	528.9
	Q_{100}	962.99	912.7

* PRE DEVELOPED EXISTING CONDITIONS CAN BE FOUND WITHIN THE GATEHOUSE UNIT 1 STORM WATER MANAGEMENT PLAN INCLUDED WITH THIS SUBMITTAL.

DRAINAGE NOTE:
DRAINAGE PATTERNS SHOWN WITHIN THE CROSSINGS AT HAVENWOOD ARE BASED ON THE AS-BUILT DESIGN PLANS

EXISTING GATEHOUSE - RUNOFF CALCULATIONS - SCS METHOD

Study Point	Drainage Area(s)	(Acres)	Curve Number (CN)	$T_{carryover}$ (min)	T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	Tlag (min)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{100} (ft^3/s)
1	PR-1	10.52	77.00		14.9	3.6		18.5	11.1	15.4	34.6	49.8	79.2
	PR-2A1	24.46	77.00		9.7	2.3	7.7	19.7	11.8	37.0	81.2	116.1	183.8
	PR-2A2	12.35	71.01		9.8	2.7	7.9	20.4	12.2	13.8	34.5	51.7	85.6
	PR-2B1	45.30	72.72		11.6	2.3	8.5	22.4	13.4	56.6	132.2	193.9	315.1
	PR-2B2	0.73	56.00		6.6	1.7	0.0	10.0	6.0	0.3	1.3	2.3	4.4
	PR-2B3	24.84	57.96		5.0	12.2	2.1	19.3	11.6	25.3	61.0	92.4	157.1
	PR-2C1	32.45	57.32		9.2	1.6	2.4	13.2	7.9	41.5	94.6	140.8	235.9
	PR-2C2	3.56	56.00		5.0	4.8	3.5	13.3	8.0	1.3	6.0	10.7	20.9
	PR-3	5.12	60.54		5.7	4.6	1.6	11.9	7.1	9.7	19.0	26.8	42.2
UNIT 2 POND	PR-2C1 + PR-3	37.57	REFERENCE HEC-HMS MODEL							43.7	102.8	153.5	257.4
POND 2	PR-2A1 + PR-2B1 + PR-2B2 + PR-2B3 + UNIT 2 POND	132.90	REFERENCE HEC-HMS MODEL							109.8	309.6	473.1	819.3
2	POND 2 + PR-2A2 + PR-2C2	148.81	REFERENCE HEC-HMS MODEL							121.0	341.5	528.9	912.7
	PR-4	17.19	70.48		5.2	2.7	3.3	11.2	6.7	31.4	65.2	92.3	145.7
POND 1	PR-4	17.19	REFERENCE HEC-HMS MODEL							19.1	56.0	85.3	142.8
	PR-5	60.60	76.53		7.9	2.0	8.1	18.0	10.8	98.2	208.0	294.9	466.5
3	PR-5 + POND 1	77.79	REFERENCE HEC-HMS MODEL							116.6	264.0	380.2	609.2



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
4/4/25
Nicholas Reynolds, P.E.

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF
PROJECT NUMBER: 24003556A	DRAWING NAME: EXISTING DRAINAGE AREA MAP		

SHEET TITLE: EXISTING SCS DRAINAGE MAP

SHEET NUMBER: 2.0

Date: Dec 20, 2024, 2:30pm User ID: dgonzalez
File: U:\Projects\343-02\08\Design\Civil\Drainage\Existing Drainage Area Map.dwg
Xrefs: C:\Users\dgonzalez\Documents\Projects\Xrefs\24003556A_Topo.dwg

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

LEGEND

DA 1
1.0 ACRES — WATERSHED IDENTIFIER / AREA (ACRES)

WATERSHED BOUNDARY

FLOW PATH

717 EXISTING CONTOURS

FLOW ARROW

1 ANALYSIS POINT

PROPOSED SITE

SCALE : 1" = 200'

0' 200' 600'

400'

RUNOFF CALCULATIONS COMPARISON - SCS METHOD

Study Point	STORM FREQUENCY	EXISTING CONDITIONS (CFS)	PROPOSED CONDITIONS (CFS)
1	Q_2	15.40	9.4
	Q_{10}	34.60	28.1
	Q_{25}	49.80	44.5
	Q_{100}	79.20	71.5

* *PRE DEVELOPED EXISTING CONDITIONS CAN BE FOUND WITHIN THE GATEHOUSE UNIT 1 STORM WATER MANAGEMENT PLAN INCLUDED WITH THIS SUBMITTAL.*

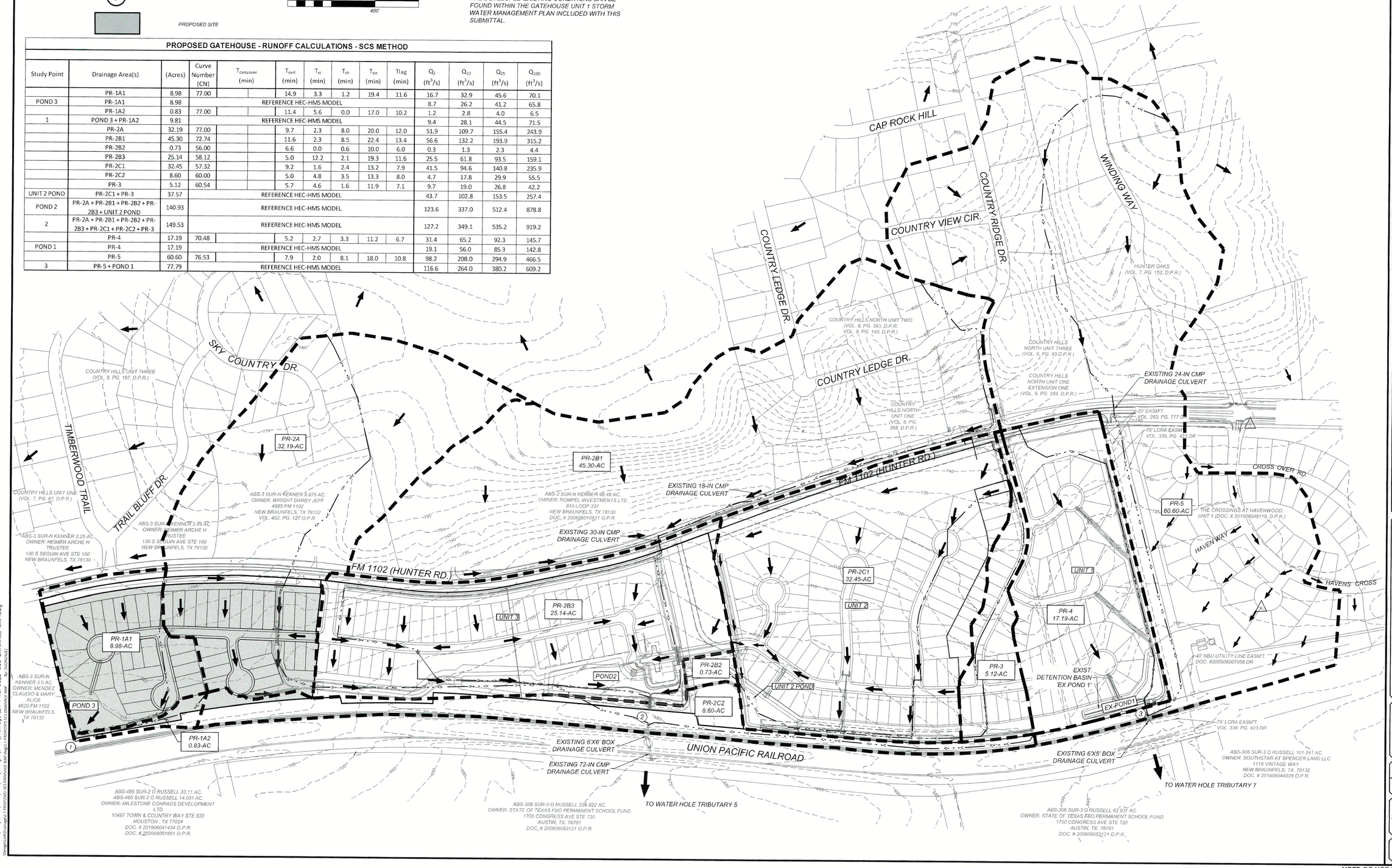
RUNOFF CALCULATIONS COMPARISON - SCS METHOD

Study Point	STORM FREQUENCY	*PRE-DEV EXISTING CONDITIONS (CFS)	PROPOSED CONDITIONS (CFS)
2	Q_2	133.63	127.2
	Q_{10}	365.36	349.1
	Q_{25}	563.49	535.2
	Q_{100}	962.99	919.2

DRAINAGE NOTE:
DRAINAGE PATTERNS SHOWN WITHIN THE CROSSINGS AT HAVENWOOD ARE BASED ON THE AS-BUILT DESIGN PLANS

PROPOSED GATEHOUSE - RUNOFF CALCULATIONS - SCS METHOD

Study Point	Drainage Area(s)	(Acres)	Curve Number (CN)	$T_{canyover}$ (min)	T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	Tlag (min)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{100} (ft^3/s)
	PR-1A1	8.98	77.00		14.9	3.3	1.2	19.4	11.6	16.7	32.9	45.6	70.1
POND 3	PR-1A1	8.98	REFERENCE HEC-HMS MODEL							8.7	26.2	41.2	65.8
	PR-1A2	0.83	77.00		11.4	5.6	0.0	17.0	10.2	1.2	2.8	4.0	6.5
1	POND 3 + PR-1A2	9.81	REFERENCE HEC-HMS MODEL							9.4	28.1	44.5	71.5
	PR-2A	32.19	77.00		9.7	2.3	8.0	20.0	12.0	51.9	109.7	155.4	243.9
	PR-2B1	45.30	72.74		11.6	2.3	8.5	22.4	13.4	56.6	132.2	193.9	315.2
	PR-2B2	0.73	56.00		6.6	0.0	0.6	10.0	6.0	0.3	1.3	2.3	4.4
	PR-2B3	25.14	58.12		5.0	12.2	2.1	19.3	11.6	25.5	61.8	93.5	159.1
	PR-2C1	32.45	57.32		9.2	1.6	2.4	13.2	7.9	41.5	94.6	140.8	235.9
	PR-2C2	8.60	60.00		5.0	4.8	3.5	13.3	8.0	4.7	17.8	29.9	55.5
	PR-3	5.12	60.54		5.7	4.6	1.6	11.9	7.1	9.7	19.0	26.8	42.2
UNIT 2 POND	PR-2C1 + PR-3	37.57	REFERENCE HEC-HMS MODEL							43.7	102.8	153.5	257.4
POND 2	PR-2A + PR-2B1 + PR-2B2 + PR-2B3 + UNIT 2 POND	140.93	REFERENCE HEC-HMS MODEL							123.6	337.0	512.4	878.8
2	PR-2A + PR-2B1 + PR-2B2 + PR-2B3 + PR-2C1 + PR-2C2 + PR-3	149.53	REFERENCE HEC-HMS MODEL							127.2	349.1	535.2	919.2
	PR-4	17.19	70.48		5.2	2.7	3.3	11.2	6.7	31.4	65.2	92.3	145.7
POND 1	PR-4	17.19	REFERENCE HEC-HMS MODEL							19.1	56.0	85.3	142.8
	PR-5	60.60	76.53		7.9	2.0	8.1	18.0	10.8	98.2	208.0	294.9	466.5
3	PR-5 + POND 1	77.79	REFERENCE HEC-HMS MODEL							116.6	264.0	380.2	609.2



Date: Jan 02, 2025, 1:04pm User ID: dgonzalez
File: U:\Projects\134.152\06 Design\Civil\Drainage\2.1 PROPOSED SCS DRAINAGE MAP.dwg
https://www.xrefs.com/cloud/workspaces/projects/134.152/06 Design/Civil/Drainage/2.1 PROPOSED SCS DRAINAGE MAP.dwg

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS — A. NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER — 1/6/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm #: F-11309
TBPLS Firm #: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
240035564	2.1 PROPOSED SCS DRAINAGE MAP

SHEET TITLE:
PROPOSED SCS DRAINAGE MAP

SHEET NUMBER:
2.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

LEGEND

- DA 1 / 1.0 ACRES — WATERSHED IDENTIFIER / AREA (ACRES)
- WATERSHED BOUNDARY
- FLOW PATH
- 717 — EXISTING CONTOURS
- FLOW ARROW
- 1 — ANALYSIS POINT
- PROPOSED SITE
- PREVIOUSLY STUDIED WITH GATEHOUSE UNITS 1-3

GATEHOUSE SUBDIVISION UNIT 4 - ONSITE PROPOSED RUNOFF CALCULATIONS - RATIONAL METHOD

Study Point	Drainage Area(s)	(Acres)	C2	C10	C25	C50	C100	$T_{carryover}$ (min)		T_{ovfl} (min)	T_{sc} (min)	T_{ch} (min)	T_{toc} (min)	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{50} (ft^3/s)	Q_{100} (ft^3/s)
	PR-2A1	23.85	0.37	0.42	0.46	0.49	0.53			9.7	2.3	3.0	15.0	4.24	6.24	7.52	8.56	9.64	37.42	62.51	82.50	100.04	121.85
	DA-1	7.44	0.47	0.53	0.58	0.61	0.65			5.2	5.8	1.0	12.0	4.70	6.97	8.45	9.61	10.83	16.43	27.48	36.46	43.61	52.37
	DA-2	1.50	0.47	0.53	0.58	0.61	0.65			5.0	0.0	2.0	10.0	5.05	7.50	9.12	10.38	11.70	3.56	5.96	7.93	9.50	11.41
SP-1	PR-2A1 + DA-2	25.35	0.38	0.43	0.47	0.50	0.54	PR-2A1	15.0			0.9	15.9	4.11	6.05	7.29	8.28	9.33	39.63	65.96	86.81	104.96	127.65
	DA-3	1.59	0.51	0.57	0.61	0.65	0.69			5.0	2.9	0.2	10.0	5.05	7.50	9.12	10.38	11.70	4.10	6.80	8.85	10.73	12.84
SP-2A	*STREET BYPASS																		3.56	4.25	4.25	4.25	4.25
SP-2B	**INTERCEPTED FLOW OF DA-3 MINUS SP-2A																		0.54	2.55	4.60	6.48	8.59
	DA-4	2.29	0.52	0.58	0.63	0.66	0.71			5.0	1.0	1.8	10.0	5.05	7.50	9.12	10.38	11.70	6.01	9.96	13.16	15.69	19.02
SP-3	SP-2A + DA-4													SIMPLY SUMMED					9.57	14.21	17.41	19.94	23.27
	DA-5	1.03	0.47	0.53	0.58	0.61	0.65			7.0	0.9	0.4	10.0	5.05	7.50	9.12	10.38	11.70	2.44	4.09	5.45	6.52	7.83
SP-4	SP-1 + DA-3 + DA-4 +DA-5	30.26	0.52	0.45	0.49	0.52	0.56	SP-1	15.9			1.0	16.9	4.00	5.87	7.07	8.03	9.04	62.88	79.93	104.80	126.42	153.22
	DA-6	1.13	0.47	0.53	0.57	0.61	0.65			15.1	2.0	0.1	17.2	3.96	5.81	7.00	7.96	8.95	2.10	3.48	4.51	5.48	6.58
SP-5	SP-2B + DA-6													SIMPLY SUMMED					2.64	6.03	9.10	11.96	15.16
	DA-7	0.27	0.47	0.53	0.57	0.61	0.65			5.0	0.1	0.5	10.0	5.05	7.50	9.12	10.38	11.70	0.64	1.07	1.40	1.71	2.05
	DA-8	0.48	0.48	0.54	0.58	0.62	0.66			6.0	0.5	0.1	10.0	5.05	7.50	9.12	10.38	11.70	1.16	1.94	2.54	3.09	3.71
SP-6	SP-5 + DA-7													SIMPLY SUMMED					3.28	7.10	10.51	13.67	17.22
SP-7	SP-1 + DA-3,4,5,6,7,8	32.14	0.40	0.46	0.50	0.53	0.57	SP-4	16.9				16.9	4.00	5.87	7.07	8.03	9.04	51.37	86.78	113.58	136.85	165.65
SP-8	DA-1 + SP-7	39.58	0.41	0.47	0.52	0.55	0.59	SP-7	16.9			1.9	18.8	3.78	5.55	6.68	7.58	8.54	61.39	103.21	137.42	164.99	199.31
	DA-9	1.92	0.57	0.64	0.69	0.72	0.77			9.5	1.6	0.0	11.1	4.85	7.20	8.75	9.95	11.22	5.31	8.85	11.59	13.76	16.58
	DA-10	0.28	0.48	0.54	0.58	0.62	0.66			7.1	1.2	0.3	10.0	5.05	7.50	9.12	10.38	11.70	0.68	1.13	1.48	1.80	2.16
SP-9	DA-9 + DA-10	2.20	0.56	0.63	0.68	0.71	0.76	DA-9	11.1			0.6	11.7	4.75	7.05	8.55	9.72	10.96	5.85	9.77	12.79	15.19	18.32
SP-10	DA-11	4.01	0.49	0.55	0.59	0.63	0.67			5.1	2.4	1.5	10.0	5.05	7.50	9.12	10.38	11.70	9.92	16.54	21.58	26.22	31.43

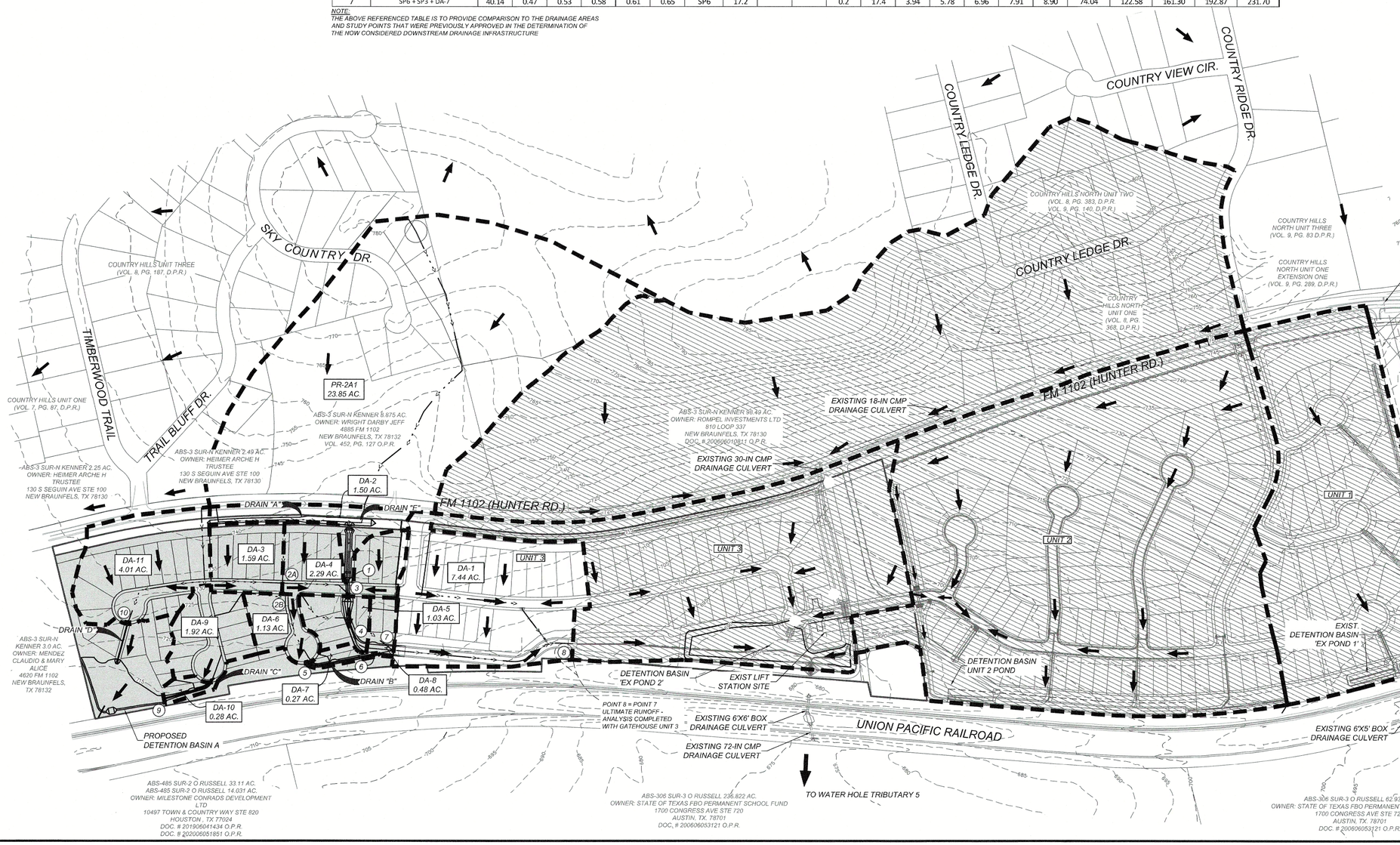
*SP-2A REPRESENTS THE BYPASS FLOW OF DA-3CONTAINED WITHIN THE CROSS SECTIONOF THE WEST BOUND LANE.
**SP-2B REPRESENTS THE INTERCEPTED FLOW OF DA-3 WHICH CONTRIBUTES TO STUDY POINT 5

- STUDY POINT 3 FLOW RATES WERE DETERMINED BY A SIMPLY SUMMED RESULT OF DA-4 & SP-2A FOR A CONSERVATIVE APPROACH
- STUDY POINT 5 FLOW RATES WERE DETERMINED BY A SIMPLY SUMMED RESULT OF DA-6 & SP-2B FOR A CONSERVATIVE APPROACH
- STUDY POINT 6 FLOW RATES WERE DETERMINED BY A SIMPLY SUMMED RESULT OF DA-7 AND STUDY POINT 5 FOR A CONSERVATIVE APPROACH

GATEHOUSE SUBDIVISION UNIT 3 - ONSITE ULTIMATE RUNOFF CALCULATIONS - RATIONAL METHOD

Study Point	Drainage Area(s)	(Acres)	C2	C10	C25	C50	C100	$T_{carryover}$ (min)		T_{ovfl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{50} (ft^3/s)	Q_{100} (ft^3/s)
7	SP6 + SP3 + DA-7	40.14	0.47	0.53	0.58	0.61	0.65	SP6	17.2			0.2	17.4	3.94	5.78	6.96	7.91	8.90	74.04	122.58	161.30	192.87	231.70

NOTE:
THE ABOVE REFERENCED TABLE IS TO PROVIDE COMPARISON TO THE DRAINAGE AREAS AND STUDY POINTS THAT WERE PREVIOUSLY APPROVED IN THE DETERMINATION OF THE NOW CONSIDERED DOWNSTREAM DRAINAGE INFRASTRUCTURE



SCALE : 1" = 200'
0' 200' 600'
400'

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
1/6/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4
CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, Tx 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-10909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 2.2 PROPOSED ONSITE DRAINAGE MAP
SHEET TITLE: PROPOSED ONSITE DRAINAGE MAP
SHEET NUMBER: 2.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Jan 02, 2025, 12:53pm User ID: dgonzalez
File: U:\Projects\314\52\06\Design\Civil\Drainage\2.2 PROPOSED ONSITE DRAINAGE MAP.dwg
Design/Admin/Layout/2.2 PROPOSED ONSITE DRAINAGE MAP Page By: DGONZALEZ

LEGEND

DA 1
1.0 ACRES — WATERSHED IDENTIFIER / AREA (ACRES)

WATERSHED BOUNDARY

FLOW PATH

717 — EXISTING CONTOURS

FLOW ARROW

1 — ANALYSIS POINT

PROPOSED SITE

SCALE : 1" = 200'

0' 200' 600' 400'

RUNOFF CALCULATIONS COMPARISON - SCS METHOD

Study Point	STORM FREQUENCY	EXISTING CONDITIONS (CFS)	ULTIMATE CONDITIONS (CFS)
1	Q_2	15.40	9.4
	Q_{10}	34.60	28.1
	Q_{25}	49.80	44.5
	Q_{100}	79.20	71.5

* *PRE DEVELOPED EXISTING CONDITIONS CAN BE FOUND WITHIN THE GATEHOUSE UNIT 1 STORM WATER MANAGEMENT PLAN INCLUDED WITH THIS SUBMITTAL.*

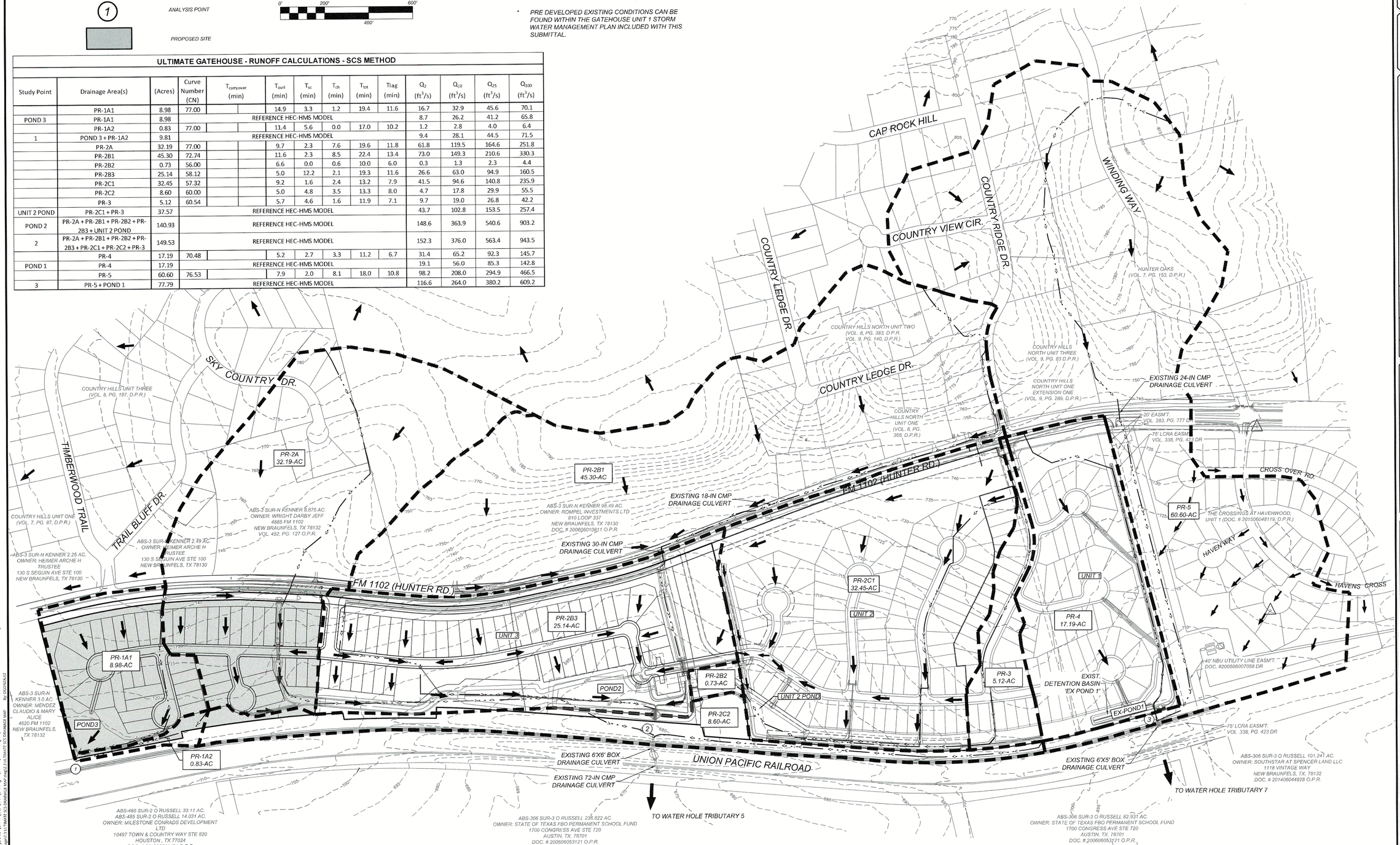
RUNOFF CALCULATIONS COMPARISON - SCS METHOD

Study Point	STORM FREQUENCY	*PRE-DEV EXISTING CONDITIONS (CFS)	ULTIMATE CONDITIONS (CFS)
2	Q_2	133.63	152.3
	Q_{10}	365.36	376.0
	Q_{25}	563.49	563.4
	Q_{100}	962.99	943.5

DRAINAGE NOTE:
DRAINAGE PATTERNS SHOWN WITHIN THE CROSSINGS AT HAVENWOOD ARE BASED ON THE AS-BUILT DESIGN PLANS

ULTIMATE GATEHOUSE - RUNOFF CALCULATIONS - SCS METHOD

Study Point	Drainage Area(s)	(Acres)	Curve Number (CN)	$T_{carryover}$ (min)	T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	Tlag (min)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{100} (ft^3/s)
	PR-1A1	8.98	77.00		14.9	3.3	1.2	19.4	11.6	16.7	32.9	45.6	70.1
POND 3	PR-1A1	8.98	REFERENCE HEC-HMS MODEL							8.7	26.2	41.2	65.8
	PR-1A2	0.83	77.00		11.4	5.6	0.0	17.0	10.2	1.2	2.8	4.0	6.4
1	POND 3 + PR-1A2	9.81	REFERENCE HEC-HMS MODEL							9.4	28.1	44.5	71.5
	PR-2A	32.19	77.00		9.7	2.3	7.6	19.6	11.8	61.8	119.5	164.6	251.8
	PR-2B1	45.30	72.74		11.6	2.3	8.5	22.4	13.4	73.0	149.3	210.6	330.3
	PR-2B2	0.73	56.00		6.6	0.0	0.6	10.0	6.0	0.3	1.3	2.3	4.4
	PR-2B3	25.14	58.12		5.0	12.2	2.1	19.3	11.6	26.6	63.0	94.9	160.5
	PR-2C1	32.45	57.32		9.2	1.6	2.4	13.2	7.9	41.5	94.6	140.8	235.9
	PR-2C2	8.60	60.00		5.0	4.8	3.5	13.3	8.0	4.7	17.8	29.9	55.5
	PR-3	5.12	60.54		5.7	4.6	1.6	11.9	7.1	9.7	19.0	26.8	42.2
UNIT 2 POND	PR-2C1 + PR-3	37.57	REFERENCE HEC-HMS MODEL							43.7	102.8	153.5	257.4
POND 2	PR-2A + PR-2B1 + PR-2B2 + PR-2B3 + UNIT 2 POND	140.93	REFERENCE HEC-HMS MODEL							148.6	363.9	540.6	903.2
2	PR-2A + PR-2B1 + PR-2B2 + PR-2B3 + PR-2C1 + PR-2C2 + PR-3	149.53	REFERENCE HEC-HMS MODEL							152.3	376.0	563.4	943.5
	PR-4	17.19	70.48		5.2	2.7	3.3	11.2	6.7	31.4	65.2	92.3	145.7
POND 1	PR-4	17.19	REFERENCE HEC-HMS MODEL							19.1	56.0	85.3	142.8
	PR-5	60.60	76.53		7.9	2.0	8.1	18.0	10.8	98.2	208.0	294.9	466.5
3	PR-5 + POND 1	77.79	REFERENCE HEC-HMS MODEL							116.6	264.0	380.2	609.2



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STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
11/6/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, PVC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
240035566	2.3 ULTIMATE SCS DRAINAGE MAP

SHEET TITLE:
ULTIMATE SCS DRAINAGE MAP

SHEET NUMBER:
2.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Jan 02, 2025, 1:03pm User ID: dgonzales
File: U:\Projects\314.52\06\Design\Civil\Drainage\2.3 ULTIMATE SCS DRAINAGE MAP.dwg
C:\Design\Civil\Drainage\2.3 ULTIMATE SCS DRAINAGE MAP.dwg 2.3 ULTIMATE SCS DRAINAGE MAP By: DGONZALEZ

LEGEND

DA 1
1.0 ACRES — WATERSHED IDENTIFIER / AREA (ACRES)

WATERSHED BOUNDARY

FLOW PATH

717 EXISTING CONTOURS

FLOW ARROW

1 ANALYSIS POINT

PROPOSED SITE

PREVIOUSLY STUDIED WITH GATEHOUSE UNITS 1-3

GATEHOUSE SUBDIVISION UNIT 4 - ONSITE ULTIMATE RUNOFF CALCULATIONS - RATIONAL METHOD

Study Point	Drainage Area(s)	(Acres)	C2	C10	C25	C50	C100	$T_{carryover}$ (min)		T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{50} (ft^3/s)	Q_{100} (ft^3/s)
	ULT-2A1	23.85	0.47	0.53	0.58	0.61	0.65			9.7	2.3	3.0	15.0	4.24	6.24	7.52	8.56	9.64	47.53	78.88	104.02	124.54	149.44
	DA-1	7.44	0.47	0.53	0.58	0.61	0.65			5.2	5.8	1.0	12.0	4.70	6.97	8.45	9.61	10.83	16.43	27.48	36.46	43.61	52.37
	DA-2	1.50	0.47	0.53	0.58	0.61	0.65			5.0	0.0	2.0	10.0	5.05	7.50	9.12	10.38	11.70	3.56	5.96	7.93	9.50	11.41
SP-1	ULT-2A1 + DA-2	25.35	0.47	0.53	0.58	0.61	0.65	ULT-2A1	15.0			0.9	15.9	4.11	6.05	7.29	8.28	9.33	49.02	81.30	107.13	128.05	153.65
	DA-3	1.59	0.51	0.57	0.61	0.65	0.69			5.0	2.9	0.2	10.0	5.05	7.50	9.12	10.38	11.70	4.10	6.80	8.85	10.73	12.84
SP-2A	*STREET BYPASS																		3.56	4.25	4.25	4.25	4.25
SP-2B	**INTERCEPTED FLOW OF DA-3 MINUS SP-2A																		0.54	2.55	4.60	6.48	8.59
	DA-4	2.29	0.52	0.58	0.63	0.66	0.71			5.0	1.0	1.8	10.0	5.05	7.50	9.12	10.38	11.70	6.01	9.96	13.16	15.69	19.02
SP-3	SP-2A + DA-4													SIMPLY SUMMED					9.57	14.21	17.41	19.94	23.27
	DA-5	1.03	0.47	0.53	0.58	0.61	0.65			7.0	0.9	0.4	10.0	5.05	7.50	9.12	10.38	11.70	2.44	4.09	5.45	6.52	7.83
SP-4	SP-1 + DA-3 + DA-4 +DA-5	30.26	0.52	0.54	0.59	0.62	0.66	SP-1	15.9			1.0	16.9	4.00	5.87	7.07	8.03	9.04	62.88	95.92	126.19	150.73	180.58
	DA-6	1.13	0.47	0.53	0.57	0.61	0.65			15.1	2.0	0.1	17.2	3.96	5.81	7.00	7.96	8.95	2.10	3.48	4.51	5.48	6.58
SP-5	SP-2B + DA-6													SIMPLY SUMMED					2.64	6.03	9.10	11.96	15.16
	DA-7	0.27	0.47	0.53	0.57	0.61	0.65			5.0	0.1	0.5	10.0	5.05	7.50	9.12	10.38	11.70	0.64	1.07	1.40	1.71	2.05
	DA-8	0.48	0.48	0.54	0.58	0.62	0.66			6.0	0.5	0.1	10.0	5.05	7.50	9.12	10.38	11.70	1.16	1.94	2.54	3.09	3.71
SP-6	SP-5 + DA-7													SIMPLY SUMMED					3.28	7.10	10.51	13.67	17.22
SP-7	SP-1 + DA-3,4,5,6,7,8	32.14	0.48	0.54	0.58	0.62	0.66	SP-4	16.9				16.9	4.00	5.87	7.07	8.03	9.04	61.65	101.88	131.76	160.09	191.80
SP-8	DA-1 + SP-7	39.58	0.48	0.54	0.58	0.62	0.66	SP-7	16.9			1.9	18.8	3.78	5.55	6.68	7.58	8.54	71.87	118.58	153.28	185.99	222.96
	DA-9	1.92	0.57	0.64	0.69	0.72	0.77			9.5	1.6	0.0	11.1	4.85	7.20	8.75	9.95	11.22	5.31	8.85	11.59	13.76	16.58
	DA-10	0.28	0.48	0.54	0.58	0.62	0.66			7.1	1.2	0.3	10.0	5.05	7.50	9.12	10.38	11.70	0.68	1.13	1.48	1.80	2.16
SP-9	DA-9 + DA-10	2.20	0.56	0.63	0.68	0.71	0.76	DA-9	11.1			0.6	11.7	4.75	7.05	8.55	9.72	10.96	5.85	9.77	12.79	15.19	18.32
SP-10	DA-11	4.01	0.49	0.55	0.59	0.62	0.67			5.1	2.4	1.5	10.0	5.05	7.50	9.12	10.38	11.70	9.92	16.54	21.58	25.81	31.43

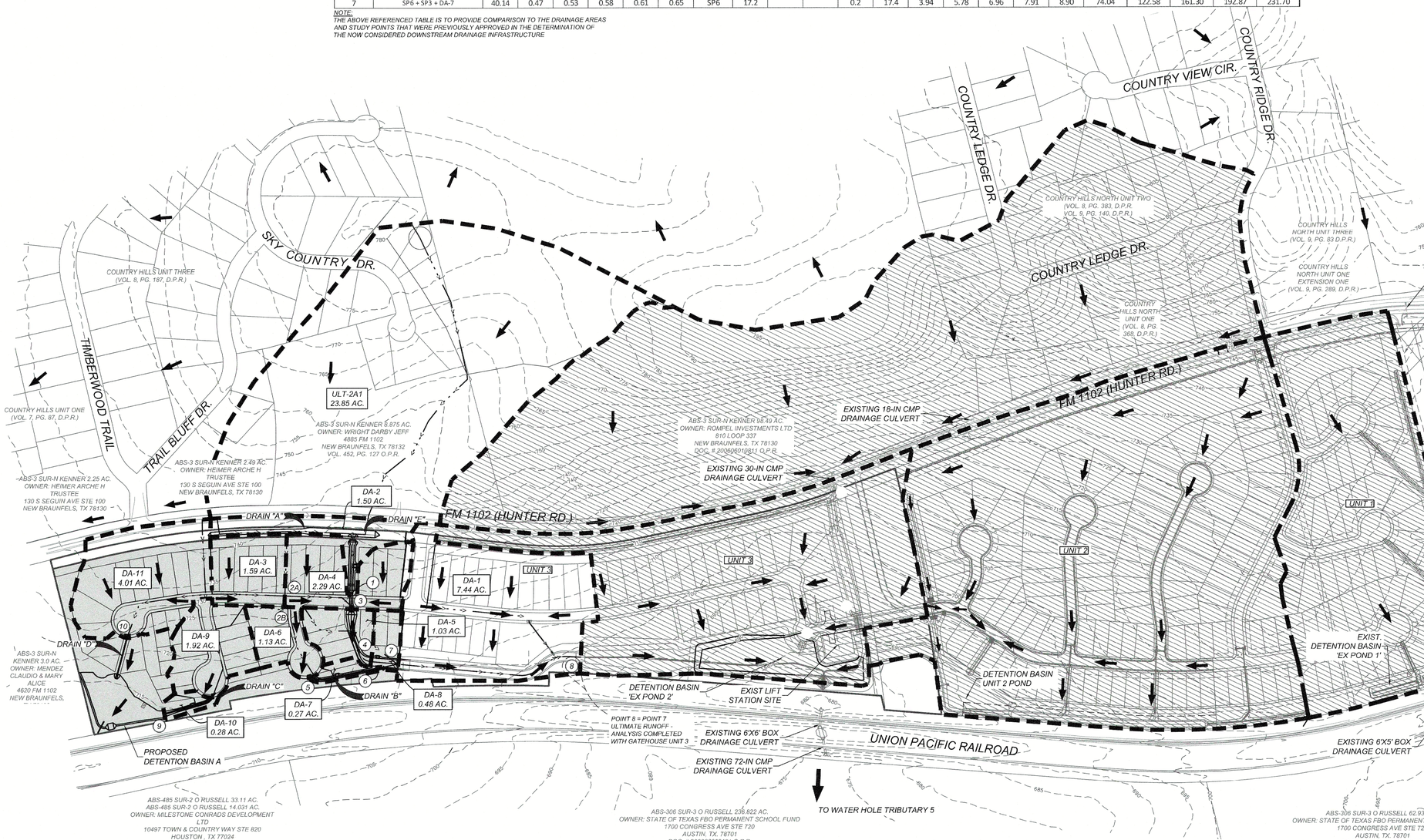
*SP-2A REPRESENTS THE BYPASS FLOW OF DA-3CONTAINED WITHIN THE CROSS SECTIONOF THE WEST BOUND LANE.
**SP-2B REPRESENTS THE INTERCEPTED FLOW OF DA-3 WHICH CONTRIBUTES TO STUDY POINT 5

- STUDY POINT 3 FLOW RATES WERE DETERMINED BY A SIMPLY SUMMED RESULT OF DA-4 & SP-2A FOR A CONSERVATIVE APPROACH
- STUDY POINT 5 FLOW RATES WERE DETERMINED BY A SIMPLY SUMMED RESULT OF DA-6 & SP-2B FOR A CONSERVATIVE APPROACH
- STUDY POINT 6 FLOW RATES WERE DETERMINED BY A SIMPLY SUMMED RESULT OF DA-7 AND STUDY POINT 5 FOR A CONSERVATIVE APPROACH

GATEHOUSE SUBDIVISION UNIT 3 - ONSITE ULTIMATE RUNOFF CALCULATIONS - RATIONAL METHOD

Study Point	Drainage Area(s)	(Acres)	C2	C10	C25	C50	C100	$T_{carryover}$ (min)		T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	Q_{25} (ft^3/s)	Q_{50} (ft^3/s)	Q_{100} (ft^3/s)
7	SP6 + SP3 + DA-7	40.14	0.47	0.53	0.58	0.61	0.65	SP6	17.2			0.2	17.4	3.94	5.78	6.96	7.91	8.90	74.04	122.58	161.30	192.87	231.70

NOTE:
THE ABOVE REFERENCED TABLE IS TO PROVIDE COMPARISON TO THE DRAINAGE AREAS AND STUDY POINTS THAT WERE PREVIOUSLY APPROVED IN THE DETERMINATION OF THE NOW CONSIDERED DOWNSTREAM DRAINAGE INFRASTRUCTURE



SCALE : 1" = 200'
0' 200' 600'
400'

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STATE OF TEXAS
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111666
LICENSED PROFESSIONAL ENGINEER
11/6/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave, Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm# F-14093
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PROJECT NUMBER: 24003556A	DRAWING NAME: 2.2 PROPOSED ONSITE DRAINAGE MAP		

SHEET TITLE:
ULTIMATE ONSITE DRAINAGE MAP

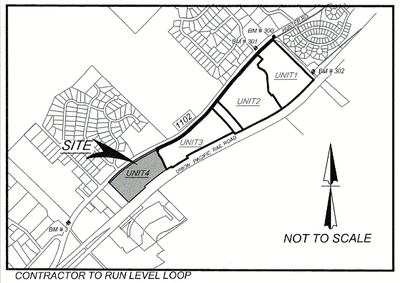
SHEET NUMBER: 2.4

Date: Jan 02, 2025, 1:23pm User ID: dgonzalez
File: U:\Projects\3141\02\06\Design\Civil\Drainage\2.2 PROPOSED ONSITE DRAINAGE MAP\2.4 ULTIMATE ONSITE DRAINAGE MAP.dwg By: DGONZALEZ

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

BENCHMARKS

BM#	NORTHING	EASTING	ELEVATION	DESCRIPTION
300	13833987.43	2266645.56	741.65	SBM
301	13833728.05	2266235.25	753.89	SBM
302	13833209.63	2267544.75	707.33	SBM



CONTRACTOR TO RUN LEVEL LOOP THROUGH BM'S PROVIDED TO CONFIRM BEFORE CONSTRUCTION. CONTACT ENGINEER/SURVEYOR IMMEDIATELY IF ELEVATIONS DO NOT MATCH THOSE SHOWN.

GENERAL NOTES:

1. ELEVATION SHOWN ON FOUNDATION IS FOR FINISHED FLOOR.

2. CONTRACTOR SHALL PROVIDE OWNER ALL NECESSARY DENSITY TESTS AND 79G LETTERS FOR FILL LOTS AS REQUIRED BY HUD SPECIFICATIONS.

3. HOME BUILDER SHALL REFER TO THE APPROVED SUBDIVISION PLAT TO CONFIRM ALL BUILDING SETBACKS PRIOR TO ANY FOUNDATION WORK.

4. AS SOON AS PRACTICAL HOME BUILDER SHALL ESTABLISH VEGETATION TO 85% (HYDROMULCH, SEEDING, SODDING, ETC...) TO PREVENT EROSION FROM OCCURRING.

5. CONTRACTOR SHALL CONTACT ENGINEER REGARDING ANY QUESTIONS ON THE INTENT OF THIS PLAN.

6. POSITIVE DRAINAGE SHALL BE MAINTAINED ON ALL SURFACE AREAS WITHIN THE SCOPE OF THIS PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS AND TOWARDS THE PROPER DRAINAGE EASEMENT OR STREET RIGHT OF WAY ACCORDING TO THE MASTER DRAINAGE PLAN FOR THE PROJECT. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW PONDING OF WATER.

7. ALL ELEVATIONS AND CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVEMENT, CURBS, SIDEWALKS, MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.

8. GRADING PLAN IS INTENDED FOR USE IN LOT GRADING ONLY. CONTRACTOR SHOULD REFER TO CONSTRUCTION DRAWINGS FOR ALL OTHER GRADES, INCLUDING, BUT NOT LIMITED TO, CHANNELS, ROADS, AND DETENTION PONDS.

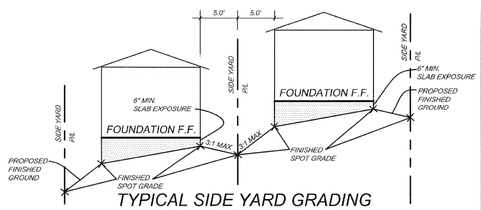
9. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALL SWALES.

10. DRIVEWAYS SERVING LOTS DOWNHILL OF STREET SHALL FOLLOW "TYPICAL RESIDENTIAL DRIVEWAY SECTION" ON SHEET 5.3 TO ENSURE FLOW IS CONTAINED WITHIN THE RIGHT OF WAY.

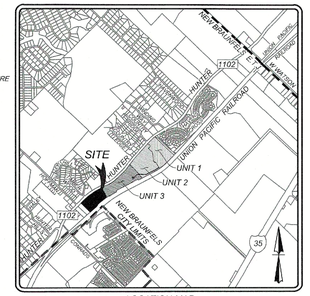
11. 85% VEGETATION SHALL BE ESTABLISHED ON ALL AREAS NOT WITHIN A BUILDABLE LOT PRIOR TO PUBLIC INFRASTRUCTURE AND ROUGH GRADING ACCEPTANCE.

