



SAN ANTONIO WATER SYSTEM
San Antonio River Outfall Pipeline Project No. 2B
SAWS Job No. 13-4510 (Sewer)
Solicitation No. CD-B-14-065-MR

ADDENDUM NO. 1
October 22, 2014

TO BIDDER OF RECORD:

The following changes, additions, and/or deletions are hereby made a part of the Contract Documents for the construction of the San Antonio River Outfall Pipeline Project No. 2B, for the San Antonio Water System, San Antonio, Texas, dated September 2014, as fully and completely as if the same were set forth therein.

PART 1 - BIDDING AND CONTRACT DOCUMENTS

1. PRICE PROPOSAL: REPLACE this section in its entirety with the attached section.
2. SPECIAL CONDITIONS:

ADD Paragraph 1.6 as follows:

“1.6 Easement Parcel P13-020 & P13-020T: Contractor to provide landowner at least one (1) month written notice prior to commencing construction. Landowner contact information is as follows:

Art Mortgage Borrower Propco 2010-6 LLC
Attn: Todd Jesca
10 Glenlake Pkwy NE #800 Tower
Atlanta, Georgia 30328-3495

Prior to commencing any construction activities, Contractor shall meet with landowner to coordinate all construction activities, traffic control and access to driveways and parking areas for delivery trucks and employee access. Access to parking areas and driveways must be maintained at all times during construction.”

PART 2 - TECHNICAL SPECIFICATIONS

1. SECTION 01130 – PAYMENT PROCEDURES:

A. REVISE the first sentence of Paragraph 1.02 G as follows:

“G. HDPE SIPHON LINE, DR 17 (IPS) (ALL DEPTHS) – Item Nos. 02700-36 & 02700-18

B. ADD the following sentence to the end of Paragraph 1.02 FF.1:

“In addition to payment items listed in Item No. 230, payment under this item shall include all work required for placement of pavement markings to match existing pavement markings in all disturbed areas.”

2. SECTION 02551 – SANITARY SEWER RENEWAL BY SPIN CAST PIPE LINING METHOD:

REPLACE this section in its entirety with the attached section.

3. SECTION 02623 – FIBERGLASS REINFORCED PIPE (FRP):

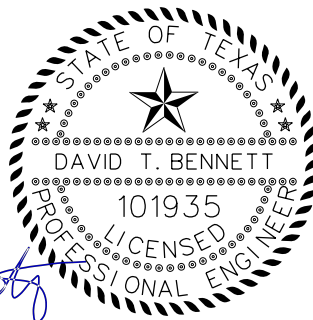
REPLACE Paragraph 2.02, E in its entirety with the following:

“E. Tee-Based Manhole fittings shall be made with fiberglass pipe and shall include a 36-inch diameter manway.”

PART 3 - DRAWINGS

1. SHEET G1 – TABLE OF CONTENTS & LEGEND: REPLACE this sheet in its entirety with the attached sheet.
2. SHEET G2 – GENERAL NOTES: REPLACE this sheet in its entirety with the attached sheet.
3. SHEET G2A – COSA FLOOD PLAIN AND R.O.W. NOTES: ADD this sheet in its entirety with the attached sheet.
4. SHEET G3 – QUANTITIES: REPLACE this sheet in its entirety with the attached sheet.
5. SHEETS PL1 through PL15, PLAN AND PROFILE: REPLACE these sheets in their entirety with the attached sheets.
6. SHEET DT1 –TRENCHING DETAILS–1: REPLACE this sheet in its entirety with the attached sheet.
7. SHEET DT4 – MANHOLE DETAILS – 2: REPLACE this sheet in its entirety with the attached sheet.
8. SHEET DT5 – MANHOLE DETAILS – 4: REPLACE this sheet in its entirety with the attached sheet.

ALL BIDDERS SHALL ACKNOWLEDGE RECEIPT OF ADDENDUM NO. 1 IN THE BID FORM AND BY HIS/HER SIGNATURE AFFIXED HERETO AND TO FILE SAME AS AN ATTACHMENT TO HIS/HER BID. BID FORMS SUBMITTED WITHOUT THIS ACKNOWLEDGEMENT WILL BE CONSIDERED INFORMAL.



10-22-14

David T. Bennett, P.E.

Freese and Nichols, Inc.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

ACKNOWLEDGEMENT BY BIDDER

THE UNDERSIGNED ACKNOWLEDGES RECEIPT OF THIS ADDENDUM NO. 1 AND THE BID SUBMITTED HERewith IS IN ACCORDANCE WITH THE INFORMATION AND STIPULATION SET FORTH.

Date

Signature of bidder

Appended hereto and part of Addendum No. 1 are:

1. PRICE PROPOSAL
2. SECTION 02551
3. PLANS (Revised Sheets)
 - a. SHEET G1
 - b. SHEET G2
 - c. SHEET G2A
 - d. SHEET G3
 - e. SHEETS PL1 through PL15
 - f. SHEET DT1
 - g. SHEET DT4
 - h. SHEET DT5

END OF ADDENDUM NO. 1

PRICE PROPOSAL

PROPOSAL OF _____,
 a corporation _____
 a partnership consisting of _____
 an individual doing business as _____

THE SAN ANTONIO WATER SYSTEM:

Pursuant to Instructions and Invitations for Competitive Sealed Proposals, the undersigned proposes to furnish all labor and materials as specified and perform the work required for the construction of the **SAN ANTONIO RIVER OUTFALL PIPELINE PROJECT NO. 2B**, San Antonio Water System Job Number 13-4510 in accordance with the Plans and Specifications for the following prices, to wit:

BID ITEMS

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
A	SANITARY SEWER BASE BID ITEMS				
02623-48a	48" FRP GRAVITY SEWER LINE (INSTALL BY OPEN CUT), SN 46 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	8,200	\$ _____	\$ _____
02623-48b	48" FRP GRAVITY SEWER LINE (INSTALL BY OPEN CUT), SN 72 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	1,800	\$ _____	\$ _____
02623-48c	48" FRP GRAVITY SEWER LINE (REMOVE AND REPLACE), SN 46 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	60	\$ _____	\$ _____
848-18	18" PVC GRAVITY SEWER LINE, F679, PS 115 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	20	\$ _____	\$ _____
848-10	10" PVC GRAVITY SEWER LINE, D3034, SDR-26 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	20	\$ _____	\$ _____
848-8	8" PVC GRAVITY SEWER LINE, D3034, SDR-26 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	80	\$ _____	\$ _____
848-6	6" PVC FORCE MAIN, AWWA C-900 (ALL DEPTHS) _____ Dollars and _____ Cents	LF	15	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
812	12" PVC WATER MAIN, C-900 _____ Dollars and _____ Cents	LF	30	\$ _____	\$ _____
02700-36	36" HDPE SIPHON LINE, DR 17 (IPS) (ALL DEPTHS) _____ Dollars and _____ Cents	LF	2,200	\$ _____	\$ _____
02700-18	18" HDPE SIPHON LINE, DR 17 (IPS) (ALL DEPTHS) _____ Dollars and _____ Cents	LF	2,200	\$ _____	\$ _____
SS848-20	20" FUSIBLE PVC AIR PIPING , AWWA C-905, DR-25, (ALL DEPTHS) _____ Dollars and _____ Cents	LF	2,200	\$ _____	\$ _____
856-66	66" STEEL CASING (BY BORE/TUNNEL) _____ Dollars and _____ Cents	LF	800	\$ _____	\$ _____
02623-48d	48" FRP GRAVITY SEWER LINE, SN 46, CARRIER PIPE WITHIN CASING PIPE _____ Dollars and _____ Cents	LF	800	\$ _____	\$ _____
856-30	30" STEEL CASING (BY OPEN-CUT) _____ Dollars and _____ Cents	LF	70	\$ _____	\$ _____
856-24	24" STEEL CASING (BY OPEN-CUT) _____ Dollars and _____ Cents	LF	70	\$ _____	\$ _____
856-16	16" STEEL CASING (BY OPEN-CUT) _____ Dollars and _____ Cents	LF	70	\$ _____	\$ _____
401-1	REINFORCED CONCRETE PIPE (TYPE III, 36") _____ Dollars and _____ Cents	LF	40	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
401-2	REINFORCED CONCRETE PIPE (TYPE III, 18") _____ Dollars and _____ Cents	LF	60	\$ _____	\$ _____
404	CORRUGATED METAL PIPE (GALVANIZED STEEL, 15") _____ Dollars and _____ Cents	LF	20	\$ _____	\$ _____
550	TRENCH EXCAVATION SAFETY PROTECTION _____ Dollars and _____ Cents	LF	13,000	\$ _____	\$ _____
854-1	6" SANITARY SEWER SERVICE LATERAL _____ Dollars and _____ Cents	LF	600	\$ _____	\$ _____
854-2	SANITARY SEWER SERVICE CLEANOUT _____ Dollars and _____ Cents	EA	18	\$ _____	\$ _____
860	VERTICAL STACKS _____ Dollars and _____ Cents	VF	100	\$ _____	\$ _____
SS-853-1	48" FRP TEE BASE MANHOLE _____ Dollars and _____ Cents	EA	18	\$ _____	\$ _____
SS-853-2	48" FRP TEE BASE DROP MANHOLE _____ Dollars and _____ Cents	EA	8	\$ _____	\$ _____
SS-853-3	TEE BASE MANHOLE EXTRA DEPTH > 15 FT _____ Dollars and _____ Cents	VF	54	\$ _____	\$ _____
850-1	TYPE "C" SANITARY SEWER STRUCTURE _____ Dollars and _____ Cents	EA	4	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
852-1	STANDARD 4' DIA FIBERGLASS MANHOLE _____ Dollars and _____ Cents	EA	4	\$ _____	\$ _____
852-2	STANDARD 4' DIA FIBERGLASS DROP MANHOLE _____ Dollars and _____ Cents	EA	1	\$ _____	\$ _____
852-3	STANDARD MANHOLE EXTRA DEPTH > 6 FT _____ Dollars and _____ Cents	VF	15	\$ _____	\$ _____
02700-1	42" SIPHON ACCESS VAULT _____ Dollars and _____ Cents	EA	4	\$ _____	\$ _____
02700-2	30" AIR BY-PASS ACCESS VAULT _____ Dollars and _____ Cents	EA	3	\$ _____	\$ _____
850-2	SIPHON #3 INLET STRUCTURE _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
850-3	SIPHON #3 OUTLET STRUCTURE _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
850-4	SIPHON #4 INLET STRUCTURE _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
850-5	SIPHON #4 OUTLET STRUCTURE _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
850-6	SIPHON #5 INLET STRUCTURE _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
850-7	SIPHON #5 OUTLET STRUCTURE _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
02251	RILLING ROAD TRANSFER STATION PIPING REHABILITATION _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
848-48	REMOVAL OF EXISTING 48" SANITARY SEWER PIPE _____ Dollars and _____ Cents	LF	210	\$ _____	\$ _____
862-1	REMOVAL OF EXISTING MANHOLE _____ Dollars and _____ Cents	EA	3	\$ _____	\$ _____
862-2	ABANDON EXISTING MANHOLE _____ Dollars and _____ Cents	EA	22	\$ _____	\$ _____
02218-1	CELLULAR GROUT FILL OF EXISTING 48" SANITARY SEWER LINE _____ Dollars and _____ Cents	LF	6,500	\$ _____	\$ _____
230	REMOVE AND REPLACE ASPHALT PAVEMENT _____ Dollars and _____ Cents	SY	8,700	\$ _____	\$ _____
503	GRAVEL DRIVEWAY REPAIR _____ Dollars and _____ Cents	SY	50	\$ _____	\$ _____
500	REMOVE AND REPLACE CONCRETE CURB _____ Dollars and _____ Cents	LF	20	\$ _____	\$ _____
505	REMOVE AND REPLACE CONCRETE RIP RAP _____ Dollars and _____ Cents	SY	80	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
554	HIGH PERFORMANCE TURF MAT (HPTRM) _____ Dollars and _____ Cents	SY	1,325	\$ _____	\$ _____
508-1	REMOVE AND REPLACE BARBED WIRE FENCE (STEEL OR WOOD POSTS) _____ Dollars and _____ Cents	LF	700	\$ _____	\$ _____
508-2	REMOVE AND REPLACE WOOD FENCE AND GATES _____ Dollars and _____ Cents	LF	100	\$ _____	\$ _____
508-3	INSTALL 16' TYPE 1 OR TYPE 2 GATE _____ Dollars and _____ Cents	EA	3	\$ _____	\$ _____
845	PIPELINE MARKER _____ Dollars and _____ Cents	EA	20	\$ _____	\$ _____
520	SEEDING _____ Dollars and _____ Cents	SY	69,600	\$ _____	\$ _____
509-1	METAL BEAM GUARDRAIL (WOOD POST) _____ Dollars and _____ Cents	LF	50	\$ _____	\$ _____
509-2	METAL BEAM GUARDRAIL (SINGLE GUARDRAIL TERMINAL - SGT) _____ Dollars and _____ Cents	EA	2	\$ _____	\$ _____
509-3	METAL BEAM GUARDRAIL (DOWNSTREAM ANCHOR TERMINAL - DAT) _____ Dollars and _____ Cents	EA	2	\$ _____	\$ _____
864	BYPASS PUMPING _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	ESTIMATED QUANTITY	UNIT PRICE (FIGURES)	TOTAL PRICE (FIGURES)
02940	TREE PROTECTION _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
02290	EROSION AND SEDIMENTATION CONTROLS (SWPPP) _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
530	BARRICADES, SIGNS AND TRAFFIC HANDLING _____ Dollars and _____ Cents	LS	1	\$ _____	\$ _____
BID SUMMARY					
<u>LINE ITEM "A"</u>					
SUBTOTAL BASE BID				\$ _____	
100	Mobilization and Demobilization: This item includes project move-in and move-out of personnel and equipment, for work shall include furnishing all labor, materials, tools, equipment and incidentals required to mobilize, demobilize, bond and insure the Work for the <i>SAN ANTONIO RIVER OUTFALL PIPELINE PROJECT NO. 2B</i> , in accordance with the contract documents, complete in place. Percent of the <u>Line Item "A"</u> , Subtotal Base Bid written in words _____ Percent (Maximum of 10% of <u>Line Item "A" Subtotal Base Bid Amount</u>)	LS	1	\$ _____	\$ _____
101	Preparing Right-of-Way: This item includes removing and disposing of all obstructions from the right-of-way and from designated easements where removal of such obstructions is not otherwise provided for in the Drawings and Specifications. Work shall include furnishing all labor, materials, tools, equipment, incidentals required, complete in place. Percent of the <u>Line Item "A"</u> , Subtotal Base Bid written in words _____ Percent (Maximum of 5% of <u>Line Item "A" Subtotal Base Bid Amount</u>)	LS	1	\$ _____	\$ _____
MOBILIZATION, DEMOBILIZATION, AND PREPARING RIGHT-OF-WAY SUBTOTAL				\$ _____	

Mobilization lump sum bid shall be limited to a maximum 10% of the Line Item "A" Sub-total Base Bid amount. Preparing Right-of-Way lump sum bid shall be limited to a maximum of 5% of the Line Item "A" Sub-total Base Bid amount. The Line Item "A" Sub-total base bid is defined as all bid items **EXCLUDING** Item 100, Mobilization and Item 101, Preparing Right-of-Way. **In the event of a discrepancy between the written percentage and dollar amount shown for Mobilization and Preparation of ROW bid items the written percentage will govern. If the percentage written exceeds the allowable maximum stated for mobilization and or preparation of ROW, SAWS reserves the right to cap the amount at the percentages shown and adjust the extensions of the bid items accordingly.**

TOTAL BID AMOUNT (LINE ITEM "A", MOBILIZATION, DEMOBILIZATION & PREPARING RIGHT-OF-WAY)

\$ _____

_____ DOLLARS

AND _____ CENTS

BIDDER'S SIGNATURE & TITLE

FIRM'S NAME (TYPE OR PRINT)

FIRM'S ADDRESS

FIRM'S PHONE NO./FAX NO.

FIRM'S PHONE EMAIL ADDRESS

The Contractor herein acknowledges receipt of the following:
Addendum Nos. _____

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE BID.

The Work included in this Bid Proposal shall be complete, as defined in the General Conditions, within **390** calendar days. **The Bidder understands and accepts the provisions of the Contract Documents relating to liquidated damages of the Project if not completed on time.** Complete the additional requirements of the Proposal which are included on the following pages.

SECTION 02551

SANITARY SEWER RENEWAL BY SPIN CAST PIPE LINING METHOD

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. SAWS Section 864 – Bypass Pumping
- B. SAWS Section 866 – Sewer Main Televising Inspection
- C. SAWS Section 868 – Sewer Main Cleaning
- D. SAWS Section 1114 – Pre-Construction Video

1.02 SUMMARY

- A. This specification covers work, materials and equipment required for the structural reconstruction of existing sanitary sewer pipe using an approved structural, monolithic spray-application of a high-build, geopolymer liner system with corrosion protection. Procedures for surface preparation, cleaning, application and testing are described herein.

1.03 REFERENCES

- A. Applicable ASTM and ACI Standards and Specifications

Unless revised herein, the Contractor shall follow the latest revision of the practices and standards of the following American Society for Testing and Materials (ASTM) Standards, which are made part of this specification:

American Society for Testing and Materials (ASTM):

1. ASTM C 109 – Compressive Strength Hydraulic Cement Mortars.
2. ASTM C 293 – Flexural Strength of Concrete
3. ASTM C 496 – Splitting Tensile Strength of Cylindrical Concrete Specimens
4. ASTM C 882 – Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear
5. ASTM F 2414 – Practice for Sealing Sewer Manhole Using Chemical Grouting

American Concrete Institute (ACI):

1. ACI 305R – Hot Weather Concreting
2. ACI 306R – Cold Weather Concreting
3. ACI Certified Concrete Field Testing Technician, Level 1

- B. SSPWC 210-2.3.3 - Chemical resistance testing published in the Standard Specifications for Public Works Construction, 1997 edition (otherwise known as “The Greenbook”).

1.04 SUBMITTALS

- A. Submittals shall be prepared and submitted in accordance with an Antonio Water System General Conditions.
- B. The following items shall be submitted:

1. Before any field work by the Contractor, the Contractor shall submit to the Owner for his review the following:
 - a. A fully detailed engineers report submitted by a third party, registered professional engineer.
 - b. Detailed installation procedures and specific procedures for rehabilitation of sewer mains and various other underground structures,
 - c. Manufacturer-certified copies of all test reports on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
 - d. Applicator Qualifications
 - (i) Manufacturer certification that Applicator has been trained and approved in the handling, mixing and application of the products to be used.
 - (ii) Certification that the equipment to be used for applying the products has been manufactured or approved by the manufacturer and Applicator personnel have been trained and certified for proper use of the equipment.
 - (iii) Three (3) years experience and five (5) recent references of projects of similar size (>24") and scope and Applicator must provide references indicating successful application on underground substrates of a minimum 1,000 LF of the specified structural, monolithic spray-application of a high-build, geopolymer liner system with corrosion protection.
 - (iv) The Contractor's office and/or domicile from which the work for THIS CONTRACT will be executed shall provide a list of qualifying experience within 14 days prior to submitting. At a minimum, the Contractor shall provide the following: project name, owner, and contact person, phone number, diameter and length of pipe. ALL PAST REFERENCES PRIOR TO THE BID MUST BE SUBMITTED. Omission of any references may be grounds for disqualification or termination.
 - (v) Proof of any required federal, state or local permits or licenses necessary for the project.
 - e. Letter acknowledging the additional warranty terms as discussed in Paragraph 1.08/B of this Specification.
2. After rehabilitation of the pipe, the Contractor shall submit to the Owner/Engineer for his records the following:
 - a. DVD or CD and log (1 copy of both) of the Contractor's TV inspection of the pipes to be rehabilitated.
 - b. Detailed minimum design thickness calculations for the geopolymer liner based on Contractor's TV inspection results.
 - c. DVD or CD and log (1 copy of both) of the Contractor's TV inspection of the Completed Work.
 - d. Test results of samples of geopolymer liner as specified in the contract documents.

1.05 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality geopolymer liner products with minimum 3-years' experience.
- B. Applicator: Company specializing in geopolymer liner products with 3-years' experience. Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM, ACI and SSPWC standards and the geopolymer liner manufacturer's recommendations.

- C. Single Source Responsibility: Provide geopolymer liner and corrosion protection produced by same manufacturer. Use only products approved by geopolymer liner manufacturer, and use only within recommended limits.

① ~~D. Do not paint over code required labels or equipment identification, performance rating, name or nomenclature plates.~~

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in original containers with seals unbroken and labels intact and free of moisture.
- B. Storage: Contractor shall designate a specific space at the project site for storing and mixing materials. Protect this space and repair all damage resulting from use. Do not store kerosene nor gasoline in this space. Remove oily rags at the end of each day's work. Products are to be kept dry, protected from weather and stored under cover within the temperature ranges recommended by the manufacturer. Products are to be stored and handled according to their MSDSs.

1.07 PROJECT CONDITIONS:

- A. Environmental Requirements: Applicator shall conform with all local, state and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities. Confined space entry requirements shall be followed.
- ① B. Maintain the temperature inside the structure at not less than ~~60°~~ 45° F and no more than 100° F during application and finishing.
- ① C. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures ~~above 65° F and below 90° F for 24 hours~~ before, during, and ~~48 hours after following~~ application of finishes, ~~within temperature range and for duration as directed by manufacturer unless required otherwise by manufacturer's instructions.~~
- D. Do not apply coating in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by the coating manufacturer's printed instructions.
- E. Protection: provide sufficient shielding to fully protect adjacent finished work.

1.08 WARRANTY

- A. Manufacturer shall warrant all work against defects in materials and applicator shall warrant all work against defects in workmanship for a period of two (2) years, unless otherwise noted, from the date of final acceptance of the project. Manufacture / Applicator shall, within a reasonable time after receipt of written notice thereof, repair defects in materials or workmanship which may develop during said two (2) year period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the Owner.
- B. Manufacture / Applicator shall provide an extended warranty for a period of three (3) additional years from the end of the two (2) year standard warranty period.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Existing pipe shall be assumed to be liner with T-lock or similar liner which shall need to be removed by applicator prior to inspection and installation of geopolymer product.

2.02 ACCEPTABLE MANUFACTURERS

- ① A. The EcoCast geopolymer liner products specified herein are manufactured by GeoTree Technologies and installed by IPR, LLC ~~or equal~~ and are intended to establish a standard of quality. There are no other acceptable manufacturers.

2.03 GEOPOLYMER LINER

- A. The geopolymer lining material shall be a micro-fiber reinforced ultra-dense geopolymer. The material shall provide a high strength fiber reinforced mortar specifically designed for ease of mechanical pumping, spraying and spin casting. The geopolymer liner shall not clog spinner heads or spray equipment.
- B. The geopolymer liner shall be designed to produce a liner with improved compressive and flexural strength, high adhesion to damp surfaces, lower permeability and increased resistance to aggressive chemical attack.
- C. The fiber reinforced formula shall be engineered to improve hydraulic abrasion resistance, provide dimensional stability and protect against penetration by substances such as fats, oils, gases, and where high corrosion exists within a sanitary sewer environment.

2.04 ANTI-MICROBIAL SYSTEM (AMS):

- A. Application of Antimicrobial Liquid, or Epoxy (only when directed by Engineer), to prevent Microbiologically Induced Corrosion (MIC). The work consists of rolling, spraying or centrifugally applying AMS Liquid, approved substitute, or epoxy to the inside of the newly cast pipe. Equipment required for application can include centrifugal spray mechanisms, pneumatic spray pumps, hand pumps or paint style roller.
- B. The Antimicrobial Liquid, or Epoxy, shall be used full strength as received from the manufacturer and shall not be diluted.
- C. The Antimicrobial Liquid, shall be applied during the application of the geopolymer liner or anytime thereafter. Epoxies shall be applied after proper curing of the liner.
- D. The Antimicrobial Liquid shall be applied adequately to achieve surface saturation. Epoxies must be applied at a minimum thickness of 125 mils.
- E. The Antimicrobial Liquid, or Epoxies, must be allowed to cure for a minimum of 12 hours, or meet manufacturer recommended cure time, prior to releasing bypass or opening to any traffic.

2.05 PHYSICAL PROPERTIES

- A. Minimum Geopolymer Liner Thickness after Curing: As specified in the table below, the minimum liner thickness is based on the maximum sewer depth for the segment being rehabilitated. The thickness installed must meet the manufacturers written requirements. The

standard conditions utilized in the table below include: a pipe in the fully deteriorated condition, the water table is assumed to be at the surface; soil is assumed at 130 lbs/cubic foot, and a traffic loading of HS-20. The installed liner system, complete in place, must meet or exceed site specific conditions.

Minimum Geopolymer Liner Thickness:

Sewer Pipe Diameter	Maximum Invert Depth 0 to 10 feet	Maximum Invert Depth 10-15 feet	Maximum Invert Depth 15-20 feet	Maximum Invert Depth 20 - 25 feet
30"	1.5 "	1.5"	1.5"	1.5"
36"	1.5"	1.5"	1.5"	1.5"
48"	1.5"	1.5"	1.5"	1.6"
54"	1.5"	1.5"	1.6"	1.7"
60"	1.5"	1.5"	1.7"	1.8"
72"	1.5"	1.6"	1.9"	2.0"
84"	1.6"	1.8"	2.0"	2.2"
96"	1.8"	1.9"	2.1"	2.4"
108"	2.4"	2.0"	2.3"	2.5"
120"	***	2.1"	2.4"	2.6"

Note: If host pipe condition is deemed to be more severe than assumed conditions, liner thickness may be increased upon approval by the Engineer.

- B. The geopolymer liner material shall also conform to the minimum requirements demonstrated in the following table:

Physical Properties	ASTM Reference	Requirements
Compressive Strength	ASTM C 39	Minimum 8,000 psi @ 28 days
Modulus of Elasticity	ASTM C 469	Min. 5,000,000 psi @ 28 days
Flexural Strength	ASTM C 293	Minimum 800 psi @ 28 days
Density		Dry 127.7 pcf, Wet 139.3 pcf

- C. If different conditions are encountered in the field, design considerations may change, if required by the Project Manager. Required thickness maybe increased or decreased based on specific design. The thickness may be increased in increments of 0.2 inches at no additional cost to Owner. However, the Contractor shall not be allowed to change any required thickness unilaterally, or offer credits after the fact as remedy for liners not meeting the required thickness. Prior approval shall always be required for any changes in geopolymer liner thickness.

2.06 GEOPOLYMER LINER APPLICATION EQUIPMENT

- A. Manufacturer approved equipment shall be used in the application of the specified geopolymer lining.

- B. Application equipment should have mortar feed, high shear mixer and pump as a single operating unit. These three functions should operate as a single synchronized unit. In addition, the application equipment needs to have sensors that maintain uniform operation of all three functions and shutdown the equipment in the event of interruption of any of the functions. This will ensure consistent delivery of materials over time and distance.
- C. Application equipment needs to have visible display for the rate of water addition. This will ensure water/cement ratios are known and controlled. Water/cement ratio must be maintained below 0.20.
- D. Application equipment should measure the back pressure on the discharge side of the pump. The change in pressure will alert the operator to any potential changes in flow rates. Do not exceed 25 bars of back pressure.
- E. Spinner head needs to be capable of spraying in a clock wise and counter clock wise direction. The change in spin direction achieves superior application by applying the materials at multiple angles.
- F. Spinner head needs to be attached to a reciprocating mechanism to layer the materials. The reciprocating mechanism needs to oscillate the spinner head by a minimum of 6 inches. The layering allows more uniform application of the product and achieves higher thickness levels.
- G. Retraction system needs to be capable of pulling the spinner head at a minimum rate of 4 inches per minute with no more than +/-5% tolerance.
- H. Retraction system needs to have a visible display that monitors the rate of retraction. The rate of retraction and the volume of material discharged is necessary to calculate the thickness of the sprayed materials.
- I. The rate of retraction, material discharge volume, dry material usage and length of pipe covered should be monitored and recorded on a daily basis. This is a critical to measure the thickness of material applied.
- J. Thickness design calculations must be provided by a registered Professional Engineer.

2.07 EQUIPMENT MAINTENANCE

- A. All equipment should be in clean and good working conditions.
- B. Maintenance and service should be performed on the equipment to manufacturers standards.
- C. Inspect the dry material hopper in the mixer to ensure that there is no blockage or debris in the dry material feed point. Remove any debris prior to feeding dry powder.
- D. Inspect the pre-mix chamber to ensure it that there is no blockage or debris. Remove any debris prior to mixing.
- E. Inspect the mixing chamber to ensure there is no blockage on debris. Remove any debris or dry materials prior to application.
- F. Inspect the rotor/stator pump to ensure there is no debris or blockage in the pump. Remove any debris prior to application.

- G. Spare parts or extra equipment should be kept on site to ensure rapid redeployment in the event of equipment failure.

PART 3 EXECUTION

3.01 ACCEPTABLE APPLICATORS

- A. Geopolymer liner must be applied by a Certified Applicator of the geopolymer lining manufacturer and according to manufacturer specifications.

3.02 EXAMINATION

- A. Applicator shall verify that surfaces and substrate conditions are ready to receive work as instructed by the product manufacturer.
- B. Applicator shall examine surfaces scheduled to be finished prior to commencement of work. Report to OWNER any condition that may potentially affect proper application.
- C. Appropriate actions shall be taken to comply with local, state and federal regulatory and other applicable agencies with regard to environment, health and safety.
- D. Any active flows shall be dammed, plugged or diverted as required to ensure that the liquid flow is maintained below the surfaces to be coated. Flows should be totally plugged and/or diverted when coating the invert and during required dry/cure periods. All extraneous flows into the concrete structure at or above the area coated shall be plugged and/or diverted until the geopolymer liner has set per manufacturer recommendations.
- E. Installation of the geopolymer liner shall not commence until the host pipe has been properly cleaned and repaired in accordance with these specifications and geopolymer liner manufacturer recommendations.
- F. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated.

3.03 DIVERSION PUMPING

- A. Maintain sanitary sewer service during the installation process.
- B. Install and operate diversion pumping equipment to maintain sewage flow around the segment of pipe being rehabilitated, and to prevent backup or overflow in compliance with OWNER requirements.
- C. Coordinate with OWNER regarding potential upstream diversion strategies which could potentially reduce influent flow from Force Main and Siphon into upstream Structure.
- D. Install all diversion and isolation material and equipment so as to not affect flow in upstream or downstream structures.

3.04 SURFACE PREPARATION

- A. The floor and interior walls of the pipe or structure shall be thoroughly cleaned and made free of all foreign materials including dirt, grit, roots, grease, sludge and all debris or material that

may be attached to the wall or bottom of the pipe. This shall include removal of existing lining systems, such as t-lock, to the extent deemed necessary by the manufacturer.

1. High pressure water blasting with a minimum of 3,500 psi shall be used to clean and free all foreign material within the pipe or structure.
2. When grease and oil are present within the pipe or structure, an approved detergent or muriatic acid shall be used integrally with the high pressure cleaning water.
3. All materials resulting from the cleaning of the pipe or structure shall be removed prior to application of the cementitious pipe material.
4. All loose or defective brick, grout, or surface irregularities shall be removed to provide an even surface prior to application of the cementitious pipe material.

3.05 SEALING ACTIVE LEAKS

- A. The work consists of hand applying a dry quick-setting cementitious mix designed to instantly stop running water or seepage in all types of concrete and masonry structures. The contractor shall apply an approved quick-setting mortar in accordance with manufacturer's recommendations.

3.06 INVERT REPAIR

- A. The work consists of mixing and applying GeoSpray™ to fill all large voids and repair inverts prior to spraying or centrifugally casting the pipe. For invert repairs, flow must be temporarily restricted by inflatable or mechanical plugs prior to cleaning.
 1. The area to be repaired must be cleaned and free of all debris per the guidelines set forth in section 4.1, Surface Cleaning and Preparation.
 2. Add GeoSpray™ to water and mix to the desired consistency. Contractor shall not exceed a 0.20 water/cement ratio.
 3. Once mixed to proper consistency, the GeoSpray™ shall be shot or hand troweled for invert repairs. Care should be taken to not apply excessive material in the channel, which could restrict flow. Once applied, GeoSpray™ should be smoothed either by hand or trowel in order to facilitate flow.
 4. Spray or centrifugal application of GeoSpray™ may proceed immediately after invert repairs are completed.

