SAN ANTONIO WATER SYSTEM
E19: SEGUIN ROAD TO NACOGDOCHES ROAD
SAWS PROJECT NO. 15-4506
SOLICITATION NO. CO-00104-DW
ADDENDUM NO. 3

December 6, 2016

This addendum, applicable to work designated above, is an amendment to the proposal and specification documents and as such shall be a part of and included in the Contract. Acknowledge receipt of this addendum by entering the addendum number and issue date in the spaces provided on all submitted copies of the proposal.

1.0 Addenda Purpose

The purpose of this addendum is to issue a revision to the Contract Documents, plans and specifications for E19: Seguin Road to Nacogdoches Road (SAWS Job No. 15-4506).

2.0 Questions and Answers (Previously unanswered questions from Addendum No. 2)

Q3: Section SS 804A – Contaminated Soil and Water Control. Specification identifies potential for contaminated soil and groundwater and the requirements for testing and disposal of such. There is no information provided for locations or quantity of each. Please provide quantities of contaminated soil and water that contractor should anticipate testing and disposing or provide an allowance item to cover these costs.

Response: *Neither contaminated groundwater nor contaminated soil is expected on this project. As such, no quantities were provided. The supplementary specification was included as a guidance document in the event that either were encountered. If contaminated soil or contaminated groundwater is encountered, the Contractor may enter into negotiations with SAWS in accordance with Article VI (CONTRACT CHANGES) of the General Conditions. Paragraph 4.02 – PAYMENT of Supplementary Specification SS 804A has been revised to reflect the above. The Contractor is directed to replace SS 804A with the attached specification.*

Q7: The costs of mob/demob for microtunnel and open cut crews are dramatically different due to the complexity of the microtunnel system and its subsystems. At the pre-bid meeting, it was mentioned that contaminated material may be encountered in the microtunnel work and archeological artifacts may be found in the open cut work. Pay Item 93-Intermediate Demobilization/Remobilization does not sufficiently address the differences in the costs in the event only one form of construction requires a demob/remob. Can that pay item be split into two items, one for each form of work (open cut and microtunnel)?

Response: *Two line items have been created for demobilization/remobilization, one for use in Microtunneling applications (line item #95), and the other for use in open cut applications (line item #94). See revised bid proposal and sheet G5, attached to this addendum.*

Q8: Is there a list of all permits required, including the agencies and contacts, that SAWS will share with the bidders?

Response: *A list of required permits that are known to be needed is included with this addendum, for use by interested contractors. Please note that project permit list is provided for informational purposes only and shall include but are not limited to permits listed in attached document. Contractor is required to acquire all permits required by Ft. Sam Houston and other agencies/entities.*

Q9: There are no permits or permit applications included in the bid documents. It is likely some permits will have requirements that are more stringent than SAWS or COSA requiring more effort by the contractor (e.g. railroad flaggers). Will SAWS share any the conditions required by the agencies for obtaining all permits on this project prior to the bid?

Response: *Please see attached permit matrix for list of anticipated permits required. Permit conditions can be shared upon receipt from corresponding agencies, which may be prior to or after the bid date. Please note that project permit list is provided for informational purposes only and shall include but are not limited to permits listed in attached document. Contractor is required to acquire all permits required by Ft. Sam Houston and other agencies/entities.*

Q10: SS 02315 and SS 02345 both list ASCE Standard Design and Construction Guidelines for Microtunneling (ASCE/CI 36-14 (or later)) as part of their specifications. The most recent ASCE Standard Design and Construct Guidelines for Microtunneling (ASCE/C 36-15) contains guidelines and recommendations (not specifications) that are in opposition to best practices commonly used in Texas. Treating ASCE/CI 16-15 as a specification and not a guideline may lead to Owner's representatives not experienced with microtunneling in the project region to require methods or practices not included in the qualified microtunnel contractor's bid. Please confirm that the microtunneling work will be construction to technical specifications of SS 02345 and not ASCE guidelines?

Response: *The microtunneling work is to be completed in accordance with technical specification SS 02345. The ASCE/CI 36-15 guidelines are included as a reference only, not as specification language.*

Q11: Addendum 1, section E.3.b removed the Obstruction section of SS 02345. Does SAWS intend to make the Contractor responsible for all microtunneling costs associated with removal, repair, and recovery from any

encountered obstruction of any size or make, known or unknown? Why has SAWS changed from sharing this risk to placing it all on the contractor?

Response: *SAWS does intend for the contractor to be responsible for all work on this project. However, paragraph 3.06 OBSTRUCTIONS has been added to SS 02345. See attached revised specification, included with this addendum. Line item #91: 02345 Microtunneling – Obstruction Removal has been added to bid proposal (see attached Addendum No. 3 bid proposal).*

Q12: SS 02345-1.05 A.5 specifies the maximum and minimum overcut, potentially superseding the contractor's means and methods. If the qualified microtunnel contractor proposes an overcut outside of the limits specified, will he be able to use his means and methods, or will SAWS take responsibility for issues arising from used of the specified overcut limits?

Response: *The allowable overcut limits were developed to balance the risks of jacking forces and settlement of features above the bores. If the contractor would like to propose an overcut outside of the limits specified, clarification will be required regarding how jacking force/settlement risks will be mitigated and clarification will be required regarding how adjacent existing infrastructure will not be impacted. No additional compensation will be provided for work outside limits specified within contract documents.*

Q18: Can micro-tunneling be performed 24/7?

Response: *With written approval from Fort Sam Houston Micro-tunneling can be performed 24 hours per day and 7 days per week only with written approval from Fort Sam Houston and provided proper procedures are followed (permits, notifications, etc.). Micro-tunneling in CoSA ROW can be performed Monday through Sunday, from 5 AM to 11 PM.*

Q19: Can SAWS provide distance between (inside wire to inside wire) and height of lowest wire on each side?

Response: *CPS is currently in construction replacing the existing 138kV transmission structures with monopoles. The transmission monopoles are approximately 120 feet high from ground surface to top of pole and 11 feet horizontal offset from centerline of pole to outside wire. Within Fort Sam Houston project limits the bottom wire ranges from 31.5 feet to 44.1 feet from sag to ground surface based on CPS design drawings.*

Existing distribution poles include 55 foot poles that are set 8'-5" underground and 60 foot poles set 9' underground per design but may vary in depth based on construction conditions. Per design, for the 55 foot poles the height of wires includes 45'-7" for the top circuit, 39'-7" for the bottom circuit and 30'-2" for the neutral. Per design, for the 60 foot poles the height of wires includes 50'-7" for the top circuit, 44'-7" for the bottom circuit and

35'-2" for the neutral. These are standard design heights but may vary based on settlement of the poles and construction conditions.

For the distribution poles, OH on an 8-foot fiberglass is 44 inches between phases and for 10-foot fiberglass 56 inches between phases.

Q26: It was mentioned in the pre-bid meeting that the schedule is aggressive, and once the NTP is issued the project duration is 730 calendar days, and the year 2023 was stated. Please confirm how soon SAWS plans to award this project and expects construction to begin?

Response: *SAWS plans to award this following approval by the SAWS Board of Trustees at their meeting on Tuesday, February 7th, 2017. SAWS intends to provide Notice to Proceed (NTP) to the selected contractor as soon as possible after board approval. The Year 2023 was in regards to SAWS consent decree deadline.*

Q29: Please see Section SS 02445 page 2 of 6, Section 1.05, Design Criteria, Table 1-maximum allowable settlement values; Has systematic settlement calculations been conducted that verifies these values within table 1 are achievable based on the ground conditions, pipe size, cover and overcut? If so can this calculation be provided to the bidders?

Response: *Settlement calculations were performed to arrive at the values shown within table 1. These calculations will not be provided as part of this bid process.*

3.0 Modifications to CONTRACT DOCUMENTS

a. OPINION OF PROBABLE CONSTRUCTION COST (OPCC) – The estimated project construction cost has been revised to $43,450,710.00

b. BID PROPOSAL – DELETE the Bid Proposal in its entirety and REPLACE with the Bid Proposal provided in Addendum No. 3. Bidders must use this version when submitting a bid for this project.

1) REVISE quantity for line item 507.1/507.2 – Chain-Link Wire Fence – (4ft & 6ft High) (Remove/Install) from 807 to 702.

2) REVISE quantity for line item C69/2 – Concrete Drainage Flume Replacement (3.5ft Wide) from 1,444 to 1,429.

3) REVISE quantity for line item 550.1 – Trench Excavation Protection from 19,200 to 19,285.

4) REVISE quantity for line item 852 – Sanitary Sewer Manhole from 10 to 12.

5) REVISE quantity for line item 852 – Extra Depth Manhole (>6') from 56 to 108.

6) REVISE line item and description of line item "SP100" - "Intermediate Demobilization/Remobilization" to "SP100A" - "Intermediate Demobilization/Remobilization (Open-Cut Construction)".

7) ADD line item SP100B – Intermediate Demobilization /Remobilization (Microtunneling Construction) and INCLUDE unit of "EA" with quantity of "2".

8) ADD line item "02345 Microtunneling – Obstruction Removal" INCLUDE unit of "EA" with quantity of "1".

c. SPECIAL PROVISIONS – REMOVE SP 100 in its entirety, and REPLACE with SP100A provided in this Addendum.

d. SPECIAL PROVISIONS – ADD SP 100B in its entirety provided in this Addendum.

e. SUPPLEMENTAL CONDITIONS – ITEM – BID REQUIREMENTS Attachment A – Project Completion has been extended to 10 years (from 8 years). This version should be used when submitting a bid for this project.

- REMOVE Attachment A – Record of Performance, REPLACE with revised attached document Attachment A – Record of Performance

f. SPECIAL CONDITIONS – ADD Section 1.8 Right of Way at the end of Special Conditions as follows.

"1.8 Right-of-Way

A. Upon Request, Contractor shall add any affected landowner (e.g. a landowner whose property contains a project easement) as an additional insured on Contractor's commercial general liability policy, and shall provide to such landowner a policy endorsement reflecting such additional insured status."

g. SUPPLEMENTARY SPECIFICATION 02610 Steel Casing Pipe – Part 4 Measurement and Payment

1) REMOVE paragraph 4.01(A) Measurement and REPLACE with the following:

- "Steel casing pipe will not be measured for payment."

2) REMOVE paragraph 4.02(A)(B) Payment and REPLACE with the following:

- "No direct payment shall be made for costs associated with Steel Casing Pipe. All costs in connection with this work shall be included in the applicable price for the item to which the work pertains."

h. SUPPLEMENTARY SPECIFICATION – REMOVE Supplementary Specification SS 02345 – Microtunneling, REPLACE with revised specification SS 02345 provided in this Addendum.

i. SUPPLEMENTARY SPECIFICATION - REMOVE Supplementary Specification SS 804A – Contaminated Soil and Water Control, REPLACE with revised specification SS 804A provided in this Addendum.

j. APPENDED HERETO and part of Addendum No. 3 – List of Permits document titled "E-19: Seguin Road to Nacogdoches Road – Segment 1 Project Permits".

4.0 Modifications to PLANS FOR CONSTRUCTION

a. SHEET G21

- REVISE callout from "National Guard Building" to "Headquarters 636th Military Intelligence BN 71st Battlefield Surveillance BDE TXARNG" and in Note 1 revise "National Guard Building" to "TXARNG"

b. SHEET C7, C8, and C9

- Add Note "Contractor to coordinate with CPS regarding any potential CPS construction of replacing overhead transmission towers that may be ongoing during sewer line construction."

c. REMOVE – Sheet G3 and G4 General Notes, REPLACE with revised attached Sheet G3 and G4.

d. REMOVE – Sheet G5 Quantities, REPLACE with revised attached Sheet G5.

e. REMOVE – Sheet G20 Contractor Access and Staging (Sheet 1 of 4), REPLACE with revised attached Sheet G20.

f. REMOVE – Sheet C2, C3, C4, C5, and C6 78-inch Sanitary Sewer Plan & Profile, REPLACE with revised attached Sheet C2, C3, C4, C5, and C6.

g. REMOVE – Sheet C10, C11, C12, C13, C14, C15, C16, C17, and C19 78-inch Sanitary Sewer Plan & Profile, REPLACE with revised attached Sheet C10, C11, C12, C13, C14, C15, C16, C17, and C19.

h. REMOVE – Sheet C33 78-inch Sanitary Sewer Plan & Profile Sta. 125+00 to 129+00, REPLACE with revised attached Sheet C33.

i. REMOVE – Sheet C51, C52, C53, C54, C55, and C58 8-inch Waterline Plan, REPLACE with revised Sheet C51, C52, C53, C54, C55, and C58.

j. REMOVE – Sheet C66 16-inch Waterline Plan & Profile Sta. 12+80 to 16+80, REPLACE with revised attached Sheet C66.

k. REMOVE – Sheet C69 General Details (Sheet 2 of 5), REPLACE with revised attached Sheet C69.

l. REMOVE – Sheet C76 Sewer Details (Sheet 4 of 4), REPLACE with revised attached Sheet C76.

12/06/16
Date

Signature

Kimley-Horn and Associates, Inc.
Texas Registered Engineering Firm F-928
601 NW Loop 410, Ste. 350
San Antonio, TX 78216

Appended hereto and part of Addendum No. 3

1. CONTRACT DOCUMENTS - Special Provision SP100A Mobilization (Open-Cut Construction)
2. CONTRACT DOCUMENTS - Special Provision SP100B Mobilization (Microtunneling Construction)
3. CONTRACT DOCUMENTS - Supplementary Specification Section SS 02345 – Microtunneling
4. CONTRACT DOCUMENTS – Bid Proposal
5. CONTRACT DOCUMENTS – Attachment A: Record of Performance
6. PLANS – Sheet G3 and G4: General Notes

7. PLANS – Sheet G5: Quantities
8. PLANS – Sheet G20: Contractor Access and Staging (Sheet 1 of 4)
9. PLANS – Sheet C2, C3, C4, C5, C6, C10, C11, C12, C13, C14, C15, C16, C17, C19, and C33: 78-inch Sanitary Sewer Plan & Profile
10. PLANS – Sheet C51, C52, C53, C54, C55, and C58: 8-inch Waterline Plan
11. PLANS – Sheet C66: 16-inch Waterline Plan and Profile
12. PLANS – Sheet C69: General Details (Sheet 2 of 5)
13. PLANS – Sheet C76: Sewer Details (Sheet 4 of 4)
14. Project Permit List
15. CONTRACT DOCUMENTS – Supplementary Specification Section SS 804A – Contaminated Soil and Water Control

END OF ADDENDUM NO. 3

REVISION TO STANDARD SPECIFICATION ITEM NO. 100 (MOBILIZATION)

100.1 DESCRIPTION

ADD the following section:

1. Intermediate Demobilization and Remobilization of all associated work with open-cut construction: This item includes all the Contractor's expenses for an Owner-directed intermediate project demobilization of personnel and equipment that occurs after the contract Notice to Proceed has been given and work has commenced, and the subsequent remobilization of personnel and equipment to complete the Project. These demobilization and remobilizations shall only be authorized upon a written directive from the Owner. Work shall include furnishing all labor, materials, tools, equipment and incidentals required to demobilize and remobilize for the E-19 Seguin Road to Nacogdoches Road – Segment 1 Project, in accordance with the Contract Documents, complete in place.

100.2 MEASUREMENT
No change

100.3 PAYMENTS

ADD the following section:

7. Intermediate Demobilization and Remobilization of all associated work with open-cut construction: This bid item will only be paid if prior authorized in writing by Owner. This bid item is limited to delays outside of the Contractor's control that are not otherwise provided for in the General Conditions. Examples of these types of delays would be Owner easement acquisition, permitting issues (only those permits not controlled by the Contractor), or other Owner activities. Any other provision contained herein notwithstanding Contractor will not be entitled to compensation under this bid item for work suspended during the 10 cumulative days allowed for by the Contract in the General Conditions, Article IV, Paragraph 4.8 Suspension of Work by Owner.

All other language in specification 100 remains in full force.

END OF SECTION

REVISION TO STANDARD SPECIFICATION ITEM NO. 100 (MOBILIZATION)

100.1 DESCRIPTION

ADD the following section:

1. Intermediate Demobilization and Remobilization of all associated work with microtunneling construction: This item includes all the Contractor's expenses for an Owner-directed intermediate project demobilization of personnel and equipment that occurs after the contract Notice to Proceed has been given and work has commenced, and the subsequent remobilization of personnel and equipment to complete the Project. These demobilization and remobilizations shall only be authorized upon a written directive from the Owner. Work shall include furnishing all labor, materials, tools, equipment and incidentals required to demobilize and remobilize for the E-19 Seguin Road to Nacogdoches Road – Segment 1 Project, in accordance with the Contract Documents, complete in place.

100.2 MEASUREMENT
No change

100.3 PAYMENTS

ADD the following section:

7. Intermediate Demobilization and Remobilization of all associated work with microtunneling construction: This bid item will only be paid if prior authorized in writing by Owner. This bid item is limited to delays outside of the Contractor's control that are not otherwise provided for in the General Conditions. Examples of these types of delays would be Owner easement acquisition, permitting issues (only those permits not controlled by the Contractor), or other Owner activities. Any other provision contained herein notwithstanding Contractor will not be entitled to compensation under this bid item for work suspended during the 10 cumulative days allowed for by the Contract in the General Conditions, Article IV, Paragraph 4.8 Suspension of Work by Owner.

