GATEHOUSE SUBDIVISION - UNIT 4

COMAL COUNTY, TEXAS STREET, DRAINAGE, WATER, SANITARY SEWER & UTILITY IMPROVEMENTS

CCSUD APPROVAL TO CONSTRUCT

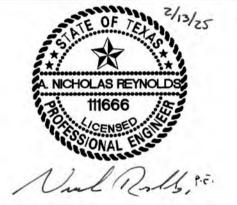
REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING

SHEET NO.

KFW

Colliers

FOR STATE SPECIFIC DIRECT PHONE NUMBERS



FINAL SUBDIVISION PLAN

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS COMAL COUNTY

TEXAS

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

NEW BRAUNFELS (KFW)

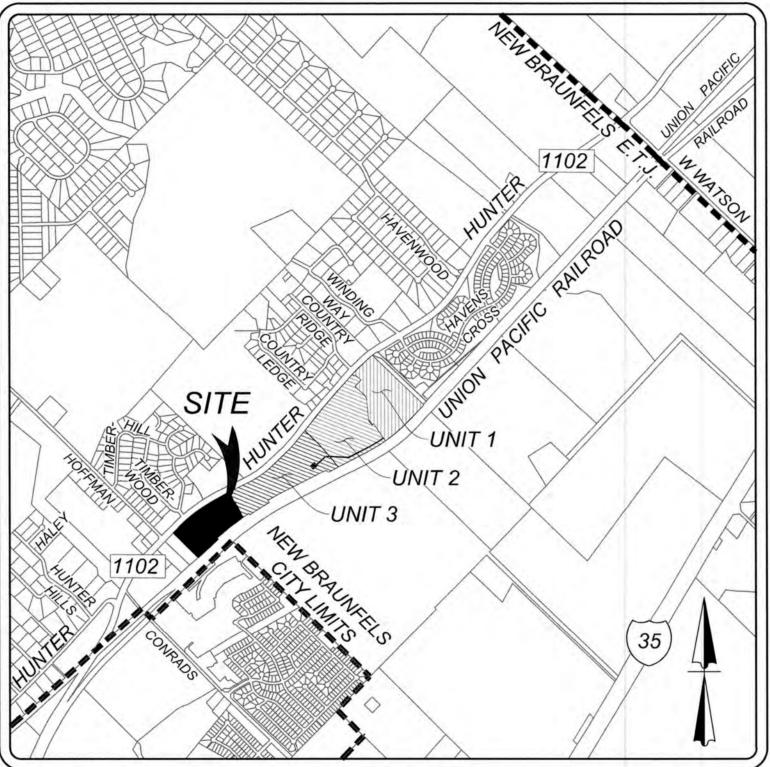
MSG 9/11/2024 COVER SHEET

COVER SHEET

KYNDWOOD MUNICIPAL UTILITY DISTRICT (MUD)

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

REVIEW OF THE PLANS BY THE DISTRICT IS LIMITED TO WATER, WASTEWATER, DRAINAGE, AND ROADS IF APPLICABLE TO THE DISTRICT, AND DOES NOT INDICATE A REVIEW OF THE ADEQUACY OF THE DESIGN FOR THE FACILITIES. IN APPROVING THESE PLANS,



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IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF COUNTY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.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

SEQUENCE OF CONSTRUCTION:

CONSTRUCTION ACTIVITY WILL INCLUDE:

INSTALLATION OF TEMPORARY BMP's

GRADING, STREETS, EXCAVATION AND EMBANKMENT.

- 2. SITE CLEARING AND GRUBBING ACTIVITIES FOR STREETS. 3. ROUGH SUBGRADE PREPARATION: EARTHWORK,
- 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 OLLOWING REGULATORY AGENCIES LISTED BELOW:

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

ARE IN THE SPECIAL FLOOD HAZARD ZONE ACCORDING TO FEMA FLOOD MAP COMMUNITY PANELS NO. 48091C0290F AND NO. 48091C0295F, DATED SEPTEMBER 2, 2009.

NO PORTION OF ANY RESIDENTIAL LOTS ON GATEHOUSE SUBDIVISION UNIT 4

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 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

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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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.

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

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

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

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 plans and 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 hydrants are situated on corners, blue 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

markings at final application.

as specified in Table 1 and 2 under Item 164.

The elevation of the lowest floor shall be at least 10 inches above the linished grade of the surrounding ground, which shall be sloped in a fashion so as to direct stormwater away from the structure. 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 structure. 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

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 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

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 reques

Watering may also be necessary to facilitate and expedite the sprouting and growth of vegetation. Item 168 of TxDOT's

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

Standard Specifications manual shall be adhered to for vegetative watering

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
- 2. A MINIMUM OF 8" WASTEWATER PIPE AND FITTINGS (P.V.C. SDR-26, ASTM, D3034, D-3212, F-477) ARE

STONE, OR GRAVEL PER SECTION 01230 OF CCSUD'S SPECIFICATIONS.

- 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
- 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 6. ALL WASTEWATER MAINS SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 30 TAC §217.53
- 7. FOR WASTEWATER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL SHALL BE
- 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
- 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.
- WASTEWATER MAIN CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL "BOOT TYPE" JOINT AS APPROVED BY CCSUD.

LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.

- 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.

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WATER MAIN NOTES

- CONSTRUCTION OF ALL CCSUD WATER UTILITY INFRASTRUCTURE MUST ADHERE TO CCSUD'S TECHNICAL SPECIFICATIONS, DETAILS AND APPROVED EQUIPMENT LIST
- REMOVE ONLY VEGETATION, TREES, STUMPS, RUBBISH, AND OTHER MATERIAL NECESSARY FOR CONSTRUCTION AND DISPOSE OF OFF SITE.
- LISTED IN THE PLANS ARE BASED ON BEST AVAILABLE INFORMATION. TH 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
- 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. 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
- 10. ALL WATER MAINS SHALL BE DISINFECTED PER AWWA AND TOEQ 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.

"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 boxe 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 undamaged 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

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

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."

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

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."

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

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

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."

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

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

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

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

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"

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

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

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

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

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

46 "For work within the State Right Of Way where removal of materials or debris within the construction limits and not

providing for positive drainage outfalls within and off the limits of the project."

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

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

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.

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.

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.

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.

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.

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.

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

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

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 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). 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

ACCORDANCE WITH ACCEPTED PLUMBING TECHNIQUES.

IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT

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. 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

IF NO STUB-OUT IS PRESENT AN ALTERNATE METHOD OF JOINING LATERALS IS SHOWN IN THE DETAIL ON PLAN SHEET 6.5. (FOR POTENTIAL FUTURE LATERALS).

THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEETS 6.3-6.4 AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL 17.

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) 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

13. TRENCHING, BEDDING AND BACKFILL MUST CONFORM WITH 30 TAC \$217.54. THE BEDDING AND

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 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 $T = 0.085 \times D \times K$

\$213.5(C)(3)(E).

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

(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:

(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. MANDREL SIZING.

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.

(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

(B) MANDREL DESIGN.

DIAMETER OF A PIPE.

DEFLECTION TEST

(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

(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,

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.

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. AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL

ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58. (a) ALL MANHOLES MUST PASS A LEAKAGE TEST. AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BACKFILLING) FOR LEAKAGE. SEPARATE AND INDEPENDENT OF THE COLLECTION SYSTEM PIPES, BY HYDROSTATIC

TESTING TO ALLOW SATURATION OF THE CONCRETE.

MOVEMENT WHILE A VACUUM IS DRAWN.

RECOMMENDATIONS.

(5) GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).

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

(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

METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER

(2) VACUUM TESTING. TO DEPENDE A VACUUM TEST AN OWNED SHALL DILIG ALL LIET HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE. NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.

(C) STUB-OUTS, MANHOLE BOOTS, AND PIPE PLUGS MUST BE SECURED TO PREVENT

(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

(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. 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.

GPS POINTS SHALL BE TO MAP GRADE.

NEW BRAUNFELS UTILITIES - ELECTRIC ONLY Please Note: NBU REQUIRES GPS POINTS FOR CERTAIN ELECTRIC, WATER AND WASTEWATER

GPS POINTS SHALL BE REQUIRED FROM THE DEVELOPERS CONTRACTOR. A MINIMUM OF

THREE COORDINATE POINTS FOR GEOREFERENCING SHALL BE REQUIRED. THE ELECTRIC

ATTRIBUTES, SOME OF WHICH MUST BE TAKEN PRIOR TO BACKFILL DURING CONSTRUCTION.

PULL BOXES

TRANSFORMERS, BOTH ABOVE AND UNDERGROUND (FRONT LOCK)

STREET LIGHTS COORDINATE GPS REQUIREMENTS WITH NBU INSPECTOR

KYNDWOOD MUNICIPAL UTILITY DISTRICT (MUD):

THE DISTRICT ENGINEER, JONES-HEROY & ASOCIATES, INC. (KEN HEROY, PH: 512/989-2200) SHALL BE CONTACTED 48 HOURS PRIOR TO: i) PRE-CONSTRUCTION MEETINGS;

ii) BEGINNING EACH PHASE OF CONSTRUCTION:

iii) TESTING; AND. iv) FINAL WALK-THROUGH OF FACILITIES.
CCSUD APPROVAL TO CONSTRUCT

REVIEW AND APPROVAL.

REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCI WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARD AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING CALCULATIONS. FRRORS IN THE DESIGN OR CALCULATIONS REMAIN. THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AN SIGNATURE ARE AFFIXED TO THIS DOCUMENT. THE ENGINEER OF RECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO COMMENCING CONSTRUCTION. IF CONSTRUCTION OF WATER AND WASTEWATER (IF REQUIRED) UTILITIES HAS NOT COMMENCED WITHIN ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR

02/25/2025

CCSUD REPRESENTATIVE

Colliers

Engineering

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FINAL SUBDIVISION PLAN

SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS

COMAL COUNTY

TEXAS

Engineering

& Design

AS SHOWN

Suite 1101 New Braunfels, TX 78130 Phone: 830.220.6042 COLLIERS ENGINEERING & DESIGN, INC

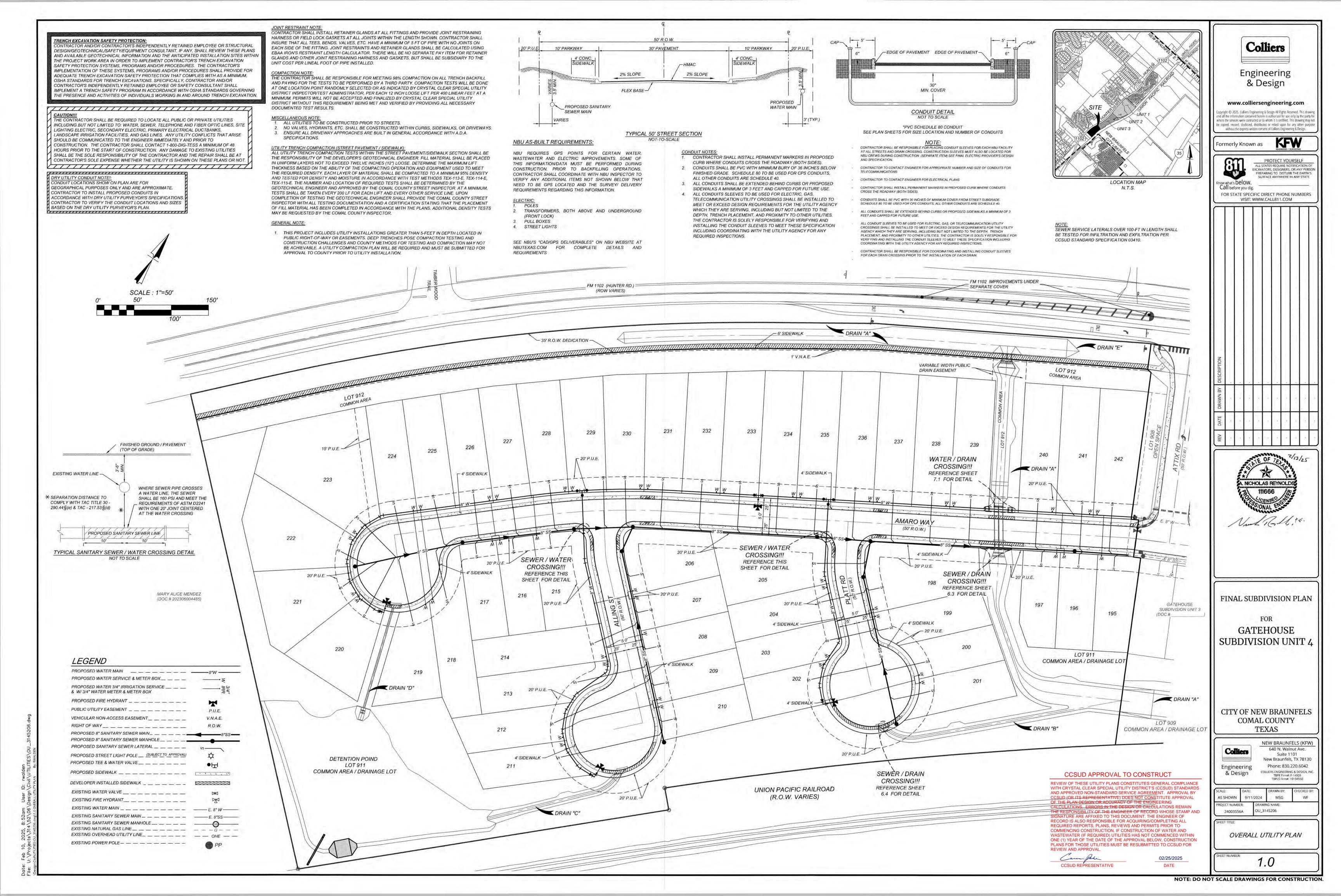
NEW BRAUNFELS (KFW)

640 N. Walnut Ave.

COVER SHEET 24003556A

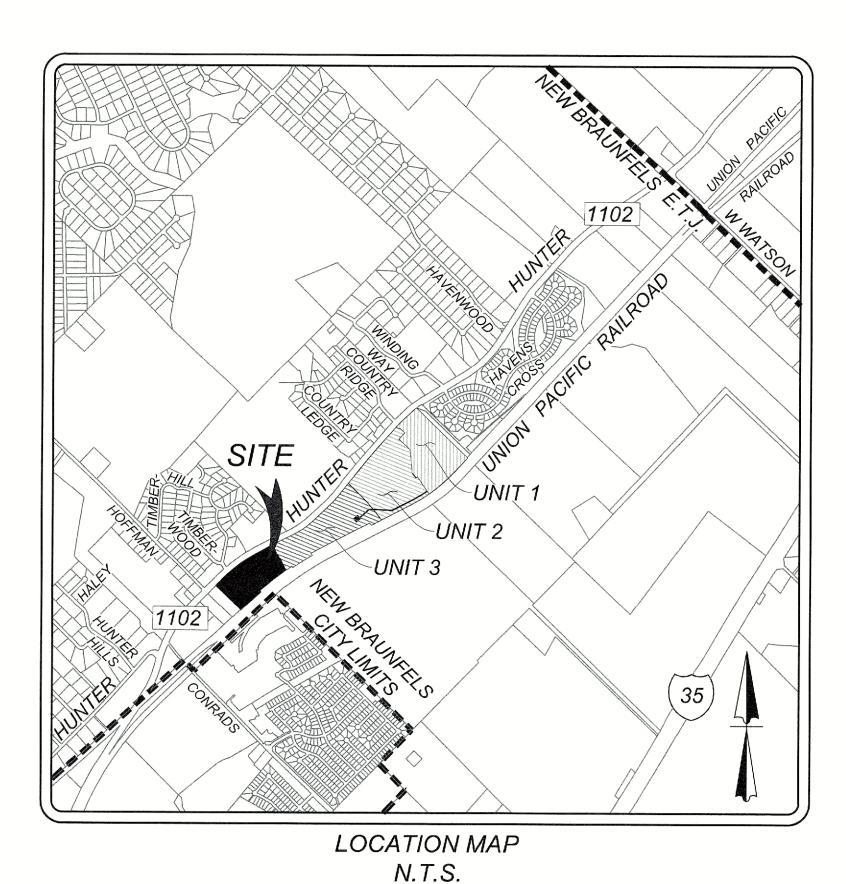
GENERAL NOTES

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



GATEHOUSE SUBDIVISION - UNIT 4

COMAL COUNTY, TEXAS SANITARY SEWER IMPROVEMENTS



FOLLOWING REGULATORY AGENCIES LISTED BELOW:
COMAL COUNTY
NEW BRAUNFELS UTILITIES - ELECTRIC

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.

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. 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

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 AQUIFE

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

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, <u>A. NICHOLAS REYNOLDS</u>, 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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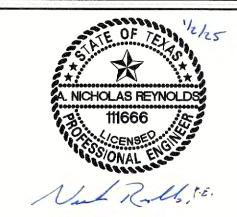
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Formerly Known as

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF BICALVATORS, DESIGNARS, OR ANY PERSON TO BETTER THE PARTY SUPPARISON TO BETTER THE PARTY



FINAL SUBDIVISION PLAN

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GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS
COMAL COUNTY
TEXAS

ColliersEngineering
& Design

NEW BRAUNFELS (KFW)
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COLLIERS ENGINEERING & DESIGN, INC.
TREE FIRM: 61-14909

AS SHOWN 9/11/2024 MSG
PROJECT NUMBER: DRAWING NAME:
24003556A SANITARY SEWER COVER

SHEET TITLE:

SANITARY SEWER COVER

6.0

02/25/2025 DATE

CCSUD APPROVAL TO CONSTRUCT

OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING

REVIEW AND APPROVAL.

REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE

WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARDS

AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY

CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL

CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN

SIGNATURE ARE AFFIXED TO THIS DOCUMENT. THE ENGINEER OF

REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO COMMENCING CONSTRUCTION. IF CONSTRUCTION OF WATER AND

RECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL

THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AND

WASTEWATER (IF REQUIRED) UTILITIES HAS NOT COMMENCED WITHIN ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION

PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR

- 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

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WASTEWATER NOTES

- 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. 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
- ALL WASTEWATER MAINS SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 30 TAC §217.53
- 7. FOR WASTEWATER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL SHALL BE
- 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
- 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
- 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

LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.

- 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
- 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).
- 5. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE WASTEWATER LINES. THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
- b. PERFORM AIR TEST

a. PULL MANDREL

- c. CLEANING OF ANY DEBRIS d. FLUSHING OF SYSTEM
- e. TV INSPECTION (WITHIN 72 HOURS OF FLUSHING
- 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.
- 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 EMPORARY 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 BACKFIL 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 MMINISTRATOR, 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

- 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.
- 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.
- 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.
- 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.
- 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.
- 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
- 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.