3.07 APPLICATION OF CENTRIFUGALLY CAST CEMENTITIOUS PIPE OR STRUCTURE MATERIAL

- A. The work consists of spray applying and / or centrifugally casting GeoSpray™ to the inside of the existing pipe or structure. The necessary equipment and application methods to apply GeoSpray™ shall be only as approved by GeoTree Technologies.
 1. Contractor shall add GeoSpray™ powder to the batch water not to exceed a 0.20 water/cement ratio.
 2. For example, add 100 lbs Geo-Spray powder to 18-20 lbs batch water. Precision metering of water in a continuous mixing chamber is required to maintain the strict water to cement ratio. It is important to maintain the specified water to cement ratio throughout the application process. Uniform water to cement ratio equates to consistent strength.

3. GeoSpray™ shall be mixed in a high shear mixer. This ensures thorough and uniform mix of water with the mortar prior to pumping. Begin pumping through an adjustable rotor stator pump for continuous delivery to the appropriate application device.
4. Continuous automated mixing and pumping eliminates human error and mechanical issues associated with maintaining consistent water/cement ratio, mix time, mix speed and dwell time prior to pumping. The automation of dry material feed rate, precise metering of water and pump rate eliminates wet/dry and thick/thin variations resulting in a uniform structure regardless of the pumping distance.
5. Spray application of GeoSpray™
 - a. GeoSpray™ mortar delivery hose shall be coupled to a medium-velocity spray application nozzle. Pumping of the material shall commence and the mortar shall be atomized by the introduction of air at the nozzle, creating a medium-velocity spray pattern for material application.
 - b. Spraying shall be performed by starting at the pipe end-project location and progressing towards the entrance of the pipe.
 - c. GeoSpray™ shall be applied to a specified uniform minimum thickness no less than 3/4 inch.
6. Centrifugal casting application of the cementitious material.
 - a. GeoSpray™ mortar delivery hose shall be coupled to a high speed rotating applicator device. The rotating casting applicator shall then be positioned within the center of the pipe cavity end-project location or access point.
 - b. The high speed rotating applicator shall then be initialized, and pumping of the material shall commence. As the mortar begins to be centrifugally cast evenly around the interior of the cavity, the rotating applicator head shall uniformly travel back and forth at the center point of the pipe at a controlled frequency conducive to providing a uniform material thickness to the pipe walls.
 - c. Controlled multiple passes are then made until the specified minimum finished thickness is attained. If the procedure is interrupted for any reason, simply arrest the retrieval of the applicator head until flows are recommenced.
 - d. Material thickness may be verified at any point with a depth gauge and shall be no less than a uniform 3/4-inch. If additional material is required at any level, the rotating applicator head shall be placed at the location and application shall recommence until that area meets the required thickness.
7. GeoSpray™ shall be applied to a damp surface, with no free water.
8. The medium-velocity spray nozzle and the centrifugal spin casting head may be used in conjunction to facilitate uniform application of the mortar material to irregularities in the contour of the pipe walls.
9. If necessary, GeoSpray™ may be troweled following the spray application. Initial troweling shall be in an upward motion, to compress the material into voids and solidify the pipe wall. Precautions should be taken not to over-trowel.
10. Proper steps shall be taken to ensure the material is cured in a moist and moderate climate. General underground conditions are usually adequate to meet this curing requirement, but situations of dry and/or hot conditions are present, the use of a wind barrier and fogging spray will be required.

11. GeoSpray™ shall not be applied during freezing weather conditions. GeoSpray™ shall not be placed when the ambient temperature is 37 degrees Fahrenheit and falling or when the temperature is anticipated to fall below 32 degrees Fahrenheit during 24 hours.
12. During extreme hot weather conditions, chilled water may be used to mix the GeoSpray™ geopolymer. The GeoSpray™ geopolymer cement should be maintained at a temperature lower than 90 degrees F. Cooling the materials overnight in a refrigeration unit is also an effective method of maintaining ideal material temperatures.

3.08 TESTING AND INSPECTION

- A. During application, Applicator shall regularly perform and record geopolymer lining thickness readings with a method approved by manufacturer. A minimum of three readings per 200 square foot area shall be recorded. Applicator shall submit all documentation on thickness readings to Inspector on a daily basis when coating application occurs.
- B. Compressive strength test should be performed at a minimum of every 40,000 lbs or as designated by the owner in the Contract documents or purchase order. The cement mortar will be collected at the discharge of the pump or at the end of the hose near the discharge point. Use cylinders as in accordance with Test Method ASTM C 39/39M (4" x 8") or shotcrete panels as in accordance with Test Method ASTM C1140. When performing ASTM C 39/39M test, it is critical to use 4" x 8" or larger cylinders. The mortar is a geopolymer matrix that is a "chemically fused" ceramic. Geopolymers work by having the covalently bound atoms within polymers at the surface of the nano-particles displaced by alkali molecules such that their molecular structure is disrupted creating future attachment sites. The nano size of the particles and mass ratio of particles make the surfaces of the various silica-oxide-based (quartz) and alumina-oxide-based (metakaolin) polymers easier to disrupt and therefore reduces the energy needed for this reaction to occur. This reaction is called "depolymerization". This process of depolymerization sheers particles apart and creating molecular disruption at the surface of the particles. Chemical reactions begin to ramp-up (being catalyzed by the initial friction/heat of the mixer). Basically, this entire process is helping the particles to begin to dissolve at their surface, breaking molecular bonds and creating future sites for attachment. Without sufficient mass and therefore chemical reactivity (catalysis), there is insufficient energy put into the system as a whole in order to create sufficient depolymerization. Simply put, there needs to be a certain amount disruption at the molecular level (breaking of molecular bonds) to make things work, this is called the "Energy of Activation". This is critical to the polymerization reaction. Then several things happen at once. Primarily, dehydroxylation (water molecules leaving) and alkalination reactions occur, cross-linking the ceramic. Other metal ions in the mass are oxidizing due to their interaction with air and general oxidation at the now disrupted surfaces of the particles, to further cross link the mass, and the "polycondensation" process moves forward, releasing heat energy, and moving the chemical process forward creating a crystalline structure that a synthetic aluminosilicate stone.
- C. A final visual inspection shall be made by the Inspector and Applicator. Any deficiencies in the finished coating shall be marked and repaired by Applicator according to the procedures set forth herein.

END OF SECTION

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G3	QUANTITIES
G4	OVERALL PROJECT LAYOUT PLAN
G5	PROJECT CONTROL & BENCHMARKS PROJECT LAYOUT PLAN

SANITARY SEWER PLAN & PROFILE SHEETS

PL1	LINE 'A' PLAN & PROFILE STA. 87+00 TO STA. 94+87.39
PL2	LINE 'B' PLAN & PROFILE STA. 100+00 TO STA. 105+30.71
PL3	LINE 'C' PLAN & PROFILE STA. 144+74.25 TO STA. 153+00
PL4	LINE 'C' PLAN & PROFILE STA. 153+00 TO STA. 162+00
PL5	LINE 'C' PLAN & PROFILE STA. 162+00 TO STA. 171+00
PL6	LINE 'C' PLAN & PROFILE STA. 171+00 TO STA. 180+00
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PAVING AND TRAFFIC CONTROL

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R2	PAVING AND TRAFFIC CONTROL OLD CORPUS CHRISTI RD.
R3	PAVING AND TRAFFIC CONTROL OLD CORPUS CHRISTI RD.
R4	PAVING AND TRAFFIC CONTROL OLD CORPUS CHRISTI RD.
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R9	TXDOT GUARDRAIL STANDARDS (4)
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SHEET NUMBER SHEET TITLE

STRUCTURAL

SG1	STRUCTURAL GENERAL NOTES
SG2	STRUCTURAL ABBREVIATIONS
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S2	SIPHON NO. 3 OUTLET STRUCTURE PLANS & SECTIONS
S3	SIPHON NO. 4 INLET STRUCTURE PLANS & SECTIONS
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TREE PROTECTION & STORM WATER POLLUTION PREVENTION PLAN

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TS6	TREE INVENTORY & EROSION CONTROL LAYOUT 6
TS7	TREE INVENTORY & EROSION CONTROL LAYOUT 7
TS8	TREE INVENTORY

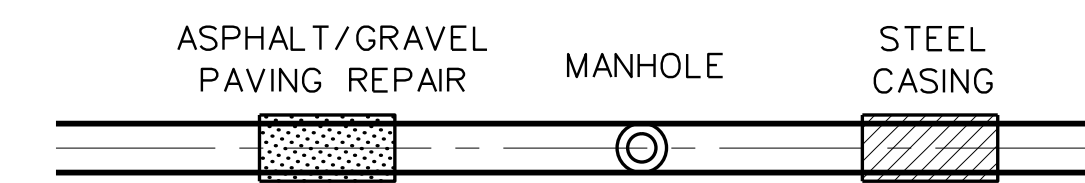
STANDARD ABBREVIATIONS

AC	ASBESTOS CONCRETE	NW	NORTHWEST
AH	AHEAD	NA	NOT APPLICABLE
ASPH	ASPHALT	NSPI	NO SEPARATE PAY ITEM
B-B	BACK TO BACK	NTS	NOT TO SCALE
BC	BACK OF CURB	OC	ON CENTER
BK	BACK	OD	OUTER DIAMETER
BSL	BUILDING SETBACK LINE	OHE	OVERHEAD ELECTRIC
CI	CAST IRON	OHT	OVERHEAD TELEPHONE
CL	CENTERLINE	PVMT	PAVEMENT
CONC	CONCRETE	+/-	PLUS OR MINUS
CP	CONTROL PANEL	PC	POINT OF CURVATURE
CORP	CORPORATION	PE PI	PLAIN END
CMP	CORRUGATED METAL PIPE	PT	POINT OF INTERSECTION
CPL	COUPLING	PVC	POINT OF TANGENCY
DWG	DRAWING	PSI	POLYVINYL CHLORIDE PIPE
DI	DUCTILE IRON	PP	POUNDS PER SQUARE INCH
E	EAST	PVI	POWER POLE
ELEV / EL	ELEVATION	PL	POINT OF VERTICAL INTERSECTION
EX / EXIST	EXISTING	R	PROPERTY LINE
EW	EACH WAY	RR	RADIUS
EWEF	EACH WAY EACH FACE	RCP	RAILROAD
FC	FACE OF CURB	REQ'D	REINFORCED CONCRETE PIPE
FO	FIBER OPTIC	RT	REQUIRED
FH	FIRE HYDRANT	ROW	RIGHT
FL	FLOWLINE	RWL	RIGHT OF WAY
FM	FORCE MAIN	S	RECYCLE WATER LINE
FRP	FIBER-REINFORCED PLASTIC PIP	SS	SLOPE
FND	FOUND	SE	SANITARY SEWER
GA	GAUGE	SW	SOUTHWEST
GI	GALVANIZED IRON	STA	SOUTHWEST
GPS	GLOBAL POSITION STATION	STD	STATION
GRND	GROUND	ST T	STANDARD
HORZ	HORIZONTAL	T/P	STORM SEWER
HMAC	HOT MIX ASPHALTIC CONCRETE	T/G	TANGENT TOP OF PIPE
HPTRM	HIGH PERFORMANCE TURF REINFORCEMENT MAT	TEL	TOP OF GROUND
HRS	HOURS	TBM	TELEPHONE
IAW	IN ACCORDANCE WITH	THD	TEMPORARY BENCH MARK
I.D.	INNER DIAMETER	TYP	TYPICAL
IP	IRON PIN	UN	UNDERGROUND
LF	LINEAR FEET	UNK	UNLESS NOTED
LT	LEFT	UPRR	UNKNOWN
L	LENGTH	VERT	UNION PACIFIC RAILROAD
LP	LIGHT POLE	VPI	VERTICAL
MH	MANHOLE	VPC	VERTICAL POINT OF INFLECTION
MAX	MAXIMUM	VPT	VERTICAL POINT OF CURVATURE
MIN	MINIMUM	VPT	VERTICAL POINT OF TANGENCY
N	NORTH	WWF	WELDED WIRE FABRIC
NE	NORTHEAST		

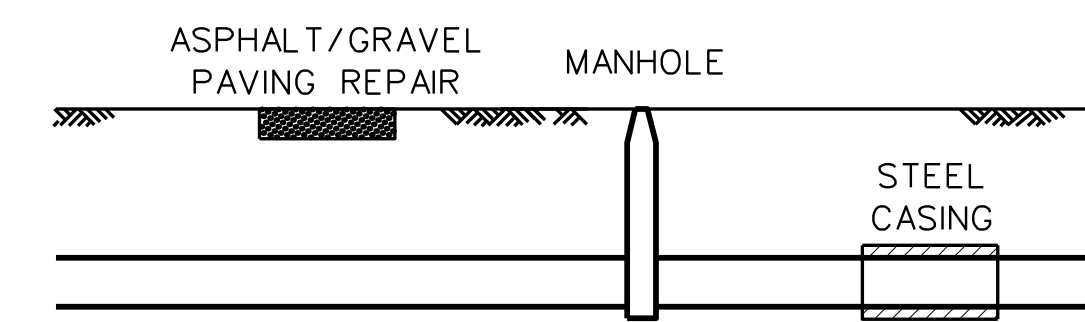
LEGEND (EXISTING ITEMS)

△	BENCHMARK	—/—/—	EARTH OR GRADE (SECTION OR PROFILE)
⊙	SIGN	—/—/—	ASPHALT PAVEMENT (SECTION OR PROFILE)
⊙	POWER POLE	—X—	BARBED WIRE FENCE
⊙	POWER POLE/TRANS.	—X—	CHAIN-LINK FENCE
⊙	ELECTRIC MANHOLE	—○—○—	NET WIRE FENCE
⊙	ELECTRIC METER	+++++	EXISTING RAILROAD
⊙	TRANSFORMER BOX (ON GROUND)	-500-	EXISTING GRADING CONTOUR
⊙	TELEPHONE MANHOLE	---	PROPERTY LINE
⊙	COMMUNICATION MANHOLE	----	EASEMENT LINE
⊙	TELEPHONE PEDESTAL	OHE	OVERHEAD ELECTRIC
⊙	CABLE T.V. PEDESTAL	UGE	UNDERGROUND ELECTRIC
⊙	LIGHT POLE	OHT	OVERHEAD TELEPHONE
⊙	LIGHT	UGT	UNDERGROUND TELEPHONE
→	GUY WIRE	UGC	UNDERGROUND CABLE
⊙	UTILITY BOX	FO	FIBER OPTIC
⊙	GAS VALVE	G	GAS
⊙	GAS METER	W	WATERLINE
⊙	WATER VALVE	18" RCP	STORM SEWER
⊙	WATER METER	8" SS	SANITARY SEWER LINE
⊙	FIRE HYDRANT	-----/SS/-----	EXISTING UTILITY ABANDONED IN PLACE AND GROUT FILLED
⊙	SPRINKLER CONTROL VALVE	---	STREAM/WATER
⊙	SPRINKLER HEADS	⊙	TREE
⊙	SANITARY SEWER MANHOLE	⊙	100 YR FLOOD ZONE
⊙	STORM DRAIN MANHOLE		

LEGEND (PROPOSED ITEMS)

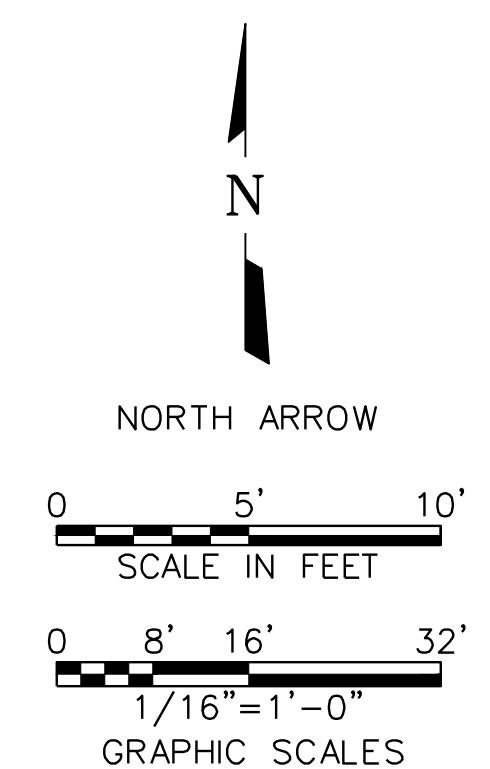


PLAN VIEW - PROPOSED PIPELINE



PROFILE - PROPOSED PIPELINE

—	PROPOSED SEWER PIPE
125+00	PROPOSED SEWER CENTERLINE STATION
---	PROPOSED SEWER CENTERLINE
— SS —	PROPOSED SAN. SEWER (BY OTHERS)
⊙	PROPOSED MANHOLE
⊙	PROPOSED STEEL CASING
⊙	ABANDON EXIST. PIPELINE AND FILL WITH FLOWABLE FILL
⊙	PROJECT CONTROL POINT LOCATION
⊙	GEOTECHNICAL BORE LOCATION
⊙	PROPOSED PLUG ON EXISTING SS LINE
⊙	PROPOSED HPTRM
-500-	PROPOSED GRADING CONTOUR
---	PROPOSED EASEMENT
⊙	PIPELINE MARKER



App. DTB
Revisions
Date 10/22 ADDENDUM NO. 1
No. A

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

SWB11467

10-22-14

DAVID T. BENNETT
101935
PROFESSIONAL ENGINEER

Date: 10/21/2014
Designed by: DTB
Drawn by: DDH
Checked by: BCT
Scale: N.T.S.

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B

TABLE OF CONTENTS & LEGEND

Sheet G1

GENERAL CONSTRUCTION

- CONTRACTOR SHALL ABIDE BY ALL APPLICABLE GOVERNMENTAL AND REGULATORY STANDARDS AND REQUIREMENTS AND OBTAIN ALL NECESSARY PERMITS AND APPROVALS FOR CONSTRUCTION OF THE PIPELINE FACILITIES SHOWN IN THE PLANS.
- THE CONTRACTOR SHALL EXCAVATE THE TOP 12 INCHES OF TOPSOIL AND STOCKPILE IT SEPARATELY FROM THE GENERAL EXCAVATION. A SUITABLE VOLUME OF TOPSOIL SHALL BE EXCAVATED TO PLACE A MINIMUM OF 12 INCHES OF TOPSOIL OVER ALL EXCAVATED OR BACKFILLED AREAS. TOPSOILING IS NOT REQUIRED WHERE PAVEMENT, CONCRETE CAP, RIPRAP OR OTHER FACILITIES ARE REQUIRED AT THE SURFACE. CONTRACTOR MAY MOUND EXCESS TRENCH EXCAVATED MATERIAL OVER PIPE UP TO 1 FOOT IN HEIGHT ABOVE NATURAL GRADE. MOUND SHALL BE COMPLETELY COVERED WITH 12 INCHES OF TOPSOIL. MOUND SHALL BE FREE OF BRUSH AND ROCK. MOUNDING IS NOT PERMITTED IN DEVELOPED PROPERTIES, ROADS, CREEKS, FLOOD PLAINS, PAVED AREAS, CULTIVATED FIELDS OR OTHER AREAS AS DIRECTED BY SAWS'S REPRESENTATIVE. RESTORE GROUND TO ORIGINAL GRADE AND PREVENT PONDING OF STORM WATER RUNOFF ON ALL GROUND DISTURBED BY CONSTRUCTION ACTIVITIES.
- CONSTRUCTION SURVEYING IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR INCLUDING BUT NOT LIMITED TO LIMITS OF PERMANENT EASEMENT AND TEMPORARY EASEMENTS, PIPE ALIGNMENT, APPURTENANCE LOCATION AND ROAD CROSSINGS. THE CONTRACTOR SHALL VERIFY ALL CONTROL MONUMENTATION PRIOR TO BEGINNING CONSTRUCTION.
- ALL PIPELINES 24" AND LARGER SHALL HAVE A MINIMUM COVER OF 48". PIPE SMALLER THAN 24" SHALL HAVE A MINIMUM COVER OF 36" (UNLESS NOTED OTHERWISE). PIPES SHALL BE ROUTED AS SHOWN UNLESS MINOR REVISIONS ARE NECESSARY TO MISS EXISTING PIPES, STRUCTURES, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL FITTINGS AND ADAPTERS REQUIRED TO MAKE THE ROUTING CHANGES. CONTRACTOR SHALL INCLUDE COST FOR THIS IN THE BID.
- CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING PIPE, STRUCTURES, EQUIPMENT, ETC. AS REQUIRED AND SHALL PROVIDE ALL FITTINGS, ADAPTERS AND APPURTENANCES REQUIRED TO MAKE THE CONNECTIONS. PROVIDE ALL SUPPORTS REQUIRED FOR A RIGID INSTALLATION AND TO HAVE A COMPLETE AND WORKING SYSTEM.
- VARIOUS LOCATIONS OF THE WORK ARE SUBJECT TO FLOODING AND STANDING WATER DURING WET WEATHER PERIODS. CONTRACTOR SHALL PLAN THIS WORK FOR DRY WEATHER PERIODS AND PROVIDE DEWATERING AND OTHER WET WEATHER PROVISIONS AS INCIDENTAL WORK.
- CONTRACTOR SHALL COORDINATE HIS PROPOSED CONSTRUCTION WITH OTHER CONTRACTORS IN THE EVENT THE OTHER CONTRACTORS ARE DOING WORK IN THE SAME AREA SIMULTANEOUSLY WITH HIS PROJECT. THIS INCLUDES, BUT IS NOT LIMITED TO, ALL CONNECTION POINTS OR OTHER SPECIAL ITEMS AS REQUIRED FOR TESTING.
- CONTRACTOR SHALL DISPOSE OF ALL EXCESS MATERIAL, CONSTRUCTION, RUBBLE, AND TRASH. ALL TRASH SHALL BE PICKED-UP AND REMOVED AT THE END OF EACH DAY. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT AS REQUIRED FROM THE U.S. CORPS OF ENGINEERS.
- NO BURNING OR BLASTING IS ALLOWED.
- CONTRACTOR SHALL INSTALL PIPELINE MARKER POSTS AT ALL PROPERTY LINES, ROAD CROSSINGS, WATERWAY CROSSINGS, AND HORIZONTAL PIS AS SHOWN ON PLANS.
- THE PERMANENT EASEMENTS ARE SHOWN ON THE DRAWINGS. THE CONTRACTOR MAY ACQUIRE ADDITIONAL TEMPORARY CONSTRUCTION EASEMENTS AT HIS OWN COST, IF HE SO CHOOSES. IF THE CONTRACTOR ACQUIRES ADDITIONAL TEMPORARY EASEMENTS, HE SHALL PROVIDE COPIES OF THE WRITTEN AGREEMENT TO SAWS. THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR ANY DAMAGES AS A RESULT OF USE OF EASEMENTS.
- ALL WORK IN THE CITY/COUNTY RIGHT OF WAYS SHALL PROCEED DURING WORKING HOURS AGREED UPON BY CITY/COUNTY INSPECTORS.
- CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC ON THE COUNTY ROAD AT ALL TIMES, AND BOTH LANES OF TRAFFIC AFTER CONSTRUCTION DUTIES ARE COMPLETE EACH DAY.
- CONTRACTOR SHALL PROVIDE APPROPRIATE SIGNAGE, BARRICADES, FLAGMEN, ETC. REQUIRED TO MAINTAIN SAFE TRAFFIC FLOW AT ALL TIMES. ALL TRAFFIC CONTROL MEASURES SHALL BE IN ACCORDANCE WITH TxDOT'S MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO SAWS AND THE RIGHT-OF-WAY OWNER FOR THE ROADWAY FOR APPROVAL NO LESS THAN 14 DAYS IN ADVANCE OF THE PROPOSED ROADWAY CLOSURE. ANY COMMENTS RECEIVED ON THE PLAN BY SAWS OR RIGHT-OF-WAY OWNER SHALL BE INCORPORATED INTO THE PLAN. THE PLAN SHALL BE PREPARED SPECIFICALLY FOR THIS PROJECT AND SHALL BE SEALED AND SIGNED BY AN ENGINEER LICENSED IN THE STATE OF TEXAS. NO SEPARATE PAY ITEM.
- CONTRACTOR SHALL NOTIFY ALL CIVIC AUTHORITIES, EMERGENCY UNITS AND SCHOOL DISTRICTS OPERATING WITHIN THE AREA OF THE PROPOSED WORK OF LINE CLOSURES, ROAD CONSTRUCTION AND INSTALLATION SCHEDULES.
- THE CONTRACTOR MAY NOT USE PRIVATELY OWNED ROADS, UNLESS HE OBTAINS PERMISSION FROM THE LANDOWNERS. CONTRACTOR SHALL REPAIR ANY DAMAGE TO PRIVATE ROADS. THE CONTRACTOR SHALL RESTORE TEMPORARY ROADS AND CONSTRUCTION WORK AREAS TO PRE-CONSTRUCTION CONDITIONS. NO SEPARATE PAY ITEM.
- CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS AT LEAST 48 HOURS PRIOR TO PERFORMING ANY WORK ON THEIR PROPERTY. CONTRACTOR SHALL ALSO DISTRIBUTE A LETTER TO ALL AFFECTED PROPERTY OWNERS THAT INCLUDES NAMES AND TELEPHONE NUMBERS OF CONTRACTOR'S CONTACTS, A DESCRIPTION OF WORK TO BE DONE, AND THE TIME FRAME FOR DOING THE WORK. A COPY OF THE NOTICE LETTERS SHALL BE FORWARDED TO SAWS'S REPRESENTATIVE.
- CONTRACTOR SHALL NOTIFY THE TxDOT MAINTENANCE INSPECTOR AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO COORDINATE A TRAFFIC CONTROL PLAN WITH THE INSPECTOR. TRAFFIC CONTROL PLANS ARE NOT APPROVED WITH THE PERMIT IN SAN ANTONIO DISTRICT. CONTRACTOR IS REQUIRED TO KEEP A COPY OF THE APPROVAL, THE NOTICE OF PROPOSED INSTALLATION AND ANY APPROVED AMENDMENTS AT THE JOB SITE AT ALL TIMES.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING AT LEAST TWO (2) WORKING DAYS PRIOR TO ANY CONSTRUCTION:

SAWS UTILITY LOCATES	1-210-233-2010
SAWS PRODUCTION CONTROL CENTER	1-210-233-2016
CITY OF SAN ANTONIO (COSA STORMWATER)	1-210-207-8052
CITY OF SAN ANTONIO (TRAFFIC OPERATIONS DIVISION)	1-210-207-7765
BEXAR COUNTY	1-210-335-6700
TEXAS ONE-CALL	1-800-545-6005 OR 811
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UNION PACIFIC RAIL ROAD (UPRR) CONTACTS AT LEAST TEN (10) WORKING DAYS PRIOR TO ANY CONSTRUCTION.

UPRR COMMUNICATIONS	1-800-336-9193
UPRR TRACK MAINTENANCE	(CONTACT): PAUL B. JONES 1-210-889-5480
UPRR SIGNAL MAINTENANCE	(CONTACT): ROLANDO VASQUEZ 1-210-216-1699
- IF EXISTING FIBER OPTIC CONDUIT SYSTEMS ARE LOCATED DURING EXCAVATION, A FIBER-OPTIC REPRESENTATIVE IS REQUIRED TO BE ON SITE, THE CONTRACTOR MUST PROVIDE SUPPORT AND/OR PROTECTION FOR THE CONDUIT AT ALL TIMES DURING BACKFILLING, WHICH IS SUITABLE TO THE FIBER-OPTIC REPRESENTATIVE. THE FIBER-OPTIC REPRESENTATIVE MAY PLACE UNDERGROUND MARKING DEVICES AS REQUIRED. REPAIR OF ANY DAMAGES TO THE CONDUIT SYSTEM AND ASSOCIATED FACILITIES SHALL BE MADE BY THE FIBER-OPTIC COMPANY PERSONNEL; AND THE CONTRACTOR SHALL REIMBURSE THEM FOR ALL COSTS OF SUCH REPAIRS, IF REQUIRED. THE CONTRACTOR SHALL CONTACT THE FIBER-OPTIC COMPANY 48 HOURS PRIOR TO THE START OF EXCAVATION. LOCATIONS SHOWN ON THESE PLANS ARE APPROXIMATE ONLY AND NOT GUARANTEED TO BE ACCURATE.

VERIZON	1-800-624-9675
AT&T	1-800-344-8377
TIME WARNER CABLE	1-800-344-8877

- CONTRACTOR SHALL NOTIFY THE APPROPRIATE CONTACTS LISTED BELOW AT LEAST TWO (2) WORKING DAYS BUT NOT MORE THAN FOURTEEN (14) CALENDAR DAYS PRIOR TO CROSSING ANY MARKED OR SHOWN UTILITIES.

CITY PUBLIC SERVICE (CPS)	(CONTACT): RICHARD RODRIGUEZ	1-210-353-2226
	ROBIN MCFARLANE	1-210-353-2967
ENTERPRISE GAS	(CONTACT): CHESTER BLAIR	1-210-240-1157
CALUMET	(CONTACT): JEFFREY LISCHKE	1-210-918-7414
- THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS AND DEPTHS OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES PRIOR TO THE MAKE AND LAY OF THE PROPOSED 48 INCH DIA. SEWER MAIN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES WHETHER SHOWN ON THE PLANS OR NOT, AND TO PROTECT ALL UTILITIES DURING CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SERVICE LINES, CULVERTS OR UTILITIES CROSSED OR EXPOSED BY HIS CONSTRUCTION OPERATIONS. WHERE EXISTING SERVICE LINES ARE CUT, BROKEN OR DAMAGED THE CONTRACTOR SHALL IMMEDIATELY REPLACE THE SERVICE LINES WITH LIKE OR BETTER MATERIALS. NO SEPARATE PAY ITEM.
- CONTRACTOR SHALL PROTECT ALL UNDERGROUND IRRIGATION SYSTEMS ENCOUNTERED WITHIN THE CONSTRUCTION AREA. ALL DAMAGE SHALL BE REPAIRED BY IRRIGATOR LICENSED IN THE STATE OF TEXAS. NO SEPARATE PAY ITEM.
- CONTRACTOR IS RESPONSIBLE FOR LOCATING AND REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION. NO SEPARATE PAY ITEM.
- NO MATERIAL OR EQUIPMENT SHALL BE STORED OVER ANY EXISTING UTILITY.
- DUE TO FEDERAL REGULATION TITLE 49, PART 192.181, UTILITY COMPANIES MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT THE WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL OVERHEAD AND UNDERGROUND ELECTRIC UTILITIES WITHIN OR ADJACENT TO WORK AREAS.
- CONTRACTOR SHALL PROTECT OR REMOVE AND REPLACE ROAD SIGNS AND OTHER SIGNS. ANY DAMAGE TO SIGNS SHALL BE REPAIRED TO ORIGINAL OR BETTER CONDITION BY THE CONTRACTOR. NO SEPARATE PAY ITEM.
- CONTRACTOR SHALL DOCUMENT AND PROVIDE TO OWNER UPON REQUEST ANY VERBAL OR WRITTEN AGREEMENTS WITH PROPERTY OWNERS.
- WHEN THE PLANS OR EASEMENTS INDICATE THE DEMOLITION OR REMOVAL OF AN EXISTING STRUCTURE OR FACILITY BY THE CONTRACTOR, THE CONTRACTOR SHALL PROVIDE AT LEAST 30 DAYS NOTICE TO THE PROPERTY OWNER AND SAWS OF THE PENDING REMOVAL.
- WHERE IT IS NECESSARY FOR LANDOWNERS TO MOVE TRAILERS, SHEDS, OR OTHER FACILITIES OR IMPROVEMENTS, THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNER AND SAWS NO LESS THAN 30 DAYS PRIOR TO THE NEED FOR MOVING THE FACILITIES OR IMPROVEMENTS.
- CONTRACTOR SHALL FLAG THE EASEMENT AND SHALL STAY WITHIN THE FLAGGED AREA.
- CONTRACTOR SHALL MAINTAIN ACCESS FOR ALL PROPERTY OWNERS AT ALL TIMES DURING CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SAFE ACCESS FOR THE DELIVERY OF MAIL BY THE U.S. POSTAL SERVICE. NO SEPARATE PAY ITEM.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SAFE ACCESS TO RESIDENCES AND BUSINESSES. NO SEPARATE PAY ITEM.
- WHEREVER POWER POLES ARE WITHIN 15' OF THE PROPOSED SEWER LINE OR OTHERWISE NOTED ON THE PLANS, THE CONTRACTOR SHALL PROVIDE PROPER SHORING AND OTHER SUITABLE SUPPORT DURING CONSTRUCTION OF THE SEWER LINES. THE UTILITY COMPANY MAINTENANCE DEPARTMENT MUST APPROVE SHORING PRIOR TO INSTALLATION. NO SEPARATE PAY ITEM.