All other language in specification 100 remains in full force.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

A. This Section establishes the minimum requirements for installing pipe by microtunneling at locations indicated on the Drawings. Jacking pipe shall be provided in accordance with the applicable Section SS 02610 – Steel Casing Pipe. The Contractor shall furnish all labor, equipment, power, water, and materials necessary for microtunneling pipe installation and other associated Work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section SS 02242 – Water Control for Shafts and Tunnels

B. Section SS 02261 – Shaft Excavation and Support

C. Section SS 02315 – Portal Stabilization

D. Section SS 02349 – Installation of Carrier Pipe in Casing

E. Section SS 02445 – Settlement Instrumentation and Monitoring

F. Section SS 02610 – Steel Casing Pipe

G. Section SS 03360 – Contact Grouting

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. The publications listed below form a part of this Specification to the extent referenced. Where conflicts between these Specifications and the referenced specification, code, or standard occur, the more restrictive specification shall govern. The latest edition available on the date of issue of Contract Documents shall be used.

B. Safety Codes:

1. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction, 29 CFR Part 1926, Subpart S, Underground Construction, and Subpart P, Excavations.

C. Standard Specifications and Guidelines
1. San Antonio Water System 2014 Specifications for Water and Sanitary Sewer Construction (Updated April 2014).
2. ASCE Standard Design and Construction Guidelines for Microtunneling, ASCE/CI 36-14.

1.04 DEFINITIONS

A. Microtunneling: A remotely controlled, guided, pipejacking process that provides continuous support to the excavation face and uses a pressurized slurry spoil removal system. The microtunneling process does not require routine personnel entry into the tunnel. A key element of microtunneling is the ability to control the stability of the face by applying fluid and mechanical pressure to balance the earth and groundwater pressures.

B. Microtunnel Boring Machine (MTBM): Remote-controlled, guided slurry shield that can provide continuous support to the excavation face. The MTBM is operated from a control container located on the ground surface. Soil excavation is achieved by a rotating cutterwheel. Excavated soil enters a slurry chamber where it is mixed with water to form a slurry. Pumps cycle the slurry to the surface where a separation plant removes the solids from the slurry. The recycled slurry is then returned to the face in a closed system of pumps and hoses. Slurry used to convey spoil may be water; however, it may contain additives such as bentonite that allow it to carry more solids and provide gel strength to prevent the slurry from permeating the soils at the heading. The guidance system consists of a laser or theodolite and EDM device mounted in the jacking shaft communicating a reference line to a target mounted in the MTBM's articulated steering head. The target in an MTBM provides the operator with information about machine attitude and pitch, and can allow for accurate steering control.

C. Jacking Pipe: Pipe jacked behind the microtunneling machine. The jacking pipe shall be the carrier pipe or casing pipe, specifically designed to be installed by pipejacking using microtunneling equipment.

D. Carrier Pipe: Permanent pipe for operational use that is used to convey flows. Carrier pipes may be installed inside a casing pipe, or direct-jacked, if designed for direct jacking and permitted for the crossing.

E. Intermediate Jacking Station (IJS): A fabricated steel cylinder fitted with hydraulic jacks spaced around the circumference which is incorporated into the pipeline between two specially fabricated pipe sections. The function of an intermediate jacking station is to distribute the jacking load along the pipe string during pipe installation. The hydraulic jacks are removed at the completion of a drive and the gap between adjacent pipe sections is fully closed by pushing the pipes together with the main shaft jacks or another IJS. The steel cylinder remains as an extended sleeve or coupling. The steel cylinder should be protected from corrosion, consistent with corrosion protection used for the jacking pipe and joints.

F. Launch/Retrieval Seal or Entry/Exit Seal: A mechanical seal usually comprised of one or more rubber flanges attached to a steel housing that is mounted to the wall of the jacking/receiving shaft. The microtunneling machine distends the flange seal as it passes through, reducing water, slurry, or lubrication inflows into the shaft during microtunneling operations.

G. Lubrication/Grout Port: A port located within the MTBM or in the jacking pipe fitted with a one-way valve for injection of lubrication material or grout into the annular space between the jacking pipe and the ground.

H. Jacking Record: A computer-generated or manually recorded report that contains information on microtunneling operations and may include: date, time, name of operator, tunnel drive identification, installed tunnel length, rate of advance, jacking forces, cutterhead speed and torque, slurry inflow and outflow rates and pressures, bypass valve position, use of any cutting

or high-pressure nozzles, face pressure, steering jack positions, line and grade offsets, any movement of the guidance system, machine inclination and roll, intermediate jacking station use and jacking forces, pressure, volume, and location of any lubricant pumped, problems encountered with the tunneling machine or other components or equipment, and durations and reasons for delays.

I. Settlement Point: A point with elevation and spatial location established by survey prior to construction. The point is re-surveyed periodically to monitor ground movements. The point may be a nail, pin, subsurface settlement rod, borehole extensometer, or other device that can be readily located and surveyed.

J. Obstruction: Objects located wholly or partially within the cross-sectional area excavated by the microtunneling machine that prevent the forward movement of the microtunneling machine after all diligent efforts to advance past the object by the Contractor have failed.

1.05 DESIGN CRITERIA

A. Microtunneling Equipment:
1. Only pressurized, closed-face, remotely operated microtunneling equipment using slurry spoil removal, shall be used for all microtunneling Work required for this project as defined in this Section. Open-shield machines are not acceptable for this project. The microtunneling machine shall be manufactured by Akkerman, Herrenknecht, Iseki, Lovat, Wirth/Soltau, or approved equal that specializes in the design and fabrication of this type of equipment. The machine shall be capable of fully supporting the face during both excavation and shutdown periods, and shall have the capability of exerting a continuous, measurable, controllable stabilizing pressure at the face as required to prevent loss of ground and groundwater inflows. The system shall be capable of adjustment required to counterbalance the groundwater and soil pressures at the tunnel face to an accuracy of ± one foot of equivalent hydrostatic pressure (i.e., ± 62.4 psf). A pressure gage shall be provided so the operator can monitor the pressure exerted at the heading.
2. Microtunneling equipment selected for the project shall be suitable for and capable of efficiently advancing through the geologic conditions anticipated by the Contractor. The microtunneling machine shall be capable of crushing or excavating boulders or other objects up to 25% of the outside diameter of the MTBM and up to an unconfined compressive strength of 15,000 psi.
3. The machine shall have a watertight articulation joint between two segments of the shield. The shield shall be steerable in both the vertical and horizontal directions to allow the operator to maintain line and grade within the specified tolerances. The guidance system shall be designed to function at the maximum required drive length without loss of accuracy or reliability of function. A display showing the position of the machine in relation to design line-and-grade shall be provided at the control panel to allow the operator to continuously monitor line and grade deviations.
4. The cutterhead shall have a reversible drive system so that it can rotate in either direction and shall have other suitable provisions to minimize rotation or roll of the machine or pipe during installation.
5. The maximum radial overcut shall be one (1.0) inch. The minimum radial overcut shall be one-half (1/2) of one inch. The radial overcut shall be determined as the difference between the maximum diameter created by the overcut band on the machine and the outer diameter of the pipeline or casing, divided by two.

6. A lubrication injection system shall be provided and used to inject pipe lubricant around the MTBM and jacking pipe to decrease frictional resistance. Lubrication materials may include a mixture of bentonite and/or polymers and water. Lubrication ports shall be provided in the MTBM and jacking pipe to allow for lubrication along the pipe string at intervals of not more than ten (10) feet.
7. The MTBM shall be equipped with a computerized data acquisition system for collecting information for the jacking record. An on-site printer and means of providing electronic copies of the data will also be required for production of a printed daily jacking record and transfer of electronic data. As a supplement to the computerized data acquisition system, the Contractor shall also use manual data acquisition for collecting information for the jacking record.
8. Where there is a potential for flammable or noxious gases to be encountered, or if required by OSHA, the machine shall have an automatic shut-off switch and provisions for continuous gas monitoring.

B. Methods and equipment shall control surface settlement and heave above the pipeline to prevent damage to existing utilities, facilities, and improvements. Ground movements (settlement/heave) shall be limited to values that do not cause damage or distress to surface features, utilities, or improvements. The Contractor shall be responsible for any damage to existing features, improvements, or utilities, and shall repair any damage to the satisfaction of the Owner, at no additional cost to the Owner, and without schedule extension.

C. The slurry separation plant shall be designed to achieve the rates of spoil separation and slurry cleaning required for the Contractor's planned production rates. Shaker screens, hydrocyclones and centrifuges will likely be required for efficient separation of spoils. The separation plant must fit within the allowable work areas shown on the Drawings. Excavated slurry pits or ponds will not be allowed. Additionally, all excavated materials and slurry must be discharged into, and completely contained within tanks, trucks, or other containers at all times. On-site stockpiling or disposal shall not be permitted.

D. Intermediate jacking stations (IJSs) shall be fully gasketed between the interjack shell and each pipe special, with two (2) gaskets installed on each pipe. The IJS sleeve must be made of material with the same corrosion resistance as the jacking pipe joint. The exact number of IJSs and pipe specials is to be determined by the Contractor and their planned usage shall be described in the Contractor's submittal. However, for drives greater than 1,000 feet in length, a minimum of two IJSs and corresponding pipe specials shall be on site and ready for installation; for drives greater than 700 feet in length, a minimum of one (1) IJS and corresponding pipe specials shall be on site and ready for installation. The Contractor shall install and use IJSs as indicated in its accepted submittal; however, an intermediate jacking station must be used immediately if jacking forces for any segment reach or exceed 70% of the safe design capacity of the jacking pipe, IJS pipe, jacking frame, or thrust block, whichever is lowest. The Contractor may elect to use IJSs before jacking forces reach the threshold values.

E. Pipe design for jacking loads and acceptable fabrication tolerances is the responsibility of the Contractor. Maximum jacking loads applied to the jacking pipe shall not exceed fifty percent (50%) of the ultimate compressive strength of the pipe material or the maximum design strength of the pipe as established by the manufacturer, whichever is lower.

F. A thrust block shall be used to transfer jacking loads to the soil behind the jacking shaft. The thrust block face shall be constructed perpendicular to the proposed pipe alignment. The thrust block shall be designed to withstand the maximum jacking forces developed by the main jacks, without excessive deflection or displacement. Forces applied to the soil shall not exceed the allowable passive earth pressure described in Contractor's approved submittal, with a minimum factor of safety of 1.5, or the strength of the ground support system with consideration of passive soil resistance and allowable deformations of the support system and soil mass. (See also Section SS 02261 – Shaft Excavation and Support, Paragraph 1.07 Submittals.)

G. Provide launch and retrieval seals at all shaft exit and entry locations. Provide portal stabilization as required in Section SS 02315 – Portal Stabilization to prevent loss of ground and uncontrolled inflows at entry and exit seal locations.

1.06 QUALITY CONTROL

A. Failure to meet the qualification requirements is failure to fulfill the Contract and the Contractor will be required to obtain a subcontractor that meets the qualification requirements.

B. All microtunneling Work shall be performed by an experienced Contractor who has at least five (5) years of experience in performing microtunneling Work and has completed at least two (2) projects of similar diameter involving a total of 2,000 feet of microtunneling each, and one (1) additional project of similar diameter involving a total of 1,500 feet of microtunneling in the past ten (10) years. The Contractor shall have completed at least three (3) individual drives exceeding 1,000 feet in length each during the same ten (10) year time period. The Contractor shall have completed at least three (3) projects where the installed diameter was 72 inches or larger within the same ten (10) year time period. The Contractor shall submit a description of referenced projects including owner's name and contact information, project superintendent, and machine operators.

C. The project superintendent shall have at least five (5) years of experience supervising microtunneling construction. The Contractor shall submit a description of referenced projects including owner's name and contact information, project superintendent, and machine operators.

D. The microtunneling machine operator(s) shall have technical training in the operation of the proposed microtunneling equipment and shall have completed, as a primary operator, at least three (3) similar microtunneling projects of similar diameter involving a total of 1,500 feet of microtunneling each. Each operator shall have completed at least three (3) individual drives exceeding 1,000 feet in length each. Each operator shall have completed at least three (3) projects where the installed diameter was 72 inches or larger. The Contractor shall submit a description of referenced projects including owner's name and contact information, project superintendent, and machine operators.

E. The site safety representative and personnel responsible for air quality monitoring shall be experienced in tunnel construction and shall have current certification by OSHA.

F. The Contractor shall use a surveyor who shall be responsible for line-and-grade control. The surveyor responsible for line-and-grade control shall be a Licensed Surveyor registered in the State of Texas who has prior experience on trenchless projects.

G. The Contractor shall provide at least 72 hours advance written notice to Owner of the planned launch of the MTBM.

H. All Work by the Contractor shall be done in the presence of the Owner unless the Owner grants prior written approval to perform such Work in Owner's absence.

I. The Contractor shall immediately notify the Owner, in writing, when any problems are encountered with equipment or materials, or if the Contractor believes the conditions encountered are materially and significantly different than those indicated by the Contract Documents.

J. The Contractor shall allow access to the Owner and shall furnish necessary assistance and cooperation to aid the Owner in observations, measurements, data and sample collection, including, but not limited to the following:
   1. The Owner shall have reasonable access to the operator control container prior to, during, and following all microtunneling operations. This shall include, but not be limited to, providing visual access to real-time operator control screens, gauges, and indicators.
   2. The Owner shall have reasonable access to the jacking and reception shafts prior to, during, and following all jacking operations. This shall include, but not be limited to, visual inspection of installed pipes, launch and retrieval seals, and verification of line and grade. The Contractor shall provide safe access in accordance with all safety regulations.
   3. The Owner shall have reasonable access to the slurry separation plant prior to, during, and following all microtunneling operations. This shall include, but not be limited to, reasonable access to shaker screens, hydrocyclones, conveyor belts, centrifuge equipment, and slurry and spoil holding tanks. The Owner shall be allowed to collect soil samples from the shaker screens and/or spoil holding tanks on the slurry separation plant a minimum of once per installed pipe section, or every ten (10) feet, whichever is more often, and at any time when soil conditions change or debris or foreign objects are apparent or suspected.
   4. The Owner shall have reasonable access to the bentonite lubrication plant prior to, during, and following all jacking operations. This shall include, but not be limited to, reasonable access to visually inspect storage and mixing tanks, lubricant pressures and pumping rates, and amount and type of lubricants on site.

1.07 SUBMITTALS

A. Submittals shall be in accordance with San Antonio Water System's General Conditions.

B. Submittals shall be made in accordance with these Specifications. Provide sufficient detail to allow the Owner to judge whether the proposed equipment, materials, and procedures will meet the Contract requirements. All drawings shall be legible with dimensions accurately shown and clearly marked in English. Poor quality drawings and photographs will not be accepted. Review and acceptance of the Contractor's submittals by the Owner shall not be construed in any way as relieving the Contractor of it responsibilities under the Contract.

C. The Contractor shall prepare and submit to the Owner, the following:
   1. Qualifications: Submit the name of the Contractor that will perform the microtunneling Work and written documentation summarizing the qualifications of the firm, description of reference projects including owner's name and contact information, project superintendent,

machine operators, and site safety representative. Submit personnel qualifications in accordance with Paragraphs 1.06 B through F. Provide qualifications and training records for site safety representative, personnel responsible for air quality monitoring, and licensed surveyor.

2. Microtunneling Equipment: Submit the following describing the microtunneling equipment and construction methods to be employed:
   a. A detailed description of the equipment to be used for each microtunnel drive.
   b. Manufacturer's literature describing the microtunneling system(s) including the machine(s) and all ancillary equipment. Provide descriptions of projects on which this system has been successfully used including names, addresses, and telephone numbers of owner's representatives for these projects as well as length, diameter, and pipe material used. Include the following information concerning the MTBM:
      1) Dimensions and weights
      2) Torque, rotation speed range, and no-load or "dry" torque reading
      3) Cutter types, number, configuration, and gauge cutter setting for overcut, (include photographs or drawings)
      4) Articulation and steering capability
      5) Cutterhead jets/ports
      6) Face/excavation chamber pressure gauge locations and types

   c. The excavation diameter based upon the outermost dimensions of the shield. Also provide the radial overcut which shall be determined as the difference between the maximum shield/overcut band diameter and the outer diameter of the jacking pipe, divided by two.
   d. A description of the alignment control systems including manufacturer's literature and drawings showing setup, support provisions, and other details for the laser, theodolite, and water level system. Submit a description of surveying methods used to set the guidance system positions and a description of procedures to check and reset or realign guidance system during construction. Submit a description of methods to ensure that thrust block, exit and entry seals, and jacking frame are installed on proper line and grade. Submit results of line and grade survey to ensure that the thrust block, jacking frame, guide rails, entry seal, and exit seals are installed properly prior to launch of each drive. Confirm that these systems can achieve the required pipeline line and grade within the specified tolerances.
   e. Capacity, number, and arrangement of main jacks including details of the thrust ring, thrust block, jacking frame, pressure gauges, and jack calibration data (pressure vs. force relationship for each stage of the jacks).
   f. Details of intermediate jacking stations, including material of IJS sleeve, number of hydraulic cylinders per IJS, thrust capacity, quantity to be used, and anticipated placement within the pipe string,
   g. Submit drawings and details of microtunneling entry and exit seals in the shafts including materials, dimensions, arrangement, and installation procedures.
   h. Details of pipe lubrication injection system and pipe lubricants to be used during microtunneling, including manufacturer's literature. Include a description of proposed lubrication procedures during jacking, including estimated volumes of lubricant that will be pumped. Confirm that sufficient volume of lubricant will be pumped at all times to completely fill the annular space outside the jacking pipe.
   i. Details of spoil and slurry handling, separation, transport, and disposal equipment and procedures including details of slurry additives, slurry separation plant, and the

location of slurry and spoil disposal sites. Confirm that slurry and spoils shall be contained at all times and shall not be stockpiled or dumped on site or allowed to spill and collect around slurry separation plant. Provide manufacturer's description for slurry additives.

j. Ventilation and air quality monitoring system, including monitors for MTBM deactivation and alarm activation.