12. STRIPPING OF VEGETATION FROM PROJECT SITES SHALL BE PHASED SO AS TO EXPOSE THE MINIMUM AMOUNT OF AREA TO SOIL EROSION FOR THE SHORTEST POSSIBLE PERIOD OF TIME PER THE NEW BRAUNFELS DRAINAGE AND EROSION CONTROL DESIGN MANUAL SEC. 12.2(N).

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 SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

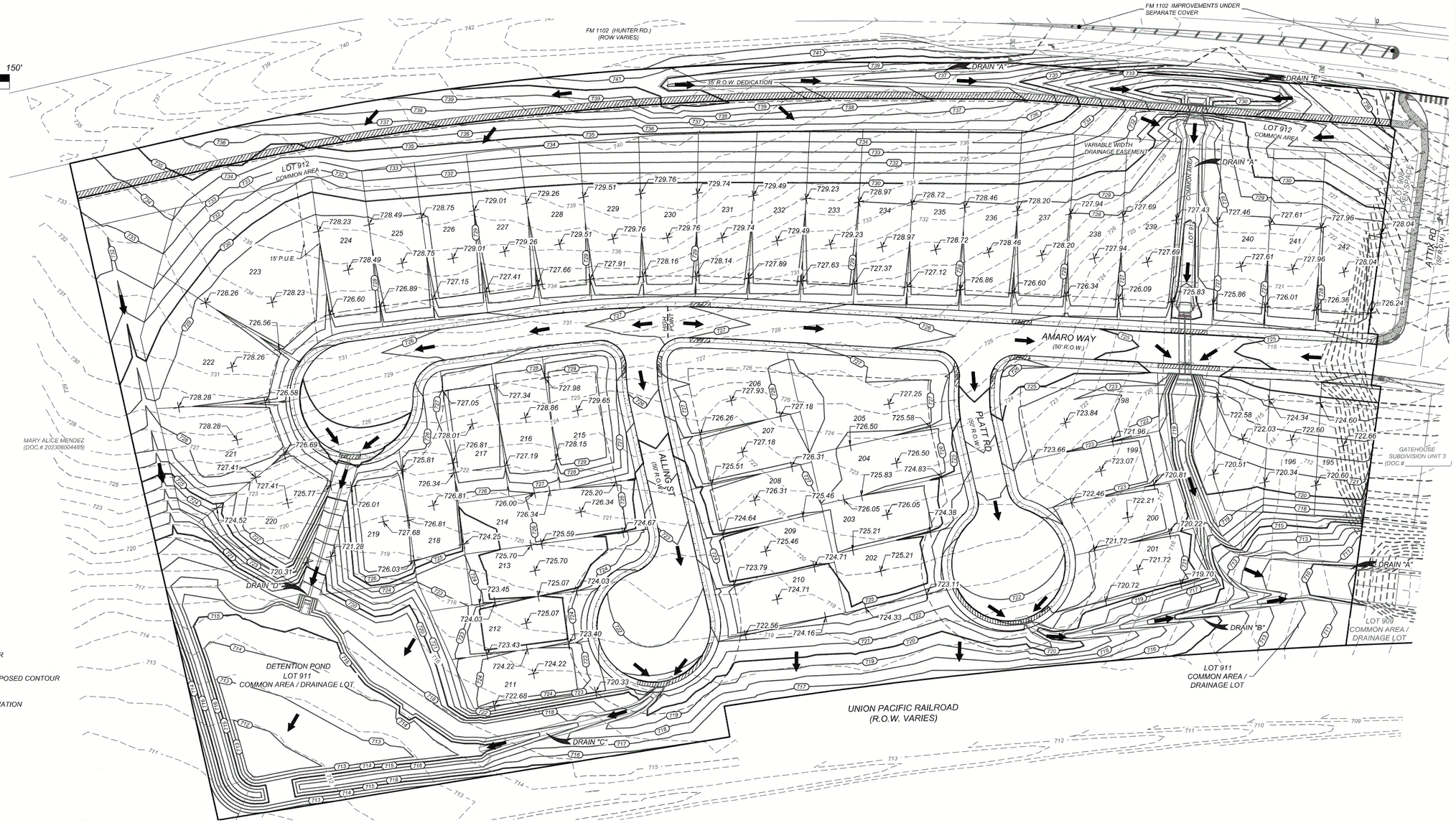


TYPICAL SIDE YARD GRADING
N.T.S.



LOCATION MAP
N.T.S.

SCALE : 1"=50'
0' 50' 150'
100'



LEGEND

- = FLOW ARROW
- 543 = EXISTING CONTOUR
- (543) = PROPOSED CONTOUR
- (600) = ADJACENT UNIT PROPOSED CONTOUR
- FF ELEV. 661.50 = FINISHED FLOOR ELEVATION

Date: May 13, 2025, 9:47am User ID: ASerio
File: U:\Projects\314-52\06\Design\Exhibits (CAD)\Tabletop Grading.dwg
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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
5/13/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
162 West Mill Street
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-19909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: TABLETOP GRADING

SHEET TITLE:
OVERALL GRADING PLAN

SHEET NUMBER:
3.0

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TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION!!:

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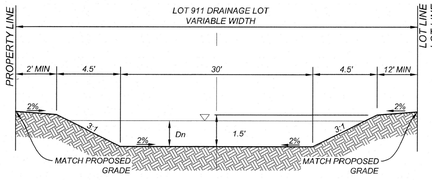
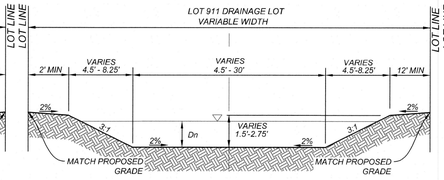
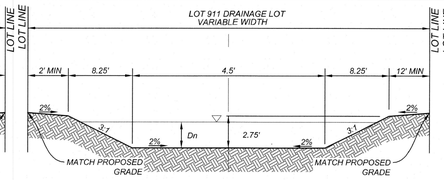


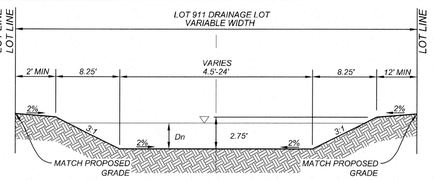
SECTION "A1 - A1"
STA. 1+30.82 TO STA. 2+41.10
N.T.S.



SECTION "A2 - A2"
STA. 2+41.10 TO STA. 3+12.42



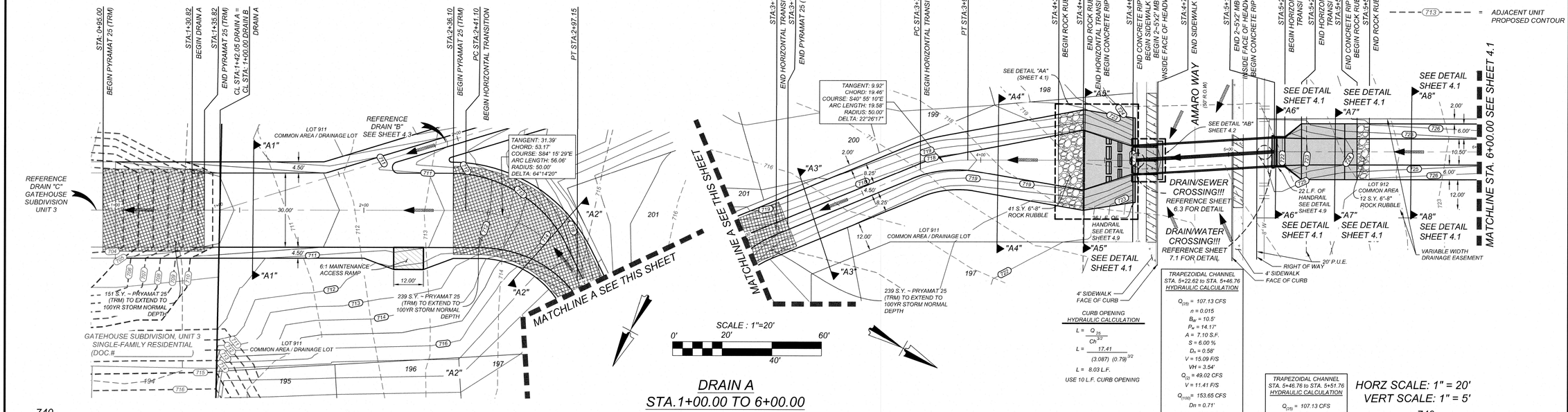
SECTION "A3 - A3"
STA. 3+12.42 TO STA. 3+75.24
N.T.S.



SECTION "A4 - A4"
STA. 3+75.24 TO STA. 4+41.35
N.T.S.

LEGEND

- = FLOW ARROW
- 715 = EXISTING CONTOUR
- 713 = PROPOSED CONTOUR
- 713 = ADJACENT UNIT PROPOSED CONTOUR



SCALE : 1"=20'
0' 20' 60' 40'

DRAIN A
STA.1+00.00 TO 6+00.00

TRAPEZOIDAL CHANNEL STA. 5+22.62 to STA. 5+46.76
HYDRAULIC CALCULATION

$Q_{(25)}$ = 107.13 CFS
n = 0.015
B_W = 10.5'
P_W = 14.17'
A = 7.10 S.F.
S = 6.00 %
D_N = 0.58'
V = 15.09 F/S
VH = 3.54'
$Q_{(2)}$ = 49.02 CFS
V = 11.41 F/S
$Q_{(100)}$= 153.65 CFS
Dn = 0.71'
V = 17.13 F/S

TRAPEZOIDAL CHANNEL STA. 5+46.76 to STA. 5+51.76
HYDRAULIC CALCULATION

$Q_{(25)}$ = 107.13 CFS
n = 0.015
B_W = 10.5'
P_W = 15.88'
A = 11.09 S.F.
S = 1.54 %
D_N = 0.85'
V = 9.66 F/S
VH = 1.45'
$Q_{(2)}$ = 49.02 CFS
V = 7.34 F/S
$Q_{(100)}$= 153.65 CFS
Dn = 1.04'
V = 10.85 F/S

CURB OPENING HYDRAULIC CALCULATION

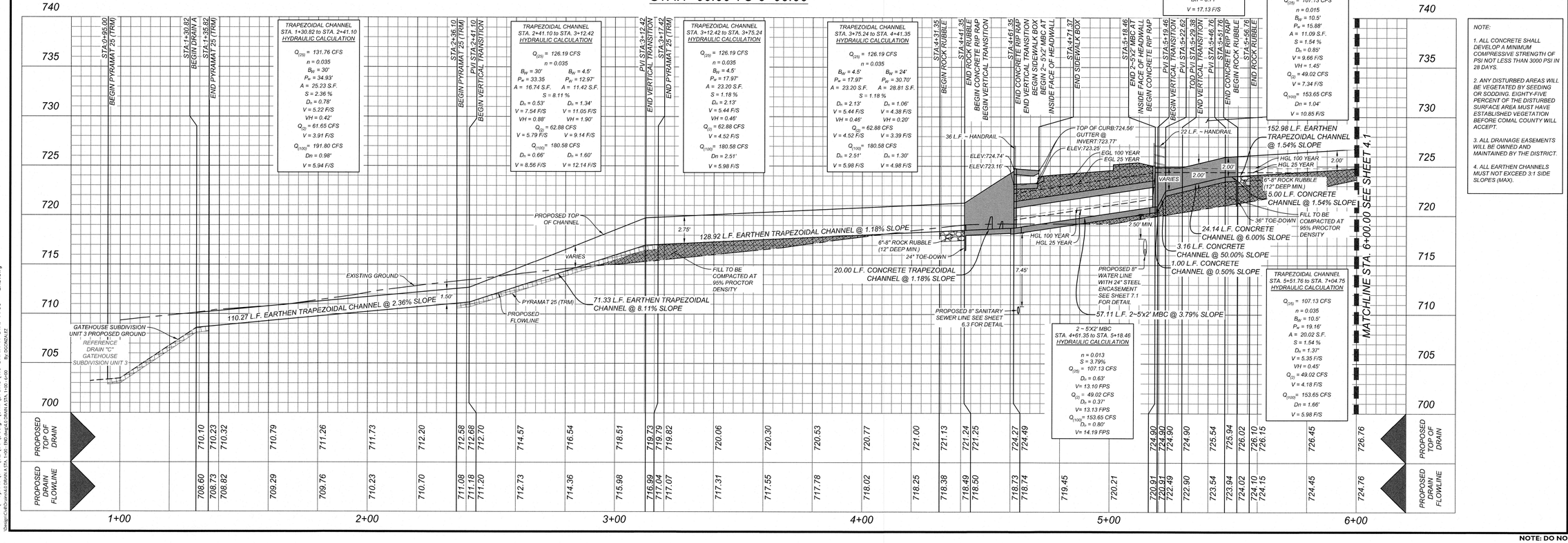
$L = \frac{Q_{25}}{CH^{3/2}}$

$L = \frac{17.41}{(3.087)\ (0.79)^{3/2}}$

L = 8.03 L.F.

USE 10 L.F. CURB OPENING

HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'



NOTE:

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NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS — A. NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER — 7/15/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194050

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.0 DRAIN A STA. 1+00 - END

SHEET TITLE: *DRAIN A STA. 1+00 - 6+00*

SHEET NUMBER: **4.0**

Date: Feb. 13, 2025, 1:14pm User ID: dgonzalez
File: U:\Projects\314.52\06\Design\Civil\Drains\4.0 DRAIN A STA. 1+00 - END.dwg
Design\Civil\Drains\4.0 DRAIN A STA. 1+00 - END.dwg 4.0 DRAIN A STA. 1+00 - END By:DGONZALEZ

TRENCH EXCAVATION SAFETY PROTECTION

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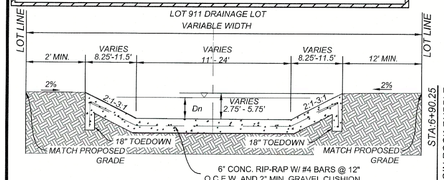
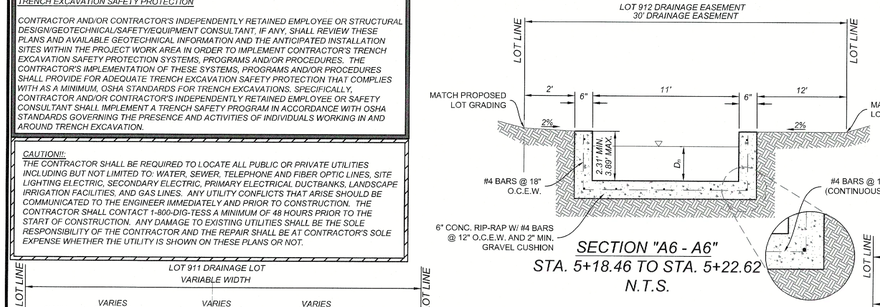
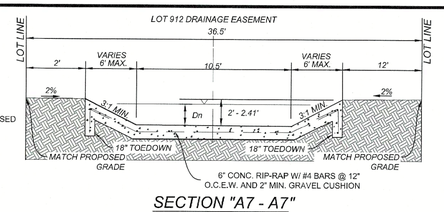


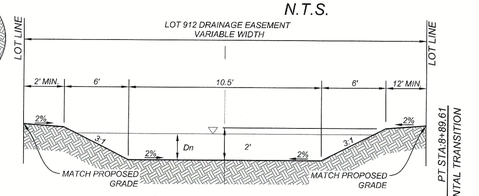
SECTION "A5 - A5"
STA. 4+41.35 TO STA. 4+61.35
N.T.S.



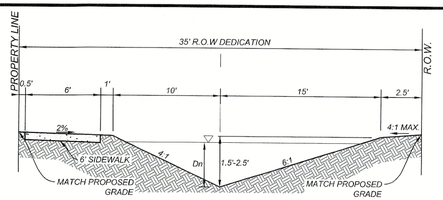
SECTION "A6 - A6"
STA. 5+18.46 TO STA. 5+22.62
N.T.S.



SECTION "A7 - A7"
STA. 5+22.62 TO STA. 5+51.76
N.T.S.



SECTION "A8 - A8"
STA. 5+51.76 TO STA 7+04.75
N.T.S.



SECTION "A9 - A9"
STA. 7+34.25 TO STA. 8+89.61
N.T.S.

LEGEND

- = FLOW ARROW
- 715 = EXISTING CONTOUR
- 713 = PROPOSED CONTOUR
- 713 = ADJACENT UNIT PROPOSED CONTOUR

SCALE : 1"=20'
0' 20' 60'
40'

NOTE:
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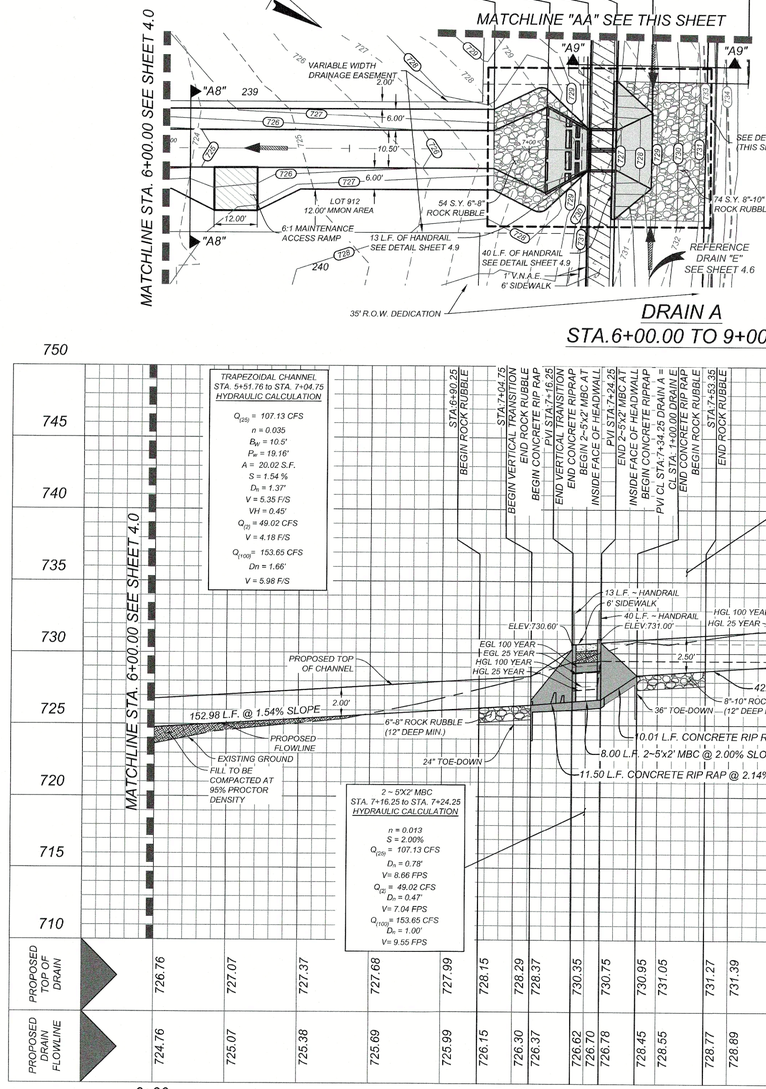
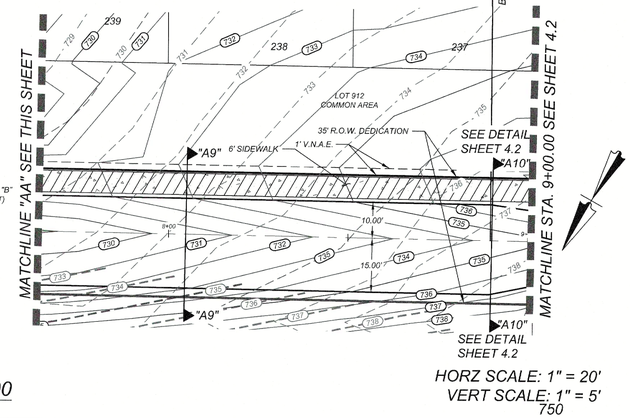


DRAIN A
STA.6+00.00 TO 9+00.00



HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'

DRAIN "A" - BAFFLE BLOCK CALCULATIONS
(CONTRA COSTA METHOD)

BAFFLE BLOCKS HAVE BEEN DESIGNED FOR THE 100-YR ULTIMATE FLOWS OF 153.65 CFS.

Q100 = 153.65 cfs
B_W (W_B) = 11
Y_1 = 1.00' (DEPTH BEFORE JUMP)
V_1 = 9.55 FPS (VELOCITY BEFORE JUMP)

FROUDE NUMBER at Y_1 is $F_1 = V_1 / ((gY_1)^{0.5}) = 1.682$
ASSUME $L_2 / H_2 = 6$

HEIGHT OF BLOCKS:
H_1 = HEIGHT OF FIRST BLOCK
H_2 = HEIGHT OF SECOND BLOCK

$L_2 / H_2 = 1.35 * F_1^2 (H_2 / Y_1)^{-1.83}$
H_2 = 0.78' USE 0.75'
$H_1 = 0.5 * H_2 = 0.75 * 1.' = 0.375'$ USE 0.5'

DISTANCE TO FLOOR BLOCKS:
L_1 = DISTANCE TO FIRST BLOCK
L_2 = DISTANCE TO SECOND BLOCK
L_3 = DISTANCE TO END SILL FROM SECOND BLOCK

$L_2 = 7 * H_2 = 7 * .75' = 4.5'$ USE 4.5'
$L_1 = 0.5 * L_2 = 0.5 * 4.5' = 2.25'$ USE 2.25'
$L_3 = 3.75 * (H_2 / L_2)^{(0.68)} * L_2$
$L_3 = 3.75 * (1'/6')^{(0.68)} * ' = 4.99'$ USE 5.0'

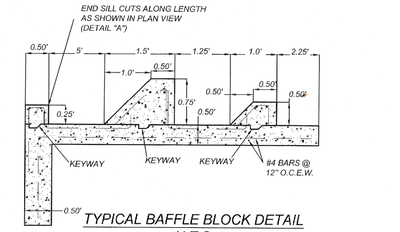
LENGTH OF BASIN:
2_{WD} BLOCK WIDTH + L_2 + L_3 + 0.5' (WIDTH OF END SILL)
1.5' + 4.5' + 5' + 0.5' = 11.5'

MAX WATER DEPTH IN BASIN:
$Y_2 = 1.3 * (L_2 / H_2)^{0.36} * H_2$
$Y_2 = 1.3 * (4.5' / 0.75')^{0.36} * 0.75' = 1.858'$

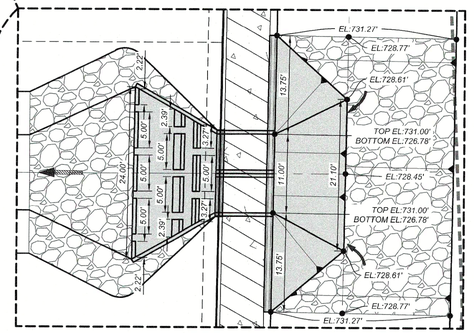
HEIGHT OF END SILL :
$H_2 = 0.1 * Y_2$
$H_3 = 0.1 * 1.858' = 0.1858'$ USE 0.25'

DEPTH OF WATER AT BASIN EXIT:
$Y_C = [(Q/W_B)^2/G]^{0.33}$
Y_C = 1.08
W_B =24
A_C = 25.989

EXIT VELOCITY:
$V_c = Q/A_c$
V_c = 5.91 fps



TYPICAL BAFFLE BLOCK DETAIL
N.T.S.



DETAIL "B"
SCALE 1"=10'

DRAIN "A" - BAFFLE BLOCK CALCULATIONS
(CONTRA COSTA METHOD)

BAFFLE BLOCKS HAVE BEEN DESIGNED FOR THE 100-YR ULTIMATE FLOWS OF 153.65 CFS.

Q100 = 153.65 cfs
B_W (W_B) = 11
Y_1 = 1.08' (DEPTH BEFORE JUMP)
V_1 = 14.19 FPS (VELOCITY BEFORE JUMP)

FROUDE NUMBER at Y_1 is $F_1 = V_1 / ((gY_1)^{0.5}) = 2.406$
ASSUME $L_2 / H_2 = 7$

HEIGHT OF BLOCKS:
H_1 = HEIGHT OF FIRST BLOCK
H_2 = HEIGHT OF SECOND BLOCK

$L_2 / H_2 = 1.35 * F_1^2 (H_2 / Y_1)^{-1.83}$
H_2 = 1.14' USE 1.25'
$H_1 = 0.5 * H_2 = 0.5 * 1.25' = 0.625'$ USE 0.75'

DISTANCE TO FLOOR BLOCKS:
L_1 = DISTANCE TO FIRST BLOCK
L_2 = DISTANCE TO SECOND BLOCK
L_3 = DISTANCE TO END SILL FROM SECOND BLOCK

$L_2 = 7 * H_2 = 7 * 1.25' = 8.75'$ USE 8.75'
$L_1 = 0.5 * L_2 = 0.5 * 8.75' = 4.375'$ USE 4.5'
$L_3 = 3.75 * (H_2 / L_2)^{(0.68)} * L_2$
$L_3 = 3.75 * (1.25' / 8.75')^{(0.68)} * 8.75' = 8.737'$ USE 8.75'

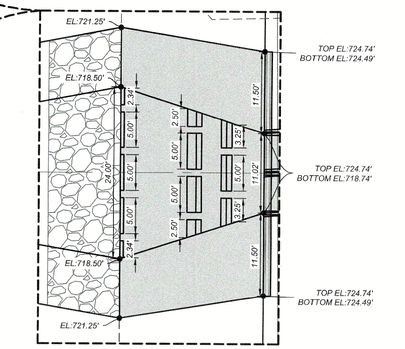
LENGTH OF BASIN:
2_{WD} BLOCK WIDTH + L_2 + L_3 + 0.5' (WIDTH OF END SILL)
2' + 8.75' + 8.75' + 0.5' = 20'

MAX WATER DEPTH IN BASIN:
$Y_2 = 1.3 * (L_2 / H_2)^{0.36} * H_2$
$Y_2 = 1.3 * (8.75' / 1.25')^{0.36} * 1.25' = 3.274'$

HEIGHT OF END SILL :
$H_2 = 0.1 * Y_2$
$H_3 = 0.1 * 3.274' = 0.3274'$ USE 0.5'

DEPTH OF WATER AT BASIN EXIT:
$Q^2 / G = (A_C)^3 / TC = (Y_C * (W_B + Y_C))^3 / (W_B + (2 * Y_C))$
W_B=24
Y_C = 1.0837
A_C = 26.0088

EXIT VELOCITY:
$V_c = Q/A_c$
V_c = 5.91 fps



TYPICAL BAFFLE BLOCK DETAIL
N.T.S.

DETAIL "AA"
SCALE 1"=10'

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
9/4/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14900
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.0 DRAIN A STA. 1+00 - END

SHEET TITLE: *DRAIN A STA. 6+00 - 9+00*

SHEET NUMBER: **4.1**

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Jan 02, 2025, 2:38pm User ID: hmiller
File: U:\Projects\4.1 NEW BRAUNFELS\24003556A_Gatehouse Subdivision Unit 4\4.0 DRAIN A STA. 1+00 - END.dwg
Usage:\Civil\Sheets\4.0 DRAIN A STA. 1+00 - END.dwg, 4.1 DRAIN A STA. 6+00 - 9+00 By: hmiller

TRENCH EXCAVATION SAFETY PROTECTION

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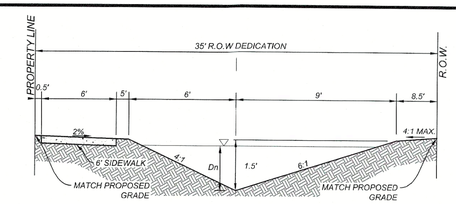


SECTION "A10 - A10"
STA. 8+89.61 TO END
N.T.S.

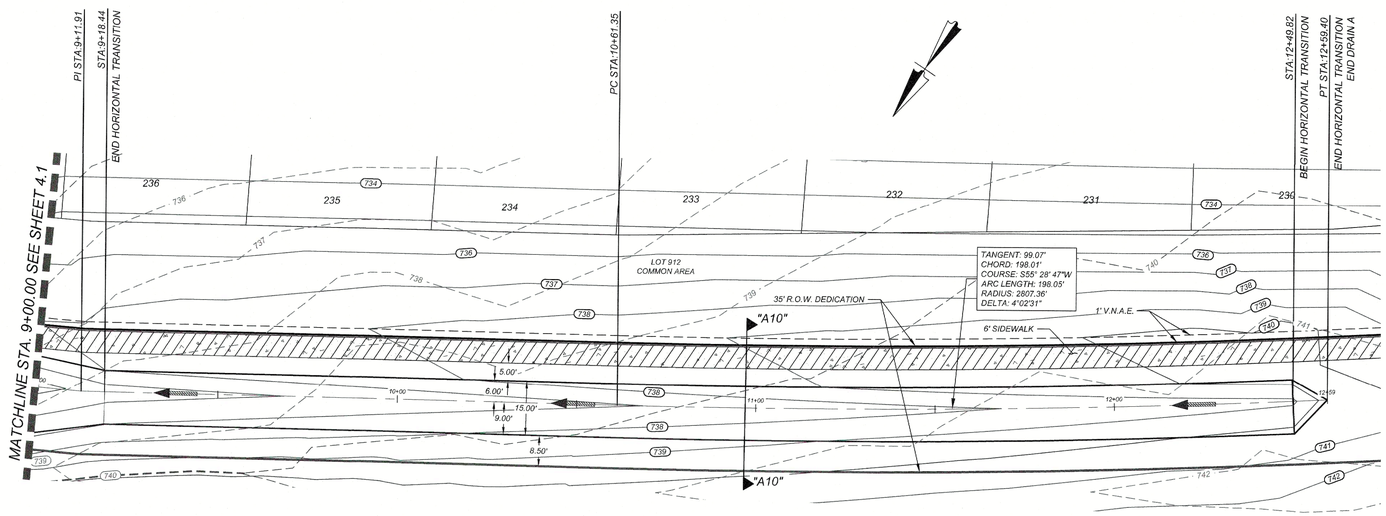
LEGEND

- = FLOW ARROW
- 715 = EXISTING CONTOUR
- 713 = PROPOSED CONTOUR
- 713 = ADJACENT UNIT PROPOSED CONTOUR

SCALE : 1"=20'

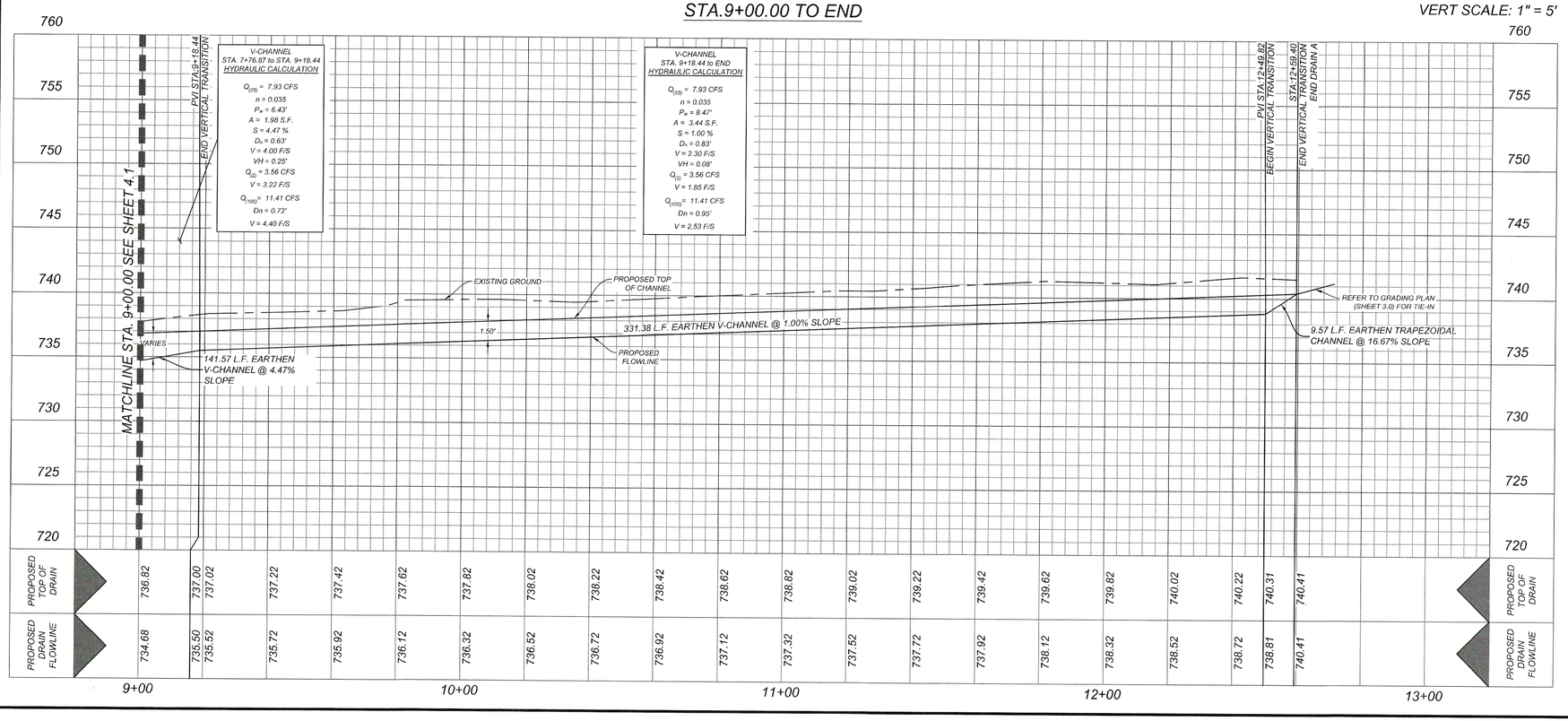
0' 20' 60'

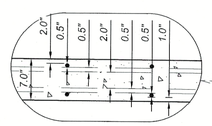
40'

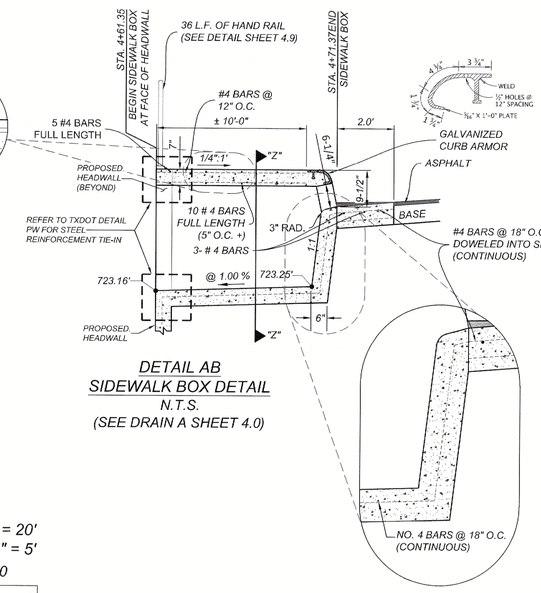


DRAIN A
STA.9+00.00 TO END

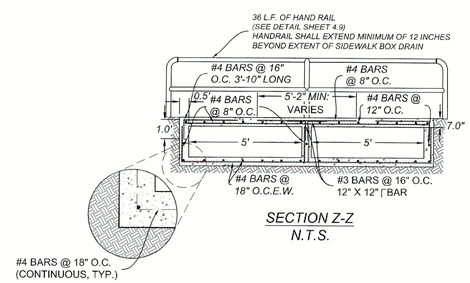
HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'







DETAIL AB
SIDEWALK BOX DETAIL
N.T.S.
(SEE DRAIN A SHEET 4.0)



SECTION Z-Z
N.T.S.

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
12/4/25
Nick Reynolds, P.E.

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KPW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.0 DRAIN A STA. 1+00 - END

SHEET TITLE: DRAIN A STA. 9+00 - END

SHEET NUMBER: 4.2

Date: Dec 20, 2024, 5:03pm User ID: mglenn
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NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

TRENCH EXCAVATION SAFETY PROTECTION

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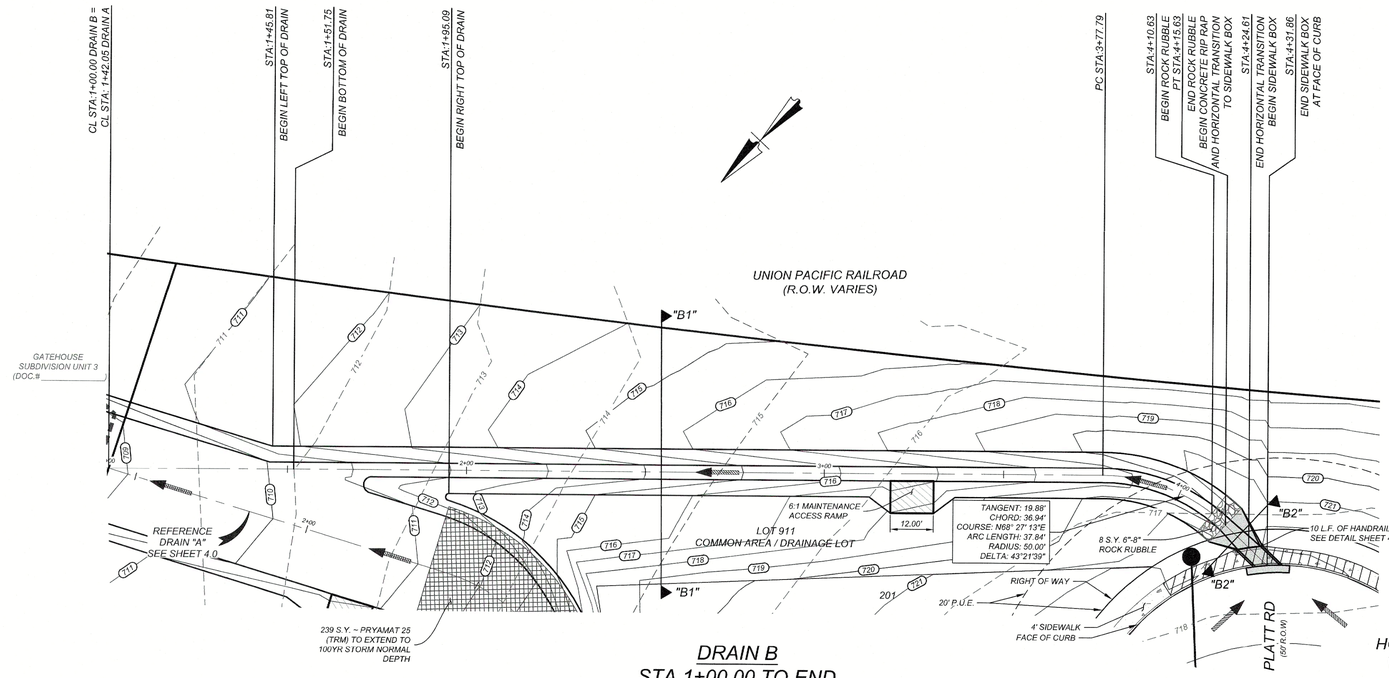
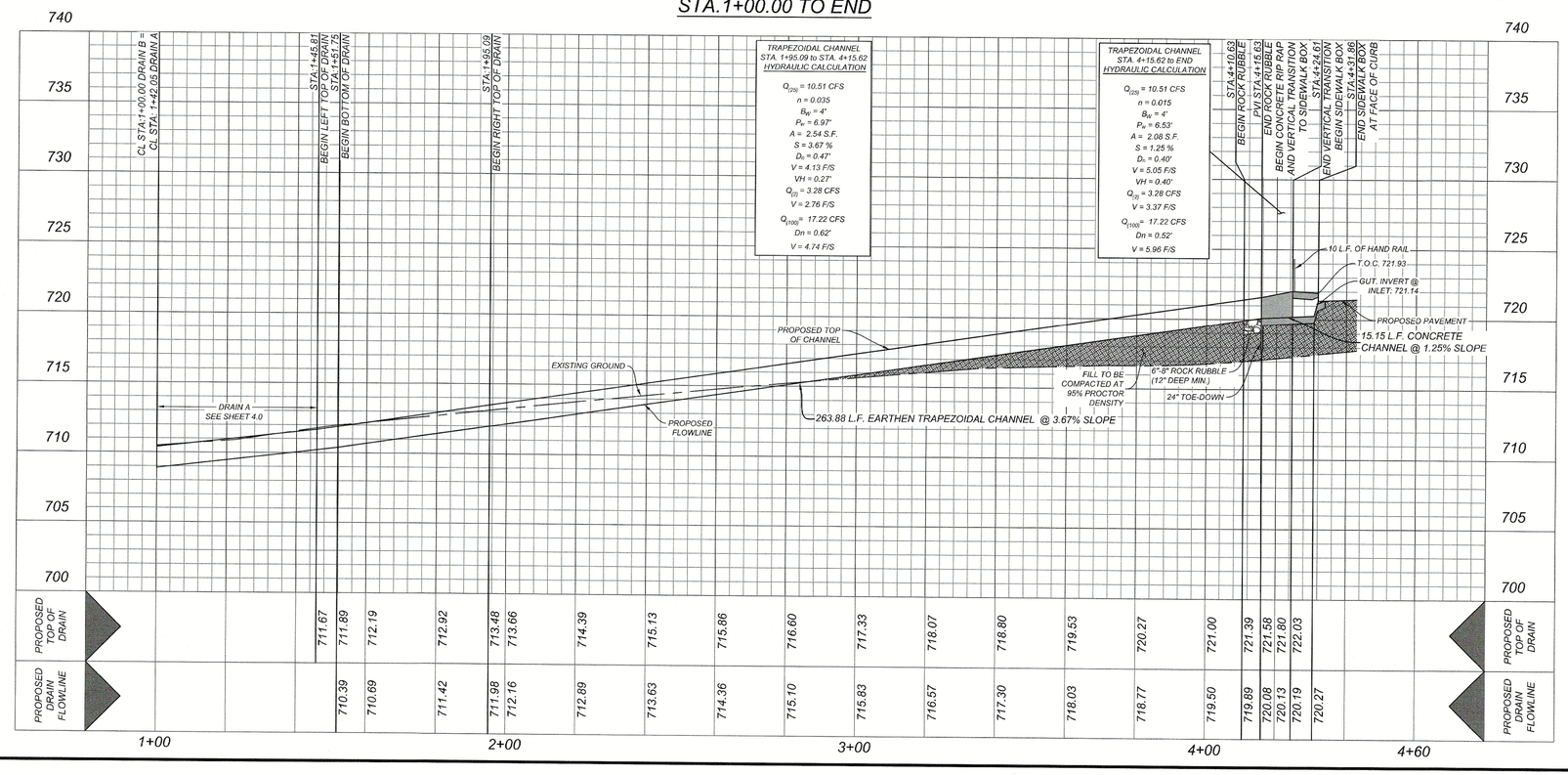
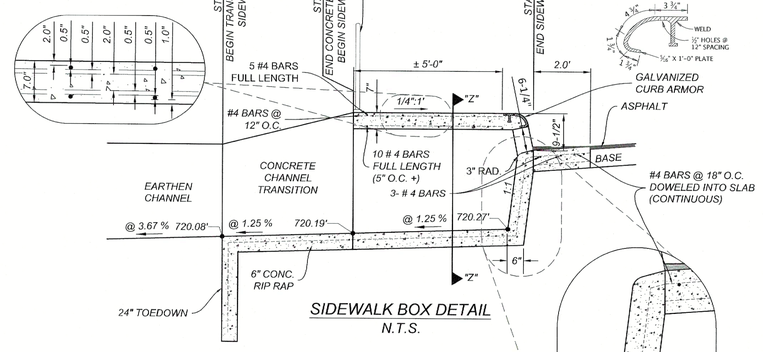
SCALE : 1"=20'
0' 20' 40' 60'



HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'

DRAIN B
STA.1+00.00 TO END





SIDEWALK BOX DETAIL
N.T.S.

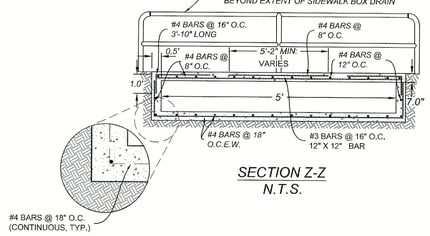
CURB OPENING HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Cn^{3/2}}$

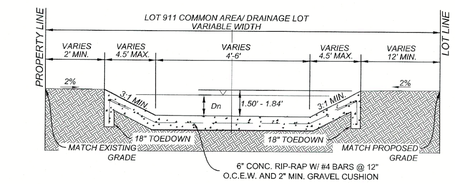
$L = \frac{8.98}{(3.087)\ (0.79)^{3/2}}$

L = 4.14 L.F.

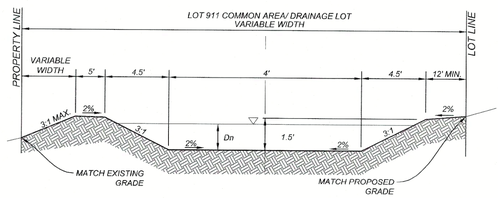
USE 5 L.F. CURB OPENING



SECTION Z-Z
N.T.S.



SECTION "B2-B2"
STA. 4+15.62 TO END
N.T.S.



SECTION "B1-B1"
STA. 1+95.09 TO STA. 4+15.62
N.T.S.

