

CITY OF NEW BRAUNFELS

ELIZABETH AVE. STORM WATER TREATMENT

WATER QUALITY RETROFIT

PLANS PREPARED AND RECOMMENDED FOR APPROVAL BY:

DOUCET & ASSOCIATES, INC.

Date

FLOODPLAIN NOTE:

THE PROPERTY IS LOCATED WITHIN ZONE "X".
NO PORTION OF THE PROJECT APPEAR TO BE LOCATED INSIDE OF THE
100-YEAR FLOODPLAIN AS SHOWN ON F.I.R.M. PANEL NO. 48091C0435F
OF COMAL COUNTY, TEXAS DATED SEPTEMBER 2, 2009.

EDWARDS AQUIFER JURISDICTIONAL BOUNDARY NOTE:
THE SITE IS LOCATED WITHIN THE EDWARDS AQUIFER TRANSITION
ZONE.

*NOTE:

ALL INSPECTIONS ARE TO BE CALLED IN AT 830.221.4068,
OR FAXED IN AT 830.608.2117 OR EMAILED AT
INSPECTION@NBTEXAS.ORG

SURVEY CONTROL:

BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL
ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT
(EPOCH 2010) AND A VERTICAL DATUM OF NAVD88,
GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE GRID
VALUES.
UNITS: US SURVEY FEET.

THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE
COMMITMENT. EASEMENTS OR OTHER MATTERS OF RECORD MAY EXIST
WHERE NONE ARE SHOWN.

BENCHMARK #1
NORTHING = 13,808,469.36
EASTING = 2,244,842.40
ELEVATION = 631.19
BM = MAGNL
DESC = NEAR HISTORICAL SIGN IN FRONT OF WURSTFEST ADMISSION
NORTH ENTRANCE

BENCHMARK #2
NORTHING = 13,808,501.05
EASTING = 2,245,086.88
ELEVATION = 629.49
BM = MAGNL
DESC = EAST OF BENCHMARK #1, NEAR GATE OF ENCLOSED WURSTFEST
STORAGE AREA

BENCHMARK INFORMATION FROM "ELIZABETH AVENUE REALIGNMENT"
CONSTRUCTION DOCUMENTS.

NOTE:
THE WATER QUALITY IMPROVEMENTS WILL BE CONSTRUCTED ALONG SIDE THE
ELIZABETH AVENUE ROADWAY IMPROVEMENTS (BY OTHERS).
PRE-PROJECT CONDITIONS SHOWN FOR THE WATER QUALITY IMPROVEMENTS
REPRESENT, AND INCLUDE, CHANGES TO EXISTING SITE ASSOCIATED WITH
ROADWAY IMPROVEMENTS.

FOR EXISTING CONDITIONS AND ROADWAY IMPROVEMENTS, REFER TO
CONSTRUCTION DOCUMENTS FOR "ELIZABETH AVENUE REALIGNMENT".



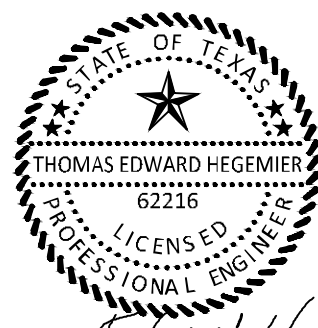
VICINITY MAP

SCALE: 1" = 1,000'

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3	EXISTING SITE, DEMOLITION, AND EROSION CONTROL PLAN
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NOTE:

- ALL CONSTRUCTION ACTIVITIES SHALL MEET THE CITY OF NEW BRAUNFELS AND/OR TXDOT CONSTRUCTION STANDARDS.
- ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
- PROJECT IS A TYPE 2 DEVELOPMENT.
- IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
- THIS PROJECT IS FUNDED BY THE EDWARDS AQUIFER HABITAT CONSERVATION PROGRAM (EAHCP) AND THE CITY OF NEW BRAUNFELS.



Thomas Edward Hegemier
4/20/2021

Scale: 1"=
Designed: GP/OF
Drawn: GP/OF
Reviewed: TEH
Date: 4/20/2021

SHEET

1

1 OF 10

Project No.:
1757-006

CONSTRUCTION PLAN NOTES

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

THE MOST CURRENT EDITIONS OF THE 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 CITY OF NEW BRAUNFELS STANDARD DETAILS.

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

PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS TO SCHEDULE A PRECONSTRUCTION MEETING.

- FOR PUBLIC INFRASTRUCTURE PERMIT (SC) OR SITE PREP PERMIT (SD) PROJECTS:
- ALL INSPECTIONS ARE TO BE CALLED IN AT 830-221-4068.
 - YOU MUST CALL BEFORE 12:00 P.M., 24 TO 48 HOURS PRIOR TO YOUR INSPECTION REQUEST.
 - IF YOU LEAVE INCOMPLETE INFORMATION, YOUR REQUEST FOR INSPECTION WILL NOT BE ACCEPTED/SCHEDULED.
 - EACH INSPECTION WILL BE ALLOTTED 1 HOUR UNLESS YOU REQUEST FOR MORE TIME.
 - ONCE YOUR REQUEST HAS BEEN ACCEPTED, YOU WILL RECEIVE A CALL FROM THE ENGINEERING INSPECTOR.
- FOR COMMERCIAL PERMIT (CP) PROJECTS:
- ALL INSPECTIONS ARE TO BE CALLED IN AT 830-221-4068 OR,
 - FAXED IN AT 830-608-2117 OR,
 - E-MAILED AT INSPECTIONS@NBTEXAS.ORG.

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.

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.

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 CITY ENGINEER AND PROJECT ENGINEER IF THE PRESENCE OF GROUNDWATER WITHIN THE SITE IS EVIDENT. UPON NOTIFICATION THE PROJECT ENGINEER SHALL RESPOND WITH PLAN REVISIONS FOR THE MITIGATION OF THE GROUNDWATER ISSUE. THE CITY ENGINEER SHALL RESPOND WITHIN TWO (2) BUSINESS DAYS UPON RECEIPT OF THE MITIGATION PLAN. ALL CONSTRUCTION ACTIVITY, IMPACTED BY THE DISCOVERY OF GROUNDWATER, SHALL BE SUSPENDED UNTIL THE CITY ENGINEER GRANTS A WRITTEN APPROVAL OF THE GROUNDWATER MITIGATION PLAN.

RECORD DRAWINGS

AS PER PLATTING ORDINANCE SECTION 118-38M.: WHEN ALL OF THE IMPROVEMENTS ARE FOUND TO BE CONSTRUCTED AND COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND WITH THE CITY'S STANDARDS, AND UPON RECEIPT OF ONE SET OF "RECORD DRAWING" PLANS, AND A DIGITAL COPY OF ALL PLANS (PDF COPY) THE CITY ENGINEER SHALL ACCEPT SUCH IMPROVEMENTS FOR THE CITY OF NEW BRAUNFELS, SUBJECT TO THE GUARANTY OF MATERIAL AND WORKMANSHIP PROVISIONS IN THIS SECTION.

CONSTRUCTION NOTE

ENGINEER OF RECORD IS RESPONSIBLE TO ENSURE THAT EROSION CONTROL MEASURES AND STORMWATER CONTROL SUFFICIENT TO MITIGATE OFF SITE IMPACTS ARE IN PLACE AT ALL STAGES OF CONSTRUCTION.

DRAINAGE NOTE

DRAINAGE IMPROVEMENTS SUFFICIENT TO MITIGATE THE IMPACT OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ADDING IMPERVIOUS COVER.

FINISHED FLOOR ELEVATIONS

THE ELEVATION OF THE LOWEST FLOOR SHALL BE AT LEAST 10 INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND, WHICH SHALL BE SLOPED IN A FASHION SO AS TO DIRECT STORMWATER AWAY FROM THE 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.

SOILS TESTING

PROCTORS SHALL BE SAMPLED FROM ON-SITE MATERIAL (ON-SITE IS DEFINED AS LIMITS OF CONSTRUCTION FOR THIS -PLAN SET) AND A COPY OF THE PROCTOR RESULTS SHALL BE DELIVERED TO THE CITY OF NEW BRAUNFELS STREET INSPECTOR PRIOR TO ANY DENSITY TESTS.

ROADWAY

ALL ROADWAY COMPACTION TESTS SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FLEXIBLE BASE OR FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED EIGHT-INCHES (8") LOOSE. EACH LAYER OF MATERIAL, INCLUSIVE OF SUBGRADE, SHALL BE COMPACTED AS SPECIFIED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT. UPON COMPLETION OF TESTING, THE GEOTECHNICAL ENGINEER WILL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FLEXIBLE BASE, AND FILL MATERIAL, AND SUBGRADE, HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR.

ITEM 340

ASPHALTIC CONCRETE PAVEMENT SHALL BE TYPE "D" HOT MIX ASPHALT AS DEFINED IN TXDOT'S STANDARD SPECIFICATIONS FOR CURRENT TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREET AND BRIDGES.

THE CITY OF NEW BRAUNFELS WILL NOT ACCEPT THE USE OF RECYCLED ASPHALT PAVEMENT (RAP) OR RECYCLED ASPHALT SHINGLES (RAS) IN ASPHALT MIXTURES FOR NEW ROADWAYS. ANY DEBRIS INCLUSIONS WITHIN NEW ASPHALT PAVEMENTS WILL RESULT IN ASPHALT REMOVAL AND REPLACEMENT FROM CURB TO CURB FOR LIMITS TO BE DETERMINED BY THE CITY OF NEW BRAUNFELS.

THE ASPHALTIC CONCRETE SURFACE COURSE SHALL BE PLANT MIXED, HOT LAID TYPE "D" MEETING THE SPECIFICATION REQUIREMENTS OF TXDOT ITEM 340. THE MIX SHALL BE DESIGNED FOR A STABILITY OF AT LEAST 35 AND SHALL BE COMPACTED TO BETWEEN 91 AND 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY TXDOT TEST METHOD TEX-227-F. THE ASPHALT CEMENT CONTENT BY PERCENT OF TOTAL MIXTURE WEIGHT SHALL FALL WITHIN A TOLERANCE OF ± 0.5 PERCENT FROM A SPECIFIC MIX DESIGN.

UTILITY TRENCH COMPACTION(ADDED TO THE CONSTRUCTION PLANS ON ALL UTILITY PLAN SHEETS).

ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN

ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR.

CURB CUT DUE TO CONSTRUCTION OF NEW RIGHT-OF-WAY CONSTRUCTION

(INDICATE THE 2 OPTIONS ON THE CONSTRUCTION PLANS).

1. SAWCUT EXISTING STREET AND MATCH TO NEW CONSTRUCTION.
2. SAWCUT EXISTING CURB TO TIE INTO EXISTING CONSTRUCTION.

CONSTRUCTION STABILIZED ENTRANCE

SAWCUT CURB FOR CONSTRUCTION ENTRANCE.

STABILIZED CONSTRUCTION AREA SHALL BE CONSTRUCTED OF 3"x5" ROCK TO BE PLACED A MINIMUM LENGTH OF 25-FT. AND MAINTAINED SO THAT CONSTRUCTION DEBRIS DOES NOT FALL WITHIN THE CITY RIGHT-OF-WAY. RIGHT-OF-WAY MUST BE CLEARED FROM MUD, ROCKS, ETC. AT ALL TIMES.

(NOTES TO BE PLACED ON ALL WW PLAN & DETAIL SHEETS)

ENSURE ALL DRIVEWAY APPROACHES ARE BUILT IN GENERAL ACCORDANCE WITH A.D.A. SPECIFICATIONS.

NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.

SIGNING AND PAVEMENT MARKING PLAN NOTES

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL REGULATORY AND WARNING SIGNS, STREETS NAME SIGNS AND SIGN MOUNTS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CITY 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 CITY AT LEAST TWENTY-FOUR (24) HOURS PRIOR TO THE INSTALLATION OF ALL SEALER AND FINAL MARKINGS. THE CITY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.

SEEDING AND ESTABLISHMENT OF VEGETATION WITHIN EARTHEN CHANNELS, STORMWATER BASINS AND DISTURBED AREAS

SEEDING FOR THE PURPOSE OF ESTABLISHING VEGETATION WITHIN CONSTRUCTED EARTHEN CHANNELS, BASINS AND DISTURBED AREAS SHALL BE CONDUCTED IN ACCORDANCE WITH ITEM 164 (SEEDING FOR EROSION CONTROL) OF TXDOT'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES MANUAL. ONLY SEED TYPES AND MIXES SPECIFIED FOR THE SAN ANTONIO DISTRICT (DISTRICT 15) IN TABLE 1 AND 2 UNDER ITEM 164 SHALL BE UTILIZED. DURING THE COOL SEASON (SEPT 1-NOV 30), CEREAL RYE AND SEED SPECIES SPECIFIED FOR THE SAN ANTONIO DISTRICT IN TABLE 3 MAY BE USED. FOR COOL SEASON SEEDING APPLICATIONS, COOL SEASON SEED MIXES SHALL BE USED IN CONJUNCTION WITH SEED MIXES FOR THE SAN ANTONIO DISTRICT AS SPECIFIED IN TABLE 1 AND 2 UNDER ITEM 164.

IT MAY BE DEEMED NECESSARY TO INCORPORATE TOPSOIL AND SOIL AMENDMENTS (I.E. COMPOST/ FERTILIZER) INTO EXISTING SOIL IN ORDER TO FACILITATE VEGETATION GROWTH. TOPSOIL, COMPOST AND FERTILIZER ADDITIONS SHALL BE CONDUCTED ACCORDING TO ITEMS 160, 161 AND 166 OF TXDOT'S STANDARD SPECIFICATIONS MANUAL, RESPECTIVELY.

WATERING MAY ALSO BE NECESSARY TO FACILITATE AND EXPEDITE THE SPROUTING AND GROWTH OF VEGETATION. ITEM 168 OF TXDOT'S STANDARD SPECIFICATIONS MANUAL SHALL BE ADHERED TO FOR VEGETATIVE WATERING.

IF EXTENDED DROUGHT CONDITIONS EXIST THAT HINDER OR PROHIBIT THE GROWTH AND ESTABLISHMENT OF VEGETATION, THE CONTRACT/ DEVELOPER SHALL PROVIDE A PLAN TO THE CITY OF NEW BRAUNFELS DESCRIBING THE MEASURES THAT WILL BE TAKEN TO STABILIZE EARTHEN DRAINAGE INFRASTRUCTURE UNTIL A TIME WHEN GROWING CONDITIONS BECOME MORE FAVORABLE.

GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THE PROJECT SHALL BE APPROVED BY NEW BRAUNFELS UTILITIES AND COMPLY WITH THE CURRENT "NEW BRAUNFELS UTILITIES WATER SYSTEMS CONNECTION/CONSTRUCTION POLICY".
2. CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE PLANS FROM THE CONSULTANT ENGINEER AND NOTIFY NBU WATER SYSTEMS ENGINEERING AT 830-608-8971 WITH AT LEAST TWO (2) WORKING DAYS (48 HOURS) NOTICE. WORK COMPLETED BY THE CONTRACTOR, WHICH HAS NOT RECEIVED A NOTICE TO PROCEED FROM NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.
3. THE DEVELOPER DEDICATES THE WATER / WASTEWATER MAINS UPON COMPLETION BY THE CONTRACTOR AND ACCEPTANCE BY THE NEW BRAUNFELS UTILITIES WATER SYSTEM. NBU WILL OWN AND MAINTAIN SAID WATER / WASTEWATER MAINS WHICH ARE LOCATED WITHIN PLATTED UTILITY EASEMENTS OR PUBLIC ROW OF PROPOSED DEVELOPMENTS. (AS APPLICABLE).
4. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNERS AND THE ENGINEER AND HIS EMPLOYEES, PARTNERS OFFICERS, DIRECTORS, OR CONSULTANTS HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR ENGINEER, ENGINEER'S DIRECTORS, OFFICERS, EMPLOYEES, OR CONSULTANTS.
5. CONTRACTOR TO CONTACT THE ENGINEER-OF-RECORD (EOR) FOR ANY FIELD CHANGES. ANY REVISIONS OR CHANGES TO THE APPROVED CONSTRUCTION PLANS WILL REQUIRE ADDITIONAL APPROVAL BY NBU IN WRITING.
6. CONTRACTOR AND / OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION, ANY DAMAGES DONE TO EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, LANDSCAPING AND STRUCTURES, AND EXISTING UTILITIES (NOT ADJUSTED ON PLANS). COST OF RESTORATIONS, IF ANY, SHALL BE THE CONTRACTOR'S ENTIRE EXPENSE.
8. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN VICINITY OF TREES SHALL PROCEED WITH CAUTION.
9. CONTRACTOR SHALL PROCURE ALL PERMITS AND LICENSES, PAY ALL CHARGES, FEES AND TAXES AND GIVE ALL NOTICES NECESSARY AND INCIDENTAL TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.
10. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM TO WHICH IT RELATES.
11. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PERMANENTLY PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.
12. THE CONTRACTOR SHALL NOT PLACE ANY MATERIALS ON THE RECHARGE ZONE OF THE EDWARDS AQUIFER WITHOUT AN APPROVED WATER POLLUTION ABATEMENT PLAN FROM THE TCEQ 31 CAC 313.4 AND 31 TAC 313.9.
13. BARRICADES AND WARNING SIGNS SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND SHALL BE LOCATED TO PROVIDE MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT WHILE PROVIDING CONTINUOUS TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL DEVICES DURING CONSTRUCTION.
14. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS. THE TERM "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY BOTH HORIZONTAL AND VERTICAL ALIGNMENT.
15. THE LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, SHOWN WITHIN THE RIGHT OF WAY ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE BEGINNING CONSTRUCTION OPERATIONS.
16. OSHA REGULATIONS PROHIBIT OPERATIONS THAT WILL BRING PERSONS OR EQUIPMENT WITHIN 10 FEET OF AN ENERGIZED LINE, WHERE WORKMEN AND/OR EQUIPMENT HAVE TO WORK CLOSE TO AN ENERGIZED ELECTRICAL LINE, THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL POWER COMPANY INVOLVED AND MAKE WHATEVER ADJUSTMENTS NECESSARY TO ENSURE THE SAFETY OF THOSE WORKMEN.

17. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION. CONTRACTORS SHALL CALL THE ONE CALL SYSTEM FOR WATER/WASTEWATER LOCATION.
18. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192 (8), GAS COMPANIES MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
19. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE TRAFFIC CONTROL AND WILL BE RESPONSIBLE FOR FURNISHING ALL TRAFFIC CONTROL DEVICES AND FLAGGERS. THE CONSTRUCTION METHODS SHALL BE CONDUCTED TO PROVIDE THE LEAST POSSIBLE INTERFERENCE TO TRAFFIC SO AS TO PERMIT THE CONTINUOUS MOVEMENT OF THE TRAFFIC IN ONE DIRECTION AT ALL TIMES. THE CONTRACTOR SHALL CLEAN UP AND REMOVE FROM THE WORK AREA ANY LOOSE MATERIAL RESULTING FROM CONTRACT OPERATIONS AT THE END OF EACH WORKDAY.
20. PRIOR TO ORDERING MATERIALS TO BE USED IN CONSTRUCTION, CONTRACTOR SHALL PROVIDE THE ENGINEER WITH FOUR (4) COPIES OF THE SOURCE, TYPE, GRADATION, MATERIAL SPECIFICATION DATA AND / OR SHOP DRAWINGS, AS APPLICABLE, TO SATISFY THE REQUIREMENTS OF THE FOLLOWING ITEMS AND ALL MATERIAL ITEMS REFERRED TO IN THESE LISTED ITEMS:
 - a. WATER MAINS AND SERVICES
 - b. WASTEWATER MAINS AND SERVICES
21. THRUST BLOCKS WILL NOT BE ALLOWED ON THE SYSTEM WITHOUT SPECIAL APPROVAL. JOINTS WILL BE RESTRAINED WITH RESTRAINING SYSTEMS APPROVED BY NBU AND RESTRAINT LENGTH SHALL BE SUBMITTED TO NBU AT THE TIME OF PLAN SUBMITTAL.
22. WATER JETTING THE BACKFILL WITHIN A STREET WILL NOT BE PERMITTED. WASTEWATER TRENCHES SUBJECT TO TRAFFIC SHALL CONFORM TO NBU CONNECTION AND CONSTRUCTION POLICY MANUAL.
23. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN WASTEWATER LINES AND WATER LINES / MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF WASTEWATER LINES SHALL BE IN STRICT ACCORDANCE WITH 30 TAC 217.
24. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
25. UTILITY TRENCH COMPACTION WITH STREET R.O.W.
 - a. ALL UTILITY TRENCH COMPACTION TEST WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER.
 - b. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE.
 - c. EACH LAYER OF MATERIAL SHALL BE COMPACTED AS SPECIFIED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEXT METHODS TEX-113-E, TEX-114-E, TEX-115-E.
 - d. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEO-TECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR.
 - e. UPON COMPLETION OF TESTING THE GEO-TECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

WATER NOTES:

1. ALL WATER MAINS SHALL BE AWWA C900 (CLASS 150 OR GREATER).
2. WATER SERVICES SHALL BE SINGLE 1" COPPER TUBING.
3. WATER LINE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NBU SYSTEMS CONNECTION & CONSTRUCTION POLICY.
4. WATER MAIN SHALL HAVE A MINIMUM OF 42 INCHES OF COVER, OTHERWISE CONCRETE ENCASEMENT WILL BE REQUIRED.
5. EACH UNIT IN A DUPLEX, TRIPLEX, FOURPLEX, OR CONDOMINIUM SHALL BE PROVIDED WITH AN INDIVIDUAL WATER METER. A MASTER METER CAN BE CONSIDERED FOR SEPARATE BUILDINGS, HOWEVER, THOSE BUILDINGS MUST BE PLUMBED TO ALLOW SEPARATE METERS FOR FUTURE CONSIDERATION.
6. CONTRACTOR WILL KEEP THE AREA ON TOP OF AND AROUND THE WATER METER BOX FREE OF ALL OBJECTS AND DEBRIS.
7. INITIAL BACKFILL OF WATER LINES SHALL BE MANUFACTURED SAND OR PEA GRAVEL AS PER NBU SYSTEMS CONNECTION & CONSTRUCTION POLICY.
8. SECONDARY BACKFILL OF WATER LINES SHALL GENERALLY CONSIST OF MATERIAL REMOVED FROM THE TRENCH AND SHALL BE FREE FROM BRUSH, DEBRIS AND TRASH OR STONES HAVING ANY DIMENSION LARGER THAN 6" INCHES AT THE LARGEST DIMENSION.
9. HYDROSTATIC TESTING IS DONE FROM VALVE TO VALVE.
10. NO METER BOXES TO BE SET IN DRIVEWAYS OR SIDEWALKS. ANY METER BOXES SET IN DRIVEWAYS OR SIDEWALKS WILL BE RELOCATED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
11. METER BOXES MUST BE SET AT THE PROPOSED GRADE. ANY METER BOXES THAT ARE NOT SET AT THE FINAL GRADE WILL BE ADJUSTED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
12. ACCEPTABLE METER BOXES ARE D13-BAMR AND D15-BAMR. NEW RESIDENTIAL LOTS ARE REQUIRED TO USE THE D15-BAMR METER BOXES (DOUBLE AMR). COMMERCIAL LOTS SHOULD CHOOSE WHICH BOX APPLIES TO THE DOMESTIC AND/OR IRRIGATION METER LAYOUT.
13. THRUST BLOCKS WILL NOT BE ALLOWED ON THE SYSTEM WITHOUT SPECIAL APPROVAL. JOINTS WILL BE RESTRAINED WITH RESTRAINING SYSTEMS APPROVED BY NBU AND RESTRAINT LENGTH SHALL BE SUBMITTED TO NBU AT THE TIME OF PLAN SUBMITTAL.
14. CONTRACTOR SHALL PLACE TRACER WIRE ON TOP OF THE WATER MAINS. TRACER WIRE SHOULD RUN FROM VALVE TO VALVE AND EXIT AT THE VALVE BOX. THE TRACER WIRE SHOULD BE ATTACHED TO THE TOP OF THE PIPE USING TAPE. EXCESS WIRE SHOULD BE LEFT WITHIN VALVE BOXES TO BE PLACED WITHIN LID OF COVER.

WASTEWATER NOTES:

1. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING WASTEWATER SYSTEM AT ALL TIMES DURING CONSTRUCTION.
2. A MINIMUM OF 8" WASTEWATER PIPE AND FITTINGS (P.V.C. SDR-26, ASTM, D-3034, D-3212, F-477) ARE REQUIRED ON NEW INSTALLATION.
3. ALL RESIDENTIAL WASTEWATER SERVICE LATERALS SHALL BE EXTENDED TO THE PROPERTY LINE AND A CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE. SERVICES TO LOTS WILL EXTEND FOUR (4) FEET PAST THE UNDERGROUND ELECTRIC CONDUIT IF ELECTRIC IS INSTALLED IN THE FRONT EASEMENT.
4. PIPE BEDDING OF WASTEWATER LINES SHALL BE MANUFACTURED SAND OR PEA GRAVEL AS PER NBU SPECIFICATIONS.
5. SECONDARY BACKFILL OF WASTEWATER LINES SHALL GENERALLY CONSIST OF MATERIALS REMOVED FROM THE TRENCH AND SHALL BE FREE FROM BRUSH, DEBRIS AND TRASH, NO ROCKS OR STONES HAVING ANY DIMENSION LARGER THAN 6 INCHES AT THE LARGEST DIMENSION.
6. ALL WASTEWATER PIPES SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 30 TAC §217.53 (C) (2).
7. FOR WASTEWATER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL SHALL BE PLACED IN TWO LIFTS.
 - a. THE FIRST LIFT SHALL BE SPREAD UNIFORMLY AND SIMULTANEOUSLY ON EACH SIDE AND UNDER THE SHOULDER 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. FOR PIPES LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.
8. ALL MANHOLES MUST BE WATER TIGHT, EITHER MONOLITHIC, CAST-IN-PLACE CONCRETE STRUCTURES OR PREFABRICATED MANHOLES SPECIFICALLY APPROVED BY NBU. 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 NBU ENGINEERING, ARE TO HAVE COVERS WITH 32" OPENINGS.
11. WASTEWATER PIPE CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL "BOOT TYPE" JOINT AS APPROVED BY NBU.
12. WASTEWATER LINES 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 / MAINS 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 150 PSI AND SHALL BE IN ACCORDANCE WITH 30 TAC §217.53 (D) (3) (A) (I).
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. WASTEWATER MAIN CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WILL REQUIRE SUCCESSFUL TESTING OF THE MAN-HOLE IN ACCORDANCE WITH NBU CONNECTION & CONSTRUCTION POLICY MANUAL.
18. 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 NBU WATER SYSTEMS.
19. ALL MANHOLES NOT WITHIN PAVED STREETS SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBU DETAIL DRAWING #329.
20. ALL MANHOLES OVER THE EDWARDS AQUIFER RECHARGE ZONE SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBU DETAIL DRAWING #329.

STANDARD SEQUENCE OF CONSTRUCTION

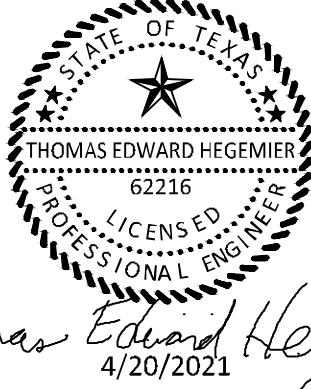
1. TEMPORARY EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSTALLED AS INDICATED ON THE APPROVED SITE PLAN OR SUBDIVISION CONSTRUCTION PLAN AND IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) THAT IS REQUIRED TO BE POSTED ON THE SITE. INSTALL TREE PROTECTION AND INITIATE TREE MITIGATION MEASURES.
2. THE ENVIRONMENTAL PROJECT MANAGER OR SITE SUPERVISOR MUST CONTACT THE CITY OF NEW BRAUNFELS TO SET A PRECONSTRUCTION MEETING. FOR PUBLIC INFRASTRUCTURE PERMIT (SC) OR SITE PREP PERMIT (SD) PROJECTS:
 - ALL INSPECTIONS ARE TO BE CALLED IN AT 830-221-4068.
 - YOU MUST CALL BEFORE 12:00 P.M., 24 TO 48 HOURS PRIOR TO YOUR INSPECTION REQUEST.
 - IF YOU LEAVE INCOMPLETE INFORMATION, YOUR REQUEST FOR INSPECTION WILL NOT BE ACCEPTED/SCHEDULED.
 - EACH INSPECTION WILL BE ALLOTTED 1 HOUR UNLESS YOU REQUEST FOR MORE TIME.
 - ONCE YOUR REQUEST HAS BEEN ACCEPTED, YOU WILL RECEIVE A CALL FROM THE ENGINEERING INSPECTOR.
3. THE ENVIRONMENTAL PROJECT MANAGER, AND/OR SITE SUPERVISOR, AND/OR DESIGNATED RESPONSIBLE PARTY AND THE GENERAL CONTRACTOR WILL FOLLOW THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) POSTED ON THE SITE. TEMPORARY EROSION AND SEDIMENTATION CONTROLS WILL BE REVISED, IF NEEDED, TO COMPLY WITH CITY INSPECTOR'S DIRECTIVES, AND REVISED CONSTRUCTION SCHEDULE RELATIVE TO THE WATER QUALITY PLAN REQUIREMENTS AND THE EROSION PLAN.
4. ROUGH GRADE THE POND(S) AT 100% PROPOSED CAPACITY. EITHER THE PERMANENT OUTLET STRUCTURE OR A TEMPORARY OUTLET MUST BE CONSTRUCTED PRIOR TO DEVELOPMENT OF EMBANKMENT OR EXCAVATION THAT LEADS TO PONDING CONDITIONS. THE OUTLET SYSTEM MUST CONSIST OF A SUMP PIT OUTLET AND AN EMERGENCY SPILLWAY MEETING THE REQUIREMENTS OF THE DRAINAGE CRITERIA MANUAL AND/OR THE ENVIRONMENTAL CRITERIA MANUAL, AS REQUIRED. THE OUTLET SYSTEM SHALL BE PROTECTED FROM EROSION AND SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION UNTIL INSTALLATION OF THE PERMANENT WATER QUALITY POND(S).
5. TEMPORARY EROSION AND SEDIMENTATION CONTROLS WILL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) POSTED ON THE SITE.
6. BEGIN SITE CLEARING/CONSTRUCTION (OR DEMOLITION) ACTIVITIES.
7. PERMANENT WATER QUALITY PONDS OR CONTROLS WILL BE CLEANED OUT AND FILTER MEDIA WILL BE INSTALLED PRIOR TO CONCURRENTLY WITH REVEGETATION OF SITE.
8. COMPLETE CONSTRUCTION AND START REVEGETATION OF THE SITE AND INSTALLATION OF LANDSCAPING.
9. UPON COMPLETION OF THE SITE CONSTRUCTION AND REVEGETATION OF A PROJECT SITE, THE DESIGN ENGINEER SHALL SUBMIT AN ENGINEER'S LETTER OF CONCURRENCE TO THE CITY INDICATING THAT CONSTRUCTION, INCLUDING REVEGETATION, IS COMPLETE AND IN SUBSTANTIAL CONFORMITY WITH THE APPROVED PLANS. AFTER RECEIVING THIS LETTER, A FINAL INSPECTION WILL BE SCHEDULED BY THE APPROPRIATE CITY INSPECTOR.
10. UPON COMPLETION OF LANDSCAPE INSTALLATION OF A PROJECT SITE, THE LANDSCAPE ARCHITECT SHALL SUBMIT A LETTER OF CONCURRENCE TO THE CITY INDICATING THAT THE REQUIRED LANDSCAPING IS COMPLETE AND IN SUBSTANTIAL CONFORMITY WITH THE APPROVED PLANS. AFTER RECEIVING THIS LETTER, A FINAL INSPECTION WILL BE SCHEDULED BY THE APPROPRIATE CITY INSPECTOR.
11. AFTER A FINAL INSPECTION HAS BEEN CONDUCTED BY THE CITY INSPECTOR AND WITH APPROVAL FROM THE CITY INSPECTOR, REMOVE THE TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND COMPLETE ANY NECESSARY FINAL REVEGETATION RESULTING FROM REMOVAL OF THE CONTROLS. CONDUCT ANY MAINTENANCE AND REHABILITATION OF THE WATER QUALITY PONDS OR CONTROLS.