3. Work Area Layout Drawings: The Contractor shall submit shaft layout drawings detailing dimensions and locations of all equipment, including overall work area boundaries. Shaft layout drawings will be required for jacking and receiving shaft locations and shall be to scale, or show correct dimensions. The Contractor's layout drawings shall show that all equipment and operations shall be completely contained within the allowable construction zones shown on the Drawings.
4. Submit details on the methods to be used to protect existing utilities from damage that may result from microtunneling operations. Specific plans shall be submitted for locating, monitoring, and protecting in place each existing utility crossed with less than eight (8) feet of clearance between the casing pipe crown and the existing utility invert. Protection methods may include exposure and direct monitoring, ground improvement, and/or direct support from the ground surface, in addition to the best practices of filling the annular space with lubricant during jacking. followed by contact grouting immediately after pipejacking is complete.
5. Schedule: Provide a schedule for all microtunneling Work, identifying all major construction activities as independent items. The schedule shall include, as a minimum, the following activities: mobilization, groundwater control at jacking and receiving shafts, shaft excavation and support, working slab construction, thrust wall construction, jacking equipment setup, ground stabilization, entry ring installation for launch of machine, microtunneling, retrieval of the MTBM, removal of shaft supports and shaft backfill, site restoration, cleanup, and demobilization. The schedule shall also include the work hours and workdays for each activity. The schedule shall be updated and resubmitted by the Contractor every two (2) weeks, or more frequently if requested by the Owner.
6. Daily Records: The following daily records shall be submitted to the onsite Owner's representative by noon on the day following the shift for which the data or records were taken.
   a. Jacking Records: The Contractor shall provide complete jacking records to the Owner. These records shall include, at a minimum: date, time, name of operator, tunnel drive identification, installed pipe number and corresponding tunnel length, rate of advance, jacking forces, cutterhead speed and torque, slurry flow rates and pressures, bypass valve position, use of any cutting or high-pressure nozzles, face pressure, steering jack positions, line and grade offsets, any movement of the guidance system, machine inclination and roll, intermediate jacking station use and jacking forces, problems encountered with the tunneling machine or other components or equipment, and durations and reasons for delays. Computer-recorded data should be referenced to time and distance and should be recorded at time intervals of one minute or less. Manually recorded observations should be made at intervals of not less than three times per pipe, whenever conditions change, and as directed by the Owner. At least seven (7) days prior to the launch of the machine, the Contractor shall submit samples of the automated and manual jacking records. Samples shall include electronic data and any necessary programs to interpret data, and the manual logs or records to be used.

b. Lubrication Records: The Contractor shall provide lubrication records to the Owner. These records shall include the injection locations along the pipe string, lubrication type and additives, and amount, in gallons, of lubricant pumped throughout a drive.
c. Slurry Additives: The Contractor shall provide records of all slurry additives including any bentonite and polymers. The time and volume, or weight, of the additive shall be noted. Measurements of mud weights, specific gravity, and viscosity shall be made at the beginning, middle, and end of each shift, and submitted with the daily logs. Measurements shall be made on slurry samples taken from the slurry tanks and noted accordingly.

7. Calculations: Calculations shall be submitted in a neat, legible format. Assumptions used in calculations shall be clearly stated and shall be consistent with anticipated ground conditions. All calculations shall be prepared by or under the direct supervision of a Professional Engineer licensed in State of Texas, who shall stamp and sign calculations.
   a. Design calculations demonstrating that the proposed jacking pipe is capable of supporting the maximum stresses to be imposed during jacking. The calculations shall take into account earth and hydrostatic loads, jacking forces, external loads such as live loads due to traffic, and any other loads that may be reasonably anticipated during jacking and during the service life of the pipe. All loads shall be shown and described. Include assumed maximum drive length.
   b. Provide an estimate of the maximum jacking force expected to complete each drive, accounting for both face pressures and frictional resistance along the pipe string.
   c. Calculations demonstrating that the soils behind the thrust block can transfer the maximum planned jacking forces exerted by the main jacks to the ground during pipe installation with a factor of safety of at least 1.5, without excessive deflection or displacement. (See also Section 02261 – Shaft Excavation and Support, Paragraph 1.06 Submittals.) The thrust block capacity submittal shall be coordinated between the General Contractor and microtunneling subcontractor.
8. Intermediate Jacking Stations: Drawings and design details for intermediate jacking stations including dimensions, shell materials, seals, proposed spacing, method of operation, number of stations, method of abandonment, and final seal configuration.
9. Contingency Plans: The following list includes problem scenarios that may be encountered during the microtunneling operations. The Contractor shall submit contingency plans for dealing with each problem scenario while satisfying the specifications. These plans shall include the observations and measurements required to clearly identify the cause of the problems.
   a. Machine unable to advance:
      1) Possible obstructions (including boulders, old foundations, well & pipe casing, metallic debris, or reinforced concrete).
      2) Insufficient jacking capacity.
      3) Machine or component malfunction.
   b. Slurry separation problems:
      1) Cuttings are not adequately separated using the slurry separation plant.
      2) Cuttings settle out in the slurry lines before reaching the separation plant.
   c. Strong hydrocarbon smell is detected in the slurry returns, MTBM, tunnel, or in the shaft. Combustible gas meters at MTBM or in tunnel exceed 10% of LEL for methane or possible volatile organic compounds.
   d. Laser distorted by heat, humidity, or physical disturbance.
   e. Jacking Forces:
      1) Jacking forces increase dramatically or suddenly.

2) Jacking forces reach design capacity of pipe, jacking frame, or thrust wall (treat these scenarios as separate incidents).

f. Settlement and Subsidence:
   1) Survey measurements indicate deformations exceed allowable limits established in Section 02445 – Settlement Monitoring.
   2) Excavated volumes significantly exceed pipe volume installed.
   3) Slurry face pressures and/or torque on head decrease suddenly and significantly.

g. Groundwater inflows to shaft increase significantly and/or transport fines into shaft in measurable quantities.

h. Steering or guidance/tracking system difficulties result in line and grade tolerances being exceeded.

i. Pipe has been damaged or has been found to be out of compliance with specifications:
   1) Before installation.
   2) During, or after installation.

j. Thrust block deforms excessively under jacking loads, or provides insufficient capacity to advance pipe.

k. Control signal is lost. Cannot monitor position, torque, thrust, steering jack position, or other performance parameters

l. Excessive pipe separation at joints or pipe string movement into shaft is experienced when jacks are retracted.

10. Safety Plan: A Safety Plan for the microtunneling operations including air monitoring equipment and procedures, and provisions for lighting, ventilation, and electrical system safeguards.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Steel Casing Pipe to be installed by microtunneling shall conform to Section SS 02610 – Steel Casing Pipe.

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. Microtunneling shall not begin until the following tasks have been completed:
   1. Contractor has requested locates from all utility owners, in accordance with State One-call Laws, and all requested utility locates have been made, or area marked clear.
   2. Contractor shall conduct visual site inspection and records search of as-builts to investigate potential unmarked, mismarked, and abandoned utilities.
   3. Contractor shall confirm locates of all marked and discovered utilities, using vacuum potholing or other soft dig techniques for all crossing utilities and all adjacent utilities within the tolerance zone defined by State One-Call Laws.
   4. Contractor has implemented appropriate measures to monitor and protect exiting utilities and sensitive features.
   5. All required submittals have been provided, reviewed, and accepted.
   6. Jacking shaft and receiving shaft excavations and support systems for each drive have been completed in accordance with approved submittals. Elevations of working slab surfaces

have been surveyed to confirm that Work can be completed in accordance with alignment and grade shown on Drawings.

7. The Contractor has stabilized the soils at entry and exit locations as required. The Contractor has confirmed that the ground has been stabilized to the extent that ground will remain stable without movement of soil or water while the entry/exit location shoring is removed and while the machine is being launched or received into a shaft or during jacking operations. The progressive steps identified in Section SS 02315 – Portal Stabilization shall be used to confirm suitable improvements for all shaft types and entry/exit locations.
8. All settlement monitoring instruments have been installed, surveyed, and baseline survey measurements have been provided to and accepted by the Owner.
9. The location, orientation and grade of the jacking frame or guide rails and entry/exit seals have been surveyed to ensure they are on the proper line and grade and to verify that they are properly supported. Special care shall be taken when setting the guide rails or jacking frame in the jacking shaft to ensure stability and accuracy of the alignment and grade.
10. Guide rails or jacking frame shall be securely attached to the shaft supports and concrete working slab to prevent movement or shifting during the Work.
11. A start-up inspection of all mechanical and hydraulic systems associated with the microtunneling operations has been completed. The system shall be tested on the surface to ensure that the microtunneling machine and supporting equipment are functioning properly. The Owner shall be notified at least 72 hours prior to the start-up inspection and a site inspector representing the Owner will be present during the start-up inspection. Key machine performance data will be measured and recorded by the Contractor during this inspection, including no-load cutterhead rotational torque, functionality of main and steering jacks, laser/theodolite/water level, and target, and other components. The records of the start-up inspection will be submitted to the Owner within 24 hours of the completed inspection.
12. Site safety representative has prepared a code of safe practices and an emergency plan in accordance with the Safety Plan. Provide the Owner with a copy of each prior to starting microtunneling. Hold safety meetings and provide safety instruction for new employees. Conduct a pre-construction safety conference. Arrange this conference and inform the Owner of the time and place of the conference at least seven (7) days in advance.

B. The Contractor shall properly manage and dispose of groundwater inflows to the shafts in accordance with all permit conditions. The Contractor shall not discharge groundwater inflows into storm sewers, sanitary sewers, water bodies, or streets without proper permits/approvals.

C. The Contractor shall furnish all necessary equipment, power, water, and utilities for pipejacking, pipe lubricant mixing and pumping, spoil removal and disposal, grouting, and other associated work required for the Contractor’s methods of construction.

D. Conduct all operations such that trucks and other vehicles do not interfere with traffic or create a mud, dust, or noise nuisance in the streets and to adjacent properties. Promptly clean up, remove, and dispose of mud, spoils and slurry spillage, and any slurry discharges.

E. All Work shall be done so as not to disturb roadways, adjacent structures, landscaped areas, or existing utilities. Any damage shall be immediately repaired to original or better condition and to the satisfaction of Owner at no additional cost to the Owner.

F. Whenever there is a condition that is likely to endanger the stability of the excavation or adjacent structures, the Contractor shall operate with a full crew 24 hours a day, including weekends and holidays, without interruption, until those conditions no longer jeopardize stability.

3.02 JACKING OPERATIONS

A. Provide a suitable jacking frame and thrust block to carry out the Work. Provide, install, and operate intermediate jacking stations as necessary to complete the microtunneling drives indicated on the Drawings and in accordance with design criteria.

B. The Contractor shall install and use IJSs if jacking forces for any segment reach or exceed 70% of the safe design capacity of the jacking pipe, IJS pipe, jacking frame, or thrust block, whichever is lowest. The Contractor may elect to use IJSs before jacking forces reach the threshold values.

C. Transport the jacking pipe from storage to the jacking shaft without damage. Transport methods shall be acceptable to pipe manufacturer. Damaged jacking pipe shall not be used in the Work, unless permitted in writing by the Owner. Set the pipe to be jacked on properly braced and supported guide rails or jacking frame.

D. The axial forces from the thrust jacks shall be distributed to the jacking pipe uniformly through a thrust ring to prevent damage to the ends of the pipe. Jacking forces applied to the pipe shall not exceed the specified allowable compressive stresses stated in Paragraph 1.05 E of this Specification.

E. Jacking pipe sections shall be jacked into position following the design line and grade without damaging the pipe. In the event a section of pipe is damaged during the jacking operation, the Contractor, with written approval from the Owner, shall make temporary repairs to the pipe and shall jack the pipe through to the next shaft for removal. Other methods of repairing the damaged pipe may be used if approved in writing by the Owner.

3.03 MICROTUNNELING

A. Microtunneling shall be completed in accordance with approved submittals, and all applicable permit conditions.

B. Microtunneling operations shall control surface settlement and heave above the pipeline to prevent damage to existing utilities, facilities, and improvements. The Contractor shall repair any damage resulting from construction activities, at no additional cost to Owner and without extension of schedule for completion. The Contractor shall grout any voids caused by or encountered during the shaft construction or microtunneling, as specified in Section 03360 – Contact Grouting. The Contractor shall modify equipment and procedures as required to avoid recurrence of excessive settlements, heave, or damage.

C. Provide a lubrication system, and inject pipe lubricants through injection ports at the rear of the microtunneling machine and ports in the jacking pipe, to minimize pipe friction. Pipe lubricants shall be injected continuously as the pipe is advanced and in sufficient volume to completely fill the calculated annulus volume.

D. Pressure shall be applied at the tunnel face to maintain face stability and shall be monitored continuously. Face pressure shall be maintained between the combination of calculated active and passive earth pressure and groundwater pressure.

E. The microtunneling machine shall be operated to restrict the excavation of the materials to a volume equal to the MTBM and pipe jacked, to prevent loss of ground and settlement or possible damage to overlying structures. Control the advance rate and monitor the volume of material excavated and adjust advance rate, as required, to avoid loss of ground, over-excavation, or surface heave.

F. Control slurry pressure and avoid excessive pumping pressures to prevent the discharge of slurry at the ground surface or into any water body. Contain and clean up any slurry discharges immediately. Wash any paved areas with water to avoid the tracking of slurry away from the discharge area.

G. Completely contain, transport, and dispose of all excavated materials, waste slurry, and drilling fluids away from the construction site. All spoils and slurry must be contained in trucks, tanks, or other containers at all times. Dumping of spoil or slurry on the ground, discharge into sewers, or discharge into the shafts is not permitted. Slurry shall be pumped into tanker trucks and disposed of at acceptable facilities in accordance with current State regulations for disposal of these materials. Only use the disposal sites identified in approved submittals for muck and slurry disposal.

3.04 CONTROL OF LINE AND GRADE

A. The Contractor shall verify survey benchmarks prior to the start of construction, and shall confirm positions or report any errors or discrepancies in writing to the Owner.

B. After confirming all established benchmarks, use these benchmarks to furnish and maintain all reference lines and grades for microtunneling. The Contractor shall use these lines and grades to establish the exact location of the MTBM as it is being advanced using a laser and/or theodolite guidance system and water level. Submit to Owner copies of field notes used to establish all lines and grades and allow Owner to check guidance system setup prior to beginning each microtunneling drive. Provide access for Owner to perform survey checks of guidance system and line-and-grade of jacking pipe on a daily basis during microtunneling operations. The Contractor is fully responsible for the accuracy of the Work and the correction of it, as required.

C. The jacking pipe shall be installed in accordance with the following tolerances:
   1. Variations from design line: +/- Three (3) inch maximum.
   2. Variations from design grade: +/- Two (2) inch maximum.

D. The machine shall be steered to maintain line and grade within the tolerances specified,by continuously monitoring and adjusting line, grade, machine inclination, roll, and steering attitude during the operation. If the installation deviates from line or grade, make the necessary corrections, and return to the design alignment and grade at a rate of not more than one inch (1) per twenty-five (25) feet.

E. The guidance system shall be mounted independently from the thrust block and jacking frame to maintain alignment if there is movement of equipment during jacking. Stop microtunneling operations and reset guidance system if its alignment shifts or is moved off design alignment and grade for any reason. Check guidance system setup at least once per shift. Guidance system should only be reset by experienced, competent surveying personnel in accordance with approved procedures outlined in the submittals.

F. Monitor line and grade continuously during microtunneling operations. Record deviation with respect to design line and grade at least once per foot and submit records to Owner. Control line and grade of the jacking pipe to within the specified tolerances.

G. If the pipe installation does not meet the specified tolerance, the Contractor shall correct the installation including any necessary redesign of the pipeline or structures and acquisition of necessary easements. All corrective work shall be performed by the Contractor at no additional cost to the Owner and without schedule extension, and is subject to the written approval of the Owner.

3.05 SAFETY

A. The Contractor is responsible for safety on the job site. Methods of construction shall be such as to ensure the safety of the Work, Contractor's and other employees on site, and the public. Perform all work in accordance with all current applicable regulations and safety requirements of the Federal, State, and local agencies. Comply with all applicable provisions of 29 CFR Part 1926, Subpart S, Underground Construction and Subpart P, Excavations, by OSHA. In the event of conflict, comply with the more stringent requirements.

B. No gasoline powered equipment shall be permitted in jacking and receiving shafts. Diesel, electrical, hydraulic, and air powered equipment is acceptable, subject to applicable local, State, and Federal regulations.

C. Furnish and operate a temporary ventilation system in accordance with applicable safety requirements when personnel are in the shaft or in the pipe. Perform all required air and gas monitoring. Ventilation system shall provide a sufficient supply of fresh air and maintain an atmosphere free of toxic or flammable gasses in all underground work areas.