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
12/23/25

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FOR
GATEHOUSE SUBDIVISION UNIT 4
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COMAL COUNTY
TEXAS

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-1909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003566A
DRAWING NAME: 4.3 DRAIN B STA. 1+00 - END

SHEET TITLE: DRAIN B STA. 1+00 - END

SHEET NUMBER: 4.3

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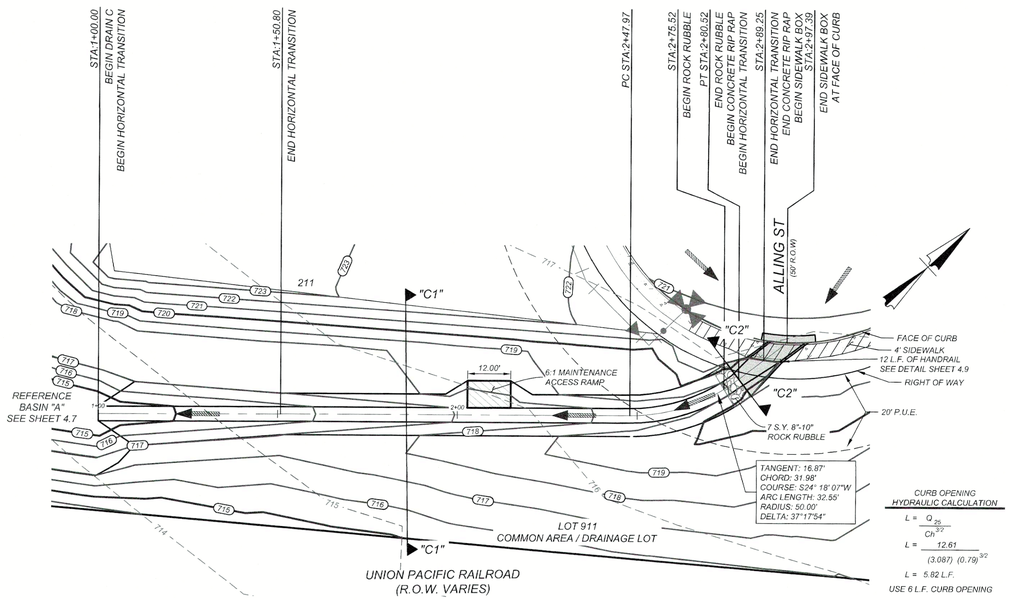
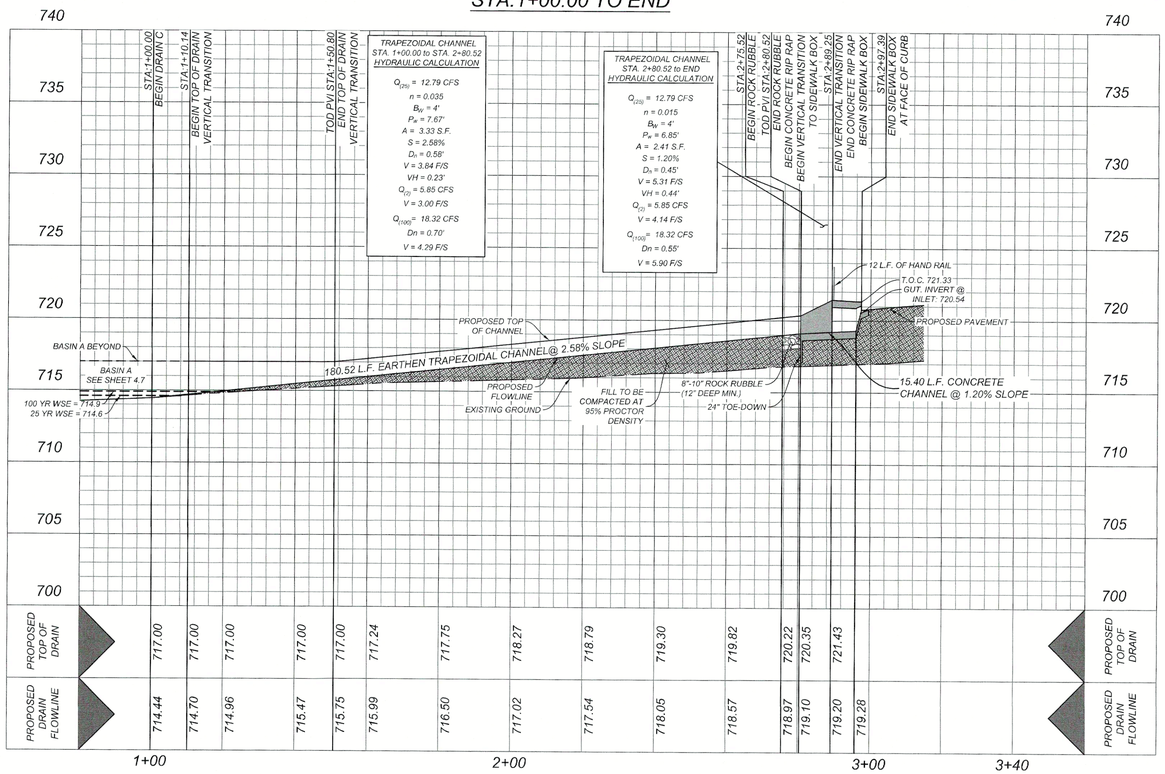


DRAIN C
STA.1+00.00 TO END

HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'



LEGEND

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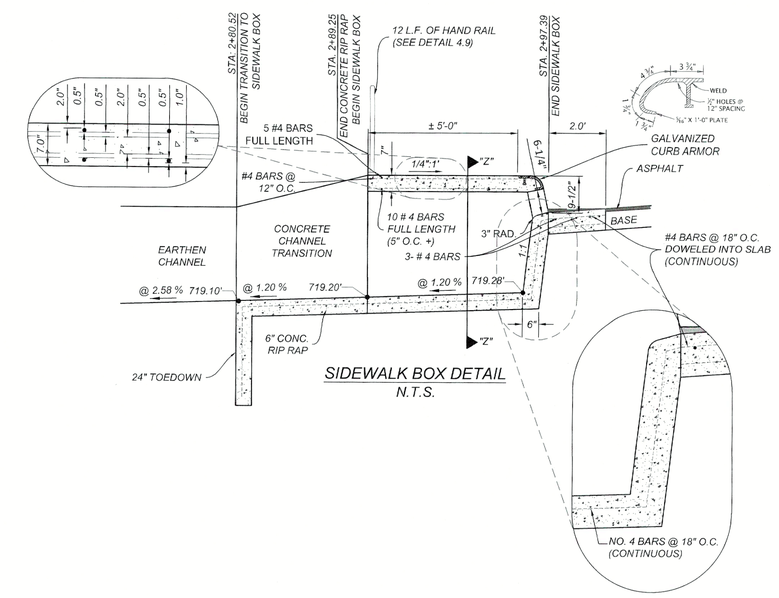
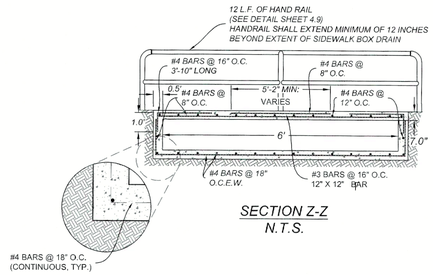
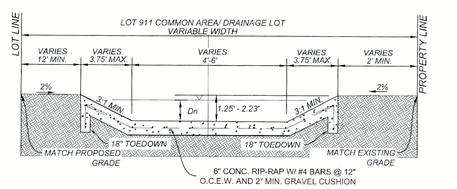
SCALE : 1"=20'
0' 20' 60'
40'



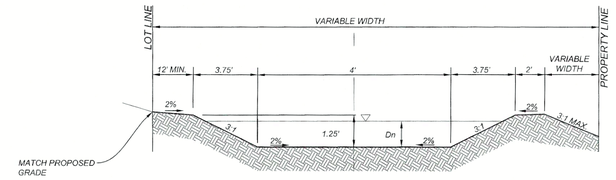
SIDEWALK BOX DETAIL
N.T.S.



SECTION Z-Z
N.T.S.



SECTION "C2-C2"
STA. 2+80.52 TO END
N.T.S.



SECTION "C1-C1"
STA. 1+50.80 TO STA. 2+80.52
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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
4/4/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

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TBPE Firm#: F-18909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.4 DRAIN C STA. 1+00 - END

SHEET TITLE: DRAIN C STA. 1+00 - END

SHEET NUMBER: 4.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Jan 02, 2025, 2:41pm User ID: tmiller
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Design\Workmaps\4.4 DRAIN C STA. 1+00 - END.dwg
4.4 DRAIN C STA. 1+00 - END By: Plotter

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LEGEND

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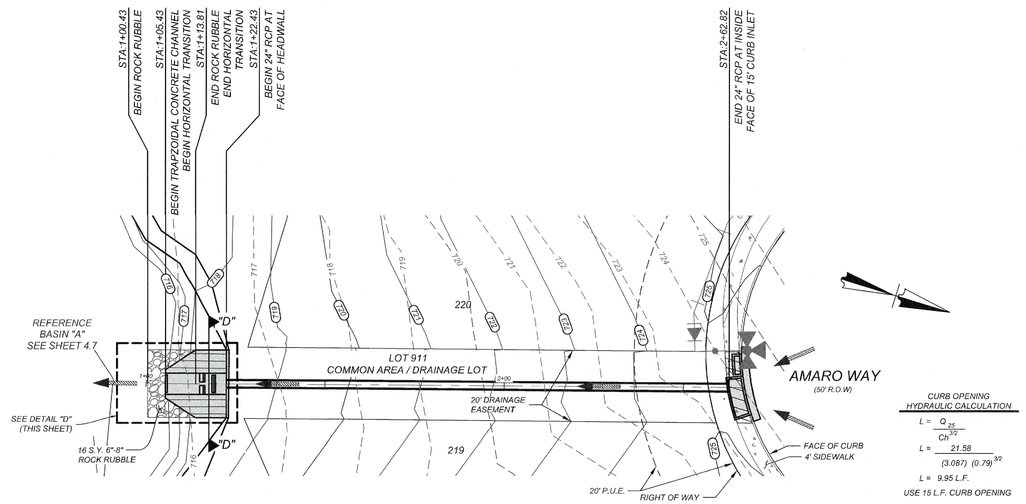
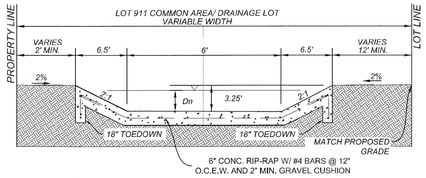
SCALE : 1"=20'

0' 20' 60'

40'

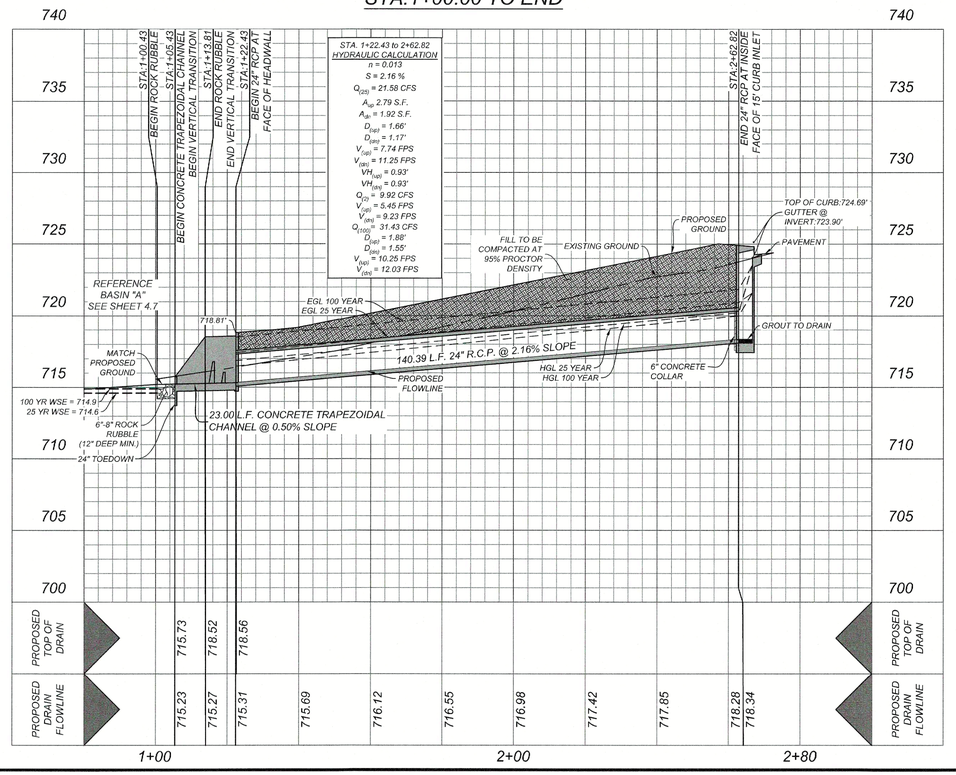




SECTION "D-D"
STA. 1+13.81 TO STA.1+22.43
N.T.S.

DRAIN D
STA.1+00.00 TO END

HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'



DRAIN "D" - BAFFLE BLOCK CALCULATIONS (CONTRA COSTA METHOD)

BAFFLE BLOCKS HAVE BEEN DESIGNED FOR THE 100-YR ULTIMATE FLOWS OF 145.3 CFS.

Q100 = 31.43 cfs
B_W (W_B) = 6
Y_1 = 1.55' (DEPTH BEFORE JUMP)
V_1 = 12.03 FPS (VELOCITY BEFORE JUMP)

FROUDE NUMBER at Y_1 is $F_1 = V_1 / ((gY_1)^{0.5}) = 1.703$
ASSUME $L_2 / H_2 = 4$

HEIGHT OF BLOCKS:
H_1 = HEIGHT OF FIRST BLOCK
H_2 = HEIGHT OF SECOND BLOCK

$L_2 / H_2 = 1.35*F_1^2(H_2 / Y_1)^{-1.83}$
H_2 = 1.53' USE 1.5'
$H_1 = 0.5 * H_2 = 0.5 * 1.5' = 0.75'$ USE 0.75'

DISTANCE TO FLOOR BLOCKS:
L_1 = DISTANCE TO FIRST BLOCK
L_2 = DISTANCE TO SECOND BLOCK
L_3 = DISTANCE TO END SILL FROM SECOND BLOCK

$L_2 = 4 * H_2 = 4 * 1.5' = 6'$ USE 6'
$L_1 = 0.5 * L_2 = 0.5 * 6' = 3'$ USE 3'
$L_3 = 3.75 * (H_2 / L_2)^{(0.68)} * L_2$
$L_3 = 3.75 * (1.5' / 6')^{(0.68)} * 6' = 8.77'$ USE 9'

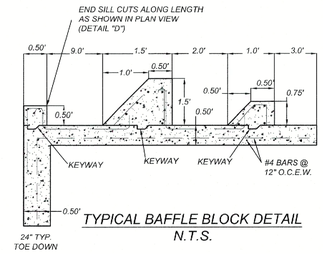
LENGTH OF BASIN:
2_{ND} BLOCK WIDTH + L_2 + L_3 + 0.5' (WIDTH OF END SILL)
1.5' + 6' + 9' + 0.5' = 17'

MAX WATER DEPTH IN BASIN:
$Y_2 = 1.3 * (L_2 / H_2)^{0.36} * H_2$
$Y_2 = 1.3 * (6' / 1.5')^{0.36} * 1.5' = 3.21'$

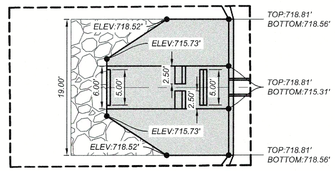
HEIGHT OF END SILL :
$H_3 = 0.1 * Y_2$
$H_3 = 0.1 * 3.21' = 0.321'$ USE 0.50'

DEPTH OF WATER AT BASIN EXIT:
$Q^2 / G = (A_C)^3 / TC = (Y_C * (W_B + Y_C))^3 / (W_B + (2 * Y_C))$
W_C=6
Y_C = 0.948
A_C = 7.491

EXIT VELOCITY:
$V_C = Q/A_C$
V_C = 4.20 fps



TYPICAL BAFFLE BLOCK DETAIL
N.T.S.



DETAIL "D"
SCALE 1"=10'

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS — A. NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER — 11/2/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TSPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.5 DRAIN D STA. 1+00 - END

SHEET TITLE: *DRAIN D STA. 1+00 - END*

SHEET NUMBER: 4.5

Date: Dec. 23, 2024, 8:15pm User ID: mgleen
File: U:\Projects\314\52.06\Design\Civil\Drains\4.5 DRAIN D STA. 1+00 - END.dwg
Design/Civil/Drains/4.5 DRAIN D STA. 1+00 - END dwg=4.5 DRAIN D STA. 1+00 - END By: MGLEEN

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

TRENCH EXCAVATION SAFETY PROTECTION

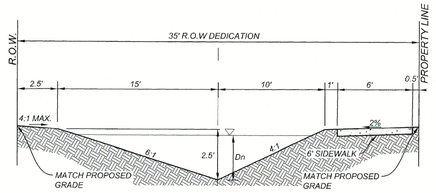
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

CAUTION!!

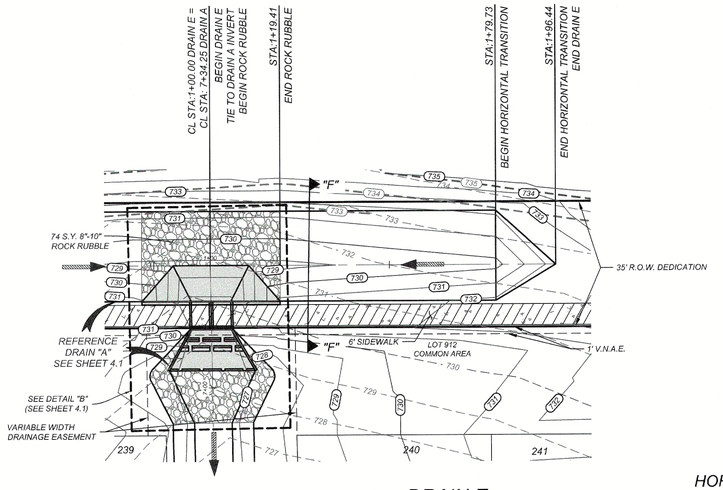
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF PSI NOT LESS THAN 3000 PSI IN 28 DAYS.
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE COMAL COUNTY WILL ACCEPT.
3. ALL DRAINAGE EASEMENTS WILL BE OWNED AND MAINTAINED BY THE DISTRICT.
4. ALL EARTHEN CHANNELS MUST NOT EXCEED 3:1 SIDE SLOPES (MAX).

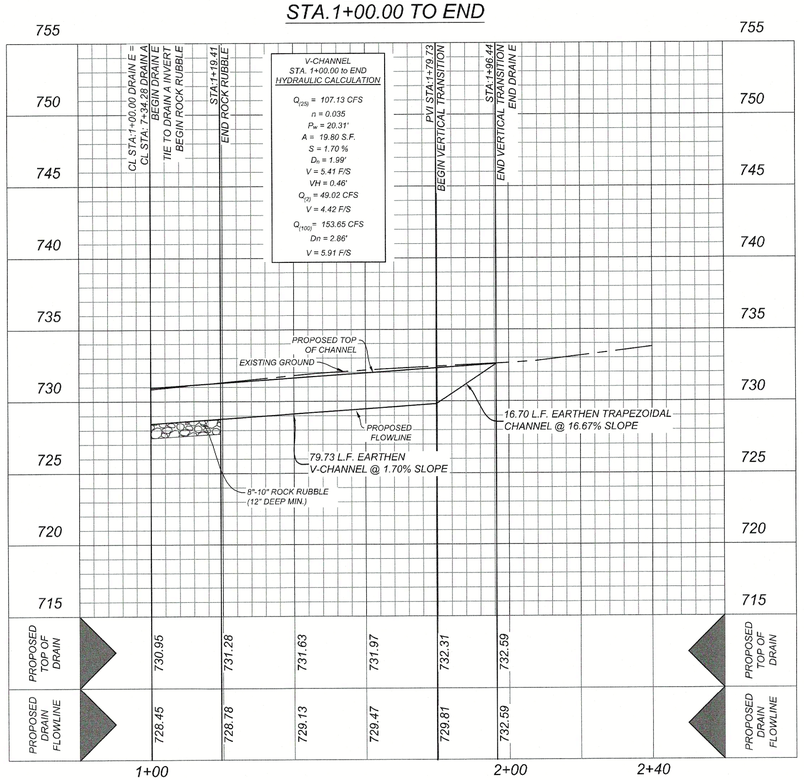


SECTION "F-F"
STA. 1+19.41 TO END
N.T.S.



DRAIN E
STA.1+00.00 TO END

HORZ SCALE: 1" = 20'
VERT SCALE: 1" = 5'



LEGEND

- FLOW ARROW
- 715 — EXISTING CONTOUR
- 713 — PROPOSED CONTOUR
- 713 — ADJACENT UNIT PROPOSED CONTOUR

SCALE : 1"=20'
0' 20' 60'
40'

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED
PROFESSIONAL ENGINEER
1/6/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.6 DRAIN E STA. 1+00 - END

SHEET TITLE: DRAIN E STA. 1+00 - END

SHEET NUMBER: 4.6

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Dec 23, 2024, 8:46am User ID: mglenn
File: U:\Projects\314\02\06\Design\Civil\Drains\4.6 DRAIN E STA. 1+00 - END.dwg
Designed:Approved:Drawn:MSG Checked:WF Xrefs:4.6 DRAIN E STA. 1+00 - END 3y:4.6DRAIN

TRENCH EXCAVATION SAFETY PROTECTION

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2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE COMAL COUNTY WILL ACCEPT.
3. ALL DRAINAGE EASEMENTS WILL BE OWNED AND MAINTAINED BY THE DISTRICT.
4. ALL EARTHEN CHANNELS MUST NOT EXCEED 3:1 SIDE SLOPES (MAX).
5. MAINTENANCE ACCESS RAMP SHALL BE 6" CONCRETE RIPRAP WITH #4 BARS @ 12" O.C.E.W. WITH 18" TOE-DOWNS.

PROPOSED DISCHARGE		
Q_2 = 8.7 CFS	WSEL $_2$ = 713.7'	PEAK STORAGE $_2$ = 0.3 AC-FT
Q_{10} = 26.2 CFS	WSEL $_{10}$ = 714.4'	PEAK STORAGE $_{10}$ = 0.6 AC-FT
Q_{25} = 41.2 CFS	WSEL $_{25}$ = 714.6'	PEAK STORAGE $_{25}$ = 0.7 AC-FT
Q_{50} = 53.1 CFS	WSEL $_{50}$ = 714.7'	PEAK STORAGE $_{50}$ = 0.8 AC-FT
Q_{100} = 65.8 CFS	WSEL $_{100}$ = 714.9'	PEAK STORAGE $_{100}$ = 0.8 AC-FT

ULTIMATE DISCHARGE		
Q_2 = 8.7 CFS	WSEL $_2$ = 713.7'	PEAK STORAGE $_2$ = 0.3 AC-FT
Q_{10} = 25.3 CFS	WSEL $_{10}$ = 714.4'	PEAK STORAGE $_{10}$ = 0.7 AC-FT
Q_{25} = 41.2 CFS	WSEL $_{25}$ = 714.6'	PEAK STORAGE $_{25}$ = 0.7 AC-FT
Q_{50} = 53.1 CFS	WSEL $_{50}$ = 714.7'	PEAK STORAGE $_{50}$ = 0.8 AC-FT
Q_{100} = 65.8 CFS	WSEL $_{100}$ = 714.9'	PEAK STORAGE $_{100}$ = 0.8 AC-FT

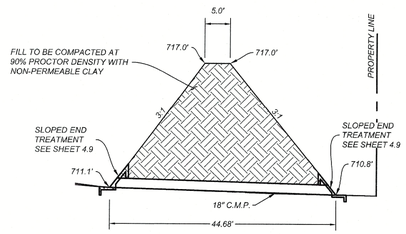
LEGEND

= FLOW ARROW
= EXISTING CONTOUR
= PROPOSED CONTOUR
= ADJACENT COUNTOURS

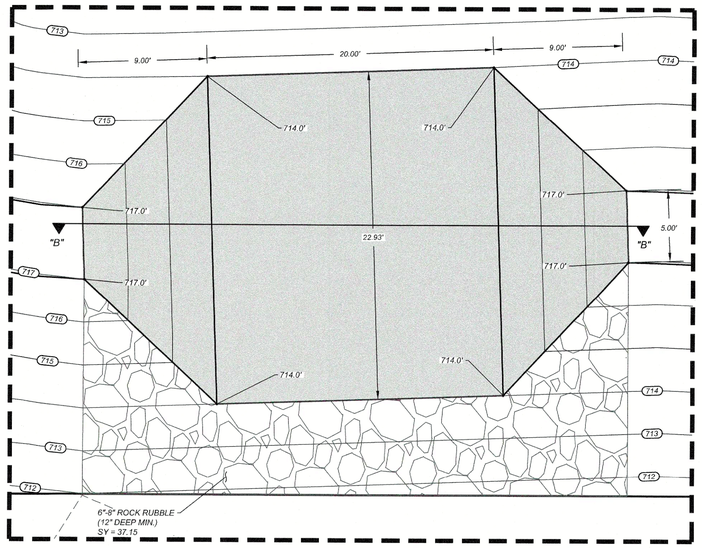
SCALE : 1"=20'

0' 20' 60'

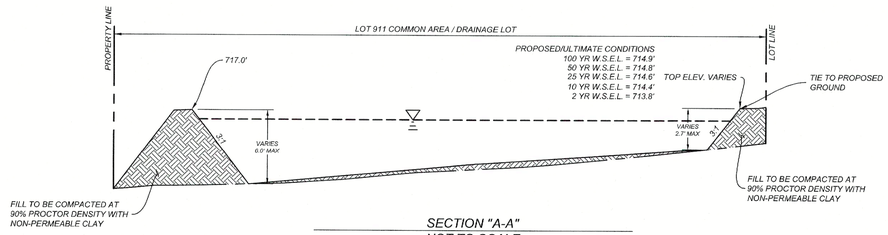
40'



SECTION "C-C"
NOT TO SCALE



DETAIL "A"
SCALE 1"=5'



SECTION "A-A"
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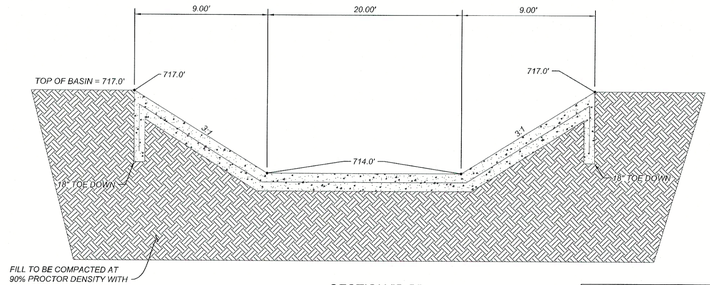

SECTION "B-B"
WEIR
NOT TO SCALE

EMERGENCY OVERFLOW WEIR CALCULATION

$Q_{CAP} = C^*L^*H^{3/2}$

$Q_{CAP} = 2.60 * 25.4\ FT * (2.1\ FT^{3/2})$

$Q_{CAP} = 200.97\ CFS$

200.97 CFS > 45.6 CFS (Q_{25}) = OK

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
4/4/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design

NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14969
TBPLS Firm#: 10194350

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
24003556A	4.7 BASIN A

SHEET TITLE: *BASIN A*

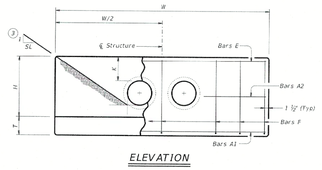
SHEET NUMBER: 4.7

Date: Apr 01, 2025, 2:56pm User ID: ASerno
File: L:\Projects\24003556A\Design\Civil\Drains\4.7 BASIN A.dwg
\Design\Civil\Drains\4.7 BASIN A.dwg\4.7 BASIN A By:ASERNO

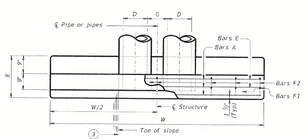
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

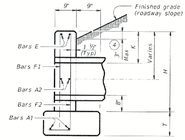
Slope	Dia of Pipe (D)	Values for One Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)	Values To Be Added For Each ADDT'L Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9'-0"	122	1.1	1'-9"	15	0.2
	15"	10'-3"	136	1.3	2'-2"	16	0.2
	18"	11'-6"	163	1.5	2'-8"	19	0.3
	21"	12'-9"	200	1.8	3'-1"	31	0.4
	24"	14'-0"	217	2.1	3'-7"	34	0.4
	27"	15'-3"	254	2.4	3'-11"	37	0.5
	30"	16'-6"	272	2.7	4'-4"	40	0.6
	33"	17'-9"	314	3.1	4'-8"	43	0.6
	36"	19'-0"	371	3.9	5'-1"	46	0.8
	42"	21'-6"	442	4.9	5'-10"	52	1.0
	48"	25'-0"	569	6.4	6'-7"	59	1.3
	54"	27'-6"	701	7.5	7'-6"	82	1.6
	60"	30'-0"	794	8.8	8'-3"	90	1.8
	66"	32'-6"	894	10.2	8'-9"	96	2.0
	72"	35'-0"	1,055	11.7	9'-4"	103	2.3
3:1	12"	13'-0"	173	1.6	1'-9"	14	0.2
	15"	14'-9"	193	1.9	2'-2"	17	0.2
	18"	16'-6"	228	2.2	2'-8"	19	0.3
	21"	18'-3"	299	2.6	3'-1"	31	0.4
	24"	20'-0"	323	3.0	3'-7"	33	0.4
	27"	21'-9"	371	3.5	3'-11"	37	0.5
	30"	23'-6"	415	4.0	4'-4"	40	0.5
	33"	25'-3"	469	4.6	4'-8"	43	0.6
	36"	27'-0"	536	5.7	5'-1"	46	0.8
	42"	30'-6"	675	7.1	5'-10"	52	1.0
	48"	35'-6"	837	9.2	6'-7"	59	1.3
	54"	39'-0"	1,015	11.0	7'-6"	84	1.6
	60"	42'-6"	1,171	12.9	8'-3"	91	1.8
	66"	46'-0"	1,298	14.9	8'-9"	98	2.0
	72"	49'-6"	1,561	17.1	9'-4"	103	2.3
4:1	12"	17'-0"	229	2.0	1'-9"	15	0.2
	15"	19'-3"	266	2.4	2'-2"	17	0.2
	18"	21'-6"	308	2.9	2'-8"	19	0.3
	21"	23'-9"	382	3.5	3'-1"	31	0.3
	24"	26'-0"	430	3.9	3'-7"	34	0.4
	27"	28'-3"	486	4.7	3'-11"	37	0.5
	30"	30'-6"	539	5.2	4'-4"	40	0.6
	33"	32'-9"	603	6.0	4'-8"	42	0.6
	36"	35'-0"	738	7.5	5'-1"	47	0.8
	42"	39'-6"	881	9.3	5'-10"	52	1.0
	48"	46'-0"	1,102	12.1	6'-7"	61	1.3
	54"	50'-6"	1,364	14.4	7'-6"	84	1.6
	60"	55'-0"	1,547	16.9	8'-3"	91	1.8
	66"	59'-6"	1,741	19.5	8'-9"	98	2.0
	72"	64'-0"	2,077	22.4	9'-4"	102	2.3
6:1	12"	25'-0"	336	3.0	1'-9"	14	0.2
	15"	28'-3"	384	3.6	2'-2"	17	0.2
	18"	31'-6"	452	4.2	2'-8"	19	0.3
	21"	34'-9"	581	5.1	3'-1"	31	0.4
	24"	38'-0"	644	5.8	3'-7"	34	0.4
	27"	41'-3"	737	6.9	3'-11"	37	0.5
	30"	44'-6"	807	7.7	4'-4"	39	0.6
	33"	47'-9"	912	8.9	4'-8"	44	0.6
	36"	51'-0"	1,108	11.0	5'-1"	48	0.8
	42"	57'-6"	1,318	13.7	5'-10"	54	1.0
	48"	67'-0"	1,682	17.9	6'-7"	59	1.3
	54"	73'-6"	2,072	21.3	7'-6"	83	1.6
	60"	80'-0"	2,351	24.9	8'-3"	89	1.8
	66"	86'-6"	2,643	28.9	8'-9"	96	2.0
	72"	93'-0"	3,121	33.1	9'-4"	101	2.3



ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE

BARS F2

DISCLAIMER:
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DATE:
FILE:

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'_c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

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

(1) Total quantities include one 3'-1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline edge of pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

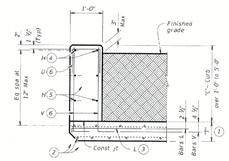
(6) Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	W	T	E
12"	0'-9"	1'-0"	2'-8"	0'-9"	1'-9"
15"	0'-11"	1'-0"	2'-11"	0'-9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	0'-9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	0'-9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	0'-9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	0'-9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	0'-9"	2'-3"
33"	2'-1"	1'-0"	4'-5"	0'-9"	2'-6"
36"	2'-3"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-6"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"
54"	3'-0"	1'-3"	6'-5"	1'-0"	3'-3"
60"	3'-3"	1'-3"	6'-11"	1'-0"	3'-6"
66"	3'-3"	1'-3"	7'-5"	1'-0"	3'-9"
72"	3'-6"	1'-3"	7'-11"	1'-0"	4'-0"

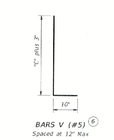
TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	–	2
A2	#5	1'-6"	–
E	#5	–	2
F	#5	1'-0"	–



TYPICAL SECTION

Used for curbs over 1'-0" to 5'-0"



BARS V (#5) (6)
Spaced at 12" Max

BARS L (#5) (3)
Spaced at 12" Max

OPTIONAL BARS L (#5) (3) (7)
Spaced at 12" Max

BARS U (#4) (6)
Spaced at 12" Max

(1) "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 7" thick, see SCP-ND standard for additional details.

(2) Adjust normal culvert slab bars as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H(#4) as required to maintain 12" Max spacing.

(6) Replace normal culvert curb bars K and bars V with bars A, F as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lbs/LF)
1'-0"	0.037	8.9
1'-6"	0.056	14.3
2'-0"	0.074	15.4
2'-6"	0.093	17.7
3'-0"	0.111	18.8
3'-6"	0.130	21.2
4'-0"	0.148	22.2
4'-6"	0.167	24.6
5'-0"	0.185	25.6

CONSTRUCTION NOTES:
Adjust reinforcing steel as necessary to provide 1 ½" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class "C" concrete (f'_c = 3,600 psi) minimum for curbs.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR1, PR2 and PR3 type rails. These details are not suitable for the mounting of bridge rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

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

Texas Department of Transportation — Bridge Division Standard

EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE: ecdd0625.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
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REVISIONS				
05-24: General form added. TEST CK	DIST	COUNTY		SHEET NO.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No liability of any kind is assumed by the Texas Department of Transportation for any damages resulting from its use or for any modification or misinterpretation of its contents by any party except the State of Texas and those persons acting through it.

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

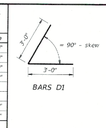
Maximum Wingwall Height He	W	X	Y	Z	Variable Reinforcing Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities per Ft of wing (2-wings) (4) Reinf (Lb/Ft)	Conc (CY/Ft)	Estimated Quantities per Ft of Toewall (1-toewall) Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.408	6.85	0.071
2'-9"	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"	53.88	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
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-2"	1'-2"	1'-45	7"	#4	1'-0"	#4	1'-0"	62.12	0.616	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'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-0"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-0"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-0"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-0"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-0"	8'-10"	4'-3"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-0"	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"
V	#4	–	1'-0"

TABLE OF TOEWALL REINFORCING

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



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

He = H + T + C
Lw = (He) (SL) + cosine (B) for Type PW-1
= (He - 7'1.5SL) + cosine (B) for Type PW-2 and He ≥ 4'
= (He - 0.5') (SL) + cosine (B) for Type PR-2 and He < 4'

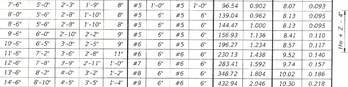
For cast-in place culverts:
Ltw = (Lw) (SL + (N + 1) (0.5)) + cosine (B)

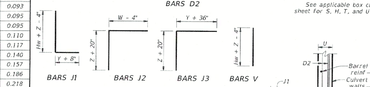
For precast culverts:
Ltw = (N) (2U + S) + (N - 1) (0.5)) + cosine (B)
Total Wingwall Area (two wings = SF)
= (2)(He)(Lw) for Type PW-1
= (2)(He)(Lw) - 6 SF for Type PW-2 and He ≥ 4'
= (2)(He)(Lw) - 1.5 SF for Type PW-2 and He < 4'

He = 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)
B = Culvert skew

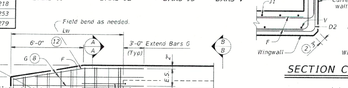
See applicable box culvert standard sheet for S, M, T, and U values.

SECTION C-C - PW-1





SECTION C-C - PW-2



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 wingwalls for wingwalls and culverts may be reduced on embankments 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 NON-SKEWED PIPE CULVERTS

CH-PW-0

FILE: CD-CH-PW0-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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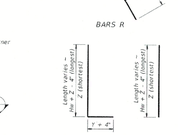

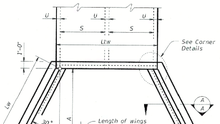

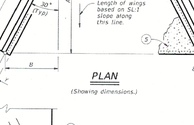

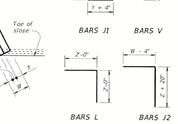

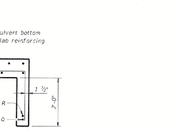

MATERIAL NOTES:
Provide Class C concrete (f'_c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing 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 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 FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

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

Maximum Wingwall Height He	W	X	Y	T	Variable Reinforcing Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities per Ft of wing (2-wings) (4) Reinf (Lb/Ft)	Conc (CY/Ft)	Estimated Quantities per Ft of Toewall (2-toewall) Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.268	5.70	0.059
2'-9"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.281	5.70	0.059
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273	5.70	0.059
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285	5.70	0.059
4'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	41.77	0.303	5.70	0.059
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343	5.70	0.059
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355	5.70	0.059
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367	5.70	0.059
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414	5.70	0.059
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486	5.70	0.059
9'-0"	4'-8"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	68.49	0.535	5.70	0.059
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584	5.70	0.059
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634	5.70	0.059
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721	5.70	0.059
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.836	5.70	0.059
14'-0"	7'-2"	3'-6"	3'-0"	#8	6"	#5	6"	216.78	0.959	5.70	0.059
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068	5.70	0.059
16'-0"	8'-2"	4'-6"	3'-3"	1'-3"	#9	6"	#6	6"	297.02	1.234	5.70	0.059

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D	#5	–	1'-0"
E	#4	–	1'-0"
F	#4	–	1'-0"
G	#6	4	–
M	#4	4	–
P	#4	–	1'-0"
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.)

He = H + T + C
Lw = (He) (SL) + (N) (0.5) + cosine (B)
Total Wingwall Area (two wings = SF)
= (2)(He)(Lw) - 6 SF

He = Height of wingwall
Lw = Length of wingwall
N = Number of culvert spans

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

(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 K 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 Ln.

(4) Recommended values of side 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 8" wide by 1'-0" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground, unpaved roadway and by extending typical riprap reinforcing into the toewall; and extend construction joints and grooved joints oriented in the direction of flow across the limits of the riprap. Where riprap is intermittently 20'. When such riprap is provided, the 8" deep 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) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 5'-0, refer to the Extended Curb Details for T631 or T631LS railing, as applicable. For structures with T631 or T631LS Rails (T631-CM) standard sheet, 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.

(8) 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 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 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: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

(1) Skew = 0°

(2) At discharge end, chamfer may be ¾" 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 Ln. Quantities shown do not include weight of Bars D.

(5) Provide weephole for He = 5'-0" and greater. Fill around weepholes with coarse gravel.

(6) Extend Bars E2 of PW-2 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 5'-0, refer to the Extended Curb Details for T631 or T631LS railing, as applicable. For structures with T631 or T631LS Rails (T631-CM) standard sheet, 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 He < 4'.

(13) 6" for He < 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

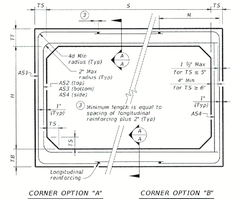
BOX DATA

SECTION DIMENSIONS S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	Fill Height (ft.)	N (Min) (in.)	REINFORCING (sq. in. / ft.) ② AS1	AS2	AS3	AS4	AS5	AS7	AS8	① (Lft) Weight (tons)
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9
5	5	6	6	6	20	35	0.13	0.31	0.32	0.14	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9

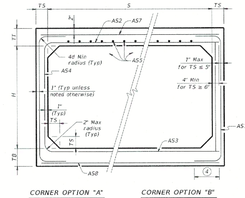
DESIGNER'S NOTE: This standard is governed by the Texas Engineering Practice Act. No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT disclaims responsibility for the adequacy of these standards and shall not be liable for any damages resulting from their use. The engineer using these standards is responsible for the correct design and detailing of the structure in accordance with sound engineering practice and the requirements of the governing jurisdiction.

① For box length = 8'-0"

② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

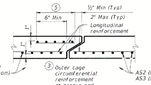


FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (110° Hook) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
Provide Class 'H' concrete (f'c = 5,000 psi).

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
The box designs for the fill heights shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)."

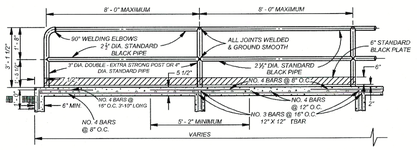
HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS
PRECAST
5'-0" SPAN

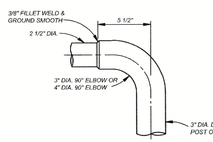
SCP-5

FILE: CD-SCP05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2005	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION

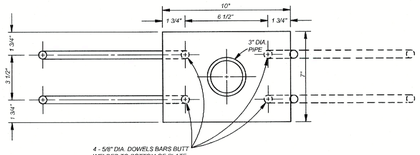
N.T.S.

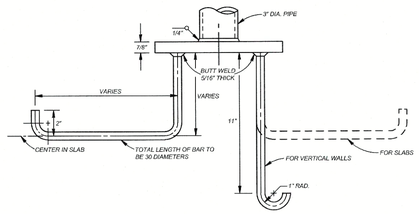


DETAIL OF 90° WELDING ELBOWS

N.T.S.

* A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.





PIPE ANCHORAGE DETAILS

N.T.S.

PYRAMAT®

Product Data

PYRAMAT® 25 TRM

PYRAMAT® 25 turf reinforcement mat (TRM) is a three-dimensional, lofty, woven polypropylene geotextile that is available in green which is specially designed for erosion control applications on steep slopes and vegetated waterways. The matrix is composed of polypropylene monofilament yarns featuring X3® technology woven into a uniform configuration of resilient pyramid-like projections. The material exhibits very high interlock and reinforcement capacity with both soil and root systems, demonstrates superior UV resistance, and enhances seedling emergence.

PYRAMAT® 25 conforms to the property values listed below[1] and is manufactured at a Propex facility having achieved ISO 9001:2008 certification. Propex performs internal Manufacturing Quality Control (MQC) tests that have been accredited by the Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

PROPERTY	TEST METHOD	ENGLISH	METRIC
ORIGIN OF MATERIALS			
% U.S. Manufactured Inputs		100%	100%
% U.S. Manufactured		100%	100%
PHYSICAL			
Mass/Unit Area [2]	ASTM D-6566	7.5 oz/yd²	254 g/m²
Thickness [2]	ASTM D-6525	0.25 in	6.4 mm
Light Penetration (% Passing) [3]	ASTM D-6567	35%	35%
Color	Visual	Green or Tan	
MECHANICAL			
Tensile Strength [2]	ASTM D-6818	2000 x 1800 lbs/ft	29.2 x 26.3 kN/m
Elongation [2]	ASTM D-6818	20 x 20 %	20 x 20 %
Resiliency [2]	ASTM D-6524	70%	70%
Flexibility [2]	ASTM D-6575	0.195 in-lb	225,000 mg-cm
ENDURANCE			
UV Resistance % Retained at 1,000 hrs [4]	ASTM D-4355	90%	90%
UV Resistance % Retained at 3,000 hrs [4]	ASTM D-4355	90%	90%
PERFORMANCE			
Velocity (Vegetated) [4, 5]	Large Scale	20 ft/sec	6.1 m/sec
Shear Stress (Vegetated) [4, 5]	Large Scale	12 lb/ft²	575 Pa
Manning's n (Unvegetated) [4, 6]	Calculated	0.028	0.028
Seedling Emergence [4]	ASTM D-7322	255%	255%
ROLL SIZES		8.5 ft x 120 ft 15.0 ft x 120 ft	2.6 m x 36.6 m 4.6 m x 36.6 m

NOTES:
1. The property values listed above are effective 02/09/2017 and are subject to change without notice.
2. Minimum average roll values (MARV) are calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.
3. Maximum Average Roll Value (MaxARV), calculated as the typical plus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance testing will meet to the value reported.
4. Typical Value.
5. Maximum permissible velocity and shear stress has been obtained through vegetated testing programs featuring specific soil types, vegetation classes, flow conditions, and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information.
6. Calculated as typical values from large-scale flexible channel lining test programs with a flow depth of 6 to 12 inches.

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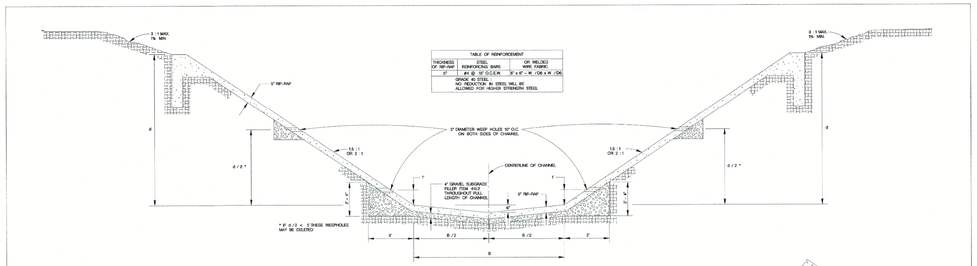


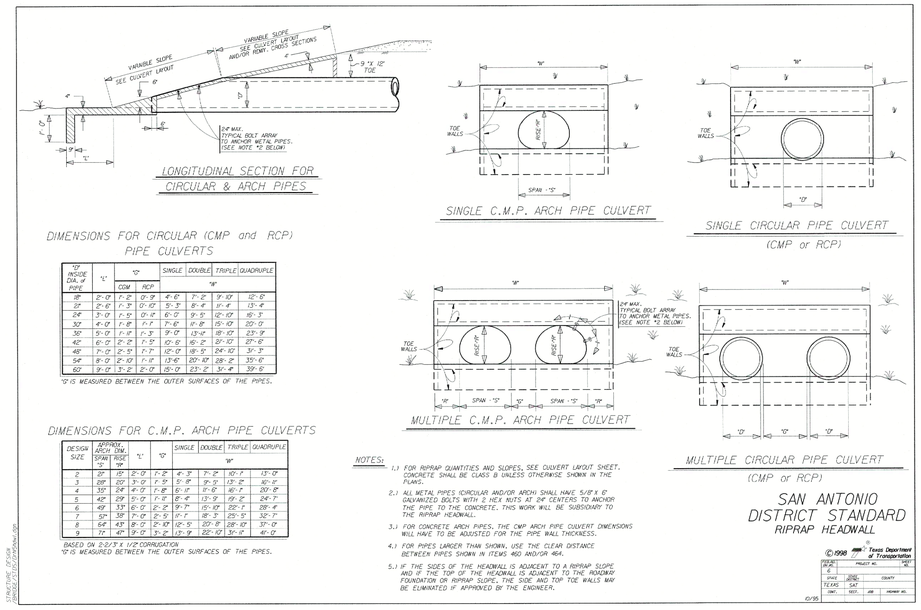
MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPICAL CONCRETE CHANNEL RIP-RAP STANDARDS

☐ SUBMITTAL	PROJECT NO.:	DATE:
DRAWN BY: K. MINGUEZ	DESIGN BY:	CHKD BY:

SHEET NO.: ___ OF ___



LONGITUDINAL SECTION FOR CIRCULAR & ARCH PIPES

SINGLE C.M.P. ARCH PIPE CULVERT

SINGLE CIRCULAR PIPE CULVERT (CMP or RCP)

DIMENSIONS FOR CIRCULAR (CMP and RCP) PIPE CULVERTS

"D" INSIDE DIA. of PIPE	"t"	"S" CMP	"S" RCP	SINGLE	DOUBLE	TRIPLE	QUADRUPLE
				"W"			
18"	2'-0"	1'-2"	0'-9"	4'-6"	7'-2"	9'-10"	12'-6"
24"	2'-0"	1'-3"	0'-10"	5'-3"	8'-4"	11'-4"	13'-8"
24"	3'-0"	1'-5"	0'-11"	6'-0"	9'-5"	12'-10"	16'-3"
30"	4'-0"	1'-8"	1'-1"	7'-6"	11'-8"	15'-10"	20'-0"
30"	5'-0"	1'-11"	1'-3"	9'-0"	13'-4"	18'-10"	23'-9"
42"	6'-0"	2'-2"	1'-5"	10'-6"	16'-2"	21'-10"	27'-6"
48"	7'-0"	2'-5"	1'-7"	12'-0"	18'-5"	24'-10"	31'-3"
54"	8'-0"	2'-8"	1'-9"	13'-6"	20'-8"	28'-2"	35'-6"
62"	9'-0"	3'-2"	2'-0"	15'-0"	23'-2"	31'-4"	39'-6"

"D" IS MEASURED BETWEEN THE OUTER SURFACES OF THE PIPES.