GENERAL NOTES

ELIZABETH AVENUE

CITY OF NEW BRAUNFELS



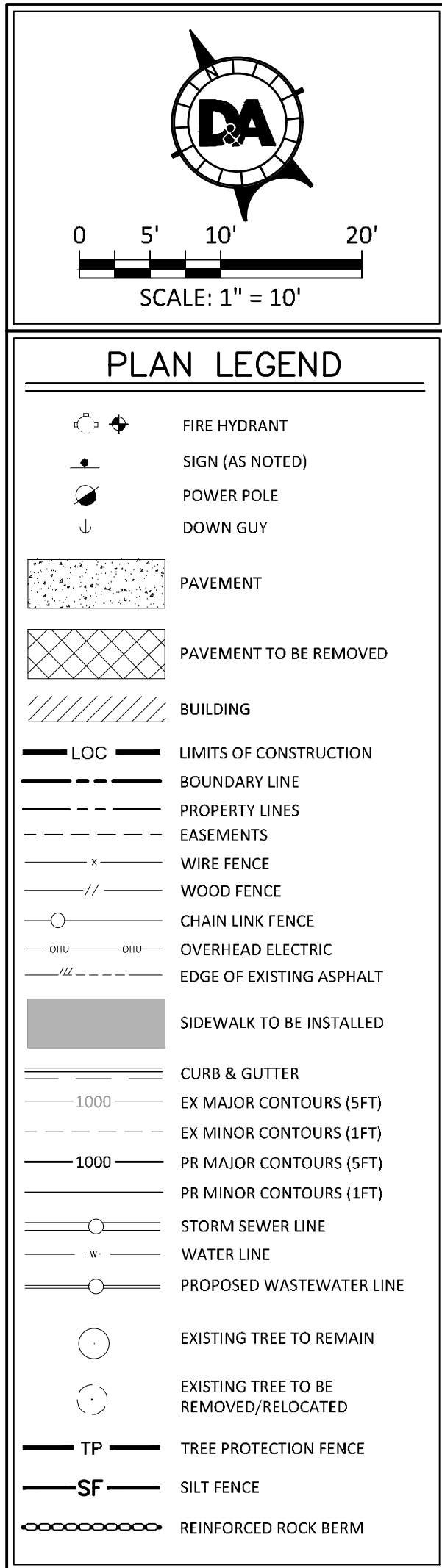
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Date:	4/20/2021

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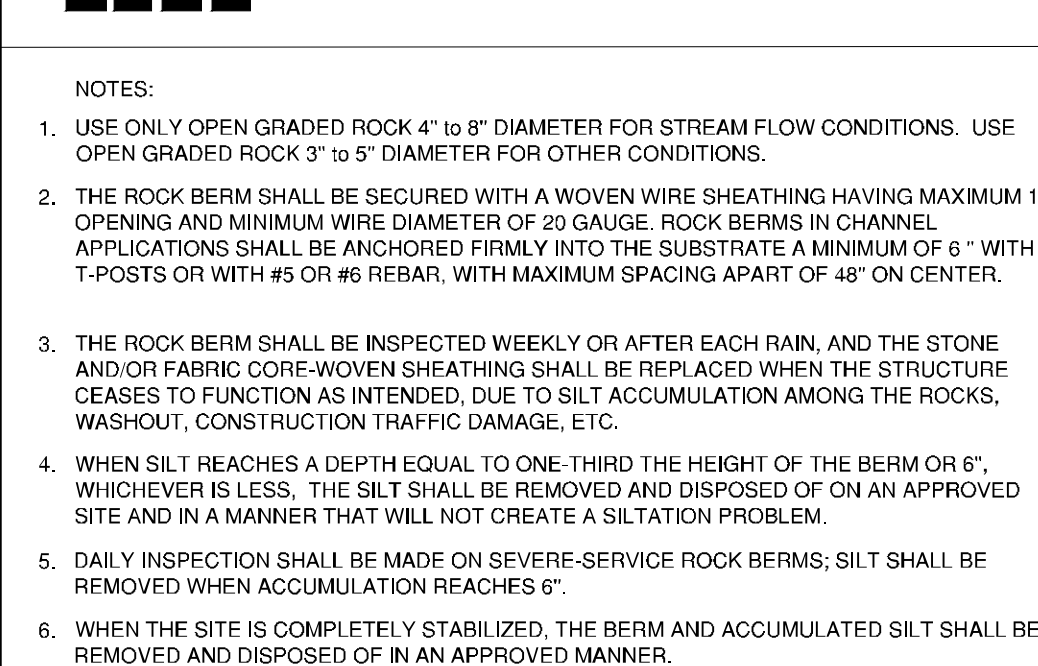
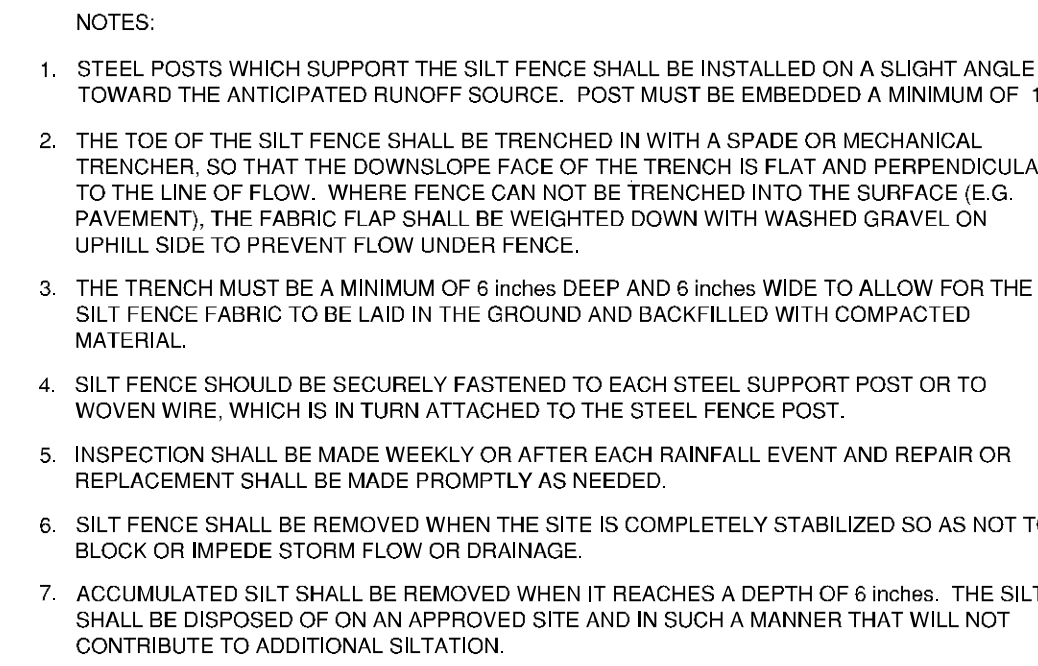
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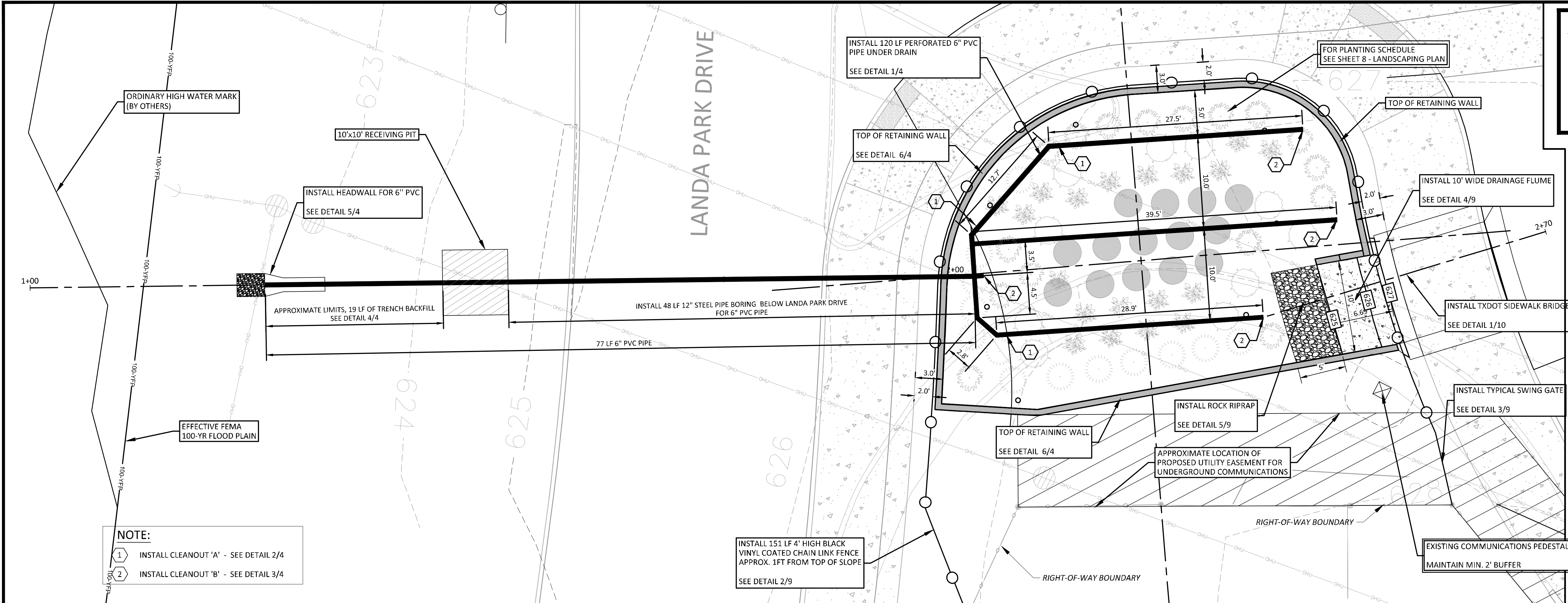
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1757-006



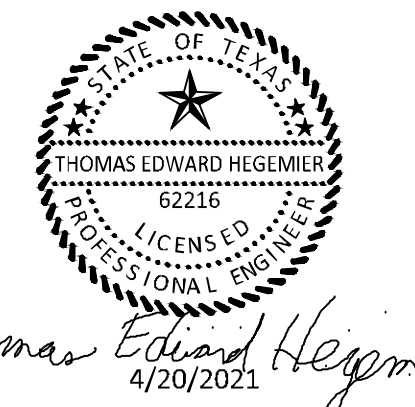
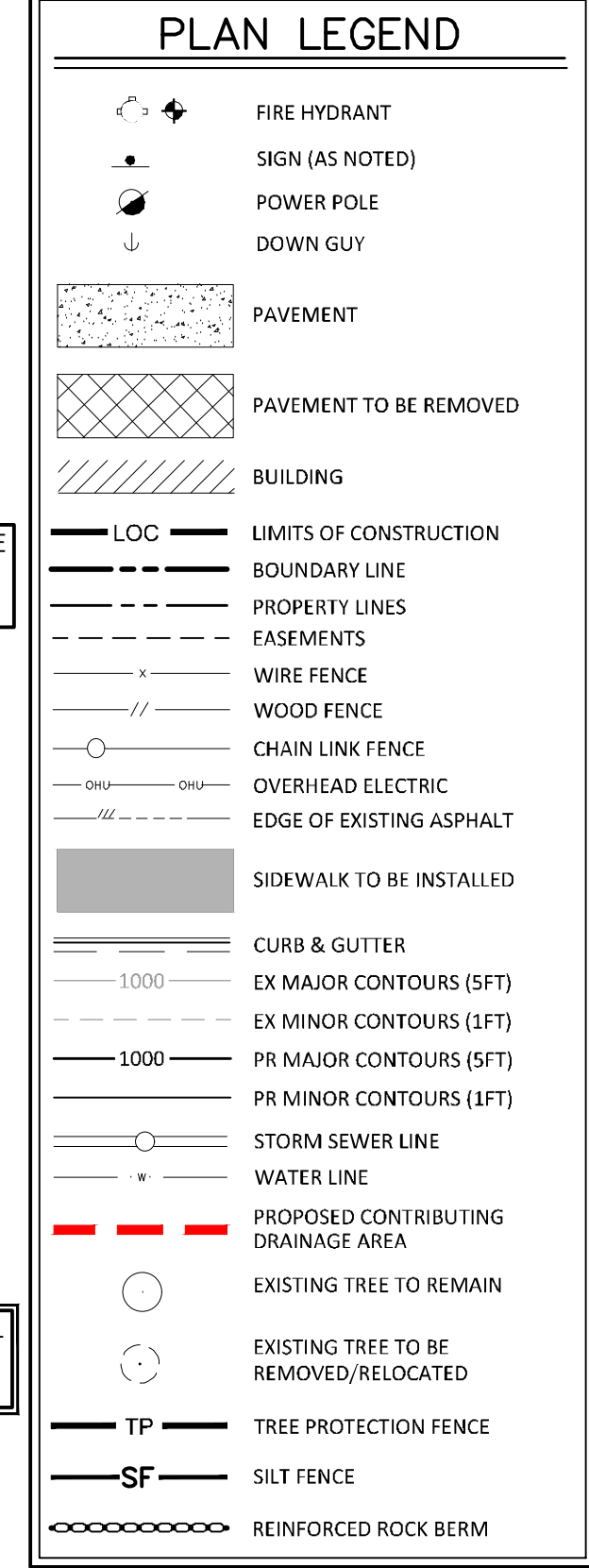
All spoils are to be hauled off from the site immediately upon excavation



FOR EXISTING CONDITIONS AND ROADWAY IMPROVEMENTS, REFER TO CONSTRUCTION DOCUMENTS FOR "ELIZABETH AVENUE REALIGNMENT"



CONTRACTOR NOTES:
EXISTING UNDERGROUND & OVERHEAD UTILITIES IN VICINITY. CONTRACTOR TO CONTACT UTILITY COMPANIES PRIOR TO CONSTRUCTION. CONTRACTOR TO CALL 811 FOR UTILITY LOCATES PRIOR TO EXCAVATION. CONTRACTOR TO FIELD VERIFY EXISTING UTILITY LOCATIONS & DEPTH PRIOR TO BEGINNING CONSTRUCTION.
CONTRACTOR SHALL CONSIDER PROPOSED UTILITY IMPROVEMENTS AND PROVIDE ADEQUATE HORIZONTAL AND VERTICAL CLEARANCE DURING INSTALLATION OF ALL UTILITY INFRASTRUCTURE.