- 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:
 - 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.
 - DIAMETER, THE FOLLOWING PROCEDURE MUST APPLY, UNLESS A PIPE IS TO BE TESTED AS REQUIRED BY PARAGRAPH (2) OF THIS SUBSECTION. A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI)

(B) FOR SECTIONS OF COLLECTION SYSTEM PIPE LESS THAN 36 INCH AVERAGE INSIDE

- GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE
- (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= <u>0.085 x D x K</u>

- T = TIME FOR PRESSURE TO DROP 1.0 POUND PER SQUARE INCH GAUGE IN SECONDS
- $K = 0.000419 \times D \times L$, BUT NOT LESS THAN 1.0

L = LENGTH OF LINE OF SAME SIZE BEING TESTED, IN FEET

- D = AVERAGE INSIDE PIPE DIAMETER IN INCHES
- Q = RATE OF LOSS, 0.0015 CUBIC FEET PER MINUTE PER SQUARE FOOT INTERNAL
- 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.
 - AN OWNER SHALL USE AN INFILTRATION TEST IN LIEU OF AN EXFILTRATION TEST WHEN
 - PIPES ARE INSTALLED BELOW THE GROUNDWATER LEVEL. 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. 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:
- FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL.

(A) MANDREL SIZING.

- 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
- (III) ALL DIMENSIONS MUST MEET THE APPROPRIATE STANDARD.
- MANDREL DESIGN. A RIGID MANDREL MUST BE CONSTRUCTED OF A METAL OR A RIGID PLASTIC
- MATERIAL THAT CAN WITHSTAND 200 PSI WITHOUT BEING DEFORMED. A MANDREL MUST HAVE NINE OR MORE ODD NUMBER OF RUNNERS OR
- (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.
- AN ADJUSTABLE OR FLEXIBLE MANDREL IS PROHIBITED.
- 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. FOR A GRAVITY COLLECTION SYSTEM PIPE WITH AN INSIDE DIAMETER 27 INCHES AND
- GREATER, OTHER TEST METHODS MAY BE USED TO DETERMINE VERTICAL DEFLECTION. A DEFLECTION TEST METHOD MUST BE ACCURATE TO WITHIN PLUS OR MINUS 0.2%
- DEFLECTION. AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL.
- GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).
- 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.
 - 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. 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
 - (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.
 - 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.
 - NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING. STUB-OUTS, MANHOLE BOOTS, AND PIPE PLUGS MUST BE SECURED TO PREVENT
 - MOVEMENT WHILE A VACUUM IS DRAWN. 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.
- PIPE MATERIAL FOR THE WASTEWATER LINE SHALL BE SDR 26 PVC.

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CCSUD APPROVAL TO CONSTRUCT

REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE

WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARDS

THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AND

AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY

CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL

CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN

SIGNATURE ARE AFFIXED TO THIS DOCUMENT. THE ENGINEER OF

RECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL

COMMENCING CONSTRUCTION. IF CONSTRUCTION OF WATER AND

WASTEWATER (IF REQUIRED) UTILITIES HAS NOT COMMENCED WITHIN

PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR

DESCRIPITION

SBM

SBM

SBM

NOT TO SCALE

ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION

02/25/2025

REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO

OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERIN

Can flake

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CONTRACTOR TO RUN LEVEL LOOP

BEFORE CONSTRUCTION. CONTACT

→ BENCHMARKS

302

THROUGH BM'S PROVIDED TO CONFIRM

ENGINEER/SURVEYOR IMMEDIATELY IF

ELEVATIONS DO NOT MATCH THOSE SHOWN.

BM# NORTHING EASTING ELEVATION

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13833728.05 2266235.25

13833209.63 2267544.75

NICHOLAS REYNOLDS

FINAL SUBDIVISION PLAN

GATEHOUSE SUBDIVISION UNIT 4

FOR

CITY OF NEW BRAUNFELS COMAL COUNTY

TEXAS



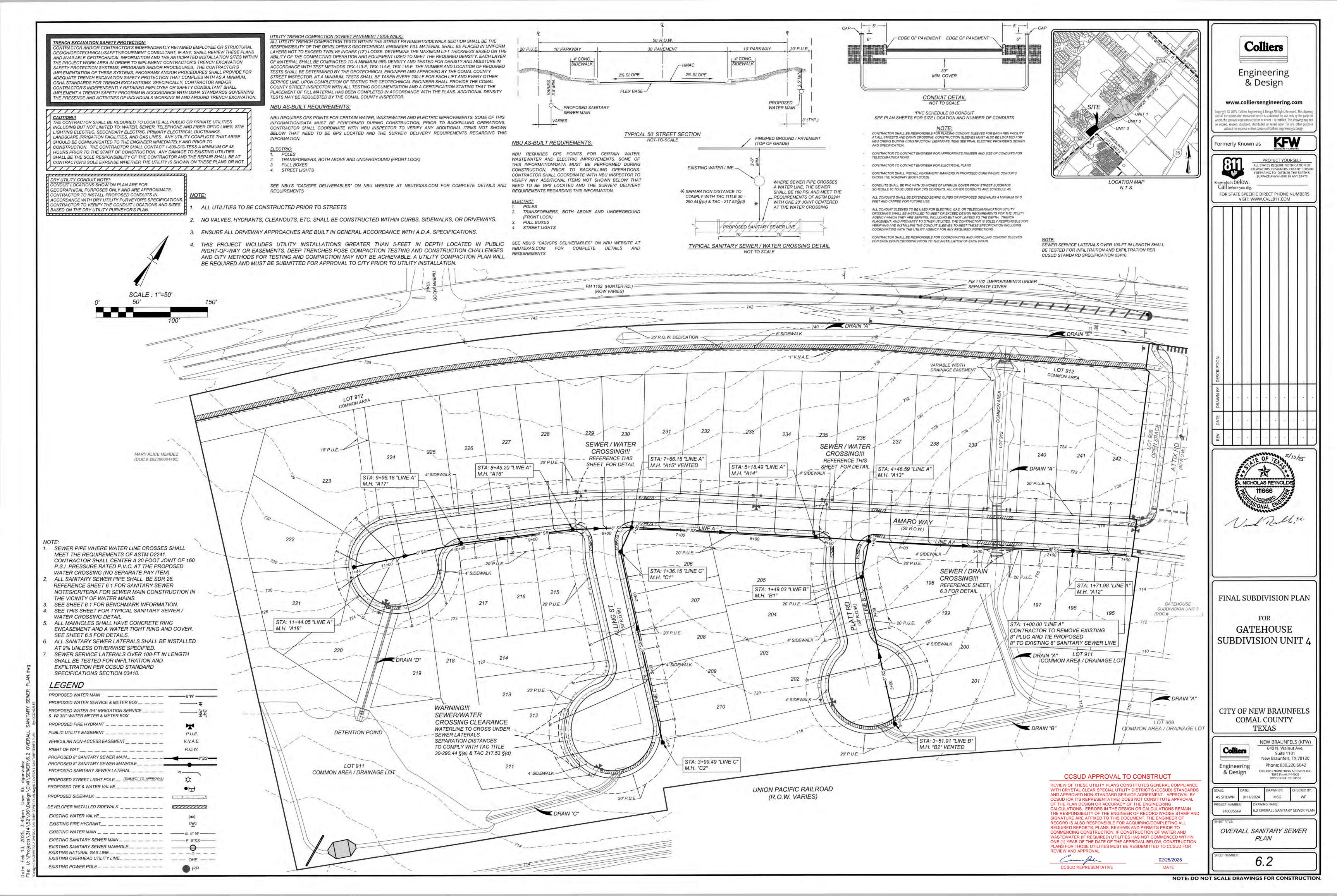
640 N. Walnut Ave. New Braunfels, TX 78130 Phone: 830.220.6042 COLLIERS ENGINEERING & DESIGN, IN TBPLS Firm#: 10194550