DIMENSIONS FOR C.M.P. ARCH PIPE CULVERTS

DESIGN SIZE	APPROX. ARCH DIM. SPAN "S"	RISE "R"	"t"	"S"	SINGLE	DOUBLE	TRIPLE	QUADRUPLE
					"W"			
1	17"	13"	2'-0"	1'-2"	4'-3"	7'-2"	10'-1"	13'-0"
3	28"	20"	3'-0"	1'-5"	5'-8"	9'-0"	13'-2"	16'-4"
4	33"	24"	4'-0"	1'-8"	6'-6"	11'-0"	16'-1"	20'-8"
5	40"	29"	5'-0"	1'-11"	8'-4"	13'-5"	19'-5"	24'-7"
6	49"	33"	6'-0"	2'-2"	9'-7"	15'-10"	22'-1"	28'-4"
7	57"	38"	7'-0"	2'-5"	11'-1"	18'-3"	25'-5"	32'-7"
8	64"	43"	8'-0"	2'-8"	12'-5"	20'-8"	28'-10"	37'-0"
9	71"	47"	9'-0"	3'-2"	13'-9"	22'-10"	31'-11"	41'-0"

BASED ON 2-2/3"X 1/2" CORRUGATION
"D" IS MEASURED BETWEEN THE OUTER SURFACES OF THE PIPES.

MULTIPLE C.M.P. ARCH PIPE CULVERT

MULTIPLE CIRCULAR PIPE CULVERT (CMP or RCP)

NOTES:
1.) FOR RIPRAP QUANTITIES AND SLOPES, SEE CULVERT LAYOUT SHEET. CONCRETE SHALL BE CLASS B UNLESS OTHERWISE SHOWN IN THE PLANS.
2.) ALL METAL PIPES (CIRCULAR AND/OR ARCH) SHALL HAVE 5/8" X 6" GALVANIZED BOLTS WITH 2 HEX NUTS AT 24" CENTERS TO ANCHOR THE PIPE TO THE CONCRETE. THIS WORK WILL BE SUBSIDIARY TO THE RIPRAP HEADWALL.
3.) FOR CONCRETE ARCH PIPES, THE CMP ARCH PIPE CULVERT DIMENSIONS WILL HAVE TO BE ADJUSTED FOR THE PIPE WALL THICKNESS.
4.) FOR PIPES LARGER THAN SHOWN, USE THE CLEAR DISTANCE BETWEEN PIPES SHOWN IN ITEMS 460 AND/OR 464.
5.) IF THE SIDES OF THE HEADWALL IS ADJACENT TO A RIPRAP SLOPE AND IF THE TOP OF THE HEADWALL IS ADJACENT TO THE ROADWAY FOUNDATION OR RIPRAP SLOPE, THE SIDE AND TOP TOE WALLS MAY BE ELIMINATED IF APPROVED BY THE ENGINEER.

SAN ANTONIO DISTRICT STANDARD
RIPRAP HEADWALL

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REVISIONS	PROJECT NO.	SHEET NO.
6		
5		
STATE	DISTRICT	COUNTY
TEXAS	SAT	
CONT.	SECT.	JOB	HIGHWAY NO.

6/95

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REV	DESCRIPTION	DRAWN BY	DATE

1/31/25
STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design

NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-1909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A

DRAWING NAME: 4.9 DRAIN DETAILS

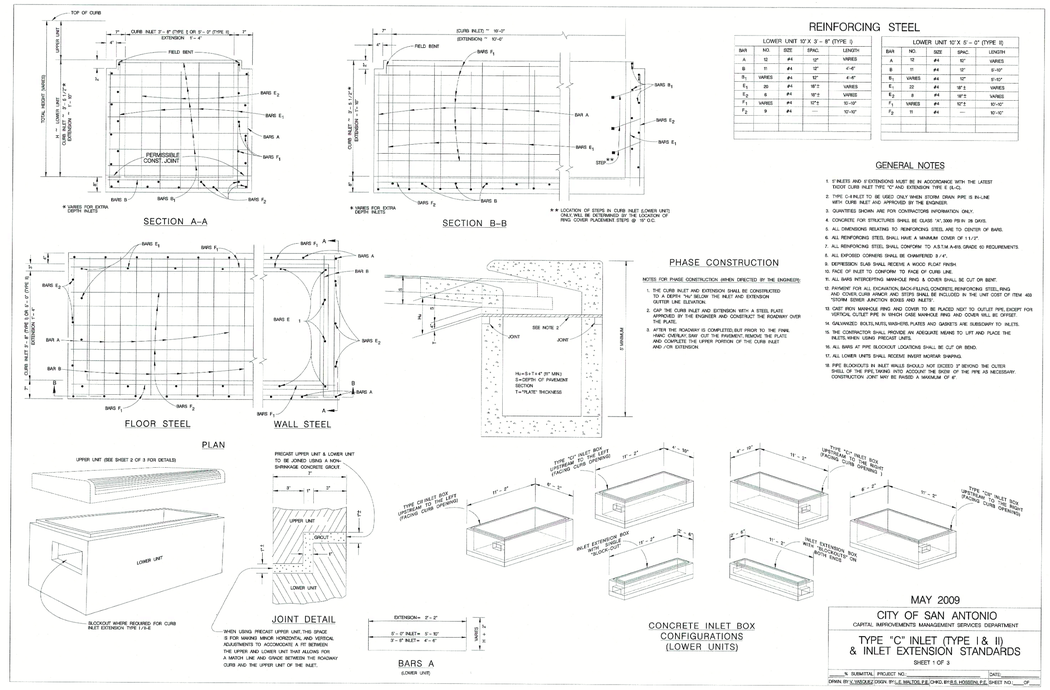
SHEET TITLE:

DRAIN DETAILS

SHEET NUMBER: 4.9

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Dec 26, 2024, 9:22am User ID: dgonzalez
File: U:\Projects\314.V.26\Design\Civil\Dgn\314.V.26 4.9 DRAIN DETAILS.dwg



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"

GENERAL NOTES

1. 'I' INLETS AND II EXTENSIONS MUST BE IN ACCORDANCE WITH THE LATEST TXDOT CURB INLET TYPE "C" AND EXTENSION TYPE E (IL-C).
2. TYPE C-4 INLET TO BE USED ONLY WHEN STORM DRAIN PIPE IS IN-LINE WITH CURB INLET AND APPROVED BY THE ENGINEER.
3. QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY.
4. CONCRETE FOR STRUCTURES SHALL BE CLASS 'A', 3,000 PSI IN 28 DAYS.
5. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
6. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2".
7. ALL REINFORCING STEEL SHALL CONFORM TO A615-14 A-615 GRADE 60 REQUIREMENTS.
8. ALL EXPOSED CONCRETE SHALL BE CHAMFERED 3 / 4".
9. DEPRESSION SLAB SHALL RECEIVE A WOOD FLOAT FINISH.
10. FACE OF INLET TO CONFORM TO FACE OF CURB LINE.
11. ALL BARS INTERSECTING VARIOUS RING & COVER SHALL BE CUT ON SITE.
12. PAYMENT FOR ALL EXCAVATION, BACK-FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER, CURB ARMOR AND STEPS SHALL BE INCLUDED IN THE UNIT COST OF ITEM 459 "STORM SEWER JUNCTION BOXES AND INLETS".
13. GRIST FROM MANHOLE RING AND COVER TO BE PLACED NOT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN KNOCK OUT MANHOLE RING AND COVER WILL BE OFFSET.
14. GALVANIZED BOLTS, NUTS, WASHERS, PLATES AND GASKETS ARE SUBSIDIARY TO INLETS.
15. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MEANS TO LIFT AND PLACE THE INLETS, WHEN USING PRECAST UNITS.
16. ALL BARS AT PIPE BLOCKOUT LOCATIONS SHALL BE CUT OR BEND.
17. ALL LOWER UNITS SHALL RECEIVE MASTER MORTAR SHAPING.
18. PIPE BLOCKOUTS IN INLET WALLS SHOULD NOT EXCEED 3' BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SIZE OF THE PIPE AS NECESSARY. CONSTRUCTION JOINT MAY BE PLACED A MAXIMUM OF 6".

PHASE CONSTRUCTION

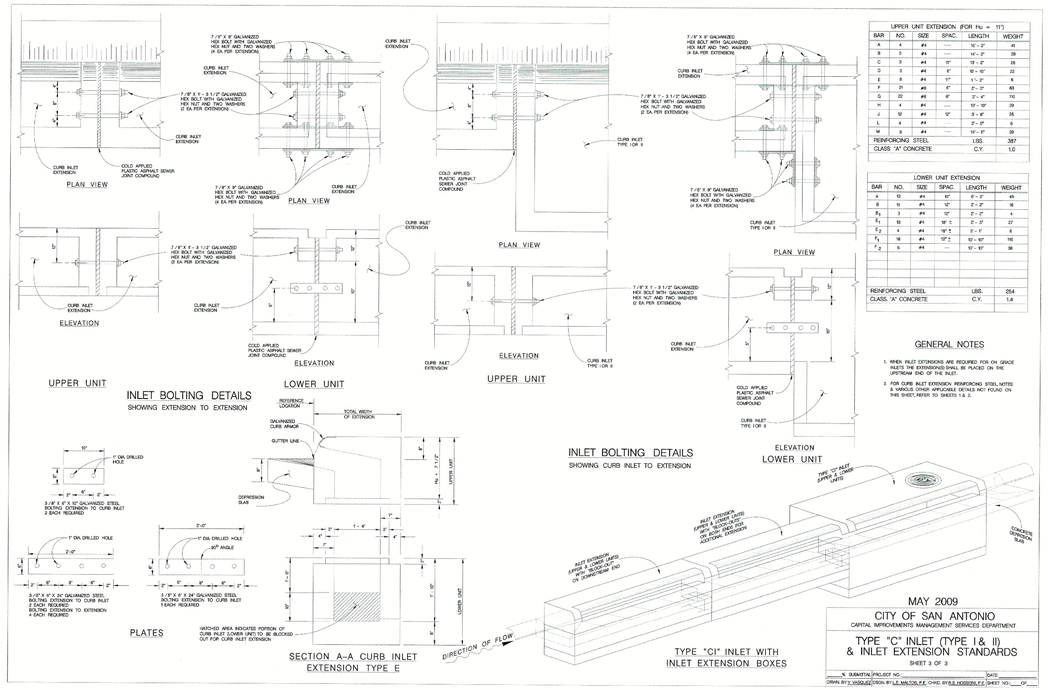
NOTES FOR PHASE CONSTRUCTION (WHEN SPECIFIED BY THE ENGINEER):

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 IT.
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.

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II)
& INLET EXTENSION STANDARDS
SHEET 1 OF 3



UPPER UNIT EXTENSION (FOR Hu = 11")

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	10'-2"	41
B	3	#4	—	14'-2"	28
C	3	#4	12"	12'-2"	28
D	3	#4	6"	10'-10"	22
E	9	#4	17"	11'-2"	6
F	21	#6	6"	2'-2"	43
G	22	#6	6"	3'-4"	110
H	4	#4	—	10'-10"	29
J	10	#4	12"	3'-8"	26
L	4	#4	—	2'-2"	5
M	3	#4	—	14'-8"	39
REINFORCING STEEL				LBS.	387
CLASS "A" CONCRETE				C.Y.	1.0

LOWER UNIT EXTENSION

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	6'-2"	49
B	11	#4	12"	2'-2"	16
B_1				2'-2"	
E_1	18	#4	18"±	2'-2"	27
E_2	4	#4	18"±	2'-2"	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

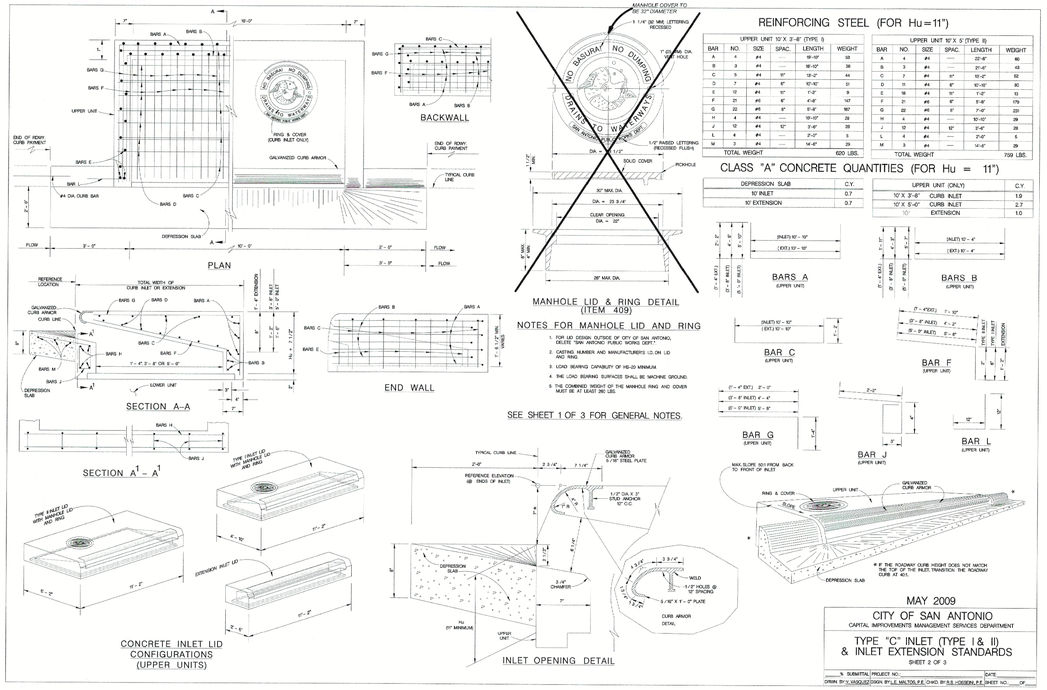
GENERAL NOTES

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 & 3.

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II)
& INLET EXTENSION STANDARDS
SHEET 2 OF 3



REINFORCING STEEL (FOR Hu=11")

UPPER UNIT 10'X 3'-8" (TYPE I)

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	18'-10"	53
B	3	#4	—	18'-10"	38
C	5	#4	10"	18'-2"	44
D	7	#4	6"	10'-10"	31
E	12	#4	12"	11'-2"	9
F	21	#6	6"	4'-8"	147
G	22	#6	6"	5'-4"	181
H	4	#4	—	10'-10"	29
J	12	#4	12"	3'-8"	33
L	4	#4	—	2'-2"	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'-8"	66
B	3	#4	—	21'-4"	43
C	7	#4	10"	19'-2"	82
D	11	#4	8"	10'-10"	80
E	18	#4	12"	11'-2"	13
F	21	#6	6"	5'-8"	179
G	22	#6	6"	7'-0"	231
H	4	#4	—	10'-10"	29
J	12	#4	12"	3'-8"	33
L	4	#4	—	2'-2"	5
M	3	#4	—	14'-8"	29
TOTAL WEIGHT					759 LBS.

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

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

UPPER UNIT (ONLY)	C.Y.
10'X 3'-8" CURB INLET	1.0
10'X 5'-0" CURB INLET	2.7
10' EXTENSION	1.0

MANHOLE LID & RING DETAIL (ITEM 409)

NOTES FOR MANHOLE LID AND RING

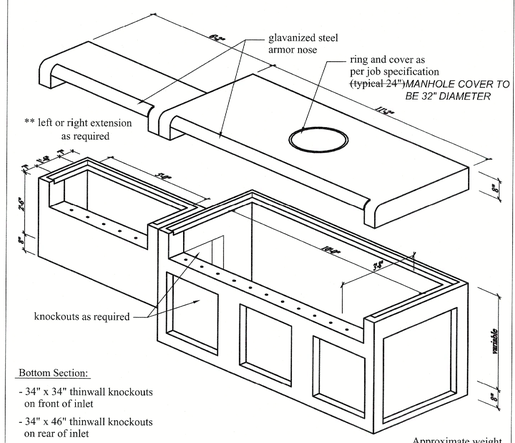
1. FOR LID DESIGN, OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT."
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 280 LBS.

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II)
& INLET EXTENSION STANDARDS
SHEET 3 OF 3

3'-8" x 10'-0" Type C-1 with 5'-0" Extension



Bottom Section:

- 34" x 34" thinwall knockouts on front of inlet
- 34" x 46" thinwall knockouts on rear of inlet
- 44" x 48" rectangular knockouts on ends of inlet
- Riser sections available upon request
- Concrete has a 28 day strength of 5,000 psi
- Steel reinforcement is ASTM A615 grade 60
- Load design is H-20

Approximate weight of base: 12,800 lbs.

Notes:

- Consult manufacturer before handling
- The structure shall be placed on a compacted granular base

Capital Precast

CAPITAL PRECAST, INC.
800 WATSON LANE EAST
NEW BRAUNFELS, TEXAS 78130
PH. (830) 606-6200

FOR 3'-8" x 10'-0" Type C-1 with 5'-0" Extension
JOB
DRAWN RW | DATE 11/15/2012 | Rev. No. | SHEET 1 of 1
FILE f:\users\renee\curbinlets\3'-8 x 10'with5'extension

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REV	DATE	DRAWN BY	DESCRIPTION

4/6/25
STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design

NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm# F-10959
TBPLS Firm# 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 4.9 DRAIN DETAILS

SHEET TITLE: DRAIN DETAILS

SHEET NUMBER: 4.10

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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Design\Civil\Drains\4.9 DRAIN DETAILS.dwg, 4.10 DRAIN DETAILS
By: tmiller

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 SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!!
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS; LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

DRAINAGE INFRASTRUCTURE AND CHANNEL MAINTENANCE PLAN

PROJECT: GATEHOUSE SUBDIVISION - UNIT 4

LOCATION: APPROXIMATELY 4300 - FT SOUTH -WEST ALONG HUNTER RD FROM ITS INTERSECTION WITH HAVENS CROSS AND HUNTER RD.
THE FOLLOWING GUIDELINES ARE ESTABLISHED FOR THE MAINTENANCE AND INSPECTION OF THE DRAINAGE INFRASTRUCTURE AND CHANNELS CONSTRUCTED FOR THE ABOVE REFERENCED PROJECT.

INSPECTIONS: THE DRAINAGE INFRASTRUCTURE AND CHANNELS WITHIN THE ABOVE REFERENCED SUBDIVISION SHOULD BE INSPECTED AT LEAST ONCE A QUARTER TO EVALUATE THAT IT IS FUNCTIONING PROPERLY. ONE OF THESE INSPECTIONS SHOULD OCCUR DURING OR IMMEDIATELY FOLLOWING A RAINFALL EVENT. BARE SPOTS AND AREAS OF EROSION IDENTIFIED DURING INSPECTIONS SHOULD BE REPLANTED AND RESTORED TO MEET WATER QUALITY SPECIFICATIONS. ALL CURB INLET GRAVEL FILTERS SHOULD BE INSPECTED AFTER EACH RAINFALL EVENT.

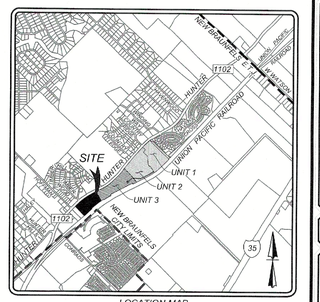
SEDIMENT REMOVAL: ALL SEDIMENT ACCUMULATION SHALL BE REMOVED FROM OUTLET STRUCTURES AND DRAINAGE PATHWAYS IMMEDIATELY DOWNSTREAM OF DRAINAGE STRUCTURES AT LEAST ONCE BI-ANNUALLY OR ANYTIME SEDIMENT ACCUMULATION IS GREATER THAN 3 INCHES OF DEPTH COVER. INSTALLATION FOR THE GRASSY SWALE BMP'S, FOR GRASSY SWALE BMP'S, GRASS DAMAGE DURING THE SEDIMENT REMOVAL PROCESS SHOULD BE PROMPTLY REPLACED WITH THE SAME SEED MIX USED IN SWALE ESTABLISHMENT. WHEN SEDIMENT ACCUMULATES WITHIN THE BASIN TO WITHIN 10% OF THE TOTAL BASIN VOLUME, THE SEDIMENT IS TO BE REMOVED AND DISPOSED OF PROPERLY. AFTER SEDIMENT REMOVAL, THE BASIN, IS TO BE RE-GRADED TO ENSURE IT IS FUNCTIONING PROPERLY. SEDIMENT SHOULD BE REMOVED FROM CURB INLET GRAVEL FILTERS WHEN MATERIAL IS WITHIN THREE INCHES OF THE TOP OF THE GRAVEL FILTER BAGS.

MOWING: THE EARTHEN SIDE SLOPES, EMBANKMENTS, AND BOTTOM OF THE DRAINAGE INFRASTRUCTURE SHALL BE MOWED AT LEAST ONCE A QUARTER, OR ANYTIME VEGETATION HEIGHT IS GREATER THAN 12 INCHES. MOWING MAY BE REQUIRED MORE FREQUENTLY FOR AESTHETIC PURPOSES AND TO PREVENT THE GROWTH OF WEEDS. FOR MOWING OPERATIONS, A MULCHING TYPE MOWER WILL BE UTILIZED OR ALL GRASS CLIPPINGS WILL BE CAUGHT AND REMOVED.

DEBRIS AND LITTER CONTROL: DURING INSPECTIONS, MOWING, OR OTHER REGULAR MAINTENANCE ACTIVITIES, ALL VISIBLE DEBRIS AND LITTER WILL BE REMOVED FROM WITHIN THE DRAINAGE INFRASTRUCTURE OR OUTLET STRUCTURES. SPECIAL ATTENTION WILL BE PAID TO FLOATING DEBRIS WITHIN THE FACILITY THAT COULD BLOCK THE OUTLET STRUCTURE AND ALTER BASIN FUNCTIONALITY. DEBRIS SHOULD ALSO BE REMOVED FROM THE INSIDE OF CONCRETE U-CHANNELS. MEANS AND METHODS OF REMOVING DEBRIS, SILT BUILD-UP, ETC. FROM THE CONCRETE U-CHANNELS/EARTHEN CHANNELS, SHALL BE AT THE DISCRETION OF THE HOME OWNERS ASSOCIATION AND ITS SUCCESSORS OR ASSIGNS; AND MAY BE LIMITED TO MANUAL OPERATIONS.

EROSION CONTROL: EARTHEN PORTIONS OF THE BASIN, WILL BE MAINTAINED WITH VEGETATIVE COVER TO CONTROL EROSION. IF DURING INSPECTIONS OR REGULAR MAINTENANCE ACTIVITIES, ANY SLUMPING OR EROSION IS OBSERVED, THE AREA WILL BE RE-GRADED AND RE-VEGETATED TO ORIGINAL CONDITIONS.

NUISANCE CONTROL: STANDING WATER OR CONSTANTLY WET CONDITIONS WITHIN THE DRAINAGE INFRASTRUCTURE CAN PROMOTE NUISANCE PROBLEMS FOR NEARBY RESIDENTS AND BUSINESSES. THESE PROBLEMS INCLUDE ODORS, MOSQUITOES, WEEDS, AND LITTER. IF ENCOUNTERED, THESE PROBLEMS WILL BE ADDRESSED DURING REGULAR MAINTENANCE OPERATIONS.



LOCATION MAP
N.T.S.

LEGEND

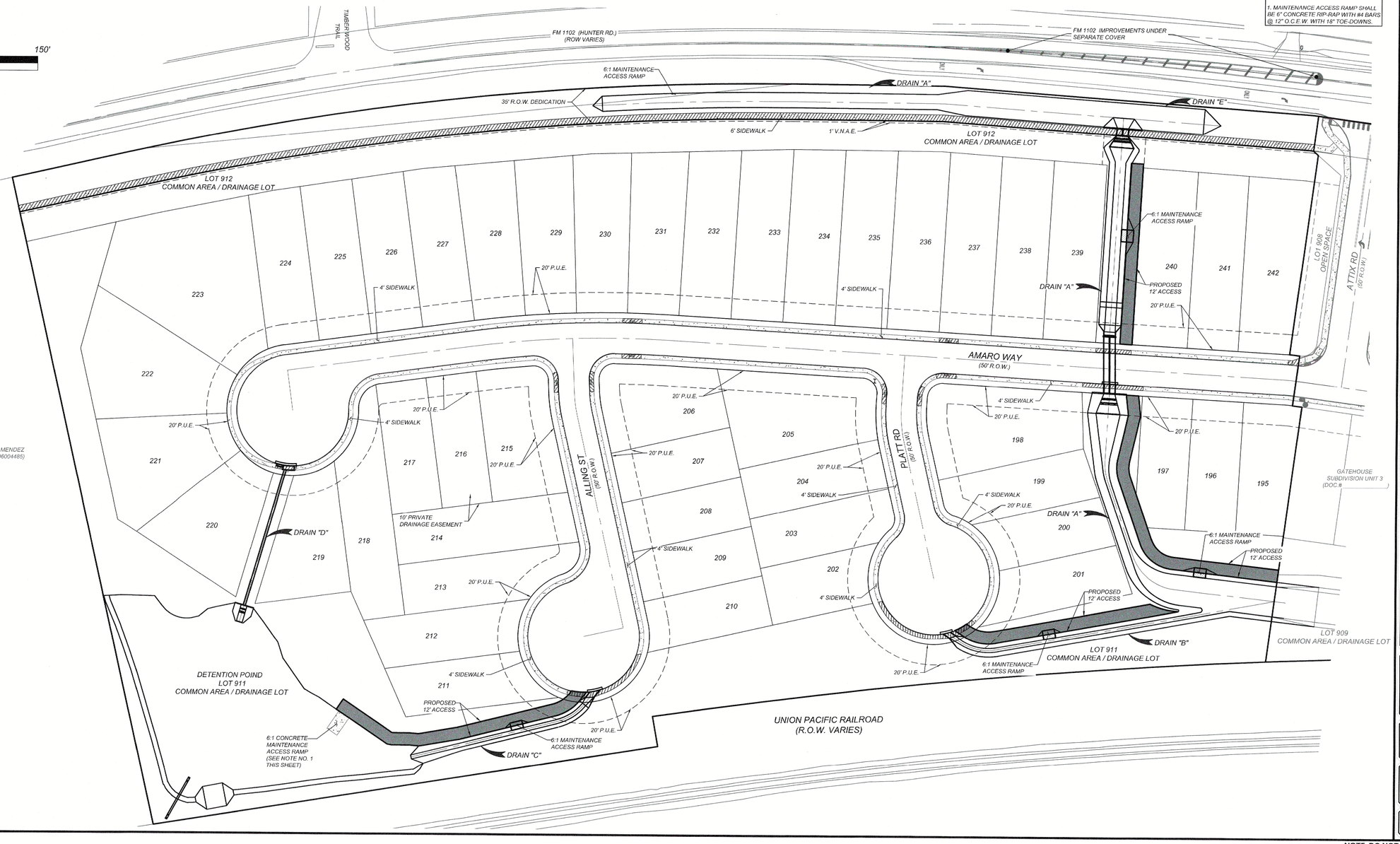
= MAINTENANCE ACCESS RAMP

= CONCRETE MAINTENANCE ACCESS RAMP (SEE NOTE NO. 1 THIS SHEET)

= MAINTENANCE ACCESS

NOTE:
1. MAINTENANCE ACCESS RAMP SHALL BE 6" CONCRETE RIP-RAP WITH #4 BARS @ 12" O.C.E.W. WITH 18" TOE-DOWNS.

SCALE : 1"=50'
0' 50' 150'
100'



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A. NICHOLAS REYNOLDS
111666
LICENSED
PROFESSIONAL ENGINEER
1/6/25

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FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
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640 N. Walnut Ave.
Suite 1101
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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F - 18009
TBPLS Firm#: 10194550

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PROJECT NUMBER: 24003556A
DRAWING NAME: 4.11 CHANNEL MAINTENANCE PLAN

SHEET TITLE:
CHANNEL MAINTENANCE PLAN

SHEET NUMBER:
4.11

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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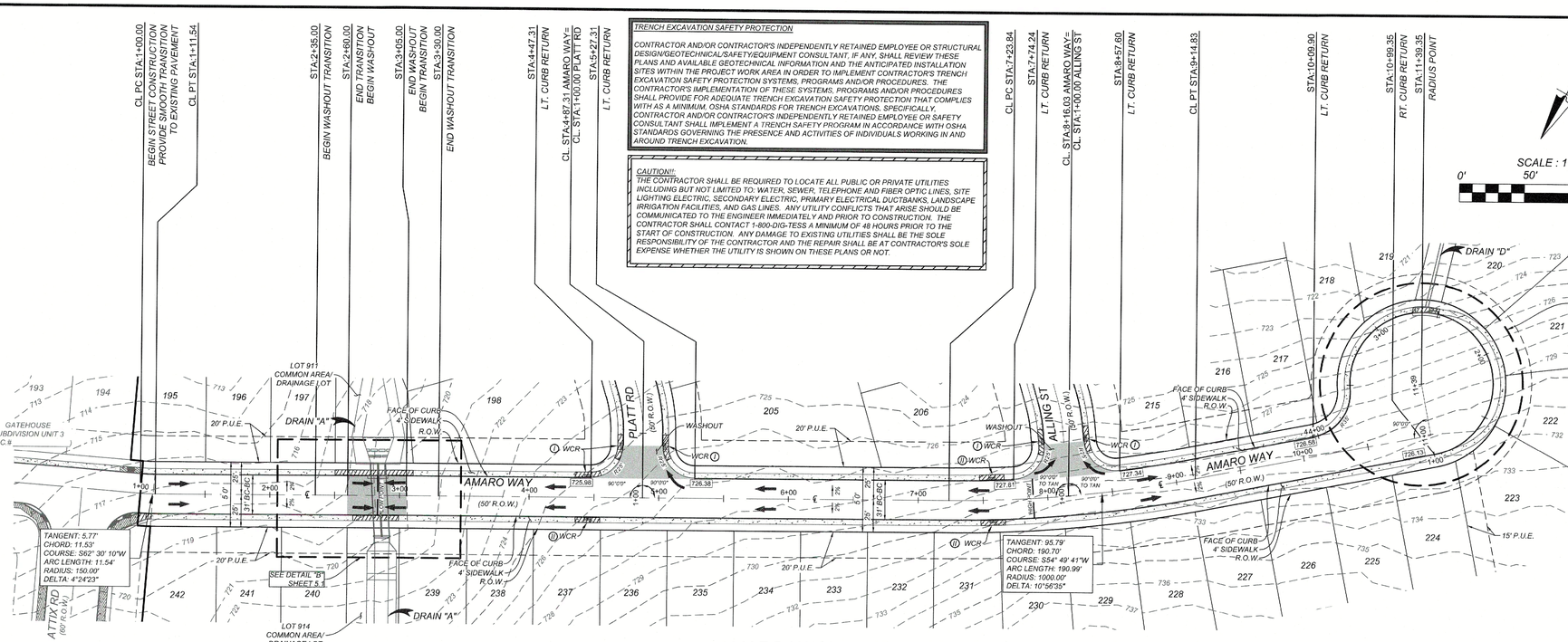
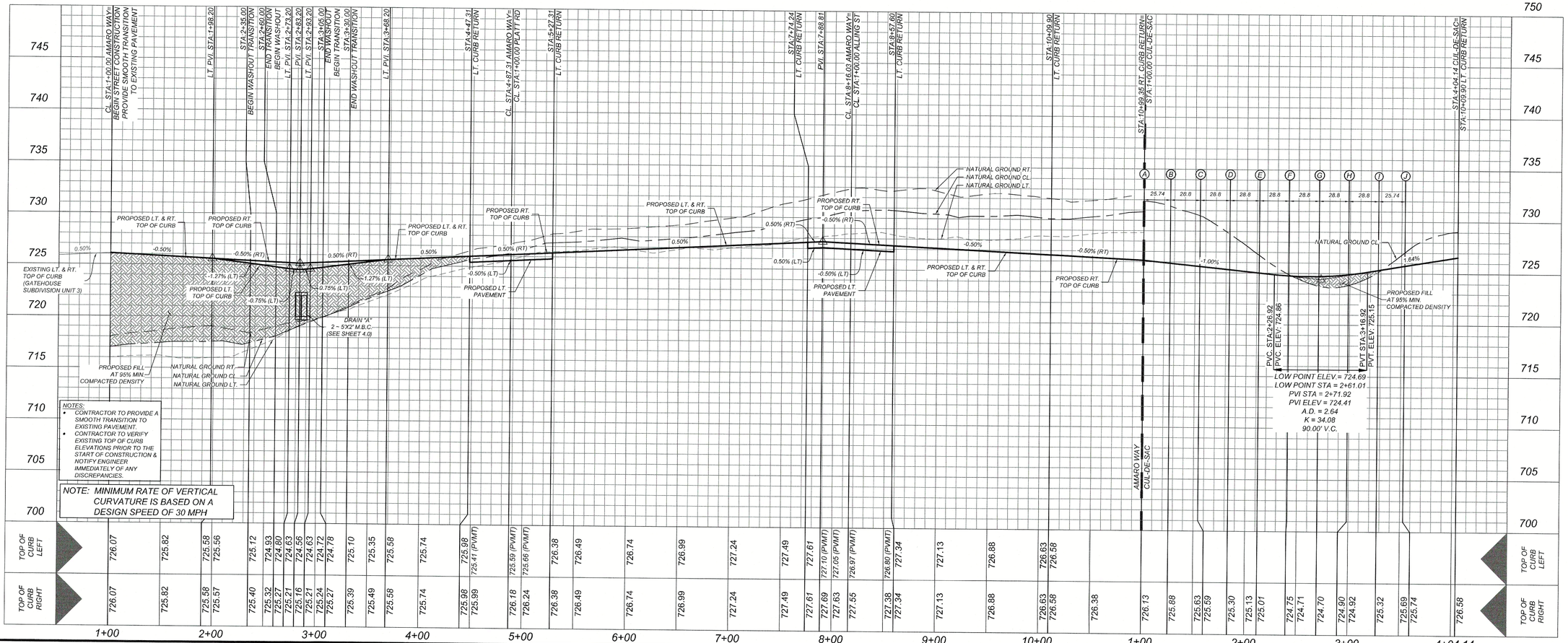
U:\Design\Civil\Drafting\Layout\4.11 CHANNEL MAINTENANCE PLAN.dwg 4.11 CHANNEL MAINTENANCE PLAN By: TMILLER



AMARO WAY
STA. 1+00.00 TO STA. 10+99.35

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'

AMARO WAY CUL-DE-SAC
STA. 1+00.00 TO STA. 4+04.14



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COLLIERS ENGINEERING & DESIGN, INC.
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TBPLS Firm#: 10194550

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PROJECT NUMBER: 24003556A
DRAWING NAME: 5.0 AMARO WAY STA. 1+00.00 - END

SHEET TITLE: AMARO WAY STA. 1+00.00 - END

SHEET NUMBER: 5.0

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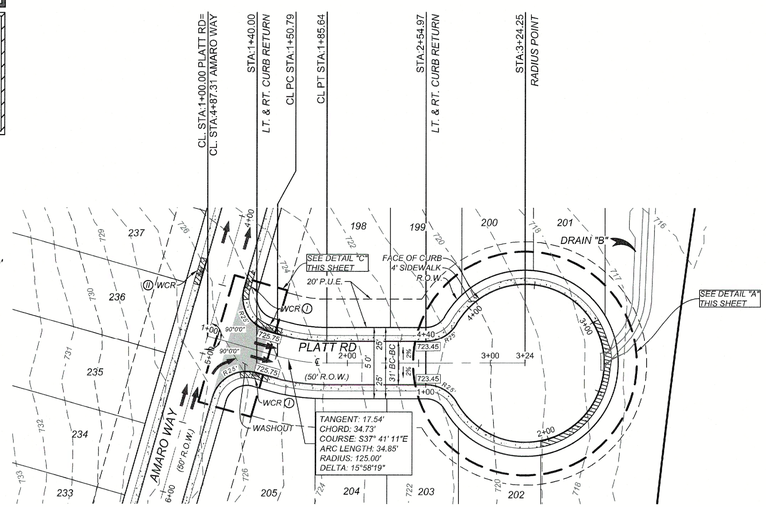
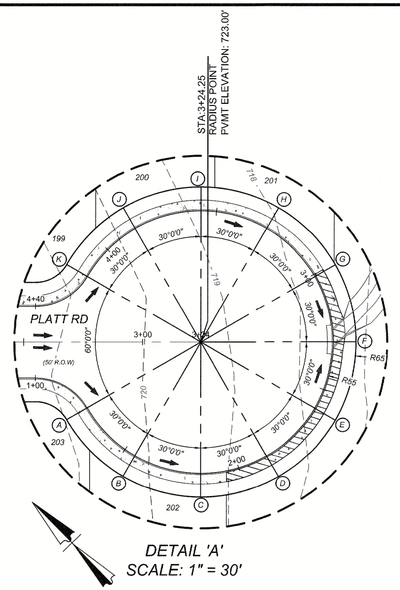
SCALE : 1"=50'

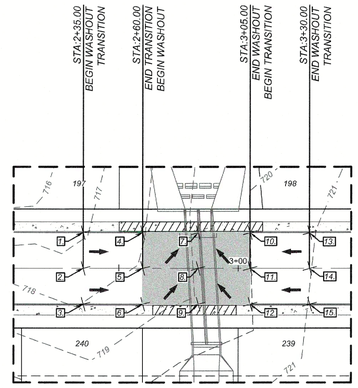
0' 50' 150'

100'





DETAIL 'A'
SCALE: 1" = 30'



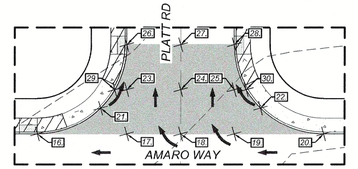
DETAIL 'B'
SCALE: 1" = 30'

NOTE:
1. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET. SEE DETAIL ON SHEET 5.4.

LEGEND

- = FLOW ARROW
- W.C.R. = WHEELCHAIR RAMPS, SEE SHEET 5.4
- I = WHEELCHAIR RAMP TYPE I SEE SHEET 5.4
- II = WHEELCHAIR RAMP TYPE II SEE SHEET 5.4
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- 732.87 = TOP OF CURB ELEVATIONS
- = WASHOUT CROWN
- = PROPOSED CONCRETE GUTTER & PAVEMENT ELEVATION WITHIN WASHOUT AREA
- = DEVELOPER INSTALLED SIDEWALK

POINT #	NORTHERN	EASTING	PAVEMENT ELEV.
1	13831108.77	2263988.32	724.54
2	13831121.80	2263980.89	725.12
3	13831134.83	2263973.46	724.82
4	13831096.38	2263966.61	724.22
5	13831109.41	2263959.18	724.45
6	13831122.44	2263951.74	724.69
7	13831084.89	2263946.46	723.98
8	13831097.92	2263939.02	724.27
9	13831110.95	2263931.59	724.58
10	13831074.09	2263927.52	724.20
11	13831087.12	2263920.09	724.44
12	13831100.15	2263912.66	724.69
13	13831061.70	2263905.80	724.52
14	13831074.73	2263898.37	725.11
15	13831087.76	2263890.94	724.81



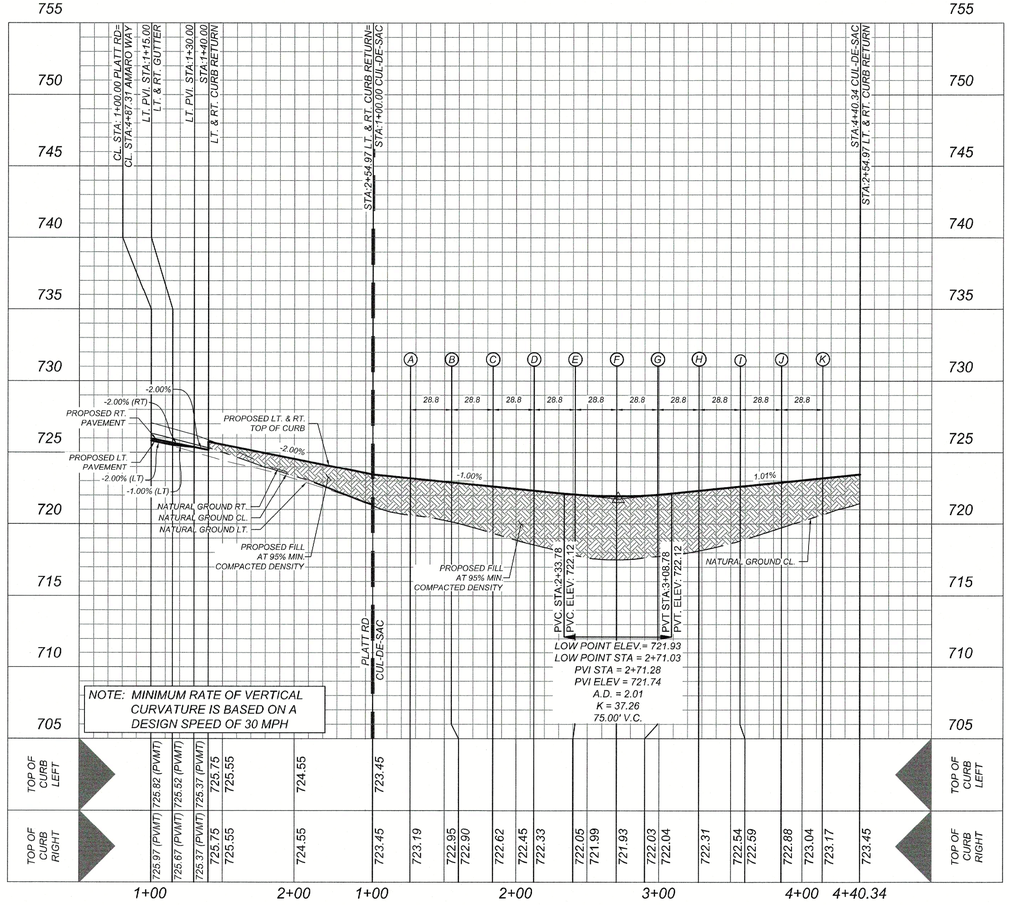
DETAIL 'C'
SCALE: 1" = 20'

POINT #	NORTHERN	EASTING	PAVEMENT ELEV.
16	13831003.58	2263803.91	725.40
17	13830991.19	2263782.19	725.52
18	13830983.76	2263769.16	725.59
19	13830976.33	2263756.13	725.67
20	13830963.94	2263734.42	725.80
21	13830988.46	2263792.18	725.49
22	13830966.34	2263753.40	725.48
23	13830980.33	2263788.38	725.40
24	13830972.90	2263775.35	725.53
25	13830965.47	2263762.33	725.42
26	13830969.48	2263794.58	725.17
27	13830962.04	2263781.55	725.47
28	13830954.61	2263768.52	725.17
29	13830981.99	2263791.29	725.37
30	13830963.81	2263759.42	725.38

PLATT RD
STA. 1+00.00 TO STA. 2+54.97

PLATT RD CUL-DE-SAC
STA. 1+00.00 TO STA. 4+40.34

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
4/4/25
Nicholas Reynolds, P.E.