SOIL MEDIA BED & GEOTEXTILE FABRIC

SOIL MEDIA TO MEET THE FOLLOWING PERFORMANCE CRITERIA:

FIRST LAYER:

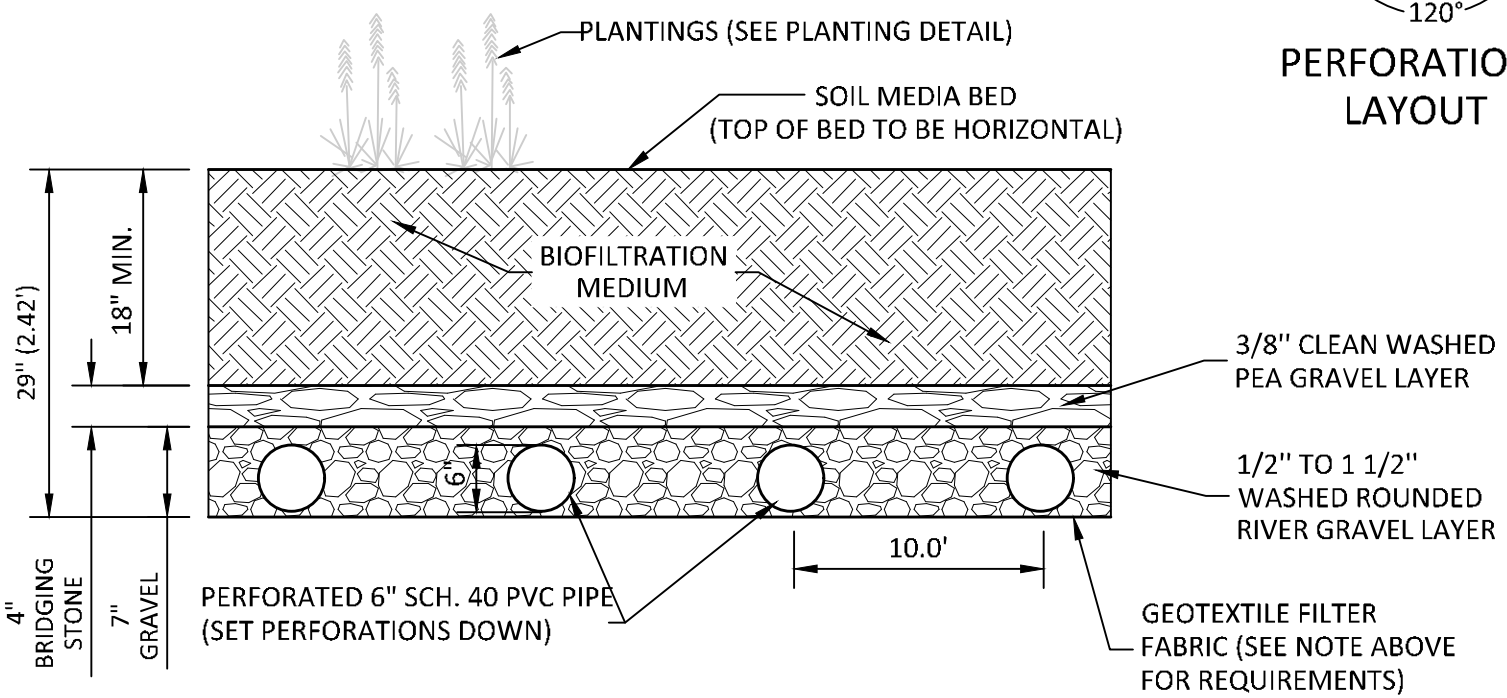
- * 75-90% 0.02-0.04 INCH DIA. SAND WHICH CORRESPONDS WITH ASTM C-33 CONCRETE SAND OR ASTM C-444 MASONRY SAND(SMALLER SIZE IS NOT ACCEPTABLE)
- * 10-25% SCREEN BULK TOPSOIL
- * <5% CLAY BY VOLUME
- * PERCENT ORGANIC MATTER (BY WEIGHT) OF 0-4%. ORGANIC MATTER SHOULD NOT INCLUDE COMPOST.

SECOND LAYER - GRAVEL, 3/8" CLEAN WASHED PEA GRAVEL LAYER

THIRD LAYER - GRAVEL, 1 TO 1 1/4 INCH WASHED RIVER GRAVEL, AT LEAST 3 TO 5 INCH DEPTH SURROUNDING UNDERLAIN PIPING, THE TWO LAYERS MUST BE SEPARATED FROM EACH OTHER USING GEOTEXTILE FILTER FABRIC THAT COMPLIES WITH CITY OF AUSTIN SPECIFICATION 6205, TABLE 2, HIGH FLOW FILTER FABRIC REQUIREMENTS AND THE FOLLOWING SPECIFICATIONS:

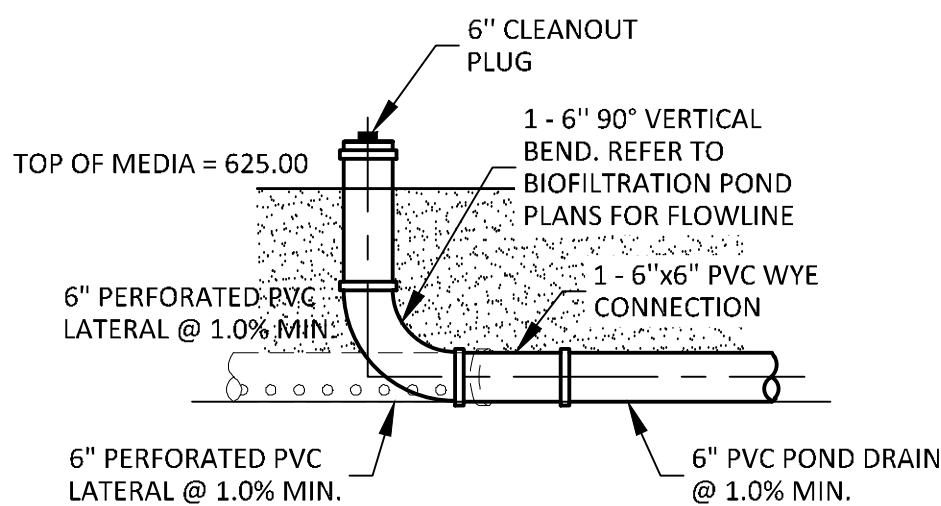
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
MATERIAL			NONWOVEN GEOTEXTILE
UNIT WEIGHT		OZ./SQ. YD.	8 (MIN.)
FILTRATION RATE		IN./SEC.	0.08 (MIN.)
GRAB STRENGTH	ASTM D-1682	LB.	400 (MIN.)
PUNCTURE STRENGTH	ASTM D-751(MODIFIED)	LB.	125 (MIN.)
MULLEN BURST STRENGTH	ASTM D-751	PSI	400 (MIN.)
TENSILE STRENGTH	ASTM D-1682	LB.	200 (MIN.)
EQUIV. OPENING SIZE	US STANDARD SIEVE	NO.	80 (MIN.)