ENVIRONMENTAL

- THE CONTRACTOR SHALL CONTROL EROSION AND SEDIMENTATION PER THE APPLICABLE LAWS AND REGULATIONS.
- NO TREES MAY BE REMOVED OUTSIDE THE DESIGNATED CLEARING WIDTH. THE FIELD INSPECTOR WILL IDENTIFY TREES TO BE PROTECTED. CLEARING WIDTH SHALL BE CONSIDERED THE FULL WIDTH OF THE PERMANENT PIPELINE EASEMENT AND TEMPORARY CONSTRUCTION EASEMENT (OR AS INDICATED ON PLANS).
- THE CONTRACTOR IS REQUIRED TO RE-SEED DISTURBED AREAS WITH NATIVE VEGETATION SEED EXCEPT IN AREAS OF FARM CROPS WHERE THEY ARE TO DISC THE TOPSOIL WITH NO REVEGETATION; IN ADDITION, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGES TO PROPERTY OUTSIDE OF THE EASEMENT LIMITS, INCLUDING REVEGETATION COST.
- ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION THAN AT THE START OF CONSTRUCTION INCLUDING ALL REMOVED OR DAMAGED FENCES, IMPROVEMENTS, LANDSCAPING, ETC. NO SEPARATE PAY ITEM.
- CONTRACTOR TO ESTABLISH SILT FENCING AND/OR ROCK BERM IN ALL AREAS TO BE IMPACTED BY CONSTRUCTION AND MAINTAIN UNTIL SUITABLE GROUND COVER/VEGETATION IS ACCEPTED.
- IF A THREATENED OR ENDANGERED PLANT OR ANIMAL SPECIES AND/OR CULTURAL/ARCHAEOLOGICAL RESOURCES ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY SAWS.
- DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT WHICH MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED ON ANY WETLANDS, WATER BODY, OR STREAM BED. THE CONTRACTOR SHALL LOCATE AND CONSTRUCT CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AND PARKING AREAS IN A MANNER TO MINIMIZE POLLUTANT RUNOFF.
- THE CONTRACTOR SHALL CLEAR ALL WATER WAYS AS SOON AS PRACTICABLE OF ALL TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK, PILING, DEBRIS, AND OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS WHICH ARE NOT PART OF THE FINISHED WORK.
- CONTRACTOR SHALL PROVIDE A STORM WATER POLLUTION PREVENTION PLAN PRIOR TO CONSTRUCTION AND PROVIDE ALL APPURTENANCES TO COMPLY WITH THE LATEST TCEQ STORM WATER POLLUTION PREVENTION REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR FILING A NOTICE OF INTENT (NOI) AT THE START OF CONSTRUCTION WITH THE TCEQ AND A NOTICE OF TERMINATION (NOT) AT THE END, ALSO WITH THE TCEQ.
- CONTRACTOR IS RESPONSIBLE FOR KEEPING ROADWAYS AND SIDEWALKS ADJACENT TO THE PROJECT FREE OF MUD, TRASH, AND CONSTRUCTION DEBRIS. NO SEPARATE PAY ITEM.
- TRIMMING OF TREES SHALL BE ACCOMPLISHED USING A SAW OR PRUNING SHEARS. ALL CUT LIMBS OVER 1 INCH IN DIAMETER SHALL BE PAINTED WITH TREE WOUND PAINT IMMEDIATELY AFTER TREE TRIMMING.
- ALL NEW TREES SHALL BE PLANTED BY A NURSERYMAN LICENSED IN THE STATE OF TEXAS. DOCUMENTATION OF TYPE, SIZE, AND LOCATION STATION SHALL BE PROVIDED TO SAWS WITH RECORD DRAWINGS AND PRIOR TO FINAL PAYMENT.

FLOOD PLAIN GENERAL CONSTRUCTION NOTES:

- CONTRACTOR IS TO MAINTAIN UNRESTRICTED DRAINAGE OF THE PROJECT SITE AND ADJACENT AREAS DURING CONSTRUCTION.
- NO WASTE MATERIAL SHALL BE PLACED IN EXISTING LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS OF THE EXISTING NATURAL DRAINAGE OR PLACED WITHIN THE LIMITS OF THE EXISTING FLOOD PLAIN.
- CONSTRUCTION MATERIALS SHALL NOT BE STORED IN EXISTING LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS OF THE EXISTING NATURAL DRAINAGE OR PLACED WITHIN THE LIMITS OF THE EXISTING FLOOD PLAIN.

WATER AND WASTEWATER NOTES:

- ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE FOLLOWING:
 - CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS [TAC 217]".
 - CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR CONSTRUCTION".
 - CURRENT "SAN ANTONIO WATER SYSTEM STANDARD MATERIALS SPECIFICATIONS".
 - CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
 - CURRENT CITY OF SAN ANTONIO "RIGHT-OF-WAY ORDINANCE AND UNDERGROUND UTILITY EXCAVATION MANUAL".
 - CURRENT TxDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES".
- CONTRACTOR SHALL COMPLY WITH ALL SAWS GENERAL NOTES AND SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION (WWW.SAWS.ORG).
- CONTRACTOR SHALL FIELD VERIFY PRECISE LOCATION, ELEVATION, AND ARRANGEMENT OF CONNECTIONS OF NEW PIPELINES WITH EXISTING PIPELINES BASED ON FIELD CONDITIONS, INCLUDING EXPOSING EXISTING PIPING PRIOR TO FABRICATING NEW PIPING, CONTRACTOR SHALL PROVIDE FITTINGS, ADAPTERS, SOLID SLEEVE CLOSURES AND HARNESS MECHANICAL COUPLING; ROTATE FITTINGS; DEFLECT JOINTS; AND MODIFY EXISTING PIPING AS APPLICABLE AND AS REQUIRED TO MAKE CONNECTIONS, INCLUDING ADJUSTMENTS FOR ANY OFFSETS IN CENTERLINE ELEVATIONS BETWEEN PIPELINES. CONTRACTOR SHALL PROVIDE TEMPORARY PLUG WITH FACTORY OUTLET SIZED AS REQUIRED FOR CONTRACTOR'S TESTING AND DISINFECTION WORK BEFORE MAKING CONNECTION, WHEN APPLICABLE. CONTRACTOR SHALL COORDINATE MAKING EACH CONNECTION WITH THE OWNER.
- EXISTING SEWER SHOWN ON PROFILES IS FOR REFERENCE ONLY, ELEVATIONS SHALL BE FIELD VERIFIED BY CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR IS TO MAINTAIN WASTEWATER SERVICE IN EXISTING LINES DURING CONSTRUCTION.
- NO OTHER UTILITY SERVICE/APPURTENANCES SHALL BE PLACED NEAR THE PROPERTY LINE OR OTHER ASSIGNED LOCATION DESIGNATED FOR WATER AND WASTEWATER UTILITY SERVICE THAT WOULD INTERFERE WITH THE WATER AND WASTEWATER SERVICES.
- ALL WATER AND WASTEWATER INSTALLATIONS SHALL BE IN ACCORDANCE WITH TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) REQUIREMENTS. WHERE A MINIMUM OF NINE (9) FEET OF SEPARATION CANNOT BE MAINTAINED BETWEEN SEWER LINES AND WATER LINES/MAINS, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ TAC 217.
- WHERE A NEW WATER OR WASTEWATER LINE CROSSES WITHIN 18 INCHES UNDER A STORM DRAIN, THE WATER OR WASTEWATER LINE SHALL BE CONCRETE ENCASED FOR AT LEAST ONE (1) FOOT OUTSIDE EACH SIDE OF THE STORM DRAIN DITCH LINE. NO SEPARATE PAY ITEM.
- THE CONTRACTOR SHALL PROVIDE FITTINGS, PLUGS AND OTHER SERVICES REQUIRED FOR FILLING, FLUSHING, TESTING, ETC. (NO SEPARATE PAY ITEM)
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL SEWAGE FLOW DURING ALL PHASES OF CONSTRUCTION. A FLOW MANAGEMENT PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
 - IDENTIFY THE SOURCE OF THE SPILL AND ATTEMPT TO ELIMINATE ANY ADDITIONAL SPILLAGE.
 - CONTAIN THE SPILL IN PLACE AND PREVENT CONTAMINATION OF STREAMS.
 - CLEAN UP THE SPILL AND DISPOSE OF CONTAMINATED MATERIALS.
 - DISINFECT THE AREA OF THE SPILL WITH A MIXTURE OF HTH CHLORINE AND WATER.
 - IDENTIFY AND TRAIN PERSONNEL RESPONSIBLE FOR SPILLAGE PREVENTION AND CONTROL.

CPS ENERGY NOTE:

- CALL THE TEXAS STATE WIDE ONE CALL NUMBER 1-800-245-4545, 48 HOURS BEFORE BEGINNING ANY EXCAVATION. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CPS ENERGY 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. THE PROJECT MUST BE GAS LEAK SURVEYED PRIOR TO THE FINAL OVERLAY. ALLOW 10 WORKING DAYS FOR THE LEAK SURVEY AND ALLOW AN ADDITIONAL 10 WORKING DAYS FOR VALVE ADJUSTMENTS. THE CONTRACTOR MUST COORDINATE THE SURVEY AND THE ADJUSTMENTS THROUGH THE PROJECT INSPECTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING CPS ENERGY OVERHEAD AND UNDERGROUND ELECTRIC FACILITIES IF ADJACENT TO WORK AREAS.

AT&T NOTE:

- THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT THE TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-242-8511. CONTRACTOR IS TO PROTECT AND SUPPORT TELEPHONE COMPANY POLES DURING CONSTRUCTION.

TRENCH EXCAVATION SAFETY PROTECTION NOTES:

- CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK ZONE IN ORDER TO DEVELOP THE CONTRACTOR'S PLANS TO IMPLEMENT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S PLANS SHALL PROVIDE FOR ADEQUATE TRENCH SAFETY SYSTEMS THAT COMPLY WITH, AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS AND THE PROTECTION OF ADJACENT STRUCTURES AND FACILITIES. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL DEVELOP AND IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION. CONTRACTOR IS RESPONSIBLE FOR A TRENCH SAFETY PLAN PREPARED BY A PROFESSIONAL ENGINEER FOR THIS PROJECT. THIS TRENCH SAFETY PLAN SHALL BE SUBMITTED TO SAWS PRIOR TO ANY WORK ACTIVITIES.
- CONTRACTOR SHALL INCORPORATE THE USE OF A TRENCH BOX OR OTHER ACCEPTABLE SAFETY SYSTEM IN ANY TRENCH THAT EXCEEDS FIVE (5) FEET IN DEPTH. THE CONTRACTOR SHALL PROTECT ALL OPEN EXCAVATION AND EQUIPMENT FROM CHILDREN, PEDESTRIANS, AND VEHICLES IN THE AREA BY PROVIDING, INSTALLING AND MAINTAINING FENCING, BARRICADES, OR OTHER PROTECTIVE SYSTEMS. NO OPEN TRENCHES ALLOWED OVERNIGHT.

App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	10/22	ADDDENDUM NO. 1
Date		
No.		

Date:	10/21/2014
Designed by:	DJB
Drawn by:	DDH
Checked by:	BCJ
Scale:	N.T.S.

FREESE AND NICHOLS
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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 GENERAL NOTES

COSA FLOOD PLAIN AND R.O.W. NOTES:

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN ALL REQUIRED STORM WATER PERMITS, FEES, AND APPROVALS. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PERMITS REQUIRED FOR CONSTRUCTION IN DRAINAGE EASEMENTS, RIGHT-OF-WAYS, AND FLOODPLAINS.
2. THE CONTRACTOR SHALL NOTIFY STORM WATER ENGINEERING AT LEAST 24 HOURS PRIOR TO THE INSTALLATION OF ANY DRAINAGE FACILITY WITHIN A DRAINAGE EASEMENT OR STREET RIGHT-OF-WAY NOT INDICATED ON THE CONSTRUCTION PLANS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING DRAINAGE FACILITIES FROM DAMAGE. ANY DAMAGE TO EXISTING DRAINAGE SYSTEMS, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AT HIS EXPENSE. THE CONTRACTOR SHALL NOTIFY STORM WATER ENGINEERING AT 210-207-8052 AS SOON AS CONFLICTS WITH UTILITIES ARE ENCOUNTERED OR ANY DRAINAGE SYSTEM IS DAMAGED DURING CONSTRUCTION.
4. CONSTRUCTION SPOILS WILL NOT BE ALLOWED TO BE DEPOSITED ANYWHERE WITHIN A DRAINAGE EASEMENT, RIGHT-OF-WAY OR FLOODPLAIN WITHIN THE LIMITS OF THE PROJECT AND SHALL BE DISPOSED OFFSITE IN COMPLIANCE WITH CURRENT APPLICABLE REGULATIONS.
5. NO STRUCTURE, FENCES, WALLS, LANDSCAPING, OR OTHER OBSTRUCTIONS THAT IMPEDE DRAINAGE SHALL BE PLACED WITHIN THE LIMITS OF THE DRAINAGE EASEMENTS SHOWN ON THE CONSTRUCTION DOCUMENTS.
6. UPON COMPLETION OF TRENCHING, THE AREA WILL BE BACKFILLED AND COMPACTED TO ITS ORIGINAL CONDITION. TRENCHES/BORE PITS OPEN AND UNATTENDED LONGER THAN 24 HOURS SHALL BE PROTECTED TO WITHSTAND ALL HYDRODYNAMIC AND HYDROSTATIC FORCES AND PREVENT DOWNSTREAM IMPACTS. TRENCHES/BORE PITS TO BE OPEN LONGER THAN 30 DAYS AFTER STARTING EXCAVATION SHALL BE BACKFILLED WITH A SEMI-PERMANENT REPAIR BACKFILL.
7. IMPROVED SECTIONS OF EARTHEN CHANNELS AND/OR WATERWAYS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE CHANNEL SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT THE CHANNEL FOR MAINTENANCE.

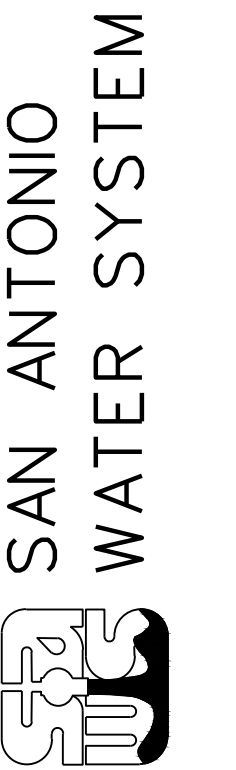
No.	Date	Revisions	App.
1	10/22	ADDENDUM NO. 1 - NEW SHEET	DTB

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

SWB11467

DAVID T. BENNETT
Professional Engineer
No. 101935
Exp. 10-22-14

Date:	10/21/2014
Designed by:	DTB
Drawn by:	MKV
Checked by:	
Scale:	N.T.S.



SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
COSA FLOOD PLAIN
AND R.O.W. NOTES

Sheet G2A

QUANTITIES			
ITEM NO.	DESCRIPTION	QTY	UNIT
02623-48a	48" FRP GRAVITY SEWER LINE (INSTALL BY OPEN CUT), SN 46 (ALL DEPTHS)	8,200	LF
02623-48b	48" FRP GRAVITY SEWER LINE (INSTALL BY OPEN CUT), SN 72 (ALL DEPTHS)	1,800	LF
02623-48c	48" FRP GRAVITY SEWER LINE (REMOVE AND REPLACE), SN 46 (ALL DEPTHS)	60	LF
848-18	18" PVC GRAVITY SEWER LINE, F679, PS 115 (ALL DEPTHS)	20	LF
848-10	10" PVC GRAVITY SEWER LINE, D3034, SDR-26 (ALL DEPTHS)	20	LF
848-8	8" PVC GRAVITY SEWER LINE, D3034, SDR-26 (ALL DEPTHS)	80	LF
848-6	6" PVC FORCE MAIN, AWWA C-900 (ALL DEPTHS)	15	LF
812	12" PVC WATER MAIN, C-900	30	LF
02700-36	36" HDPE SIPHON LINE, DR 17 (IPS) (ALL DEPTHS)	2,200	LF
02700-18	18" HDPE SIPHON LINE, DR 17 (IPS), (ALL DEPTHS)	2,200	LF
SS-848-20	20" FUSIBLE PVC AIR PIPING, AWWA C-905, DR-25, (ALL DEPTHS)	2,200	LF
856-66	66" STEEL CASING (BY BORE/TUNNEL)	800	LF
02623-48d	48" FRP GRAVITY SEWER LINE, SN 46, CARRIER PIPE WITHIN CASING PIPE	800	LF
856-30	30" STEEL CASING (BY OPEN-CUT)	70	LF
856-24	24" STEEL CASING (BY OPEN-CUT)	70	LF
856-16	16" STEEL CASING (BY OPEN-CUT)	70	LF
401-1	REINFORCED CONCRETE PIPE (TYPE III, 36")	40	LF
401-2	REINFORCED CONCRETE PIPE (TYPE III, 18")	60	LF
404	CORRUGATED METAL PIPE (GALVANIZED STEEL, 15")	20	LF
550	TRENCH EXCAVATION SAFETY PROTECTION	13,000	LF
854-1	6" SANITARY SEWER SERVICE LATERAL	600	LF
854-2	SANITARY SEWER SERVICE CLEANOUT	18	EA
860	VERTICAL STACKS	100	VF
SS-853-1	48" FRP TEE BASE MANHOLE	18	EA
SS-853-2	48" FRP TEE BASE DROP MANHOLE	8	EA
SS-853-3	TEE BASE MANHOLE EXTRA DEPTH > 15 FT	54	VF
850-1	TYPE "C" SANITARY SEWER STRUCTURE	4	EA
852-1	STANDARD 4' DIA FIBERGLASS MANHOLE	4	EA
852-2	STANDARD 4' DIA FIBERGLASS DROP MANHOLE	1	EA

1

QUANTITIES (CONT.)			
ITEM NO.	DESCRIPTION	QTY	UNIT
852-3	STANDARD MANHOLE EXTRA DEPTH > 6 FT	15	VF
02700-1	42" SIPHON ACCESS VAULT	4	EA
02700-2	30" AIR BY-PASS ACCESS VAULT	3	EA
850-2	SIPHON #3 INLET STRUCTURE	1	LS
850-3	SIPHON #3 OUTLET STRUCTURE	1	LS
850-4	SIPHON #4 INLET STRUCTURE	1	LS
850-5	SIPHON #4 OUTLET STRUCTURE	1	LS
850-6	SIPHON #5 INLET STRUCTURE	1	LS
850-7	SIPHON #5 OUTLET STRUCTURE	1	LS
02251	RILLING ROAD TRANSFER STATION PIPING REHABILITATION	1	LS
848-48	REMOVAL OF EXISTING 48" SANITARY SEWER PIPE	210	LF
862-1	REMOVAL OF EXISTING MANHOLE	3	EA
862-2	ABANDON EXISTING MANHOLE	22	EA
02218-1	CELLULAR GROUT FILL OF EXISTING 48" SANITARY SEWER LINE	6,500	LF
230	REMOVE AND REPLACE ASPHALT PAVEMENT	8,700	SY
503	GRAVEL DRIVEWAY REPAIR	50	SY
500	REMOVE AND REPLACE CONCRETE CURB	20	LF
505	REMOVE AND REPLACE CONCRETE RIP RAP	80	SY
554	HIGH PERFORMANCE TURF MAT (HPTRM)	1,325	SY
508-1	REMOVE AND REPLACE BARBED WIRE FENCE (STEEL OR WOOD POSTS)	700	LF
508-2	REMOVE AND REPLACE WOOD FENCE AND GATES	100	LF
508-3	INSTALL 16' TYPE 1 OR TYPE 2 GATE	3	EA
845	PIPELINE MARKER	20	EA
520	SEEDING	69,600	SY
509-1	METAL BEAM GUARDRAIL (WOOD POST)	50	LF
509-2	METAL BEAM GUARDRAIL (SINGLE GUARDRAIL TERMINAL - SGT)	2	EA
509-3	METAL BEAM GUARDRAIL (DOWNSTREAM ANCHOR TERMINAL - DAT)	2	EA
864	BYPASS PUMPING	1	LS
02940	TREE PROTECTION	1	LS
02290	EROSION AND SEDIMENTATION CONTROLS (SWPPP)	1	LS
530	BARRICADES, SIGNS AND TRAFFIC HANDLING	1	LS
100	MOBILIZATION AND DEMOBILIZATION	1	LS
101	PREPARING RIGHT-OF-WAY	1	LS

1

App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	10/22	ADDENDUM NO. 1
Date	10/22	ADDENDUM NO. 1
No.	1	ADDENDUM NO. 1

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

David T. Bennett
101935
10-22-14

Date: 10/22/2014
 Designed by: DTB
 Drawn by: DDH
 Checked by: BCJ
 Scale: N.T.S.

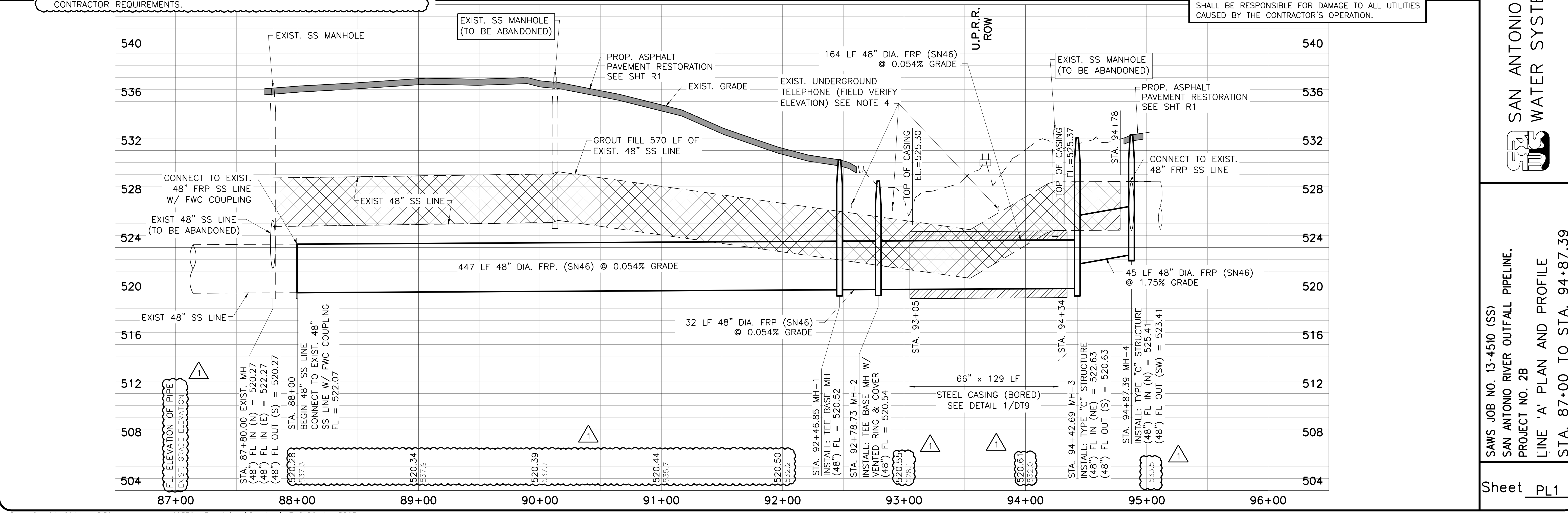
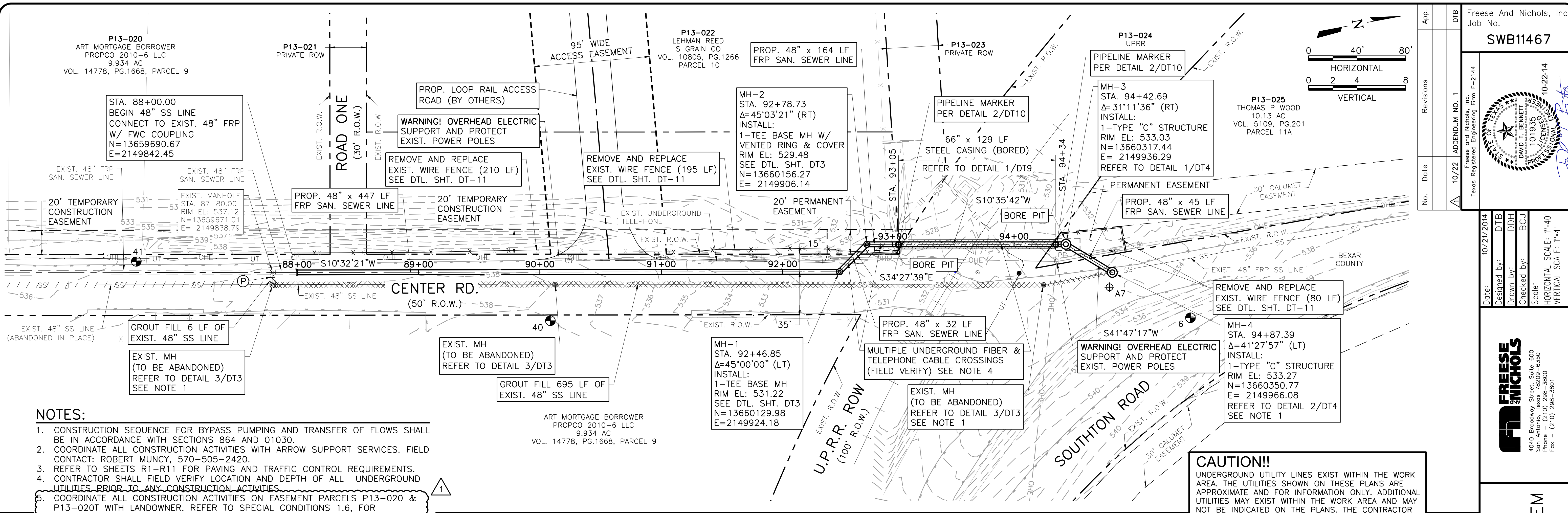
FREES & NICHOLS
 4040 Broadway Street, Suite 600
 San Antonio, Texas 78209-6350
 Phone - (210) 298-3800
 Fax - (210) 298-3801

**SAN ANTONIO
 WATER SYSTEM**

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B

QUANTITIES

SWB11467 / San Antonio Server / ACAD CIVIL 3D_2014



App. DTB Freese And Nichols, Inc. Job No. SWB11467

Revisions: 10/22 ADDENDUM NO. 1

Date: 10/22

No. 1

Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144

101935

DAVID T. BENNETT

10-22-14

Date: 10/21/2014

Designed by: DIB

Drawn by: DDH

Checked by: BCI

Scale: HORIZONTAL SCALE: 1"=40'

VERTICAL SCALE: 1"=4'

FREES & NICHOLS

4040 Broadway Street, Suite 600
San Antonio, Texas 78209-6350
Phone - (210) 298-3800
Fax - (210) 298-3801

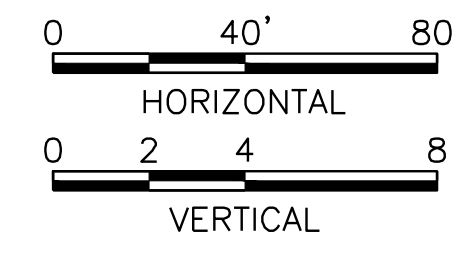
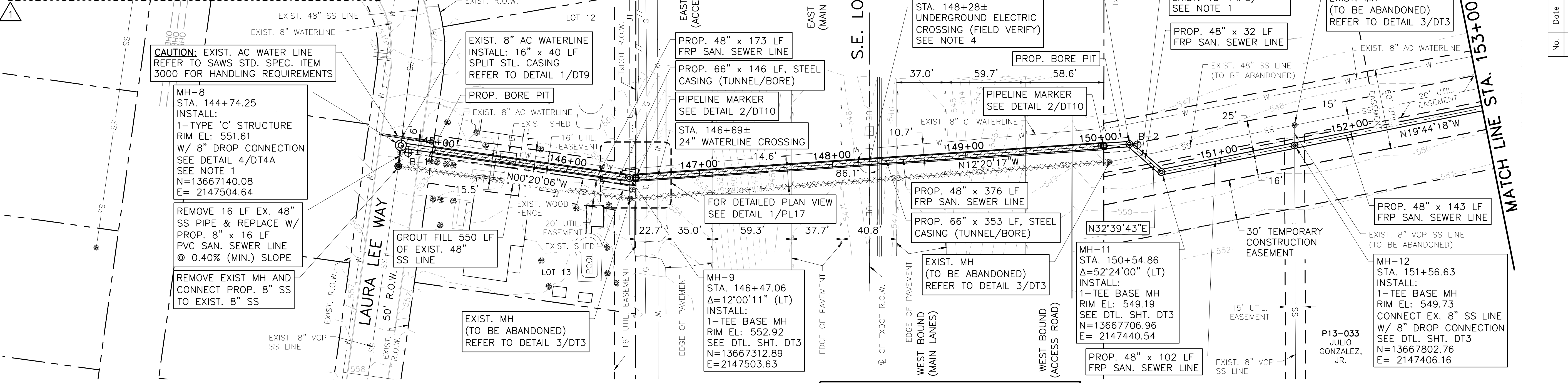
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
LINE 'A' PLAN AND PROFILE
STA. 87+00 TO STA. 94+87.39

Sheet PL1

NOTES:

- CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
- REFER TO SHEETS R1-R11 FOR PAVING AND TRAFFIC CONTROL REQUIREMENTS.
- CONTRACTOR SHALL TEMPORARILY RELOCATE EXIST. SHED AS NECESSARY FOR CONSTRUCTION AND REPAIR ANY DAMAGE TO SHED.
- CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.
- CONTRACTOR SHALL PROVIDE VIBRATION MONITORING AT ALL TIMES FOR ALL TUNNELING/BORING ACTIVITIES BETWEEN STA. 144+75 AND STA. 146+75. VIBRATION DATA SHALL BE PROVIDED AS RECORD DATA TO OWNER AND ENGINEER.



App. DTB
 Revisions
 Date
 No.