3.06 OBSTRUCTIONS

A. If the microtunneling operations should encounter an object or condition that impedes the forward progress of the machine along the design alignment within the specified horizontal and vertical tolerances, the Contractor shall notify the Owner immediately. The Contractor shall submit a plan to correct the condition, and remove, clear, or otherwise make it possible for the microtunneling machine and jacked pipe to advance past any and all objects or obstructions that impede forward progress of the machine along the design alignment within the specified horizontal and vertical tolerances. Upon written notification of the Owner, the Contractor shall immediately proceed with removal of the object or obstruction by means of an obstruction removal shaft or by other approved methods, as submitted by the Contractor. An obstruction removal shaft shall consist of a small excavation for the purpose of removing the obstruction. The Contractor will receive compensation for removal of obstructions, as defined as metallic debris, reinforced concrete, whole trees,

rocks and other hard objects larger than 25% of the outer diameter of the shield or cutter head, which cannot be broken up by the cutting tools with diligent effort, and that are partially or wholly within the cross-sectional area of the bore. It shall be the responsibility of the contractor to provide clear evidence that the obstruction is of the variety that warrants compensation. Compensation will be on a per each basis, and will include all activities incidental to the obstruction removal. For this project, compensation will be limited to no more than five (5) obstructions removed. Additional obstructions that may need to be removed will be no separate pay item. The Contractor will receive no additional compensation for removing, clearing, or otherwise making it possible for the microtunneling machine to advance past objects consisting of cobbles, boulders, wood, non-reinforced concrete, and other nonmetallic objects or debris with maximum lateral dimensions less than 25% of the outer diameter of the shield or cutterhead, whichever is larger. Additionally, full- or partial-face rock with unconfined compressive strength less than 6,000 psi will not be considered an obstruction, and will not be grounds for additional compensation. Compensation will also not be provided for obstructions that were removed without proper notification to Owner in advance of obstruction removal.

3.07 CLEANUP

A. After completion of microtunneling and carrier pipe installation, all construction debris, slurry, oil, grease, and other materials will be removed from the microtunneled pipe, jacking and receiving shafts, and all Contractor work areas. Cleaning shall be incidental to the construction. No separate payment shall be made for cleanup.

B. Restoration shall follow construction as the Work progresses, and shall be completed as soon as possible. Restore and repair any damage resulting from surface settlement caused by shaft excavation, or pipejacking. Any property damaged or destroyed, shall be restored to a condition equal to or better than existing prior to construction. Restoration shall be completed no later than thirty (30) days after the microtunneling is complete. The restoration shall include all property affected by the construction operations.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Microtunneling will be measured by the linear foot.

4.02 PAYMENT

A. Payment for microtunnel completed will be made at the unit price bid per linear foot. Such payment shall also include installation of steel casing, and all work incidental to microtunneling construction.

END OF SECTION

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BID PROPOSAL

PROPOSAL OF _____, a corporation

a partnership consisting of

_____

an individual doing business as

_____

THE SAN ANTONIO WATER SYSTEM:
Pursuant to Instructions and Invitation to Bidders, the undersigned proposes to furnish all labor and materials as specified and perform the work required for the project as specified, in accordance with the Plans and Specifications for the following prices to wit:

(PLEASE SEE ATTACHED PDF LIST OF BID ITEMS)

TOTAL BID PRICE **$**_____

Mobilization and Prep of ROW shall be limited to the maximum percentage shown. **If the percentage 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.**

_____
BIDDER'S SIGNATURE & TITLE

_____
FIRM'S NAME (TYPE OR PRINT)

_____
FIRM'S ADDRESS

_____
FIRM'S PHONE NO. /FAX NO.

_____
FIRM'S EMAIL ADDRESS

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

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE BID PROPOSAL
The bidder offers to construct the Project in accordance with the Contract Documents for the contract price, and to complete the Project within **730** calendar days after the start date, as set forth in the Authorization to Proceed. **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 Bid Proposal which are included on the following pages.

E: 19 Seguin Road to Nacogdoches Road - Segment 1
Addendum No. 3

General Bid Items:						
Line No.	**Item No.**	**Item Description**	**Unit**	**Quantity**	**Unit Bid Price**	**Total Price**
1	104.1	STREET EXCAVATION (12" DEPTH)	CY	7293	$	$
2	202	PRIME COAT	GAL	4647	$	$
3	203	TACK COAT	GAL	2599	$	$
4	205.2	HOT MIX ASPHALTIC PAVEMENT (10" TYPE B)	SY	21879	$	$
5	205.4 535	HOT MIX ASPHALTIC PAVEMENT (2" TYPE D)	SY	24629	$	$
6	208	SALVAGING, HAULING, & STOCKPILING RECLAIMABLE ASPHALTIC PAVEMENT (2" DEPTH)	SY	2751	$	$
7	103.1 500.4	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	911	$	$
8	103.3 503.4	PORTLAND CEMENT CONCRETE DRIVEWAY - COMMERCIAL (REMOVE/INSTALL)	SY	125	$	$
9	503.5	GRAVEL DRIVEWAY (REMOVE/INSTALL)	SY	222	$	$
10	507.1 507.2	CHAIN-LINK WIRE FENCE - (4 FT & 6 FT. HIGH) (REMOVE/INSTALL)	LF	702	$	$
11	507.5	CHAIN-LINK WIRE FENCE VEHICULAR GATE (REMOVE/INSTALL)	EA	1	$	$
12	C71/2	BARB-WIRE FENCE WITH METAL POSTS (REMOVE/INSTALL)	LF	2645	$	$
13	C69/2	CONCRETE DRAINAGE FLUME REPLACEMENT (3.5' WIDE)	LF	1429	$	$
14	C69/3	FORT SAM CONCRETE PAVEMENT REPLACEMENT (UNKNOWN WIDTH)	SF	1870	$	$
15	C68/1	FORT SAM HOUSTON TEMPORARY CHAIN-LINK SECURITY FENCE	LF	270	$	$
16	C68/1	FORT SAM HOUSTON TEMPORARY SECURITY GATE	EA	1	$	$
17	505.1	CONCRETE RIPRAP	SF	720	$	$
18	509.1	METAL BEAM GUARD RAIL	LF	342	$	$
19	510.1	TIMBER POSTS AND WIRE BARRIER (REMOVE/INSTALL)	LF	745	$	$
20	511.3	REPLACE WITH HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D AND 10" TYPE B)	SY	1346	$	$
21	530.1	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	$	$
22	550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	19285	$	$
23	SWPPP	STORM WATER POLLUTION PREVENTION PLAN	LS	1	$	$
24	812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	6036	$	$
25	812	16-INCH DR-14 (C-905) PVC WATER LINE	LF	1623	$	$
26	824	RELAY SHORT SERVICE (3/4" - 2")	EA	12	$	$
27	824	RELAY LONG SERVICE (3/4" - 2")	EA	4	$	$
28	828	8-INCH GATE VALVE W/VALVE BOX	EA	19	$	$
29	828	16-INCH GATE VALVE W/VALVE BOX	EA	5	$	$
30	834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	16	$	$
31	836	DUCTILE IRON FITTINGS	TN	10	$	$
32	840	8-INCH X 6-INCH WATER TIE-IN	EA	3	$	$
33	840	8-INCH X 8-INCH WATER TIE-IN	EA	1	$	$
34	840	16-INCH X 16-INCH WATER TIE-IN	EA	3	$	$
35	841	HYDROSTATIC PRESSURE TEST	LS	1	$	$
36	844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (6-8-INCH MAINS)	EA	4	$	$
37	844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (12-16-INCH MAINS)	EA	2	$	$
38	846	COMBINATION AIR RELEASE ASSEMBLY (1-INCH)	EA	2	$	$
39	848	8-INCH DR-14 (C-900) PVC SEWER LINE, PRESSURE RATED (6' TO 10')	LF	805	$	$
40	848	8-INCH DR-14 (C-900) PVC SEWER LINE, PRESSURE RATED (18' TO 22')	LF	93	$	$
41	848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (0' TO 6')	LF	37	$	$
42	848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (6' TO 10')	LF	60	$	$
43	848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (10' TO 14')	LF	358	$	$
44	848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (14' TO 18')	LF	55	$	$
45	848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (18' TO 22')	LF	24	$	$
46	848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (0' TO 6')	LF	20	$	$
47	848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (6' TO 10')	LF	112	$	$
48	848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (10' TO 14')	LF	16	$	$
49	848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (14' TO 18')	LF	24	$	$

50	857	48-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (6' TO 10')	LF	18	$	$
51	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (10' TO 14')	LF	707	$	$
52	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (14' TO 18')	LF	2542	$	$
53	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (18' TO 22')	LF	2363	$	$
54	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (22' TO 25')	LF	803	$	$
55	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	2485	$	$
56	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (30' TO 35')	LF	795	$	$
57	857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (35' TO 40')	LF	225	$	$
58	850	SANITARY SEWER STRUCTURE (COMPLETE) TYPE "C" (ALL DEPTHS)	EA	1	$	$
59	852	SANITARY SEWER MANHOLE	EA	12	$	$
60	852	SANITARY SEWER DROP MANHOLE	EA	3	$	$
61	852	EXTRA DEPTH MANHOLE (>6')	VF	108	$	$
62	852	EXTRA DEPTH DROP MANHOLE (>6')	VF	25	$	$
63	853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	24	$	$
64	853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, EXTRA DEPTH (>6')	VF	371	$	$
65	853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	15	$	$
66	853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	315	$	$
67	853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER, STAINLESS STEEL CLOSURE COUPLING	EA	2	$	$
68	854	SANITARY SEWER LATERAL - (4"-8")	LF	285	$	$
69	854	SANITARY SEWER CLEANOUT (4"-8")	EA	8	$	$
70	856	STEEL CASING PIPE BY OPEN CUT - (24")	LF	85	$	$
71	856	JACKING, BORING, OR TUNNELING - (24") INCLUSIVE OF CASING	LF	42	$	$
72	856	JACKING, BORING, OR TUNNELING - (30") INCLUSIVE OF CASING	LF	355	$	$
73	02345 02610	MICROTUNNELING - 96" INCLUSIVE OF CASING	LF	6343	$	$
74	856	8-INCH PVC SDR-26 (ASTM D-3034) RESTRAINED CARRIER PIPE (INSTALL)	LF	42	$	$
75	856	8-INCH PVC DR-14 (C-900) CARRIER PIPE (INSTALL)	LF	85	$	$
76	856	16-INCH PVC DR-14 (C-905) CARRIER PIPE (INSTALL)	LF	355	$	$
77	02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	6343	$	$
78	862	ABANDON - SANITARY SEWER MAIN (48-INCH)	LF	16285	$	$
79	864-S1	BYPASS PUMPING SMALL DIAMETER SANITARY SEWERS (< 24")	LS	1	$	$
80	864-S2	BYPASS PUMPING LARGE DIAMETER SANITARY SEWERS (≥ 24")	LS	1	$	$
81	866A	EXISTING SEWER MAIN TELEVISION INSPECTION (48")	LF	16285	$	$
82	866.2	SEWER MAIN POST TELEVISION INSPECTION (8" - 15")	LF	1646	$	$
83	866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	16281	$	$
84	3000	REMOVAL, TRANSPORT, AND DISPOSAL OF AC PIPE	LF	1612	$	$
85	C72/3	WOOD FENCE (REMOVE/INSTALL)	LF	95	$	$
86	C71/1	WROUGHT IRON FENCE (REMOVE/INSTALL)	LF	365	$	$
87	C72/4	IRON WIRE FENCE (REMOVE/INSTALL)	LF	348	$	$
88	C72/5	IRON WIRE FENCE VEHICULAR GATE (REMOVE/INSTALL)	EA	1	$	$
89	03100	TEMPORARY 8" WATER BYPASS	LF	1600	$	$
90	SC	CPS POLE BRACING ALLOWANCE	LS	1	$ $30,000.00	$
91	02345	MICROTUNNELING - OBSTRUCTION REMOVAL	EA	5	$	$
92	100.1	MOBILIZATION (MAXIMUM of 10% of LINE 1 - 91 SUB-TOTAL BASE BID AMOUNT)	LS	1	$	$
93	101.1	PREPARING RIGHT-OF-WAY (MAXIMUM of 5% of LINE 1 - 91 SUB-TOTAL BASE BID AMOUNT)	LS	1	$	$
94	SP100A	INTERMEDIATE DEMOBILIZATION/REMOBILIZATION (OPEN-CUT CONSTRUCTION)	EA	2	$	$
95	SP100B	INTERMEDIATE DEMOBILIZATION/REMOBILIZATION (MICROTUNNELING CONSTRUCTION)	EA	2	$	$

ATTACHMENT A

RECORD OF PERFORMANCE

(Addendum No.3 - Rev. 12/06/16)

E19: Seguin Road to Nacogdoches Road, Segment 1
SAWS Job No. 15-4506
SAWS Solicitation No. CO-00104-DW

A. Please check the applicable boxes, and complete **all** the fields, below. In addition, please provide the supplemental information requested for each submitted project.

If all fields are not completed and boxes are not checked, the Bid is at risk for being rejected due to non-responsiveness. It is not acceptable to indicate "See attached."

Project A-1 is to have been completed by the Bidder and/or their subcontractor

☐ Project A-1 contains micro-tunneling of at least 72" diameter.
☐ Project A-1 contains micro-tunneling of at least 2000 feet in total length.
☐ Project A-1 contains individual tunneling drive of at least 1000 feet in total length.
☐ Project A-1 was completed within the last ten (10) years.
☐ Project A-1 can provide an owner reference for the firm, validating the boxes above.

Project A-1 Description

Name of Project: _____ Location: _____

Type of Work: _____

Pipe Sizes: _____ Pipe Lengths: _____

Reference Name: _____ Reference Title: _____

Reference Phone Number: _____ Construction Cost: _____

Project Start Date: _____ Project End Date: _____

Project Description: _____

_____
_____
_____
_____

Additional Information: _____

Project A-2 is to have been completed by the Bidder and/or their subcontractor

☐ Project A-2 contains micro-tunneling of at least 72" diameter.
☐ Project A-2 contains micro-tunneling of at least 2000 feet in total length.
☐ Project A-1 contains individual tunneling drive of at least 1000 feet in total length.
☐ Project A-2 was completed within the last ten (10) years.
☐ Project A-2 can provide an owner reference for the firm, validating the boxes above.

Project A-2 Description

Name of Project: _____ Location: _____

Type of Work: _____

Pipe Sizes: _____ Pipe Lengths: _____

Reference Name: _____ Reference Title: _____

Reference Phone Number: _____ Construction Cost: _____

Project Start Date: _____ Project End Date: _____

Project Description: _____

_____
_____
_____
_____

Additional Information: _____

Project A-3 is to have been completed by the Bidder and/or their subcontractor

☐ Project A-3 contains micro-tunneling of at least 72" diameter.
☐ Project A-3 contains micro-tunneling of at least 1500 feet in total length.
☐ Project A-3 contains individual tunneling drive of at least 1000 feet in total length.
☐ Project A-3 was completed within the last ten (10) years.
☐ Project A-3 can provide an owner reference for the firm, validating the boxes above.

Project A-3 Description

Name of Project: _____ Location: _____

Type of Work: _____

Pipe Sizes: _____ Pipe Lengths: _____

Reference Name: _____ Reference Title: _____

Reference Phone Number: _____ Construction Cost: _____

Project Start Date: _____ Project End Date: _____

Project Description: _____

_____
_____
_____
_____

Additional Information: _____

B. Please check the applicable boxes, and complete **all** the fields, below. In addition, please provide the supplemental information requested for each submitted project.

If all fields are not completed and boxes are not checked, the Bid is at risk for being rejected due to non-responsiveness. It is not acceptable to indicate "See attached."

Project B-1 is to be have been completed by the Bidder and/or their subcontractor.

☐ Project B-1 contains open cut, large diameter (60" minimum diameter) sewer construction of at least 1500 feet in length.
☐ Project B-1 contains open cut, large diameter (60" minimum diameter) sewer construction of at least 20 feet in depth.
☐ Project B-1 was completed within the last ten (10) years.

Project B-1 Description

Name of Project: _____ Location: _____

Type of Work: _____

Pipe Sizes: _____Pipe Lengths: _____Pipe Depths:_____

Reference Name: _____ Reference Title: _____

Reference Phone Number: _____ Construction Cost: _____

Project Start Date: _____ Project End Date: _____

Project Description: _____

_____
_____
_____
_____

Additional Information: _____

Project B-2 is to be have been completed by the Bidder and/or their subcontractor.

- ☐ Project B-2 contains open cut, large diameter (60" minimum diameter) sewer construction of at least 1500 feet in length.
- ☐ Project B-2 contains open cut, large diameter (60" minimum diameter) sewer construction of at least 20 feet in depth.
- ☐ Project B-2 was completed within the last ten (10) years.

Project B-2 Description

Name of Project: _____ Location: _____

Type of Work: _____

Pipe Sizes: _____Pipe Lengths: _____Pipe Depths:_____

Reference Name: _____ Reference Title: _____

Reference Phone Number: _____ Construction Cost: _____

Project Start Date: _____ Project End Date: _____

Project Description: _____

_____

_____

_____

_____

Additional Information: _____

Project B-3 is to be have been completed by the Bidder and/or their subcontractor.

- ☐ Project B-3 contains open cut, large diameter (60" minimum diameter) sewer construction of at least 1000 feet in length.
- ☐ Project B-3 contains open cut, large diameter (60" minimum diameter) sewer construction of at least 15 feet in depth.
- ☐ Project B-3 was completed within the last ten (10) years.