SOURCE: CITY OF AUSTIN

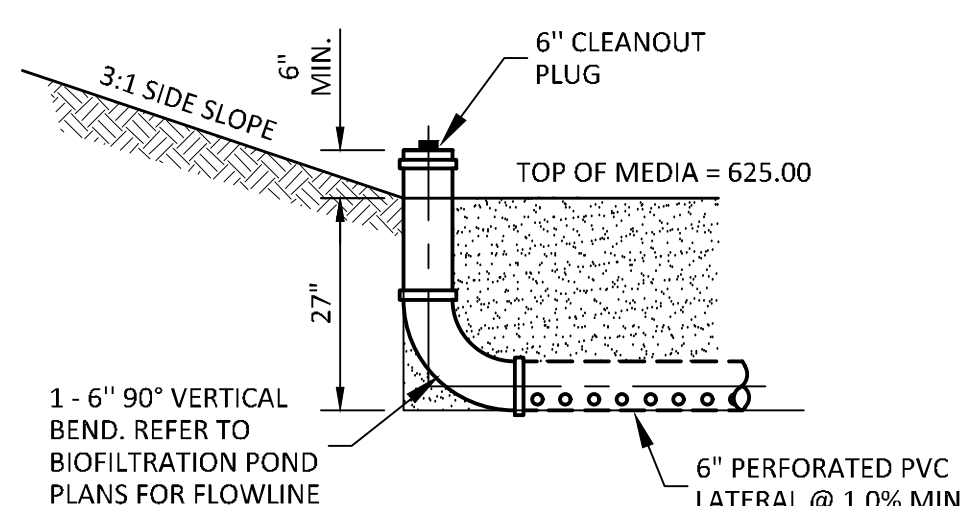


1 **BIOFILTRATION SOIL MEDIUM BED SECTION**
(WITHOUT IMPERMEABLE LINER)
SCALE: NONE

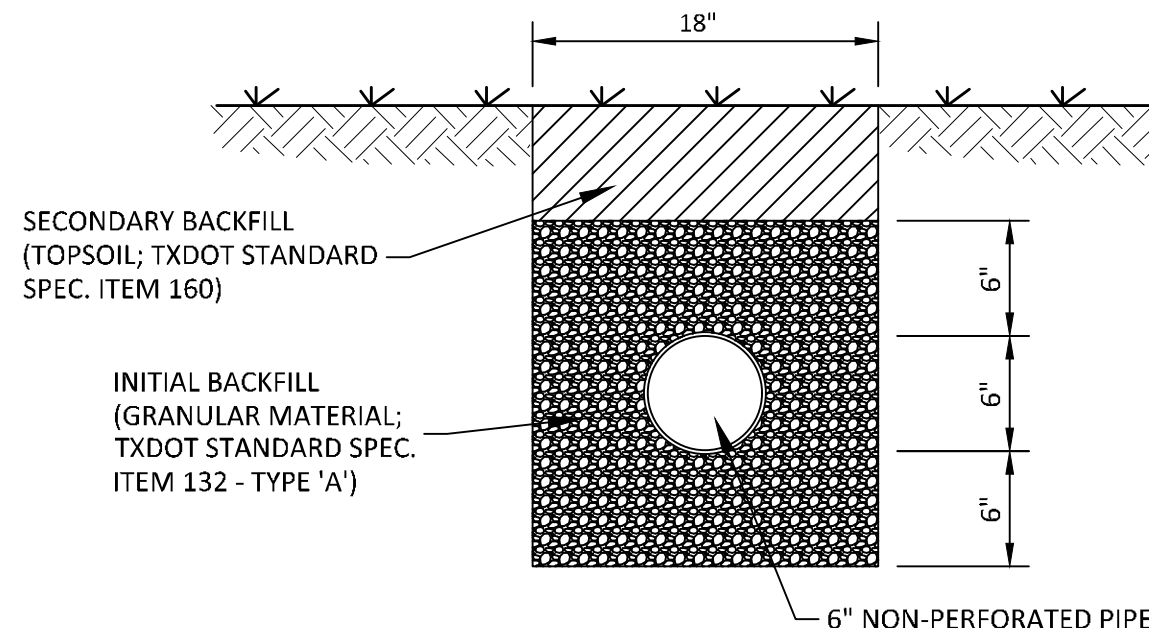
PERFORATION LAYOUT



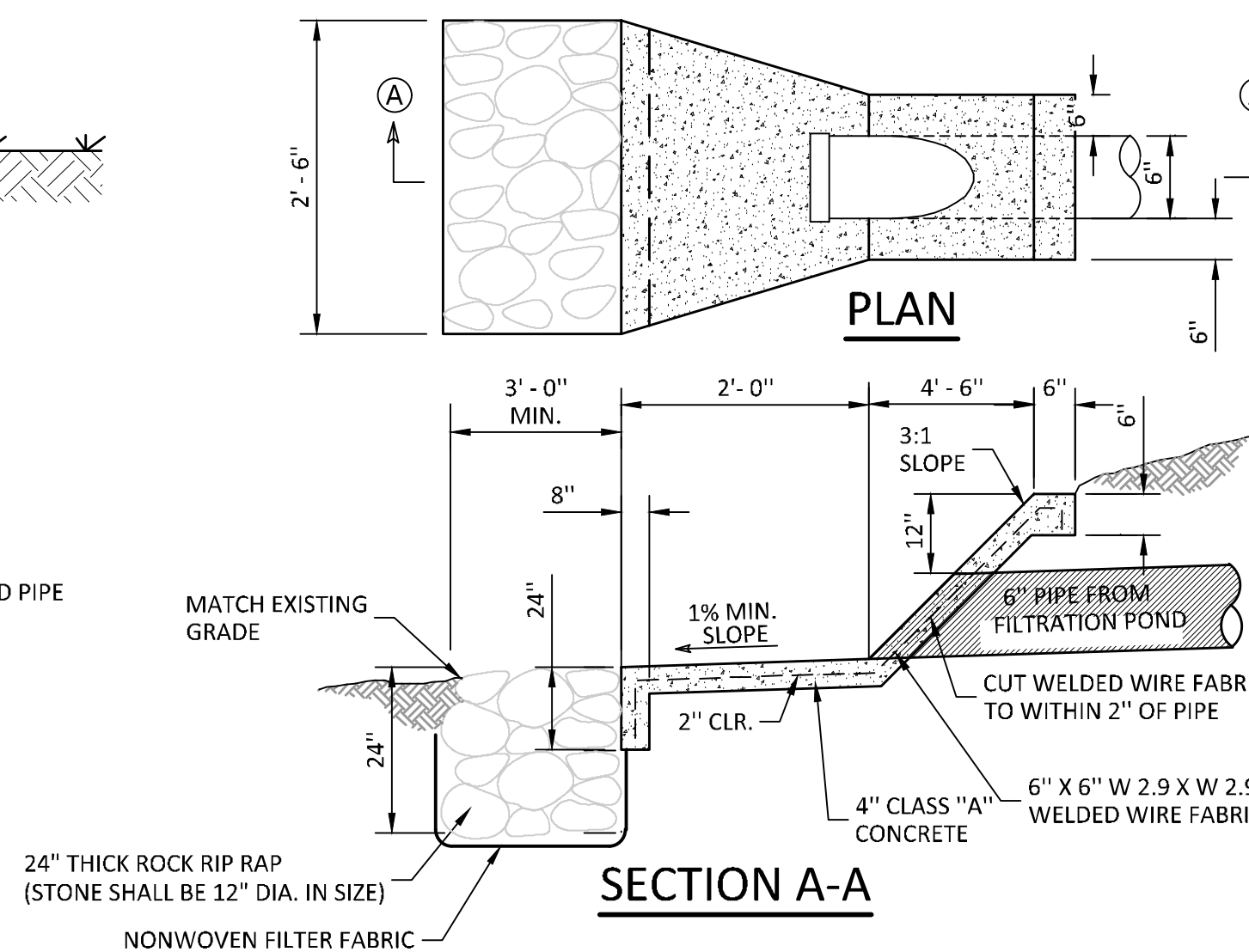
2 **CLEANOUT 'A'**



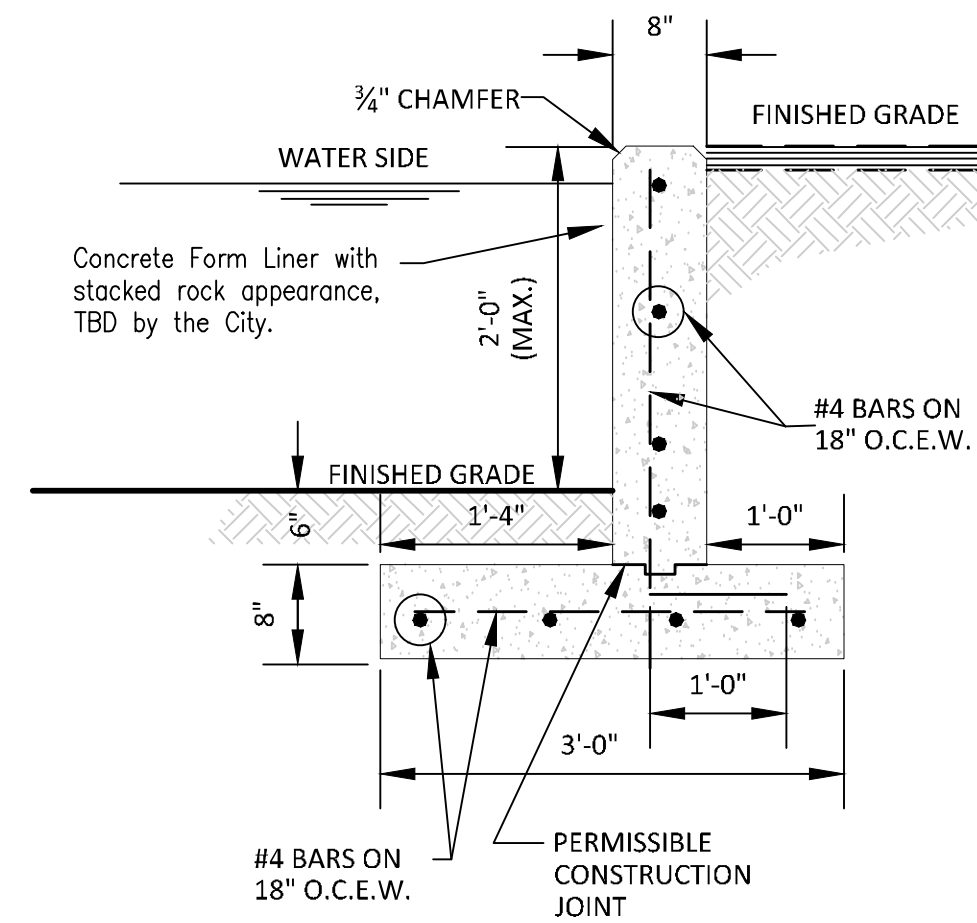
3 **CLEANOUT 'B'**



4 **TRENCH BACKFILL**



5 **HEADWALL FOR 6\" P.V.C. FROM BIOFILTRATION POND**
CUST - 440
SCALE: NONE



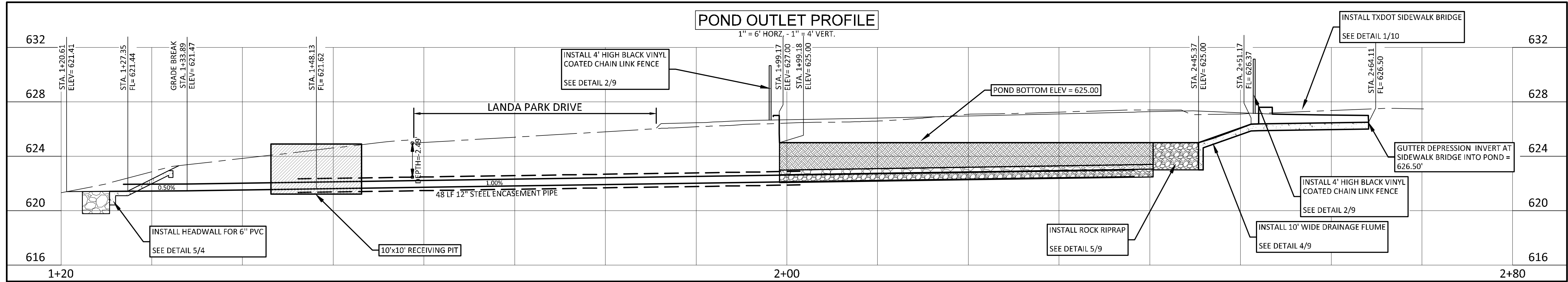
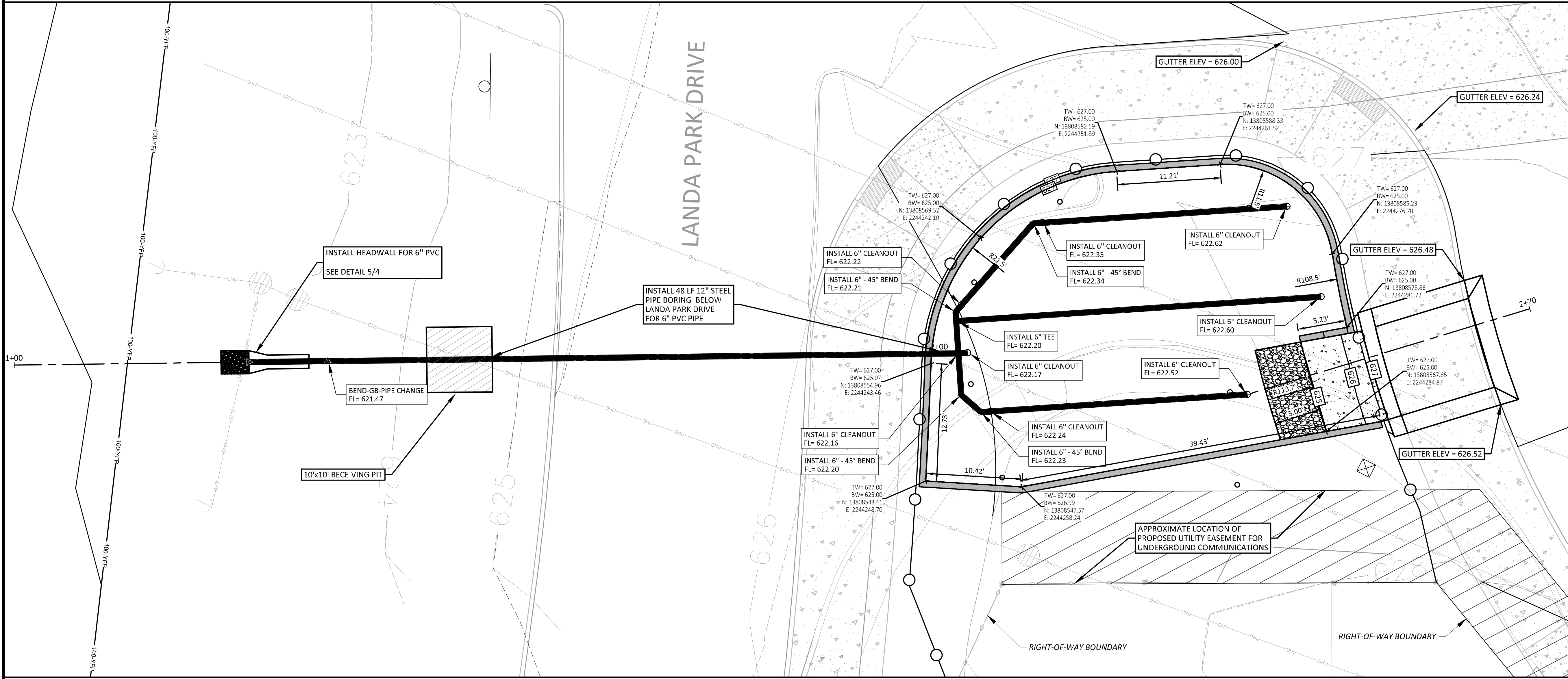
6 **RETAINING WALL SECTION**
(2.0' MAX. HEIGHT)
SCALE: NONE

Maintenance Requirements (Source: TCEQ Edwards Aquifer Rules: Technical Guidance on Best Management Practices and the LCRA Highland Lakes Water Quality Management Technical Manual)

Accumulated sediment and debris removal (especially at the inflow point) will be the primary maintenance function. Other potential tasks include replacement of dead vegetation, erosion repair at inflow points, media replenishment, unclogging the underdrain, and repairing overflow structures. Specific maintenance requirements include:

- **Inspections.** BMP facilities should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. During each inspection, erosion areas inside and downstream of the BMP must be identified and repaired or revegetated immediately. Identify areas that do not have acceptable vegetated covers (80% or higher). Reseed, add soil, and irrigate as required to ensure that coverage requirements are met.
- **Sediment Removal.** Remove sediment from the facility when sediment depth reaches 3 inches or when the sediment interferes with the health of vegetation or ability of the facility to meet required drawdown times. Sediment removal should be performed at least every 2 years.
- **Drain Time.** When the drain time exceeds 72 hours as observed, the filter media should be removed and replaced with more permeable material.
- **Vegetation.** All dead and diseased vegetation considered beyond treatment shall be removed and replaced during semi-annual inspections. Grass areas in and around the bioretention facility must be mowed at least twice annually to limit vegetation height to 18 inches. Remove clippings from site to prevent release of nutrients from decaying plant matter. Remove any woody growth, especially from embankments. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. Use non-chemical methods for maintaining health of vegetation. Pesticides, herbicides, or fertilizers should only be used as a last option, and then as minimally as possible. Fertilizer should not be required because runoff will typically contain sufficient nutrient loads.
- **Debris and Litter Removal.** Debris and litter will accumulate in the facility and should be removed during regular mowing operations and inspections.
- **Filter Underdrain.** Clean underdrain piping network to remove any sediment buildup every 5 years, or as needed to maintain design drawdown time.

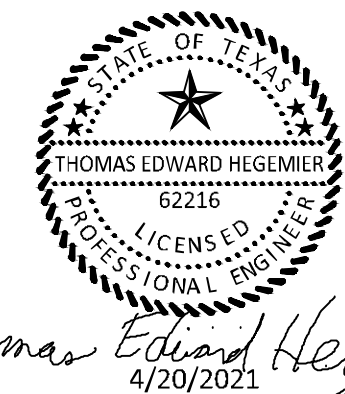
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TBPLS Firm Number: 10105800

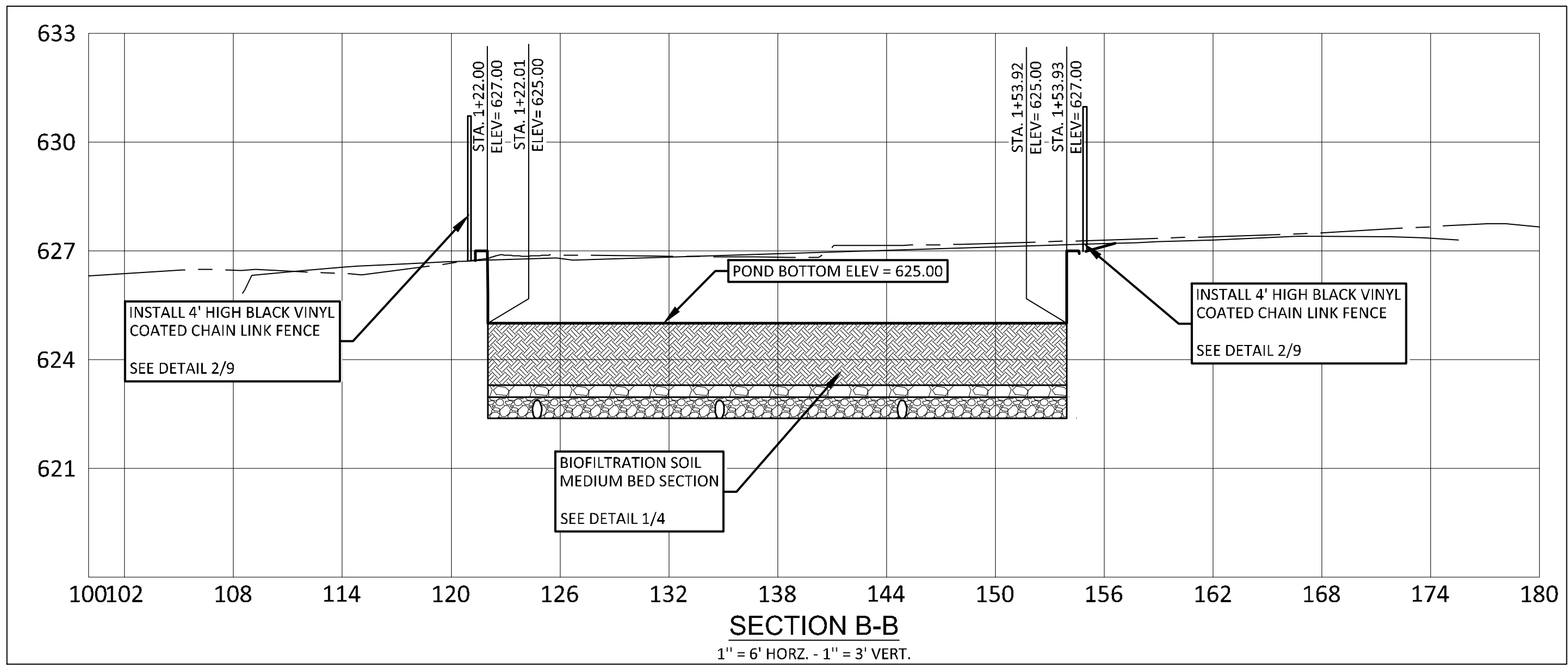
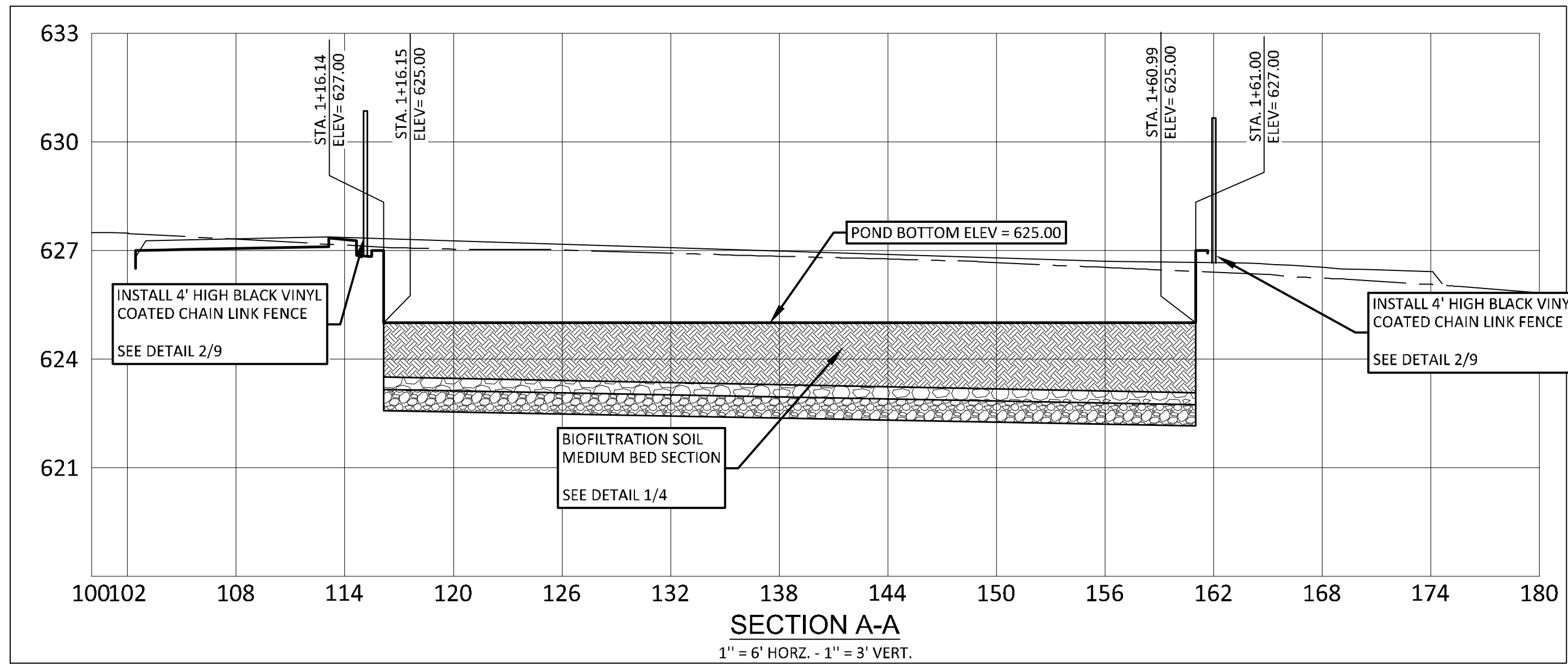
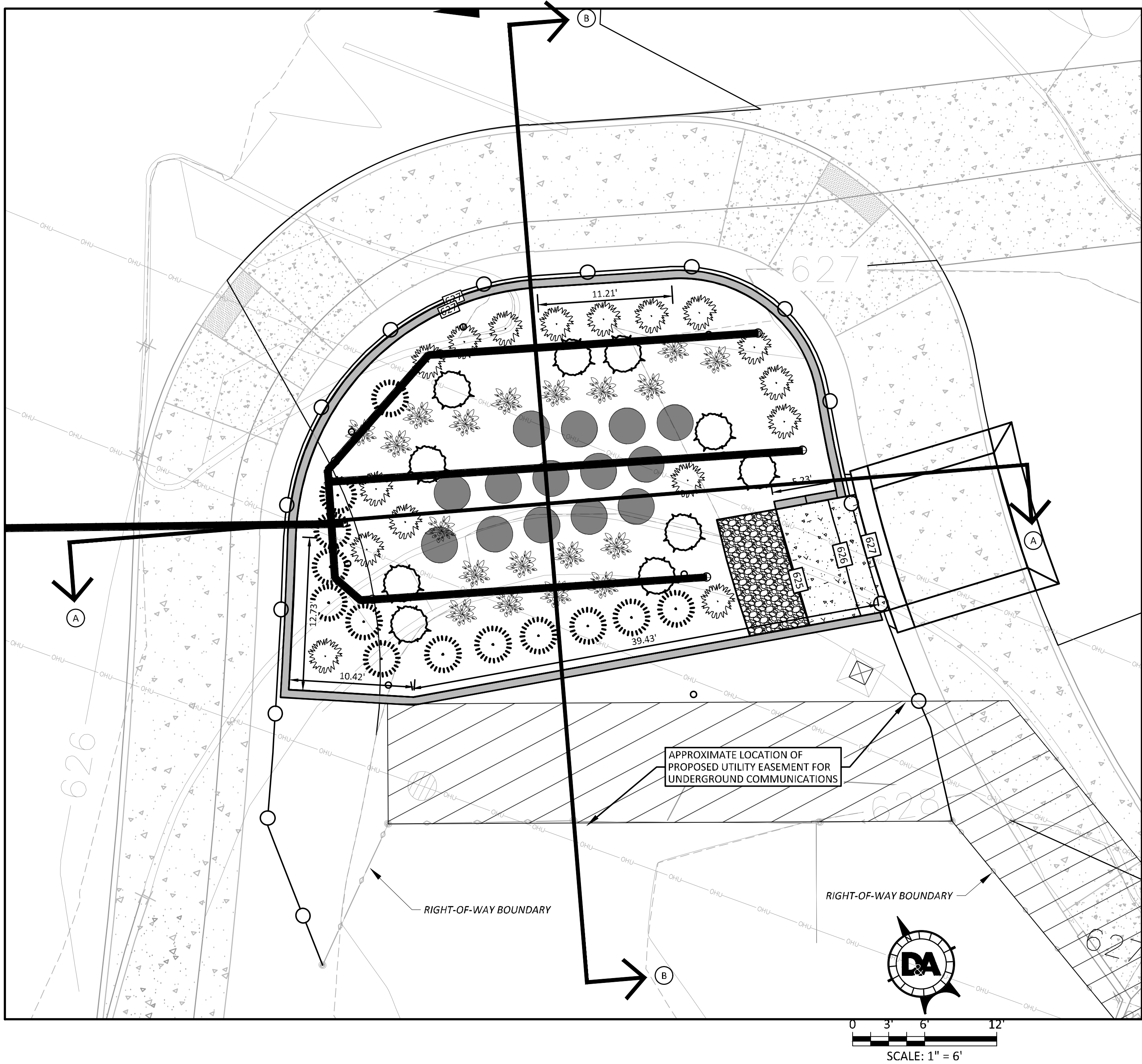
GRADING PLAN