MSG AS SHOWN 9/11/2024 SANITARY SEWER COVER 24003556A

SANITARY SEWER

GENERAL NOTES

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



LEGEND FINISHED GROUND / PAVEMENT (TOP OF GRADE) ORY UTILITY CONDUIT NOTE!: CONDUIT LOCATIONS SHOW ON PLAN ARE FOR PROPOSED WATER MAIN _____ 8"W -1. SEWER PIPE WHERE WATER LINE CROSSES SHALL MEET THE 1. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS Colliers ITRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT PROPOSED FIRE HYDRANT _ _ _ _ _ _ _ _ _ _ STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL CONTRACTOR TO INSTALL PROPOSED CONDUITS IN JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER 2. NO VALVES, HYDRANTS, CLEANOUTS, ETC. SHALL BE REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. PUBLIC UTILITY EASEMENT _ _ _ _ _ _ _ _ _ P.U.E. INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES CROSSING (NO SEPARATE PAY ITEM). EXISTING WATER LINE -CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS. CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR BASED ON THE DRY UTILITY PURVEYOR'S PLAN. ALL SANITARY SEWER PIPE SHALL BE SDR 26. VEHICULAR NON-ACCESS EASEMENT _ _ _ _ _ _ V.N.A.E. PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS REFERENCE SHEET 6.1 FOR SANITARY SEWER NOTES/CRITERIA FOR 3. ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL WHERE SEWER PIPE CROSSES AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY RIGHT OF WAY __ _ _ _ _ _ _ _ _ SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS. PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH A WATER LINE, THE SEWER ACCORDANCE WITH A.D.A. SPECIFICATIONS. & Design PROPOSED 8" SANITARY SEWER MAIN_ _ _ _ _ _ _ EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY * SEPARATION DISTANCE TO SHALL BE 160 PSI AND MEET THE SEE SHEET 6.1 FOR BENCHMARK INFORMATION. ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK PROPOSED 8" SANITARY SEWER MANHOLE __ _ _ __ COMPLY WITH TAC TITLE 30 -REQUIREMENTS OF ASTM D2241 RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY 4. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING 4. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL 290.44§(e) & TAC - 217.53§(d) WITH ONE 20' JOINT CENTERED PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND PROPOSED TEE & WATER VALVE_ _ _ _ _ _ _ ENGINEER, FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR DETAIL. ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION. AT THE WATER CROSSING PROPOSED SANITARY SEWER LATERAL ____ _ 5 TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON 5. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER www.colliersengineering.com EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE EXISTING SANITARY SEWER LATERAL _______ TIGHT RING AND COVER. SEE SHEET 6.5 FOR DETAILS. CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING pyright © 2025. Colliers Engineering & Design All Rights Reserved. This draw REQUIRED DENSITY. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A 6. ALL SANITARY SEWER LATERALS SHALL BE INSTALLED AT 2% UNLESS EXISTING WATER VALVE __ _ _ _ _ _ _ _ nd all the information contained herein is authorized for use only by the party for AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE PROPOSÉD SANITARY SEWER LINE hom the services were contracted or to whom it is certified. This drawing may n WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED OTHERWISE SPECIFIED. EXISTING FIRE HYDRANT__ _ _ _ _ _ _ _ _ _ _ _ _ _ e copied, reused, disclosed, distributed or relied upon for any other purpos HE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND SEWER SERVICE LATERALS OVER 100-FT IN LENGTH SHALL BE TESTED without the express written consent of Colliers Engineering & Design FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION. INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE APPROVED BY THE COMAL COUNTY STREET INSPECTOR. AT A MINIMUM, TESTS FOR INFILTRATION AND EXFILTRATION PER CCSUD STANDARD LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. EXISTING SANITARY SEWER MAIN _ _ _ _ _ _ _ _ _ _ E. 8"SS— _ LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE SPECIFICATIONS SECTION 03410. NOT TO SCALE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO THE COMAL COUNTY STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE COMAL COUNTY INSPECTOR. SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO EXISTING OVERHEAD UTILITY LINE_ _ _ _ _ OHE — — CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT. PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE EXISTING POWER POLE _ _ _ _ _ _ _ _ _ _ _ _ Call before you dig. FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM **GATEHOUSE UNIT 1** SCALE: 1"=50 SEWER / WATER CROSSING!!! REFERENCE THIS SHEET FOR DETAIL SEWER / WATER CROSSING!!! REFERENCE THIS REFERENCE THIS SHEET FOR DETAIL SHEET FOR DETAIL 20' P.U.E. CCSUD APPROVAL TO CONSTRUCT VIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE TH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARDS AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING AMARO WAY CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN AMARO WAY THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT. THE ENGINEER OF (50' R.O.W) ECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO COMMENCING CONSTRUCTION, IF CONSTRUCTION OF WATER AND WASTEWATER (IF REQUIRED) UTILITIES HAS NOT COMMENCED WITH 236 233 ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR REVIEW AND APPROVAL. CCSUD REPRESENTATIVE A. NICHOLAS REYNOLDS HORZ SCALE: 1"=50" STA. 1+00.00 - END VERT SCALE: 1"=5" 740 740 8 INCH SEWER LINE 8 INCH SEWER LINE 735 GPM = 28.87 Q = 0.07 CFS ONTRIBUTING LUE = 3 Q = 0.05 CFS PIPE DIAMETER = 8 IN FILL TO BE COMPACTED AT 95% 730 PROCTOR DENSITY CENTERLINE FINAL SUBDIVISION PLAN FILL TO BE COMPACTED AT 95% PROCTOR DENSITY 725 **GATEHOUSE** " WATER LINE SUBDIVISION UNIT 4 PROP. GRADE @ CENTERLINE EXIST. GRADE @ CENTERLINE 147.87 L.F.~8" SDR 26 715 SAN. SWR. PIPE @ 0.34% CITY OF NEW BRAUNFELS PEAK DRY WEATHER COMAL COUNTY PEAK DRY WEATHER 247.67 L.F.~8" SDR 26 LINE "C" SEWER TEXAS 710 CONTRIBUTING LUE = 48 SAN. SWR. PIPE @ 0.34% INV. IN = 712.80 GPM = 31.40 Q = 0.07 CFS ONTRIBUTING LUE = 8 + 20 LF. 160 PSI 274.62 L.F.~8" SDR 26 NEW BRAUNFELS (KFW) 20 LF. 160 PSI GPM = 5.46 Q = 0.02 CFS 79.05 L.F.~8" SDR 26 PIPE DIAMETER = 8 II PIPE PRESSURE RATED PV PIPE PRESSURE RATED PVC 640 N. Walnut Ave. SAN. SWR. PIPE @ 2.8 PIPE DIAMETER = 8 II SDR 26 D-2241 (GREEN, $D_n = 0.15 \, FT.$ $V = 1.17 \, F/S$ S = 0.34% $D_n = 0.08 \, FT$ New Braunfels, TX 78130 8 INCH SEWER LINE 8 INCH SEWER LINE PEAK DRY WEATHER 705 71.89 L.F.~8" SDR 26 COLLIERS ENGINEERING & DESIGN, IN & Design SAN. SWR. PIPE @ 0.34% SAN. SWR. PIPE @ 0.34% CONTRIBUTING LUE = 16 CONTRIBUTING LUE = 14 GPM = 9.46 Q = 0.02 CFSQ = 0.05 CFSCONTRACTOR TO VERIFY DEPTH OF EXIST. 8" SAN SWR PIPE DIAMETER = 8 IN. PIPE DIAMETER = 8 IN. EXISTING SEWER MAIN PRIOR TO START PIPE DIAMETER = 8 IN AS SHOWN 9/11/2024 OF CONSTRUCTION & NOTIFY ENGINEER @ 0.34% S = 1.33% $D_n = 0.06 \, FT$ S = 0.34%IMMEDIATELY OF ANY DISCREPANCIES 700 DRAWING NAME: 5.3 SEWER LINE A STA, 1+00,00 TO V = 1.90 F/S SEWER LINE A STA. 1+00.00 TO END 11+50 10+00 11+00 7+00 8+00 4+00 6+00 3+00 5+00 2+00

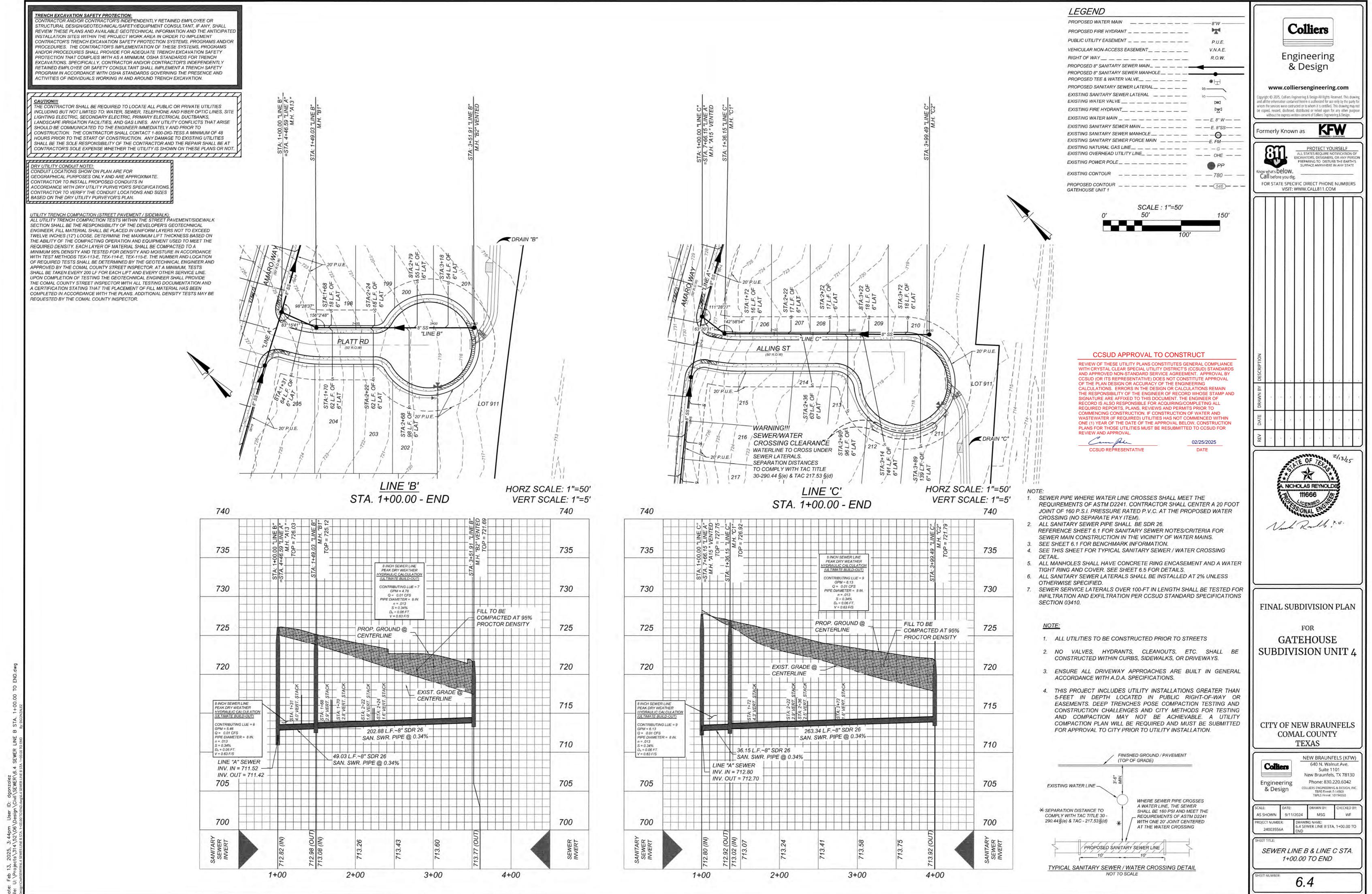
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Suite 1101