10/22 ADDENDUM NO. 1
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144
 David T. Bennett
 101935
 10-22-14

Freese And Nichols, Inc.
 Job No.
SWB11467

Date: 10/21/2014
 Designed by: DTB
 Drawn by: DDH
 Checked by: BCT
 Scale: HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=4'

FREES & NICHOLS
 4040 Broadway Street, Suite 600
 San Antonio, Texas 78209-6350
 Phone - (210) 298-3800
 Fax - (210) 298-3801

SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 144+74.25 TO STA. 153+00

SWB11467 / San Antonio Server / ACAD CIVIL 3D 2014

P13-033
 JULIO GONZALEZ, JR.
 46.908 AC
 VOL. 10917, PG.1428

PROP. 48" x 126 LF
 FRP SAN. SEWER LINE

MH-14
 STA. 160+73.85
 $\Delta=61'27.07"$ (RT)
 INSTALL:
 1-TEE BASE MH W/
 VENTED RING & COVER
 RIM EL: 550.93
 SEE DTL. SHT. DT3
 N=13668420.22
 E= 2146978.88

EXIST. MH
 (TO BE ABANDONED)
 REFER TO DETAIL 3/DT3

PROP. 48" x 194 LF
 FRP SAN. SEWER LINE

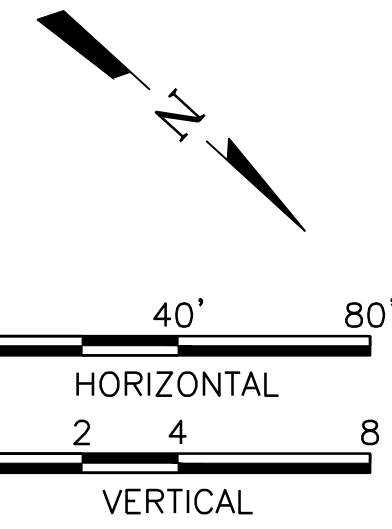
STA. 159+19±
 SUPPORT & PROTECT EXIST.
 8" WATER LINE CROSSING

MH-13
 STA. 158+80.20
 $\Delta=89'25.50"$ (LT)
 INSTALL:
 1-TEE BASE MH
 RIM EL: 560.56
 SEE DTL. SHT. DT3
 N=13668483.81
 E= 2147161.80

P13-033
 JULIO GONZALEZ, JR.
 46.908 AC
 VOL. 10917, PG.1428

P13-033
 JULIO GONZALEZ, JR.
 46.908 AC
 VOL. 10917, PG.1428

EXIST. MH
 (TO BE ABANDONED)
 REFER TO DETAIL 3/DT3



App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	ADDENDUM NO. 1	SWB11467
Date	10/22	10/22-14
No.	1	101935

Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144
 DAVID T. BENNETT
 101935
 PROFESSIONAL ENGINEER
 10-22-14

DESIGNED BY: DIB
 DRAWN BY: DDH
 CHECKED BY: BCT
 SCALE: HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=4'

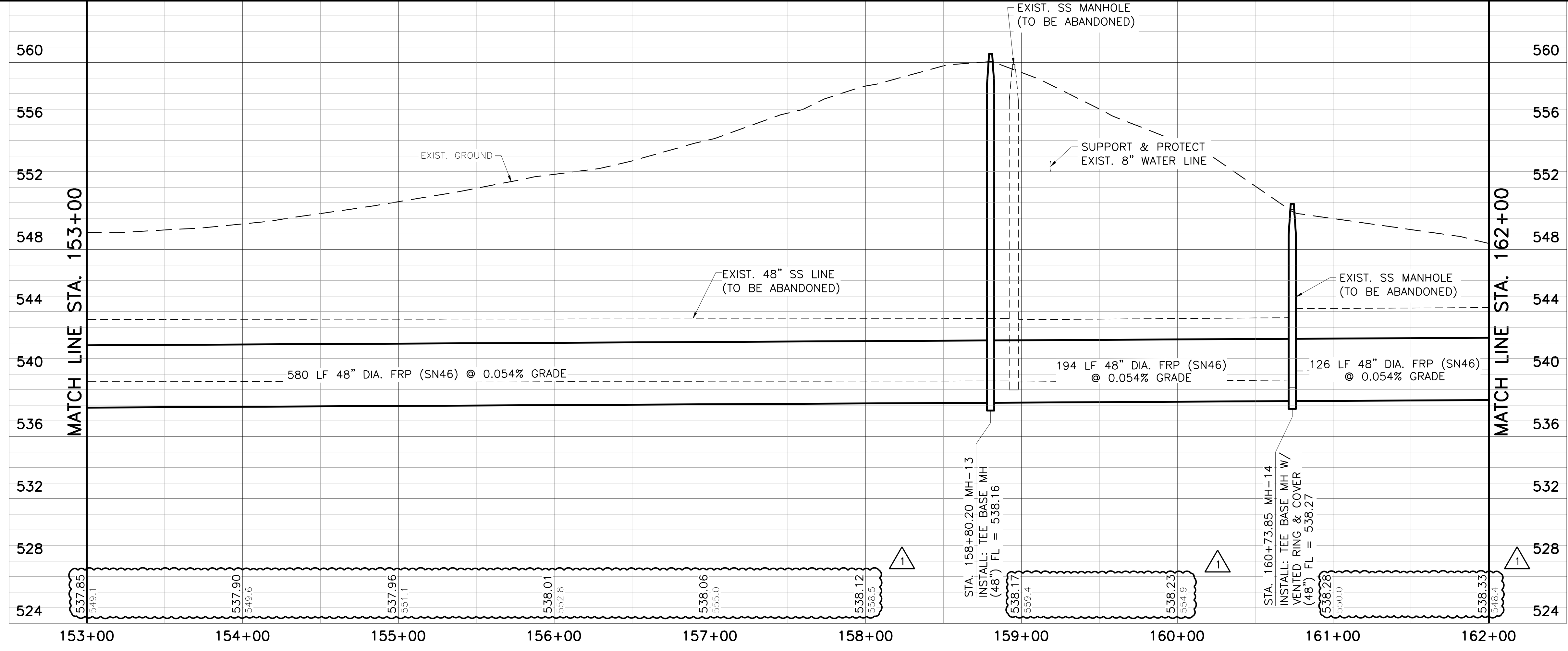
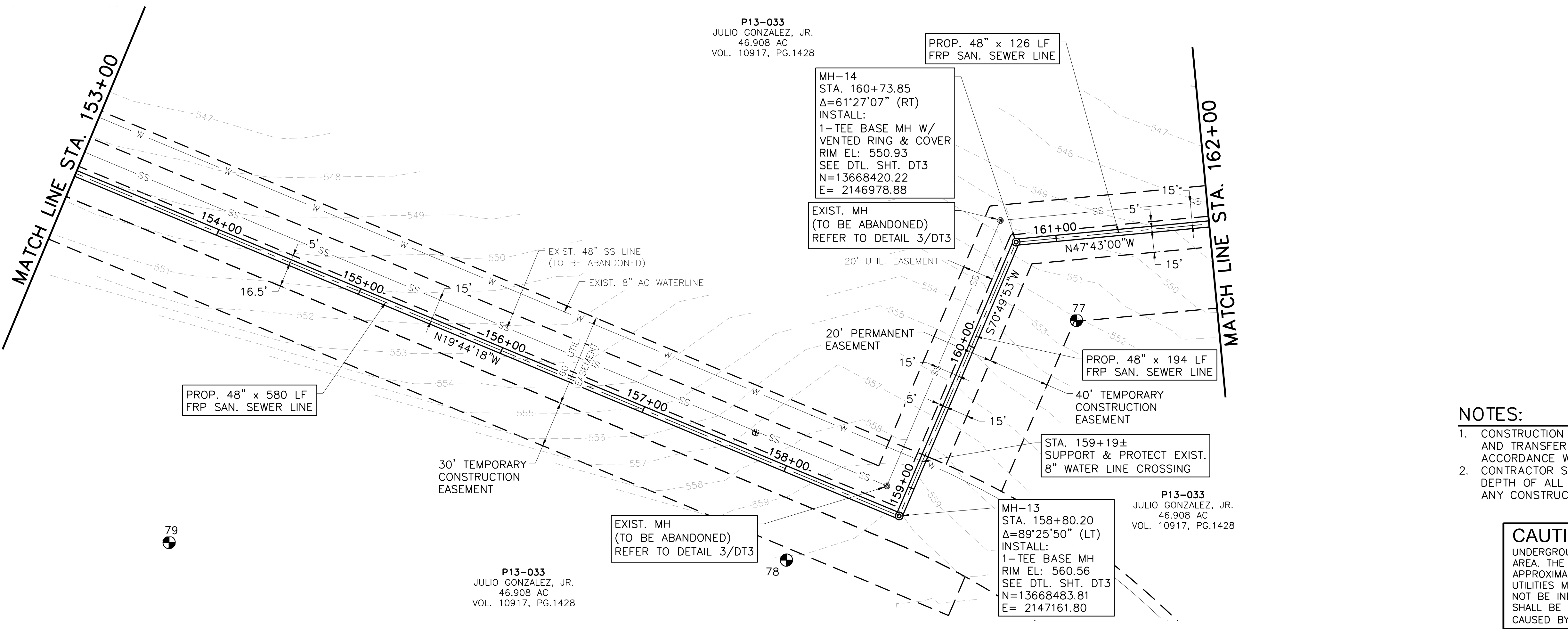
FRESE AND NICHOLS
 4040 Broadway Street, Suite 600
 San Antonio, Texas 78209-6350
 Phone - (210) 298-3800
 Fax - (210) 298-3801

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 153+00 TO STA. 162+00

Sheet PL4

- NOTES:**
- CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.

CAUTION!!
 UNDERGROUND UTILITY LINES EXIST WITHIN THE WORK AREA. THE UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND FOR INFORMATION ONLY. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA AND MAY NOT BE INDICATED ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION.



SWB11467 / San Antonio Server / ACAD CIVIL 3D 2014

EXISTING MANHOLES TO BE ABANDONED: (NOT SHOWN ON THIS SHEET)				
MH#	NORTHING	EASTING	RIM ELEV.	FL ELEV.
1	13670360.87	2144507.50	549.87	542.17
2	13670318.53	2145087.07	550.30	543.00
3	13670360.87	2144507.50	552.87	543.58
4	13670844.17	2144329.02	559.73	544.55
5	13671203.01	2144325.18	553.80	544.99

P13-033
JULIO GONZALEZ, JR.
46.908 AC
VOL. 10917, PG.1428

EXIST. MH'S TO BE ABANDONED
REFER TO TABLE, THIS SHEET
REFER TO DETAIL 3/DT3

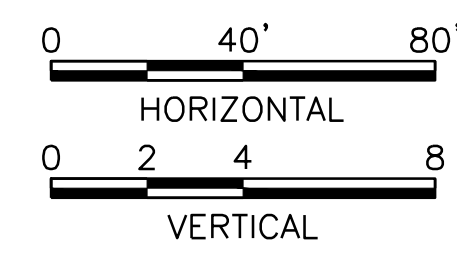
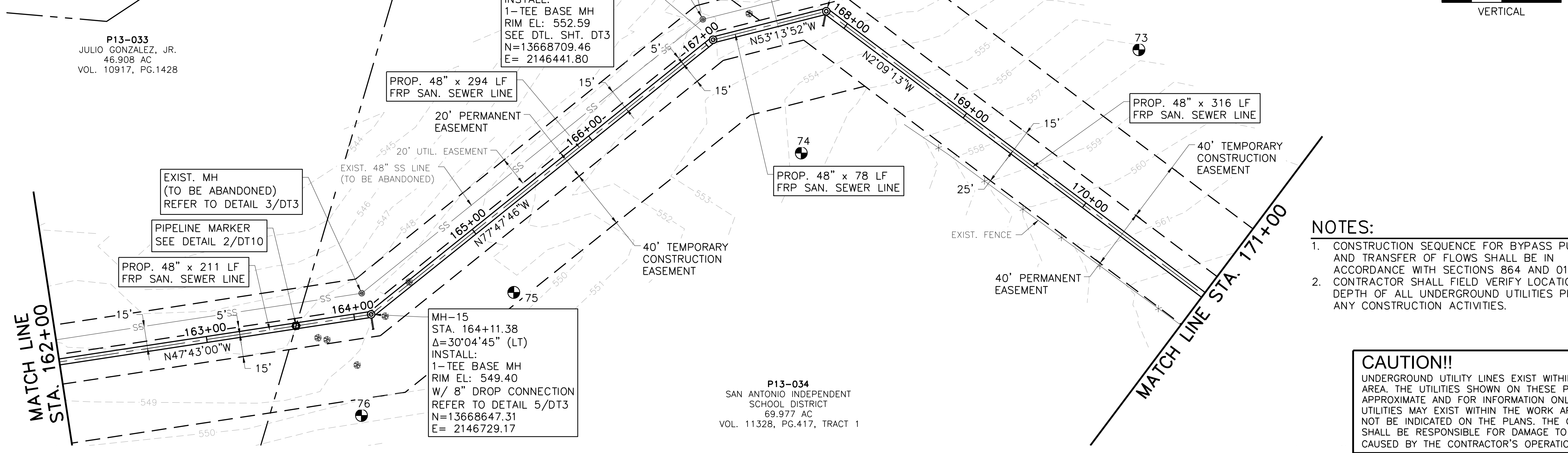
EXIST. MH
(TO BE ABANDONED)
REFER TO DETAIL 3/DT3

MH-16
STA. 167+05.40
 $\Delta=24'33'54''$ (RT)
INSTALL:
1-TEE BASE MH
RIM EL: 552.59
SEE DTL. SHT. DT3
N=13668709.46
E= 2146441.80

P13-034
SAN ANTONIO INDEPENDENT
SCHOOL DISTRICT
69.977 AC
VOL. 11328, PG.417, TRACT 1

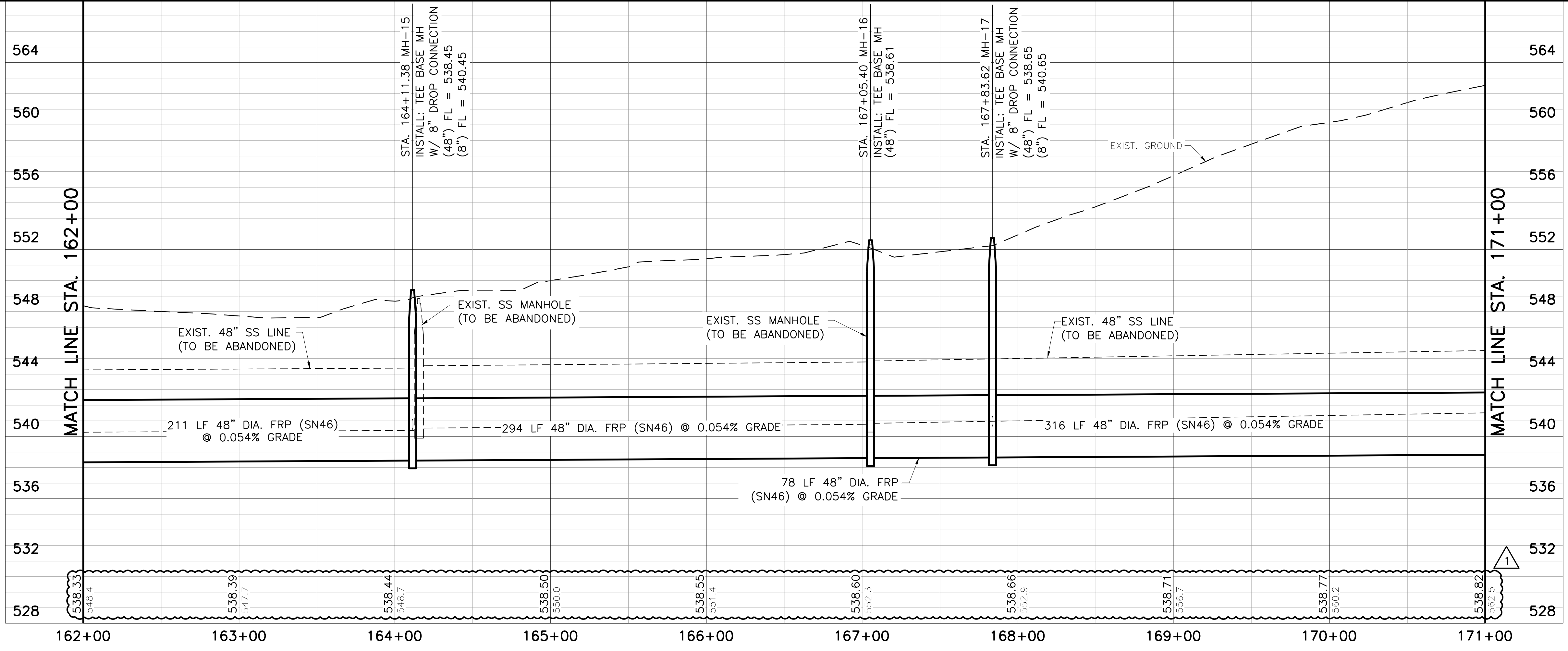
MH-17
STA. 167+83.62
 $\Delta=51'04'39''$ (RT)
INSTALL:
1-TEE BASE MH
RIM EL: 552.74
W/ 8" DROP CONNECTION
REFER TO DETAIL 5/DT3
N=13668756.29
E= 2146379.13

P13-034
SAN ANTONIO INDEPENDENT
SCHOOL DISTRICT
69.977 AC
VOL. 11328, PG.417, TRACT 1



- NOTES:**
- CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.

CAUTION!!
UNDERGROUND UTILITY LINES EXIST WITHIN THE WORK AREA. THE UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND FOR INFORMATION ONLY. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA AND MAY NOT BE INDICATED ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION.



No.	Date	Revisions	App.	DTB
1	10/22	ADDENDUM NO. 1		

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
101935
DAVID T. BENNETT
PROFESSIONAL ENGINEER
10-22-14

Date: 10/21/2014
Designed by: DIB
Drawn by: DDH
Checked by: BCJ
Scale: HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

FREES & NICHOLS
4040 Broadway Street, Suite 600
San Antonio, Texas 78209-6350
Phone - (210) 298-3800
Fax - (210) 298-3801

**SAN ANTONIO
WATER SYSTEM**

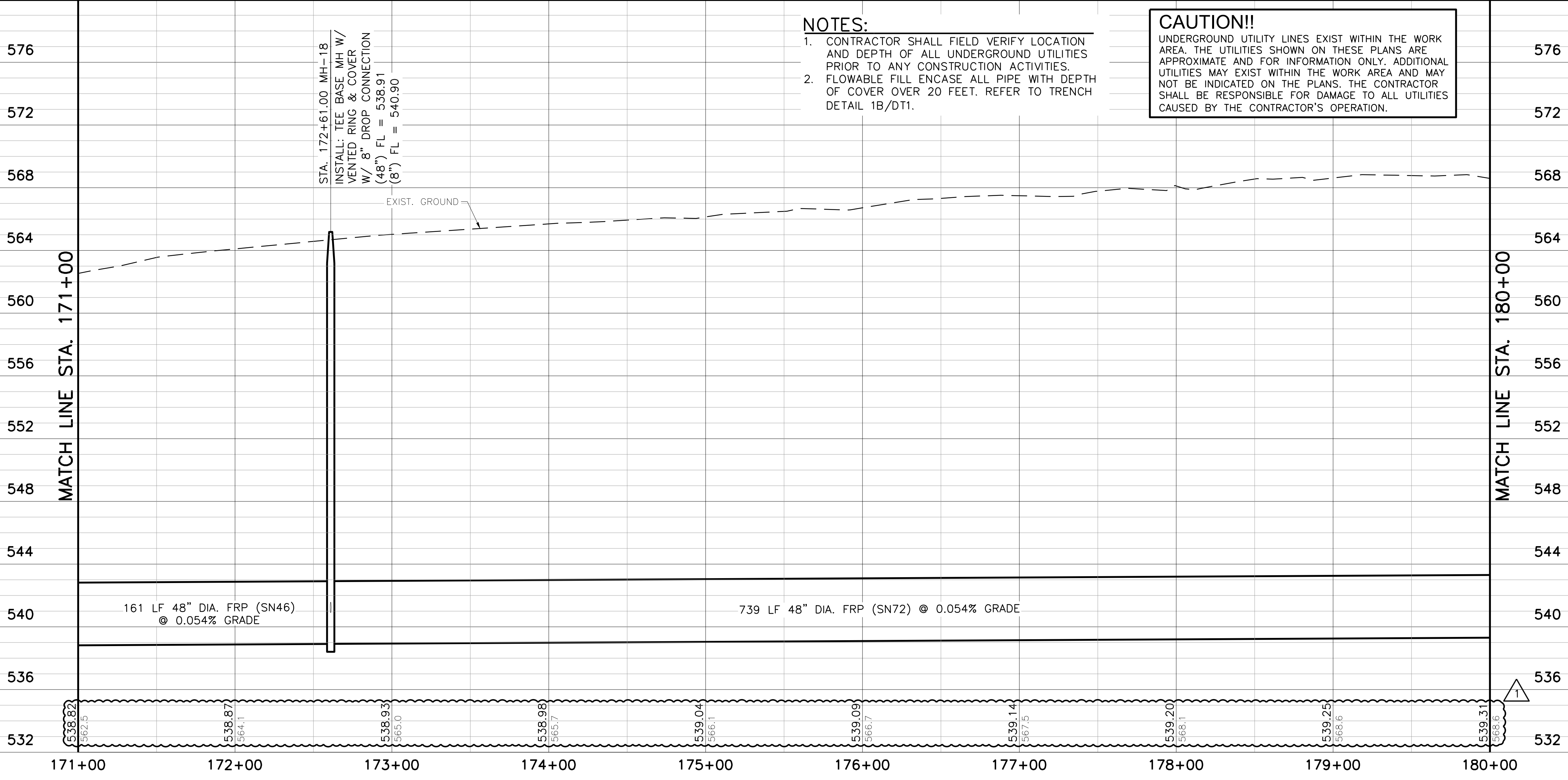
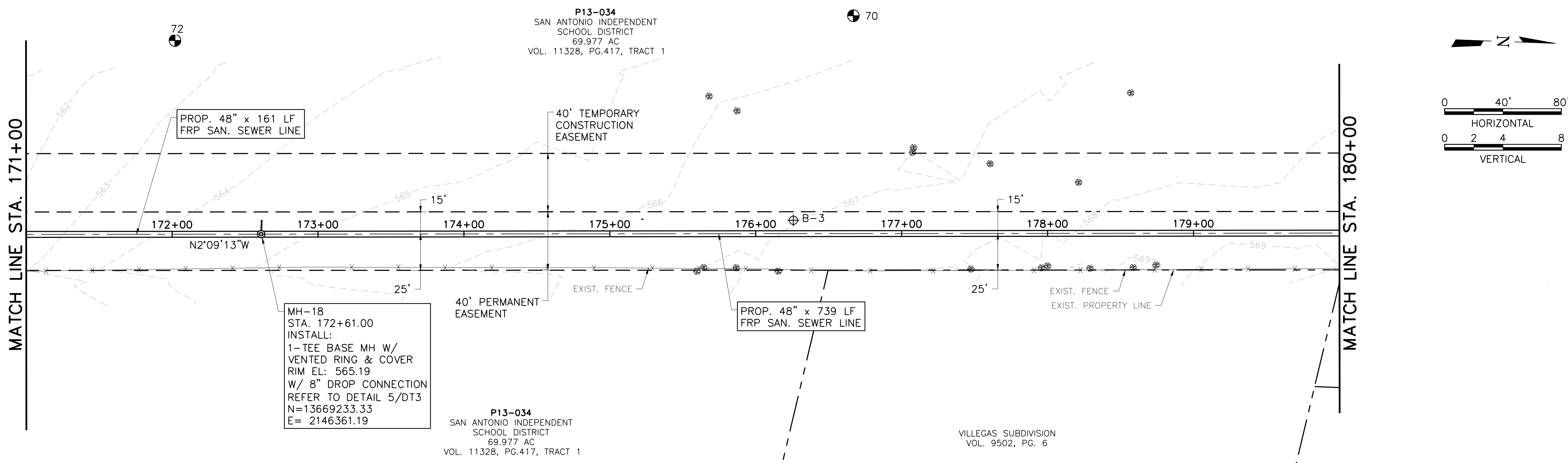
SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
LINE 'C' PLAN AND PROFILE
STA. 162+00 TO STA. 171+00

Sheet PL5

Date: 10/21/2014
Designed by: DIB
Drawn by: DDH
Checked by: BCJ
Scale: HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

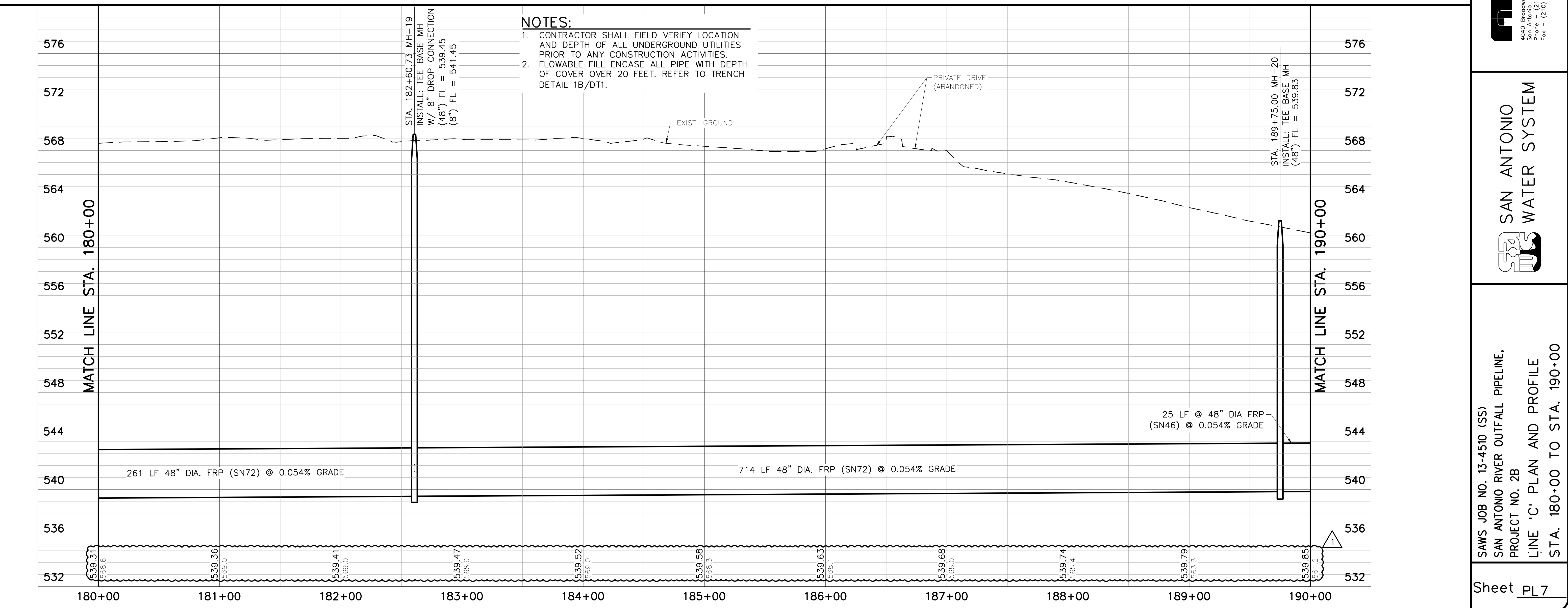
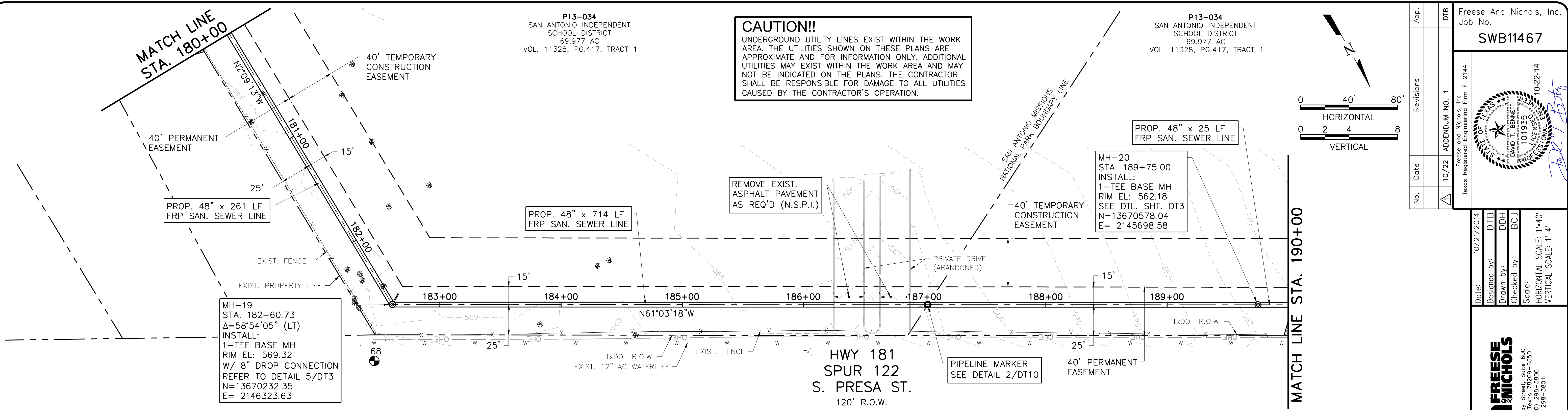


SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
LINE 'C' PLAN AND PROFILE
STA. 171+00 TO STA. 180+00



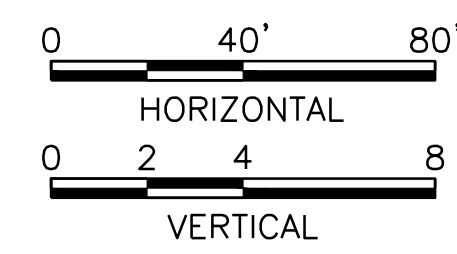
- NOTES:**
- CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.
 - FLOWABLE FILL ENCASE ALL PIPE WITH DEPTH OF COVER OVER 20 FEET. REFER TO TRENCH DETAIL 1B/DT1.

CAUTION!!
UNDERGROUND UTILITY LINES EXIST WITHIN THE WORK AREA. THE UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND FOR INFORMATION ONLY. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA AND MAY NOT BE INDICATED ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION.



- NOTES:**
- CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.
 - FLOWABLE FILL ENCASE ALL PIPE WITH DEPTH OF COVER OVER 20 FEET. REFER TO TRENCH DETAIL 1B/DT1.