ELIZABETH AVENUE
CITY OF NEW BRAUNFELS

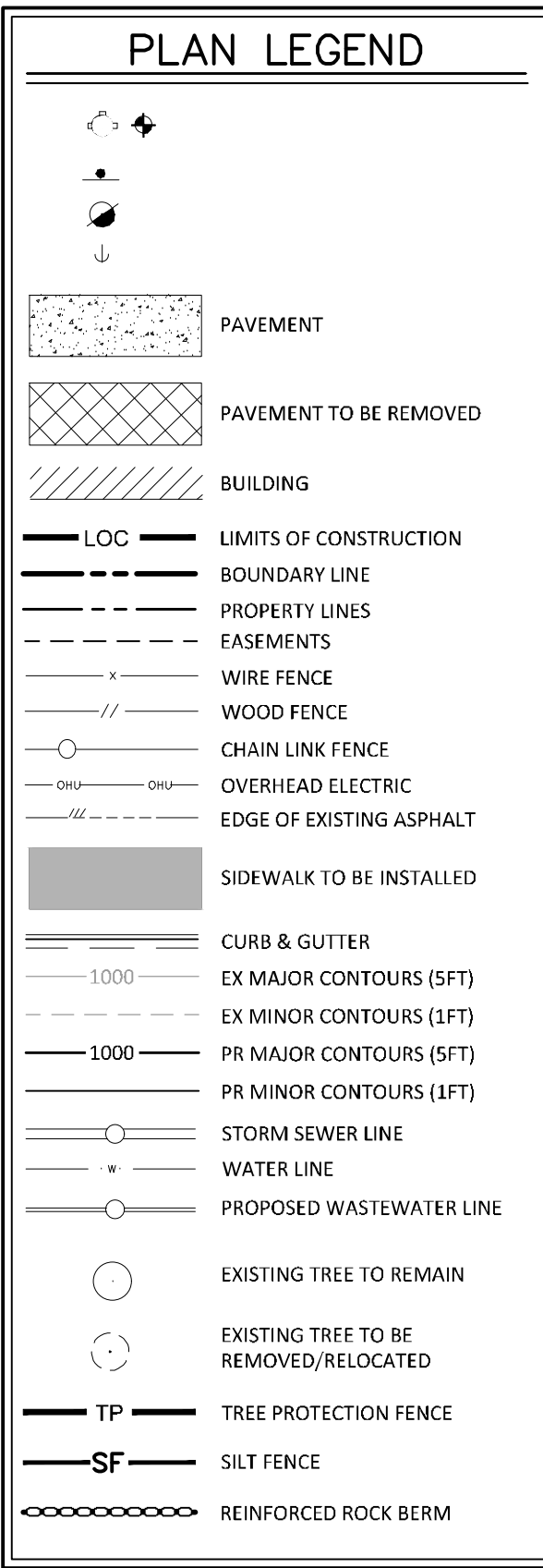


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Date: 4/20/2021
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Project No.: 1757-006

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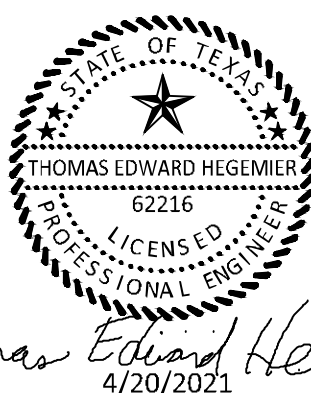
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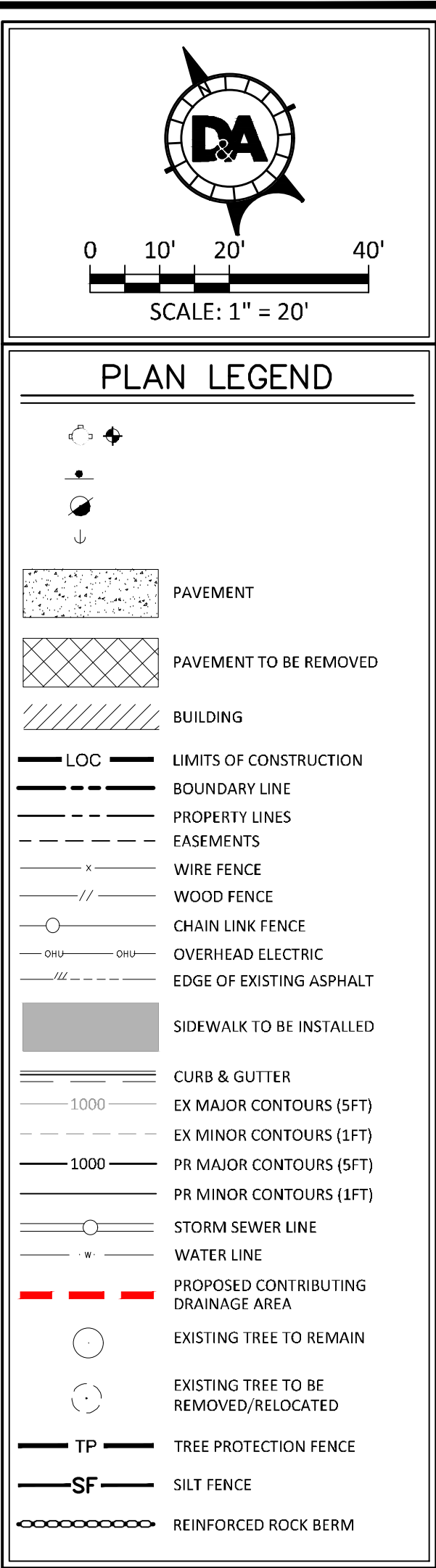
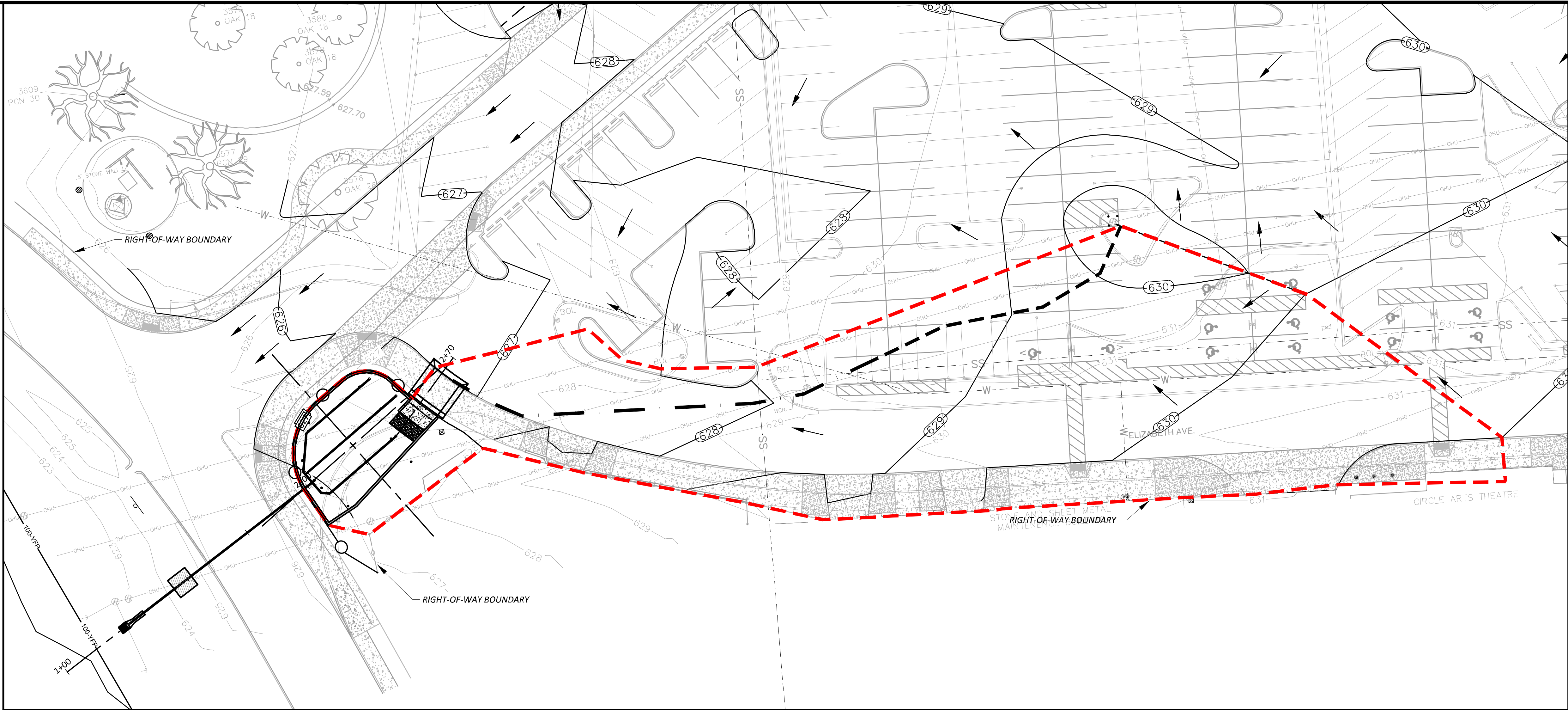
POND SECTIONS

ELIZABETH AVENUE
CITY OF NEW BRAUNFELS



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Reviewed: TEH
Date: 4/20/2021
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Project No.:
1757-006

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ELIZABETH AVENUE - WATER QUALITY RETROFIT Water Quality Pond 1 Summary - Bioretention

Date: 2/26/2021
Project No: 1757-006
Pond: 1

BASIN DATA		
Parameter	Pre-Project	Post-Project
Basin ID	Greenfield	1
Basin Area (Acres)	0.50	0.50
Impervious (Acres)	0.00	0.45
Permeable (Acres)	0.50	0.05
IC (%)	0.0%	89.1%
DESIGN DATA		
County	Cornal	
P ₁	33	
Treatment Level	80%	
Load Managed - LM (lbs)	402	

BMP DATA	
BMP	Bioretention
BMP Efficiency ₁	89%
TSS CALC DATA	
Load Removed - LR (lbs) ₁	456
LM (lbs) Desired	365
F ₁	0.80
Rainfall Depth (in) ₁	1.08
Runoff Coefficient ₁	0.77
WATER QUALITY VOLUME DATA	
WQV (CF) ₁	1,435
Capture Vol. (120% WQV) ₁	1,722

Post-Project Impervious Cover Calculations			
Post-Project Area:		0.50 Ac.	
IC Type	Sq. Ft	Acres	Site Percent
Structures	0	0.00	0.0%
Parking	19,531	0.45	89.1%
Other Paved	0	0.00	0.0%
		0.45	89.1%

VOLUME PROVIDED			
STAGE STORAGE DATA			
Elevation	Area (SF)	Volume (CF)	Σ Vol. (CF)
625	1,248.08	-	0
625.5	1,271.92	630	630
626	1,293.94	641	1,271
626.37	1,310.14	482	1,753

RG-348 References
1 - P - Table 3-3
2 - LM - Equation 3.2
3 - BMP EH - Table 3-4
4 - LR - Equation 3.8
5 - F - Equation 3.9
6 - Rainfall Depth - Table 3-5
7 - Runoff Coeff. - Eq. 3.11
8 - WQV - Eq. 3.10

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Elizabeth Ave
Date Prepared: Feb-26-2021

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields. Changes to these fields will remove the equations used in the spreadsheet.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_d = 27.2(A_i + P)$

where:
 L_d TOTAL PROJECT = Required TSS removal resulting from the proposed development = 80% of increased L
 A_i = Net increase in impervious area for the project
 P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project
County = Cornal
Total project area included in plan = 0.50 acres
Predevelopment impervious area within the limits of the plan = 0.00 acres
Total post-development impervious area within the limits of the plan = 0.45 acres
Total post-development impervious cover fraction = 0.89
 P = 33 inches

L_d TOTAL PROJECT = 402 lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area = 0.50 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 0.45 acres
Post-development impervious fraction within drainage basin/outfall area = 0.89
 L_d basin area = 402 lbs.

3. Indicate the proposed BMP Code for this basin:

Proposed BMP = Bioretention
Removal efficiency = 89 percent

Aquaticus Cartridge Filter
Bioretention
Corbich StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strip
Vetris
Wet Vault

4. Calculate Maximum TSS Load Removed (L_d) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_d = (BMP \text{ efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$

where:
 A_i = Total On-Site drainage area in the BMP catchment area
 A_p = Impervious area proposed in the BMP catchment area
 A_p = Previous area remaining in the BMP catchment area
 L_d = TSS Load removed from this catchment area by the proposed BMP
 A_i = 0.50 acres
 A_p = 0.45 acres
 A_p = 0.00 acres
 L_d = 457 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired L_d in basins = 365 lbs.

P = 0.89

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Calculations from RG-348 Pages 3-36 to 3-37

Rainfall Depth = 1.08 inches

Post Development Runoff Coefficient = 0.73

On-site Water Quality Volume = 1435 cubic feet

Off-site area draining to BMP = 0.00 acres

Off-site Impervious cover draining to BMP = 0.00 acres

Impervious fraction of off-site area = 0

Off-site Runoff Coefficient = 0.00

Off-site Water Quality Volume = 0 cubic feet

Storage for Sediment = 287 cubic feet

Total Capture Volume (required water quality volume) = 1,722

RATIONAL METHOD DRAINAGE CALCULATIONS

Drainage Area	Overland Sheet Flow						Shallow Concentrated Flow						TC _{TOTAL}	Notes	
	Length	n-Value	E _{START}	E _{END}	Slope	TC _{SHEET}	Length	Paved(P/ Unpaved(U))	E _{START}	E _{END}	Slope	Velocity			TC _{SHALLOW}
1	100	0.016	630.8	628.7	2.10%	1.42	142.44	P	628.7	628.95	1.23%	2.25	1.06	2.48	TC is less than 5 min.; use 5 min.