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 5.1 PLATT RD STA. 1+00.00 - END

SHEET TITLE:
PLATT RD STA. 1+00.00 - END

SHEET NUMBER:
5.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Apr 04, 2025, 11:43am User ID: ASerna
File: L:\Projects\314\62\06\Design\Civil\STREETS\5.1 PLATT RD STA. 1+00.00 - END.dwg
Design\Civil\STREETS\5.1 PLATT RD STA. 1+00.00 - END.dwg By: ASerna

TRENCH EXCAVATION SAFETY PROTECTION

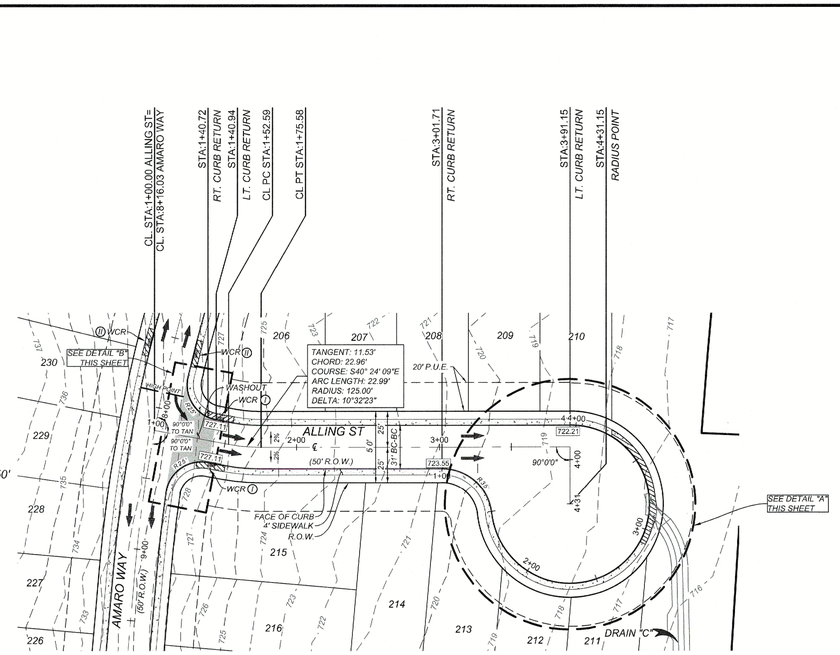
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

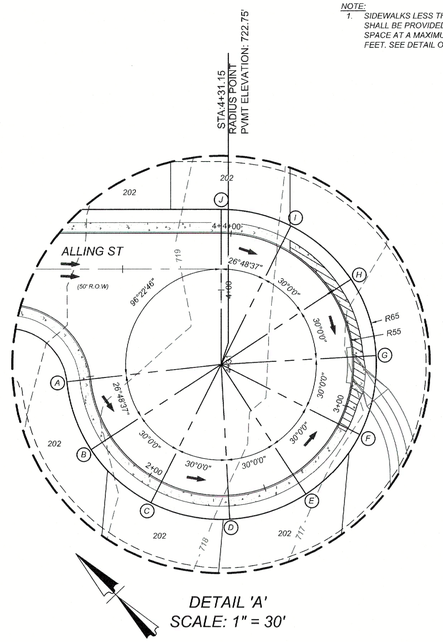
CAUTION!!:

THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

SCALE : 1"=50'

0' 50' 150' 100'



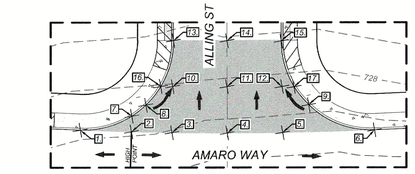


DETAIL 'A'
SCALE: 1" = 30'

ALLING ST
STA. 1+00.00 TO STA. 3+91.15

ALLING ST CUL-DE-SAC
STA. 4+04.14 TO STA. 1+00.00

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



DETAIL 'B'
SCALE: 1" = 20'

POINT #	NORTHERN	EASTING	PAVEMENT ELEV.
1	13830840.89	2263521.22	727.03
2	13830833.08	2263509.18	727.10
3	13830826.80	2263499.79	727.04
4	13830818.03	2263487.04	726.97
5	13830809.14	2263474.55	726.89
6	13830793.84	2263453.96	726.76
7	13830829.42	2263511.60	727.11
8	13830824.66	2263510.16	726.95
9	13830798.68	2263472.94	726.87
10	13830816.12	2263507.01	726.78
11	13830807.44	2263494.54	726.91
12	13830798.75	2263482.06	726.76
13	13830805.44	2263514.24	726.52
14	13830796.90	2263501.91	726.83
15	13830788.36	2263489.58	726.53
16	13830818.03	2263509.75	726.75
17	13830796.82	2263479.29	726.73

NOTE:
1. *SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET. SEE DETAIL ON SHEET 5.4.*

LEGEND

- = FLOW ARROW
- W.C.R. = WHEELCHAIR RAMPS, SEE SHEET 5.4
- (I) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.4
- (II) = WHEELCHAIR RAMP TYPE II SEE SHEET 5.4
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- 732.87 = TOP OF CURB ELEVATIONS
- = WASHOUT CROWN
- 7 = PROPOSED CONCRETE GUTTER & PAVEMENT ELEVATION WITHIN WASHOUT AREA
- = DEVELOPER INSTALLED SIDEWALK

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REV	DATE	DESCRIPTION	DRAWN BY

4/14/25
STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14309
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: 5.2 ALLING ST STA. 1+00.00 - END

SHEET TITLE: *ALLING ST STA. 1+00.00 - END*

SHEET NUMBER: **5.2**

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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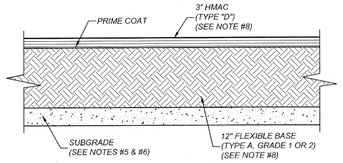
Design\Civil\STREETS\2 ALLING ST STA. 1+00.00 END.dwg 5.2 ALLING ST STA. 1+00.00 END By: ASerna

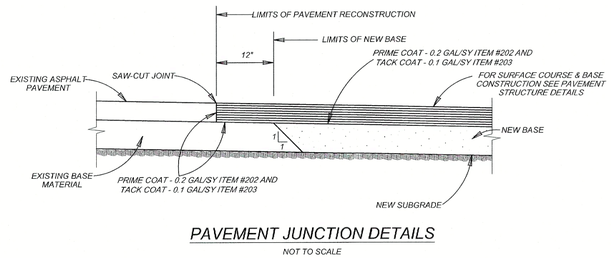
Pavement Section
3" HMAC [8]
12" Flexible Base Course [8]
Total: 15"



ASPHALT PAVEMENT DETAIL - 50 FT R.O.W.

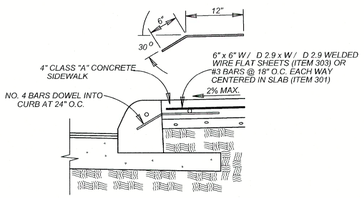
NOT-TO-SCALE

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY TTL, INC., REPORT NO. 00210900720.00, DATED 04/16/21.
2. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.
4. CONTRACTOR MAY LEAVE VERTICAL CUT BANKS AT R.O.W. LINE AND MEDIANS PROVIDED PROJECT GEOTECHNICAL ENGINEER DETERMINES ROCK IS COMPETENT TO STAND ON ITS OWN.
5. EXPOSED EXCAVATED SUBGRADE SHALL BE PROOF ROLLED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT TO IDENTIFY WEAK YIELDING ZONES.
6. SOIL SUBGRADE AREAS REQUIRING FILL, SHALL BE SCARIFIED AND MOISTURE CONDITIONED PER THE GEOTECHNICAL REPORT.
7. THE GEOTECHNICAL REPORT FOR THIS DEVELOPMENT INCLUDES ALTERNATE PAVEMENT SECTIONS. SHOULD AN ALTERNATE SECTION BE CONSIDERED, THE CONTRACTOR WILL BE REQUIRED TO GAIN APPROVAL FROM THE COUNTY. IT SHOULD BE NOTED THAT PAVEMENT SECTIONS THAT INCLUDE LIME TREATED SUBGRADE SHOULD RESULT IN A SOIL-LIME MIXTURE WITH A PH OF AT LEAST 12.4. IT IS RECOMMENDED THAT SUBGRADE SOILS BE TESTED FOR SOLUBLE SULFATE CONTENT PRIOR TO LIME TREATMENT.
8. REFERENCE CITY OF NEW BRAUNFELS DETAIL ST-011 FOR MINIMUM PAVEMENT THICKNESS REQUIRED.



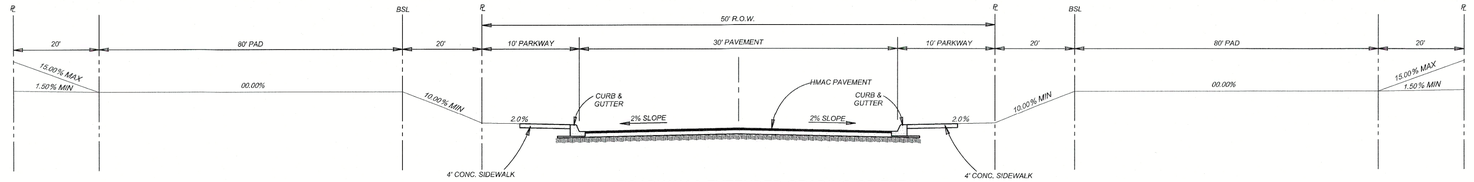
PAVEMENT JUNCTION DETAILS

NOT TO SCALE



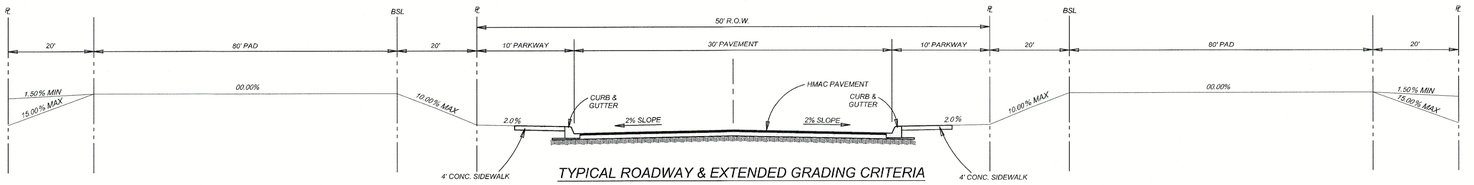
CONCRETE SIDEWALK ABUTTING CURB SECTION

NOT TO SCALE



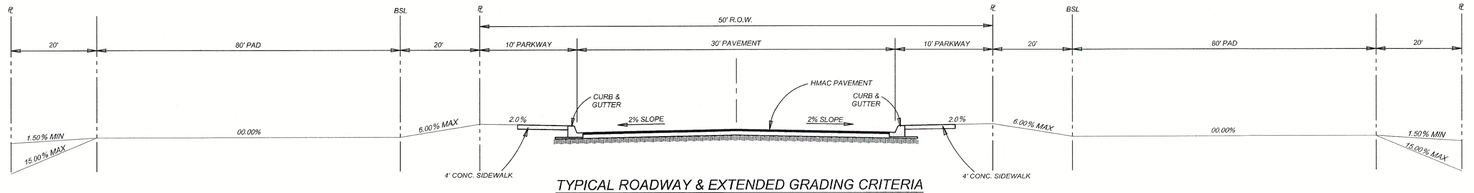
TYPICAL ROADWAY & EXTENDED GRADING CRITERIA

SCALE : NOT TO SCALE



TYPICAL ROADWAY & EXTENDED GRADING CRITERIA

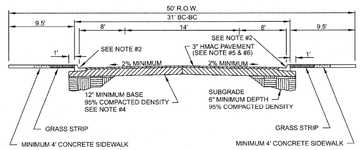
SCALE : NOT TO SCALE



TYPICAL ROADWAY & EXTENDED GRADING CRITERIA

SCALE : NOT TO SCALE

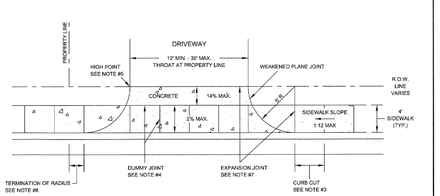
ONE & TWO FAMILY RESIDENTIAL LOCAL PARKING BOTH SIDES



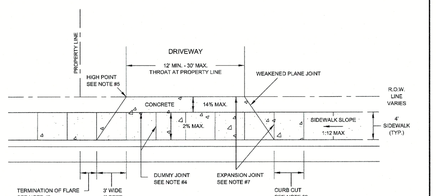
NOTES:
1. STRUCTURAL SECTION REQUIRES DETAILED ENGINEERING DESIGN, SUBJECT TO THE APPROVAL OF THE CITY ENGINEER. CITY WILL ACCEPT DESIGNS THAT INCORPORATE BIAXIAL GEOGRID.
2. CITY WILL ACCEPT CURB AND GUTTER OR STAND-ALONE CURB. SEE CURB DETAIL ST-013 (CURB & GUTTER) & ST-013a (STAND-ALONE CURB).
3. ROADWAY MEASUREMENT SHOWN FROM BACK OF CURB (BC).
4. FLEXIBLE BASE MATERIAL SHALL BE TYPE "A" GRADE 2 PER TXDOT STD.
5. ASPHALT CONCRETE PAVEMENT SHALL BE TYPE "D" HOT MIX PER TXDOT ITEM 340 (2004).
6. IN NO CASE SHALL THE HMAC SECTION BE LESS THAN THAT SHOWN.
7. BASE MUST EXTEND 1' BEYOND BACK OF CURB, 9" MINIMUM THICKNESS

City of New Braunfels — ENGINEERING DIVISION | STANDARD CONSTRUCTION DETAIL | SCALE: N.T.S. | APPROVED DATE: | STANDARD NO: ST-011

DRIVEWAY APRON (RESIDENTIAL - ONE OR TWO FAMILY)



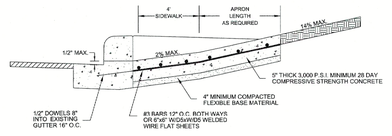
RADIUS PLAN VIEW



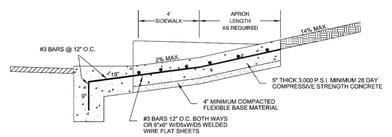
FLARE PLAN VIEW

DATE APPROVED: 04/2016 | DWG. NO: ST-014.1 | SCALE: N.T.S.
DRAWN BY: RAS | SHEET: 1 OF 2
FILENAME: DRIVEWAY (RESIDENTIAL - ONE OR TWO FAMILY)
City of New Braunfels — ENGINEERING DEPARTMENT

DRIVEWAY APRON (RESIDENTIAL - ONE OR TWO FAMILY)



STRUCTURAL SECTION



NO EXISTING CURB STRUCTURAL SECTION

NOTES:
1. WHERE GUTTER DOES NOT EXIST DRIVEWAY APRON SHALL EXTEND TO EDGE OF ASPHALT AND SHALL HAVE A MINIMUM 6" WIDE 1' DEEP GRADE BEAM MONOLITHIC AND REINFORCED SIMILAR TO APRON.
2. PLACEMENT OF SIDEWALK SHOWN IS TYPICAL; HOWEVER, ALTERNATIVE SIDEWALK PLACEMENT COMMON TO DRIVEWAY APRON WILL BE CONSIDERED PROVIDED CROSS SLOPE OF SIDEWALK IS NO GREATER THAN 2%.
3. CURB CUT LENGTH NO GREATER THAN AS REQUIRED TO MATCH SLOPE OF ADJACENT SIDEWALK.
4. DUMMY JOINTS TO BE PROVIDED AT MINIMUM 4-FT. INTERVALS PERPENDICULAR TO THE CURB LINE WITHIN THE SIDEWALK AREA AND PARALLEL TO THE SIDEWALK AREA.
5. PROVIDE A MINIMUM 7" HIGH POINT. HIGH POINT HEIGHT SHALL BE MEASURED FROM THE GUTTER FLOW LINE TO THE DRIVEWAY APRON. NOTE HIGH POINT MAY OCCUR OUTSIDE OF ROW.
6. DRIVEWAY THROAT TRANSITION MAY OCCUR OUTSIDE OF ROW.
7. PROVIDE EXPANSION JOINTS AT ALL SIDEWALK AND DRIVEWAY THROAT JOINTS. EXPANSION JOINTS SHALL BE PLACED USING 1/2" ASPHALTIC MATERIAL WITH 1/2" DOWELS 16" O.C.
8. THE TANGENT POINT OF THE DRIVEWAY CURB RETURN AT THE PUBLIC ROADWAY LINE OR FLARE SHALL BE A MINIMUM DISTANCE OF 1' OFF THE PROPERTY PROJECTED PERPENDICULAR TO THE STREET CENTERLINE, EXCEPT SINGLE FAMILY OR ZERO LOT LINE LOTS. ON SINGLE FAMILY ZERO LOT LINE LOTS WHERE THE DRIVE IS ON THE ZERO LOT LINE, THE TANGENT POINT OR FLARE SHALL BE NO GREATER THAN 3' BEYOND THE ADJOINING PROPERTY LINE PROJECTED PERPENDICULAR TO THE STREET CENTERLINE.

DATE APPROVED: 04/2016 | DWG. NO: ST-014.2 | SCALE: N.T.S.
DRAWN BY: RAS | SHEET: 2 OF 2
FILENAME: DRIVEWAY (RESIDENTIAL - ONE OR TWO FAMILY)
City of New Braunfels — ENGINEERING DEPARTMENT

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS — A. NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER — 5/13/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
162 West Mill Street
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: TABLETOP GRADING STREET SECTIONS

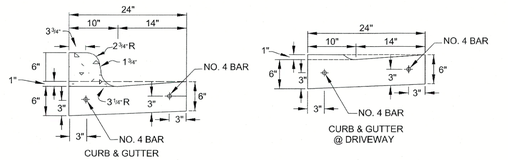
SHEET TITLE: *STREET DETAIL SHEET*

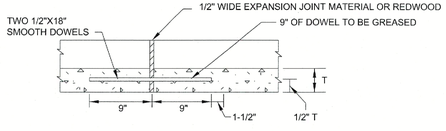
SHEET NUMBER: **5.3**

Date: May 12, 2025, 3:13pm User ID: 45ems
File: U:\Projects\2314.432\08\Design\E.Exhibits\CAD\Tabletop Grading Street Sections.dwg
(Design\Exhibits\CAD\Tabletop Grading Street Sections.dwg)(ST-STREET DETAIL SHEET By: AMPNA

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CURB AND GUTTER





LONGITUDINAL SECTION THRU CURB AND GUTTER
SHOWING TYPICAL EXPANSION JOINT DETAILS.
REINFORCING STEEL SHALL NOT CROSS EXPANSION JOINTS.
STEEL SHALL BE TERMINATED 3" (+ OR -) 1" FROM FACE OF THE JOINT.

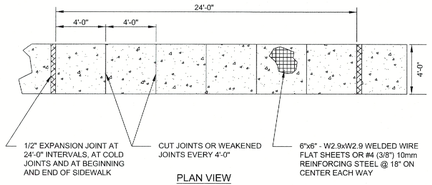
NOTES:

1. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 18".
2. CURB AND GUTTER SHALL HAVE FORMED TOOLED OR SAWED CONTRACTION JOINTS AT ± 10'. THE DEPTH OF THESE JOINTS SHALL BE SUFFICIENT TO ENSURE CRACKING AT THE JOINTS.
3. CURB OR CURB AND GUTTER SHALL HAVE EXPANSION JOINTS AT POINTS OF CURVATURE, AT INTERVALS NO GREATER THAN 100' AND AT ALL ADJACENT STRUCTURES.
4. UNLESS OTHERWISE SHOWN, TRANSITIONS BETWEEN CURBS OR CURBS AND GUTTER OF DIFFERING CROSS SECTION SHALL BE ACCOMPLISHED OVER A 10' LENGTH OR AS APPROVED BY THE CITY ENGINEER.
5. ALL CONCRETE TO BE CLASS "A" 3000 PSI CONCRETE.
6. ALL EXPOSED CONCRETE SURFACES TO BE BRUSHED SMOOTH AND UNIFORM.

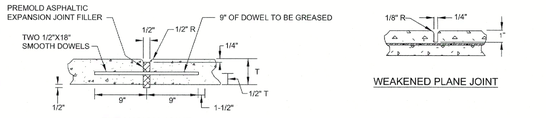
DATE APPROVED: 07/2008	DWG. NO: ST-013	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 1 OF 1	
FILENAME: CURB & GUTTER		

City of New Braunfels — ENGINEERING DEPARTMENT

SIDEWALK
(RESIDENTIAL)

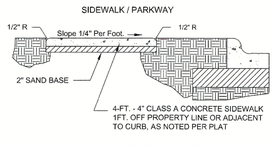


PLAN VIEW



EXPANSION JOINT

WEAKENED PLANE JOINT



TYPICAL SECTION

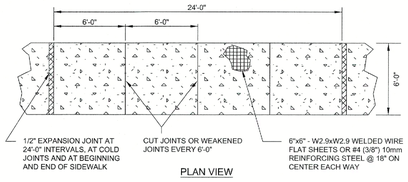
NOTES:

1. EXPANSION JOINTS ARE TO BE USED BETWEEN CONCRETE DRIVEWAY AND SIDEWALK.
2. SCORED JOINTS DENOTE SIDEWALK ACROSS THE DRIVEWAY AND ARE TO BE PLACED AT LEAST 1/3 rd. THROUGH THE SLAB THICKNESS.
3. ALL SIDEWALK AND DRIVEWAY CONSTRUCTION SHALL MEET A.D.A. SPECIFICATIONS.

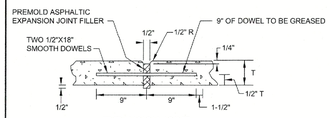
DATE APPROVED: 07/2008	DWG. NO: ST-016	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 1 OF 1	
FILENAME: SIDEWALK (RESIDENTIAL)		

City of New Braunfels — ENGINEERING DEPARTMENT

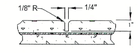
SIDEWALK
(COMMERCIAL - INDUSTRIAL)



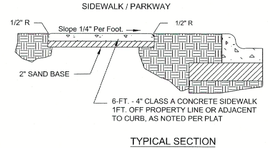
PLAN VIEW



EXPANSION JOINT



WEAKENED PLANE JOINT



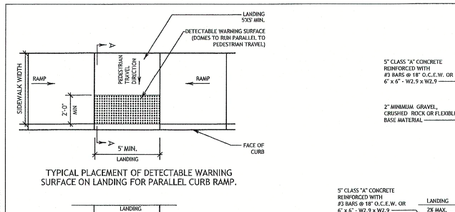
TYPICAL SECTION

NOTES:

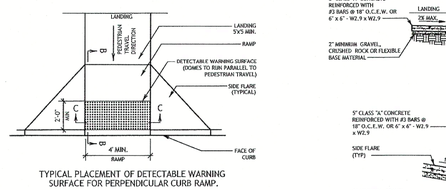
1. EXPANSION JOINTS ARE TO BE USED BETWEEN CONCRETE DRIVEWAY AND SIDEWALK.
2. SCORED JOINTS DENOTE SIDEWALK ACROSS THE DRIVEWAY AND ARE TO BE PLACED AT LEAST 1/3 rd. THROUGH THE SLAB THICKNESS.
3. ALL SIDEWALK AND DRIVEWAY CONSTRUCTION SHALL MEET A.D.A. SPECIFICATIONS.

DATE APPROVED: 07/2008	DWG. NO: ST-017	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 1 OF 1	
FILENAME: SIDEWALK (COMMERCIAL - INDUSTRIAL)		

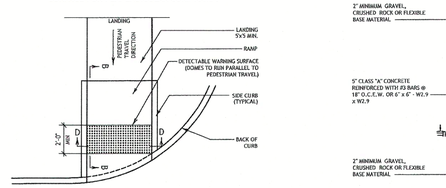
City of New Braunfels — ENGINEERING DEPARTMENT



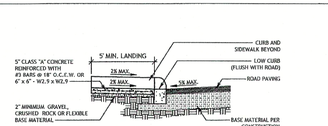
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING FOR PARALLEL CURB RAMP.



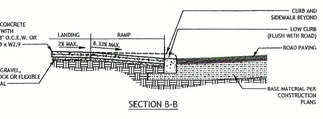
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE FOR PERPENDICULAR CURB RAMP.



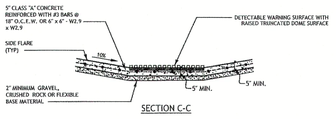
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN FOR DIRECTIONAL CURB RAMP.



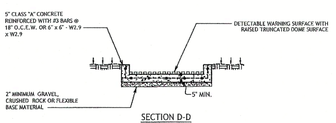
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

CURB RAMP NOTES

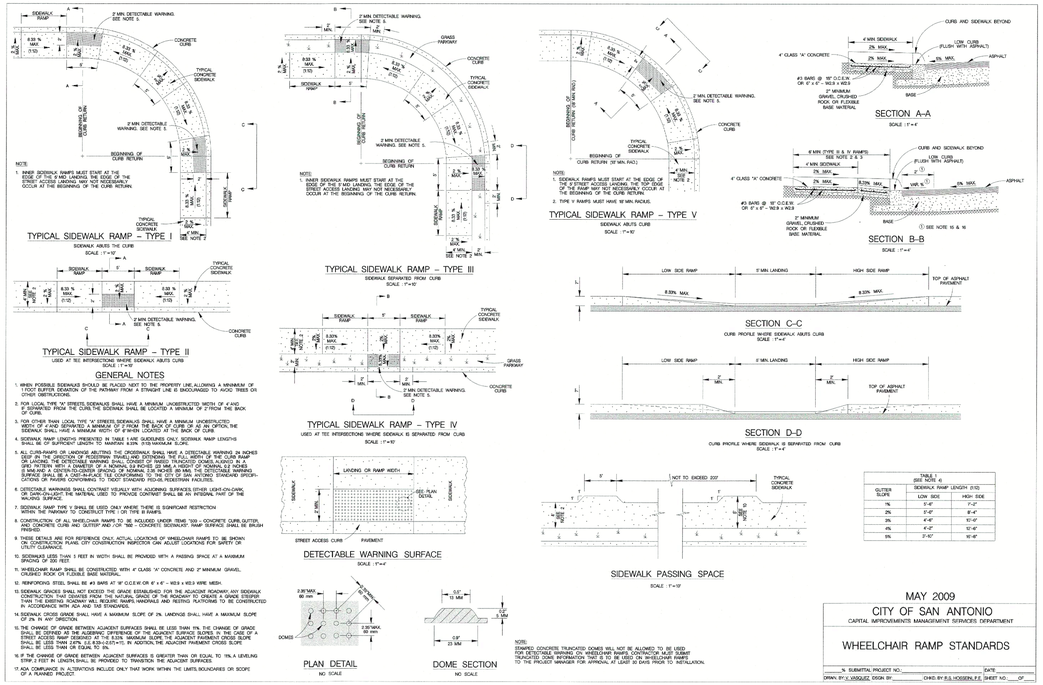
1. ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED.
2. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF CURB RAMPS ARE TO BE SHOWN ON THE CONSTRUCTION PLANS. ALL ACCESSIBLE WALK WAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT (ADA) AND TEXAS ACCESSIBILITY STANDARDS (TAS). CITY ENGINEER OR BUILDING OFFICIAL MAY ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
3. THE MINIMUM STANDARD SIDEWALKS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 118-49 OF THE NEW BRAUNFELS CODE OF ORDINANCES.
4. ALL LANDINGS WHERE REQUIRED SHALL BE 5'X 5' (60"X60") MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
5. RAMP LENGTHS SHALL BE SUFFICIENT TO MAINTAIN A MAXIMUM SLOPE OF 8.33% (1Y:12X). MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP SURFACES IS 2% (1Y:50X).
6. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY, ANY SIDEWALK CONSTRUCTION THAT DEVIATES FROM THE GRADE OF THE NATURAL GRADE OF THE ROADWAY TO CREATE A GRADE STEEPER THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS, AND LANDINGS IN ACCORDANCE WITH CURRENT ADA AND TAS REQUIREMENTS.
7. PROVIDE FLARED RAMP SIDES WITH A MAXIMUM SLOPE OF 10% (1Y:10X) MEASURED ALONG THE CURB LINE. CURB RETURNS MAY BE USED IN LIEU OF SIDE FLARES IN AREAS NOT NORMALLY WALKED ACROSS BY PEDESTRIANS, BECAUSE THE ADJACENT SURFACE IS VEGETATION OR OTHER NON-WALKING SURFACE OR WHERE THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
8. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X 4' (48"X48") WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
9. CROSSWALK DIMENSIONS, CROSSWALK MARKINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, CURB RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY THE CITY ENGINEER OR BUILDING OFFICIAL.
10. EXISTING FEATURES THAT COMPLY WITH CURRENT TAS REQUIREMENTS MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
11. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. PROVIDE CURB RAMPS WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
12. SEPARATE CURB RAMP AND LANDINGS FROM ADJACENT SIDEWALK AND ANY OTHER ELEMENTS WITH PRE-MOLD OR BOARD JOINT OF 1/2" UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER OR BUILDING OFFICIAL.
13. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET.
14. 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. NO 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 EQUAL TO 5%.
15. 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.
16. ADA RAMP SHALL BE CONSTRUCTED WITH 5" CLASS "A" CONCRETE WITH 2" MINIMUM GRAVEL/CRUSHED ROCK OR FLEXIBLE BASE MATERIAL. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6"x6"-W2.9 X W2.9 WIRE MESH.
17. THE EXTENTS OF ADA COMPLIANCE IN ALTERATIONS SHALL BE WITHIN THE LIMITS, BOUNDARIES OR SCOPE OF A PLANNED PROJECT AND AS DETERMINED BY THE CITY BUILDING OFFICIAL.

DETECTABLE WARNING NOTES

1. CURB RAMPS OR LANDINGS ABUTTING THE CROSSWALK MUST HAVE A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 705 OF THE TEXAS ACCESSIBILITY STANDARDS (TAS). THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. DETECTABLE WARNING SURFACE SHALL BE CONSTRUCTED WITH A CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
5. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS AT THE BACK OF CURB. ALIGN THE ROWS OF DOMES TO BE PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
6. DETECTABLE WARNING MATERIALS MUST MEET TXDOT DEPARTMENTAL MATERIALS SPECIFICATION DMS 4350 AND BE LISTED ON THE MATERIAL PRODUCER LIST. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
7. DETECTABLE WARNING PAVERS SHALL NOT BE PERMITTED WITHOUT THE APPROVAL BY THE PUBLIC WORKS DEPARTMENT.

City of New Braunfels — ENGINEERING DIVISION
550 LANDA STREET
NEW BRAUNFELS, TEXAS 78130
PHONE: 830 221 4020
FAX: 830 629 3600

CURB RAMP STANDARDS		
APPROVED DATE: 05/18/2017	DWG. NO.: ST-019	SCALE: AS NOTED
DRAWN BY: RC	CONTACT: GF	SHEET: 1 OF 1



GENERAL NOTES

1. WHEN POSSIBLE SIDEWALK SHOULD BE PLACED NEXT TO THE PROPERTY LINE ALLOWING A MINIMUM OF 1 FOOT BUFFER SEPARATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR UTILITY CONFLICTS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4'-0" AND SEPARATED A MINIMUM OF 3' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 8'-0" WIDTH LOCATED AT THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4'-0" AND SEPARATED A MINIMUM OF 3' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 8'-0"WIDTH 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% (1Y:12X) MAXIMUM SLOPE.
5. ALL CURB RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING IN INCHES WIDE AND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET 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). 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 RED-US 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 CONCRETE OR PAVER UNIT.
7. BORDER SHALL NOT BE USED ON EDGES ONLY WHERE THERE IS SIGNIFICANT RESTRICTION PERPENDICULAR TO CONSTRUCTED TILE. (I.E. TYPE B RAMPS).
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS 1000 – CONCRETE CURB, GUTTER, AND CONCRETE CURB AND GUTTER AND / OR 1986 – CONCRETE SIDEWALKS. RAMP SURFACE SHALL BE BRUSH FINISHED.
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON THE 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"x6" – 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 GRADE OF 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 THEN 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.

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

MAY 2009
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

_____% SUBMITTAL PROJECT NO.: _____ DATE: _____
DRAWN BY: V. VASQUEZ DSGN BY: _____ CHKD BY: R.S. HOSSEIN, P.E. SHEET NO.: ___ OF ___

DISCLAIMER
The work of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the City of New Braunfels for any purpose whatsoever.

Date: Dec 23, 2024, 11:07am User ID: mglenn
File: U:\Projects\314\52\06\Design\Civil\STREETS\STREET DETAIL SHEET.dwg
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Engineering & Design
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REV	DESCRIPTION	DATE	DRAWN BY

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
1/2/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF
PROJECT NUMBER: 24003556A	DRAWING NAME: STREET DETAIL SHEET		

SHEET TITLE: *WHEELCHAIR RAMP DETAIL SHEET*

SHEET NUMBER: 5.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

NOTE:
ALL WHEELCHAIR RAMPS ARE TO BE CONSTRUCTED AT THE TIME OF STREET CONSTRUCTION

NOTE:
FIRE HYDRANT LOCATIONS AND SYMBOLS HAVE BEEN SCALED AND SHOWN FOR CLARITY PURPOSES ONLY AND SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD WATER DETAIL. SEE SHEET 7.2

GENERAL NOTES:

1. COMAL COUNTY WILL INSTALL COUNTY ROAD SIGNS AND INVOICE THE OWNER. THE CONTRACTOR IS TO INSTALL PAVEMENT MARKINGS. ALL ROAD SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED ENGINEERING PLANS. THE COUNTY WILL INSPECT ALL SIGNS AT THE FINAL INSPECTION.

2. THE CONTRACTOR SHALL INSTALL ALL PAVEMENT MARKINGS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CONTRACTOR SHALL NOTIFY THE COUNTY AT LEAST 24 HOURS PRIOR TO THE INSTALLATION OF ALL SEALER AND FINAL MARKINGS. THE COUNTY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.

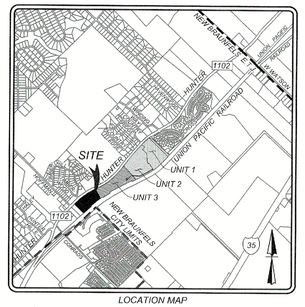
PAVEMENT MARKING REQUIREMENTS
PAVEMENT MARKINGS SHALL BE USED IN ACCORDANCE WITH THE LATEST REVISION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND WHERE JUSTIFIED BY ENGINEERING JUDGMENT OR STUDY.

ALL PAVEMENT MARKINGS SHALL BE SHOWN IN THE ENGINEERING PLANS FOR REVIEW AND APPROVAL AS PART OF THE PLAN & PROFILE SHEET OR SEPARATE SIGNING & PAVEMENT MARKING LAYOUT SHEET. DESIGN, MATERIALS AND INSTALLATION SHOULD FOLLOW TXDOT TRAFFIC STANDARDS PM (1-4) – 12. CITY OF SAN ANTONIO TRAFFIC ENGINEERING STANDARDS FOR PAVEMENT MARKINGS DESIGNATING TRAFFIC LANES, LANE USAGE & LANE REGULATIONS AND PEDESTRIAN/BICYCLIST ACCOMMODATIONS MAY BE USED FOR ADDITIONAL STANDARD DESIGN DETAILS. MARKING STANDARDS SHALL BE INCLUDED IN THE ENGINEERING PLANS.

ALL PAVEMENT MARKINGS SHALL BE TYPE I HOT APPLIED THERMOPLASTIC AND MEET TXDOT DEPARTMENTAL MATERIAL SPECIFICATIONS DMS-8220. TYPE II TRAFFIC PAINT MARKINGS SHALL ONLY BE USED AS SEALER AND MEET TXDOT DEPARTMENTAL MATERIAL SPECIFICATIONS DMS-8200.

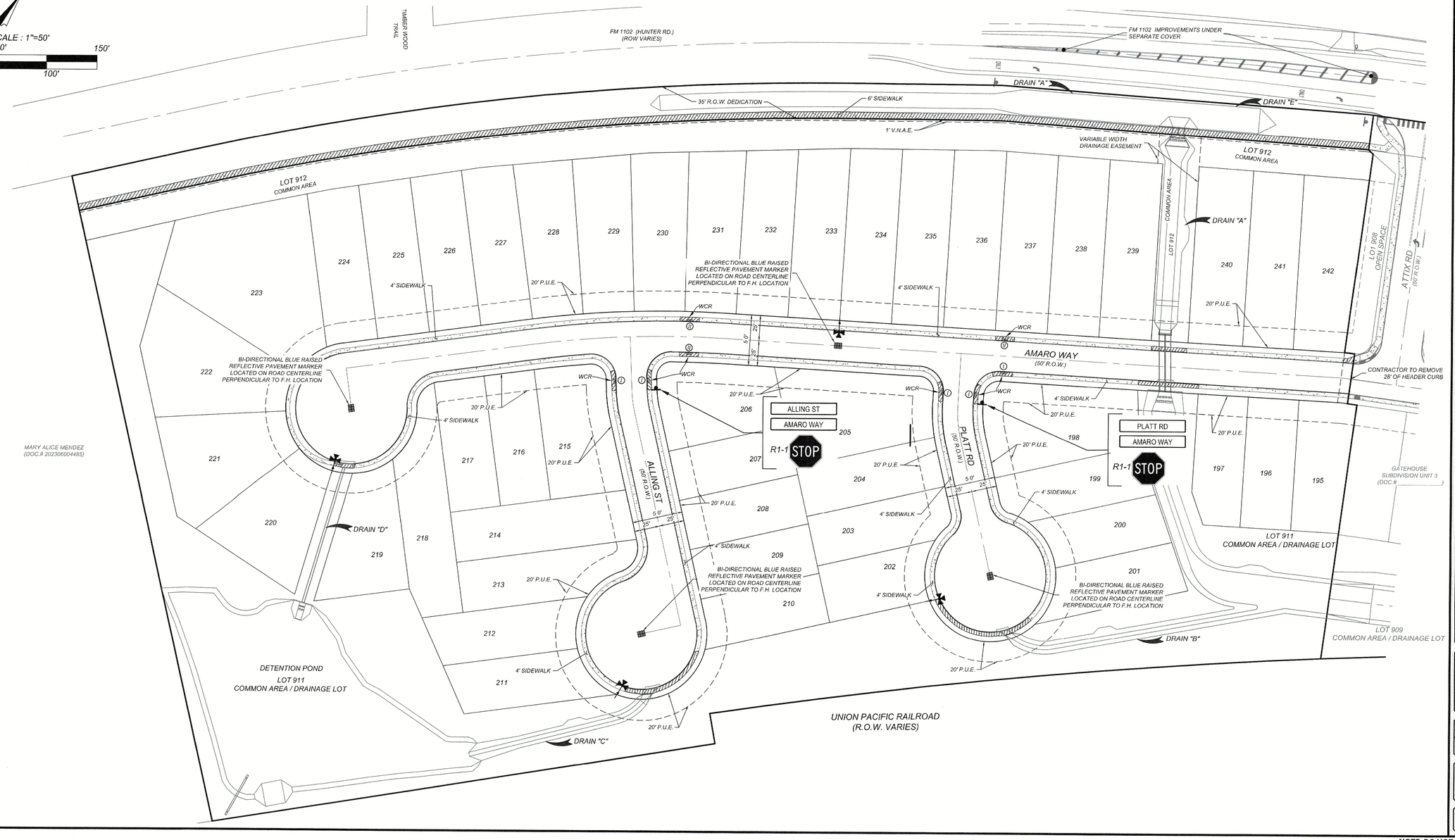
LEGEND

WHEELCHAIR RAMP	=	W.C.R.
WHEELCHAIR RAMP TYPE "I" (SEE SHEET 5.4)	=	(I)
WHEELCHAIR RAMP TYPE "II" (SEE SHEET 5.4)	=	(II)
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED FIRE HYDRANT	=	



LOCATION MAP
N.T.S.

SCALE : 1"=50'
0' 50' 150'
100'



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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
1/2/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4
CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN

SHEET TITLE:
TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN

SHEET NUMBER:
5.5

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Dec 23, 2024, 11:11am User ID: mjolen
File: U:\Projects\3?4\52\08\Design\Civil\SHEETS\TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN.dwg
\Design\CAD\TIFF\TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN.dwg\5.5 TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN By: MJOLEN

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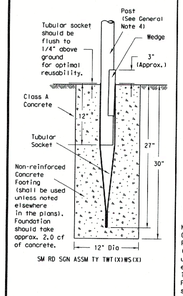
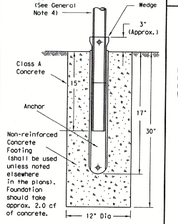
DATE REVISED:

Wedge Anchor Steel System



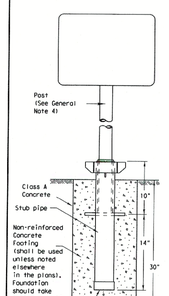
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

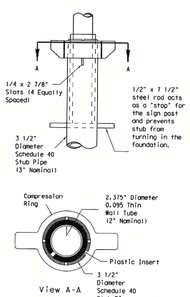


SMD RD SGN ASSM TY TWT(X)WP(X)

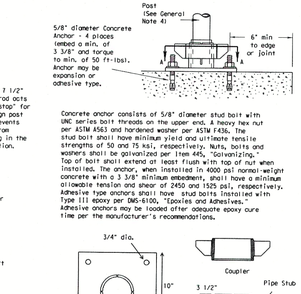
Universal Anchor System with Thin-Walled Tubing Post



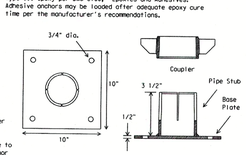
SM RD SGN ASSM TY TWT(X)UA(P)



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 sign 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.

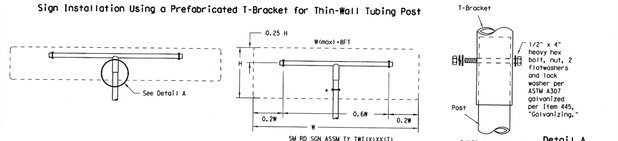


Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.



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

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



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

9/16" hole may need to be drilled through post to accommodate bolt.

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 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: https://www.txdot.gov/business/producer list.html
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (0.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: https://www.txdot.gov/publications/traffic.html

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE
1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE
1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

©TxDOT July 2002	BY: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

266

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE	3" x 1/8"	4" x 1/8"	6" x 1/8"	12" x 1/8" / 3" x 1/8"
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (fix). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE	4" / 4"	3" / 4"	4" / 4" / 1/8" Max	3" / 4" / 1/8" Max
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	FLX	WC	FLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)		Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE	18" / 18"	4" / 4" / 4" Max	6" / 12"	3" / 12"	12" / 36" / 45° / 6" / 6"	12" / 36"	12" / 36"	18" / 18"
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	FLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Minimum 9 square inches of reflective sheeting surface area.		

CHEVRONS

DEVICE	W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	
NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. The Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTIONAL LARGE ARROW (W1-6).			

ONE DIRECTION LARGE ARROW

DEVICE	W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
FLX = Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
FLX = Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

NOTE:
Delineator and object marker backplates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation
Traffic Operations Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-15

FILE: dom-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
10-09 REVISIONS 3-15 4-10	DIST	COUNTY		SHEET NO.

204

PAVEMENT MARKING REQUIREMENTS

PAVEMENT MARKINGS SHALL BE USED IN ACCORDANCE WITH THE LATEST REVISION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND WHERE JUSTIFIED BY ENGINEERING JUDGMENT OR STUDY.

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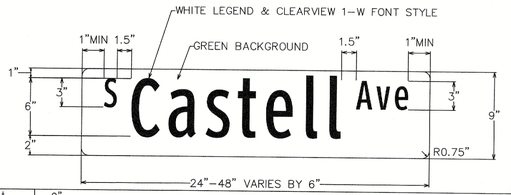
THE CONTRACTOR SHALL NOTIFY COMAL COUNTY AT LEAST TWENTY-FOUR (24) HOURS PRIOR TO THE INSTALLATION OF ALL SEALER AND FINAL MARKINGS. THE CONTRACTOR MAY BE RESPONSIBLE FOR THE PLACING SPOTS TABS BEFORE MARKING APPLICATION. THE COUNTY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.

NOTES:

1. *SIGNS AND GUARD POSTS SHALL BE INSTALLED BY COMAL COUNTY IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND AS DIRECTED BY THE COUNTY ENGINEER. THE DEVELOPER WILL BE RESPONSIBLE TO PAY THE COST OF LABOR AND MATERIALS FOR THIS PORTION OF THE ROAD REQUIREMENTS.*

STREET SIGN DETAIL - GROUND MOUNT



Height	9"
Length	24" min 48" max 6" increments in length
Thickness	0.080"
Substrate	Flat aluminum sheeting with ¾" radius circular fillets at corners conforming to the requirements of ASTM B 209, Alloys 6061–T–6, or 5052–H38.
Sign Face Materials	Green film over High Intensity Prismatic sheeting
Legend	Legends shall be Clearview 1–W font style. Reduced spacing between the letters or words should not be used as a means of reducing the overall size of a street name sign unless approved by the City Traffic Engineer.
Color	White legend on green background

Notes:

1. Street name signs shall be double sided when center mounted on top of sign post. Only one street name sign should be installed on top of sign post with STOP or YIELD sign.
2. When two sets of street name signs are required (e.g. at "T" intersections), one double-sided street name sign shall be mounted on sign post. The sign assembly shall meet minimum height requirements as required in the Texas Manual on Uniform Traffic Control Devices (TMUTCD). When required, DEAD END (W14-1a) or NO OUTLET (W14-2a) signs shall also be mounted on the sign post.
3. Street name signs greater than 36" long and center mounted on top of sign post shall be mounted on post top bracket with 12" slot. All other street name signs center mounted on top of sign post shall be mounted on post top bracket with 5 ¼" slot.
4. Street name signs mounted on sign post shall be mounted with double-sided round pole brackets. Two holes should be punched in the center of the 9" street name sign blank 1" from edge of the blank with 7"spacing between holes.
5. The lettering for names of streets shall be composed of a combination of lower-case letters with initial upper-case letters. Acceptable abbreviations per TMUTCD may be used except for the street name itself.
6. Red background (red film over High Intensity Prismatic) should be used for private street name signs.

Street Sign Detail - Ground Mount			
ISSUE DATE: February 2013	DWG. NO:ST-024	SCALE: N.T.S.	
DRAWN BY: RAS	CONTACT: GF	SHEET: 1 OF 1	

City of New Braunfels — ENGINEERING DIVISION
424 S. CASTELL AVE.
NEW BRAUNFELS, TEXAS 78130
PHONE: 830 221 4030
FAX: 830 626 3600

P:\2010 ENGINEERING-AUTOCAD\DETAILS\NB-PUBLIC WORKS DETAILS\NB-UNAPPROVED DETAILS-2013\ST-2013.024 STREET SIGN DETAIL - GROUND MOUNT.DWG

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS — NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER — 1/2/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194552

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: TRAFFIC SIGNAGE AND OBJECT MARKER DETAILS

SHEET TITLE:
TRAFFIC SIGNAGE AND OBJECT MARKER DETAILS

SHEET NUMBER:
5.6

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Date: Dec 23, 2024, 11:12am User ID: mglenn
File: U:\Projects\314\52\06\Design\Civil\STREETS\TRAFFIC SIGNAGE AND OBJECT MARKER DETAILS.dwg
Design\CAD\STREETS\TRAFFIC SIGNAGE AND OBJECT MARKER DETAILS.dwg
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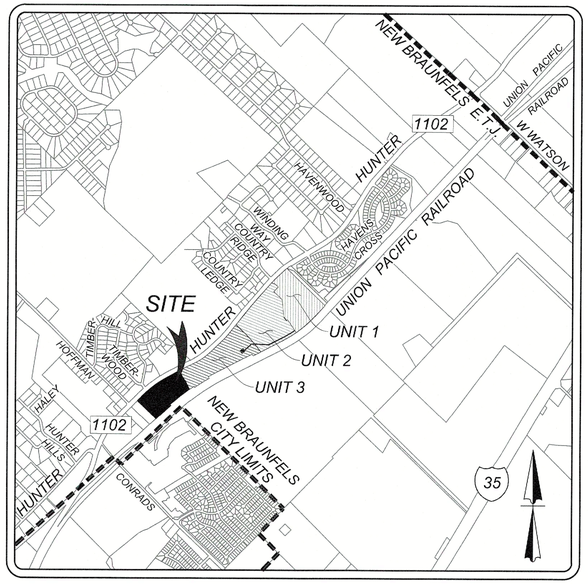
By: MGLENN

GATEHOUSE SUBDIVISION - UNIT 4

COMAL COUNTY, TEXAS

SANITARY SEWER IMPROVEMENTS



LOCATION MAP
N.T.S.