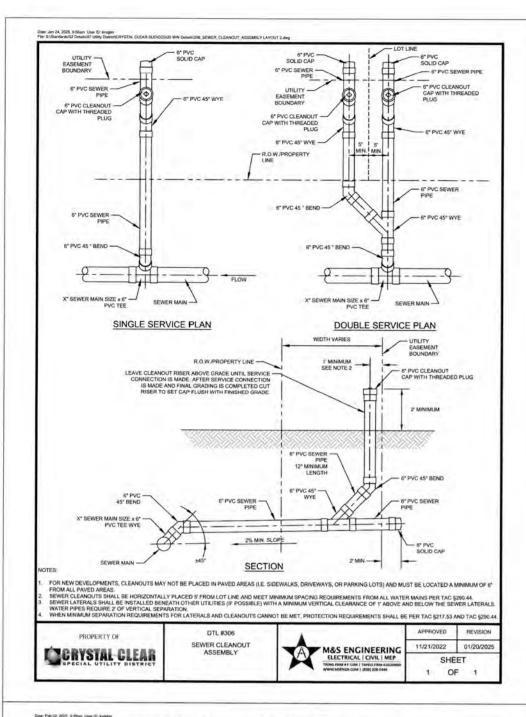
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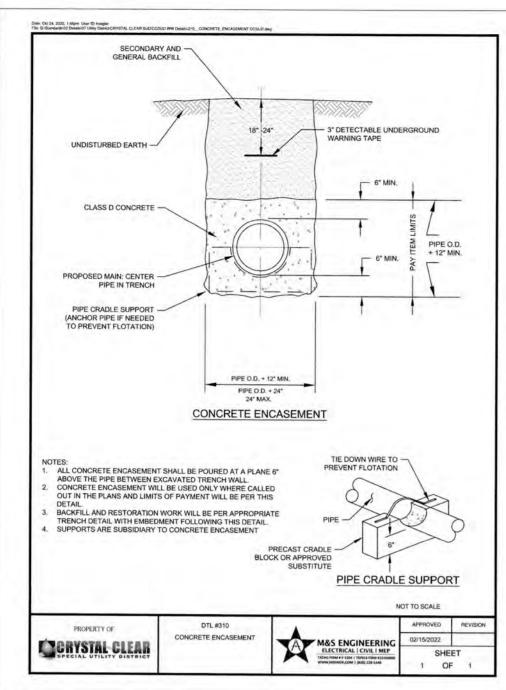
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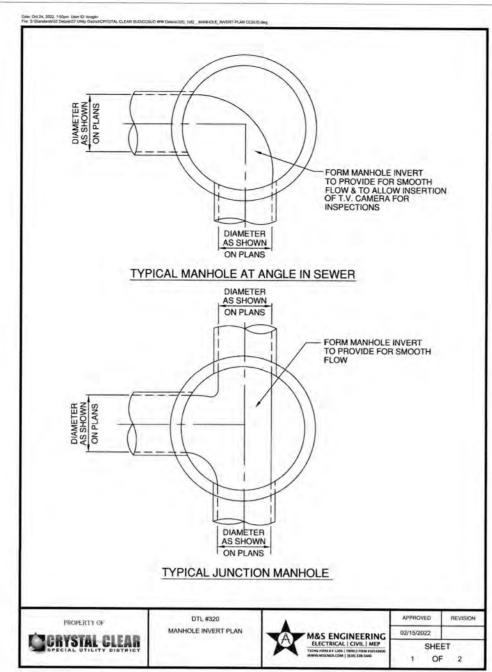
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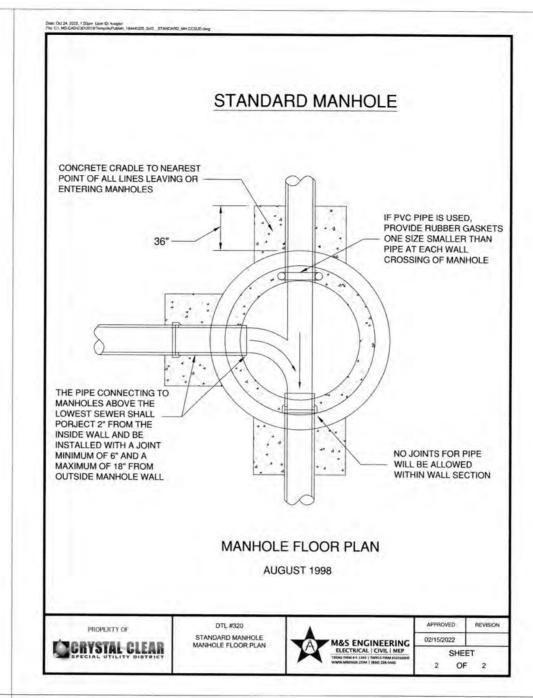


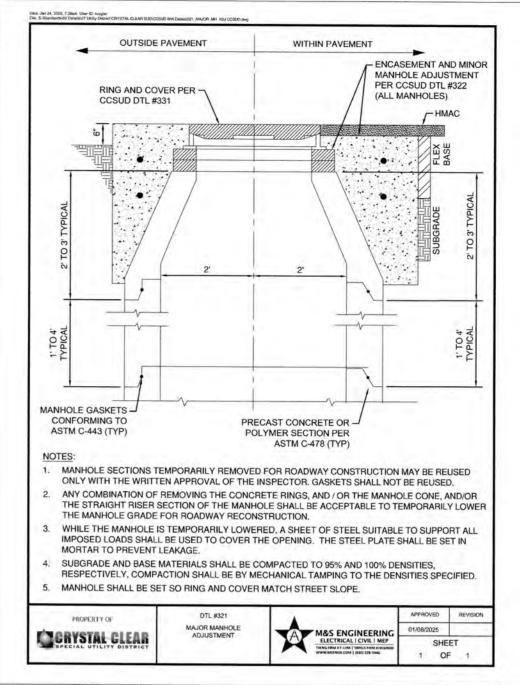
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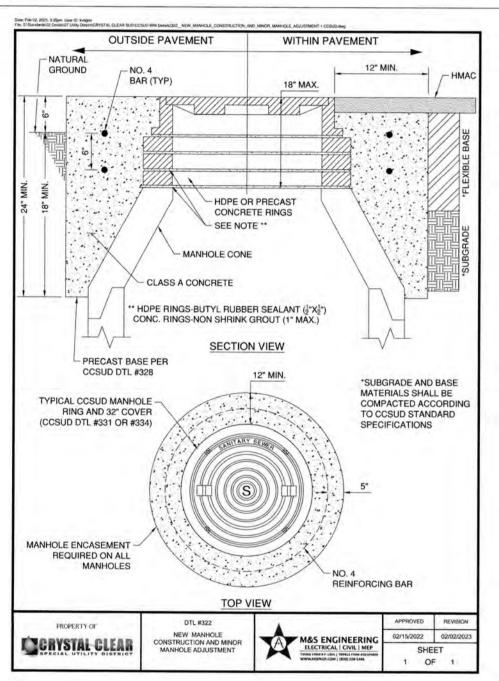