COMPOSITE C							
Imp. %	Perious Class	2	5	10	25	50	100
89.1%	GGA	0.700	0.748	0.778	0.827	0.866	0.914

DA CHARACTERISTICS				INTENSITY (IN/HR)						COMPOSITE C-VALUE						RUNOFF FLOW - Q					
Drainage	Area (AC)	IC %	Tc (Min)	2	5	10	25	50	100	2	5	10	25	50	100	2	5	10	25	50	100
1	0.50	89.1%	5.00	6.34	7.97	9.37	11.35	12.98	14.64	0.70	0.75	0.78	0.83	0.87	0.91	2.2	3.0	3.7	4.7	5.6	6.7

Peak Discharge							Gutter Analysis							Curb Inlet Analysis										
Inlet ID	Area (Ac)	C	Time to Inlet	Intensity (in/hr)	Q (CFS)	CO (CFS)	Q/A (CFS)	n	S _L (ft/ft)	S _x (ft/ft)	d (ft)	Curb/Max Depth (in)	Depth Check	Spread (ft)	Allowable Spread	Spread Check	Inlet Type	a (ft)	W (ft)	Length Required	Design Length	E	Q _i (cfs)	CO _i (cfs)
25-yr	0.500	0.83	5	11.350	4.71	0.00	4.71	0.016	0.02	0.03	0.26	6	OK	8.78	16.50	OK	SDW/UKR	0.208	2	16.81	10	0.80	3.78	0.93
100-yr	0.500	0.91	5	14.640	6.66	0.00	6.66	0.016	0.02	0.03	0.30	6	OK	10.00	16.50	OK	SDW/UKR	0.208	2	20.21	10	0.71	4.71	1.95

NOTE:
THE WATER QUALITY IMPROVEMENTS WILL BE CONSTRUCTED ALONG SIDE THE ROADWAY IMPROVEMENTS (BY OTHERS).
PRE-PROJECT CONDITIONS SHOWN FOR THE WATER QUALITY IMPROVEMENTS REPRESENT, AND INCLUDE, CHANGES TO EXISTING SITE ASSOCIATED WITH ROADWAY IMPROVEMENTS.
FOR EXISTING CONDITIONS DRAINAGE CALCULATIONS AND SUMMARY, REFER TO STORMWATER REPORT ASSOCIATED WITH ELIZABETH AVENUE REALIGNMENT BY OTHERS.

FILTRATION MEDIA

FILTRATIO MEDIA AREA = 1198 SQ. FT.
FLOW THROUGH RATE = 0.0545 GPM/SF
APPLYING THE FLOW THROUGH RATE & FILTRATION MEDIA AREA
 $Q = 0.1455$ CFS
TOTAL BASIN WQ VOL = 1753 CF
50% BASIN WQ VOL = 876.5
12-HOUR DRAIN TIME VOLUME, MEDIA ONLY
12 HOURS x 0.1455 CFS = 6284
THUS, MEDIA DOES NOT RESTRICT THE FLOW TO DETAIN THE 50% WATER QUALITY VOLUME.
CONSIDER AN ORIFICE TO RESTRICT

* PER THE CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL

WATER QUALITY BASIN DRAIN TIME

DISCHARGE RATE TO DRAIN 876.5 CUBIC FEET IN 12 HOURS
 $A = 0.25 \times (\pi \times d^2)$
 $d = \sqrt{(4 \times A / \pi)}$
 $d = 0.062$ FT
 $d = 0.75$ INCH
TOTAL HEAD (INCL. MEDIA) = 3.78 FT
SINCE MEDIA SOIL WILL BE SATURATED AND CONTROL FLOW TO ACCOUNT FOR DRAWDOWN OVER FULL POND DRAIN PERIOD, USE AVERAGE H = 1.895 FEET
HOWEVER, ORIFICE DIAMETER IS APPROXIMATELY 3/4". VERY SMALL AND PRONE TO CLOGGING. MAINTENANCE CONCERNS WOULD PREVENT FEASIBILITY.
 $Q = C \times A \times \sqrt{(2 \times g \times h)}$
 $A = Q / (C \times \sqrt{(2 \times g \times h)})$
 $C = 0.6$
 $A = 0.0031$ SF
USING 1 INCH ORIFICE
 $A = 0.0055$ SF
 $Q = 0.0362$ CFS
VOLUME DRAIN IN 12 HOURS = 1562 CF
THE DRAIN VOLUME IS GREATER THAN 50% WQV IN 12-HOURS.
A 1 INCH ORIFICE IS SMALL AND ALSO PRONE TO CLOGGING.

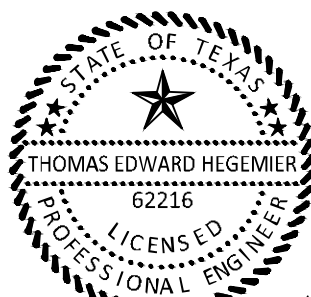
CONCLUSION

RECOMMEND THAT NO ORIFICE BE USED TO MINIMIZE LONG TERM MAINTENANCE REQUIREMENTS.
POND WILL DRAIN A BIT MORE RAPID BUT STILL ACHIEVE WATER QUALITY GOALS AS FILTRATION PROCESS OCCURS WITHIN THE MEDIA.

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TBPLS Firm Number: 10105800

WATER QUALITY
CALCULATIONS

ELIZABETH AVENUE
CITY OF NEW BRAUNFELS



Thomas Edward Heigemeier
4/20/2021

Designed: GP/OF
Drawn: GP/OF
Reviewed: TEH

Date: 4/20/2021

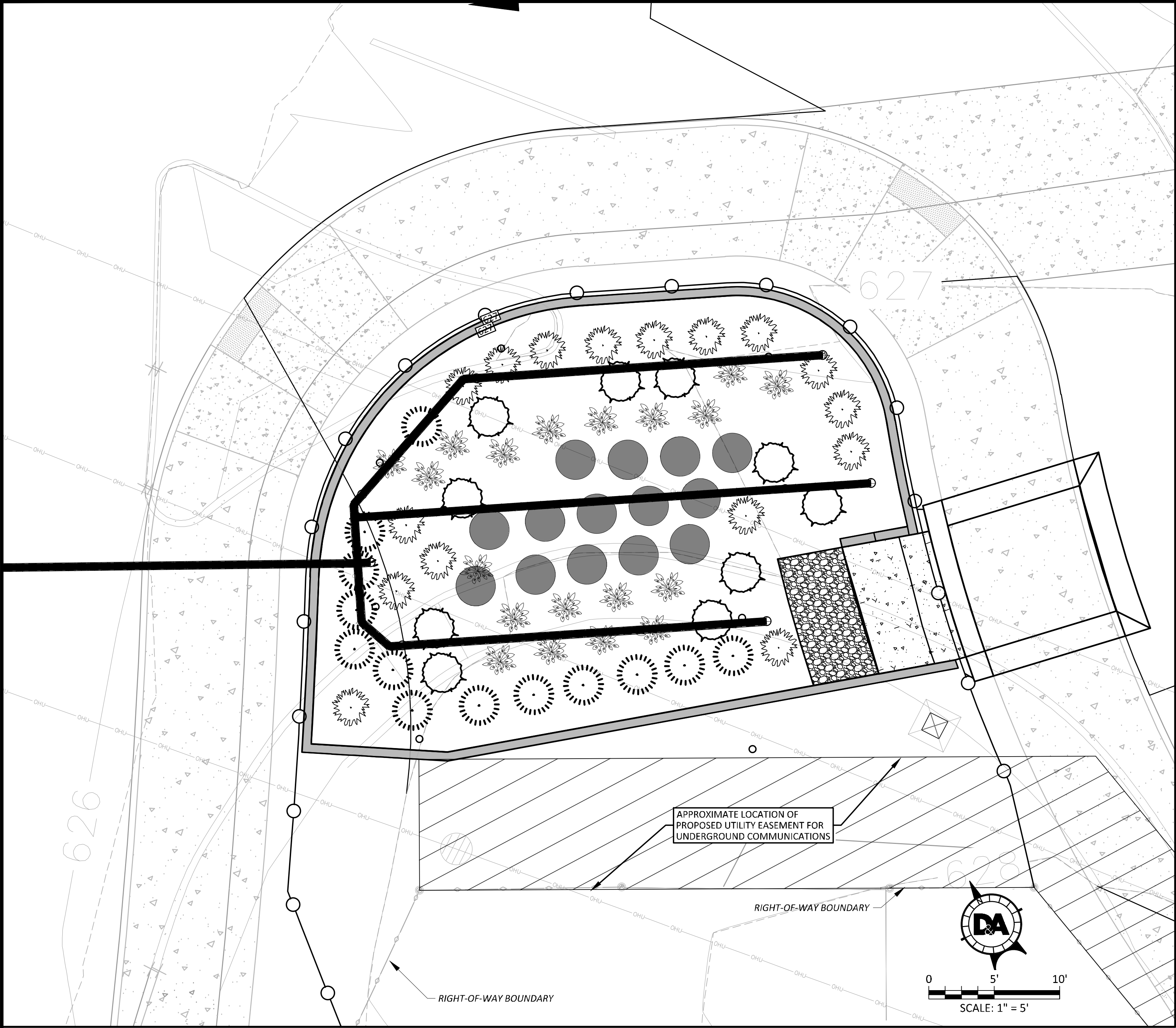
SHEET

7

7 OF 10

Project No.:
1757-006

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Plot Date/Time: Apr 20, 21 - 17:29:48



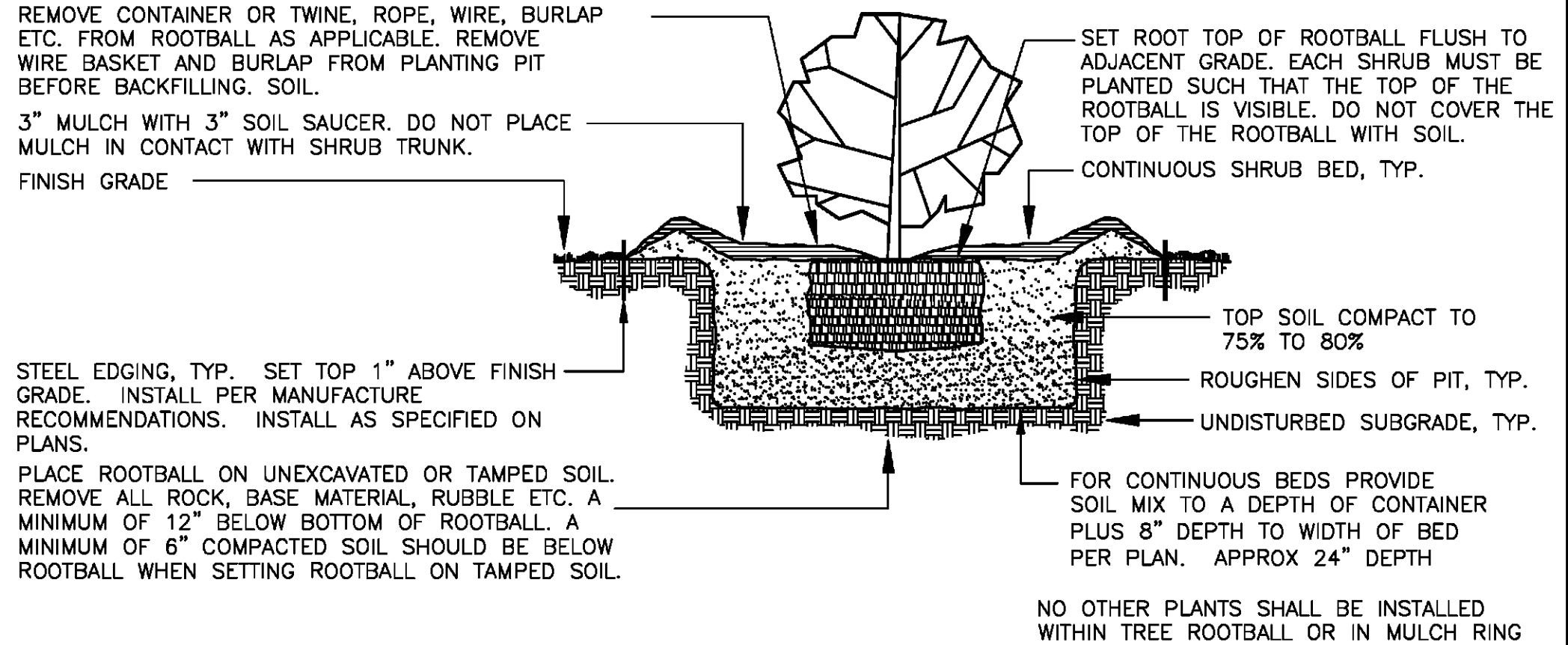
PLANTING LEGEND

- LINDHEIMER MUHLY - 5 GAL.**
3FT SEPARATION ALONG STAGGERED ROWS 3FT O.C. ALONG SLOPE OF TOE AS SHOWN.
- GULF MUHLY - 5 GAL.**
3FT SEPARATION ALONG STAGGERED ROWS 3FT O.C. ALONG SLOPE OF TOE AS SHOWN.
- TURKS CAP - 5 GAL.**
3FT SEPARATION ALONG STAGGERED ROWS 3FT O.C. ALONG SLOPE OF TOE AS SHOWN.
- FLAME ACANTHUS - 5 GAL.**
MINIMUM 3FT SEPARATION. PLACE AS SHOWN
- ROCK ROSE - 5 GAL.**
3FT SEPARATION ALONG STAGGERED ROWS 3FT O.C. ALONG SLOPE OF TOE AS SHOWN.

CONTRACTOR NOTES:

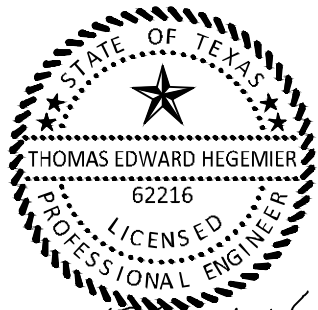
EXISTING UNDERGROUND & OVERHEAD UTILITIES IN VICINITY. CONTRACTOR TO CONTACT UTILITY COMPANIES PRIOR TO CONSTRUCTION. CONTRACTOR TO CALL 811 FOR UTILITY LOCATES PRIOR TO EXCAVATION. CONTRACTOR TO FIELD VERIFY EXISTING UTILITY LOCATIONS & DEPTH PRIOR TO BEGINNING CONSTRUCTION.

CONTRACTOR SHALL CONSIDER PROPOSED UTILITY IMPROVEMENTS AND PROVIDE ADEQUATE HORIZONTAL AND VERTICAL CLEARANCE DURING INSTALLATION OF ALL UTILITY INFRASTRUCTURE.



1 SHRUB PLANTING DETAIL
8 SCALE: NONE

PLANTING SCHEDULE		
TYPE	SIZE	QUANTITY
LINDHEIMER MUHLY	5-GAL	10
GULF MUHLY	5-GAL	16
TURKS CAP	5-GAL	19
FLAME ACANTHUS	5-GAL	14
ROCK ROSE	5-GAL	13



Thomas Edward Hegemier
4/20/2021

Designed: GP/OF
Drawn: GP/OF
Reviewed: TEH
Date: 4/20/2021

SHEET

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Project No.:
1757-006



6. AS A MINIMUM, SAFETY FENCING IS REQUIRED IN AREAS ADJACENT TO EXCAVATIONS GREATER THAN OR EQUAL TO 150 mm {6"}.



4'-0"

FORK LATCH WITH LOCKING CAPABILITY

GATE POST
2-3/4" o.d. GALV. PIPE

GATE 1-5/8" o.c. GALV. PIPE WELDED FRAME

POST CAP RAIL END

TOP RAIL 1-3/8" o.d. GALV. PIPE

9 GA. TIE WIRE 24" o.c.

POST BAND - 14" o.c.