CAUTION!!
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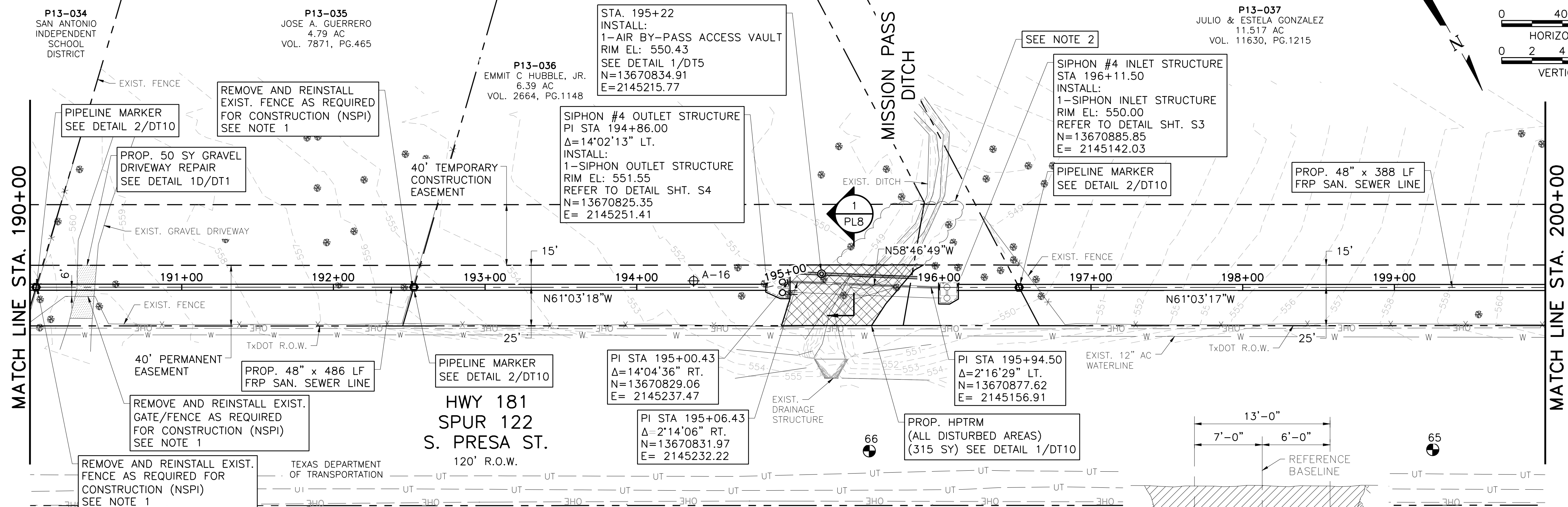
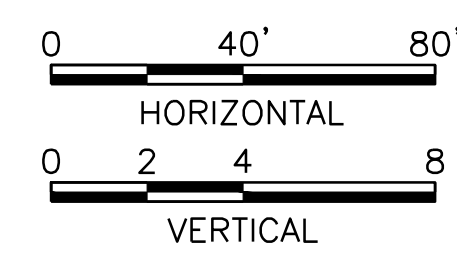
App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	10/22	ADDENDUM NO. 1
Date	10/22	Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144
No.	1	DAVID T. BENNETT PROFESSIONAL ENGINEER 101935 10-22-14

Date:	10/21/2014
Designed by:	DTB
Drawn by:	DDH
Checked by:	BCJ
Scale:	HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=4'

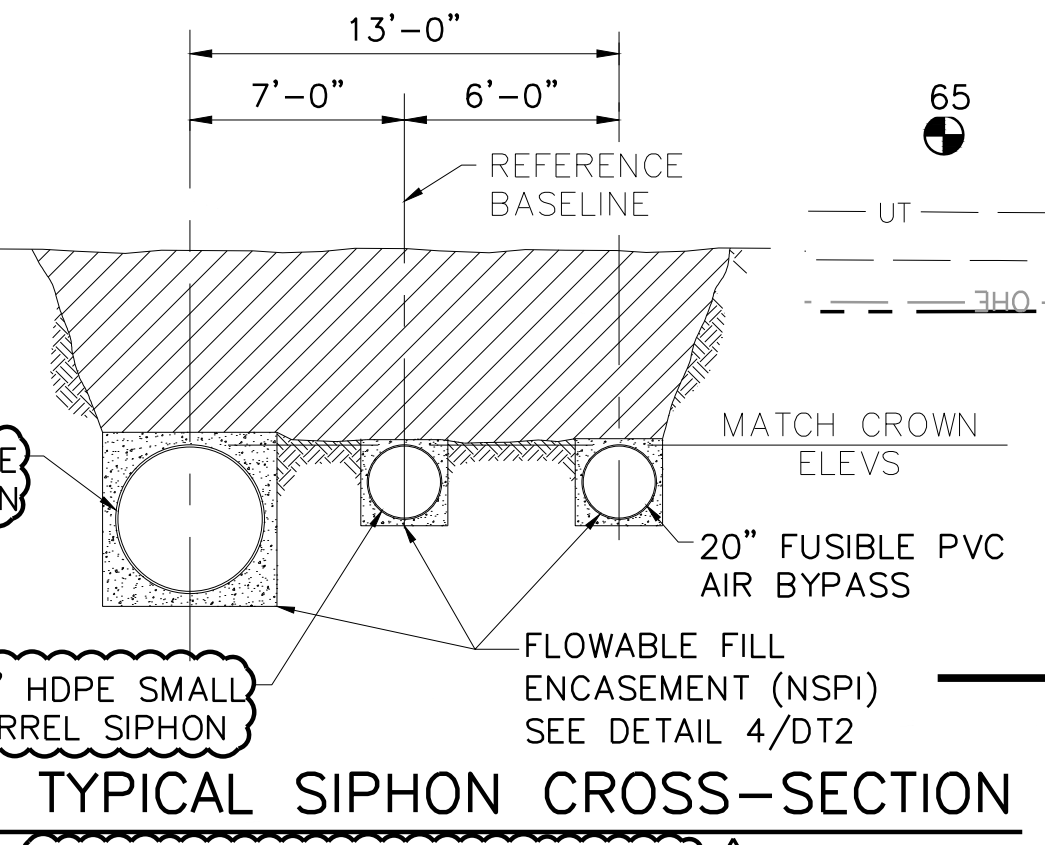
FRESE AND NICHOLS
 4040 Broadway Street, Suite 600
 San Antonio, Texas 78209-6350
 Phone - (210) 298-3800
 Fax - (210) 298-3801

SAN ANTONIO WATER SYSTEM

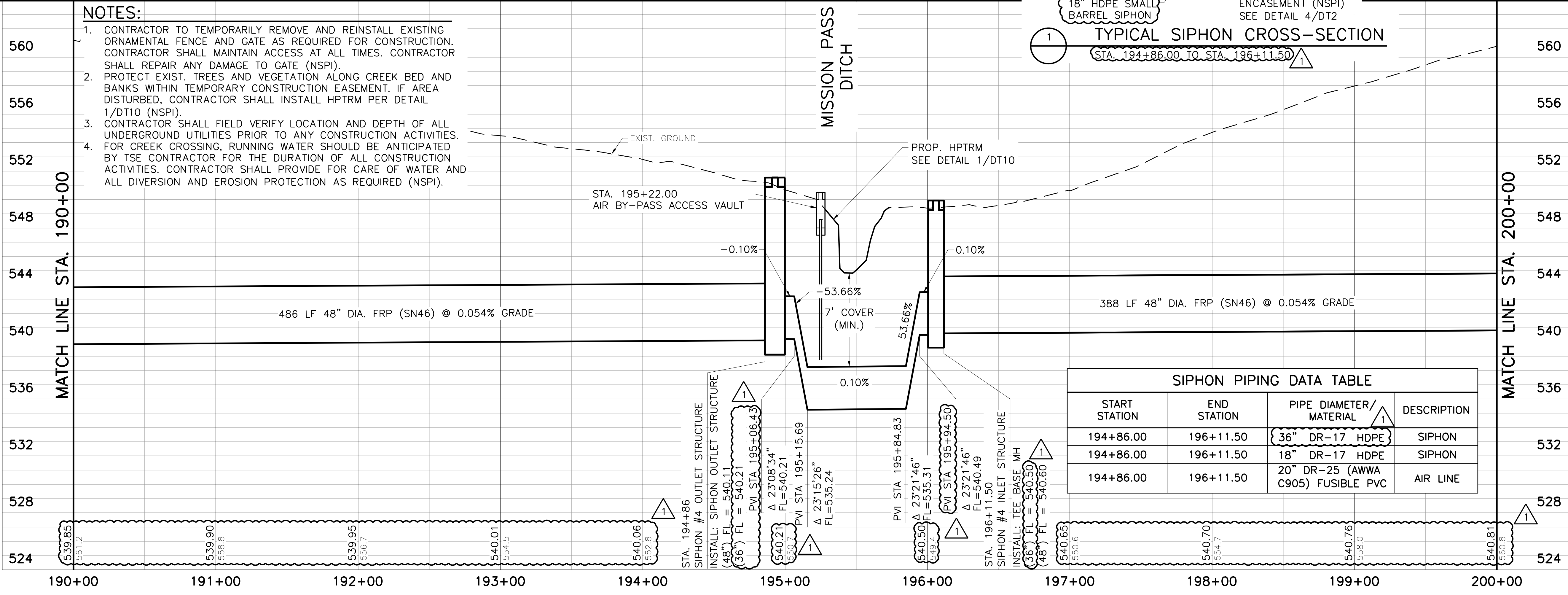
SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 180+00 TO STA. 190+00



CAUTION!!
UNDERGROUND UTILITY LINES EXIST WITHIN THE WORK AREA. THE UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND FOR INFORMATION ONLY. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA AND MAY NOT BE INDICATED ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION.



- NOTES:**
- CONTRACTOR TO TEMPORARILY REMOVE AND REINSTALL EXISTING ORNAMENTAL FENCE AND GATE AS REQUIRED FOR CONSTRUCTION. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES. CONTRACTOR SHALL REPAIR ANY DAMAGE TO GATE (NSPI).
 - PROTECT EXIST. TREES AND VEGETATION ALONG CREEK BED AND BANKS WITHIN TEMPORARY CONSTRUCTION EASEMENT. IF AREA DISTURBED, CONTRACTOR SHALL INSTALL HPTRM PER DETAIL 1/DT10 (NSPI).
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES. FOR CREEK CROSSING, RUNNING WATER SHOULD BE ANTICIPATED BY TSE CONTRACTOR FOR THE DURATION OF ALL CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL PROVIDE FOR CARE OF WATER AND ALL DIVERSION AND EROSION PROTECTION AS REQUIRED (NSPI).
 -



SIPHON PIPING DATA TABLE

START STATION	END STATION	PIPE DIAMETER/MATERIAL	DESCRIPTION
194+86.00	196+11.50	36" DR-17 HDPE	SIPHON
194+86.00	196+11.50	18" DR-17 HDPE	SIPHON
194+86.00	196+11.50	20" DR-25 (AWWA C905) FUSIBLE PVC	AIR LINE

Freese And Nichols, Inc.
Texas Registered Engineering Firm F-2144

10/22/2014
Designed by: DDB
Drawn by: DDH
Checked by: BCJ
Scale: HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

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4040 Broadway Street, Suite 600
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Phone - (210) 298-3800
Fax - (210) 298-3801

SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
LINE 'C' PLAN AND PROFILE
STA. 190+00 TO STA. 200+00

P13-037
 JULIO & ESTELA GONZALEZ
 11.517 AC
 VOL. 11630, PG.1215

MH-21
 STA. 203+92.86
 $\Delta=54'42'42''$ (RT)
 INSTALL:
 1- TEE BASE MH
 RIM EL: 555.77
 SEE DTL. SHT. DT3
 N=13671264.00
 E= 2144458.28

REMOVE AND REPLACE
 EXIST. FENCE (50 LF)
 INSTALL 16' TYPE 1 GATE

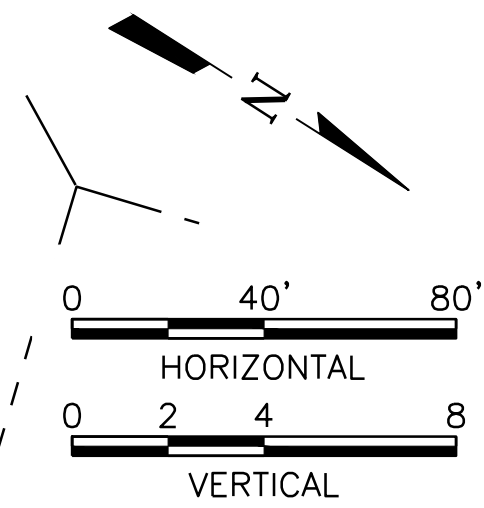
EXIST. MH
 (TO BE ABANDONED)
 REFER TO DETAIL 3/DT3

PIPELINE MARKER
 SEE DETAIL 2/DT10

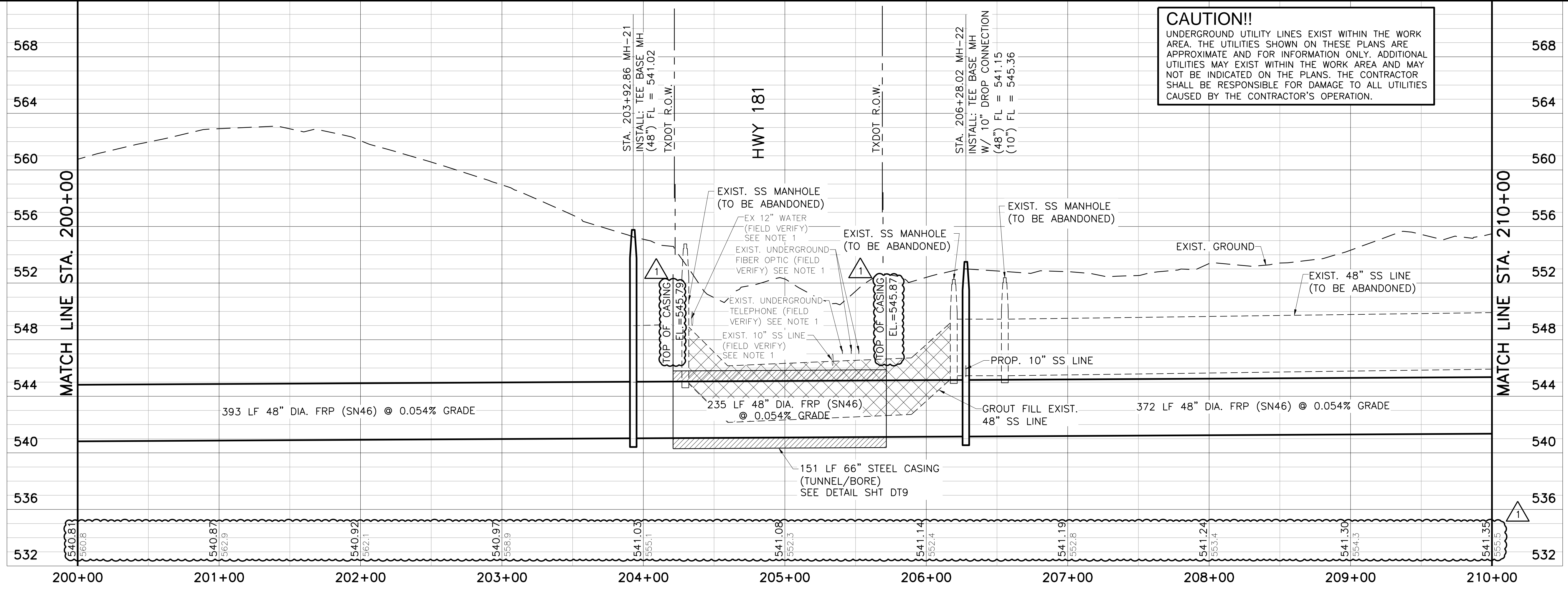
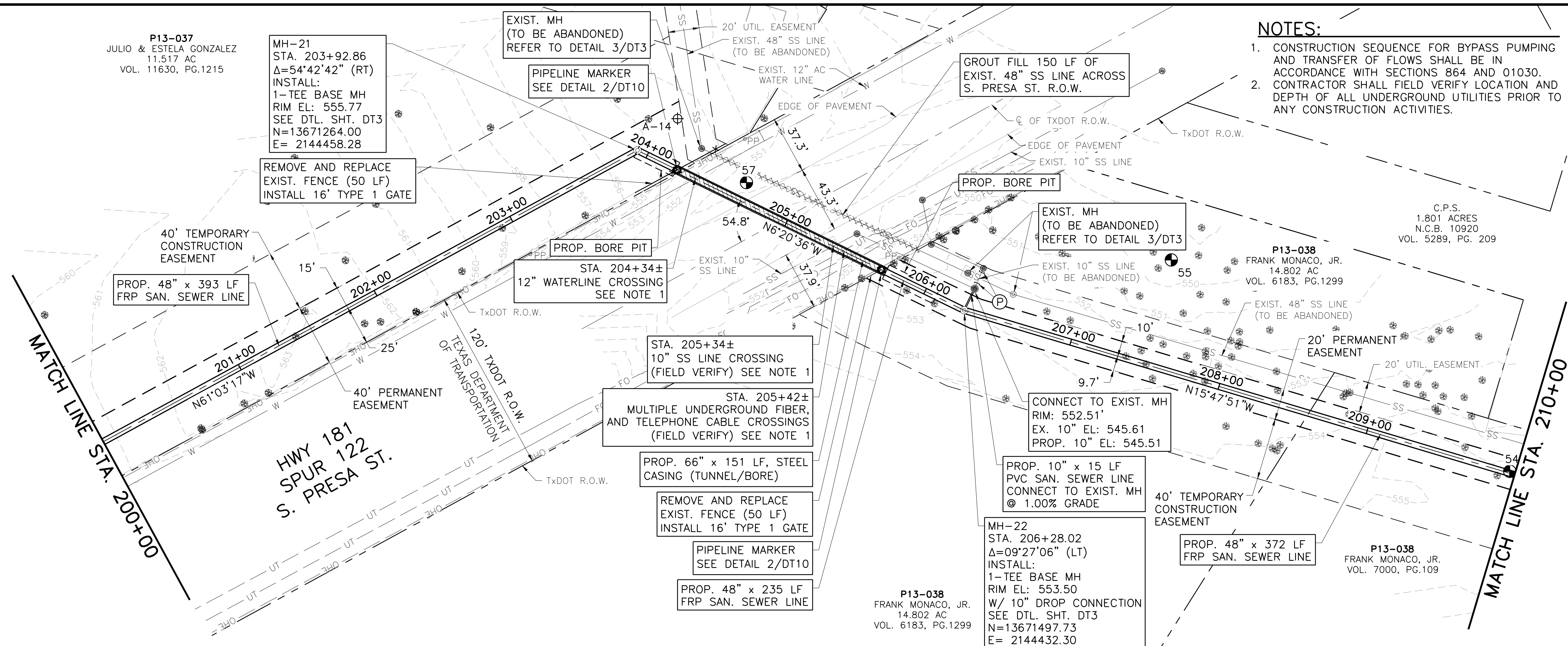
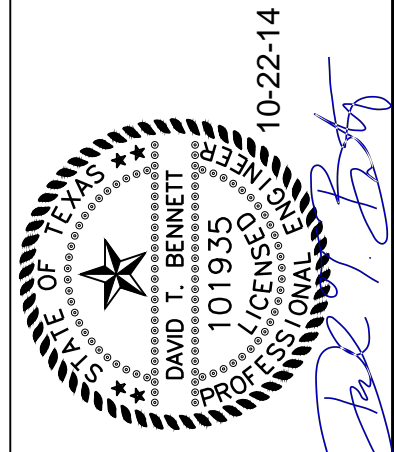
GROUT FILL 150 LF OF
 EXIST. 48" SS LINE
 ACROSS
 S. PRESA ST. R.O.W.

NOTES:

1. CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.



App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	10/22	ADDENDUM NO. 1
Date		
No.		



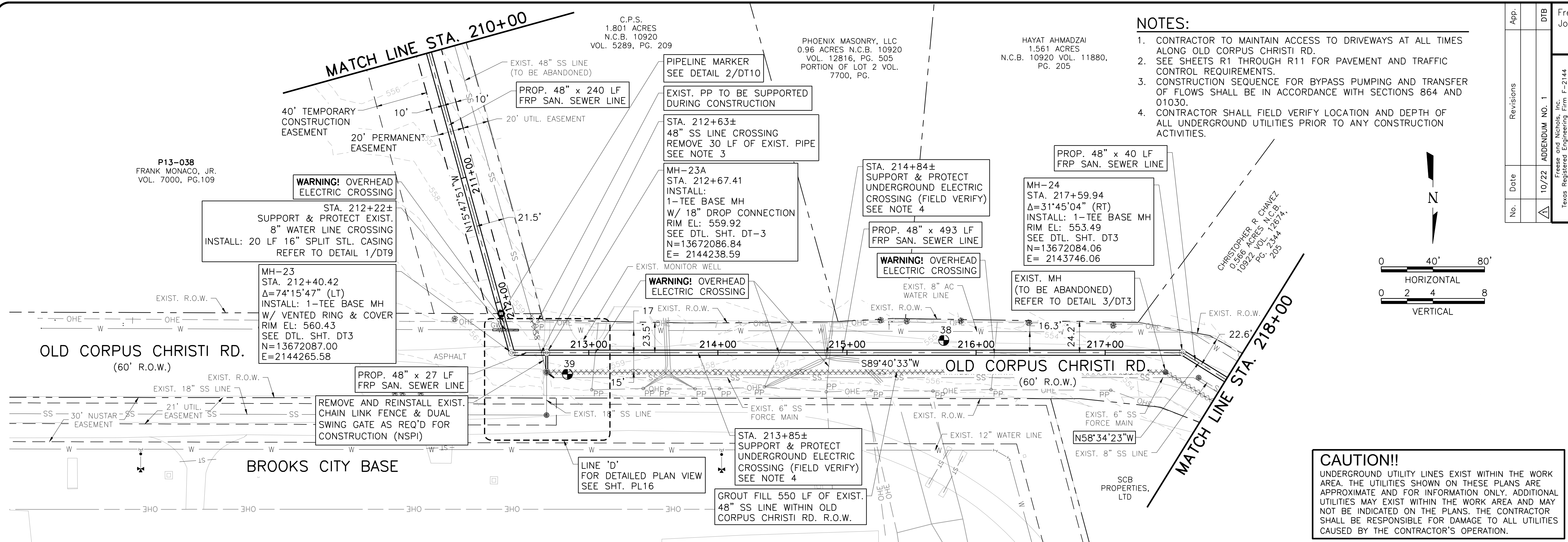
CAUTION!!
 UNDERGROUND UTILITY LINES EXIST WITHIN THE WORK AREA. THE UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND FOR INFORMATION ONLY. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA AND MAY NOT BE INDICATED ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION.

Date:	10/21/2014
Designed by:	DTB
Drawn by:	DDH
Checked by:	BCJ
Scale:	HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=4'

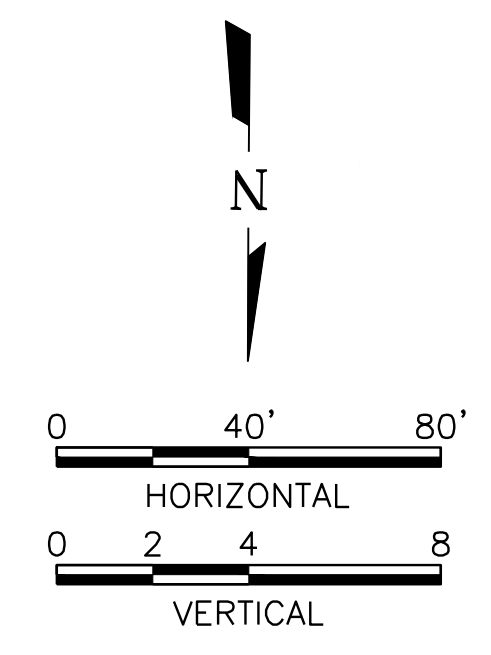


**SAN ANTONIO
 WATER SYSTEM**

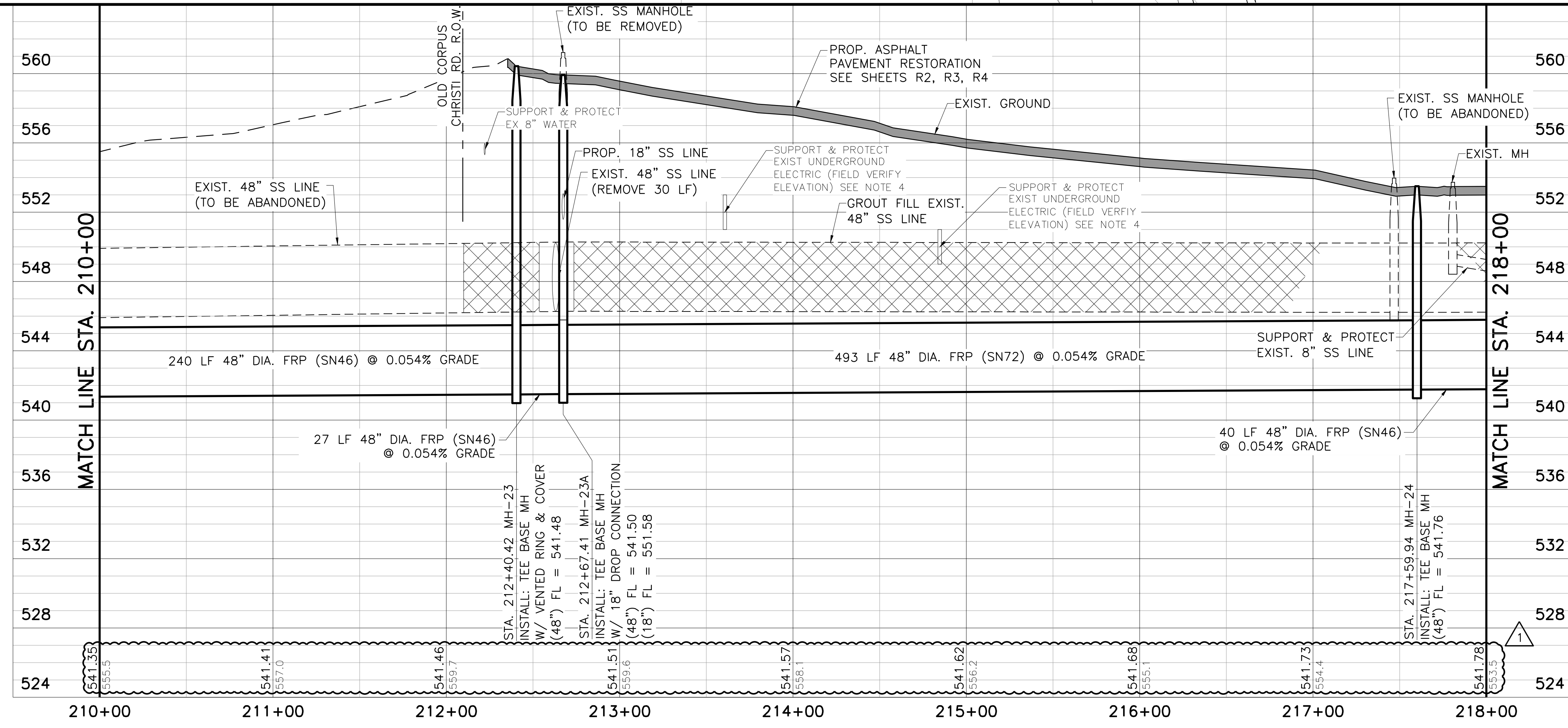
SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 200+00 TO STA. 210+00



- NOTES:**
1. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES ALONG OLD CORPUS CHRISTI RD.
 2. SEE SHEETS R1 THROUGH R11 FOR PAVEMENT AND TRAFFIC CONTROL REQUIREMENTS.
 3. CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
 4. CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.



CAUTION!!
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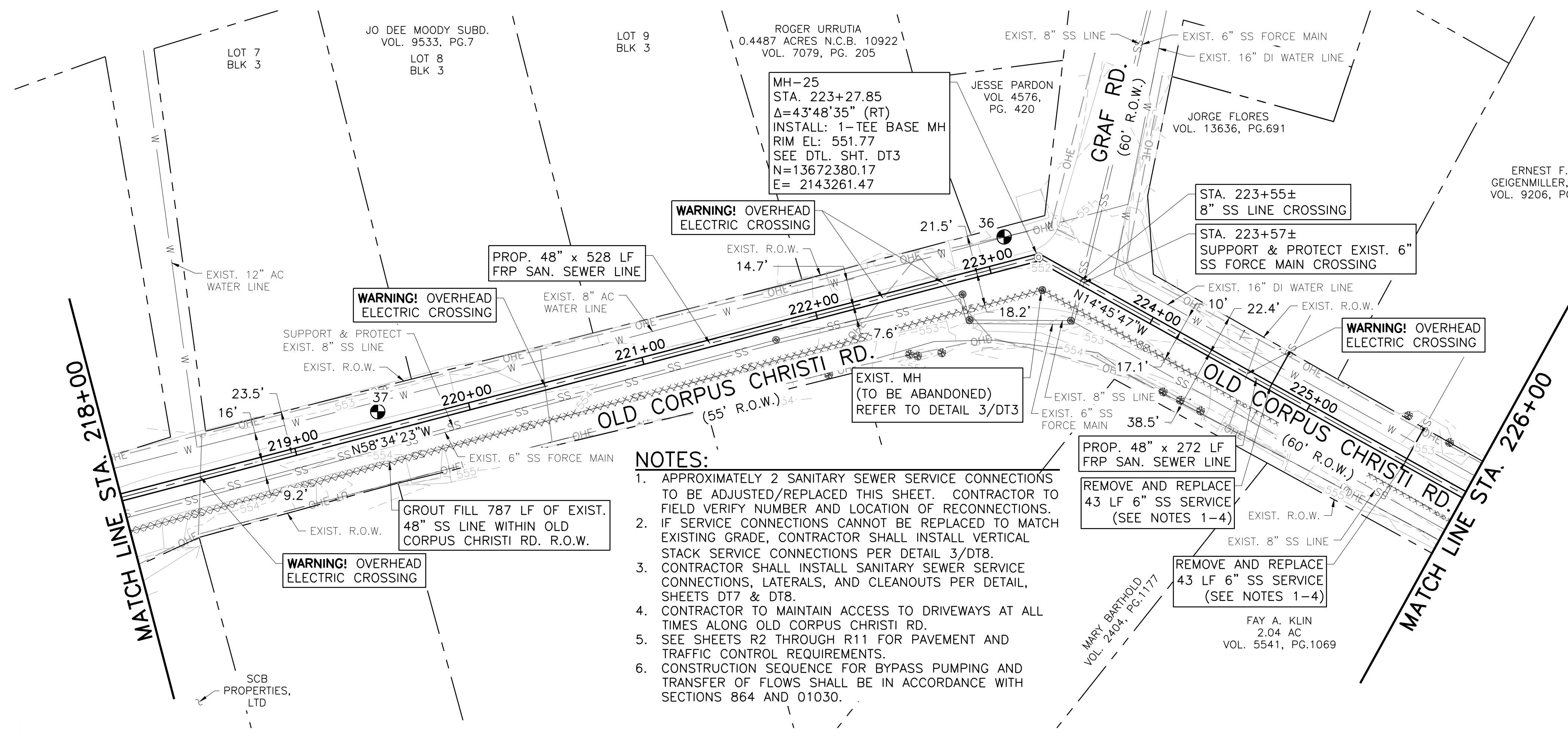
App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	ADDENDUM NO. 1	SWB11467
Date	10/22	TECHNICAL SEAL
No.		10-22-14

Date: 10/21/2014
 Designed by: DDB
 Drawn by: DDH
 Checked by: BCI
 Scale: HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=4'

FREES & NICHOLS
 4040 Broadway Street, Suite 600
 San Antonio, Texas 78209-6350
 Phone - (210) 298-3800
 Fax - (210) 298-3801

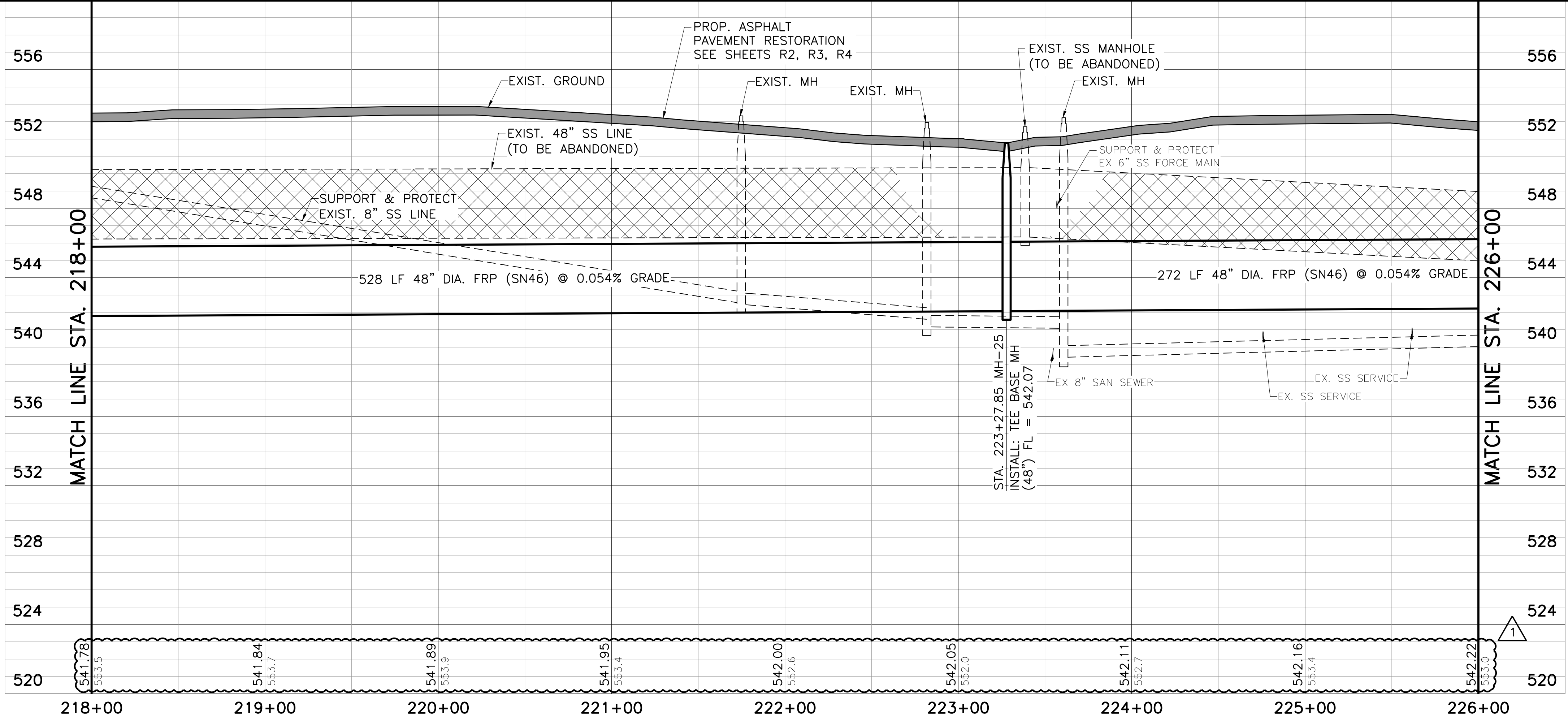
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 210+00 TO STA. 218+00



- NOTES:**
- APPROXIMATELY 2 SANITARY SEWER SERVICE CONNECTIONS TO BE ADJUSTED/REPLACED THIS SHEET. CONTRACTOR TO FIELD VERIFY NUMBER AND LOCATION OF RECONNECTIONS.
 - IF SERVICE CONNECTIONS CANNOT BE REPLACED TO MATCH EXISTING GRADE, CONTRACTOR SHALL INSTALL VERTICAL STACK SERVICE CONNECTIONS PER DETAIL 3/DT8.
 - CONTRACTOR SHALL INSTALL SANITARY SEWER SERVICE CONNECTIONS, LATERALS, AND CLEANOUTS PER DETAIL SHEETS DT7 & DT8.
 - CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES ALONG OLD CORPUS CHRISTI RD.
 - SEE SHEETS R2 THROUGH R11 FOR PAVEMENT AND TRAFFIC CONTROL REQUIREMENTS.
 - CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.

CAUTION!!
 UNDERGROUND UTILITY LINES EXIST WITHIN THE WORK AREA. THE UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND FOR INFORMATION ONLY. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA AND MAY NOT BE INDICATED ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION.