Project B-3 Description

Name of Project: _____ Location: _____

Type of Work: _____

Pipe Sizes: _____Pipe Lengths: _____Pipe Depths:_____

Reference Name: _____ Reference Title: _____

Reference Phone Number: _____ Construction Cost: _____

Project Start Date: _____ Project End Date: _____

Project Description: _____

_____
_____
_____
_____

Additional Information: _____

C. Please check the applicable boxes, and complete **all** the fields, below. In addition, please provide the supplemental information requested.

If all fields are not completed and boxes are not checked, the Bid is at risk for being rejected due to non-responsiveness.

Project Superintendent

- ☐ Project Superintendent proposed for this project, has at least five (5) years experience supervising micro-tunneling construction.
- ☐ Project Superintendent proposed for this project, has completed at least three (3) projects of 72" diameter or larger
- ☐ Project Superintendent proposed for this project, has completed at least three (3) individual drives exceeding 1,000 feet in length, each.
- ☐ Resume for the Project Superintendent proposed for this project, demonstrating the above, is enclosed in the project bid package.

SAWS General Construction Notes

1. 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 PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:

   A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.

   B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE."

   C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION."

   D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION."

   E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).

2. THE CONTRACTOR SHALL OBTAIN SAWS STANDARD DETAILS FROM SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS. UNLESS OTHERWISE NOTED WITHIN DESIGN PLANS.

3. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 233-3500, AND PROVIDE NOTIFICATION PROCEDURES THE CONTRACTOR WILL USE TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO EXCAVATION.

4. LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.

5. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:

   SAN ANTONIO WATER SYSTEM:
   SAWS UTILITY LOCATES: HTTP://WWW.SAWS.ORG/SERVICE/LOCATES

   COSA DRAINAGE 207-8048
   COSA TRAFFIC SIGNAL OPERATIONS 207-7720
   TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005 OR 811

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGES DONE BY THE PROJECT'S CONSTRUCTION.

7. ALL WORK IN TEXAS HIGHWAY DEPARTMENT AND BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.

8. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.

9. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.

10. ANY WORK COMPLETED WITHOUT PRIOR WRITTEN AUTHORIZATION WHICH IS NOT INCLUDED IN THESE PLANS AND SPECIFICATIONS WILL NOT BE COMPENSATED BY THE SAN ANTONIO WATER SYSTEM.

11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.

    WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.

    ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.

12. PRE CON SITE VIDEO: BEFORE THE START OF ANY CONSTRUCTION. THE SITE MUST BE VIDEO RECORDED BY THE CONTRACTOR WITH ONE COPY SUBMITTED TO SAWS INSPECTIONS. A PRE-SITE VIDEO WILL PROVIDE ACCURATE DOCUMENTATION OF THE EXISTING CONDITIONS. (NSPI)

13. POWER POLE BRACING: CONTRACTORS SHOULD BE ADVISED THAT THERE ARE EXISTING OVERHEAD UTILITY POLES ALONG THE PROJECT CORRIDOR. CONTRACTORS SHOULD FURTHER BE ADVISED THAT IF THE DISTANCE FROM THE OUTSIDE FACE OF A UTILITY TRENCH TO THE FACE OF A UTILITY POLE IS LESS THAN 5 FEET, SAID UTILITY POLE IS SUBJECT TO BRACING, BASED ON A DETERMINATION MADE BY UTILITY POLE OWNER. COSTS INCURRED BY CONTRACTOR FOR BRACING OF THESE UTILITY POLES THAT EXCEEDS THE ALLOWANCE IS SUBSIDIARY TO THAT RESPECTIVE UTILITY COMPANY'S WORK. IT IS ADVISABLE FOR THE CONTRACTOR TO REVIEW THE CONSTRUCTION DOCUMENTS, AND VISIT THE CONSTRUCTION SITE TO DETERMINE POTENTIAL IMPACTS. ⚠

SAWS General Water Notes

14. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS INSPECTION AND/OR SAWS PRODUCTION GROUPS AT LEAST ONE WEEK OR MORE IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY. SAWS PRODUCTION CONTROL CENTER 233-2016

15. ASBESTOS CEMENT (AC) PIPE, ALSO KNOWN AS TRANSITE PIPE WHICH IS KNOWN TO CONTAIN ASBESTOS-CONTAINING MATERIAL (ACM), MAYBE LOCATED WITHIN THE PROJECT LIMITS. SPECIAL WASTE MANAGEMENT PROCEDURES AND HEALTH AND SAFETY REQUIREMENTS WILL BE APPLICABLE WHEN REMOVAL AND/OR DISTURBANCE OF THIS PIPE OCCURS, PAYMENT FOR SUCH WORK IS TO BE MADE UNDER SPECIAL SPECIFICATION ITEM NO. 3000, "SPECIAL SPECIFICATION FOR HANDLING ASBESTOS CEMENT PIPE".

16. VALVE REMOVAL: WHERE THE CONTRACTOR IS TO ABANDON A WATER MAIN, THE CONTROL VALVE LOCATED ON THE ABANDONING BRANCH WILL BE REMOVED AND REPLACED WITH A CAP/PLUG. (NSPI).

SAWS General Sewer Notes

17. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:

    A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS EMERGENCY OPERATIONS CENTER (EOC) IMMEDIATELY AT (210)233-2015. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW.

    B. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.

    C. CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.

    D. CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.

    E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.

    F. MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.

    SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS SATISFACTION, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING ANY FINES FROM EPA.

    NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND SAWS.

18. ⚠ THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED, IN ACCORDANCE WITH SUPPLEMENTARY SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864-S1, 864-S2, "BYPASS PUMPING". PAYMENT FOR SUCH WORK WILL BE MADE UNDER THE BID ITEM "SANITARY SEWER (BYPASS PUMPING)" (LUMP SUM) AS PER SUPPLEMENTARY SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864-S1, 864-S2, "BYPASS PUMPING".

19. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 233-3500 AND/OR SAWS PRODUCTION GROUPS AT LEAST ONE WEEK OR MORE IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.

20. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS. (NSPI)

General Notes

1. WITHIN THE LIMITS OF CONSTRUCTION AND/OR ACCESS TO THE PROJECT, THE CONTRACTOR WILL ENCOUNTER TRASH, DEBRIS, DUMPED OBJECTS, AND OTHER WASTE MATERIAL. THE CONTRACTOR WILL BE REQUIRED TO PROPERLY DISPOSE OF THESE MATERIALS AT AN APPROVED LOCATION. THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST.

2. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THESE PLANS AND SPECIFICATIONS.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ANY DAMAGES DONE TO EXISTING LANDSCAPING AND DRAINAGE INLETS TO THE ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO SAWS.

4. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY ARBORIST AT 207-0278 FOR GUIDANCE. THE SAWS INSPECTOR SHALL ALSO BE NOTIFIED. TRIMMING AND ANY OTHER ADJUSTMENTS TO EXISTING TREES SHALL BE PERFORMED TO THE SATISFACTION OF THE CITY ARBORIST & SAWS AT NO ADDITIONAL COST.

5. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD SAWS AND THE CONSULTANT HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF SAWS OR CONSULTANT.

6. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS. "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY VERTICAL AND HORIZONTAL ALIGNMENT.

7. THE CONTRACTOR SHALL FURNISH ALL ASSISTANCE REQUIRED OF HIM BY ALL INSPECTORS IN OBTAINING SAMPLES AT THE EXPENSE OF THE CONTRACTOR.

8. CONTRACTOR TO PERFORM ALL TESTS REQUIRED BY SAWS AND TCEQ. ADDITIONAL TESTS WILL BE DONE BY TV CAMERA BY THE CONTRACTOR AND OBSERVED BY SAWS INSPECTOR AS THE CAMERA IS RUN THROUGH THE LINES. ANY ABNORMALITIES, SUCH AS BROKEN PIPE OR MISALIGNED JOINTS, MUST BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE. CONTRACTOR TO PROVIDE TV TAPES TO CONSTRUCTION INSPECTION FOR REVIEW PRIOR TO FINAL INSPECTION OF THE PROJECT.

9. ELECTRICAL LINES ARE LOCATED IN THE PROJECT AREA. THE ATTENTION OF THE CONTRACTOR IS DIRECTED TO STATE LAW (HEALTH AND SAFETY CODE, TITLE 9, SUBTITLE A, CHAPTER 752) CONCERNING CONSTRUCTION OPERATIONS IN THE VICINITY OF ELECTRICAL LINES AND THE NEED FOR EFFECTIVE PRECAUTIONARY MEASURES.

10. CONTRACTOR SHALL MAINTAIN ACCESS TO PUBLIC AND PRIVATE FACILITIES DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE AND SAN ANTONIO WATER SYSTEM.

General Notes Con't

11. THESE PLANS, PREPARED BY KIMLEY-HORN AND ASSOCIATES, INC. DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF KIMLEY-HORN AND ASSOCIATES, INC.'S LICENSED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THE WORK. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS.

12. CONTRACTOR TO ASSURE HIMSELF THAT ALL CONSTRUCTION PERMITS HAVE BEEN OBTAINED PRIOR TO COMMENCEMENT OR WORK. REQUIRED PERMITS THAT CAN ONLY BE ISSUED TO CONTRACTOR ARE TO BE OBTAINED AT THE CONTRACTORS EXPENSE.

13. CONTRACTOR SHALL COORDINATE INTERRUPTIONS OF ALL UTILITIES AND SERVICES WITH APPLICABLE UTILITY COMPANY OR COMPANIES. ALL WORK TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY COMPANY OR AGENCY INVOLVED.

14. CONTRACTOR SHALL LOCATE, PROTECT, AND MAINTAIN BENCHMARKS, MONUMENTS, AND CONTROL POINTS. RE-ESTABLISH DISTURBED OR DESTROYED ITEMS BY REGISTERED PUBLIC SURVEYOR IN THE STATE OF TEXAS AT NO ADDITIONAL COST TO SAWS.

15. EXISTING PAVING, BUILDINGS, AND OTHER ITEMS SHOWN ON PLANS NOT SPECIFICALLY RELATED TO THE WORK OF THE CONTRACT ARE FOR INFORMATIONAL PURPOSES ONLY.

16. ANY CHANGES OR REVISIONS TO THESE PLANS MUST FIRST BE SUBMITTED TO SAWS FOR REVIEW AND WRITTEN APPROVAL.

17. NO SEPARATE PAY FOR ITEMS REQUIRED BY NOTES ON THIS SHEET, UNLESS INCLUDED ON PROPOSAL FORM.

18. THE SAWS INSPECTOR WILL ADDRESS ALL LIMITS FOR CURB, SIDEWALK, AND TREE PROTECTION BEYOND WHAT IS CONSIDERED INCIDENTAL TO NORMAL UTILITY CONSTRUCTION. ALL COMMUNICATION FROM THE CITY WILL BE COORDINATED THROUGH THE SAWS INSPECTOR. SAWS INSPECTOR WILL DETERMINE IF ADDITIONAL COMPENSATION IS WARRANTED IF LIMITS EXCEED INCIDENTALS.

19. ⚠ ~~CONTRACTOR SHALL BE AWARE THAT EXISTING UTILITIES MAY IMPACT THE METHOD OF TRENCHLESS INSTALLATION. THE INTENT IS FOR THE CONTRACTOR TO USE A MEANS OF JACKING, BORING, OR TUNNELING TO FIT IN THE FOOTPRINT AVAILABLE.~~

20. IN ALL AREAS WHERE AN EXISTING PAVED SURFACE (SUCH AS A ROADWAY, DRIVEWAY, OR SIDEWALK) ARE TO BE IMPACTED BY CONSTRUCTION. THE CONTRACTOR SHALL SAW-CUT THE PAVED SURFACE, ASSURING CLEAN & STRAIGHT CUT TO FULL DEPTH OF THE PAVED SURFACE.

21. IN ALL AREAS WHERE SIDEWALK, CURB, OR DRIVEWAY IS TO BE REPLACED, THE CONTRACTOR SHALL REMOVE AT NEAREST JOINT (N.S.P.I.).

22. FINAL PAY CUTS TO BE DETERMINED IN THE FIELD AT THE TIME OF CONSTRUCTION. FINAL CUTS SHALL BE BASED UPON THE EXISTING GROUND ELEVATIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION.

23. COORDINATES ARE BASED ON THE STATE PLANE COORDINATE SYSTEM ESTABLISHED FOR THE TEXAS SOUTH CENTRAL ZONE 4204, NORTH AMERICAN DATUM (NAD) OF 1983, SURFACE.

24. CONTRACTOR WILL RESTORE ALL CONSTRUCTION AREAS TO THE EXTENT THEY ARE DISTURBED DURING CONSTRUCTION, TO THEIR PRIOR CONDITION.

25. CONTRACTOR MAY USE PROPERTIES HAVING APPROPRIATE EASEMENTS AND PUBLIC RIGHT-OF-WAY FOR TEMPORARY STAGING AND MATERIAL STORAGE. MATERIAL STORAGE IN THESE AREAS ARE INTENDED TO BE TEMPORARY AND THE TEMPORARILY STORED MATERIALS MUST BE INSTALLED WITHIN 48-HOURS OF ARRIVING ON-SITE. ALL OTHER MATERIALS ARE TO BE STORED OFF-SITE, AT NO ADDITIONAL COST TO SAWS.

26. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES AND STRUCTURES, WHETHER PRIVATE OR PUBLIC, PRIOR TO EXCAVATION. THE INFORMATION AND DATA SHOWN WITH RESPECT TO EXISTING UNDERGROUND FACILITIES AT OR CONTIGUOUS TO THE SITE IS APPROXIMATE AND BASED ON INFORMATION FURNISHED BY THE OWNERS OF SUCH UNDERGROUND FACILITIES OR ON PHYSICAL APPURTENANCES OBSERVED IN THE FIELD. THE OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA; AND, THE CONTRACTOR, SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA, FOR LOCATING ALL UNDERGROUND FACILITIES, FOR COORDINATION OF THE WORK WITH THE OWNERS OF SUCH UNDERGROUND FACILITIES DURING CONSTRUCTION, FOR THE SAFETY AND PROTECTION THEREOF, AND REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK, THE COST OF ALL WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE. THE CONTRACTOR SHALL NOTIFY ANY AFFECTED UTILITY COMPANIES OR AGENCIES IN WRITING AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

27. THE CONTRACTOR SHALL DEWATER ALL TRENCHES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION ITEM NO. 804, "EXCAVATION, TRENCHING AND BACKFILL". ALL SUBSURFACE CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND/OR UNSTABLE SOIL CONDITIONS, SHALL BE MITIGATED BY THE CONTRACTOR, AS REQUIRED, IN ORDER TO INSTALL THE SANITARY SEWER PER THE SPECIFICATIONS AND THE CONTRACT DOCUMENTS. ALL ADDITIONAL WORK REQUIRED TO MEET THE INTENT OF THE SPECIFICATION AND THE CONTRACT DOCUMENTS SHALL BE AT NO ADDITIONAL COST TO SAWS (N.S.P.I.).

NON-STANDARD WORKING HOURS

28. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WORK OUTSIDE OF STANDARD WORKING HOURS. WORK OUTSIDE OF STANDARD WORKING HOURS SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT.

29. CONTRACTOR MAY OPT TO WORK DURING TIME PERIODS THAT ARE OUTSIDE OF NORMAL WORKING HOURS (NIGHTS, WEEKENDS). IF WORK OUTSIDE OF NORMAL WORK HOURS IS DESIRED, CONTRACTOR MUST NOTIFY SAWS INSPECTIONS AND THE PROJECT DESIGN MANAGER AT LEAST 72 HOURS IN ADVANCE OF NORMAL WORK HOURS. CONTRACTOR MAY NOT PERFORM SEWER ~~CONSTRUCTION~~ BETWEEN THE HOURS OF 11:00 PM AND 5:00 AM AT ANY TIME (N.S.P.I.). ⚠

TRENCH EXCAVATION SAFETY PROCEDURE

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

RECORDS

31. THE CONTRACTOR SHALL MAINTAIN A NEAT AND ACCURATE RECORD OF CONSTRUCTION FOR THE ENGINEER'S RECORDS THAT ARE UP TO DATE AND AVAILABLE FOR REVIEW AT ALL TIMES BY SAWS OR DESIGN ENGINEER. THE CONTRACTOR SHALL PROVIDE ENGINEER WITH FULL SIZE REPRODUCIBLE MARKUPS THAT RECORD ALL CONSTRUCTION DEVIATING FROM THE PLANS.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

32. A CONSTRUCTION SITE NOTICE SHALL BE POSTED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

33. ALL CONTRACTORS AND SUBCONTRACTORS PROVIDING SERVICES RELATED TO THE SWPPP SHALL SIGN A CONTRACTOR CERTIFICATION STATEMENT ACKNOWLEDGING THEIR RESPONSIBILITY AS SPECIFIED IN THE SWPPP.

34. A COPY OF THE SWPPP, INCLUDING CONTRACTOR CERTIFICATIONS AND ANY REVISIONS, SHALL BE SUBMITTED TO THE CITY AND FILED WITH THE CONSTRUCTION PLANS, AND SHALL BE RETAINED ON-SITE DURING CONSTRUCTION.