1/2" x 3/2" DRAW BAR

GATE HINGE

7 GA. BOTTOM TENSION WIRE

2"x2"x9 GA. FABRIC KNUCKLED TOP & BOTTOM

FINISH GRADE

9 GA. TIE-WIRE TOP & BOTTOM

3500 psi CONCRETE

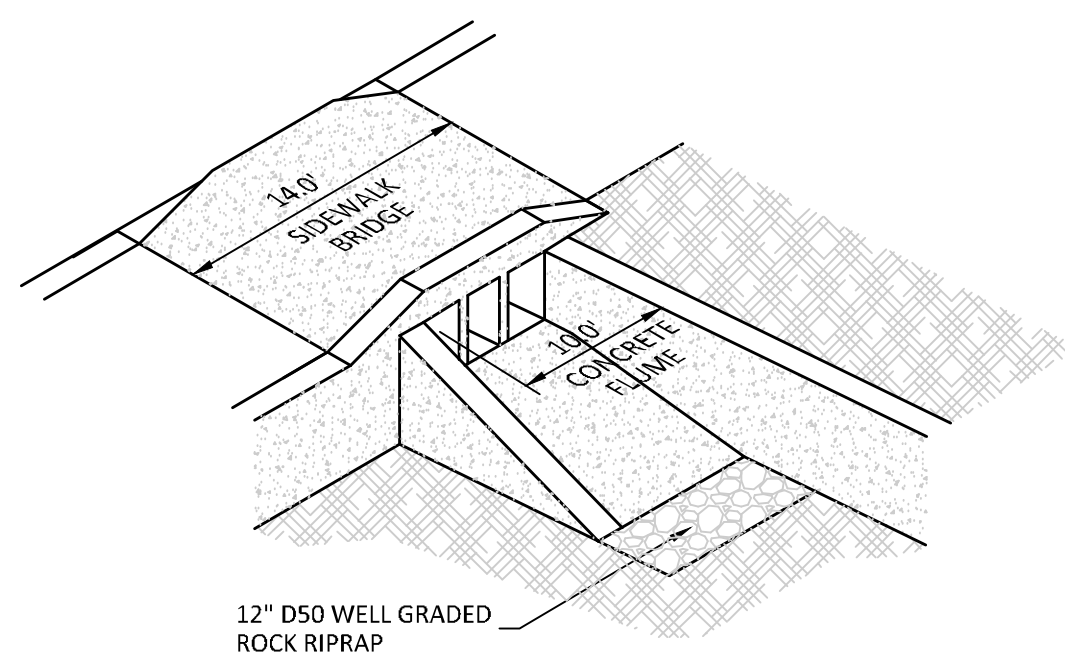
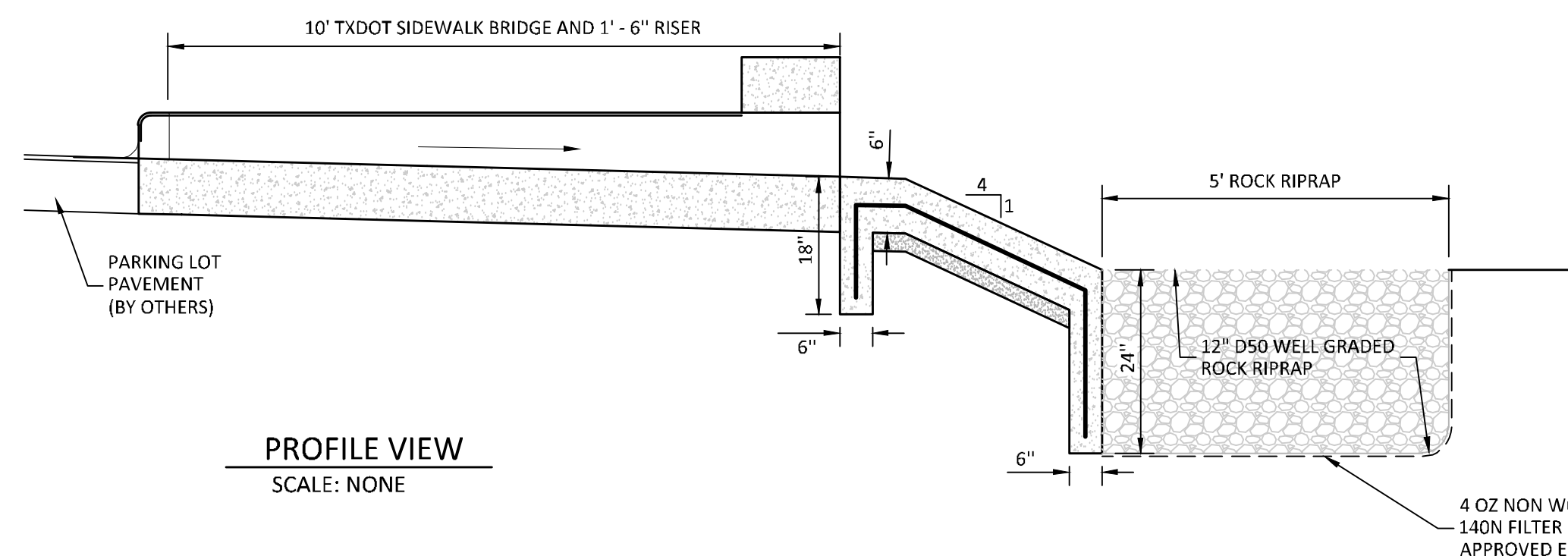
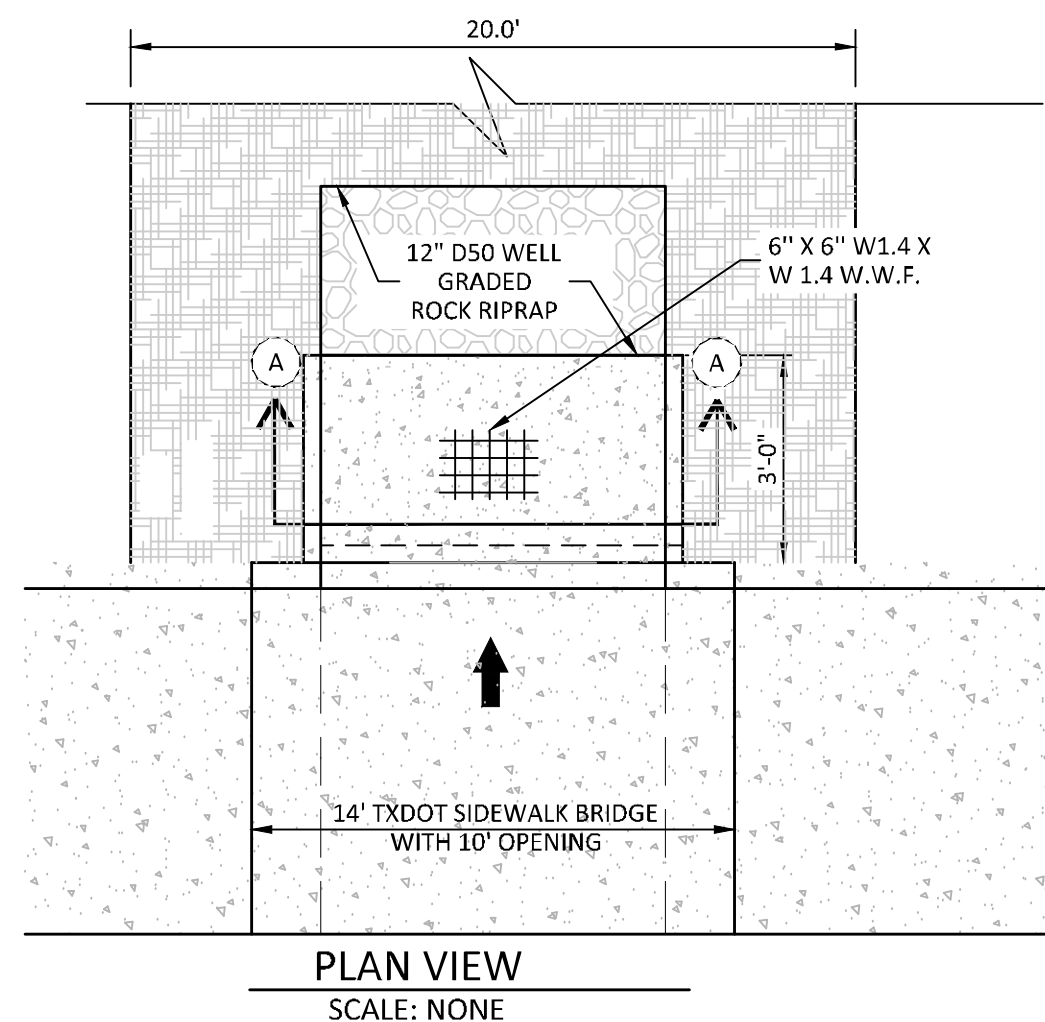
TYPICAL FOOTING

NOTE: ALL WIRE FABRIC AND FENCE HARDWARE SHALL BE GALVANIZED. GATE SHALL BE COMPLETED WITH BALL AND SOCKET HINGES OR APPROVED EQUAL.

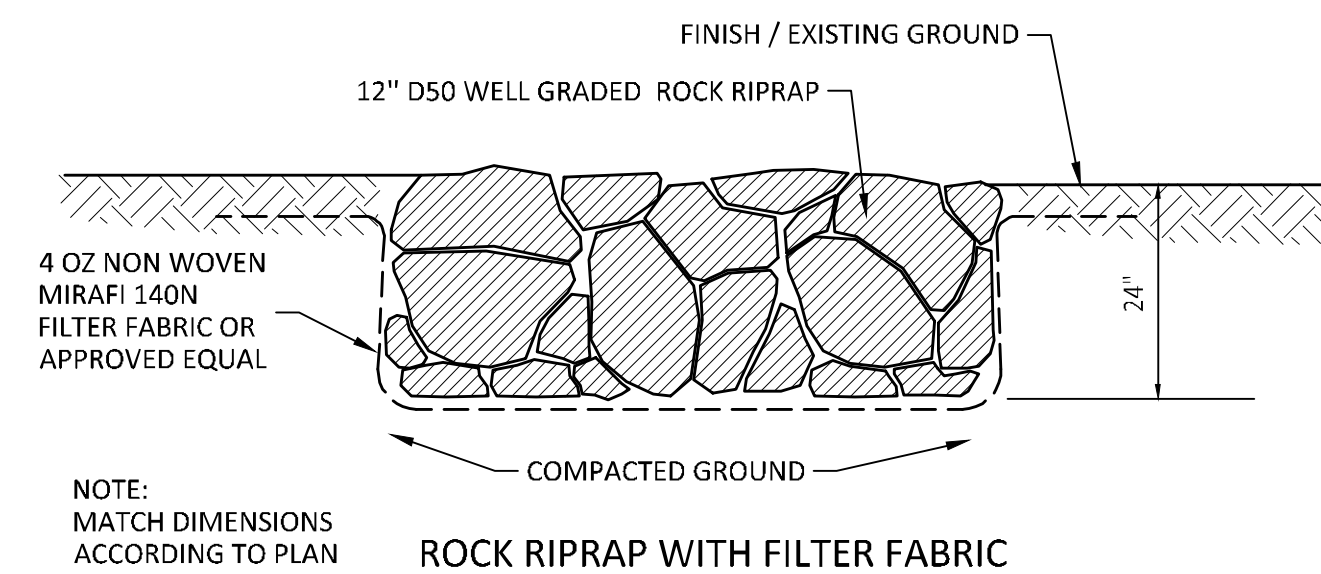
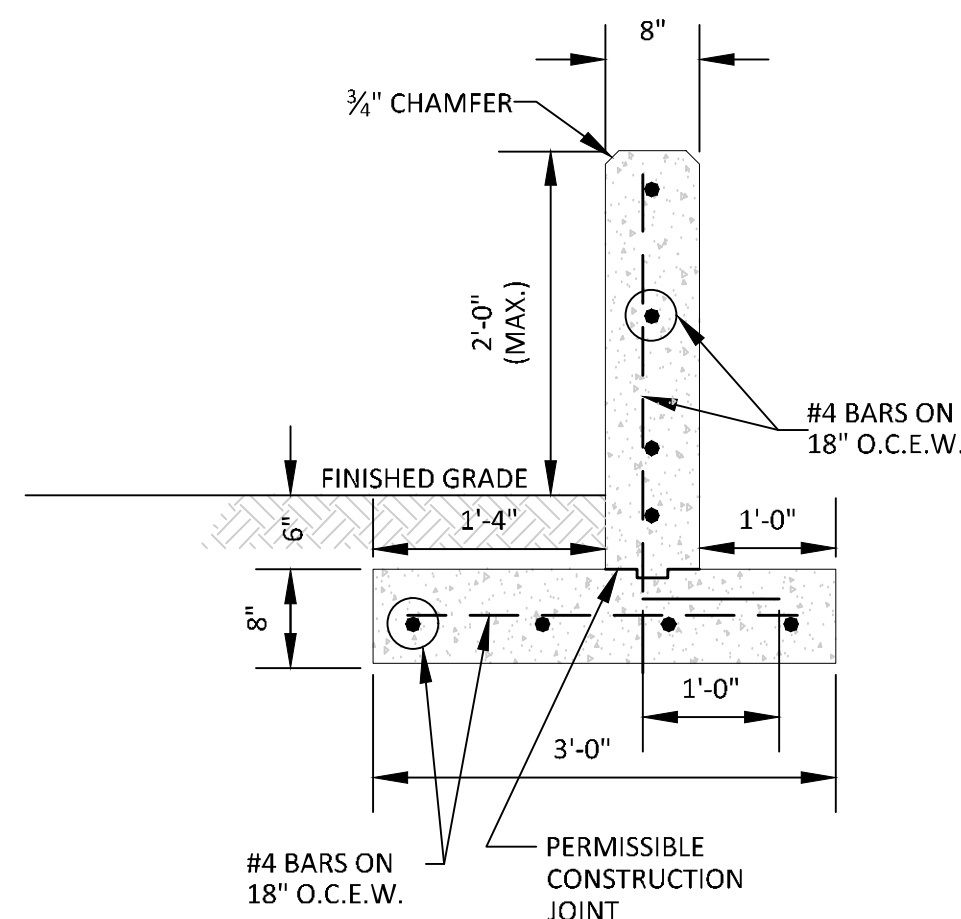
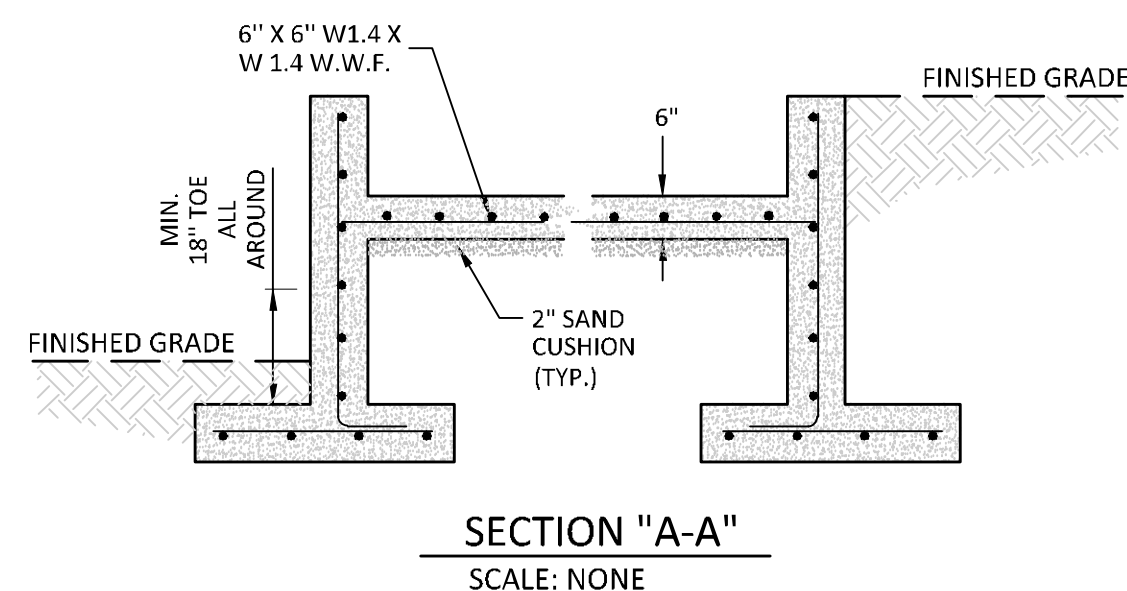
3 TYPICAL SWING GATE

SCALE: NONE

CUST-338



ISOMETRIC VIEW
SCALE: NONE



NOTE:
MATCH DIMENSIONS
ACCORDING TO PLAN

ROCK RIPRAP DETAIL

SCALE: NONE

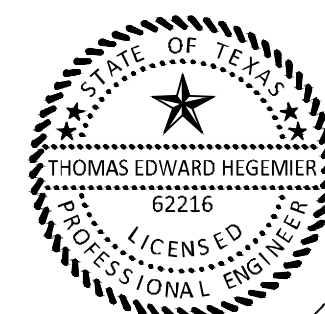
CUST-001

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TBPE Firm Number: 3937
TBPLS Firm Number: 10105800

DETAILS SHEET 1

ELIZABETH AVENUE
CITY OF NEW BRAUNFELS



Thomas Edison Hegmore
4/20/2021

Designed:	GP/OF
Drawn:	GP/OF
Reviewed:	TEH
Date:	4/20/2021

SHEET

9 OF 10

Project No.:
1757-006