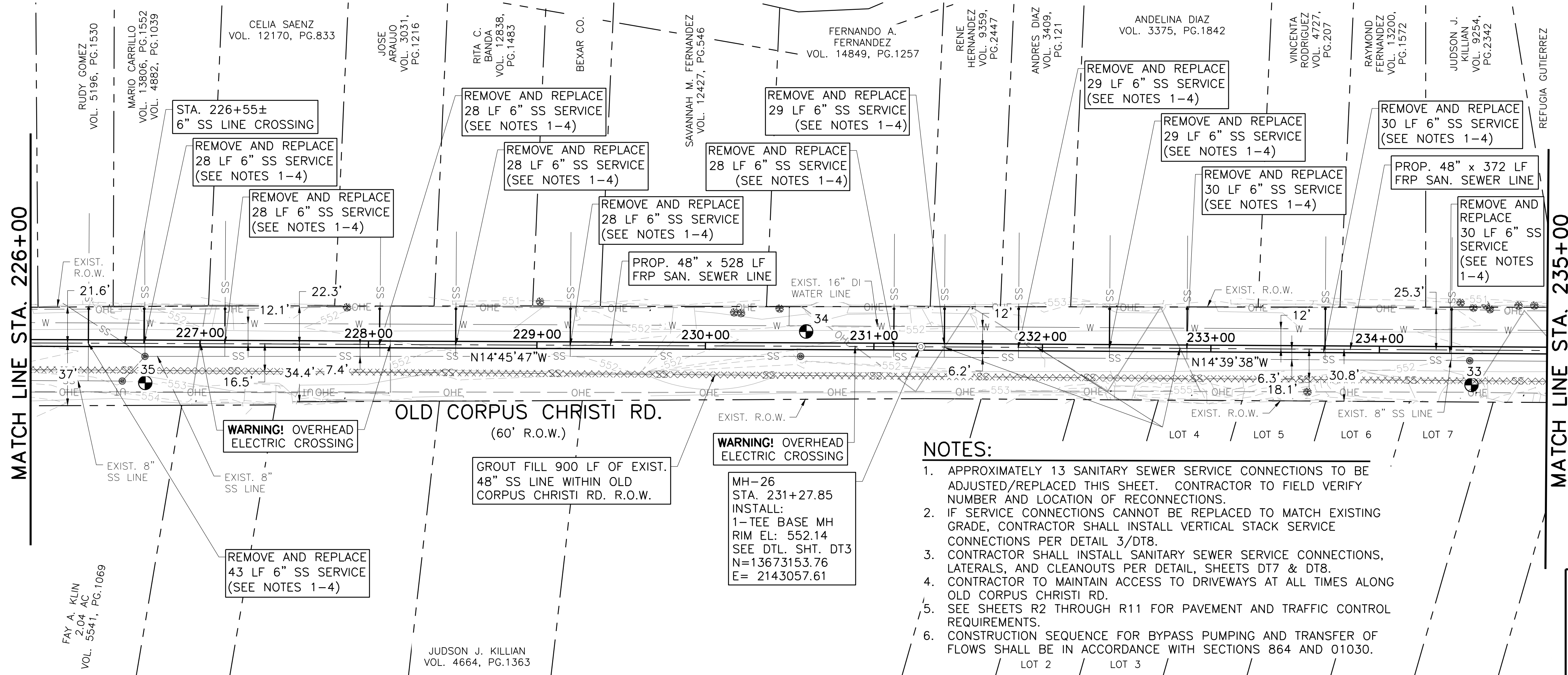
App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	ADDENDUM NO. 1	SWB11467
Date	10/22	101935 10-22-14
No.	A	DAVID T. BENNETT PROFESSIONAL ENGINEER 101935 10-22-14

Date: 10/21/2014
 Designed by: DIB
 Drawn by: DDH
 Checked by: BCJ
 Scale: HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=4'

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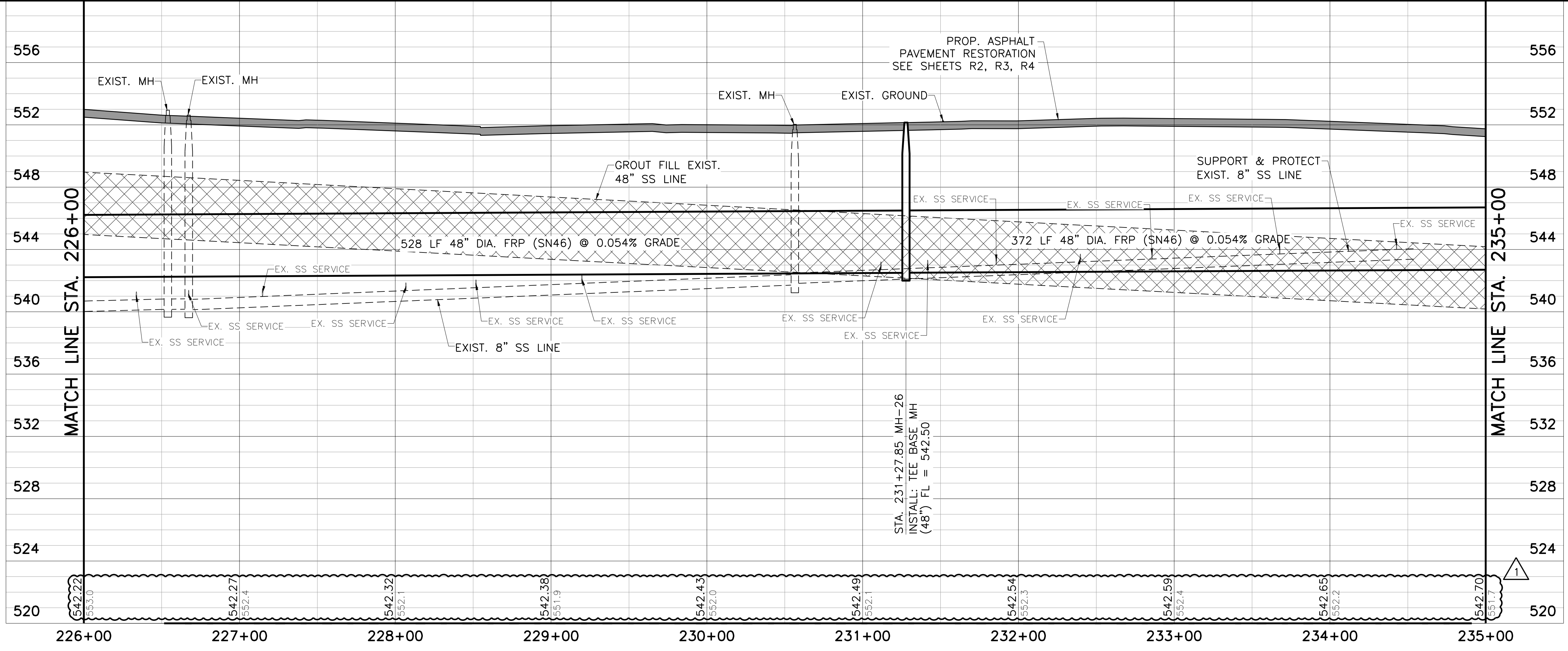
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 218+00 TO STA. 226+00



- NOTES:**
- APPROXIMATELY 13 SANITARY SEWER SERVICE CONNECTIONS TO BE ADJUSTED/REPLACED THIS SHEET. CONTRACTOR TO FIELD VERIFY NUMBER AND LOCATION OF RECONNECTIONS.
 - IF SERVICE CONNECTIONS CANNOT BE REPLACED TO MATCH EXISTING GRADE, CONTRACTOR SHALL INSTALL VERTICAL STACK SERVICE CONNECTIONS PER DETAIL 3/DT8.
 - CONTRACTOR SHALL INSTALL SANITARY SEWER SERVICE CONNECTIONS, LATERALS, AND CLEANOUTS PER DETAIL, SHEETS DT7 & DT8.
 - CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES ALONG OLD CORPUS CHRISTI RD.
 - SEE SHEETS R2 THROUGH R11 FOR PAVEMENT AND TRAFFIC CONTROL REQUIREMENTS.
 - CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.

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App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	10/22	ADDENDUM NO. 1
Date	10/22	ADDENDUM NO. 1
No.	1	ADDENDUM NO. 1

SWB11467

101935

DAVID T. BENNETT

PROFESSIONAL ENGINEER

10-22-14

10/21/2014

Designed by: DTB

Drawn by: DDH

Checked by: BCJ

Scale: HORIZONTAL SCALE: 1"=40'

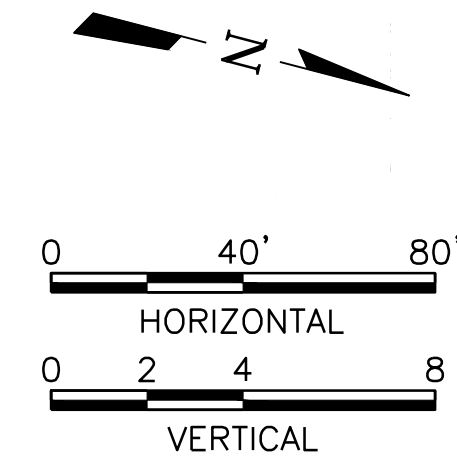
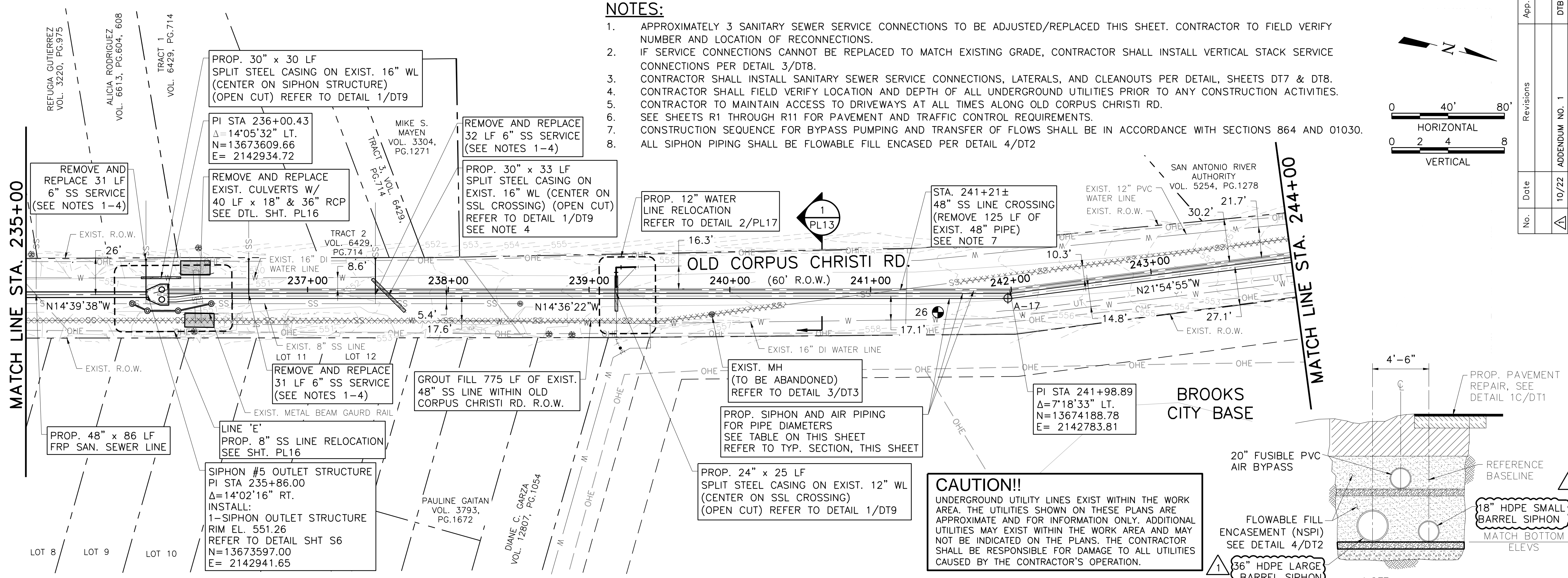
VERTICAL SCALE: 1"=4'

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 226+00 TO STA. 235+00



App: Freese And Nichols, Inc.
DTB: Job No. SWB11467

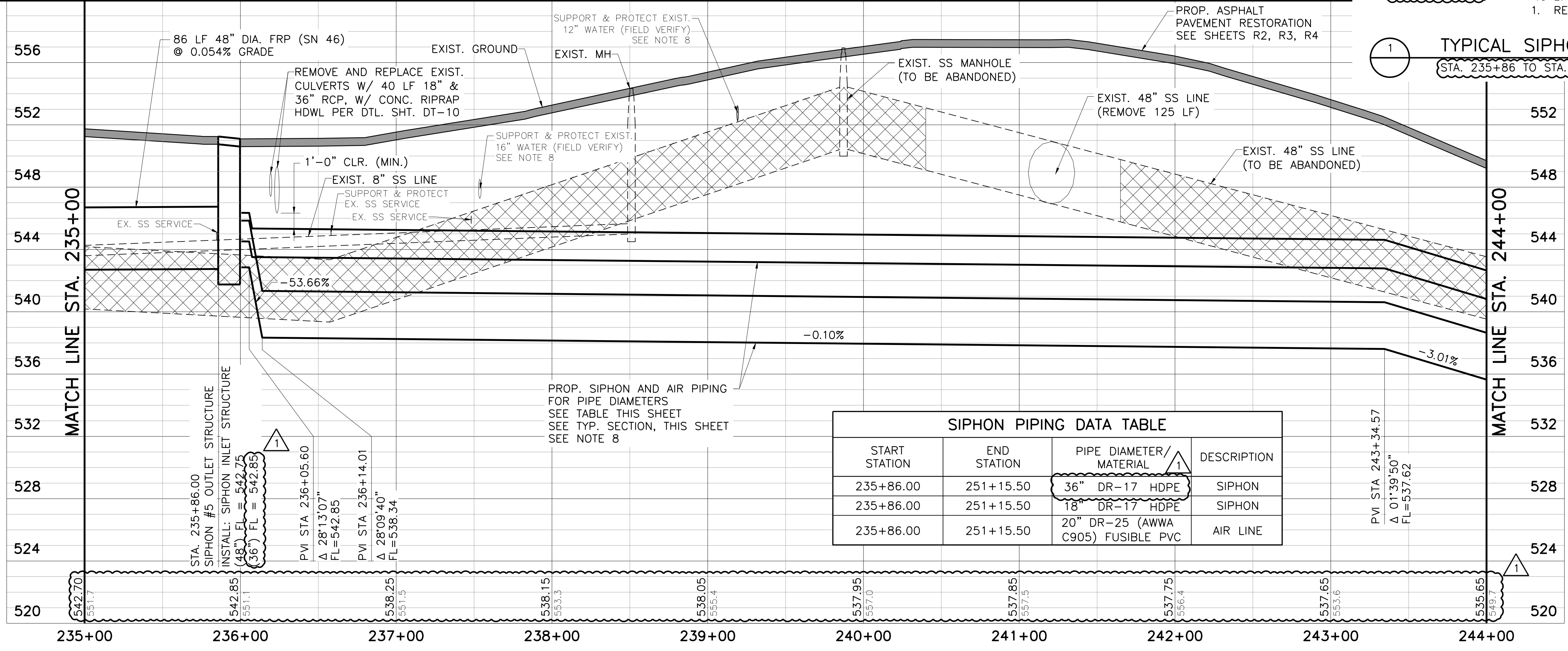
Revisions: 10/22/2014 ADDENDUM NO. 1

Date: 10/22/2014

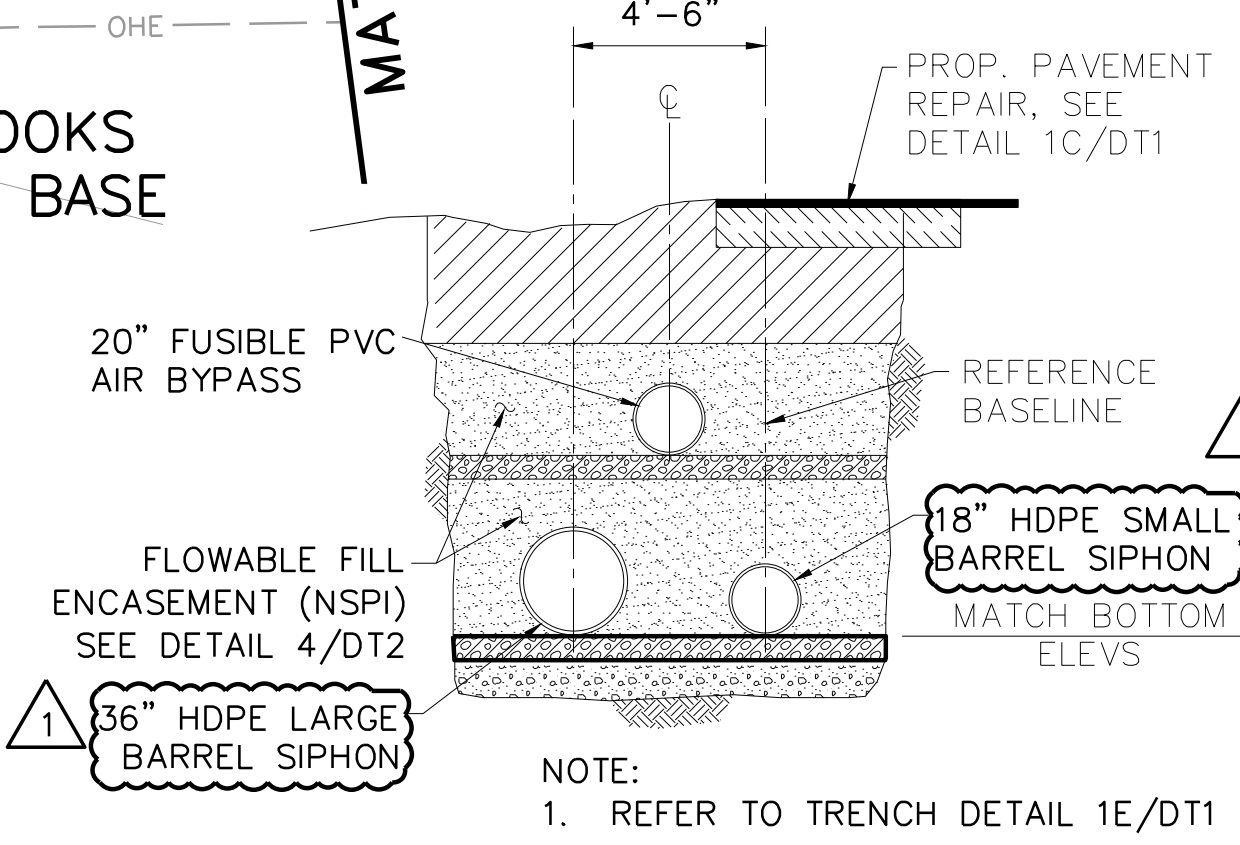
No.:

Designed by: DDH
Drawn by: BCT
Checked by: BCT
Scale: HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=8'

Professional Engineer Seal: DAVID T. BENNETT, No. 101935, State of Texas, License No. 10-22-14



TYPICAL SIPHON CROSS-SECTION
(STA. 235+86 TO STA. 251+15.50)



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SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
LINE 'C' PLAN AND PROFILE
STA. 235+00 TO STA. 244+00

SAN ANTONIO WATER SYSTEM

Sheet **PL13**

App. DTB Freese And Nichols, Inc.
Job No. SWB11467

Revisions: 10/22/2014 ADDENDUM NO. 1

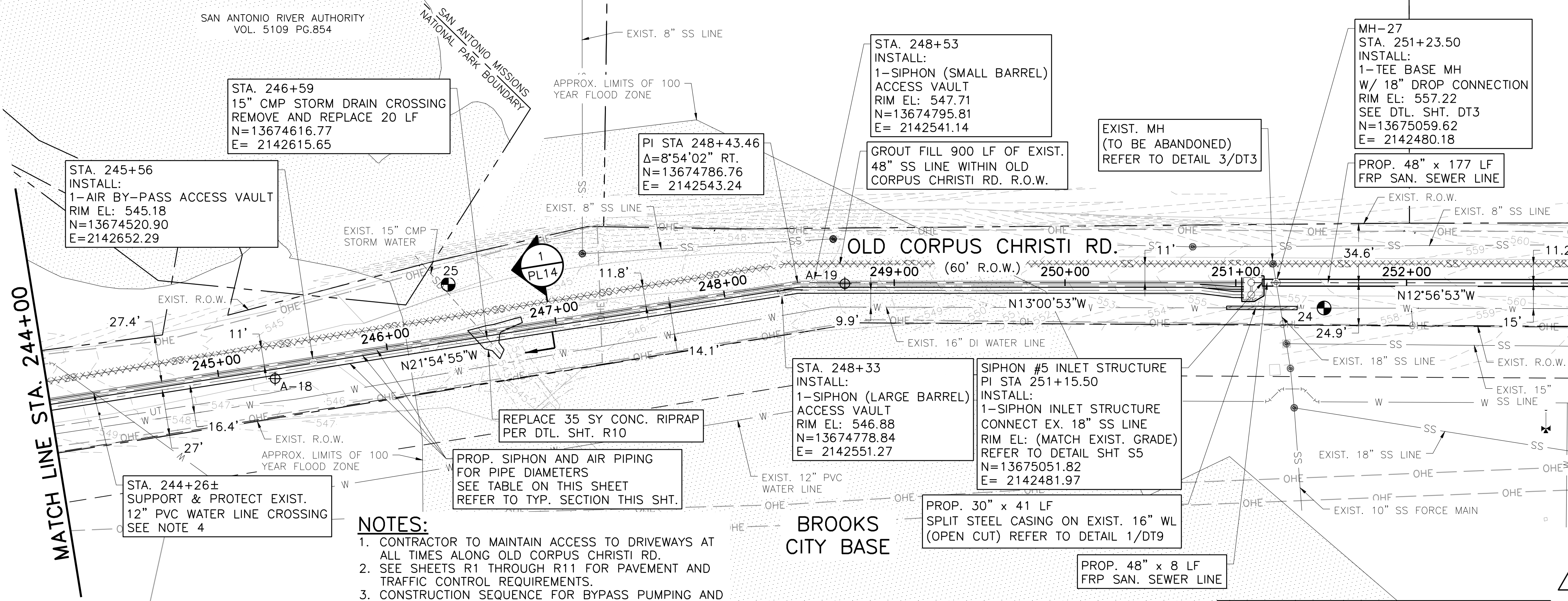
Date: 10/22/2014

No. 10/22/2014

Designed by: DDH
Drawn by: BCT
Checked by: BCT

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VERTICAL SCALE: 1"=4'

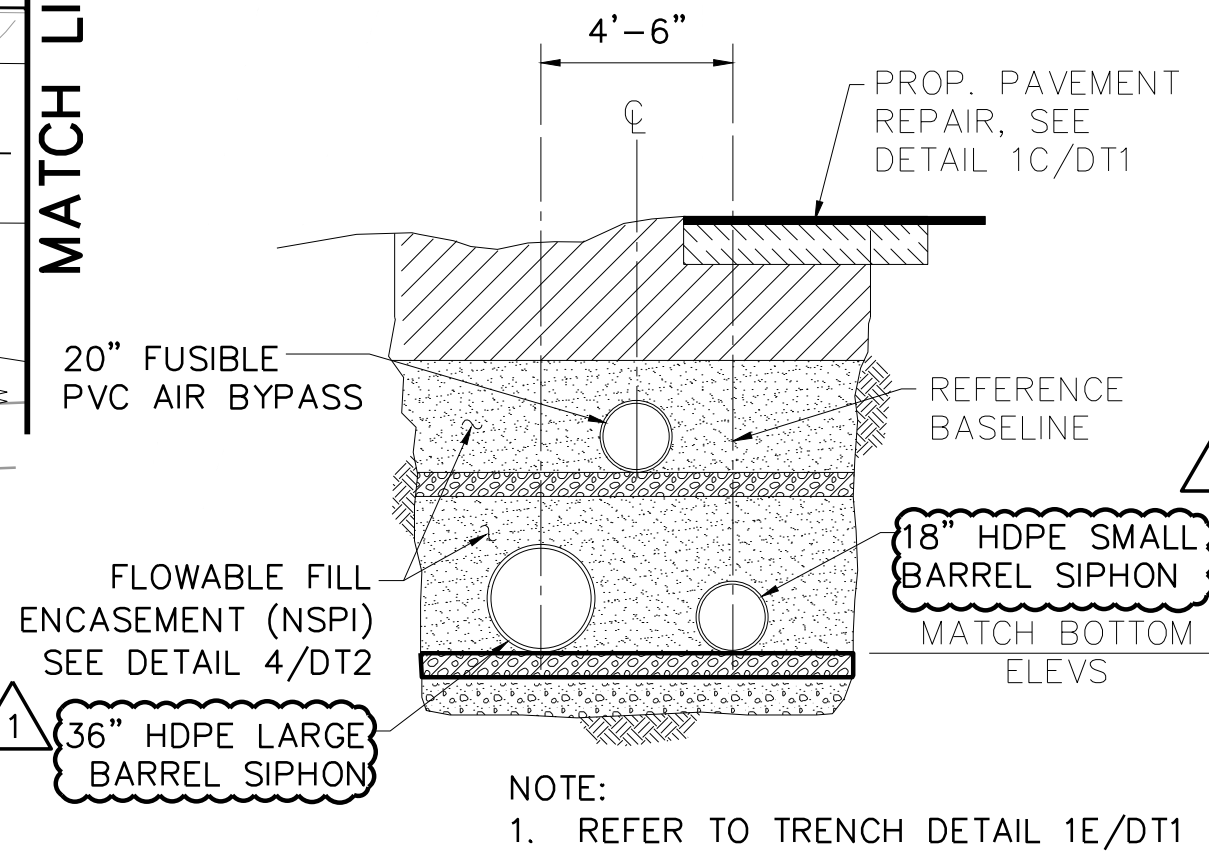
Professional Engineer
DAVID T. BENNETT
101935
10-22-14



MATCH LINE STA. 253+00

1

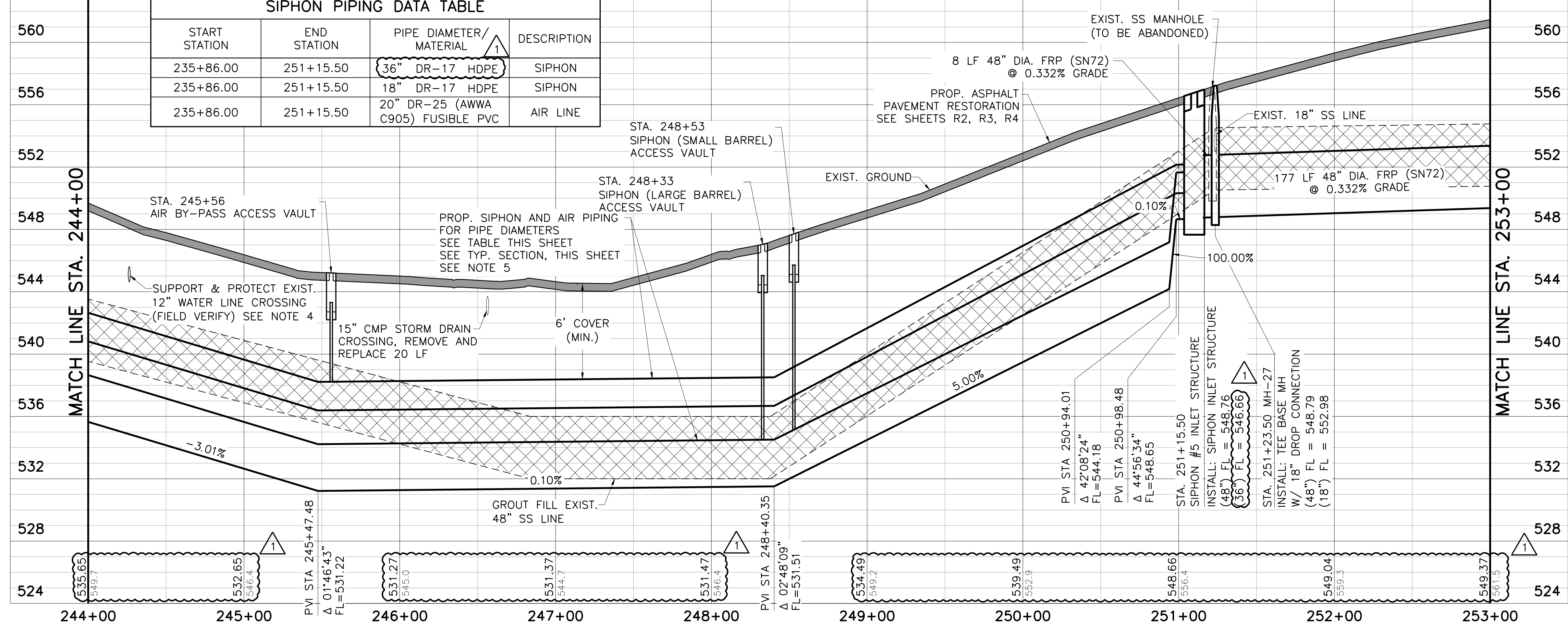
TYPICAL SIPHON CROSS-SECTION
(STA. 235+86 TO STA. 251+15.50)



- NOTES:**
- CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES ALONG OLD CORPUS CHRISTI RD.
 - SEE SHEETS R1 THROUGH R11 FOR PAVEMENT AND TRAFFIC CONTROL REQUIREMENTS.
 - CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.
 - ALL SIPHON PIPING SHALL BE FLOWABLE FILL ENCASED PER DETAIL 4/DT2

CAUTION!!
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SIPHON PIPING DATA TABLE			
START STATION	END STATION	PIPE DIAMETER/MATERIAL	DESCRIPTION
235+86.00	251+15.50	36" DR-17 HDPE	SIPHON
235+86.00	251+15.50	18" DR-17 HDPE	SIPHON
235+86.00	251+15.50	20" DR-25 (AWWA C905) FUSIBLE PVC	AIR LINE



Freese And Nichols, Inc.
Texas Registered Engineering Firm F-2144

10/22/2014

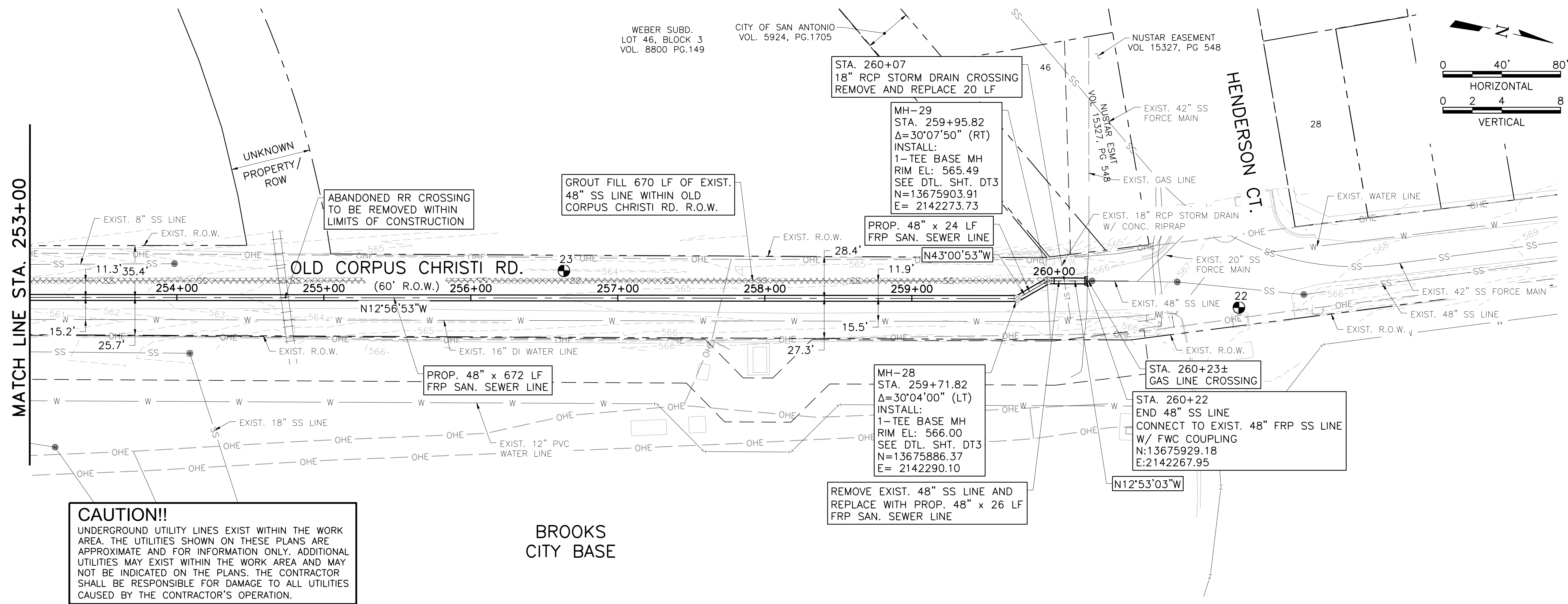
Designed by: DDH
Drawn by: BCT
Checked by: BCT

Scale: HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

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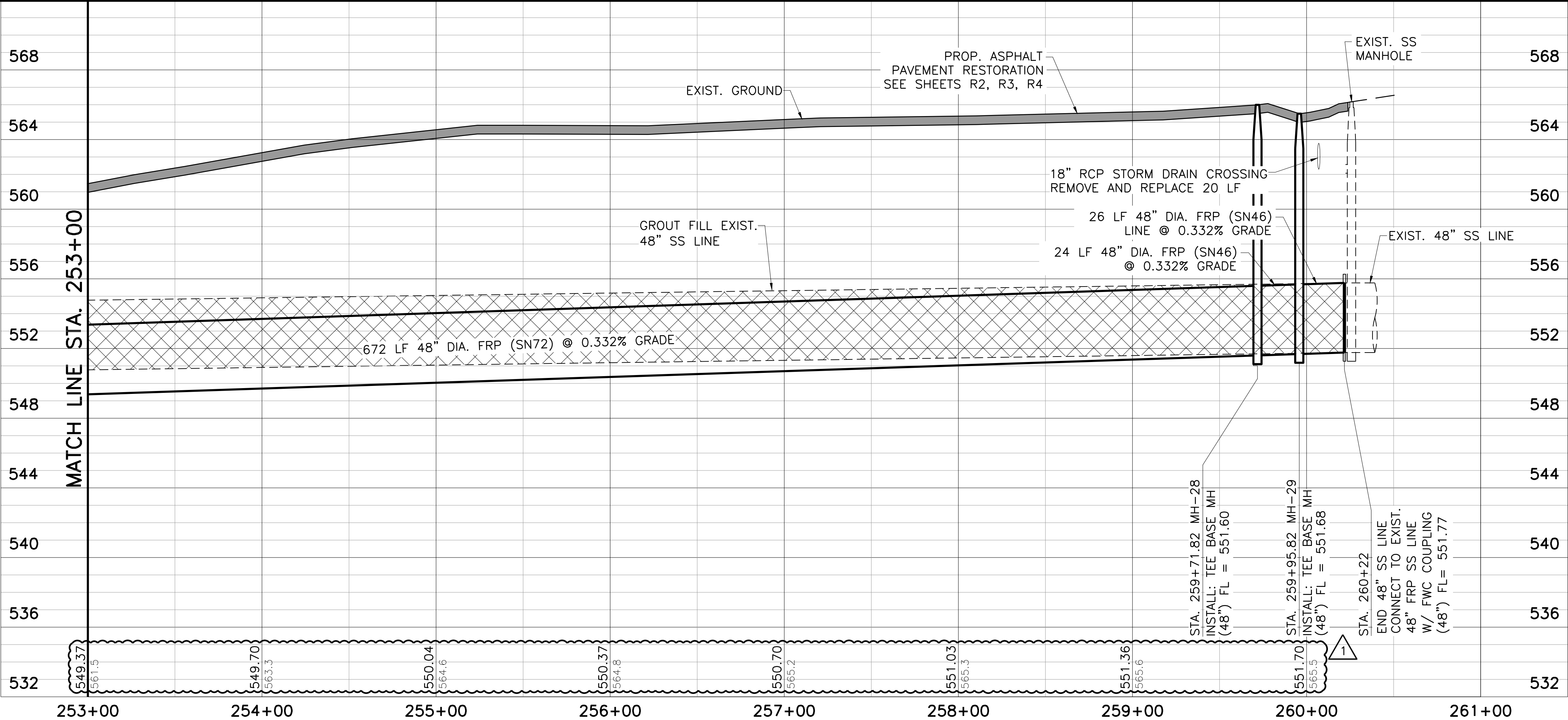
SAN ANTONIO
WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
LINE 'C' PLAN AND PROFILE
STA. 244+00 TO STA. 253+00



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BROOKS CITY BASE



- NOTES:**
- CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES ALONG OLD CORPUS CHRISTI RD.
 - SEE SHEETS R1 THROUGH R11 FOR PAVEMENT AND TRAFFIC CONTROL REQUIREMENTS.
 - CONSTRUCTION SEQUENCE FOR BYPASS PUMPING AND TRANSFER OF FLOWS SHALL BE IN ACCORDANCE WITH SECTIONS 864 AND 01030.
 - CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.