35. A NOTICE OF TERMINATION (N.O.T.) SHALL BE SUBMITTED TO THE TCEQ BY THE CONTRACTOR WHEN THE SITE HAS 100% OF THE DISTURBED AREAS STABILIZED AND THE SITE NO LONGER HAS STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES, OR THE N.O.T. PERMITTEE OR CO-PREMITTEE

36. CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING, SUBMITTING, AND POSTING THE NOTICE OF INTENT AND STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH STATE RULES AND REGULATIONS.

37. CONTRACTOR SHALL OBTAIN AND MAINTAIN SWPPP THROUGHOUT THE ENTIRE DURATION OF CONSTRUCTION AND SURFACE IS RESTORED.

38. GRAVEL FILTER BAGS TO BE USED ALONG THE CURB WITHIN CONSTRUCTION LIMITS.

39. ALL COSTS FOR THE STORM WATER POLLUTION PREVENTION PLAN, PERMIT, ETC... SHALL SUBSIDIARY TO THE LUMP SUM COST OF THE "SWPPP" LINE ITEM.

AT&T:

40. THE CONTRACTOR SHOULD CALL FOR LOCATES THROUGH THE "ONE CALL" UTILITY LOCATE SERVICE (1-800-344-8377) 48 HOURS PRIOR TO CONSTRUCTION/EXCAVATION WORK. CONTRACTORS HAVE THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION.

* N.S.P.I. (NO SEPARATE PAY ITEM)

STATE OF TEXAS — JEFFREY A. FARNSWORTH — 80190 — LICENSED PROFESSIONAL ENGINEER — 12/5/16

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No.	Revision	By	Date
⚠	ADDENDUM 1	JAF	11/11/2016
⚠	ADDENDUM 3	JAF	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

GENERAL NOTES (SHEET 1 OF 2)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: MAV	15-4506	G3
DRAWN: DPF	KHA PROJECT NO.	
CHECKED: GAG	068665018	

PLOTTED BY PURDOCK, DANIEL 12/5/2016 9:55 AM
DWG NAME K:\SNA_UTILITIES\068665018 - SAWS E19\CADD\SEGMENT 1\SHEETS\GENERAL_NOTES_E-19_SEG1-068665018.DWG
LAST SAVED 12/5/2016 9:53 AM

General Notes (Cont.)

CPS ENERGY NOTE:

1. CALL CPS LOCATOR AT 353-2970 48 HOURS BEFORE BEGINNING ANY EXCAVATION.

2. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING CPS ENERGY OVERHEAD AND UNDERGROUND ELECTRIC FACILITIES IF ADJACENT TO WORK AREAS.

3. 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 CPS VALVES THAT ARE IN THE PROJECT AREA.

4. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH CPS TO BRACE DISTRIBUTION POWER POLES. ANY POLES WITHIN 10 FEET OF CONSTRUCTION SHALL BE REVIEWED WITH CPS TO DETERMINE IF BRACING IS REQUIRED (NO SEPARATE PAY ITEM).

5. NEW SEWER CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO TRANSMISSION POWER LINES ON THE FORT SAM HOUSTON MILITARY INSTALLATION ON THE SAN ANTONIO MILITARY MEDICAL CENTER PROPERTY. IN THESE AREAS, THE CONTRACTOR IS DIRECTED TO CONTAIN ALL CONSTRUCTION ACTIVITIES TO REMAIN 30-FEET OR MORE FROM TRANSMISSION TOWERS/POLES. CONTRACTOR MAY USE THE EXISTING CPS ENERGY DISTRIBUTION AND TRANSMISSION LINE EASEMENTS FOR ACCESS, FOR VEHICLE PARKING AND FOR TEMPORARY LAY DOWN OF CONSTRUCTION MATERIALS. CONSTRUCTION MATERIALS THAT ARE LAID DOWN TEMPORARILY MAY NOT REMAIN IN THE EASEMENT FOR LONGER THAN 48 HOURS, WITHOUT PERMISSION FROM CPS ENERGY. STOCKPILING OF DIRT, STACKING OF CONSTRUCTION MATERIALS, OR CREATION OF ANY MEANS FOR PERSONNEL OR EQUIPMENT TO BE CLOSER TO LIVE POWER LINES, IS STRICTLY FORBIDDEN. CONTRACTOR SHALL TAKE ALL MEANS NECESSARY TO CONSTRUCT NEW SEWER IN PROXIMITY TO POWER LINES SAFELY, AND IN ACCORDANCE WITH CURRENT OSHA GUIDELINES. CONTRACTOR SHALL BE PREPARED TO RELOCATE ANY AND ALL TEMPORARILY STORED MATERIALS WITHIN CPS EASEMENT AT ANY TIME UPON REQUEST BY CPS.

TRENCHLESS

6. THE CONTRACTOR SHALL SECURE ALL BORE AREAS AND RECEIVING PITS WITH SECURITY FENCING AND ALL PROPER SAFETY MEASURES (N.S.P.I.).*

7. CONTRACTOR SHALL SUBMIT BORING PLAN TO INSPECTOR AND ENGINEER FOR REVIEW AND APPROVAL. BORE/RECIEVING SHAFT LOCATIONS AND DIMENSIONS ARE FOR INFORMATIONAL PURPOSES ONLY. (N.S.P.I.)*

8. ONLY CASING WILL BE ALLOWED, NO LINER PLATE WILL BE PERMITTED.

ABANDONMENT/REMOVAL OF OLD MAINS AND MANHOLES

9. ABANDONMENT OF SANITARY SEWER MAINS AND MANHOLES SHALL BE IN ACCORDANCE WITH SAWS SPECIFICATION NO. 862.

SUPPLEMENTARY

10. ALL ASTM D-3262 SANITARY SEWER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF 150 PSI.

11. NO EXTRA-PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM TO WHICH IT RELATES.WORK COMPLETED BY THE CONTRACTOR WHICH HAS NOT RECEIVED A WORK ORDER OR THE NOTICE TO PROCEED FROM THE ENGINEER AND INSPECTOR WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.

12. NO MORE THAN 200 LINEAR FEET OF TRENCH EXCAVATION IN ADVANCE OF THE UTILITY WILL BE ALLOWED AT A TIME.

13. CONTRACTOR MUST CALL FOR BACKFILL INSPECTIONS.

14. DENSITY REPORTS MUST BE SUBMITTED TO THE INSPECTOR WITHIN 24 HOURS OF TESTING.

COSA

15. NEW SEWER CONSTRUCTION IS TO OCCUR IN HOLBROOK ROAD AND ADJACENT TO THE CITY OF SAN ANTONIO SALADO CREEK GREENWAY IN SOME AREAS. IN THESE AREAS, THE CONTRACTOR IS DIRECTED TO PLACE TEMPORARY FENCING BETWEEN SAWS UTILITY CONSTRUCTION AND THE GREENWAY, SO THAT USERS OF THE GREENWAY WILL BE UNABLE TO ENTER CONSTRUCTION ZONE. IF CONSTRUCTION ACTIVITIES ARE REQUIRED THAT MAY IMPACT OR TEMPORARILY CLOSE THE GREENWAY, CONTRACTOR IS DIRECTED TO NOTIFY SAWS INSPECTIONS, COSA PARKS AND RECREATION, AND THE PROJECT DESIGN MANAGER AT LEAST 2 WEEKS IN ADVANCE OF INTENDED GREENWAY CLOSURE. CONTRACTOR WILL ALSO INSTALL TEMPORARY WARNING SIGNS, AS DIRECTED BY THE CITY OF SAN ANTONIO, PRIOR AND DURING WORK. CONTRACTOR IS DIRECTED TO TAKE A HIGH DEGREE OF CARE TO ENSURE THAT GREENWAY PATRONS ARE KEPT SAFE.

UPRR

16. FOR ALL WORK WITHIN UNION PACIFIC RAILROAD RIGHT-OF-WAY, REFER TO SPECIAL CONDITIONS. CONTRACTOR SHALL NOTIFY THE FOLLOWING UNION PACIFIC RAIL ROAD (UPRR) CONTACTS AT LEAST TEN (10) WORKING DAYS PRIOR TO ANY CONSTRUCTION.

    UPRR TRACK MAINTENANCE (CONTACT): JASON M. PEDERSON 210-825-0362
    UPRR SIGNAL MAINTENANCE (CONTACT): MARIO ALCALA 210-200-3505

17. CONTRACTOR SHALL CONTACT THE FOLLOWING NUMBER DURING NORMAL BUSINESS HOURS (7:00 AM TO 9:00 PM CENTRAL TIME), MONDAY THROUGH FRIDAY, EXCEPT FOR HOLIDAYS) TO DETERMINE IF FIBER OPTIC CABLE IS BURIED ANYWHERE IN THE UPRR RIGHT-OF-WAY TO BE USED BY THE CONTRACTOR:

    UPRR COMMUNICATIONS 1-800-336-9193

GENERAL SEWER NOTES:

18. NEW SEWER CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO EXISTING SEWER MAINS ALONG HOLBROOK ROAD, IN LOCATIONS WHERE WORKING ROOM IS LIMITED, IN SOME OF THESE LOCATIONS, SOIL STRATA MAY BE UNSTABLE/LOOSE. THIS COULD LEAD TO SLOUGHING OF TRENCH WALLS, THAT COULD BE DETRIMENTAL TO THE EXISTING ADJACENT SEWER LINE AND CAUSE A SEWER SPILL INTO THE NEW TRENCH. CONTRACTOR IS TO DEVISE A MEANS TO ENSURE THAT TRENCH WALLS REMAIN STABLE DURING CONSTRUCTION, SO THAT THE INTEGRITY OF THE ADJACENT EXISTING SEWER IS PRESERVED AT ALL TIMES. THIS IS TO BE DONE INCIDENTAL TO THE PRICE OF PIPE INSTALLATION (N.S.P.I.)*.

19. CONTRACTOR IS RESPONSIBLE TO SUPPORT AND PROTECT ANY EXISTING UTILITIES ADJACENT TO WORK AREA (N.S.P.I.)*.

20. ALL GRADES ARE CALCULATED TO THE CENTERLINE OF MANHOLE FOR MANHOLES WITH A 0.1 FOOT DROP. MANHOLES WITH POINT OF INTERSECTION SHALL HAVE 0.1 FOOT DROP PLUS INCREASE FOR PIPE GRADES. RESULTING DROP BETWEEN PIPES ACROSS ENTIRE MANHOLE WILL BE THE SUM OF THE 0.1 FOOT DROP AND THE TWO INTERSECTION PIPE GRADES MULTIPLIED BY THE RADIUS FOR ALL MANHOLES SPECIFIED IN THE PLANS TO HAVE A DROP. (TOTAL DROP ACROSS MANHOLE = 0.1 + GRADE1(R) + GRADE2(R))

21. CONNECTION OF EXISTING SANITARY SEWERS TO PROPOSED MANHOLES, CONNECTION OF PROPOSED SANITARY SEWERS TO EXISTING MANHOLES, AND EXTENSIONS OF EXISTING SANITARY SEWER PIPE TO PROPOSED MANHOLES SHALL BE SUBSIDIARY TO THE COST OF THE PROJECT (NO SEPARATE PAY ITEM).

22. REMOVAL OF EXISTING SEWER LINES TO BE REPLACED WITH PROPOSED LINES IN THE SAME TRENCH AT THE SAME OR SHALLOWER GRADE SHALL BE SUBSIDIARY TO THE COST OF THE PROPOSED SEWER LINES (NO SEPARATE PAY ITEM).

23. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION. (N.S.P.I.)* △3

24. ALL HINGED SANITARY SEWER MANHOLES INSTALLED WITHIN PAVEMENT SHALL CLOSE IN DIRECTION OF TRAFFIC FLOW.

25. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR THE TOP OF MANHOLES TO MATCH THE FINISHED GRADE FOR THE STREET IMPROVEMENTS (N.S.P.I.).

26. MANHOLES INSTALLED IN OUTSIDE OF PAVEMENT LIMITS SHALL HAVE A RIM ELEVATION 6-INCHES ABOVE NATURAL GROUND ELEVATION.

27. CONTRACTOR MAY ENCOUNTER CONCRETE ENCASEMENT IN THE IMMEDIATE VICINITY OF EXISTING MANHOLES. ANY CONCRETE REMOVAL REQUIRED FOR THE PROPER INSTALLATION OF PROPOSED SEWER MAIN AND TIE-INS SHALL BE AT NO ADDITIONAL COST TO THE OWNER. (N.S.P.I.)*

28. SEWER IS TO BE BUILT IN PHASES, TEMPORARY CONNECTIONS AND BYPASS PUMPING MAY BE REQUIRED.

29. ALL SANITARY SEWER MANHOLE RING AND COVERS SHALL BE WATERTIGHT.

30. ~~ALL FIBER GLASS REINFORCED PIPE SHALL BE HOBAS. NO APPROVED EQUAL WILL BE ACCEPTED.~~ △2

FLOODPLAIN

31. THE CONTRACTOR SHALL COMPLY WITH THE APPROVED COSA FLOODPLAIN PERMIT. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION.

32. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF WORK, MATERIAL, AND EQUIPMENT PRIOR TO RAIN EVENTS. THE LOCATION OF THE PROJECT IS LOCATED ENTIRELY WITHIN THE 100-YEAR FLOODPLAIN AND FLOODWAY AREAS OF SALADO CREEK. THE PROJECT SITE IS SUSCEPTIBLE TO QUICKLY RISING WATER IN RESPONSE TO RAINFALL EVENTS. NO MATERIAL SHALL BE STORED IN THE 100-YEAR FLOODPLAIN LONGER THAN THE END OF THE SHIFT IN WHICH IT WAS GENERATED. CONTRACTOR IS SOLELY RESPONSIBLE FOR PROTECTING TRENCHES, PITS, MATERIALS, AND EQUIPMENT FROM DAMAGE/INUNDATION OF FLOOD WATERS. ROADWAYS TO THE PROJECT SITE CAN BE EXPECTED TO BE BLOCKED OFF AS LOW WATER CROSSING DURING STORM EVENTS AND FOR EXTENDED PERIODS THEREAFTER. CONTRACTOR SHALL COORDINATE WITH SAWS TO DETERMINE WHETHER CONTRACTOR MAY RETURN TO WORK ONSITE AFTER RAIN EVENT/PARK CLOSURE.

TRAFFIC CONTROL

33. BARRICADES AND WARNING SIGNS SHALL CONFORM TO THE CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND ARE TO BE GENERALLY LOCATED TO AFFORD MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT AND TO ASSURE AN EXPEDITIOUS TRAFFIC FLOW AT ALL TIMES. DURING THE PROGRESS OF WORK, THE CONTRACTOR SHALL PROVIDE ACCESS FOR LOCAL TRAFFIC.

34. CONTRACTOR TO ESTABLISH AND MAINTAIN TRAFFIC BARRICADING AND CONTROL DEVICES ALONG THE ALIGNMENT IN ACCORDANCE WITH THE TRAFFIC CONTROL PLAN.

ROAD NOTES

35. PRIOR TO BEGINNING ANY TRENCHING WITHIN ROADWAY PAVEMENT, CONTRACTOR IS EXPECTED TO PERFORM SURVEY CROSS SECTIONS OF EXISTING PAVED SURFACE AT 50-FT INTERVALS. EACH CROSS SECTION SHOULD CONTAIN A SURVEYED ELEVATION AT THE EDGE OF PAVEMENT ON EACH SIDE OF THE ROAD, AND AT THE CENTERLINE OF THE ROAD. THE CONTRACTOR SHALL USE THESE ELEVATIONS TO CONSTRUCT THIS TYPICAL SECTION AT PRIOR ROAD ELEVATIONS.

36. ROAD STRIPING SHALL BE INSTALLED TO MATCH EXISTING CONDITION. ALL STRIPING SHALL BE SUBSIDIARY TO HOT MIX ASPHALTIC PAVEMENT LINE ITEM. STRIPING SHALL BE IN ACCORDANCE WITH THE LATEST LOCAL AND STATE REQUIREMENTS.

37. CONTRACTOR SHALL SALVAGE RUBBER SPEED BUMP MATS OR REPLACE THEM AS NEEDED PER CITY OF SAN ANTONIO. CONTRACTOR SHALL RE-INSTALL MATS AT SAME LOCATION AFTER PAVEMENT INSTALLATION (N.S.P.I.)*

GENERAL WATER NOTES

38. THRUST RESTRAINTS ARE REQUIRED AT ALL MECHANICAL JOINT (MJ) FITTINGS AND BELL JOINTS PER SAWS STANDARD SPECIFICATION ITEM NO. 818. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE LINE.