PERMITS OR APPROVALS MUST BE OBTAINED FROM THE FOLLOWING REGULATORY AGENCIES LISTED BELOW:

- ***COMAL COUNTY***
- ***NEW BRAUNFELS UTILITIES - ELECTRIC***
- ***CRYSTAL CLEAR SPECIAL UTILITY DISTRICT - WATER & SEWER***

ALL RESPONSIBILITTY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, COMAL COUNTY MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

ANY REVISIONS REQUIRED PER THE REGULATORY AGENCIES THAT CHANGE THE CIVIL SITE PLANS MUST BE SUBMITTED TO COMAL COUNTY FOR ACCEPTANCE.

IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF COUNTY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, COMAL COUNTY MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

FEMA FLOODPLAIN
NO PORTION OF ANY RESIDENTIAL LOTS ON GATEHOUSE SUBDIVISION UNIT 4 ARE IN THE SPECIAL FLOOD HAZARD ZONE ACCORDING TO FEMA FLOOD MAP COMMUNITY PANELS NO. 48091C0290F AND NO. 48091C0295F, DATED SEPTEMBER 2, 2009.

EDWARDS AQUIFER
NO PORTION OF ANY LOTS ON GATEHOUSE SUBDIVISION UNIT 4 ARE LOCATED WITHIN EDWARDS CONTRIBUTING ZONE OR RECHARGE ZONE. GATEHOUSE SUBDIVISION IS LOCATED WITHIN EDWARDS AQUIFER TRANSITION ZONE.

GAS UTILITY
GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE COUNTY FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.

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LEGAL DESCRIPTION
GATEHOUSE SUBDIVISION UNIT 4

A 17.14 ACRE TRACT OF LAND SITUATED IN THE NANCY KENNER LEAGUE SURVEY NO. 3 ABSTRACT 306 COMAL COUNTY, TEXAS AND BEING A PORTION OF THAT CALLED 96.044 ACRE TRACT OF LAND CONVEYED TO LENNAR HOMES OF TEXAS LAND & CONSTRUCTION LTD AND RECORDED IN DOC.# 202206011832 OF THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS.

DEVELOPER INFORMATION:
LENNAR HOMES OF TEXAS
100 NE LOOP 410, STE 1155
SAN ANTONIO, TEXAS 78216
PHONE: (210) 403-6282

KNOW ALL MEN BY THESE PRESENTS:

I, THE UNDERSIGNED, A. NICHOLAS REYNOLDS, A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS, HEREBY CERTIFY THAT PROPER ENGINEERING CONSIDERATION HAS BEEN GIVEN TO THESE PLANS AND ALL ENGINEERING ASPECTS ARE IN COMPLIANCE WITH CITY AND STATE ENGINEERING REGULATIONS AND LAWS.

REGISTERED PROFESSIONAL ENGINEER
P.E. REGISTRATION NO. 111666

Colliers
Engineering & Design
www.colliersengineering.com

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Formerly Known as KFW

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
1/6/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194559

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: SANITARY SEWER COVER

SHEET TITLE: *SANITARY SEWER COVER*

SHEET NUMBER: *6.0*

Date: Dec 23, 2024, 11:14am User ID: mglenn
File: U:\Projects\314\52\06\Design\Civil\SEWER\SANITARY SEWER COVER.dwg
Image(s) used from external reference: C:\Users\mglenn\AppData\Local\Temp\acpublish_5440\SANITARY SEWER COVER By Matthew

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

REV. 01/2025

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WASTEWATER NOTES

1. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING THE WASTEWATER SYSTEM AT ALL TIMES DURING CONSTRUCTION.
2. A MINIMUM OF 8" WASTEWATER PIPE AND FITTINGS (P.V.C, SDR-26, ASTM, D3034, D-3212, F-477) ARE REQUIRED ON NEW INSTALLATION.
3. ALL RESIDENTIAL WASTEWATER SERVICE LATERALS SHALL BE EXTENDED TO THE PROPERTY LINE AND A CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE. SERVICES TO LOTS WILL EXTEND FOUR (4) FEET PAST THE UNDERGROUND ELECTRIC CONDUIT IF ELECTRIC IS INSTALLED IN THE FRONT EASEMENT. ALL SEWER CLEANOUTS THAT LEAD TO CCSUD MAINS SHALL BE INSTALLED WITH A PROTECTIVE UTILITY SHROUD AND PIVOTING MARKER POLE DURING TIME OF CONSTRUCTION.
4. PIPE BEDDING MATERIAL OF WASTEWATER MAINS SHALL BE COMPOSED OF WELL-GRADED, CRUSHED STONE, OR GRAVEL PER SECTION 01230 OF CCSUD'S SPECIFICATIONS.
5. SECONDARY AND GENERAL BACKFILL OF WASTEWATER MAINS SHALL BE APPROVED SOIL MATERIALS FOR BACKFILL AND FILL, FREE OF CLAY, ROCK, OR GRAVEL LARGER THAN 2-INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETABLE, AND OTHER ORGANIC MATTER AND DELETERIOUS MATERIALS. PREVIOUSLY EXCAVATED MATERIALS MEETING THESE REQUIREMENTS MAY BE USED FOR BACKFILL.
6. ALL WASTEWATER MAINS SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 30 TAC §217.53 (C) (2).
7. FOR WASTEWATER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL SHALL BE PLACED IN TWO LIFTS.
   a. THE FIRST LIFT SHALL BE SPREAD UNIFORMLY AND SIMULTANEOUSLY ON EACH SIDE AND UNDER THE SHOULDERS OF THE PIPE TO THE MID POINT OR SPRING LINE OF THE PIPE.
   b. THE SECOND LIFT SHALL BE PLACED TO A DEPTH AS SHOWN ON THE PIPE BACKFILL DETAIL. MAINS LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.
8. ALL MANHOLES MUST BE WATERTIGHT, EITHER MONOLITHIC, CAST-IN-PLACE CONCRETE STRUCTURES OR PREFABRICATED MANHOLES SPECIFICALLY APPROVED BY CCSUD. THE MANHOLES SHALL HAVE WATER-TIGHT RINGS AND COVERS. WHEREVER THEY ARE WITHIN THE 100 YEAR FLOODPLAIN. THE MANHOLE COVERS SHALL BE BOLTED. EVERY THIRD MANHOLE IN SEQUENCE SHALL HAVE AN ALTERNATE MEANS OF VENTING. 30 TAC §213.5 (C) (3) (A) AND 30 TAC §217.55 (O).
9. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS TWO INCHES (2") ABOVE SURROUNDING GROUND EXCEPT WHEN LOCATED IN PAVED AREA. IN PAVED AREAS, THE MANHOLE RING SHALL BE FLUSH WITH PAVEMENT.
10. ALL NEW MANHOLES, UNLESS APPROVED BY CCSUD, ARE TO HAVE COVERS WITH 32" OPENINGS.
11. WASTEWATER MAIN CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL "BOOT TYPE" JOINT AS APPROVED BY CCSUD.
12. WASTEWATER MAINS SHALL BE TESTED FROM MANHOLE TO MANHOLE.
13. IN AREAS WHERE A NEW WASTEWATER MANHOLE IS TO BE CONSTRUCTED OVER AN EXISTING WASTEWATER SYSTEM, IT SHALL BE THE CONTACTOR'S RESPONSIBILITY TO TEST THE EXISTING MANHOLES BEFORE CONSTRUCTION. AFTER THE PROPOSED MANHOLE(S) HAS BEEN BUILT, THE CONTRACTOR SHALL RE-TEST THE EXISTING SYSTEM TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR. (NO SEPARATE PAY ITEM).
14. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN WASTEWATER LINES AND WATER LINES CANNOT BE MAINTAINED, THE INSTALLATION OF WASTEWATER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ. THE WASTEWATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC MEETING THE ASTM SPECIFICATION FOR BOTH PIPES AND JOINTS OF 160 PSI AND SHALL BE IN ACCORDANCE WITH 30 TAC § 217.53 (D) AND 30 TAC § 290.44 (E).
15. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE WASTEWATER LINES. THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
   a. PULL MANDREL
   b. PERFORM AIR TEST
   c. CLEANING OF ANY DEBRIS
   d. FLUSHING OF SYSTEM
   e. TV INSPECTION (WITHIN 72 HOURS OF FLUSHING)
16. A MINIMUM OF 3 FEET OF COVER IS TO BE MAINTAINED OVER THE WASTEWATER MAIN AND LATERALS AT SUBGRADE, OTHERWISE CONCRETE ENCASEMENT WILL BE REQUIRED.
17. TCEQ AND EPA REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF WASTEWATER COLLECTION SYSTEMS. DEVELOPER OR AUTHORIZED REPRESENTATIVE SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL AS NOTES ON THE PROJECT'S PLAN AND PROFILE SHEETS. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY CCSUD.
18. ALL MANHOLES NOT WITHIN PAVED STREETS SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER CCSUD DETAIL DRAWING #329.
19. ALL MANHOLES OVER THE EDWARDS AQUIFER RECHARGE ZONE SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER CCSUD DETAIL DRAWING #329.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY CCSUD INSPECTOR/TEST ADMINISTRATOR. PER EACH 12-INCH LOOSE LIFT 400 LINEAR FEET AT A MINIMUM. PERMITS WILL NOT BE ACCEPTED AND FINALIZED BY CCSUD WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ORGANIZED SEWAGE COLLECTION SYSTEM (SCS)
GENERAL CONSTRUCTION NOTES

1. THIS ORGANIZED SEWAGE COLLECTION SYSTEM (SCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C) AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS MUST BE REQUIRED TO KEEP ON-SITE COPIES OF THE PLAN AND THE APPROVAL LETTER.
3. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
4. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED SCS APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF AN SCS APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERED. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING AND THE APPLICANT MUST SUBMIT A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.
7. SEWER LINES LOCATED WITHIN OR CROSSING THE 5-YEAR FLOODPLAIN OF A DRAINAGE WAY WILL BE PROTECTED FROM INUNDATION AND STREAM VELOCITIES WHICH COULD CAUSE EROSION AND SCOURING OF BACKFILL. THE TRENCH MUST BE CAPPED WITH CONCRETE TO PREVENT SCOURING OF BACKFILL, OR THE SEWER LINES MUST BE ENCASED IN CONCRETE. ALL CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES.
8. ALL MANHOLES CONSTRUCTED OR REHABILITATED ON THIS PROJECT MUST HAVE WATERTIGHT SIZE ON SIZE RESILIENT CONNECTORS ALLOWING FOR DIFFERENTIAL SETTLEMENT. IF MANHOLES ARE CONSTRUCTED WITHIN THE 100-YEAR FLOODPLAIN, THE COVER MUST HAVE A GASKET AND BE BOLTED TO THE RING. WHERE GASKETED MANHOLE COVERS ARE REQUIRED FOR MORE THAN THREE MANHOLES IN SEQUENCE OR FOR MORE THAN 1500 FEET, ALTERNATE MEANS OF VENTING WILL BE PROVIDED. BRICKS ARE NOT AN ACCEPTABLE CONSTRUCTION MATERIAL FOR ANY PORTION OF THE MANHOLE.

   THE DIAMETER OF THE MANHOLES MUST BE A MINIMUM OF FOUR FEET AND THE MANHOLE FOR ENTRY MUST HAVE A MINIMUM CLEAR OPENING DIAMETER OF 30 INCHES. THESE DIMENSIONS AND OTHER DETAILS SHOWING COMPLIANCE WITH THE COMMISSION'S RULES CONCERNING MANHOLES AND SEWER LINE/MANHOLE INVERTS DESCRIBED IN 30 TAC §217.55 ARE INCLUDED ON PLAN SHEET 6.7.

   IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.
9. WHERE WATER LINES AND NEW SEWER LINE ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES, OR WATER LINES NEXT TO MANHOLES) THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).
10. WHERE SEWERS LINES DEVIATE FROM STRAIGHT ALIGNMENT AND UNIFORM GRADE ALL CURVATURE OF SEWER PIPE MUST BE ACHIEVED BY THE FOLLOWING PROCEDURE WHICH IS RECOMMENDED BY THE PIPE MANUFACTURER: **NOT ALLOWED**

    IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT MUST BE USED: **NOT ALLOWED**

    SPECIFIC CARE MUST BE TAKEN TO ENSURE THAT THE JOINT IS PLACED IN THE CENTER OF THE TRENCH AND PROPERLY BEDDED IN ACCORDANCE WITH 30 TAC §217.54.
11. NEW SEWAGE COLLECTION SYSTEM LINES MUST BE CONSTRUCTED WITH STUB OUTS FOR THE CONNECTION OF ANTICIPATED EXTENSIONS. THE LOCATION OF SUCH STUB OUTS MUST BE MARKED ON THE GROUND SUCH THAT THEIR LOCATION CAN BE EASILY DETERMINED AT THE TIME OF CONNECTION OF THE EXTENSIONS. SUCH STUB OUTS MUST BE MANUFACTURED WYES OR TEES THAT ARE COMPATIBLE IN SIZE AND MATERIAL WITH BOTH THE SEWER LINE AND THE EXTENSION. AT THE TIME OF ORIGINAL CONSTRUCTION, NEW STUB-OUTS MUST BE CONSTRUCTED SUFFICIENTLY TO EXTEND BEYOND THE END OF THE STREET PAVEMENT. ALL STUB-OUTS MUST BE SEALED WITH A MANUFACTURED CAP TO PREVENT LEAKAGE. EXTENSIONS THAT WERE NOT ANTICIPATED AT THE TIME OF ORIGINAL CONSTRUCTION OR THAT ARE TO BE CONNECTED TO AN EXISTING SEWER LINE NOT FURNISHED WITH STUB OUTS MUST BE CONNECTED USING A MANUFACTURED SADDLE AND IN ACCORDANCE WITH ACCEPTED PLUMBING TECHNIQUES.

    IF NO STUB-OUT IS PRESENT AN ALTERNATE METHOD OF JOINING LATERALS IS SHOWN IN THE DETAIL ON PLAN SHEET **N/A**. (FOR POTENTIAL FUTURE LATERALS).

    THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEET **N/A** AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET **N/A**.
12. TRENCHING, BEDDING AND BACKFILL MUST CONFORM WITH 30 TAC §217.54. THE BEDDING AND BACKFILL FOR FLEXIBLE PIPE MUST COMPLY WITH THE STANDARDS OF ASTM D-2321, CLASSES IA, IB, II OR III. RIGID PIPE BEDDING MUST COMPLY WITH THE REQUIREMENTS OF ASTM C 12 (ANSI A 106.2) CLASSES A, B OR C.
13. SEWER LINES MUST BE TESTED FROM MANHOLE TO MANHOLE. WHEN A NEW SEWER LINE IS CONNECTED TO AN EXISTING STUB OR CLEAN-OUT, IT MUST BE TESTED FROM EXISTING MANHOLE TO NEW MANHOLE. IF A STUB OR CLEAN-OUT IS USED AT THE END OF THE PROPOSED SEWER LINE, NO PRIVATE SERVICE ATTACHMENTS MAY BE CONNECTED BETWEEN THE LAST MANHOLE AND THE CLEANOUT UNLESS IT CAN BE CERTIFIED AS CONFORMING WITH THE PROVISIONS OF 30 TAC §213.5(C)(3)(E).
14. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH 30 TAC §217.57. THE ENGINEER MUST RETAIN COPIES OF ALL TEST RESULTS WHICH MUST BE MADE AVAILABLE TO THE EXECUTIVE DIRECTOR UPON REQUEST. THE ENGINEER MUST CERTIFY IN WRITING THAT ALL WASTEWATER LINES HAVE PASSED ALL REQUIRED TESTING TO THE APPROPRIATE REGIONAL OFFICE WITHIN 30 DAYS OF TEST COMPLETION AND PRIOR TO USE OF THE NEW COLLECTION SYSTEM. TESTING METHOD WILL BE:

    (a) FOR A COLLECTION SYSTEM PIPE THAT WILL TRANSPORT WASTEWATER BY GRAVITY FLOW, THE DESIGN MUST SPECIFY AN INFILTRATION AND EXFILTRATION TEST OR A LOW-PRESSURE AIR TEST. A TEST MUST CONFORM TO THE FOLLOWING REQUIREMENTS:
    (1) LOW PRESSURE AIR TEST.
    (A) A LOW PRESSURE AIR TEST MUST FOLLOW THE PROCEDURES DESCRIBED IN AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C-828, ASTM C-924, OR ASTM F-1417 OR OTHER PROCEDURE APPROVED BY THE EXECUTIVE DIRECTOR, EXCEPT AS TO TESTING TIMES AS REQUIRED IN TABLE C.3 IN SUBPARAGRAPH (C) OF THIS PARAGRAPH OR EQUATION C.3 IN SUBPARAGRAPH (B)(II) OF THIS PARAGRAPH.
    (B) FOR SECTIONS OF COLLECTION SYSTEM PIPE LESS THAN 36 INCH AVERAGE INSIDE DIAMETER, THE FOLLOWING PROCEDURE MUST APPLY, UNLESS A PIPE IS TO BE TESTED AS REQUIRED BY PARAGRAPH (2) OF THIS SUBSECTION.
    (I) A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE.
    (II) ONCE THE PRESSURE IS STABILIZED, THE MINIMUM TIME ALLOWABLE FOR THE PRESSURE TO DROP FROM 3.5 PSI GAUGE TO 2.5 PSI GAUGE IS COMPUTED FROM THE FOLLOWING EQUATION:

    EQUATION C.3 $T = \frac{0.085 \times D \times K}{Q}$

    WHERE:

    T = TIME FOR PRESSURE TO DROP 1.0 POUND PER SQUARE INCH GAUGE IN SECONDS
    K = 0.000419 X D X L, BUT NOT LESS THAN 1.0
    D = AVERAGE INSIDE PIPE DIAMETER IN INCHES
    L = LENGTH OF LINE OF SAME SIZE BEING TESTED, IN FEET
    Q = RATE OF LOSS, 0.0015 CUBIC FEET PER MINUTE PER SQUARE FOOT INTERNAL SURFACE

    (C) SINCE A K VALUE OF LESS THAN 1.0 MAY NOT BE USED, THE MINIMUM TESTING TIME FOR EACH PIPE DIAMETER IS SHOWN IN THE FOLLOWING TABLE C.3:

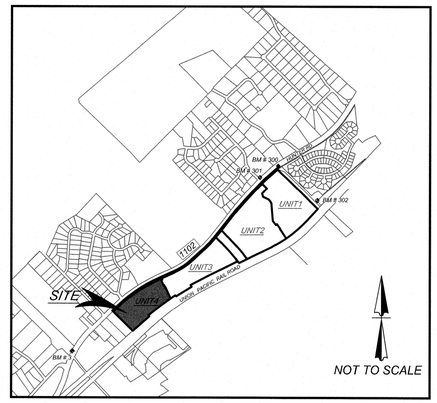
PIPE DIAMETER (INCHES)	MINIMUM TIME (SECONDS)	LENGTH FOR MINIMUM (FEET)	TIME FOR LONGER LENGTH (SECONDS/FOOT)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

    (D) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME.
    (E) IF ANY PRESSURE LOSS OR LEAKAGE HAS OCCURRED DURING THE FIRST 25% OF A TESTING PERIOD, THEN THE TEST MUST CONTINUE FOR THE ENTIRE TEST DURATION AS OUTLINED ABOVE OR UNTIL FAILURE.
    (F) WASTEWATER COLLECTION SYSTEM PIPES WITH A 27 INCH OR LARGER AVERAGE INSIDE DIAMETER MAY BE AIR TESTED AT EACH JOINT INSTEAD OF FOLLOWING THE PROCEDURE OUTLINED IN THIS SECTION.
    (G) A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 33 INCHES MUST BE APPROVED BY THE EXECUTIVE DIRECTOR.
    (2) INFILTRATION/EXFILTRATION TEST.
    (A) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF 2.0 FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE.
    (B) AN OWNER SHALL USE AN INFILTRATION TEST IN LIEU OF AN EXFILTRATION TEST WHEN PIPES ARE INSTALLED BELOW THE GROUNDWATER LEVEL.
    (C) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE, OR AT LEAST TWO FEET ABOVE EXISTING GROUNDWATER LEVEL, WHICHEVER IS GREATER.
    (D) FOR CONSTRUCTION WITHIN A 25-YEAR FLOOD PLAIN, THE INFILTRATION OR EXFILTRATION MUST NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT THE SAME MINIMUM TEST HEAD AS IN SUBPARGRAPH (C) OF THIS PARAGRAPH.
    (E) IF THE QUANTITY OF INFILTRATION OR EXFILTRATION EXCEEDS THE MAXIMUM QUANTITY SPECIFIED, AN OWNER SHALL UNDERTAKE REMEDIAL ACTION IN ORDER TO REDUCE THE INFILTRATION OR EXFILTRATION TO AN AMOUNT WITHIN THE LIMITS SPECIFIED. AN OWNER SHALL RETEST A PIPE FOLLOWING A REMEDIATION ACTION.
    (b) IF A GRAVITY COLLECTION PIPE IS COMPOSED OF FLEXIBLE PIPE, DEFLECTION TESTING IS ALSO REQUIRED. THE FOLLOWING PROCEDURES MUST BE FOLLOWED:
    (1) FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL.
    (A) MANDREL SIZING.
    (I) A RIGID MANDREL MUST HAVE AN OUTSIDE DIAMETER (OD) NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER (ID) OR AVERAGE ID OF A PIPE, AS SPECIFIED IN THE APPROPRIATE STANDARD BY THE ASTMS, AMERICAN WATER WORKS ASSOCIATION, UNI-BELL, OR AMERICAN NATIONAL STANDARDS INSTITUTE, OR ANY RELATED APPENDIX.
    (II) IF A MANDREL SIZING DIAMETER IS NOT SPECIFIED IN THE APPROPRIATE STANDARD, THE MANDREL MUST HAVE AN OD EQUAL TO 95% OF THE ID OF A PIPE. IN THIS CASE, THE ID OF THE PIPE, FOR THE PURPOSE OF DETERMINING THE OD OF THE MANDREL, MUST EQUAL BE THE AVERAGE OUTSIDE DIAMETER MINUS TWO MINIMUM WALL THICKNESSES FOR OD CONTROLLED PIPE AND THE AVERAGE INSIDE DIAMETER FOR ID CONTROLLED PIPE.
    (III) ALL DIMENSIONS MUST MEET THE APPROPRIATE STANDARD.
    (B) MANDREL DESIGN.
    (I) A RIGID MANDREL MUST BE CONSTRUCTED OF A METAL OR A RIGID PLASTIC MATERIAL THAT CAN WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
    (II) A MANDREL MUST HAVE NINE OR MORE ODD NUMBER OF RUNNERS OR LEGS.
    (III) A BARREL SECTION LENGTH MUST EQUAL AT LEAST 75% OF THE INSIDE DIAMETER OF A PIPE.
    (IV) EACH SIZE MANDREL MUST USE A SEPARATE PROVING RING.
    (C) METHOD OPTIONS.
    (I) AN ADJUSTABLE OR FLEXIBLE MANDREL IS PROHIBITED.
    (II) A TEST MAY NOT USE TELEVISION INSPECTION AS A SUBSTITUTE FOR A DEFLECTION TEST.
    (III) IF REQUESTED, THE EXECUTIVE DIRECTOR MAY APPROVE THE USE OF A DEFLECTOMETER OR A MANDREL WITH REMOVABLE LEGS OR RUNNERS ON A CASE-BY-CASE BASIS.
    (2) FOR A GRAVITY COLLECTION SYSTEM PIPE WITH AN INSIDE DIAMETER 27 INCHES AND GREATER, OTHER TEST METHODS MAY BE USED TO DETERMINE VERTICAL DEFLECTION.
    (3) A DEFLECTION TEST METHOD MUST BE ACCURATE TO WITHIN PLUS OR MINUS 0.2% DEFLECTION.
    (4) AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL.
    (5) GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).
    (6) IF A PIPE SECTION FAILS A DEFLECTION TEST, AN OWNER SHALL CORRECT THE PROBLEM AND CONDUCT A SECOND TEST AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS.
15. ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.
    (a) ALL MANHOLES MUST PASS A LEAKAGE TEST.
    (b) AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BACKFILLING) FOR LEAKAGE, SEPARATE AND INDEPENDENT OF THE COLLECTION SYSTEM PIPES, BY HYDROSTATIC EXFILTRATION TESTING, VACUUM TESTING, OR OTHER METHOD APPROVED BY THE EXECUTIVE DIRECTOR.
    (1) HYDROSTATIC TESTING.
    (A) THE MAXIMUM LEAKAGE FOR HYDROSTATIC TESTING OR ANY ALTERNATIVE TEST METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER HOUR.
    (B) TO PERFORM A HYDROSTATIC EXFILTRATION TEST, AN OWNER SHALL SEAL ALL WASTEWATER PIPES COMING INTO A MANHOLE WITH AN INTERNAL PIPE PLUG, FILL THE MANHOLE WITH WATER, AND MAINTAIN THE TEST FOR AT LEAST ONE HOUR.
    (C) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
    (2) VACUUM TESTING.
    (A) TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
    (B) NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
    (C) STUB-OUTS, MANHOLE BOOTS, AND PIPE PLUGS MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
    (D) AN OWNER SHALL USE A MINIMUM 60 INCH/LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
    (E) A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
    (F) THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
    (G) A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
    (H) A MANHOLE PASSES THE TEST IF AFTER 2.0 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.
17. *ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §213.5(C)(3)(I). AFTER INSTALLATION OF AND, PRIOR TO COVERING AND CONNECTING A PRIVATE SERVICE LATERAL TO AN EXISTING ORGANIZED SEWAGE COLLECTION SYSTEM, A TEXAS LICENSED PROFESSIONAL ENGINEER, TEXAS REGISTERED SANITARIAN, OR APPROPRIATE CITY INSPECTOR MUST VISUALLY INSPECT THE PRIVATE SERVICE LATERAL AND THE CONNECTION TO THE SEWAGE COLLECTION SYSTEM, AND CERTIFY THAT IT IS CONSTRUCTED IN CONFORMITY WITH THE APPLICABLE PROVISIONS OF THIS SECTION. THE OWNER OF THE COLLECTION SYSTEM MUST MAINTAIN SUCH CERTIFICATIONS FOR FIVE YEARS AND FORWARD COPIES TO THE APPROPRIATE REGIONAL OFFICE UPON REQUEST. CONNECTIONS MAY ONLY BE MADE TO AN APPROVED SEWAGE COLLECTION SYSTEM.*
18. *PIPE MATERIAL FOR THE WASTEWATER LINE SHALL BE SDR 26 PVC.*

CONTRACTOR TO RUN LEVEL LOOP THROUGH BM'S PROVIDED TO CONFIRM BEFORE CONSTRUCTION. CONTACT ENGINEER/SURVEYOR IMMEDIATELY IF ELEVATIONS DO NOT MATCH THOSE SHOWN.

BENCHMARKS

BM#	NORTHING	EASTING	ELEVATION	DESCRIPITION
300	13833987.43	2266645.56	741.65	SBM
301	13833728.05	2266235.25	753.89	SBM
302	13833209.63	2267544.75	707.33	SBM



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED
PROFESSIONAL ENGINEER
2/13/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14999
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER: 24003556A
DRAWING NAME: SANITARY SEWER COVER

SHEET TITLE:
SANITARY SEWER GENERAL NOTES

SHEET NUMBER:
6.1

Date: Feb 10, 2025, 8:55am User ID: nelden
File: U:\Projects\314\50\05\Design\Civil\SEWER\SANITARY SEWER COVER.dwg
\Design\Civil\SEWER\SANITARY SEWER COVER.dwg\T1 SANITARY SEWER GENERAL NOTES
by: NVALDEN

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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

CAUTION!!!
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

DRY UTILITY CONDUIT NOTE:
CONDUIT LOCATIONS SHOW ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYOR'S PLAN.

NOTE:

1. *ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS*
2. *NO VALVES, HYDRANTS, CLEANOUTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.*
3. *ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.*
4. *THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.*

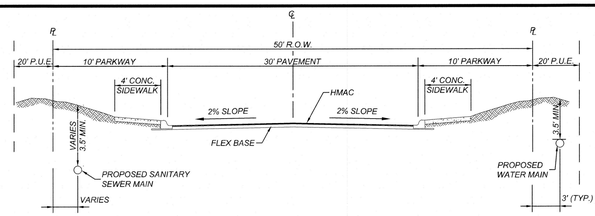
SCALE : 1"=50'
0' 50' 150'
100'

UTILITY TRENCH COMPACTION (STREET PAVEMENT / SIDEWALK):
ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE COMAL COUNTY STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE COMAL COUNTY STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE COMAL COUNTY INSPECTOR.

NBU AS-BUILT REQUIREMENTS:
NBU REQUIRES GPS POINTS FOR CERTAIN WATER, WASTEWATER AND ELECTRIC IMPROVEMENTS. SOME OF THIS INFORMATION/DATA MUST BE PERFORMED DURING CONSTRUCTION, PRIOR TO BACKFILLING OPERATIONS. CONTRACTOR SHALL COORDINATE WITH NBU INSPECTOR TO VERIFY ANY ADDITIONAL ITEMS NOT SHOWN BELOW THAT NEED TO BE GPS LOCATED AND THE SURVEY/ DELIVERY REQUIREMENTS REGARDING THIS INFORMATION.

ELECTRIC:
1. *POLES*
2. *TRANSFORMERS, BOTH ABOVE AND UNDERGROUND (FRONT LOCK)*
3. *PULL BOXES*
4. *STREET LIGHTS*

SEE NBU'S "CAD/GPS DELIVERABLES" ON NBU WEBSITE AT NBUTEXAS.COM FOR COMPLETE DETAILS AND REQUIREMENTS



TYPICAL 50' STREET SECTION
NOT-TO-SCALE

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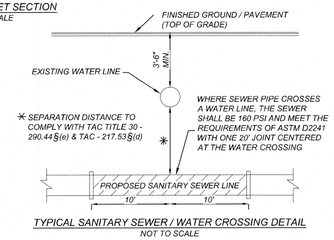
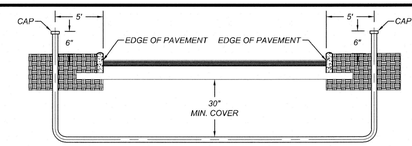


TYPICAL SANITARY SEWER / WATER CROSSING DETAIL
NOT TO SCALE

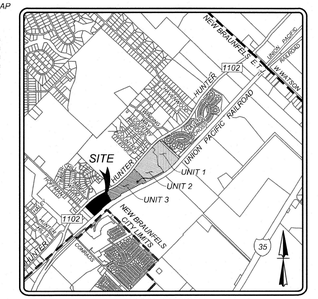


CONDUIT DETAIL
NOT TO SCALE

"PVC SCHEDULE 80 CONDUIT
SEE PLAN SHEETS FOR SIZE LOCATION AND NUMBER OF CONDUITS

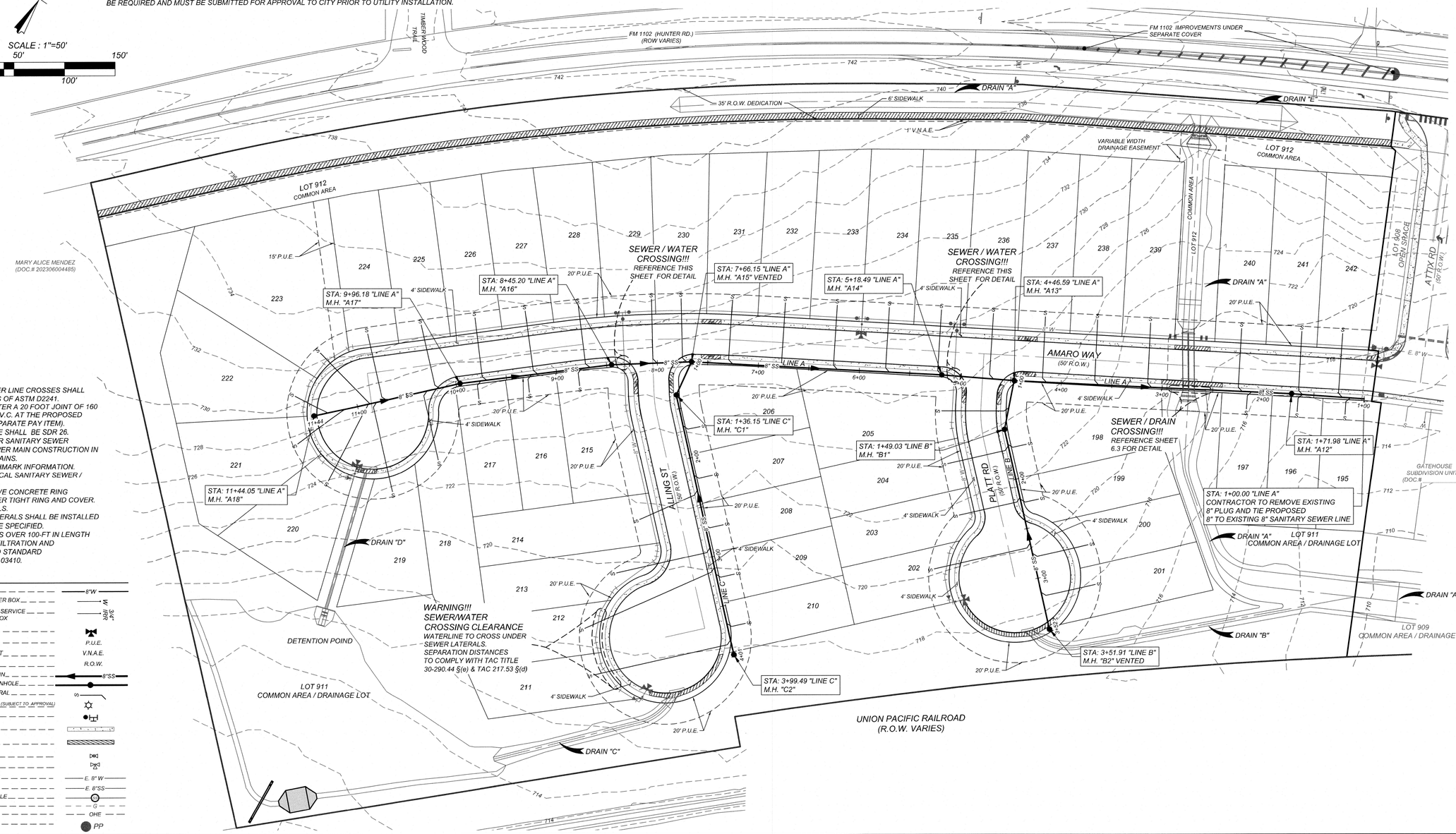
NOTE:

- *CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH NBU FACILITY AT ALL STREETS AND DRAIN CROSSING. CONSTRUCTION SLEEVES MUST ALSO BE LOCATED FOR NBU CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE FINAL ELECTRIC PROVIDER'S DESIGN AND SPECIFICATION.*
- *CONTRACTOR TO CONTACT ENGINEER FOR APPROPRIATE NUMBER AND SIZE OF CONDUITS FOR TELECOMMUNICATIONS*
- *CONTRACTOR TO CONTACT ENGINEER FOR ELECTRICAL PLANS*
- *CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).*
- *CONDUITS SHALL BE PVC WITH 30 INCHES OF MINIMUM COVER FROM STREET SUBGRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.*
- *ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.*
- *ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATION INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS.*
- *CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND INSTALLING CONDUIT SLEEVES FOR EACH DRAIN CROSSING PRIOR TO THE INSTALLATION OF EACH DRAIN.*



LOCATION MAP
N.T.S.

NOTE:
SEWER SERVICE LATERALS OVER 100-FT IN LENGTH SHALL BE TESTED FOR INFILTRATION AND EXFILTRATION PER CCSUD STANDARD SPECIFICATION 03410.



NOTE:
1. *SEWER PIPE WHERE WATER LINE CROSSES SHALL MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM).*
2. *ALL SANITARY SEWER PIPE SHALL BE SDR 26. REFERENCE SHEET 6.1 FOR SANITARY SEWER NOTES/CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.*
3. *SEE SHEET 6.1 FOR BENCHMARK INFORMATION.*
4. *SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
5. *ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE SHEET 6.5 FOR DETAILS.*
6. *ALL SANITARY SEWER LATERALS SHALL BE INSTALLED AT 2% UNLESS OTHERWISE SPECIFIED.*
7. *SEWER SERVICE LATERALS OVER 100-FT IN LENGTH SHALL BE TESTED FOR INFILTRATION AND EXFILTRATION PER CCSUD STANDARD SPECIFICATIONS SECTION 03410.*

LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED WATER SERVICE & METER BOX	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & W/ 3/4" WATER METER & METER BOX	3/4" IRR
PROPOSED FIRE HYDRANT	
PUBLIC UTILITY EASEMENT	P.U.E.
VEHICULAR NON-ACCESS EASEMENT	V.N.A.E.
RIGHT OF WAY	R.O.W.
PROPOSED 8" SANITARY SEWER MAIN	8"SS
PROPOSED 8" SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER LATERAL	S
PROPOSED STREET LIGHT POLE (SUBJECT TO APPROVAL)	
PROPOSED TEE & WATER VALVE	
PROPOSED SIDEWALK	
DEVELOPER INSTALLED SIDEWALK	
EXISTING WATER VALVE	
EXISTING FIRE HYDRANT	
EXISTING WATER MAIN	E. 8" W
EXISTING SANITARY SEWER MAIN	E. 8"SS
EXISTING SANITARY SEWER MANHOLE	
EXISTING NATURAL GAS LINE	G
EXISTING OVERHEAD UTILITY LINE	OHE
EXISTING POWER POLE	PP

Date: Feb 13, 2025, 3:45pm User ID: dgonzalez
File: I:\Projects\0314_K2A_GH\Design\Civil\SHEETS\6.2 OVERALL SANITARY SEWER PLAN.dwg By: DGONZALEZ

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REV	DATE	DRAWN BY	DESCRIPTION

2/13/25
STATE OF TEXAS — NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
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New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
24003556A	6.2 OVERALL SANITARY SEWER PLAN

SHEET TITLE:
OVERALL SANITARY SEWER PLAN

SHEET NUMBER:
6.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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4. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.

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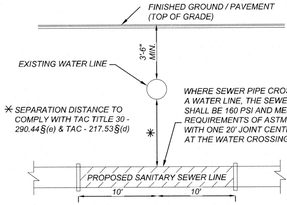
6. ALL SANITARY SEWER LATERALS SHALL BE INSTALLED AT 2% UNLESS OTHERWISE SPECIFIED.
7. SEWER SERVICE LATERALS OVER 100-FT IN LENGTH SHALL BE TESTED FOR INFILTRATION AND EXFILTRATION PER CCSUD STANDARD SPECIFICATIONS SECTION 03410.

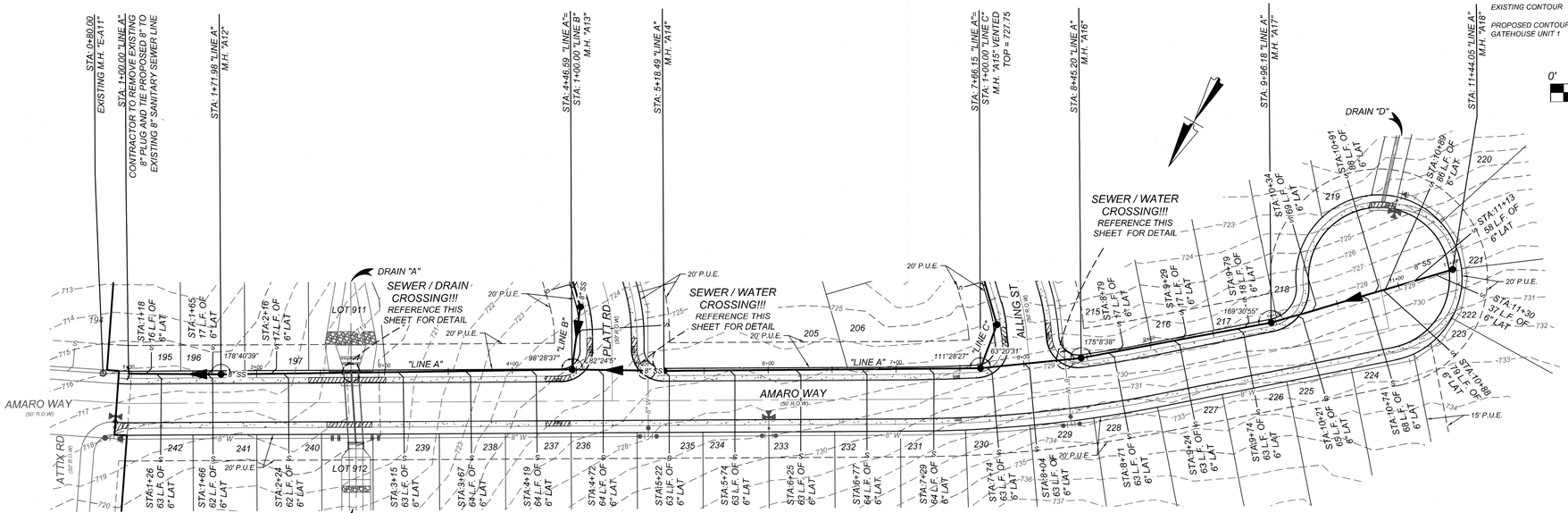


TYPICAL SANITARY SEWER / WATER CROSSING DETAIL
NOT TO SCALE

LEGEND

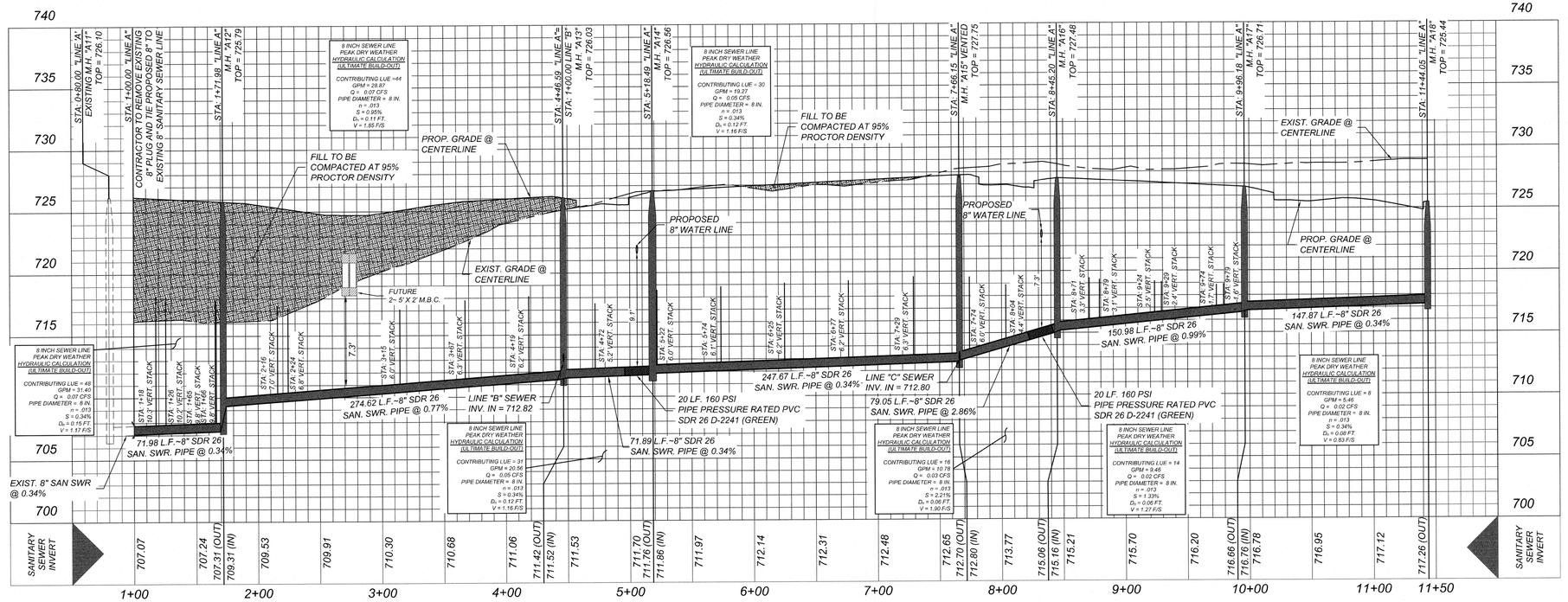
- PROPOSED WATER MAIN — 8"W
- PROPOSED FIRE HYDRANT
- PUBLIC UTILITY EASEMENT — P.U.E.
- VEHICULAR NON-ACCESS EASEMENT — V.N.A.E.
- RIGHT OF WAY — R.O.W.
- PROPOSED 8" SANITARY SEWER MAIN
- PROPOSED 8" SANITARY SEWER MANHOLE
- PROPOSED TEE & WATER VALVE
- PROPOSED SANITARY SEWER LATERAL — SS
- EXISTING SANITARY SEWER LATERAL — SS
- EXISTING WATER VALVE — WV
- EXISTING FIRE HYDRANT — FH
- EXISTING WATER MAIN — E. 8"W
- EXISTING SANITARY SEWER MAIN — E. 8"SS
- EXISTING SANITARY SEWER MANHOLE — E. FM
- EXISTING SANITARY SEWER FORCE MAIN — G
- EXISTING NATURAL GAS LINE — OHE
- EXISTING OVERHEAD UTILITY LINE — PP
- EXISTING POWER POLE — 780
- EXISTING CONTOUR — 545
- PROPOSED CONTOUR
- GATEHOUSE UNIT 1

SCALE : 1"=50'
0' 50' 150' 100'



LINE 'A'
STA. 1+00.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



CONTRACTOR TO VERIFY DEPTH OF EXISTING SEWER MAIN PRIOR TO START OF CONSTRUCTION & NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES

Date: Feb 13, 2025, 3:44pm User ID: dgonzalez
File: U:\Projects\314.026\06 Design\Civil\Sheets\6.3 SEWER LINE A STA. 1+00.00 TO END.dwg
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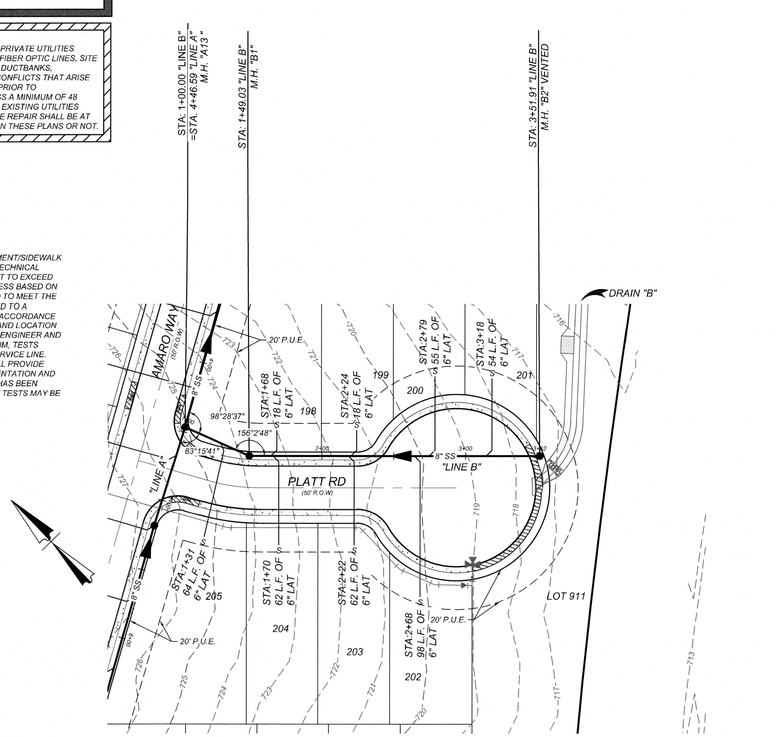
TRENCH EXCAVATION SAFETY PROTECTION:
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!!
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

DRY UTILITY CONDUIT NOTE:
CONDUIT LOCATIONS SHOW ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYOR'S PLAN.