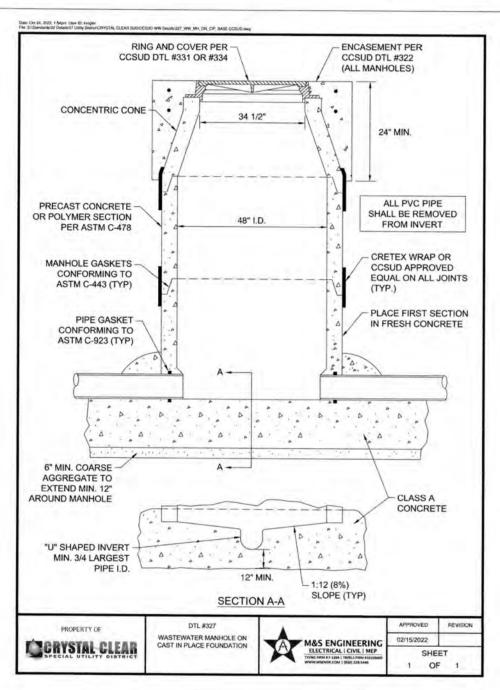


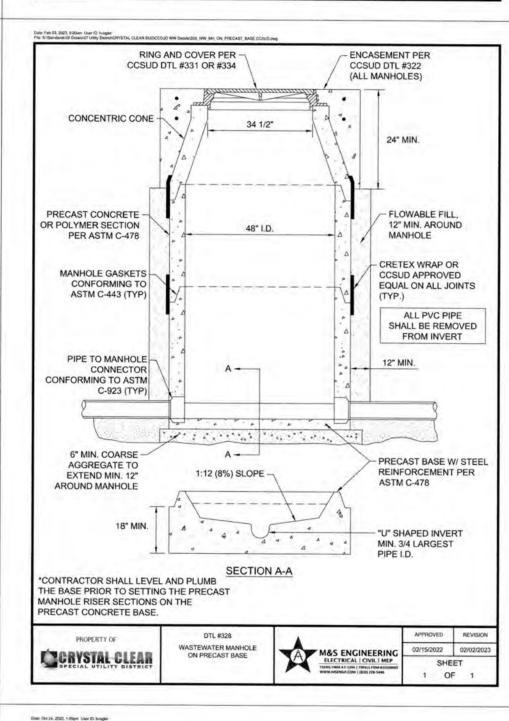


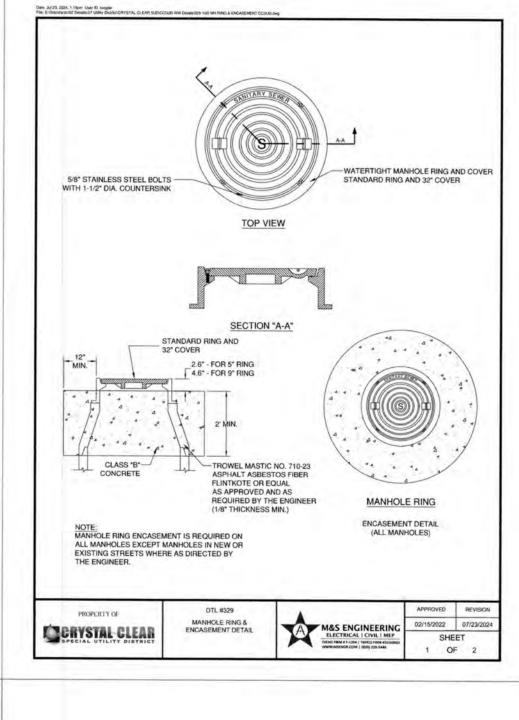


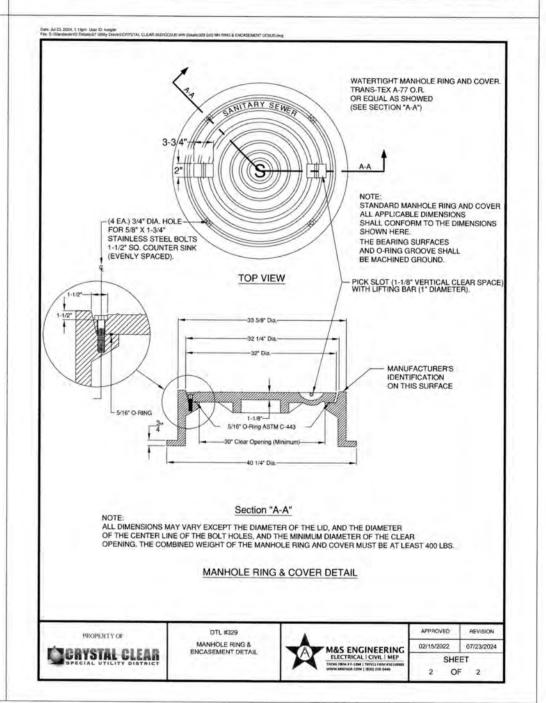


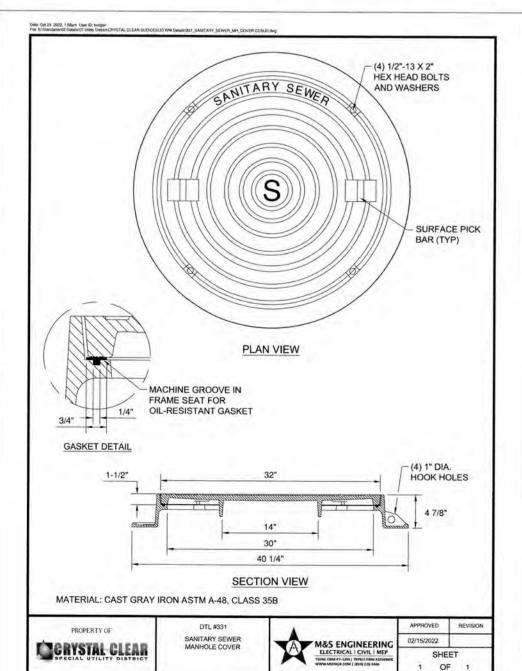


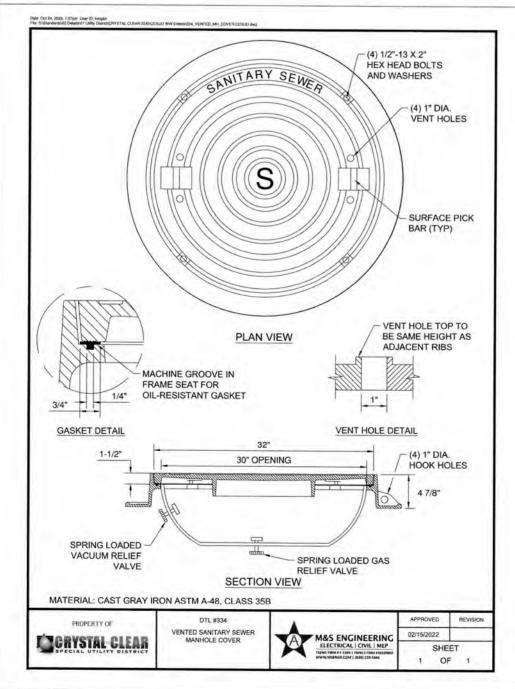


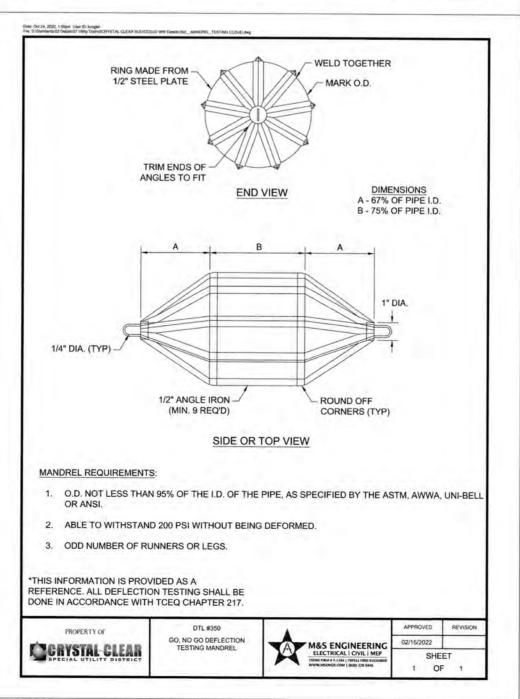












CCSUD APPROVAL TO CONSTRUCT

REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARDS AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT. THE ENGINEER OF RECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO COMMENCING CONSTRUCTION. IF CONSTRUCTION OF WATER AND WASTEWATER (IF REQUIRED) UTILITIES HAS NOT COMMENCED WITHIN ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR

CCSUD REPRESENTATIVE

02/25/2025 DATE

CITY OF NEW BRAUNFELS COMAL COUNTY TEXAS 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 & Design AS SHOWN 9/11/2024 MSG AWING NAME: SANITARY SEWER DETAILS 24003556A SANITARY SEWER DETAILS

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*

A. NICHOLAS REYNOLDS

FINAL SUBDIVISION PLAN

GATEHOUSE

SUBDIVISION UNIT 4

Formerly Known as

ow what's below.

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KFW

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GATEHOUSE SUBDIVISION - UNIT 4

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

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

5. ALL WATER LINE CROSSINGS OF WASTEWATER MAINS SHALL BE PERPENDICULAR

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

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

 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 = 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

 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 = 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

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

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

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

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.

COMAL COUNTY, TEXAS WATER IMPROVEMENTS

CRYSTAL CLEAR SPECIAL UTILITY DISTRICT (CCSUD) WATER

1. CONSTRUCTION OF ALL CCSUD WATER UTILITY INFRASTRUCTURE MUST ADHERE TO CCSUD'S TECHNICAL SPECIFICATIONS, DETAILS AND APPROVED

2. REMOVE ONLY VEGETATION, TREES, STUMPS, RUBBISH, AND OTHER MATERIAL NECESSARY FOR CONSTRUCTION

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

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

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

8. LOCATIONS OF COMBINATION AIR VALVES SHOWN ARE APPROXIMATE. INSTALL AIR RELEASE VALVES AT THE HIGH POINT IN THE WATER MAIN FOR THE LOCATIONS

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.

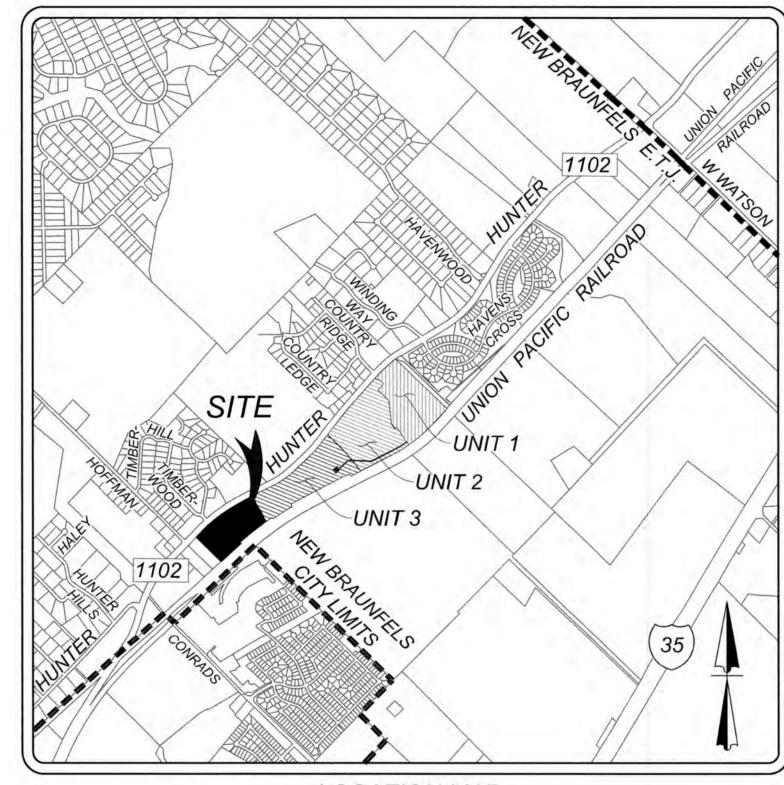
10. ALL WATER MAINS SHALL BE DISINFECTED PER AWWA AND TCEQ STANDARDS.