LEGEND

Symbol	Description
— — (S) — —	PROPOSED SANITARY SEWER LINE
	PROPERTY LINE
	PROPOSED EASEMENT
	EXISTING EASEMENT
	PROPOSED WATERLINE
6" W	EXISTING WATERLINE
6" AC-W	EXISTING ASBESTOS CONCRETE WATERLINE
48" SS	EXISTING SANITARY SEWER LINE
4" G	EXISTING GAS LINE
OHE	EXISTING OVER-HEAD ELECTRIC LINE
UGC	EXISTING UNDERGROUND CABLE
	EXISTING ASPHALT PAVEMENT
	EXISTING CONCRETE
	EXISTING GRAVEL PAVEMENT
	EXISTING 100-YR FLOOD PLAIN
SD	EXISTING STORM DRAIN
	EXISTING POST AND CABLE FENCE
X X X	EXISTING BARBED-WIRE FENCE
(S)	EXISTING SANITARY SEWER MANHOLE
(D)	EXISTING STORM DRAIN MANHOLE
	PROPOSED WATER VALVE
	PROPOSED FIRE HYDRANT
	EXISTING WATER METER
	EXISTING WATER VALVE
	EXISTING FIRE HYDRANT
	EXISTING SIGN
	EXISTING POWER POLE
	EXISTING GUY WIRE ANCHOR
T	EXISTING TELECOMMUNICATION BOX
	EXISTING MAILBOX
	EXISTING TREE

* N.S.P.I. (NO SEPARATE PAY ITEM)

STATE OF TEXAS
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No.	Revision	By	Date
△2	ADDENDUM 2	JAF	11/22/2016
△3	ADDENDUM 3	JAF	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

GENERAL NOTES (SHEET 2 OF 2)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: MAV	15-4506	
DRAWN: DPF	KHA PROJECT NO.	G4
CHECKED: GAG	068665018	

PLOTTED BY FURDOCK, DANIEL 12/5/2016 9:55 AM
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ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
104.1	STREET EXCAVATION (12" DEPTH)	CY	7293
202	PRIME COAT	GAL	4647
203	TACK COAT	GAL	2599
205.2	HOT MIX ASPHALTIC PAVEMENT (10" TYPE B)	SY	21879
205.4 535	HOT MIX ASPHALTIC PAVEMENT (2" TYPE D)	SY	24629
208	SALVAGING, HAULING, & STOCKPILING RECLAIMABLE ASPHALTIC PAVEMENT (2" DEPTH)	SY	2751
103.1 500.4	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	911
103.3 503.2	PORTLAND CEMENT CONCRETE DRIVEWAY - COMMERCIAL (REMOVE/INSTALL)	SY	125
503.5	GRAVEL DRIVEWAY (REMOVE/INSTALL)	SY	222
507.1 507.2	CHAIN-LINK WIRE FENCE - (4 FT & 6 FT. HIGH) (REMOVE/INSTALL)	LF	702
507.5	CHAIN-LINK WIRE FENCE VEHICULAR GATE (REMOVE/INSTALL)	EA	1
C71/2	BARB-WIRE FENCE WITH METAL POSTS (REMOVE/INSTALL)	LF	2645
C69/2	CONCRETE DRAINAGE FLUME REPLACEMENT (3.5' WIDE)	LF	1429
C69/3	FORT SAM CONCRETE PAVEMENT REPLACEMENT (UNKNOWN THICKNESS)	SF	1870
C68/1	FORT SAM HOUSTON TEMPORARY CHAIN-LINK SECURITY FENCE	LF	270
C68/1	FORT SAM HOUSTON TEMPORARY SECURITY GATE	EA	1
505.1	CONCRETE RIPRAP	SF	720
509.1	METAL BEAM GUARD RAIL	LF	342
510.1	TIMBER POSTS AND WIRE BARRIER (REMOVE/INSTALL)	LF	745
511.3	REPLACE WITH HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D AND 10" TYPE B)	SY	1346
530.1	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	19285
SWPPP	STORM WATER POLLUTION PREVENTION PLAN	LS	1
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	6036
812	16-INCH DR-18 (C-905) PVC WATER LINE	LF	1623
824	RELAY SHORT SERVICE (3/4" - 2")	EA	12
824	RELAY LONG SERVICE (3/4" - 2")	EA	4
828	8-INCH GATE VALVE W/VALVE BOX	EA	19
828	16-INCH GATE VALVE W/VALVE BOX	EA	5
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	16
836	DUCTILE IRON FITTINGS	TON	10
840	8-INCH X 6-INCH WATER TIE-IN	EA	3
840	8-INCH X 8-INCH WATER TIE-IN	EA	1
840	16-INCH X 16-INCH WATER TIE-IN	EA	3
841	HYDROSTATIC PRESSURE TEST	LS	1
844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (6-8-INCH MAINS)	EA	4
844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (12-16-INCH MAINS)	EA	2
846	COMBINATION AIR RELEASE ASSEMBLY (1-INCH)	EA	2
848	8-INCH DR-14 (C-900) PVC SEWER LINE, PRESSURE RATED (6' TO 10')	LF	805
848	8-INCH DR-14 (C-900) PVC SEWER LINE, PRESSURE RATED (18' TO 22')	LF	93
848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (0' TO 6')	LF	37
848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (6' TO 10')	LF	60
848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (10' TO 14')	LF	358
848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (14' TO 18')	LF	55
848	8-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (18' TO 22')	LF	24
848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (0' TO 6')	LF	20
848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (6' TO 10')	LF	112
848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (10' TO 14')	LF	16

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (14' TO 18')	LF	24
857	48-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (6' TO 10')	LF	18
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (10' TO 14')	LF	707
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (14' TO 18')	LF	2542
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (18' TO 22')	LF	2363
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (22' TO 25')	LF	803
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	2485
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (30' TO 35')	LF	795
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (35' TO 40')	LF	225
850	SANITARY SEWER STRUCTURE (COMPLETE) TYPE "C" (ALL DEPTHS)	EA	1
852	SANITARY SEWER MANHOLE	EA	12
852	SANITARY SEWER DROP MANHOLE	EA	3
852	EXTRA DEPTH MANHOLE (>6')	VF	108
852	EXTRA DEPTH DROP MANHOLE (>6')	VF	25
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	24
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, EXTRA DEPTH (>6')	VF	371
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	15
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	315
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER, STAINLESS STEEL CLOSURE COUPLING	EA	2
854	SANITARY SEWER LATERAL - (4"-8")	LF	285
854	SANITARY SEWER TWO-WAY CLEANOUT (4"-8")	EA	8
856	STEEL CASING PIPE BY OPEN-CUT - (24")	LF	85
856	JACKING, BORING, OR TUNNELING - (24") INCLUSIVE OF CASING	LF	42
856	JACKING, BORING, OR TUNNELING - (30") INCLUSIVE OF CASING	LF	355
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	6343
856	8-INCH PVC SDR-26 (ASTM D-3034) RESTRAINED CARRIER PIPE (INSTALL)	LF	42
856	8-INCH PVC DR-14 (C-900) CARRIER PIPE (INSTALL)	LF	85
856	16-INCH PVC DR-18 (C-905) CARRIER PIPE (INSTALL)	LF	355
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	6343
862	ABANDON - SANITARY SEWER MAIN (48-INCH)	LF	16285
864-S1	BYPASS PUMPING SMALL DIAMETER SANITARY SEWERS (< 24")	LS	1
864-S2	BYPASS PUMPING LARGE DIAMETER SANITARY SEWERS (≥ 24")	LS	1
866A	EXISTING SEWER MAIN TELEVISION INSPECTION (48")	LF	16285
866.2	SEWER MAIN POST TELEVISION INSPECTION (8" - 15")	LF	1646
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	16281
3000	REMOVAL, TRANSPORT, AND DISPOSAL OF AC PIPE	LF	1612
C72/3	WOOD FENCE (REMOVE/INSTALL)	LF	95
C72/1	WROUGHT IRON FENCE (REMOVE/INSTALL)	LF	365
C72/4	IRON WIRE FENCE (REMOVE/INSTALL)	LF	348
C72/5	IRON WIRE FENCE VEHICULAR GATE (REMOVE/INSTALL)	EA	1
03100	TEMPORARY 8" WATER BYPASS	LF	1600
SC	CPS POLE BRACING ALLOWANCE	LS	1
02345	MICROTUNNELING – OBSTRUCTION REMOVAL	EA	5
100.1	MOBILIZATION	LS	1
101.1	PREPARING RIGHT-OF-WAY	LS	1
SP100A	INTERMEDIATE DEMOBILIZATION/REMOBILIZATION (OPEN-CUT CONSTRUCTION)	EA	2
SP100B	INTERMEDIATE DEMOBILIZATION/REMOBILIZATION (MICROTUNNELING CONSTRUCTION)	EA	2

12/5/16

STATE OF TEXAS
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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

QUANTITIES

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	G5
CHECKED: DTB	KMH16157	

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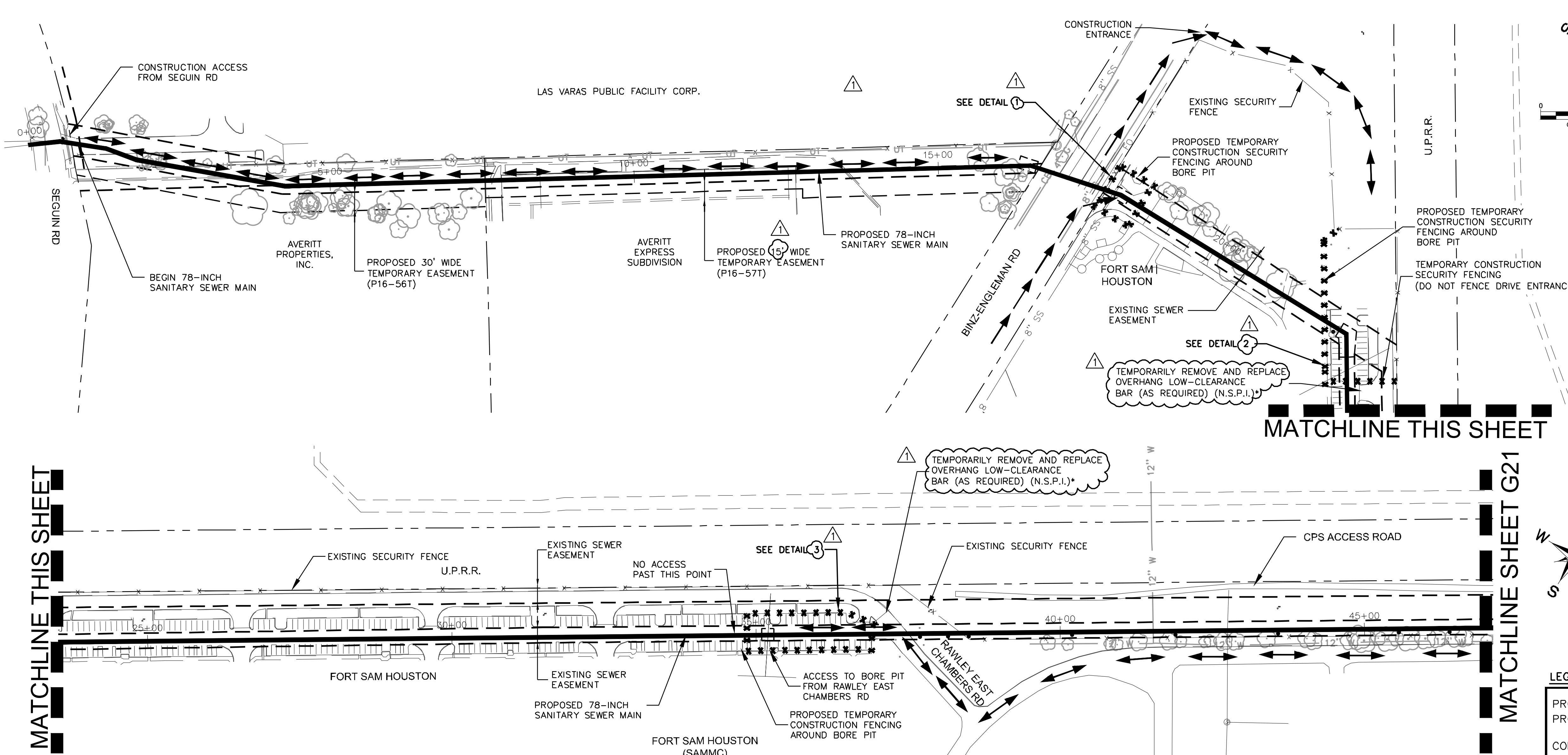
LAST SAVED 12/2/2016 4:59 PM

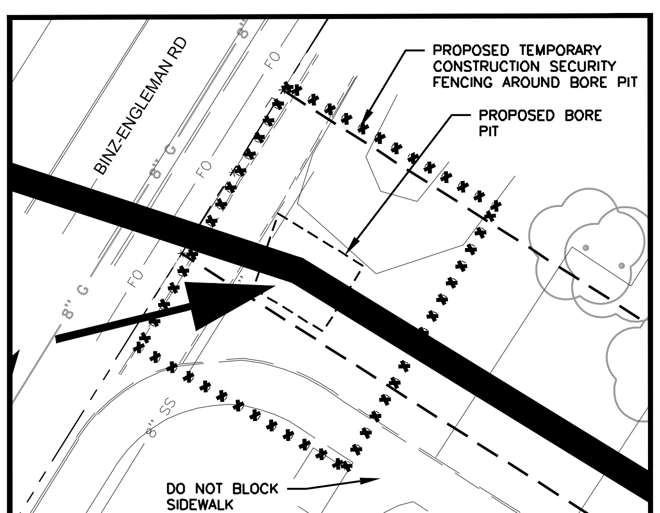


NOTES:
1. FORT SAM HOUSTON MAY HAVE TEMPORARY CONSTRUCTION STAGING AREAS AVAILABLE DURING CONSTRUCTION. CONTRACTOR TO COORDINATE AVAILABILITY AND USE WITH FORT SAM HOUSTON PRIOR TO CONSTRUCTION.

LEGEND *NO SEPARATE PAY ITEM (N.S.P.I.)

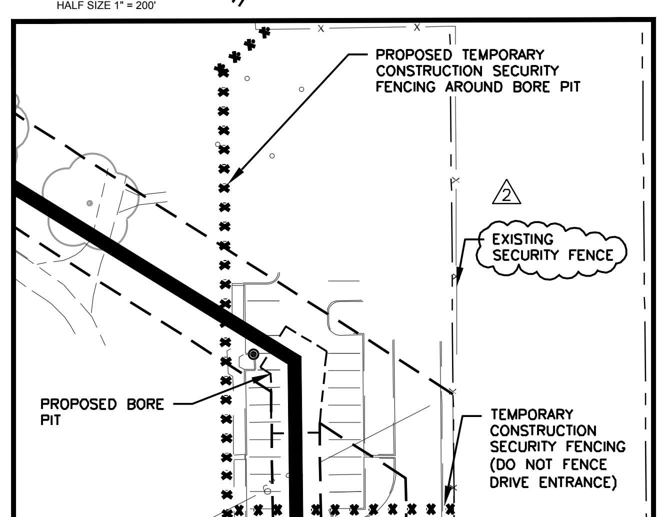
PROPOSED SANITARY SEWER LINE	(heavy solid line)
PROPERTY LINE	(dash-dot line)
CONSTRUCTION ACCESS	(double arrows)
BORE PIT	(dashed line)
PROPOSED TEMPORARY FENCING	(x x x line)

NOTE:
1. CONTRACTOR TO REMOVE TEMPORARY CONSTRUCTION FENCING UPON COMPLETION OF CONSTRUCTION AND RESTORE PERMANENT FENCE TO ORIGINAL CONDITION.



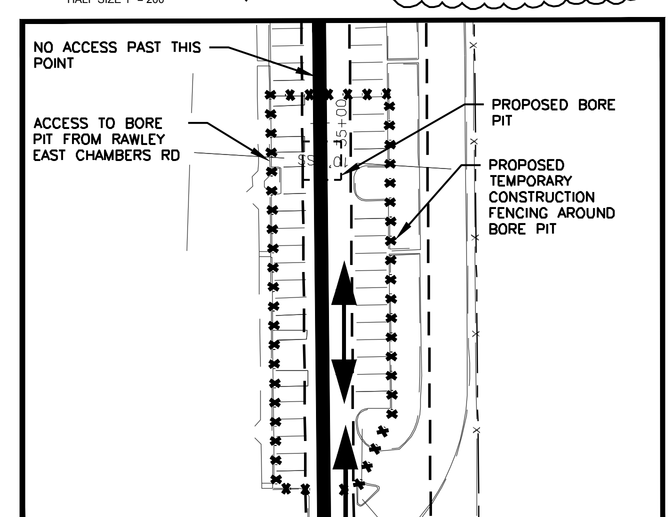
1 CONSTRUCTION SECURITY FENCING
1"=50'

NOTE:
1. CONTRACTOR TO REMOVE TEMPORARY CONSTRUCTION FENCING UPON COMPLETION OF CONSTRUCTION AND RESTORE PERMANENT FENCE TO ORIGINAL CONDITION.



2 CONSTRUCTION SECURITY FENCING
1"=100'

NOTE:
1. CONTRACTOR TO REMOVE TEMPORARY CONSTRUCTION FENCING UPON COMPLETION OF CONSTRUCTION.