UTILITY TRENCH COMPACTION (STREET PAVEMENT / SIDEWALK):
ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE COMAL COUNTY STREET INSPECTOR, AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE COMAL COUNTY STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE COMAL COUNTY INSPECTOR.



LINE 'B'
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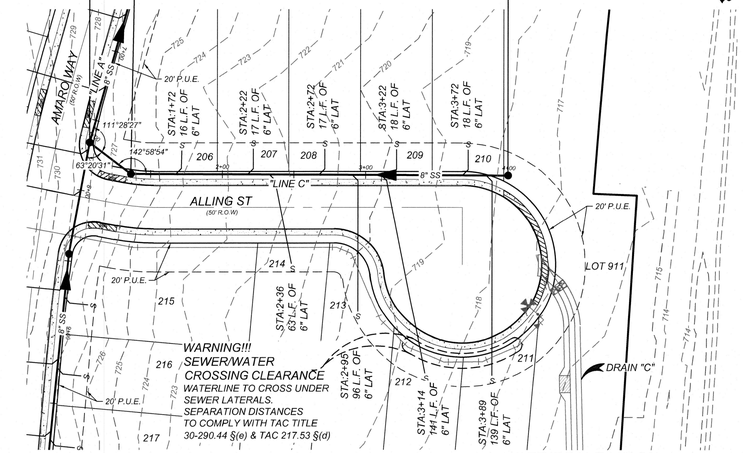
HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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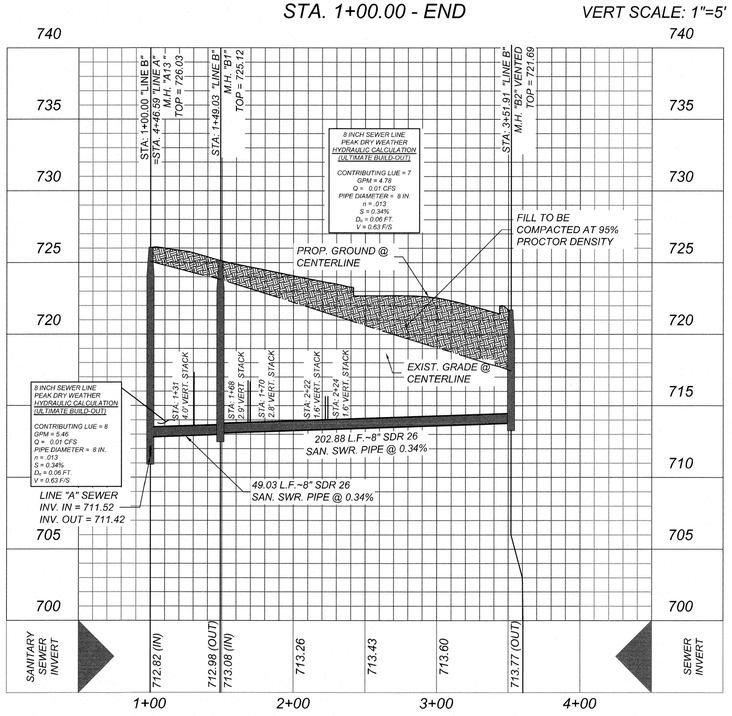
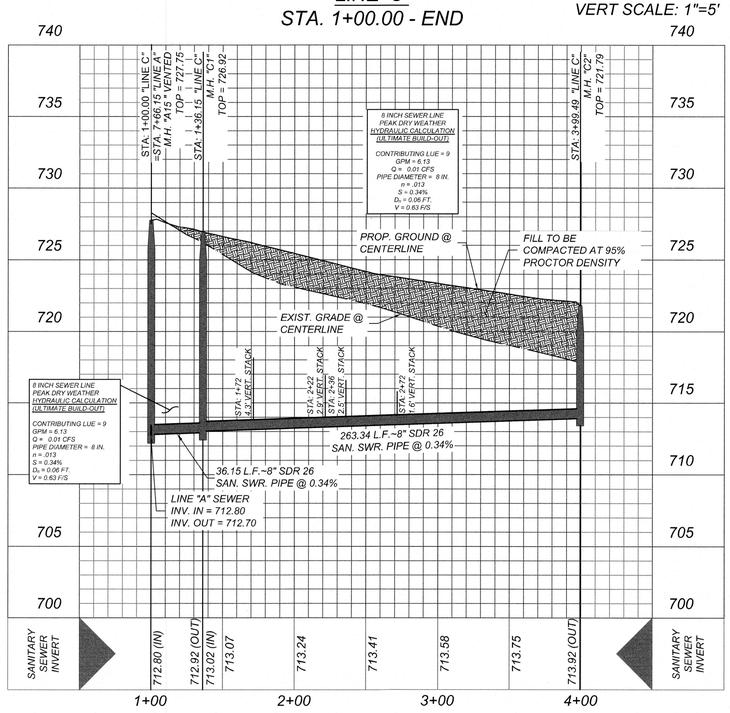




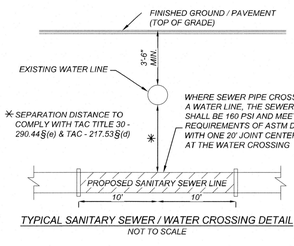
LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED FIRE HYDRANT	
PUBLIC UTILITY EASEMENT	P.U.E.
VEHICULAR NON-ACCESS EASEMENT	V.N.A.E.
RIGHT OF WAY	R.O.W.
PROPOSED 8" SANITARY SEWER MAIN	
PROPOSED 8" SANITARY SEWER MANHOLE	
PROPOSED TEE & WATER VALVE	
PROPOSED SANITARY SEWER LATERAL	SS
EXISTING SANITARY SEWER LATERAL	SS
EXISTING WATER VALVE	
EXISTING FIRE HYDRANT	
EXISTING WATER MAIN	E. 8"W
EXISTING SANITARY SEWER MAIN	E. 8"SS
EXISTING SANITARY SEWER MANHOLE	
EXISTING SANITARY SEWER FORCE MAIN	E. FM
EXISTING NATURAL GAS LINE	G
EXISTING OVERHEAD UTILITY LINE	OHE
EXISTING POWER POLE	PP
EXISTING CONTOUR	780
PROPOSED CONTOUR	646
GATEHOUSE UNIT 1	

SCALE : 1"=50'
0' 50' 150'
100'

NOTE:
1. SEWER PIPE WHERE WATER LINE CROSSES SHALL MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM).
2. ALL SANITARY SEWER PIPE SHALL BE SDR 26.
3. REFERENCE SHEET 6.1 FOR SANITARY SEWER NOTES/CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.
4. SEE SHEET 6.1 FOR BENCHMARK INFORMATION.
5. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
6. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE SHEET 6.5 FOR DETAILS.
7. ALL SANITARY SEWER LATERALS SHALL BE INSTALLED AT 2% UNLESS OTHERWISE SPECIFIED.
8. SEWER SERVICE LATERALS OVER 100-FT IN LENGTH SHALL BE TESTED FOR INFILTRATION AND EXFILTRATION PER CCSUD STANDARD SPECIFICATIONS SECTION 03410.

NOTE:
1. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS
2. NO VALVES, HYDRANTS, CLEANOUTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
3. ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.
4. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.



TYPICAL SANITARY SEWER / WATER CROSSING DETAIL
NOT TO SCALE

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED
PROFESSIONAL ENGINEER
2/13/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

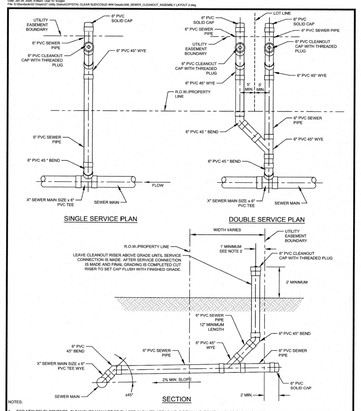
PROJECT NUMBER: 24003556A
DRAWING NAME: 6.4 SEWER LINE B STA. 1+00.00 TO END

SHEET TITLE:
SEWER LINE B & LINE C STA. 1+00.00 TO END

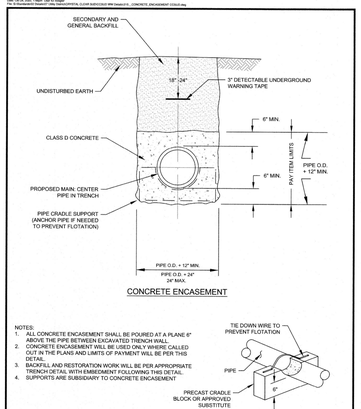
SHEET NUMBER: 6.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

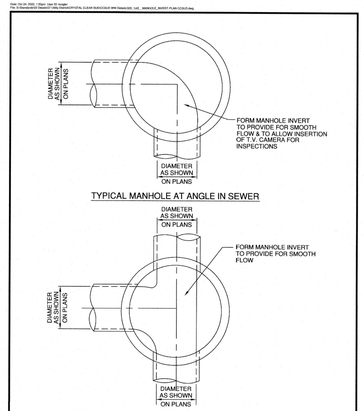
Date: Feb 13, 2025, 3:44pm User ID: dgonzalez
File: U:\Projects\3141.52\06\Design\Civil\SEWER\6.4 SEWER LINE B STA. 1+00.00 TO END.dwg
Design\Civil\SEWER\6.4 SEWER LINE B STA. 1+00.00 TO END.dwg 6.4 SEWER LINE B STA. 1+00.00 TO END By: DGONZALEZ



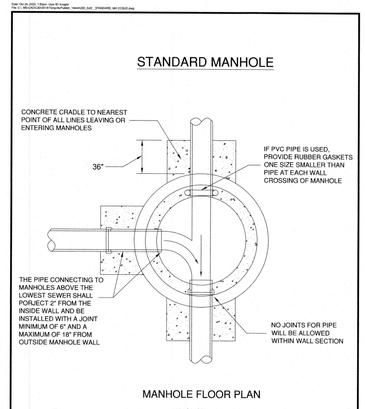
PROPERTY OF	DTL #306		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	SEWER CLEANOUT ASSEMBLY	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	11/21/2022	01/20/2025
			SHEET 1 OF 1	



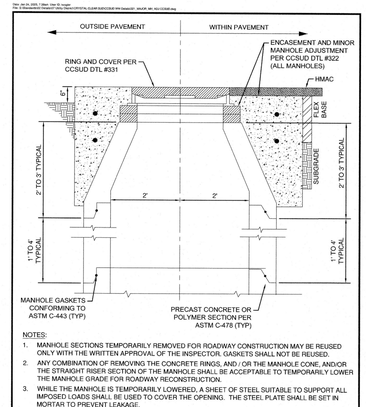
PROPERTY OF	DTL #310		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	CONCRETE ENCASEMENT	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 1 OF 1	



PROPERTY OF	DTL #320		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	MANHOLE INVERT PLAN	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 1 OF 2	



PROPERTY OF	DTL #320		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	STANDARD MANHOLE MANHOLE FLOOR PLAN	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 2 OF 2	



NOTES:
1. MANHOLE SECTIONS TEMPORARILY REMOVED FOR ROADWAY CONSTRUCTION MAY BE REUSED ONLY WITH THE WRITTEN APPROVAL OF THE INSPECTOR. GASKETS SHALL NOT BE REUSED.
2. ANY COMBINATION OF REMOVING THE CONCRETE RINGS, AND / OR THE MANHOLE CONE, AND/OR THE STRAIGHT RISER SECTION OF THE MANHOLE SHALL BE ACCEPTABLE TO TEMPORARILY LOWER THE MANHOLE GRADE FOR ROADWAY RECONSTRUCTION.
3. WHILE THE MANHOLE IS TEMPORARILY LOWERED, A SHEET OF STEEL SUITABLE TO SUPPORT ALL IMPOSED LOADS SHALL BE USED TO COVER THE OPENING. THE STEEL PLATE SHALL BE SET IN MORTAR TO PREVENT LEAKAGE.
4. SUBGRADE AND BASE MATERIALS SHALL BE COMPACTED TO 95% AND 100% DENSITIES, RESPECTIVELY, COMPACTION SHALL BE BY MECHANICAL TAMPING TO THE DENSITIES SPECIFIED.
5. MANHOLE SHALL BE SET SO RING AND COVER MATCH STREET SLOPE.

PROPERTY OF	DTL #321		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	MAJOR MANHOLE ADJUSTMENT	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	01/08/2025	
			SHEET 1 OF 1	

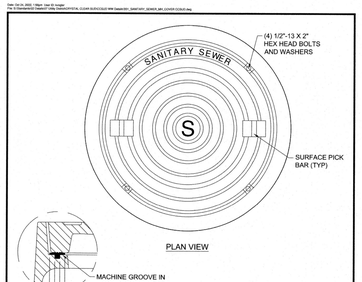
PROPERTY OF	DTL #322		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	02/02/2023
			SHEET 1 OF 1	

PROPERTY OF	DTL #327		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	WASTEWATER MANHOLE ON CAST IN PLACE FOUNDATION	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 1 OF 1	

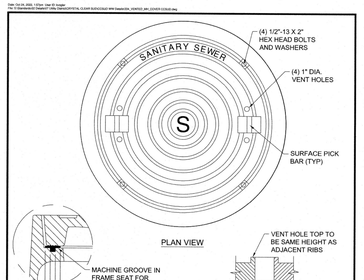
PROPERTY OF	DTL #328		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	WASTEWATER MANHOLE ON PRECAST BASE	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	02/02/2023
			SHEET 1 OF 1	

PROPERTY OF	DTL #329		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	MANHOLE RING & ENCASEMENT DETAIL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	07/23/2024
			SHEET 1 OF 2	

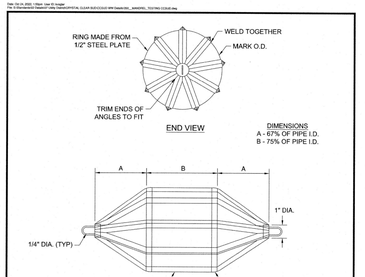
PROPERTY OF	DTL #329		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	MANHOLE RING & ENCASEMENT DETAIL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	07/23/2024
			SHEET 2 OF 2	



PROPERTY OF	DTL #331		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	SANITARY SEWER MANHOLE COVER	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 1 OF 1	



PROPERTY OF	DTL #334		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	VENTED SANITARY SEWER MANHOLE COVER	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 1 OF 1	



MANDREL REQUIREMENTS:
1. O.D. NOT LESS THAN 95% OF THE I.D. OF THE PIPE, AS SPECIFIED BY THE ASTM, AWWA, UNI-BELL OR ANSI.
2. ABLE TO WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
3. ODD NUMBER OF RUNNERS OR LEGS.

*THIS INFORMATION IS PROVIDED AS A REFERENCE. ALL DEFLECTION TESTING SHALL BE DONE IN ACCORDANCE WITH TCEQ CHAPTER 217.

PROPERTY OF	DTL #350		APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	GO, NO GO DEFLECTION TESTING MANDREL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	02/15/2022	
			SHEET 1 OF 1	

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2/13/25
STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave, Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-1-9929
TBPLS Firm#: 10194550

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PROJECT NUMBER:	DRAWING NAME:
24003556A	SANITARY SEWER DETAILS

SHEET TITLE:
SANITARY SEWER DETAILS

SHEET NUMBER:
6.5

Date: Feb 10, 2025, 9:33am User ID: rwalden
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Design\Civil\WASTEWATER\SANITARY SEWER DETAILS.dwg
By: RWALDEN

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

GATEHOUSE SUBDIVISION - UNIT 4

COMAL COUNTY, TEXAS
WATER IMPROVEMENTS

TCEQ WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES

1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. AT A MINIMUM, CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS MEET TCEQ'S "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS."

2. ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI §290.44(A)(1)].

3. PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NSF INTERNATIONAL SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS §290.44(A)(2)].

4. NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR USE IN ANY PUBLIC DRINKING WATER SUPPLY §290.44(A)(3)].

5. ALL WATER LINE CROSSINGS OF WASTEWATER MAINS SHALL BE PERPENDICULAR §290.44(E)(4)(B)].

6. WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE §290.44(A)(4)].

7. THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES IS 0.25 PERCENT §290.44(B)].

8. THE CONTRACTOR SHALL INSTALL APPROPRIATE AIR RELEASE DEVICES WITH VENT OPENINGS TO THE ATMOSPHERE COVERED WITH 16-MESH OR FINER, CORROSION RESISTANT SCREENING MATERIAL OR AN ACCEPTABLE EQUIVALENT §290.44(D)(1)].

9. THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION §290.44(F)(1)].

10. WHEN WATERLINES ARE LAID UNDER ANY FLOWING OR INTERMITTENT STREAM OR SEMI-PERMANENT BODY OF WATER THE WATERLINE SHALL BE INSTALLED IN A SEPARATE WATERTIGHT PIPE ENCASEMENT. VALVES MUST BE PROVIDED ON EACH SIDE OF THE CROSSING WITH FACILITIES TO ALLOW THE UNDERWATER PORTION OF THE SYSTEM TO BE ISOLATED AND TESTED §290.44(F)(2)].

11. PURSUANT TO 30 TAC §290.44(A)(5), THE HYDROSTATIC LEAKAGE RATE SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY THE MOST CURRENT AWWA FORMULAS FOR PVC PIPE, CAST IRON AND DUCTILE IRON PIPE. INCLUDE THE FORMULAS IN THE NOTES ON THE PLANS.

- *THE HYDROSTATIC LEAKAGE RATE FOR POLYVINYL CHLORIDE (PVC) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-605 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;*

$$Q = \frac{(LD)^{0.5}}{148,000}$$

WHERE:
- *Q = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,*
- *L = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET,*
- *D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND*
- *P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).*

- *THE HYDROSTATIC LEAKAGE RATE FOR DUCTILE IRON (DI) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-600 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;*

$$L = \frac{(SD)^{0.5}}{148,000}$$

WHERE:
- *L = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,*
- *S = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET,*
- *D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND*
- *P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).*

12. THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATERLINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET §290.44(E)(1)-(4).

13. THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT [§290.44(E)(5)].

14. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER LINE, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION §290.44(E)(6)].

15. SUCTION MAINS TO PUMPING EQUIPMENT SHALL NOT CROSS WASTEWATER MAINS, WASTEWATER LATERALS, OR WASTEWATER SERVICE LINES. RAW WATER SUPPLY LINES SHALL NOT BE INSTALLED WITHIN FIVE FEET OF ANY TILE OR CONCRETE WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE [§290.44(E)(7)].

16. WATERLINES SHALL NOT BE INSTALLED CLOSER THAN TEN FEET TO SEPTIC TANK DRAINFIELDS §290.44(E)(8)].

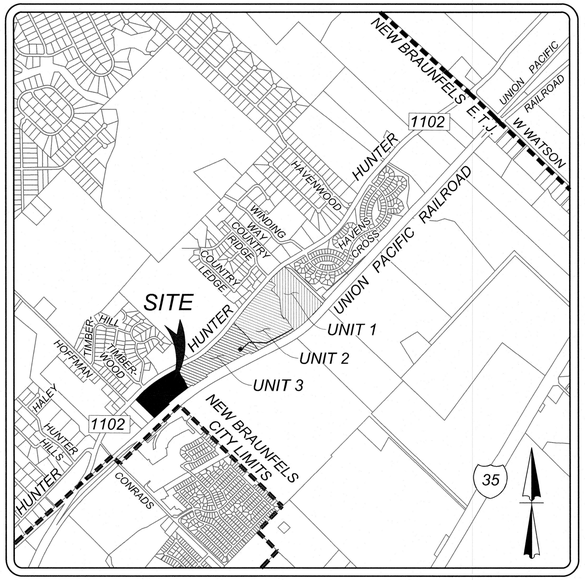
17. THE CONTRACTOR SHALL DISINFECT THE NEW WATERLINES IN ACCORDANCE WITH AWWA STANDARD C-651-14 OR MOST RECENT, THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF THE DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1,000 FEET OF COMPLETED WATERLINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1,000 FEET AS DESIGNATED BY THE DESIGN ENGINEER [§290.44(F)(3)].

18. DECHLORINATION OF DISINFECTING WATER SHALL BE IN STRICT ACCORDANCE WITH CURRENT AWWA STANDARD C655-09 OR MOST RECENT.

REV. 1/2025

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WATER MAIN NOTES

1. *CONSTRUCTION OF ALL CCSUD WATER UTILITY INFRASTRUCTURE MUST ADHERE TO CCSUD'S TECHNICAL SPECIFICATIONS, DETAILS AND APPROVED EQUIPMENT LIST.*
2. *REMOVE ONLY VEGETATION, TREES, STUMPS, RUBBISH, AND OTHER MATERIAL NECESSARY FOR CONSTRUCTION AND DISPOSE OF OFF SITE.*
3. *THE CONNECTION LOCATIONS LISTED IN THE PLANS ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL FIELD LOCATE EXISTING WATER MAIN LOCATIONS AT ALL TIE-IN LOCATIONS TO VERIFY SIZE, ELEVATION, AND MATERIAL PRIOR TO ORDERING MATERIALS FOR CONNECTION.*
4. *THE CONTRACTOR SHALL MAINTAIN MINIMUM SEPARATION BETWEEN UTILITIES PER TCEQ STANDARDS.*
5. *UNLESS OTHERWISE SPECIFIED, ALL PVC WATER MAINS SHALL BE C900/C905 DR 18, COLORED BLUE.*
6. *ALL DUCTILE IRON WATER MAINS SHALL BE PRESSURE CLASS CONFORMING TO AWWA C151 AND CEMENT LINED.*
7. *WATER MAINS SHALL BE RESTRAINED WITH RESTRAINT LENGTHS OF FITTINGS SHOWN IN PLANS. THRUST BLOCKING IS REQUIRED AT ALL FITTINGS AND BENDS IN ACCORDANCE WITH THE THRUST BLOCKING DETAIL PROVIDED AND SPECIFICATION SECTION 02680 - JOINT RESTRAINTS AND THRUST BLOCKING.*
8. *LOCATIONS OF COMBINATION AIR VALVES SHOWN ARE APPROXIMATE. INSTALL AIR RELEASE VALVES AT THE HIGH POINT IN THE WATER MAIN FOR THE LOCATIONS GIVEN.*
9. *THE CONTRACTOR SHALL COORDINATE PRESSURE TESTING OF NEW WATER MAINS WITH OWNER AND ENGINEER AT LEAST TWO BUSINESS DAYS PRIOR. PRESSURE TESTING REQUIREMENTS ARE INCLUDED IN THE SPECIFICATIONS.*
10. *ALL WATER MAINS SHALL BE DISINFECTED PER AWWA AND TCEQ STANDARDS.*
11. *THE OWNER SHALL SUPPLY ALL WATER NEEDED FOR CONSTRUCTION TESTING AND DISINFECTION. THE CONTRACTOR SHALL NOT BE REQUIRED TO PAY FOR THIS WATER.*
12. *UNLESS NOTED OTHERWISE, ALL WATER MAIN P.I.'S SHALL BE ACHIEVED USING THE WATER MAIN MANUFACTURER'S ALLOWABLE JOINT DEFLECTION*
13. *WATER MAINS, FIRE HYDRANTS, APPURTENANCES, AND VALVES THAT ARE ABANDONED SHALL BE CUT AND PLUGGED PER SPECIFICATION SECTION 02500 - ABANDONMENT OF WATER INFRASTRUCTURE.*
14. *THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY CCSUD INSPECTOR/TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT 400 LINEAR FEET AT A MINIMUM. PERMITS WILL NOT BE ACCEPTED AND FINALIZED BY CCSUD WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.*



LOCATION MAP
N.T.S.

IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF COUNTY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, COMAL COUNTY MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

FEMA FLOODPLAIN
NO PORTION OF ANY RESIDENTIAL LOTS ON GATEHOUSE SUBDIVISION UNIT 4 ARE IN THE SPECIAL FLOOD HAZARD ZONE ACCORDING TO FEMA FLOOD MAP COMMUNITY PANELS NO. 48091C0290F AND NO. 48091C0295F, DATED SEPTEMBER 2, 2009.

EDWARDS AQUIFER
NO PORTION OF ANY LOTS ON GATEHOUSE SUBDIVISION UNIT 4 ARE LOCATED WITHIN EDWARDS CONTRIBUTING ZONE OR RECHARGE ZONE.
GATEHOUSE SUBDIVISION IS LOCATED WITHIN EDWARDS AQUIFER TRANSITION ZONE.

GAS UTILITY
GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE COUNTY FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.

INDEX

DESCRIPTION	SHEET NO.
WATER DISTRIBUTION COVER	7.0
WATER DISTRIBUTION PLAN	7.1
WATER DETAILS	7.2

LEGAL DESCRIPTION
GATEHOUSE SUBDIVISION UNIT 4

A 17.14 ACRE TRACT OF LAND SITUATED IN THE NANCY KENNER LEAGUE SURVEY NO. 3 ABSTRACT 306 COMAL COUNTY, TEXAS AND BEING A PORTION OF THAT CALLED 96.044 ACRE TRACT OF LAND CONVEYED TO LENNAR HOMES OF TEXAS LAND & CONSTRUCTION LTD AND RECORDED IN DOC.# 202206011832 OF THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS.

PERMITS OR APPROVALS MUST BE OBTAINED FROM THE FOLLOWING REGULATORY AGENCIES LISTED BELOW:

- ***COMAL COUNTY***
- ***NEW BRAUNFELS UTILITIES - ELECTRIC***
- ***CRYSTAL CLEAR SPECIAL UTILITY DISTRICT - WATER & SEWER***

ANY REVISIONS REQUIRED PER THE REGULATORY AGENCIES THAT CHANGE THE CIVIL SITE PLANS MUST BE SUBMITTED TO COMAL COUNTY FOR ACCEPTANCE.

DEVELOPER INFORMATION:
LENNAR HOMES OF TEXAS
100 NE LOOP 410, STE 1155
SAN ANTONIO, TEXAS 78216
PHONE: (210) 403-6282

KNOW ALL MEN BY THESE PRESENTS:

I, THE UNDERSIGNED, A. NICHOLAS REYNOLDS, A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS, HEREBY CERTIFY THAT PROPER ENGINEERING CONSIDERATION HAS BEEN GIVEN TO THESE PLANS AND ALL ENGINEERING ASPECTS ARE IN COMPLIANCE WITH CITY AND STATE ENGINEERING REGULATIONS AND LAWS.

REGISTERED PROFESSIONAL ENGINEER
P.E. REGISTRATION NO. 111666

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
2/12/25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14005
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
24003556A	7.0 WATER DISTRIBUTION COVER

SHEET TITLE:
WATER DISTRIBUTION COVER

SHEET NUMBER:
7.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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Xrefs:\\nwfile\shared\COLLIERS\Design\Templates\NEW BRAUNFELS\Civil - by Division\

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 SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!!
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

DRY UTILITY CONDUIT NOTE:
CONDUIT LOCATIONS SHOW ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYOR'S PLAN.

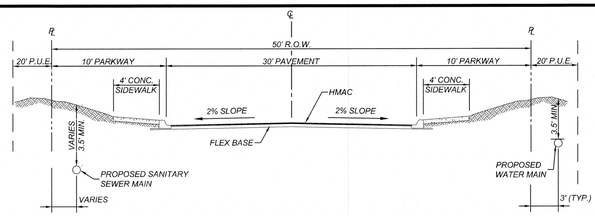
JOINT RESTRAINT NOTE:
CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOINT RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL INSURE THAT ALL TEES, BENDS, VALVES, ETC. HAVE A MINIMUM OF 5 FT OF PIPE WITH NO JOINTS ON EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED USING EBAA IRON'S RESTRAINT LENGTH CALCULATOR. THERE WILL BE NO SEPARATE PAY ITEM FOR RETAINER GLANDS AND OTHER JOINT RESTRAINING HARNESS AND GASKETS, BUT SHALL BE SUBSIDIARY TO THE UNIT COST PER LINEAL FOOT OF PIPE INSTALLED.

COMPACTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY CRYSTAL CLEAR SPECIAL UTILITY DISTRICT INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS AND/OR WILL NOT BE ACCEPTED AND FINALIZED BY CRYSTAL CLEAR SPECIAL UTILITY DISTRICT WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

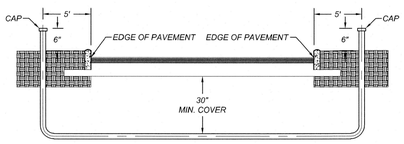
MISCELLANEOUS NOTE:
1. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
2. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
3. ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.

UTILITY TRENCH COMPACTION (STREET PAVEMENT / SIDEWALK):
ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE COMAL COUNTY STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE COMAL COUNTY STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE COMAL COUNTY INSPECTOR.

GENERAL NOTE:
1. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES MAY IMPACT COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND COUNTY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO COUNTY PRIOR TO UTILITY INSTALLATION.



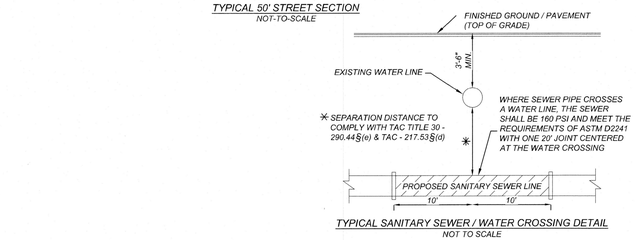
TYPICAL 50' STREET SECTION
NOT-TO-SCALE



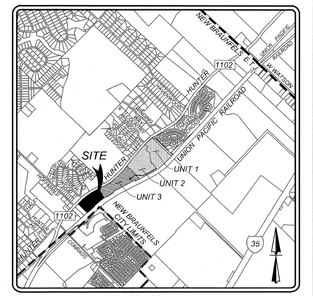
CONDUIT DETAIL
NOT TO SCALE

*PVC SCHEDULE 80 CONDUIT
SEE PLAN SHEETS FOR SIZE LOCATION AND NUMBER OF CONDUITS

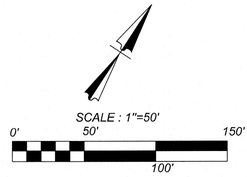
NOTE:
- CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH NBU FACILITY AT ALL STREETS AND DRAIN CROSSING. CONSTRUCTION SLEEVES MUST ALSO BE LOCATED FOR NBU CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE FINAL ELECTRIC PROVIDER'S DESIGN AND SPECIFICATION.
- CONTRACTOR TO CONTACT ENGINEER FOR APPROPRIATE NUMBER AND SIZE OF CONDUITS FOR TELECOMMUNICATIONS
- CONTRACTOR TO CONTACT ENGINEER FOR ELECTRICAL PLANS
- CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
- CONDUITS SHALL BE PVC WITH 30 INCHES OF MINIMUM COVER FROM STREET SUBGRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
- ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
- ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH. TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATION INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND INSTALLING CONDUIT SLEEVES FOR EACH DRAIN CROSSING PRIOR TO THE INSTALLATION OF EACH DRAIN.

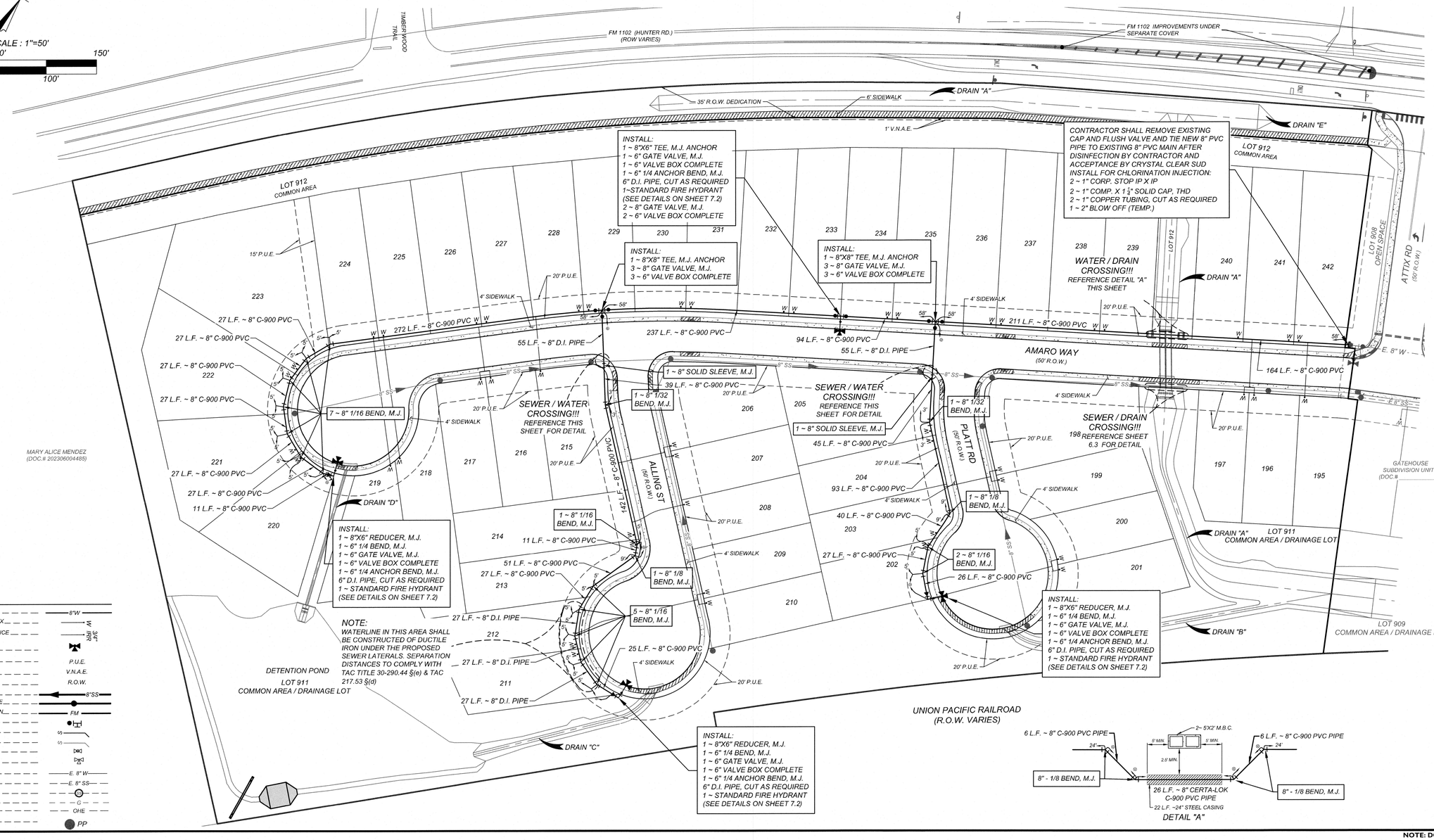


TYPICAL SANITARY SEWER / WATER CROSSING DETAIL
NOT TO SCALE



LOCATION MAP
N.T.S.





LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED WATER SERVICE & METER BOX	W 3/4"
PROPOSED WATER 3/4" IRRIGATION SERVICE & W/ 3/4" WATER METER & METER BOX	IRR
PROPOSED FIRE HYDRANT	
PUBLIC UTILITY EASEMENT	P.U.E.
VEHICULAR NON-ACCESS EASEMENT	V.N.A.E.
RIGHT OF WAY	R.O.W.
PROPOSED 8" SANITARY SEWER MAIN	8"SS
PROPOSED 8" SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER FORCE MAIN	FM
PROPOSED TEE & WATER VALVE	
PROPOSED SANITARY SEWER LATERAL	S
EXISTING SANITARY SEWER LATERAL	S
EXISTING WATER VALVE	
EXISTING FIRE HYDRANT	
EXISTING WATER MAIN	E. 8" W
EXISTING SANITARY SEWER MAIN	E. 8" SS
EXISTING SANITARY SEWER MANHOLE	S
EXISTING NATURAL GAS LINE	G
EXISTING OVERHEAD UTILITY LINE	OHE
EXISTING POWER POLE	PP

Date: Feb 13, 2025, 1:54pm User ID: dgonzalez
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By: DGONZALEZ

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
2/13/25

FINAL SUBDIVISION PLAN
FOR
GATEHOUSE SUBDIVISION UNIT 4
CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC
TBPE Firm#: F-10909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF
PROJECT NUMBER: 24003556A	DRAWING NAME: 7.1 WATER DISTRIBUTION PLAN		

SHEET TITLE:
WATER DISTRIBUTION PLAN

SHEET NUMBER:
7.1

CRYSTAL CLEAR
SPECIAL UTILITY DISTRICT

Crystal Clear SUD

Approved Equipment List (AEL)

Below is a list of Crystal Clear SUD (CCSUD) approved brands for use in the Distribution and Collection system.

Brands

Air Relief Valves: Empire Controls, Val-matic, Apco

Corporation Stops: Ford, Mueller

Curb Stops: Ford, Mueller

Fire Hydrants: American, Mueller Company, EJ

Gate Valves: Mueller Company, American Cast Iron Pipe Company, EJ Group, Inc., Clow Valve Company

Restraining Joints: EBAA Iron Inc., Star Pipe Products, SIP

Service Saddles: Smith-Blair, Ford, Mueller, JCM Industries

Tapping Sleeves: Smith-Blair, Mueller

Tapping Valves: American, Mueller

Meters: Kamstrup

Meter Boxes: DFW Plastics, NDS Meter Boxes

VFD: Yaskawa

Vertical Turbine Pump: HydroFlo

Motors: TECO or US Motor

Any equipment to be installed in the CCSUD Distribution or Collection systems must come from the list above. Any equipment installed that is not listed above must be approved by the CCSUD inspector or a CCSUD Manager or the installation is subject to a failed inspection until the correct brand can be installed. If you have any questions about these procedures please contact the CCSUD Inspector.

Last Updated: 03/2024

Date: Aug 11, 2022, 7:08am User ID: knagler
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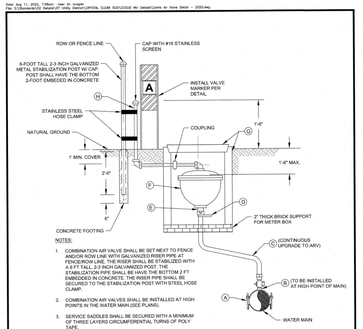


NOTES:

1. COMBINATION AIR VALVE SHALL BE SET NEXT TO FENCE AND/OR ROW LINE WITH GALVANIZED RISER PIPE AT FENCE/ROW LINE. THE RISER SHALL BE STABILIZED WITH 6' TALL 2-3 INCH GALVANIZED METAL POST. STABILIZATION PIPE SHALL BE HAVE THE BOTTOM 2 FT EMBEDDED IN CONCRETE. THE RISER PIPE SHALL BE SECURED TO THE STABILIZATION POST WITH STEEL HOSE CLAMP.
2. COMBINATION AIR VALVES SHALL BE INSTALLED AT HIGH POINTS IN THE WATER MAIN (SEE PLANS).
3. SERVICE SADDLES SHALL BE SECURED WITH A MINIMUM OF THREE LAYERS CIRCUMFERENTIAL TURNS OF POLY TAPE.

TAP MATERIAL LIST

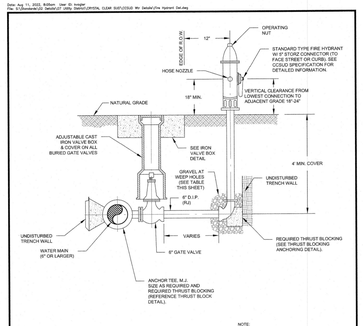
LABEL	ITEM	MATERIAL LIST SIZE(S) 1-INCH TAP	2-INCH TAP
A	APPROVED TAPPING SADDLE	1"	2"
B	CORPORATION STOP	1"	2"
C	CTS SDR9 HDPE TUBING	1"	2"
D	BRASS BALL VALVE WITH LEVER	1"	2"
E	BRASS NIPPLE THREADED	1"	2"
F	COMBINATION AIR VALVE	PER AEL*	
G	METER BOX AND LID	DFW3032FD OR DFW3536FD**	
H	GALVANIZED IRON PIPE AND FITTINGS	1"	2"

* AEL = APPROVED EQUIPMENT LIST
** METER BOX TO BE INSTALLED AS NECESSARY TO COVER FULL DEPTH OF COMBINATION AIR RELEASE VALVE.

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	COMBINATION AIR VALVE DETAIL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	OCTOBER 2020
			SHEET 1 OF 1	

Date: Aug 11, 2022, 8:05am User ID: knagler
File: N:\Standards\CAD Details\DET Utility Details\CRYSTAL CLEAR SUD\CCSUD Wtr Details\Fire Hydrant Det.dwg



GRAVEL AT WEEPHOLE	
LENGTH OF HYDRANT RISER	TOTAL FT. OF GRAVEL REQUIRED
1'	2.5
2'	3
3'	3.5
4'	4
>6'	TBD BY CCSUD

NOTE:

1. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
2. ALL PIPE JOINTS SHALL BE KEPT FREE FROM CONCRETE.
3. POLYWRAP SHALL BE SECURED WITH A MINIMUM OF THREE CIRCUMFERENTIAL TURNS OF POLY TAPE.
4. 12"x12"x6" THICK CONCRETE BLOCKS SHALL BE INSTALLED DIRECTLY UNDER ALL VALVES, FITTINGS, ETC.

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	FIRE HYDRANT ASSEMBLY DETAIL (NEW BRAUNFELS)	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	NOV 2021
			SHEET 1 OF 1	

Date: Dec 16, 2024, 7:58am User ID: knagler
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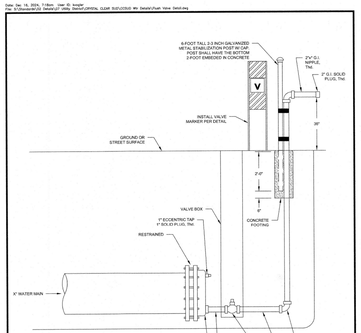

NOTE:

1. BURIED PIPING, FITTINGS, AND FITTINGS JOINTS SHALL BE WRAPPED IN POLYWRAP.
2. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
3. ALL PIPE JOINTS SHALL BE KEPT FREE FROM CONCRETE.
4. POLYWRAP SHALL BE SECURED WITH A MINIMUM OF THREE CIRCUMFERENTIAL TURNS OF POLY TAPE.

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	FLUSH VALVE DETAIL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	OCTOBER 2020	DECEMBER 2024
			SHEET 1 OF 1	

Date: Aug 11, 2022, 8:07am User ID: knagler
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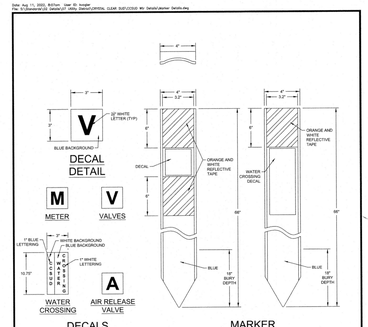

NOTES:

1. MARKERS SHALL BE 96" COMPOSITE POSTS SIMILAR TO RHINO FIBERCURE COMPOSITE MARKER POST.
2. MARKERS SHALL BE PLACED AT ALL GATE VALVES, FLUSHING VALVES, & AIR RELEASE VALVES PER ITEM DETAIL.
3. MARKERS SHALL BE PLACED AT WATER METERS AS SPECIFIED ON PLANS
4. PIPELINE MARKERS SHALL BE PLACED ON R.O.W./FENCE LINE AT ALL ROAD CROSSINGS.