11. THE OWNER SHALL SUPPLY ALL WATER NEEDED FOR CONSTRUCTION TESTING AND DISINFECTION. THE CONTRACTOR SHALL NOT BE REQUIRED TO PAY FOR

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

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

GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE COUNTY FOR ANY WORK

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 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

REGISTERED PROFESSIONAL ENGINEER P.E. REGISTRATION NO. 111666

CCSUD APPROVAL TO CONSTRUCT

REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARDS AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AND RECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO COMMENCING CONSTRUCTION. IF CONSTRUCTION OF WATER AND ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR

INDEX

DESCRIPTION WATER DISTRIBUTION COVER WATER DISTRIBUTION PLAN

SHEET NO.

NICHOLAS REYNOLD

Colliers

Engineering

& Design

www.colliersengineering.com

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS

VISIT: WWW.CALL811.COM

FINAL SUBDIVISION PLAN

GATEHOUSE SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS COMAL COUNTY TEXAS

Colliers Engineering & Design

NEW BRAUNFELS (KFW) Suite 1101

640 N. Walnut Ave. New Braunfels, TX 78130 Phone: 830.220.6042 COLLIERS ENGINEERING & DESIGN, INC TBPLS Firm#: 10194550

AS SHOWN 7.0 WATER DISTRIBUTION COVER 24003556A

WATER DISTRIBUTION COVER

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION

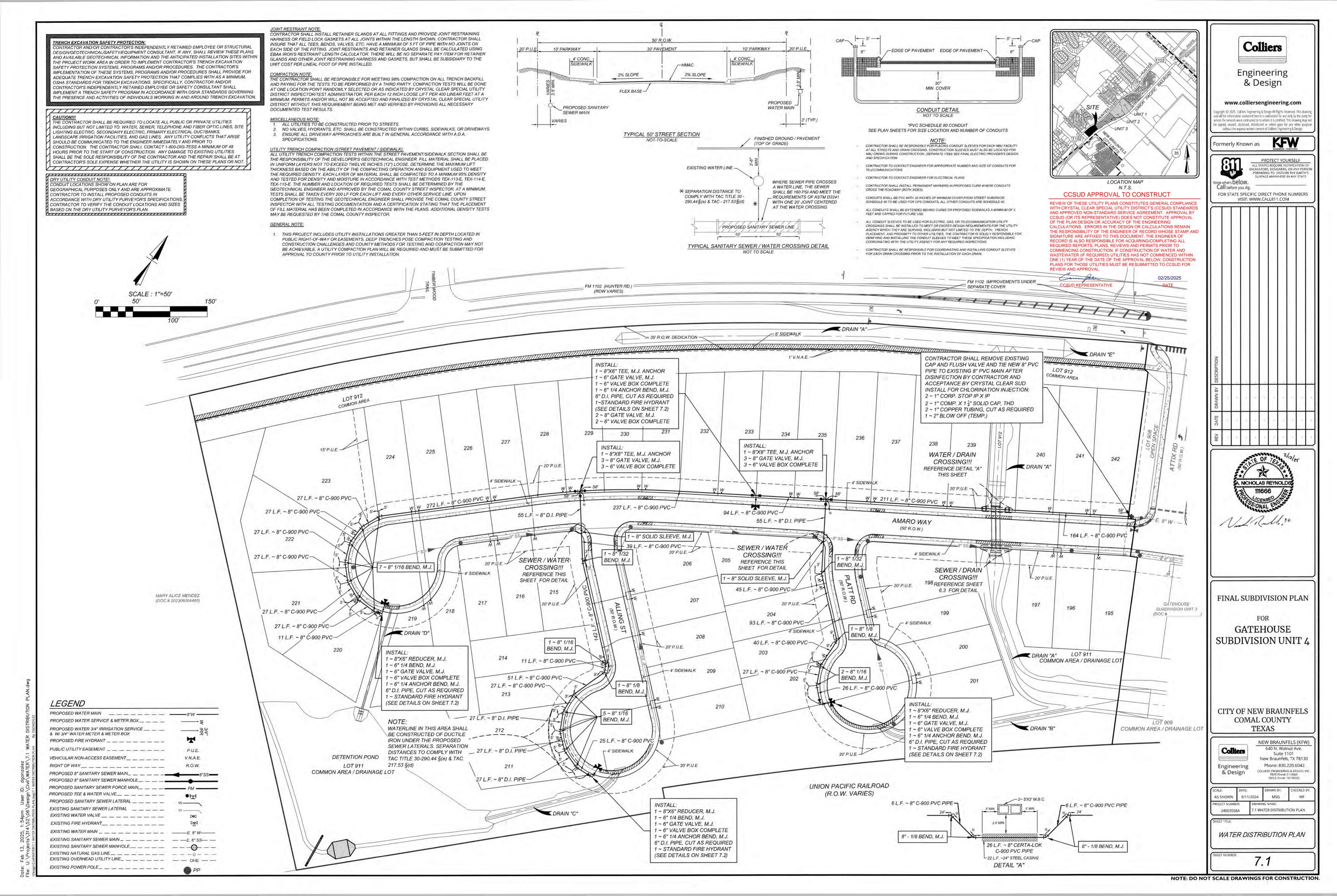
LEGAL DESCRIPTION GATEHOUSE SUBDIVISION UNIT 4

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 DLLOWING REGULATORY AGENCIES LISTED BELOW:

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.





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

Meter Boxes: DFW Plastics, NDS Meter Boxes

Tapping Valves: American, Mueller

Meters: Kamstrun

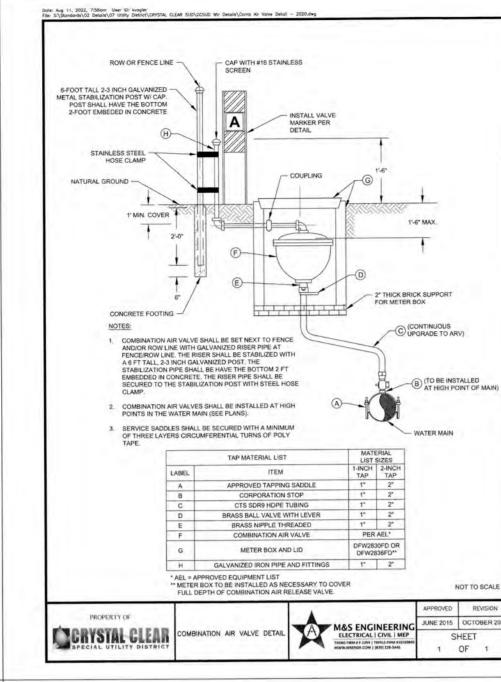
Meters: Kamstrup

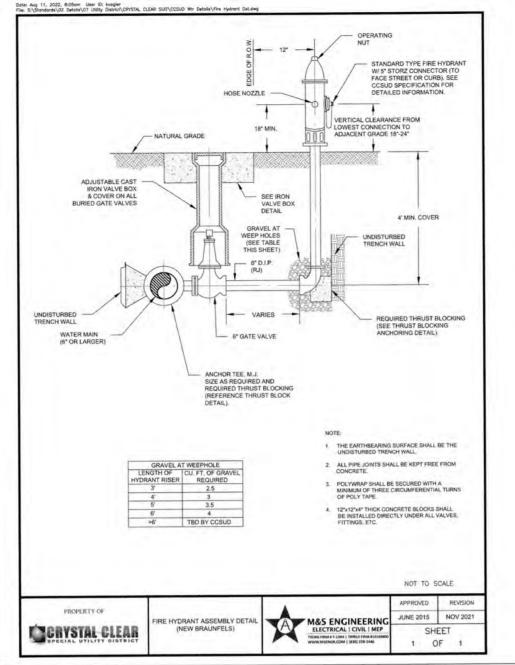
VFD: Yaskawa

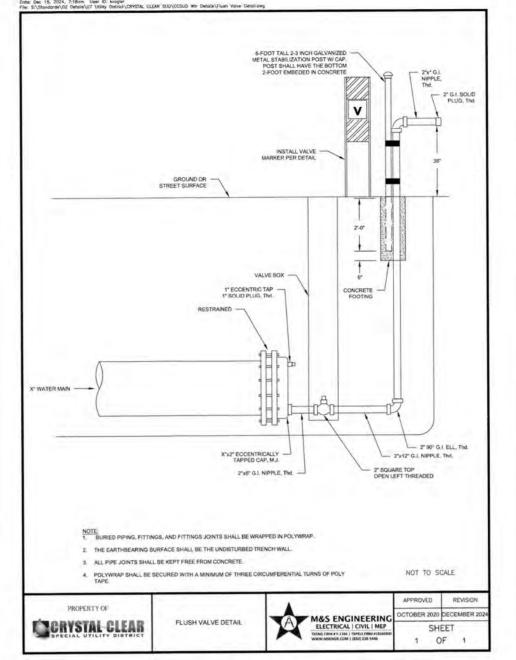
Vertical Turbine Pump: HydroFlo Motors: TECO or US Motor

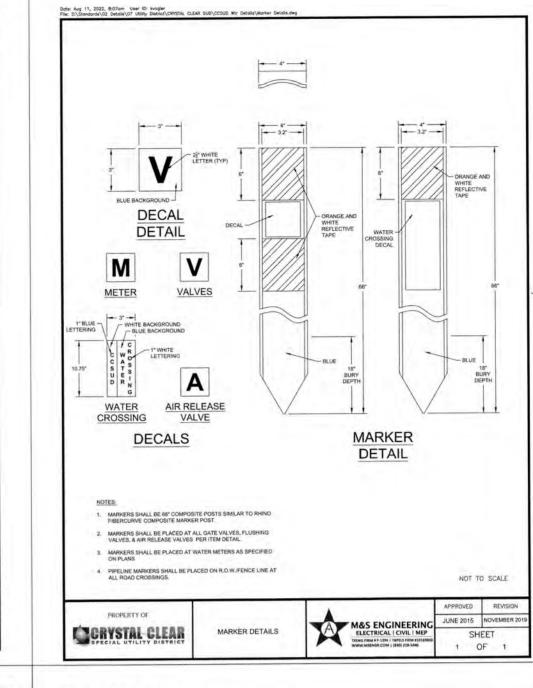
Any equipment to be installed in the CCSUD Distribution or Collection systems must come from the list above. Any equipment installed that is not listed above must be approved by the CCSUD inspector or a CCSUD Manager or the installation is subject to a failed inspection until the correct brand can be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