App.	DTB	Freese And Nichols, Inc. Job No.
Revisions	10/22	ADDENDUM NO. 1
Date	10/22	10-22-14
No.		

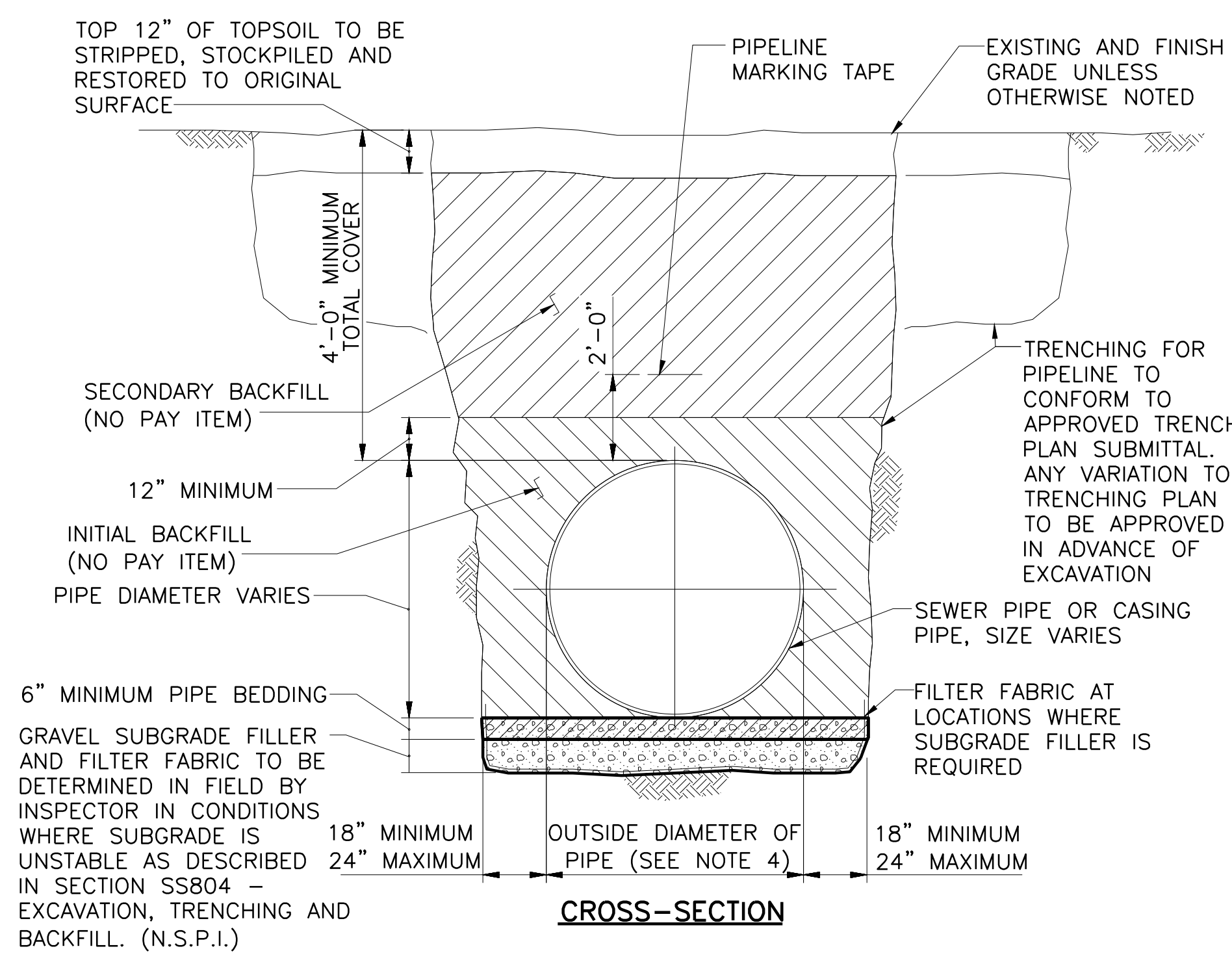
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 Vertical Scale: 1"=4'

Date: 10/21/2014
 Drawn by: DIB
 Checked by: BCT
 Scale: HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=4'

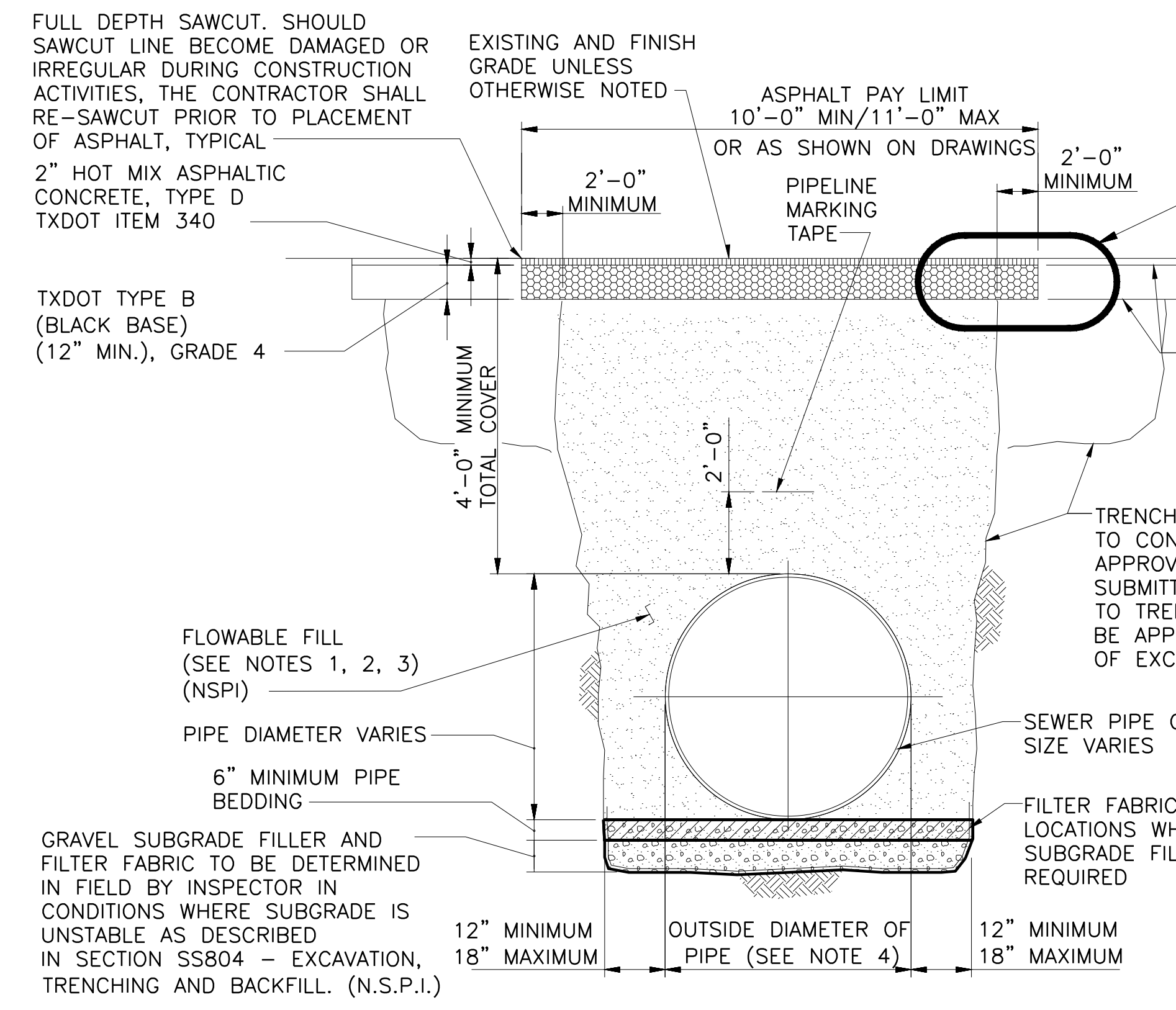
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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 LINE 'C' PLAN AND PROFILE
 STA. 253+00 TO STA. 260+22

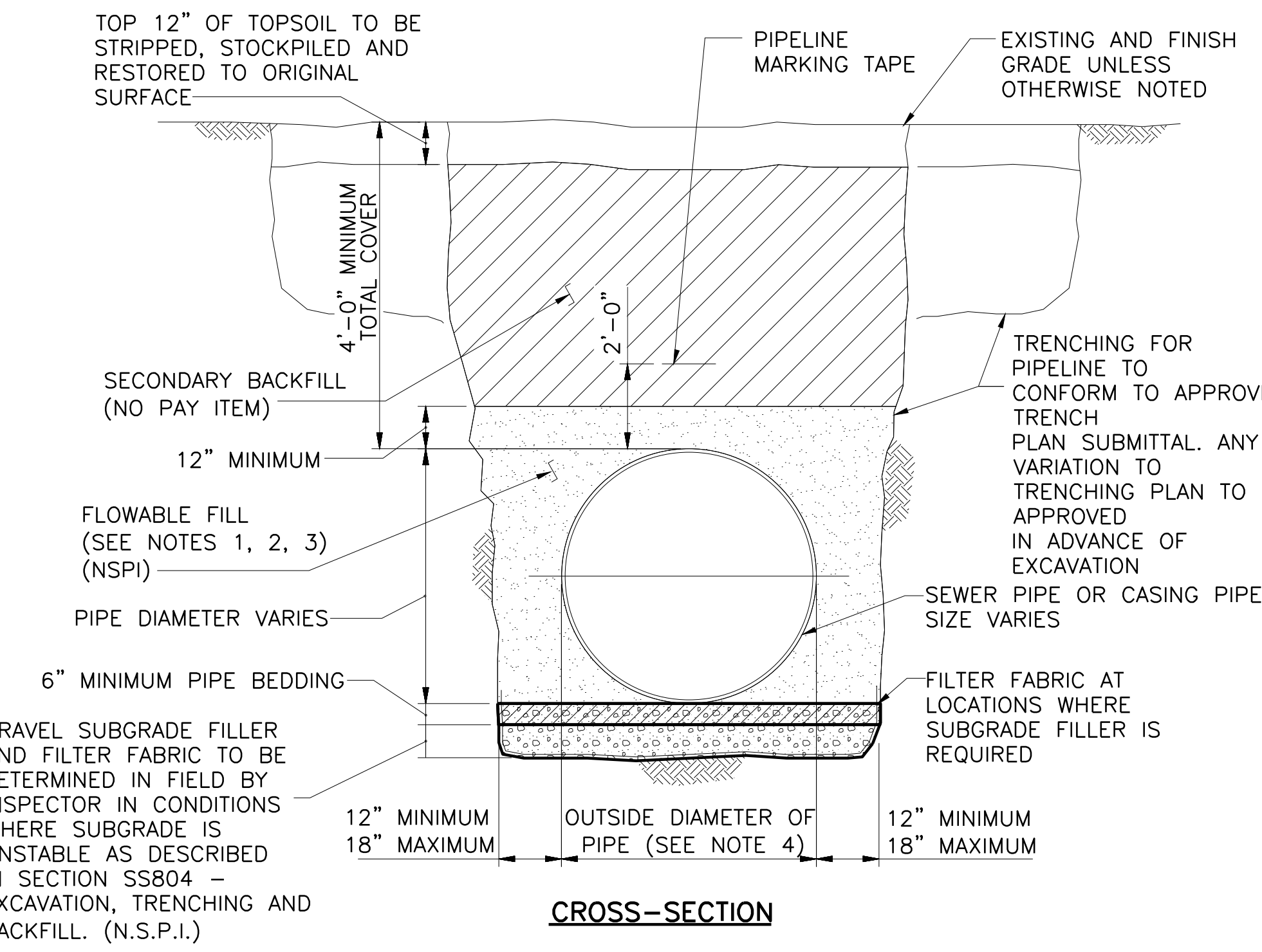


1A
 NOT TO SCALE
 TYPICAL PIPE TRENCH SECTION FOR DEPTH OF COVER 4 TO 20 FEET (SOIL SURFACE)

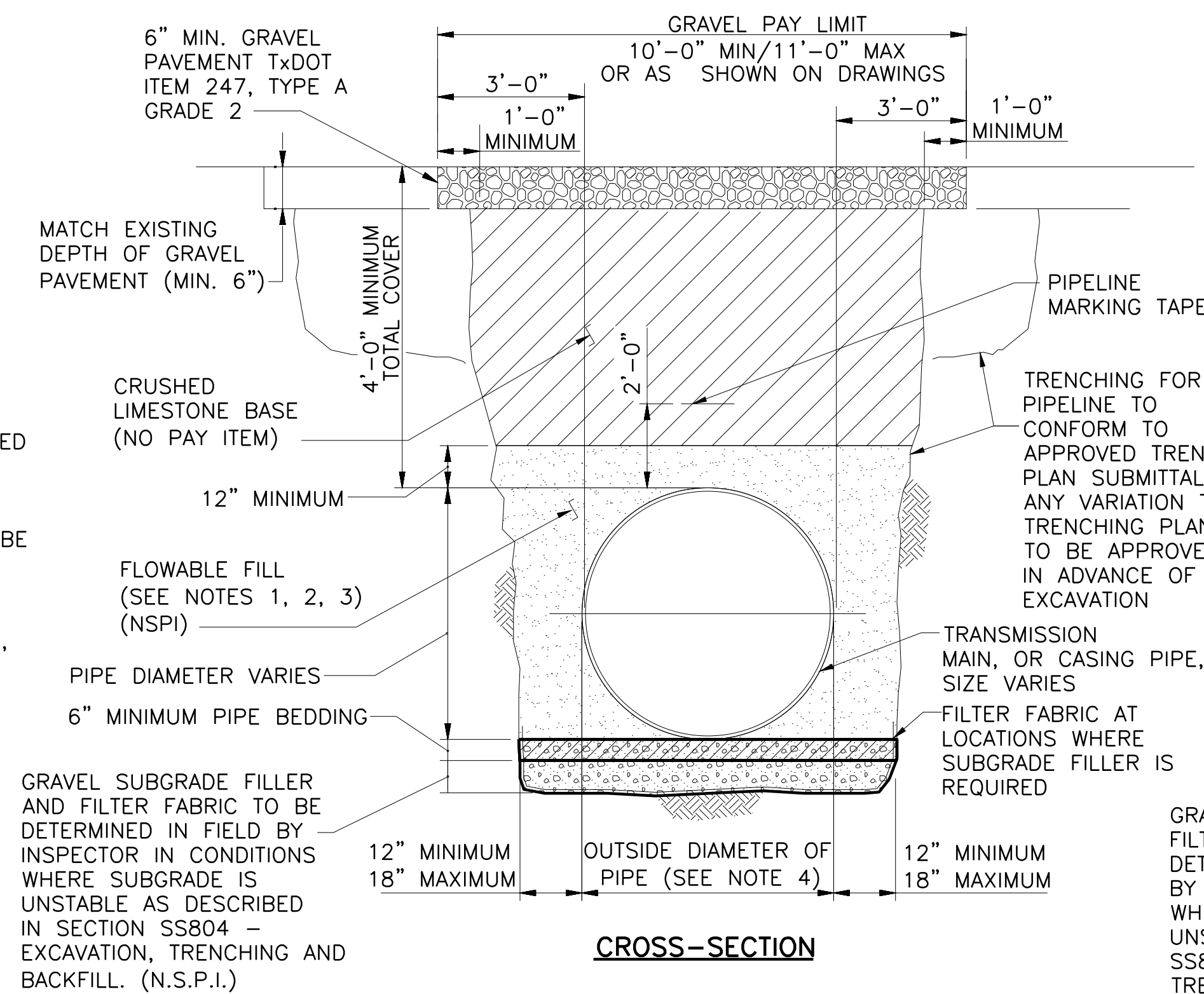


1C
 NOT TO SCALE
 TYPICAL PIPE TRENCH (ASPHALT SURFACE)

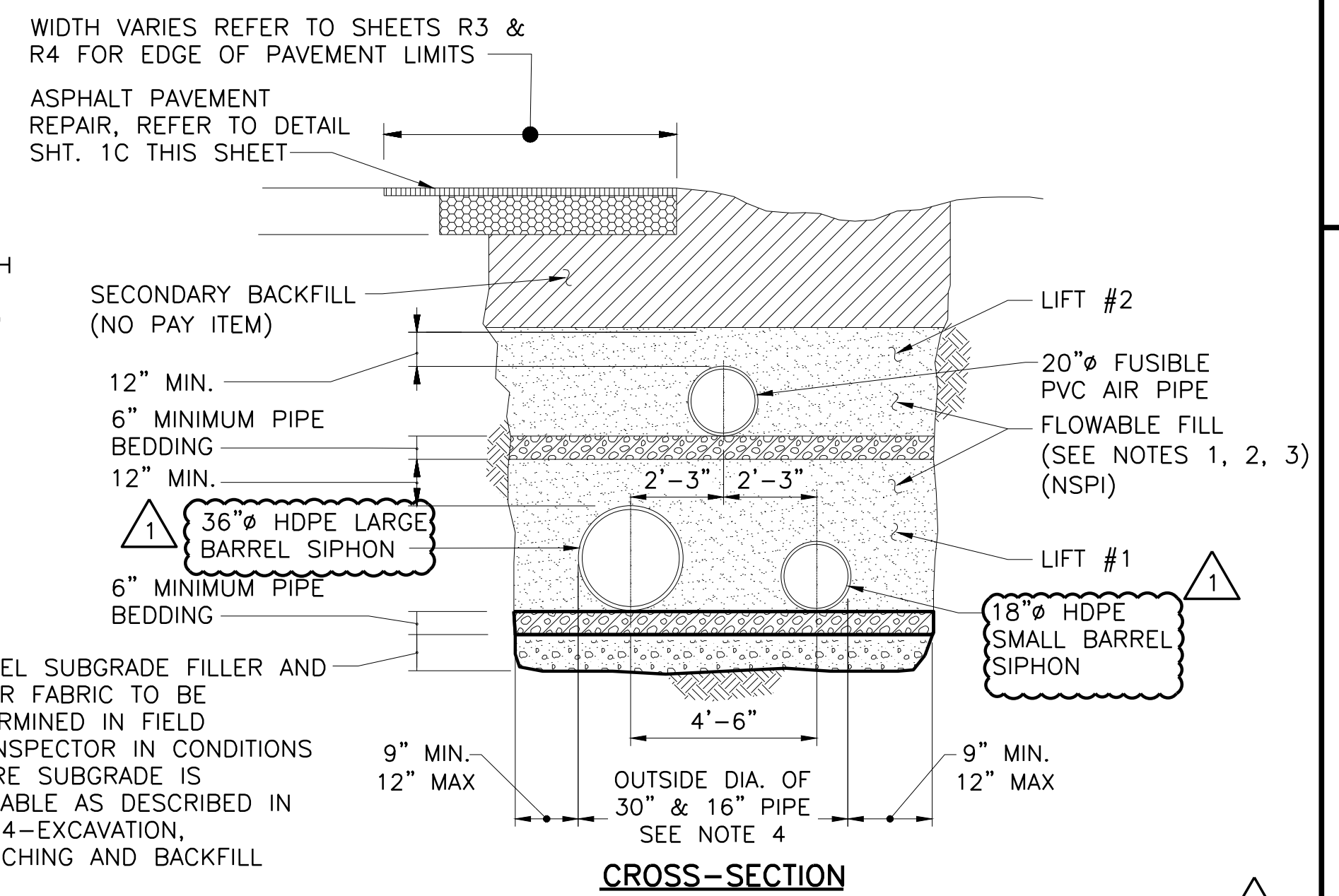
- PIPE TRENCH NOTES:**
- CONTRACTOR SHALL TAKE REQUIRED PREVENTIVE MEASURES TO HOLD PIPE IN PLACE TO PREVENT PIPE FLOATATION DURING PLACEMENT OF FLOWABLE FILL.
 - FLOWABLE FILL SHALL BE INSTALLED PER DETAIL 4/DT2.
 - INSTALL "HIGH-STRENGTH" FLOWABLE FILL PER COSA ITEM NO. 413 IN ALL ROADS AND PAVED AREAS.
 - OUTSIDE DIAMETER OF PIPE SHALL BE SEWER PIPE OR CASING PIPE AS SHOWN ON PLANS.



1B
 NOT TO SCALE
 TYPICAL PIPE TRENCH SECTION FOR DEPTH OF COVER OVER 20 FEET (SOIL SURFACE)



1D
 NOT TO SCALE
 TYPICAL PIPE TRENCH (GRAVEL SURFACE)



1E
 NOT TO SCALE
 TYPICAL PIPE TRENCH SIPHON SECTION LINE 'C' STA 235+86 TO 251+15.50

1
 NOT TO SCALE
 PIPE TRENCH DETAILS

Date: 10/22/2014
 Designed by: DTB
 Drawn by: DTI
 Checked by: BCJ
 Scale: N.T.S.
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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 TRENCHING DETAILS - 1