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	MARKER DETAILS	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	NOVEMBER 2018
			SHEET 1 OF 1	

Date: Jan 23, 2025, 4:30pm User ID: knagler
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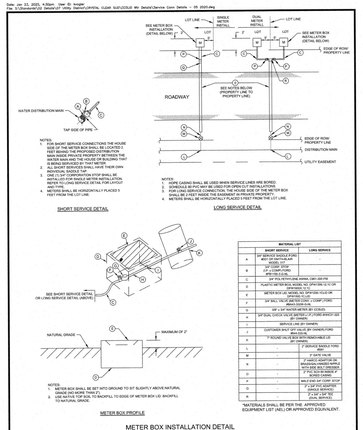
SEE METER BOX INSTALLATION DETAIL BELOW
LOT LINE
SADDLE TAPPING MACHINE
CURB STOP METER INSTALL
LOT
SEE METER BOX INSTALLATION DETAIL BELOW
EDGE OF ROW/ PROPERTY LINE
ROADWAY
SEE NOTES BELOW (PROPERTY LINE)
EDGE OF ROW/ PROPERTY LINE
UTILITY EASEMENT
WATER DISTRIBUTION MAIN
TAP SIDE OF MAIN
DISTRIBUTION MAIN
NOTES:
1. FOR SHORT SERVICE CONNECTIONS THE HOUSE SIDE OF THE METER BOX SHALL BE LOCATED 5 FEET BEHIND THE PROPOSED DISTRIBUTION MAIN. FOR LONG SERVICE CONNECTIONS, THE HOUSE SIDE OF THE METER BOX AND THE HOUSE OR BUILDING THAT IS BEING SERVICED BY THAT METER SHALL BE LOCATED 5 FEET FROM THEIR OWN PROPERTY LINE.
2. METER BOX LOCATIONS MAY BE ADJUSTED AS INSTALLED FOR RANGE WATTER INSTALLATION AND TYPE.
3. METERS SHALL BE HORIZONTALLY PLACED 5 FEET FROM THE LOT LINE.
SHORT SERVICE DETAIL
LONG SERVICE DETAIL
NOTES:
1. TAP CASING SHALL BE USED WHEN SERVICE LINES ARE BORED.
2. DOWSELS BUTT MAY BE USED FOR OPEN CUT INSTALLATIONS.
3. FOR LONG SERVICE CONNECTION, THE HOUSE SIDE OF THE METER BOX SHALL BE LOCATED 5 FEET BEHIND THE PROPERTY LINE.
4. METERS SHALL BE HORIZONTALLY PLACED 5 FEET FROM THE LOT LINE.
SEE SHORT SERVICE DETAIL OR LONG SERVICE DETAIL ABOVE
NATURAL GRADE
MAXIMUM OF 2"
NOTES:
1. METER BOX SHALL BE SET MTO GROUND TO 57" SLIGHTLY ABOVE NATURAL GRADE AT METER BOX LID.
2. USE AUTOCAD SOIL TO BACKFILL TO EDGE OF METER BOX LID. BACKFILL TO NATURAL GRADE.
METER BOX PROFILE
MATERIAL LIST

	SHORT SERVICE	LONG SERVICE
A	3/4" SERVICE SADDLE (FORT) WITH 3/4" FIPT OUTLET AND 3/4" CORP STOP (FORT)	
B	3/4" CORP STOP (FORT) WITH FIPS X C.C.N.	
C	PLASTIC METER BOX, ADDING 152" EXTENSIONS TO 1'-0" (MYAMAX TYP.)	
D	METER BOX LID (DFW3032FD OR DFW3536FD) W/ CCSUD LOGO	
E	3/4" BALL VALVE METER CONN. J COMP (TYPE)	
F	3/4" METER SETTER W/ 90° ELBOW	
G	3/4" DUAL CHECK VALVE (METER) (1" FOR 2" METER) W/ 90° ELBOW	
H	SERVICE LINE (SIZ SHOWN)	
I	CUSTOMER SHUT OFF VALVE (BY OWNER/OTHER)	
J	1" SQUARE NUT OR BAR WITH MINIMUM 48" OF THREADED ROD	
K	-	2" SERVICE SADDLE TYPE
L	-	2" CORP STOP
M	-	2" METER BOX W/ 2" CASING ADAPTER W/ DFW3536FD LID
N	-	2" CURB STOP W/ BOX (MUELLER/FORD)
O	-	2" POLY SDR-9 HDPE 3408 TUBING
P	-	MALE ENDS W/ CORP. STOP
Q	-	2" CURB STOP ADAPTER (MUELLER/FORD)
R	-	2" CURB STOP W/ BOX (MUELLER/FORD)

*MATERIALS SHALL BE PER THE APPROVED EQUIPMENT LIST (AEL) OR APPROVED EQUIVALENT.

METER BOX INSTALLATION DETAIL

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	SERVICE CONNECTION DETAILS	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	JANUARY 2025
			SHEET 1 OF 1	

Date: Jul 22, 2024, 1:06pm User ID: knagler
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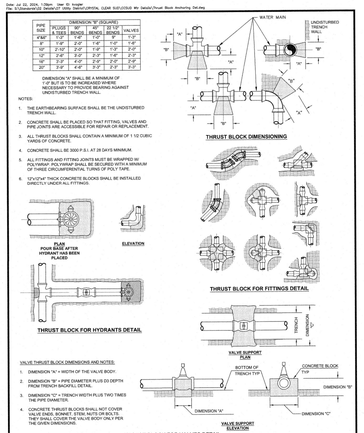

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	THRUST BLOCKING DETAILS	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	JULY 2024
			SHEET 1 OF 1	

Date: Aug 11, 2022, 8:00am User ID: knagler
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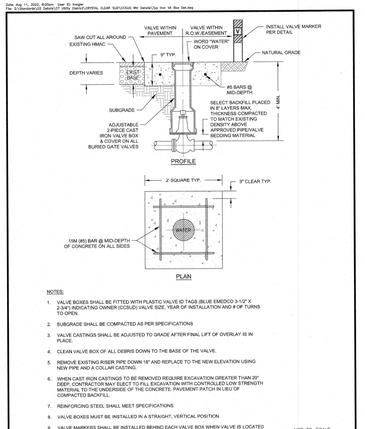

NOTES:

1. VALVE BOXES SHALL BE FITTED WITH PLASTIC VALVE ID TAGS (BLUE EMEDCO 3-1/2" X 2-3/4") INDICATING OWNER (CCSUD) VALVE SIZE, YEAR OF INSTALLATION AND # OF TURNS TO OPEN.
2. SUBGRADE SHALL BE COMPACTED AS PER SPECIFICATIONS
3. VALVE CASTINGS SHALL BE ADJUSTED TO GRADE AFTER FINAL LIFT OF OVERLAY IS IN PLACE.
4. CLEAN VALVE BOX OF ALL DEBRIS DOWN TO THE BASE OF THE VALVE.
5. REMOVE EXISTING RISER PIPE DOWN 18" AND REPLACE TO THE NEW ELEVATION USING NEW PIPE AND A COLLAR CASTING.
6. WHEN CAST IRON CASTINGS TO BE REMOVED REQUIRE EXCAVATION GREATER THAN 20" DEEP, CONTRACTOR MAY ELECT TO FILL EXCAVATION WITH CONTROLLED LOW STRENGTH MATERIAL (CLSM) TO A DEPTH 6" BELOW THE CONCRETE PAVEMENT PATCH IN LIEU OF COMPACTED BACKFILL.
7. REINFORCING STEEL SHALL MEET SPECIFICATIONS.
8. VALVE BOXES MUST BE INSTALLED IN A STRAIGHT, VERTICAL POSITION.
9. VALVE MARKERS SHALL BE INSTALLED BEHIND EACH VALVE BOX WHEN VALVE IS LOCATED WITHIN EASEMENT OR R.O.W.

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	TYPICAL IRON VALVE BOX DETAILS	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	AUGUST 2018
			SHEET 1 OF 1	

Date: Jan 20, 2025, 8:40am User ID: knagler
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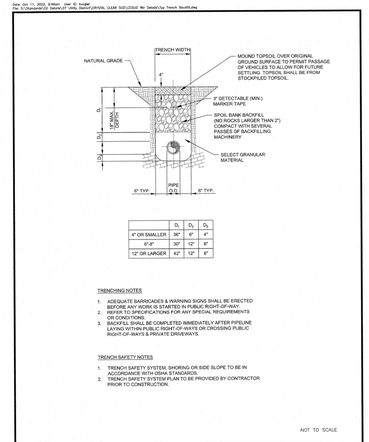

	D_1	D_2	D_3
4" OR SMALLER	36"	6"	4"
6"-8"	30"	12"	6"
12" OR LARGER	42"	12"	8"

TRENCHING NOTES

1. ADEQUATE BARRICADES & WARNING SIGNS SHALL BE ERECTED BEFORE ANY WORK IS STARTED IN PUBLIC RIGHT-OF-WAYS.
2. REFER TO SPECIFICATIONS FOR ANY SPECIAL REQUIREMENTS IN PUBLIC R.O.W.
3. BACKFILL SHALL BE COMPLETED IMMEDIATELY AFTER PIPELINE LAYING WITHIN PUBLIC RIGHT-OF-WAYS OR CROSSING PUBLIC RIGHT-OF-WAYS & PRIVATE DRIVEWAYS.

TRENCH SAFETY NOTES

1. TRENCH SAFETY SYSTEM, SHORING OR SIDE SLOPE TO BE IN ACCORDANCE WITH OSHA STANDARDS
2. TRENCH SAFETY SYSTEM PLAN TO BE PROVIDED BY CONTRACTOR PRIOR TO CONSTRUCTION.

NOT TO SCALE

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	TYPICAL TRENCH BACKFILL DETAIL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	NOV 2021
			SHEET 1 OF 1	

Date: Jan 20, 2025, 8:40am User ID: knagler
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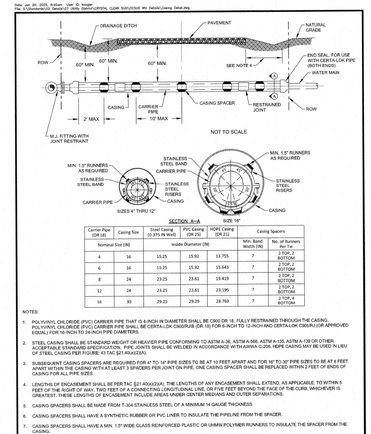

SECTION A-n/A

Carrier Pipe (DR 18)	Casing Size	Steel Casing (0.375 IN Wall)	PVC Casing (DR 25)	HDPE Casing (DR 21)	Casing Spacers	
Nominal Size (IN)		Inside Diameter (IN)			Min. Band Width (IN)	No. of Runners Per Tie
4	16	15.25	15.92	13.755	7	2 TOP, 2 BOTTOM
6	16	15.25	15.92	15.643	7	2 TOP, 2 BOTTOM
8	24	23.25	23.61	19.433	7	2 TOP, 2 BOTTOM
12	24	23.25	23.61	23.195	7	2 TOP, 2 BOTTOM
16	30	29.25	29.29	28.768	7	2 TOP, 4 BOTTOM

NOTES:

1. POLYVINYL CHLORIDE (PVC) CARRIER PIPE THAT IS 4-INCH IN DIAMETER SHALL BE CIOD DR 18, FULLY RESTRAINED THROUGH THE CASING. POLYVINYL CHLORIDE (PVC) CARRIER PIPE SHALL BE CERTA-LOK CIAOR/SUB (DR 18) FOR 6-INCH TO 12-INCH AND CERTA-LOK CIAWA (OR APPROVED EQUAL) FOR 16-INCH TO 24-INCH PIPE DIAMETERS.
2. STEEL CASING SHALL BE STANDARD WEIGHT OR HEAVIER PIPE CONFORMING TO ASTM A-36, ASTM A-568, ASTM A-134, ASTM A-139 OR OTHER ACCEPTABLE STANDARD SPECIFICATION. PIPE JOINTS SHALL BE WELDED IN ACCORDANCE WITH AWWA. C-206. HDPE CASING MAY BE USED IN LIEU OF STEEL CASING PER FIGURE. 4-TAC §21.4504(5)(H)
3. SUBSEQUENT CASING SPACERS ARE REQUIRED FOR 4" TO 14" PIPE SIZES TO BE AT 10 FEET APART AND FOR 16" TO 30" PIPE SIZES TO BE AT 8 FEET APART WITHIN THE CASING WITH AT LEAST 3 SPACERS PER JOINT ON PIPE. ONE CASING SPACER SHALL BE REPLACED WITHIN 2 FEET OF ENDS OF CASING FOR ALL PIPE SIZES.
4. LENGTHS OF ENCASEMENT SHALL BE PER TAC §21.4504(3)(A). THE LENGTHS OF ANY ENCASEMENT SHALL EXTEND, AS APPLICABLE, TO WITHIN 5 FEET OF THE RIGHT OF WAY, TWO FEET OF A CONNECTING LONGITUDINAL LINE, OR FIVE FEET BEYOND THE FACE OF THE CURB, WHICHEVER IS GREATEST. THESE LENGTHS OF ENCASEMENT INCLUDE AREAS UNDER CENTER medians AND OUTER SEPARATIONS.
5. CASING SPACERS SHALL BE MADE FROM T-304 STAINLESS STEEL OF A MINIMUM 14 GAUGE THICKNESS.
6. CASING SPACERS SHALL HAVE A SYNTHETIC RUBBER OR PVC LINER TO INSULATE THE PIPELINE FROM THE SPACER.
7. CASING SPACERS SHALL HAVE A MIN. 1.5" WIDE GLASS REINFORCED PLASTIC OR UNMIX POLYMER RUNNERS TO INSULATE THE SPACER FROM THE CASING.
8. CASING END SEALS SHALL BE MADE OF 1/8" THICK NEOPRENE RUBBER AND INCLUDE 1/2" WIDE T-304 STAINLESS STEEL BANDINGS.

PROPERTY OF			APPROVED	REVISION
CRYSTAL CLEAR SPECIAL UTILITY DISTRICT	CASING DETAIL	M&S ENGINEERING ELECTRICAL | CIVIL | MEP	JUNE 2015	JULY 2024
			SHEET 1 OF 1	

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REV	DESCRIPTION	DRAWN BY	DATE

2/13/25
STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
Nicholas Reynolds, P.E.

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave.
Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

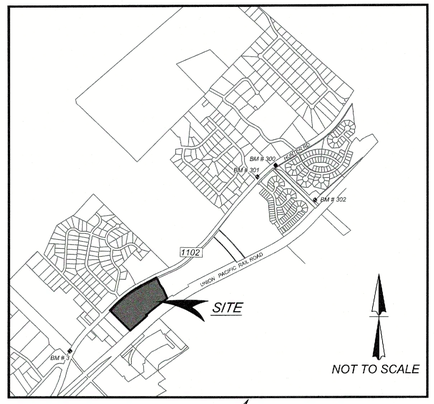
PROJECT NUMBER:	DRAWING NAME:
24003556A	7.2 WATER DETAILS

SHEET TITLE:
WATER DETAILS

SHEET NUMBER:
7.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Feb 13, 2025, 1:31pm User ID: dgonzalez
File: U:\Projects\314\52\06\Design\Civil\WATER\7.2 WATER DETAILS.dwg
Image/XrWATER\7.2 WATER DETAILS.dwg>7.2 WATER DETAILS By: DGONZALEZ



NOT TO SCALE

CONTRACTOR TO RUN LEVEL LOOP THROUGH BM'S PROVIDED TO CONFIRM BEFORE CONSTRUCTION. CONTACT ENGINEER/SURVEYOR IMMEDIATELY IF ELEVATIONS DO NOT MATCH THOSE SHOWN.

BENCHMARKS

BM#	NORTHING	EASTING	ELEVATION	DESCRIPITION
300	13833987.43	2266645.56	741.65	SBM
301	13833728.05	2266235.25	753.89	SBM
302	13833209.63	2267544.75	707.33	SBM

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

LEGEND

- LIMITS OF CONSTRUCTION
- 780 EXISTING CONTOURS
- 782 PROPOSED GRADE
- 543 ADJACENT UNIT PROPOSED CONTOUR
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- CONCRETE TRUCK WASHOUT PIT
- INLET WITH PROTECTION (GRAVEL FILTER BAGS)
- DISTURBED AREA
- ROCK BERM
- SACK GABION
- SILT FENCE PHASE 1
- SILT FENCE PHASE 2
- ROLLED EROSION CONTROL BLANKET

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 SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

PROJECT COMPLETION:

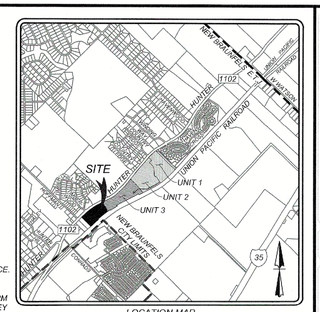
1. ALL DISTURBED AREAS ARES NOT COVERED BY IMPERVIOUS COVER ARE TO BE STABILIZED PER THE SWPPP AND PROJECT SPECIFICATIONS PRIOR TO REMOVAL OF ANY BMP'S AND/OR PRIOR TO FILING A NOTICE OF TERMINATION (NOT).
2. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN PHASES IF ALL UPGRADIENT AREAS HAVE BEEN STABILIZED PER SWPPP AND PROJECT SPECIFICATIONS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
3. CONTRACTOR TO ENSURE THEY HAVE MET ALL REQUIREMENTS OF THE SWPPP BEFORE FILING A NOTICE OF TERMINATION (NOT).

GENERAL:

1. THIS EXHIBIT IS TO BE USED FOR THE PURPOSES OF STORMWATER POLLUTION PREVENTION ONLY. ALL OTHER CIVIL ENGINEERING INFORMATION SHOULD BE OBTAINED FROM THE APPROPRIATE CONSTRUCTION DOCUMENTS.
2. THE PURPOSE OF THE SIGNATURE AND SEAL OF THE ENGINEER ON THIS DOCUMENT IS TO DEMONSTRATE COMPLIANCE WITH THE TPDES STORMWATER POLLUTION PREVENTION PLAN REGULATIONS ONLY.
3. ALL OWNERS/OPERATORS ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE STORMWATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REGULATIONS CONTAINED WITHIN IT.
4. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.

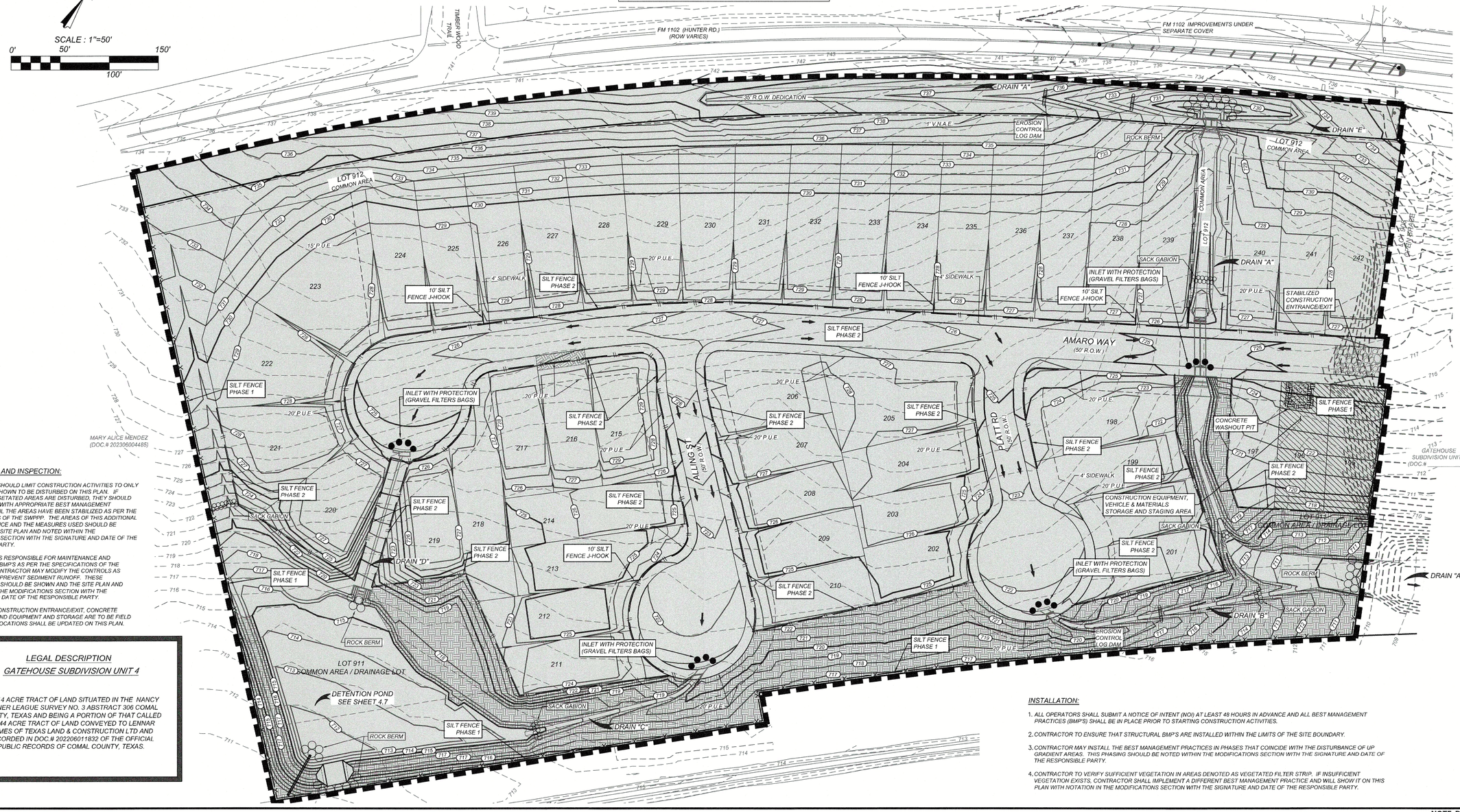
COORDINATION NOTE:

1. CONTACT SPECTRUM TO COORDINATE CABLE TV SERVICE. (210) 244-0500
2. CONDUIT FOR ELECTRICAL SERVICE. CONFIRM REQUIREMENTS AND COORDINATE WITH GUADALUPE VALLEY ELECTRIC COOPERATIVE FOR INSPECTION. (830) 379-2114.
3. CONTACT AT&T TO COORDINATE TELEPHONE SERVICE. 1-800-449-7928.
4. CONTRACTOR TO COORDINATE WITH GUADALUPE VALLEY ELECTRIC COOPERATIVE PRIOR TO CONSTRUCTION TO PLAN ELECTRIC SERVICE.
5. CONTRACTOR TO COORDINATE WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT TO PLAN WATER & SEWER SERVICES (830) 914-2330
6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.



LOCATION MAP
N.T.S.

SCALE : 1"=50'
0' 50' 150'
100'



MAINTENANCE AND INSPECTION:

1. CONTRACTOR SHOULD LIMIT CONSTRUCTION ACTIVITIES TO ONLY THOSE AREAS SHOWN TO BE DISTURBED ON THIS PLAN. IF ADDITIONAL VEGETATED AREAS ARE DISTURBED, THEY SHOULD BE PROTECTED WITH APPROPRIATE BEST MANAGEMENT PRACTICES UNTIL THE AREAS HAVE BEEN STABILIZED AS PER THE SPECIFICATIONS OF THE SWPPP. THE AREAS OF THIS ADDITIONAL SOIL DISTURBANCE AND THE MEASURES USED SHOULD BE SHOWN ON THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND INSPECTION OF BMP'S AS PER THE SPECIFICATIONS OF THE SWPPP. THE CONTRACTOR MAY MODIFY THE CONTROLS AS NECESSARY TO PREVENT SEDIMENT RUNOFF. THESE MODIFICATIONS SHOULD BE SHOWN AND THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
3. LOCATION OF CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND EQUIPMENT AND STORAGE ARE TO BE FIELD DETERMINED. LOCATIONS SHALL BE UPDATED ON THIS PLAN.

LEGAL DESCRIPTION
GATEHOUSE SUBDIVISION UNIT 4

A 17.14 ACRE TRACT OF LAND SITUATED IN THE NANCY KENNER LEAGUE SURVEY NO. 3 ABSTRACT 306 COMAL COUNTY, TEXAS AND BEING A PORTION OF THAT CALLED 96.044 ACRE TRACT OF LAND CONVEYED TO LENNAR HOMES OF TEXAS LAND & CONSTRUCTION LTD AND RECORDED IN DOC.# 202206011832 OF THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS.

INSTALLATION:

1. ALL OPERATORS SHALL SUBMIT A NOTICE OF INTENT (NOI) AT LEAST 48 HOURS IN ADVANCE AND ALL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE THAT STRUCTURAL BMP'S ARE INSTALLED WITHIN THE LIMITS OF THE SITE BOUNDARY.
3. CONTRACTOR MAY INSTALL THE BEST MANAGEMENT PRACTICES IN PHASES THAT COINCIDE WITH THE DISTURBANCE OF UP GRADIENT AREAS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
4. CONTRACTOR TO VERIFY SUFFICIENT VEGETATION IN AREAS DENOTED AS VEGETATED FILTER STRIP. IF INSUFFICIENT VEGETATION EXISTS, CONTRACTOR SHALL IMPLEMENT A DIFFERENT BEST MANAGEMENT PRACTICE AND WILL SHOW IT ON THIS PLAN WITH NOTATION IN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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REV	DATE	DRAWN BY	DESCRIPTION

5/13/25

STATE OF TEXAS
A. NICHOLAS REYNOLDS
111666
LICENSED
PROFESSIONAL ENGINEER

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
162 West Mill Street
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm# F-14909
TBPLS Firm# 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
24003556A	8.0 EROSION AND SEDIMENTATION CONTROL PLAN_REV

SHEET TITLE:
EROSION AND SEDIMENTATION CONTROL PLAN

SHEET NUMBER:
8.0

Date: May 13, 2025, 5:09pm User ID: ASerna
File: U:\Projects\314\52\06\Design\Civil\SW3P\8.0 EROSION AND SEDIMENTATION CONTROL PLAN_REV.dwg
Design\Civil\SW3P\8.0 EROSION AND SEDIMENTATION CONTROL PLAN_REV.dwg
By: ASERNA

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 SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE COMAL COUNTY WILL ACCEPT.
3. ALL DRAINAGE EASEMENTS WILL BE OWNED AND MAINTAINED BY THE DISTRICT.
4. ALL EARTHEN CHANNELS MUST NOT EXCEED 3:1 SIDE SLOPES (MAX).
5. MAINTENANCE ACCESS RAMP SHALL BE 6" CONCRETE RIPRAP WITH #4 BARS @ 12" O.C.E.W. WITH 18" TOE-DOWNS.

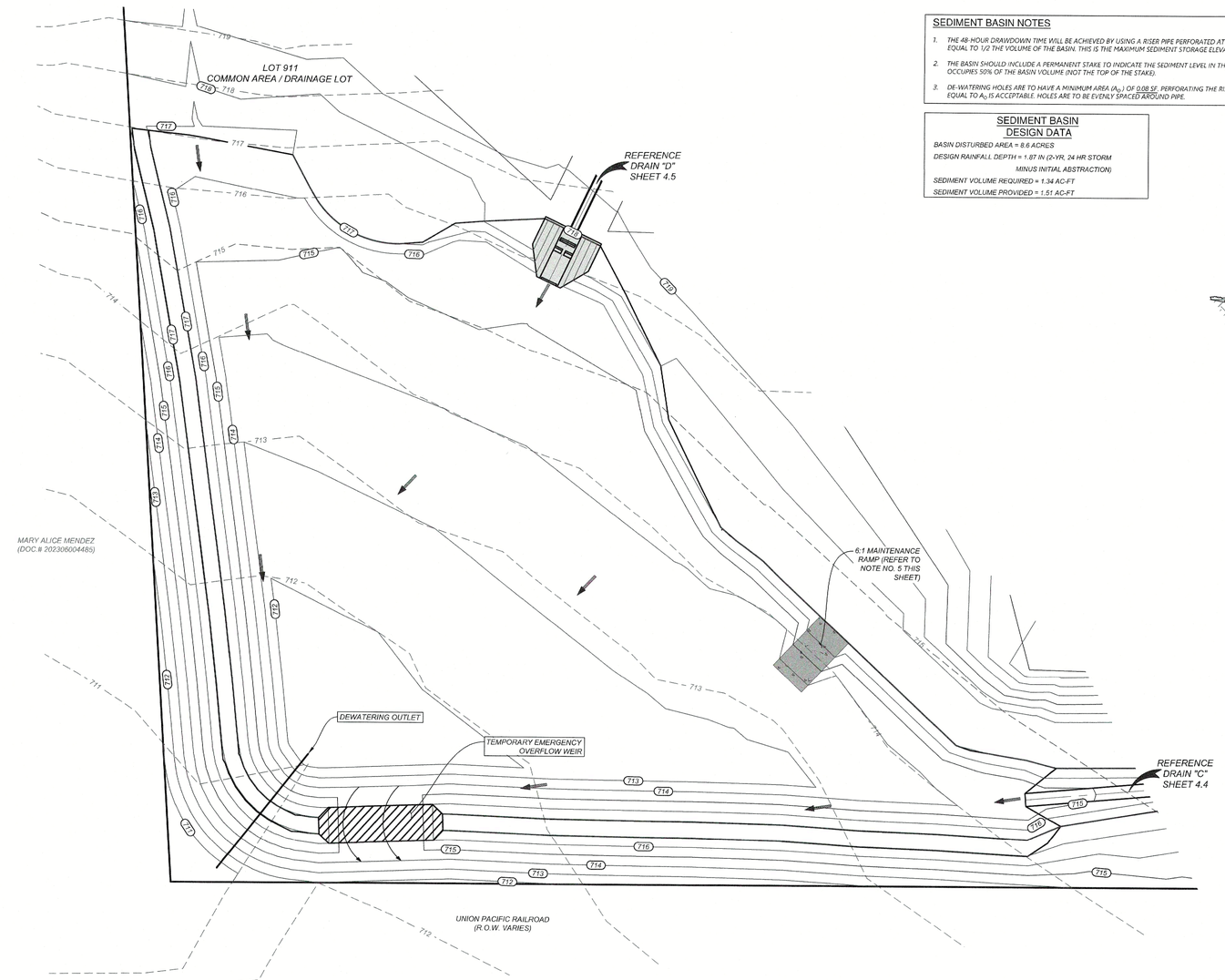
LEGEND

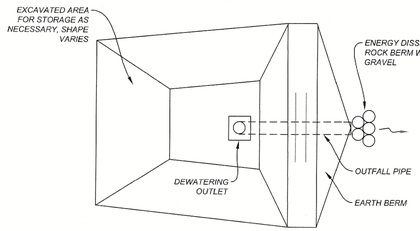
- = FLOW ARROW
- 715 = EXISTING CONTOUR
- 713 = PROPOSED CONTOUR
- 684 = ADJACENT COUNTOURS

SCALE : 1"=20'

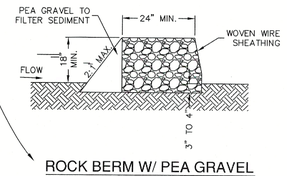
0' 20' 60'

40'





PLAN VIEW
NOT TO SCALE



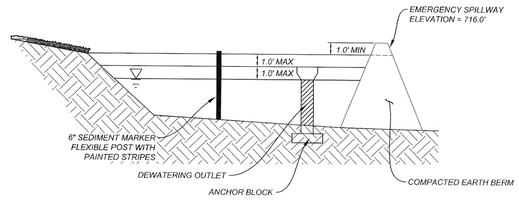
ROCK BERM W/ PEA GRAVEL
NOT TO SCALE

SEDIMENT BASIN NOTES

1. THE 48-HOUR DRAWDOWN TIME WILL BE ACHIEVED BY USING A RISER PIPE PERFORATED AT THE POINT MEASURED FROM THE BOTTOM OF THE RISER PIPE EQUAL TO 1/2 THE VOLUME OF THE BASIN. THIS IS THE MAXIMUM SEDIMENT STORAGE ELEVATION.
2. THE BASIN SHOULD INCLUDE A PERMANENT STAKE TO INDICATE THE SEDIMENT LEVEL IN THE POOL AND MARKED TO INDICATE WHEN THE SEDIMENT OCCUPIES 50% OF THE BASIN VOLUME (NOT THE TOP OF THE STAKE).
3. DE-WATERING HOLES ARE TO HAVE A MINIMUM AREA (A_{DE}) OF 0.08 SF. PERFORATING THE RISER WITH MULTIPLE HOLES WITH A COMBINED SURFACE AREA EQUAL TO A_{DE} IS ACCEPTABLE. HOLES ARE TO BE EVENLY SPACED AROUND PIPE.

SEDIMENT BASIN DESIGN DATA

BASIN DISTURBED AREA = 8.6 ACRES
DESIGN RAINFALL DEPTH = 1.87 IN (2-YR, 24 HR STORM MINUS INITIAL ABSTRACTION)
SEDIMENT VOLUME REQUIRED = 1.34 AC-FT
SEDIMENT VOLUME PROVIDED = 1.51 AC-FT



CROSS SECTION SEDIMENT BASIN
N.T.S.

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
NICHOLAS REYNOLDS
111666
LICENSED PROFESSIONAL ENGINEER
11-4-25

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

Colliers Engineering & Design
NEW BRAUNFELS (KFW)
640 N. Walnut Ave, Suite 1101
New Braunfels, TX 78130
Phone: 830.220.6042
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-11809
TBPLS Firm#: 10194350

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

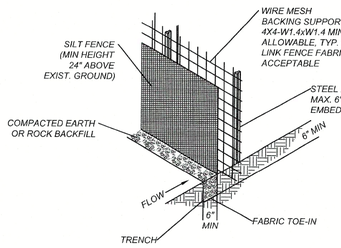
PROJECT NUMBER:	DRAWING NAME:
24003556A	8.1 TEMPORARY SEDIMENT BASIN

SHEET TITLE:
TEMPORARY SEDIMENT BASIN

SHEET NUMBER:
8.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Jan 03, 2025, 10:38am User ID: dgonzalez
File: U:\Projects\314.52\06\Design\Civil\SWPPP\8.1 TEMPORARY SEDIMENT BASIN.dwg
Design\Civil\SWPPP\8.1 TEMPORARY SEDIMENT BASIN.dwg 8.1 by: DGONZALEZ



ISOMETRIC PLAN VIEW

Materials:

(1) Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in2, 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 Ybar cross section, surface painted or galvanized, minimum nominal weight 1.25 lb/ft2, and Brindell hardness exceeding 140.

(3) Woven wire backing to support the fabric should be galvanized 2" x 4" welded wire, 12 gauge minimum.

Installation:

(1) 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 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.

(2) Lay silt 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/ 00 feet of fence.

(3) The toe of the silt fence should be trenched in with a spade or mechanical trencher, so that the down- slope face of the trench is flat and perpendicular to the line of flow. Where fence cannot be trenched in (e.g., pavement or rock outcrop), weight fabric flap with 3 inches of pea gravel on uphill side to prevent flow from seeping under fence.

(4) 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.

(5) 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.

(6) Silt fence should be removed when the site is completely stabilized so as not to block or impede stone flow or drainage.

Inspection and Maintenance Guidelines:

(1) Inspect all fencing weekly, and after any rainfall.

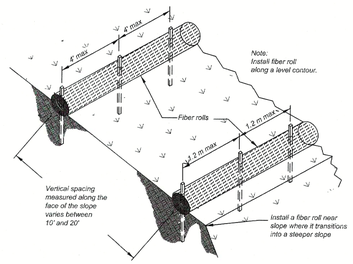
(2) Remove sediment when buildup reaches 6 inches.

(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.

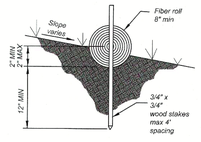
(4) Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.

(5) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

SILT FENCE



TYPICAL FIBER ROLL INSTALLATION
N.T.S.



ENTRENCHMENT DETAIL
N.T.S.

THE MATERIAL, INSTALLATION, INSPECTION, AND MAINTENANCE OF FIBER ROLLS WILL BE PER THE MANUFACTURE'S SPECIFICATIONS AND SHALL ALSO COMPLY WITH THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY CURRENT "TECHNICAL GUIDANCE ON BEST MANAGEMENT PRACTICES" AS NOTED BELOW.

Material:

(1) Core material: Core material should be biodegradable or recyclable. Material may be compost, mulch, aspen wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or similar materials.

(2) Containment Mesh: Containment mesh should be 100% biodegradable, photodegradable or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or similar material. When the fiber role will remain in place as part of a vegetative system use biodegradable or photodegradable mesh. For temporary installation recyclable mesh is recommended.

Implementation:

(1) Locate fiber rolls on level contours spaced as follows:
Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).
Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).

(2) Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.

(3) Stake fiber rolls into a 2 to 4 in. deep trench with a width equal to the diameter of the fiber roll.

(4) Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.

(5) Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.

(6) If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

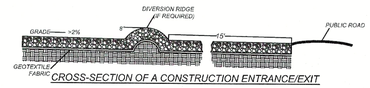
Inspection and Maintenance Guidelines:

(1) Inspect prior to forecast rain, daily during extended rain events, after rain events, and weekly.

(2) Repair or replace split, torn, unraveling, or slumping fiber rolls.

(3) If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates behind the role must be periodically removed in order to maintain its effectiveness. Sediment should be removed when the accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground surface. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed of at an appropriate location.

FIBER ROLL



CROSS-SECTION OF A CONSTRUCTION ENTRANCE/EXIT

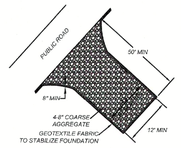
Materials:

(1) The aggregate should consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.

(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/yd2, a mullen burst rating of 140 lb/in2, and an equivalent opening size greater than a number 50 sieve.

(4) If a washing facility is required, a level area with a minimum of 4 inch diameter washed stone or commercial rock should be included in the plans. Divert wastewater to a sediment trap or basin.



TEMPORARY CONSTRUCTION ENTRANCE/EXIT

Installation: (North Carolina, 1993)

(1) Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.

(2) The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.

(3) The construction entrance should be at least 50 feet long.

(4) If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3:1 (H:V) side slopes, across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.

(5) Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.

(6) Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.

(7) Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.

(8) Install pipe under pad as needed to maintain proper public road drainage.

Inspection and Maintenance Guidelines:

(1) 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.

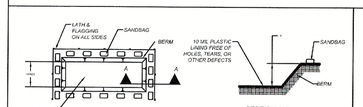
(2) All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.

(3) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.

(4) 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.

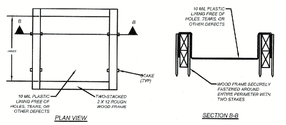
(5) All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

STABILIZED CONSTRUCTION ENTRANCE / EXIT



PLAN VIEW — SECTION A-A

TYPE "BELOW GRADE"



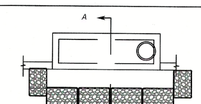
PLAN VIEW — SECTION B-B

TYPE "ABOVE GRADE"

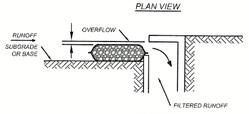
GENERAL NOTES:

- *DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.*
- *WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.*
- *WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF AND AT LEAST 50 FEET FROM SENSITIVE FEATURES, STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.*

CONCRETE TRUCK WASHOUT PIT



PLAN VIEW



SECTION A-A

GENERAL NOTES:

- *ALL STORM DRAINAGE SYSTEMS INLETS SHOULD FILTER RUNOFF BEFORE THE WATER IS DISCHARGED INTO STREAMS OR ONTO ADJACENT PROPERTIES. UNLESS TREATMENT IS PROVIDED ELSEWHERE.*
- *IF NO ADDITIONAL DOWNSTREAM TREATMENT EXISTS, THE MAXIMUM DRAINAGE AREA TRIBUTARY TO AN AREA DRAIN INSTALLED WITH A GRAVEL FILTER SHOULD BE ONE ACRE.*
- *ALL CURB INLET GRAVEL FILTERS SHOULD BE INSPECTED AND REPAIRED AFTER EACH RUNOFF EVENT. SEDIMENT SHOULD BE REMOVED WHEN MATERIAL IS WITHIN THREE INCHES OF THE TOP OF THE CONCRETE BLOCKS. PERIODICALLY, THE GRAVEL SHOULD BE RAKED TO INCREASE INFILTRATION AND FILTERING OF RUNOFF WATERS.*

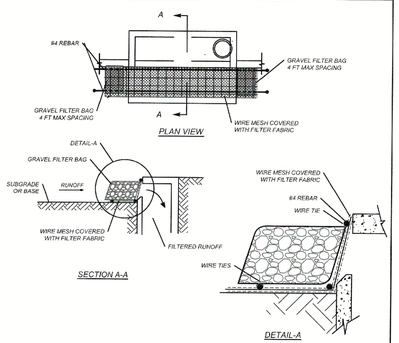
CURB INLET PROTECTION GRAVEL FILTER BAGS

SECTION A-A

GENERAL NOTES:

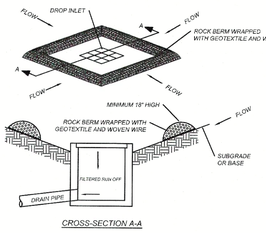
- *THE FILTER BAG MATERIAL SHALL BE MADE OF POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN FABRIC. MIN UNIT WEIGHT OF 4 OUNCES/SY, MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70%.*
- *THE FILTER BAG SHALL BE FILLED WITH CLEAN, MEDIUM TO COARSE GRAVEL (0.31 TO 0.75 INCH DIAMETER).*

GRAVEL FILTER BAG DETAIL



PLAN VIEW — SECTION A-A — DETAIL-A

CURB INLET PROTECTION (ALRTERNATE)

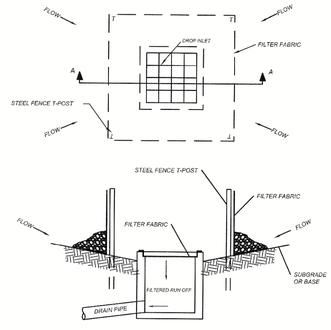


CROSS-SECTION A-A

GENERAL NOTES:

- *USE OPEN GRADED CLEAN STONE.*
- *THE ROCK SHOULD BE ENCLOSED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1 INCH OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE AND WRAPPED IN GEOTEXTILE WITH 300 PSI BURST STRENGTH FILTER FABRIC.*
- *INSPECTION SHOULD BE MADE FREQUENTLY ON SEVERE SERVICE ROCK BERMS. SILT SHOULD BE REMOVED WHEN ACCUMULATION REACHES 4 INCHES OR MORE.*
- *WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHOULD BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.*

GRATE INLET PROTECTION

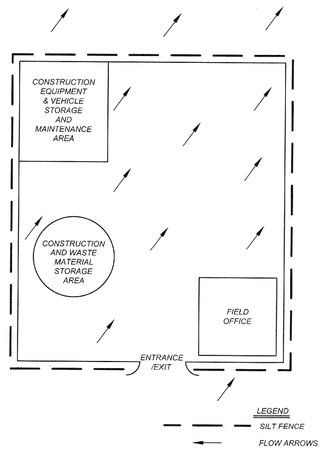


CROSS-SECTION A-A

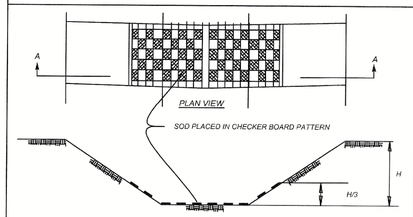
GENERAL NOTES:

- *ALL MATERIALS AND ERECTION PROCEDURES WILL BE THE SAME AS DESCRIBED IN THE STANDARD SILT FENCE REQUIREMENTS.*

GRATE INLET PROTECTION (ALRTERNATE)



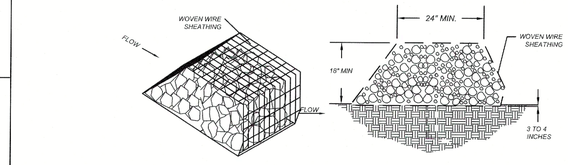
TYPICAL CONSTRUCTION STAGING AREA



SECTION A-A

- *CHANNEL TO BE STABILIZED WITH SOD PLACED IN A CHECKER BOARD PATTERN TOM THE CHANNEL BOTTOM AND ON THE SIDES UP TO 1/3 THE DEPTH OF CHANNEL.*

CHANNEL LINING



ISOMETRIC PLAN VIEW — CROSS SECTION

Materials:

(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.

Installation:

(1) Lay out the woven wire sheathing perpendicular to the flow line. The sheathing should be 20 gauge woven wire mesh with 1 inch openings.

(2) Berm should have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.

(3) Place the rock along the sheathing as shown in the diagram Figure 1-28), to a height not less than 18".

(4) Wrap the wire sheathing around the rock and secure with tie wire so that the ends of the sheathing overlap at least 2 inches, air the berm retains its shape when walked upon.

(5) Berm should be built along the contour at zero percent grade or as near as possible.

(6) 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.

Inspection and Maintenance Guidelines:

(1) Inspection should be made weekly by the responsible party. For installations in streambeds, additional daily inspections should be made.

(2) Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.

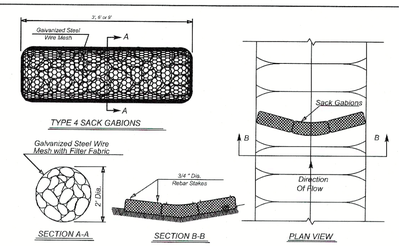
(3) Repair any loose wire sheathing.

(4) The berm should be reshaped as needed during inspection.

(5) 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.

(6) The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

ROCK BERM



SECTION A-A — SECTION B-B — PLAN VIEW

GENERAL NOTES:

- *THE TOP OF THE SACK GABIONS SHOULD BE LEVEL AND ORIENTED PERPENDICULAR TO THE DIRECTION OF FLOW.*
- *FILTER FABRIC MATERIAL SHALL BE FASTENED TO WOVEN WIRE SUPPORT.*
- *FILTER FABRIC MATERIAL SHOULD MEET THE FOLLOWING SPECIFICATIONS: RESISTANT TO ULTRAVIOLET LIGHT, FABRIC SHOULD BE NON-WOVEN GEOTEXTILE WITH MINIMUM WEIGHT OF 3.5 OUNCES PER SQUARE YARD, MINIMUM MULLEN BURST STRENGTH OF 300 POUNDS PER SQUARE INCH AND A FLOW THRU RATE OF 130 GALLONS PER MINUTE PER SQUARE FOOT OF FRONTAL AREA.*
- *STONE SIZE: ±4"-8" OPEN GRADED CRUSHED LIMESTONE.*
- *INSPECT WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACE AS NEEDED.*
- *WHEN SILT REACHES A DEPTH OF 6 INCHES OR MORE ABOVE NATURAL GROUND, SILT SHALL BE REMOVED AND DISPOSED IN AN APPROVED MANNER THAT WILL NOT CONTRIBUTE TO PEDILTION. CONTAMINATED SEDIMENT MUST BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH APPLICABLE REGULATIONS.*

TYPE 4 SACK GABIONS

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STATE OF TEXAS — A. NICHOLAS REYNOLDS — 111666 — LICENSED PROFESSIONAL ENGINEER

Nicholas Reynolds, P.E.

FINAL SUBDIVISION PLAN

FOR

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

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TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/11/2024	MSG	WF

PROJECT NUMBER:	DRAWING NAME:
24003556A	8.2 EROSION AND SEDIMENTATION CONTROL PLAN DETAILS

SHEET TITLE:
EROSION AND SEDIMENTATION CONTROL PLAN DETAILS

SHEET NUMBER:
8.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Date: Dec 23, 2024, 12:48pm User ID: mglenn
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Xref: L:\Projects\Templates\Standard Sheets\Civil\Xrefs\8.2 EROSION AND SEDIMENTATION CONTROL PLAN DETAILS - 8½ x 11.dwg