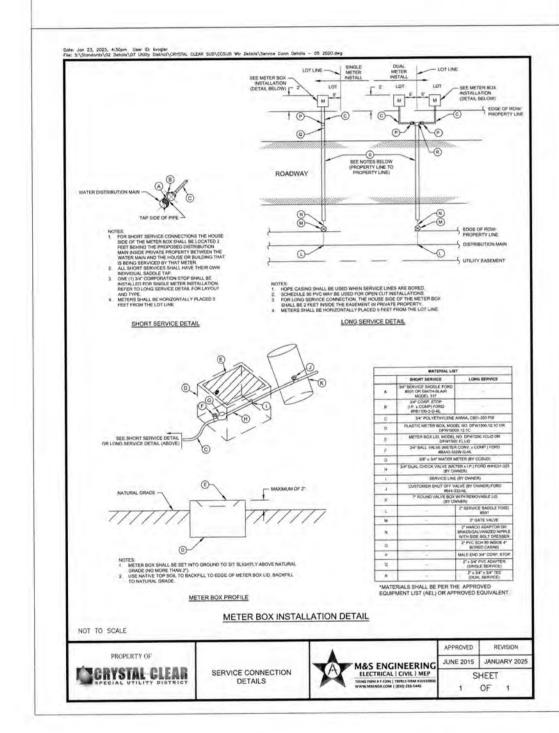
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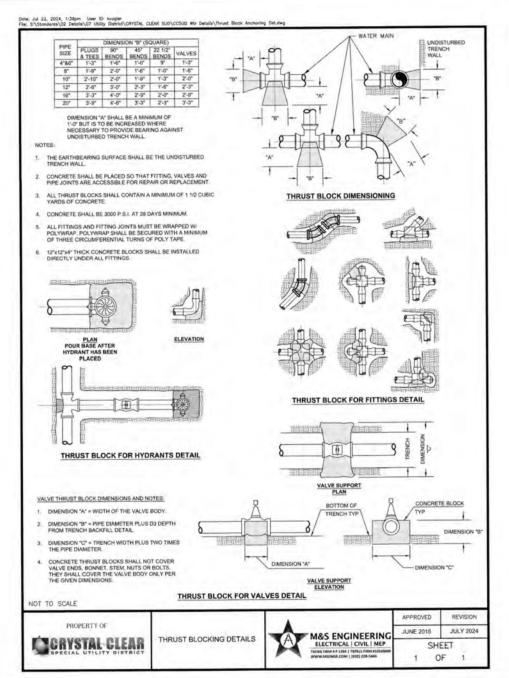


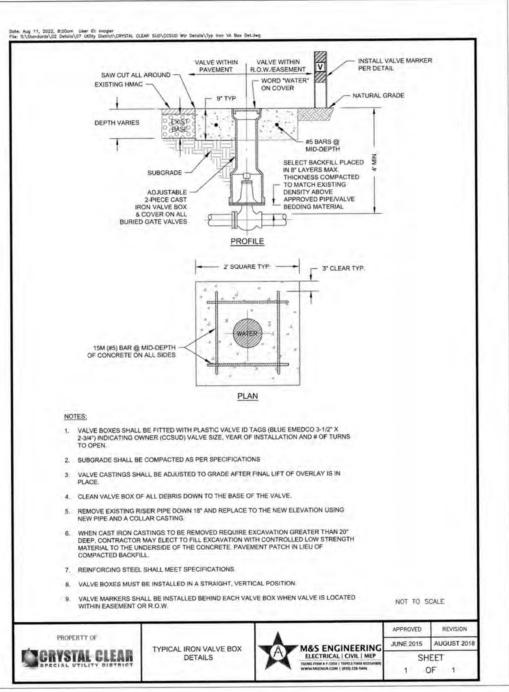


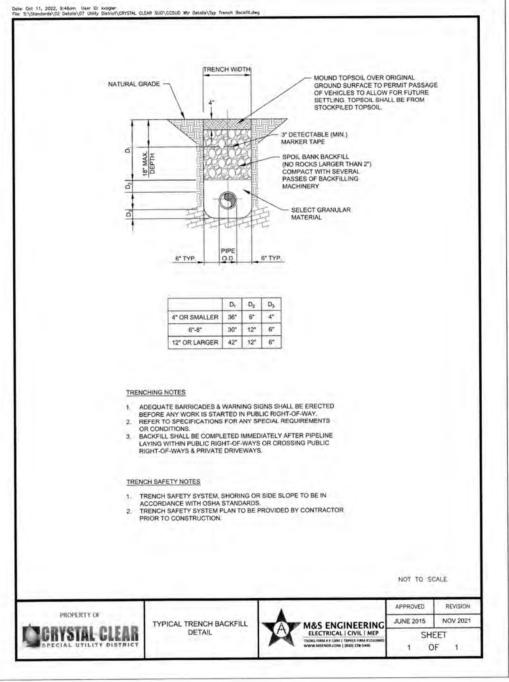


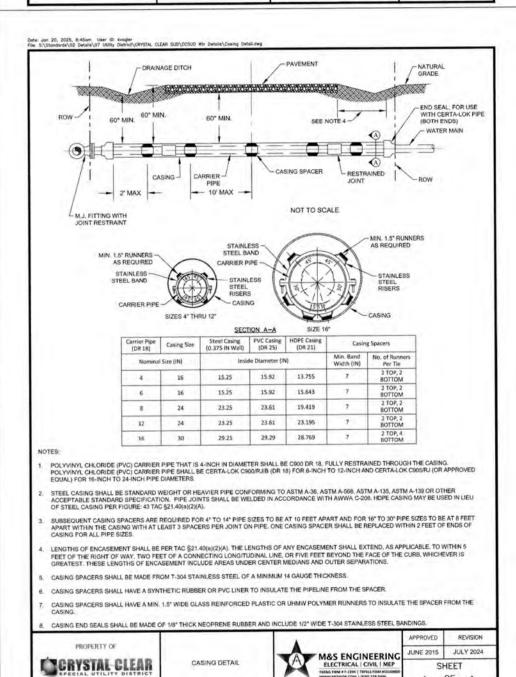


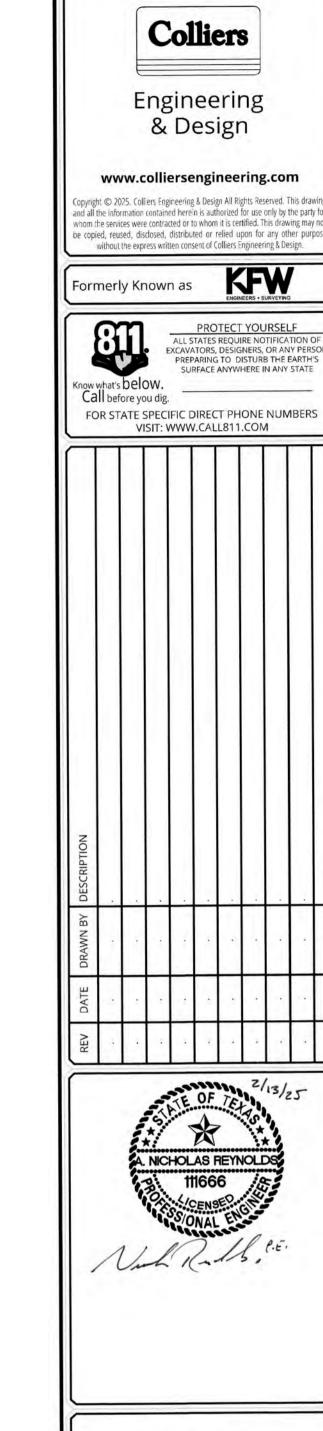












FINAL SUBDIVISION PLAN

FOR
GATEHOUSE
SUBDIVISION UNIT 4

CITY OF NEW BRAUNFELS COMAL COUNTY TEXAS

Colliers

Engineering
& Design

CCSUD APPROVAL TO CONSTRUCT

OF THE PLAN DESIGN OR ACCURACY OF THE ENGINEERING

REVIEW AND APPROVAL.

CCSUD REPRESENTATIVE

REVIEW OF THESE UTILITY PLANS CONSTITUTES GENERAL COMPLIANCE WITH CRYSTAL CLEAR SPECIAL UTILITY DISTRICT'S (CCSUD) STANDARDS

AND APPROVED NON-STANDARD SERVICE AGREEMENT. APPROVAL BY

CCSUD (OR ITS REPRESENTATIVE) DOES NOT CONSTITUTE APPROVAL

CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN

THE RESPONSIBILITY OF THE ENGINEER OF RECORD WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT. THE ENGINEER OF RECORD IS ALSO RESPONSIBLE FOR ACQUIRING/COMPLETING ALL REQUIRED REPORTS, PLANS, REVIEWS AND PERMITS PRIOR TO COMMENCING CONSTRUCTION. IF CONSTRUCTION OF WATER AND WASTEWATER (IF REQUIRED) UTILITIES HAS NOT COMMENCED WITHIN

ONE (1) YEAR OF THE DATE OF THE APPROVAL BELOW, CONSTRUCTION PLANS FOR THOSE UTILITIES MUST BE RESUBMITTED TO CCSUD FOR

02/25/2025

DATE

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

AS SHOWN 9/11/2024 MSG WF
PROJECT NUMBER: DRAWING NAME:
24003556A 7.2 WATER DETAILS

WATER DETAILS

7.2