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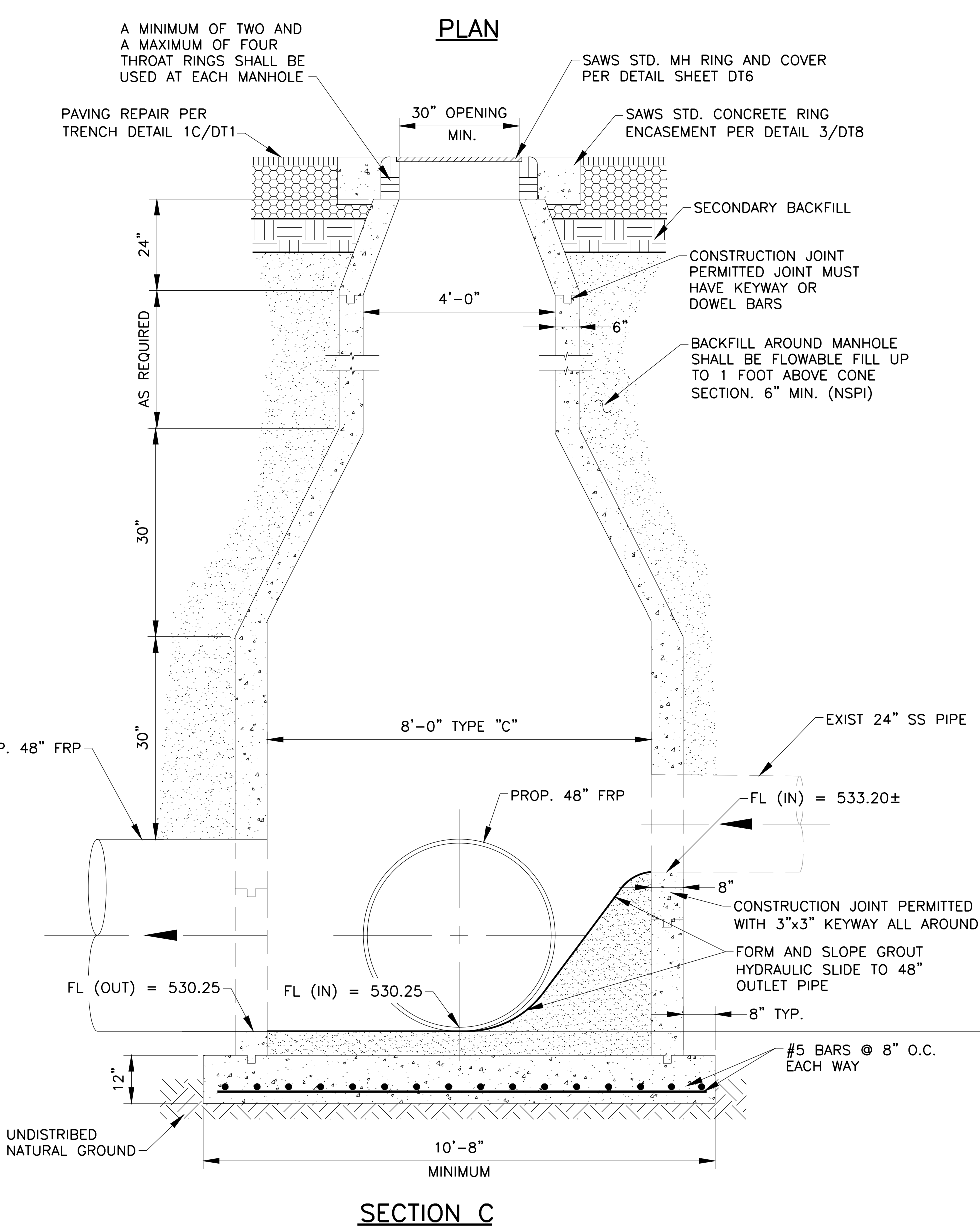
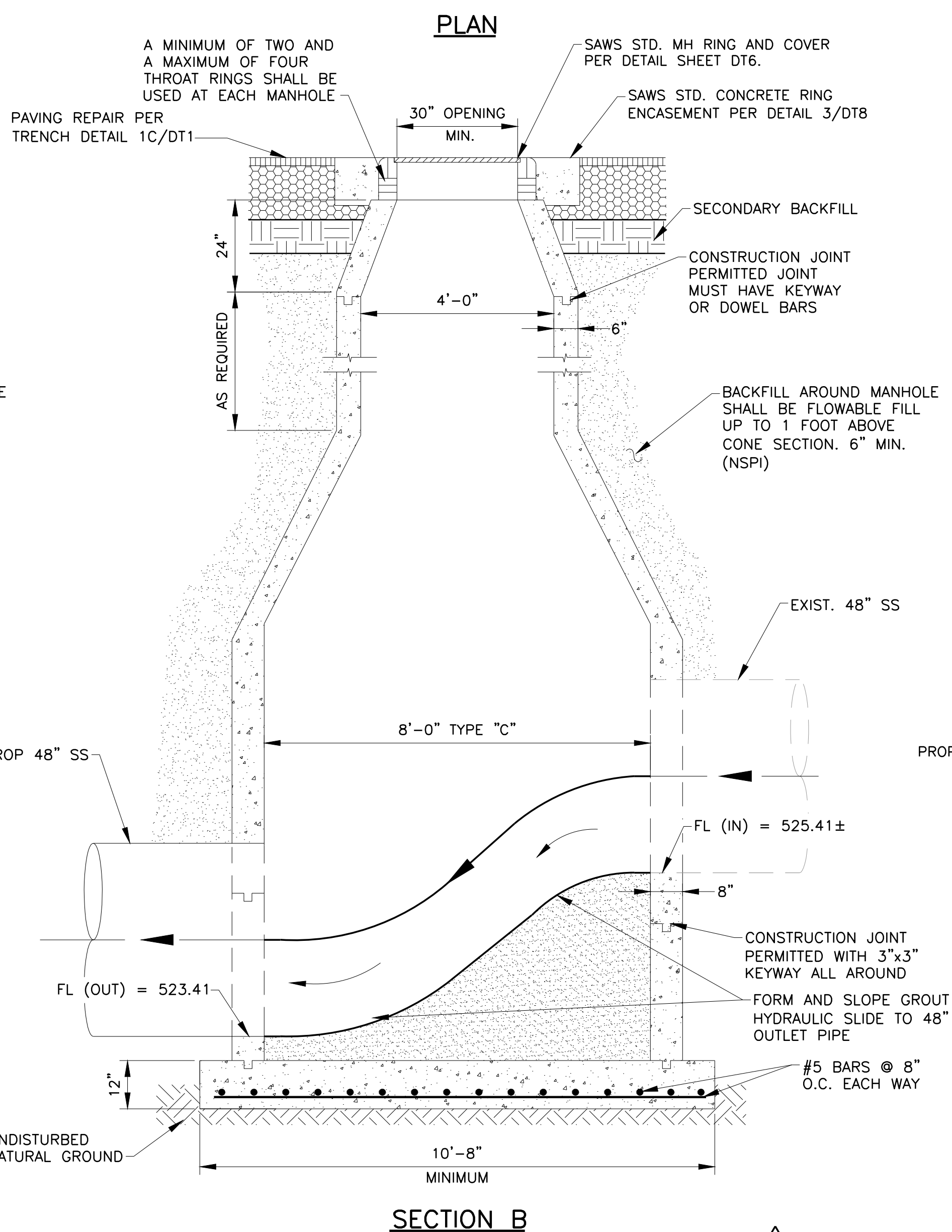
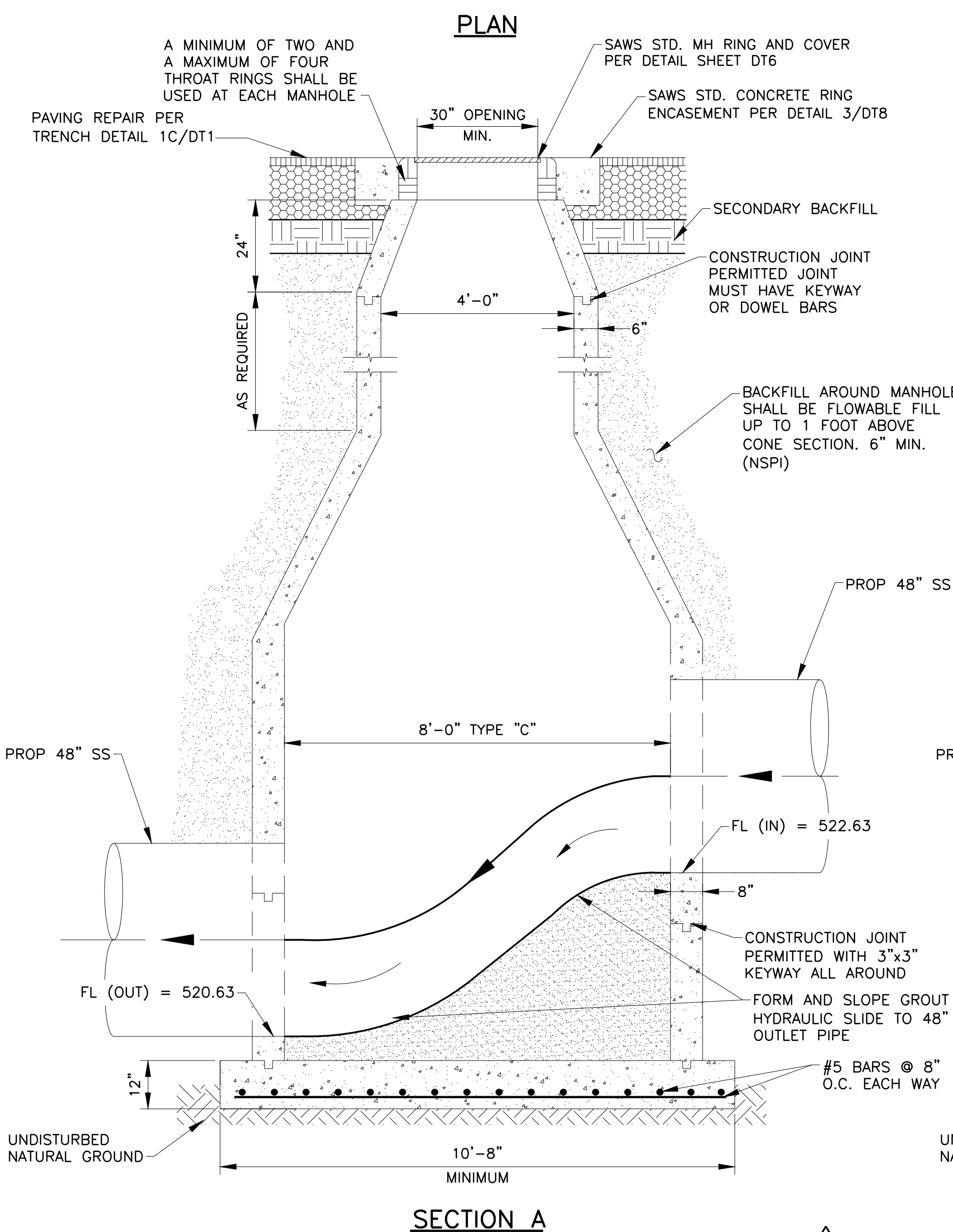
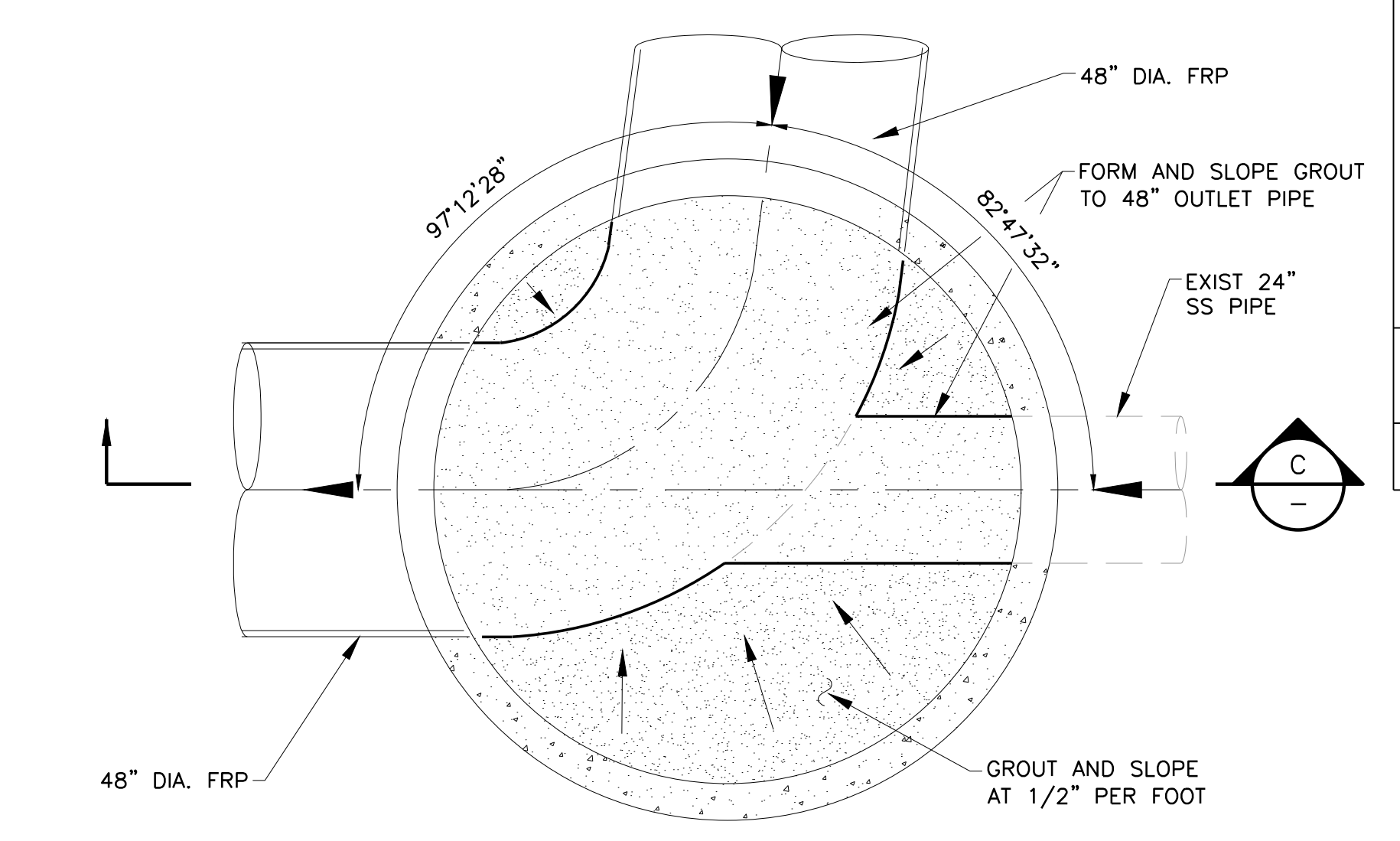
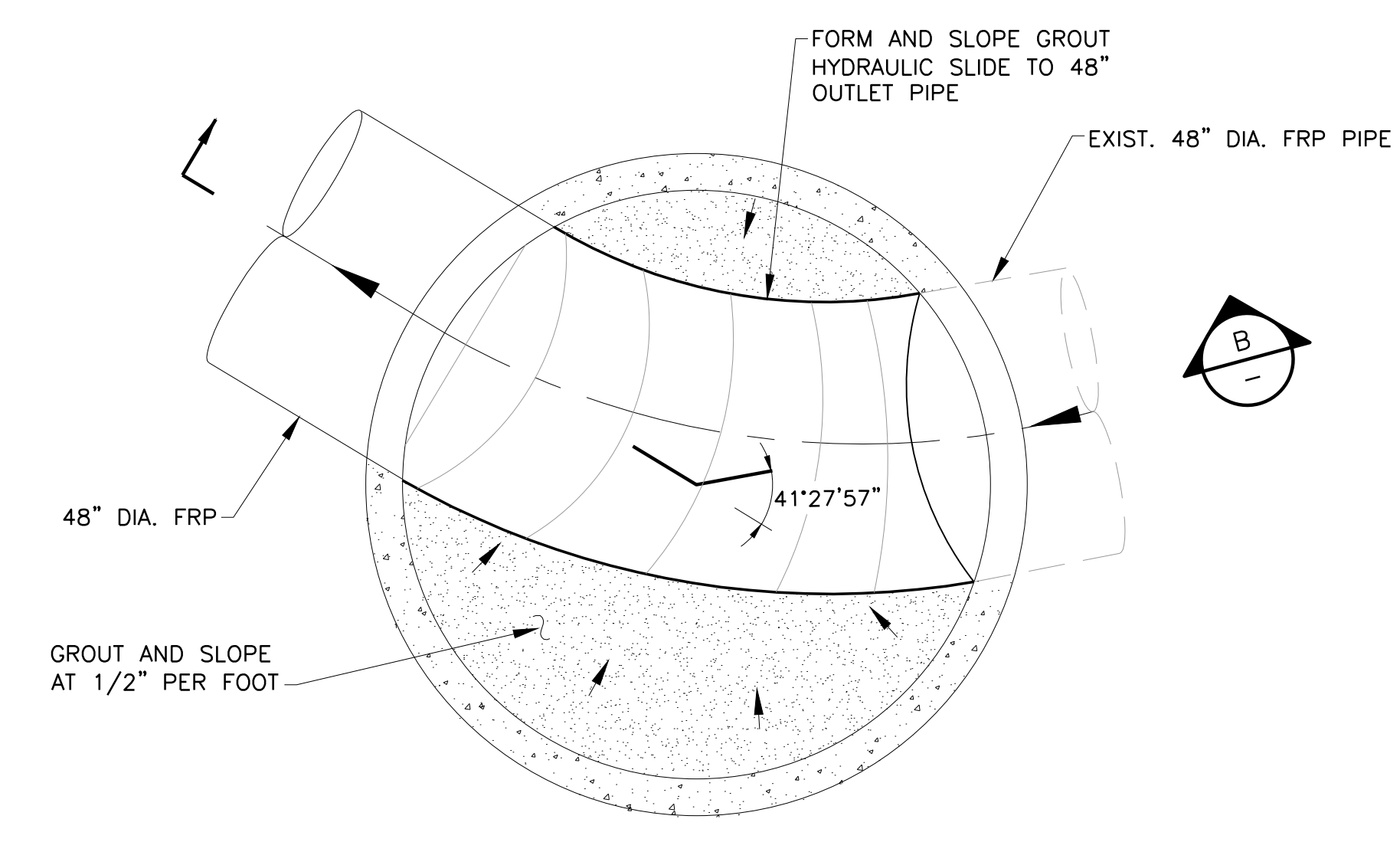
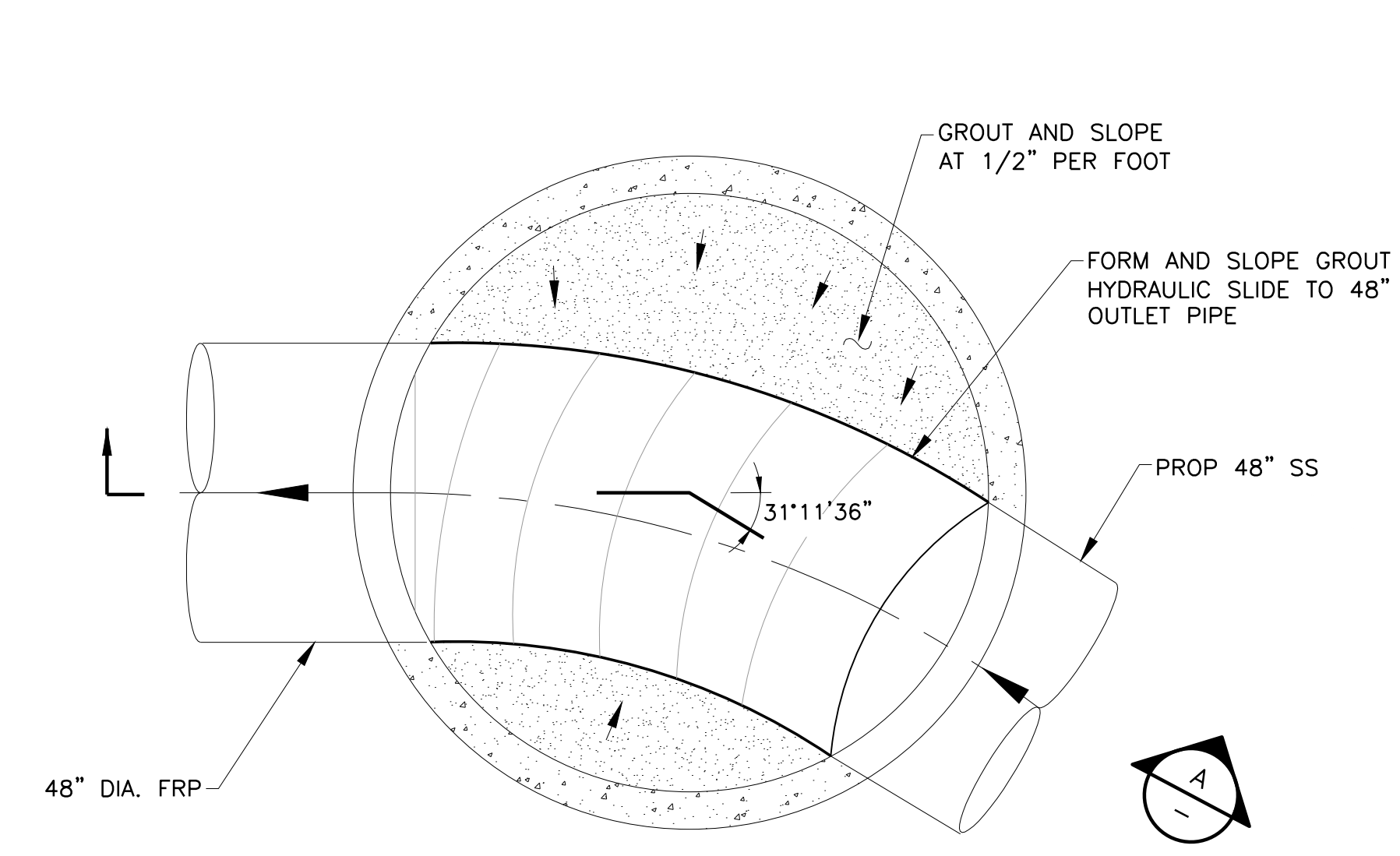
App.	DTB	Freese And Nichols, Inc.
Revisions	NO. 1	Job No. SWB11467
Date	10/22	ADDENDUM NO. 1
No.		Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144

Date: 10/21/2014
 Drawn by: DDH
 Checked by: BCT
 Scale: N.T.S.

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**SAN ANTONIO
 WATER SYSTEM**

SAWS JOB NO. 13-4510 (SS)
 SAN ANTONIO RIVER OUTFALL PIPELINE,
 PROJECT NO. 2B
 MANHOLE DETAILS - 2

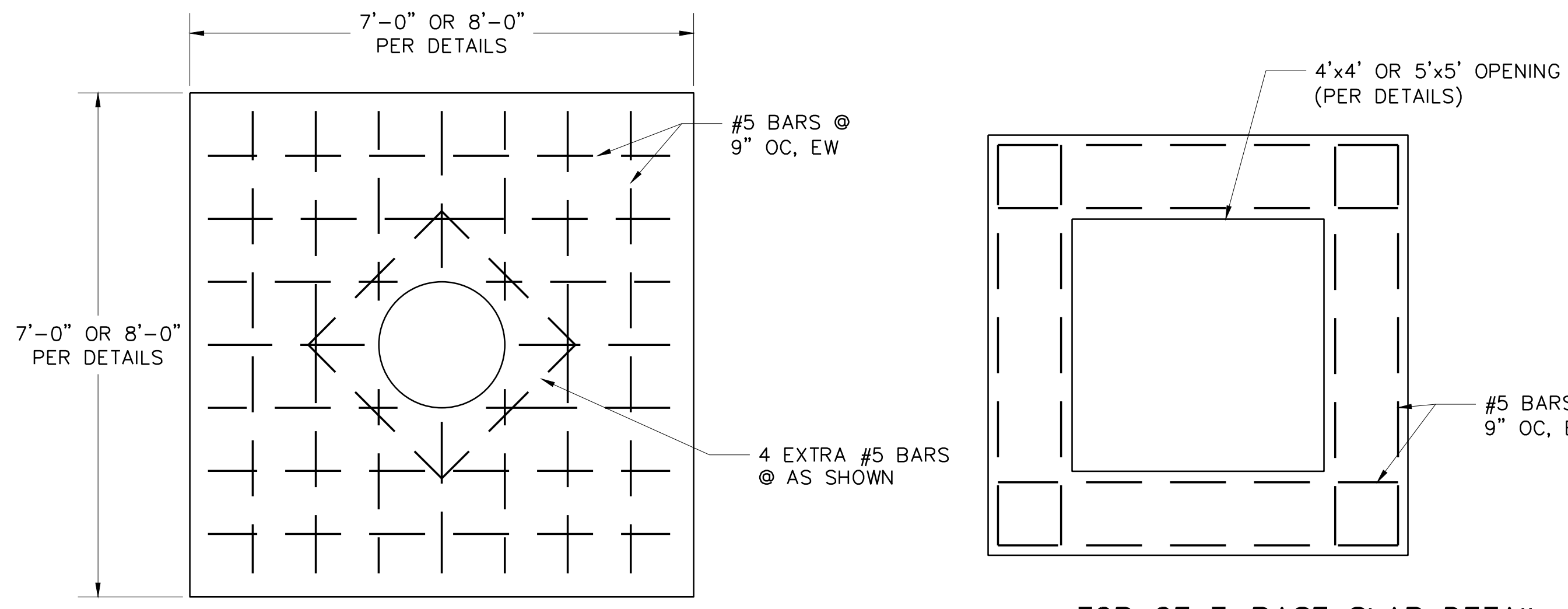


SAWS ITEM 850
 MANHOLE-3 (LINE A, STA. 94+42.69)
 SANITARY SEWER 8' STRUCTURE TYPE "C"
 NOT TO SCALE

SAWS ITEM 850
 MANHOLE-4 (LINE A, STA. 94+87.39)
 SANITARY SEWER 8' STRUCTURE TYPE "C"
 NOT TO SCALE

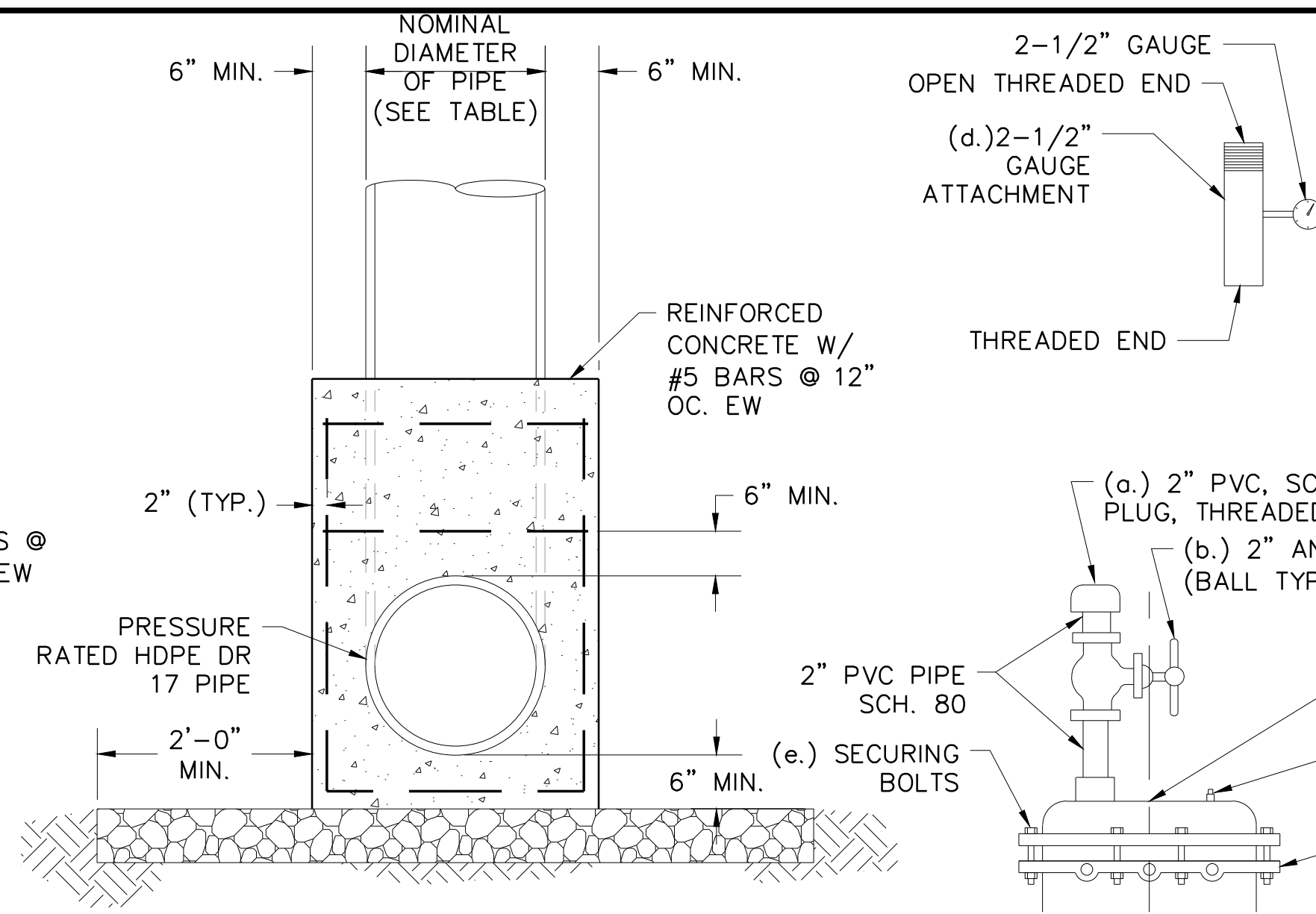
SAWS ITEM 850
 MANHOLE-5 (LINE B, STA. 100+18.65)
 SANITARY SEWER 8' STRUCTURE TYPE "C"
 NOT TO SCALE

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BOTTOM OF T-BASE SLAB DETAIL

TOP OF T-BASE SLAB DETAIL



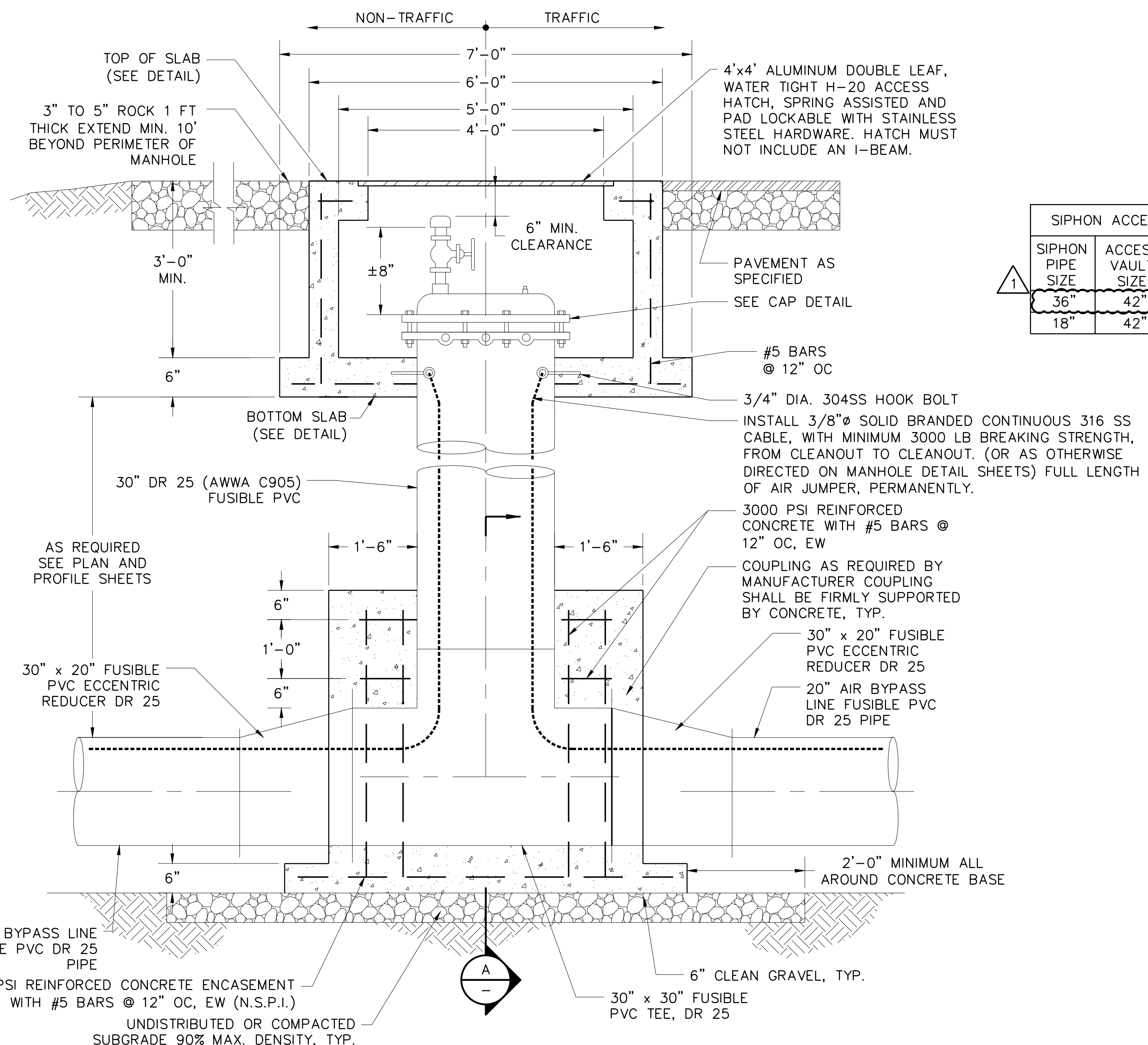
SECTION A

CAP DETAIL

- SEQUENCE OF OPERATION**
1. CLOSE THE 2" ANGLE VALVE (b.)
 2. UNTHREAD 2" PLUG (a.) AND FASTEN THE 2-1/2" GAUGE ATTACHMENT (d.)
 3. ATTACH 2" HOSE TO OPEN END OF ATTACHMENT (d.)
 4. OPEN 2" ANGLE VALVE TO DISPOSE OF EFFLUENT.
 5. WHEN GAUGE REACHES ZERO (NEGATIVE PRESSURE), CLOSE 2" ANGLE VALVE (b.)
 6. REMOVE SECURING BOLTS (e.) AND REMOVE 18" CAP.
 7. WITH CAP REMOVED DROP PORTABLE PUMP INTO PIPE AND COMPLETE THE DEWATERING OPERATIONS.

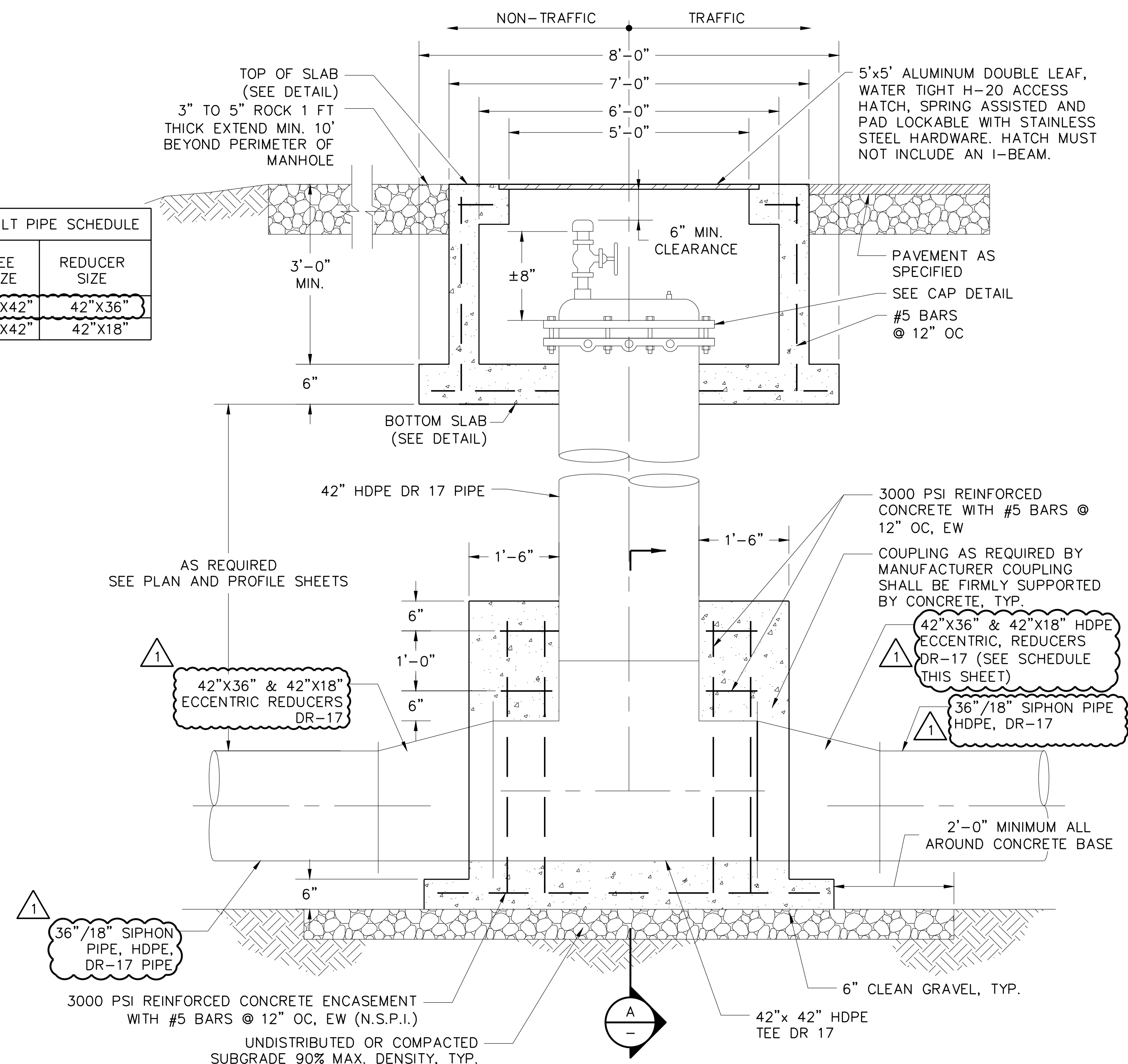
App.		DTB	Freese And Nichols, Inc. Job No.
Revisions		ADDENDUM NO. 1	SWB11467
Date	10/22		10/22/2014
No.	A		

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
101935
DAVID T. BENNETT
PROFESSIONAL ENGINEER
10-22-14



1 AIR BYPASS ACCESS VAULT
NOT TO SCALE

SIPHON ACCESS VAULT PIPE SCHEDULE			
SIPHON PIPE SIZE	ACCESS VAULT SIZE	TEE SIZE	REDUCER SIZE
36"	42"	42"x42"	42"x36"
18"	42"	42"x42"	42"x18"



2 SIPHON ACCESS VAULT
NOT TO SCALE

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Designed by: DTB
Drawn by: DDH
Checked by: BCT
Scale: N.T.S.

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-4510 (SS)
SAN ANTONIO RIVER OUTFALL PIPELINE,
PROJECT NO. 2B
MANHOLE DETAILS - 4

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