3 CONSTRUCTION SECURITY FENCING
1"=100'

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No.	Revision	By	Date
1	ADDENDUM 3	DTB	12/05/2016

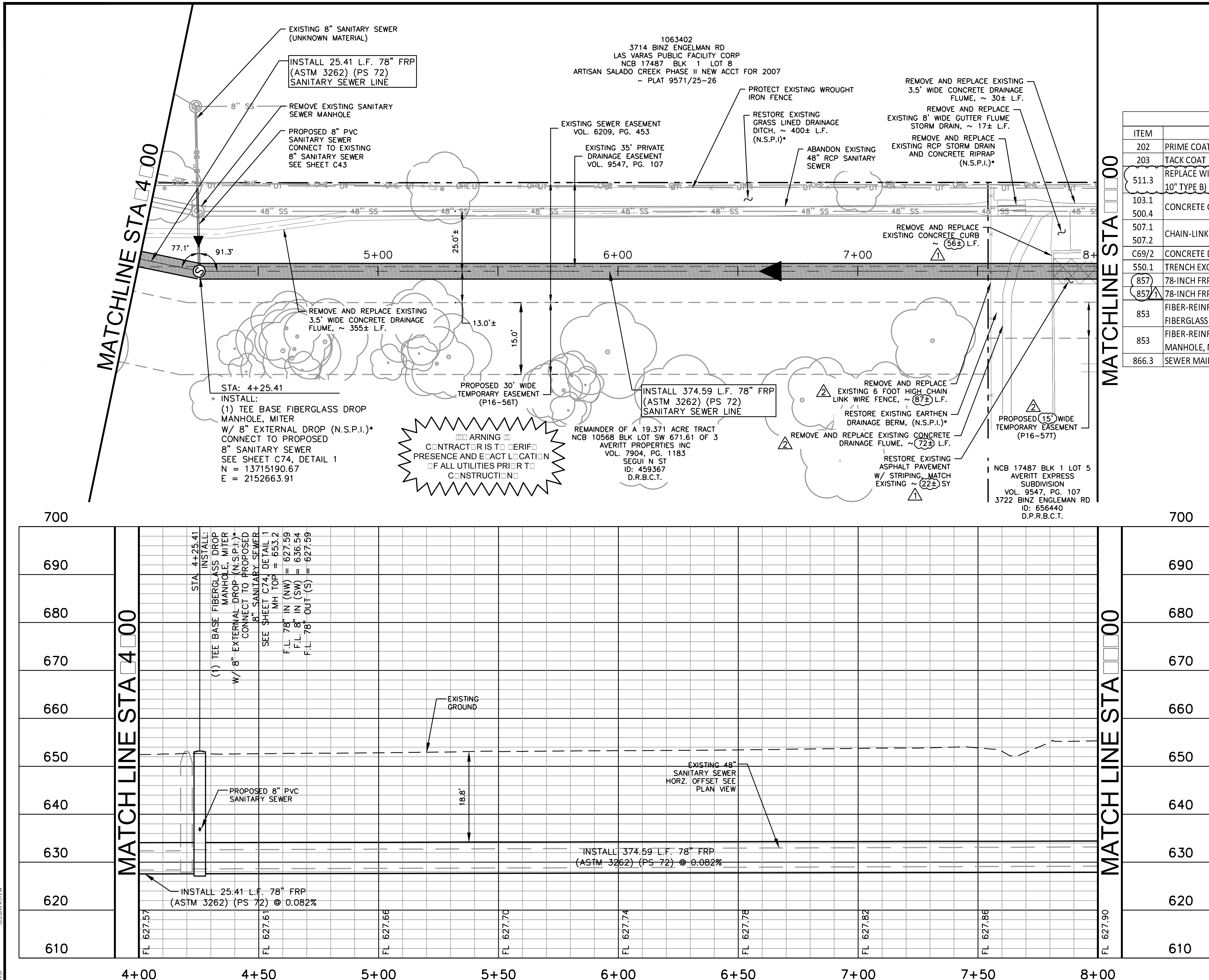
SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

CONTRACTOR ACCESS AND STAGING (SHEET 1 OF 4)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	G20
CHECKED: DTB	KMH16157	



GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
202	PRIME COAT	GAL	4
203	TACK COAT	GAL	2
511.3	REPLACE WITH HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D AND 10" TYPE B)	SY	22
103.1 500.4	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	56 (1)
507.1 507.2	CHAIN-LINK WIRE FENCE - (6 FT. HIGH) (REMOVE/INSTALL)	LF	87 (2)
C69/2	CONCRETE DRAINAGE FLUME REPLACEMENT (3.5' WIDE)	LF	474
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	400
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (22' TO 25')	LF	110
857 (1)	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	290
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	20 (1)
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

NOTES:

1. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
2. AT NO TIME SHALL THE AVERITT EXPRESS SITE BE LEFT UNATTENDED BY THE CONTRACTOR WITHOUT EXISTING, PROPOSED OR TEMPORARY FENCING IN PLACE. ALL TEMPORARY FENCING SHALL MATCH COSA STANDARD, ITEM 507.1 CHAIN-LINK FENCE (6' HIGH)(REMOVE/INSTALL).
3. (2) NO WORK IS ALLOWED ON THE WEEKENDS IN THE PROPOSED TEMPORARY EASEMENT ON THE EXISTING ASPHALT PAVEMENT OF THE AVERITT EXPRESS SUBDIVISION.
4. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE (OHE)
- EXISTING WATER METER
- EXISTING FIRE HYDRANT

STATE OF TEXAS — DAVID T. BENNETT — 101935 — LICENSED PROFESSIONAL ENGINEER — 12/5/16

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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 4+00 TO 8+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C2
CHECKED: RR	KMH16157	

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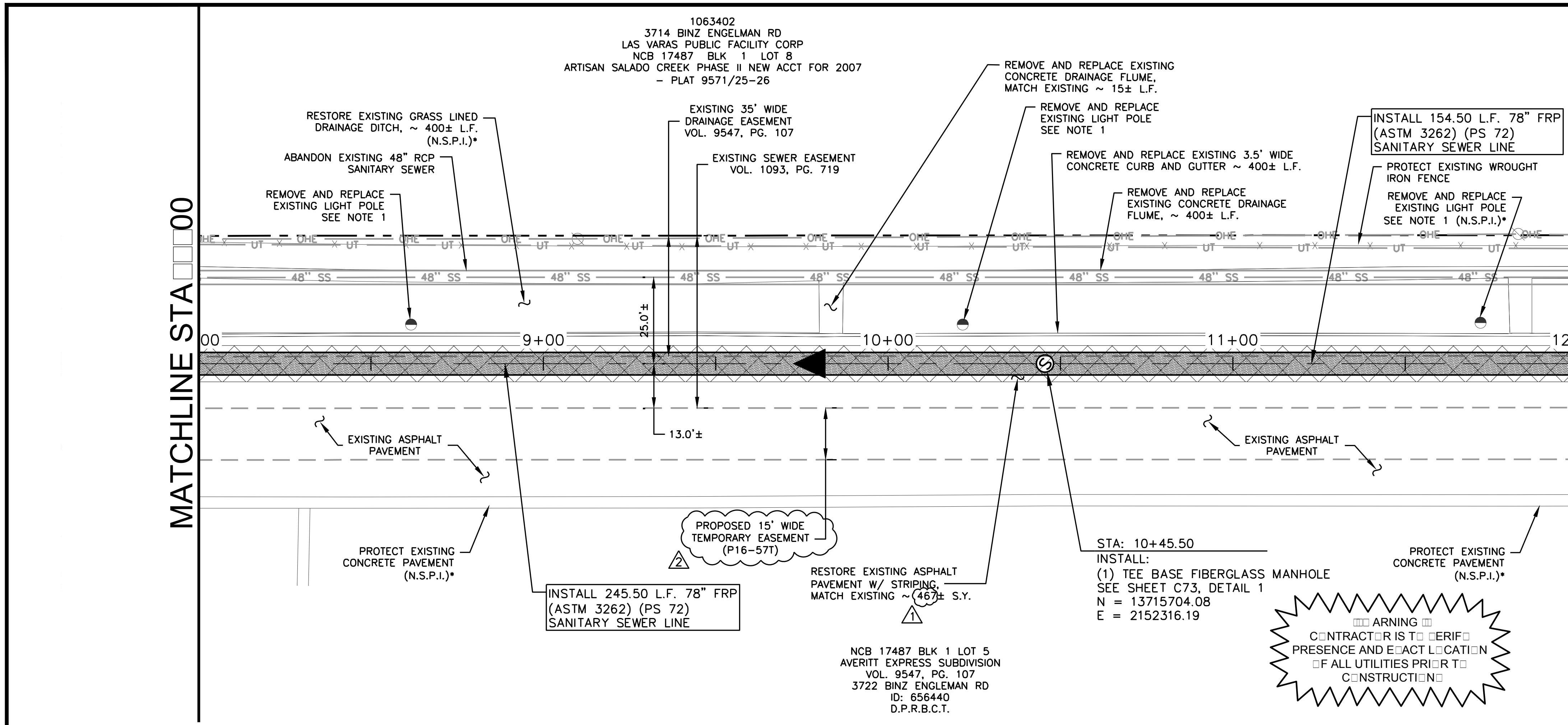


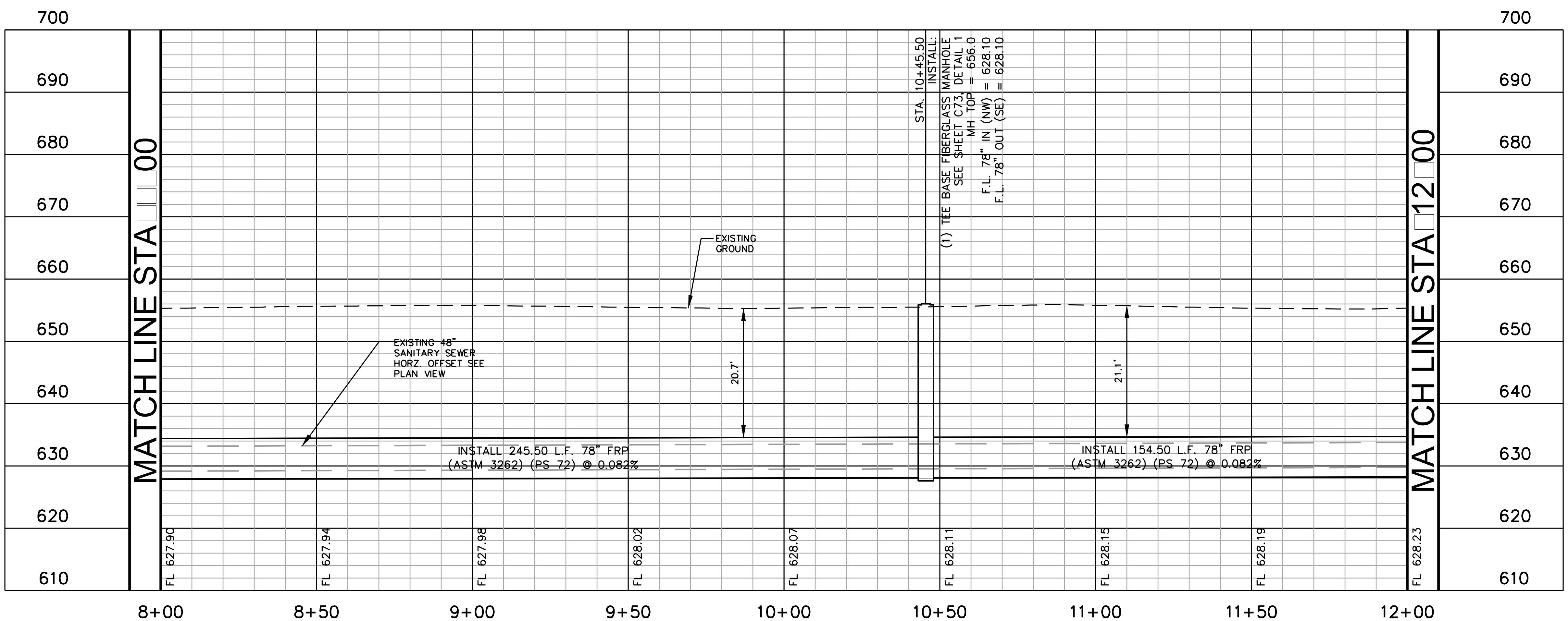
ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
202	PRIME COAT	GAL	93
203	TACK COAT	GAL	47
511.3	REPLACE WITH HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D AND 10" TYPE B)	SY	467
103.1 500.4	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	400
C69/2	CONCRETE DRAINAGE FLUME REPLACEMENT (3.5' WIDE)	LF	415
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	400
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	400
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, EXTRA DEPTH (>6')	VF	22
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

NOTES:
1. REMOVE AND REPLACE EXISTING LIGHT POLES AND UNDERGROUND ELECTRIC TO LIGHT POLES AS REQUIRED. (N.S.P.I.)* MATCH EXISTING.
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
3. NO WORK IS ALLOWED ON THE WEEKENDS IN THE PROPOSED TEMPORARY EASEMENT ON THE EXISTING ASPHALT PAVEMENT OF THE AVERITT EXPRESS SUBDIVISION.
4. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL	HALF SIZE (11" x 17") 1" = 20' VERTICAL



LEGEND

PROPOSED SANITARY SEWER LINE	
EXISTING SANITARY SEWER LINE	48" SS
EXISTING WATER LINE	6" W
EXISTING GAS LINE	4" G
PROPERTY LINE	
EXISTING WIRE FENCE	
EFFECTIVE 100-YR FLOOD PLAIN	
EDGE OF ASPHALT	
EXISTING EASEMENT LINE	
PROPOSED EASEMENT LINE	
EXISTING OVERHEAD ELECTRIC LINE & POLE	OHE
EXISTING WATER METER	
EXISTING FIRE HYDRANT	

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1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 8+00 TO 12+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C3
CHECKED: DTB	KMH16157	

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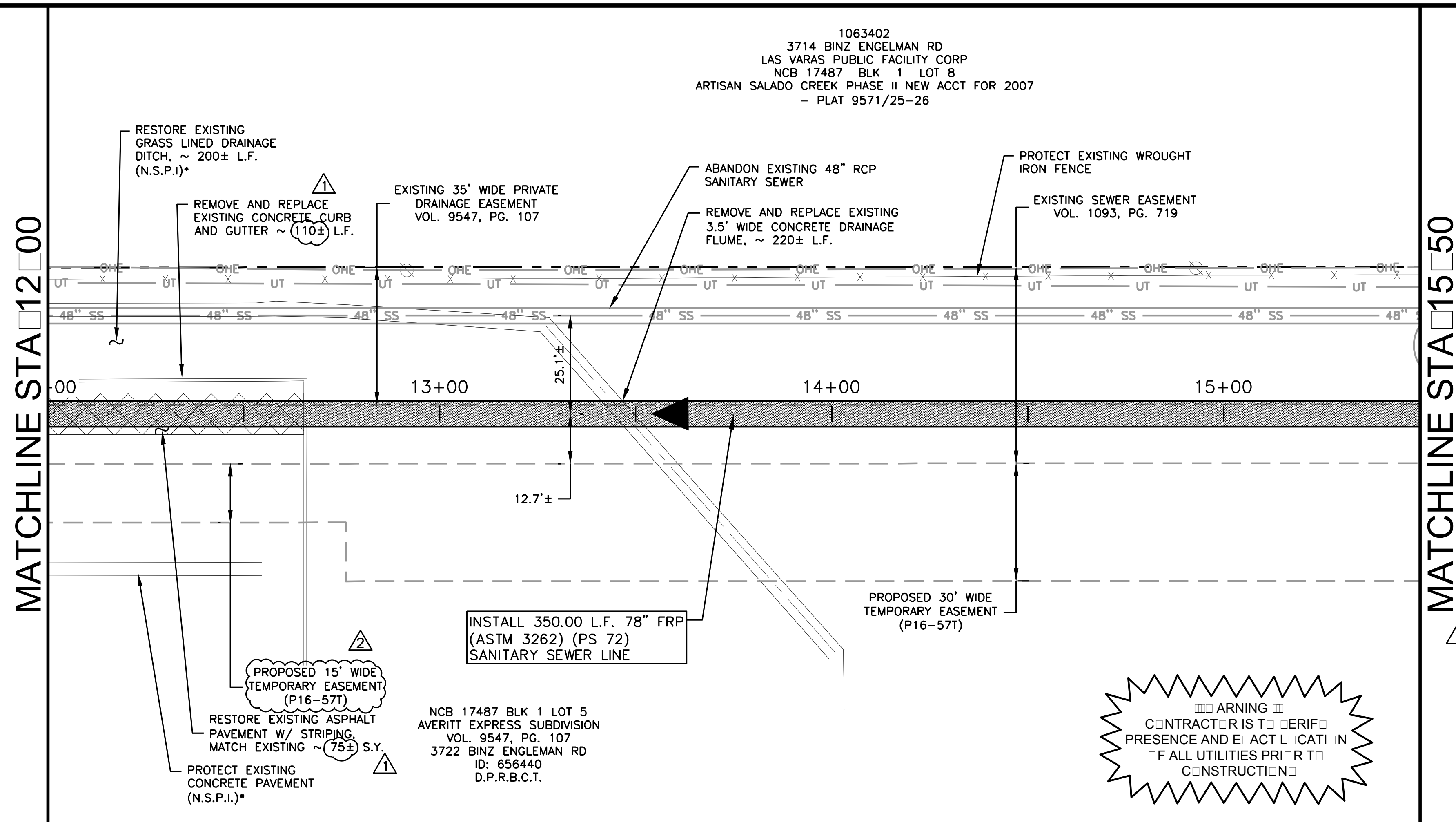
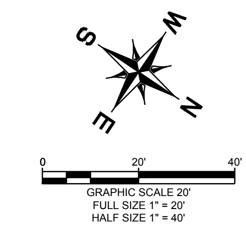


1063402
3714 BINZ ENGELMAN RD
LAS VARAS PUBLIC FACILITY CORP
NCB 17487 BLK 1 LOT 8
ARTISAN SALADO CREEK PHASE II NEW ACCT FOR 2007
- PLAT 9571/25-26
RESTORE EXISTING GRASS LINED DRAINAGE DITCH, ~ 200± L.F. (N.S.P.I)*
REMOVE AND REPLACE EXISTING CONCRETE CURB AND GUTTER ~ 110± L.F.
EXISTING 35' WIDE PRIVATE DRAINAGE EASEMENT VOL. 9547, PG. 107
ABANDON EXISTING 48" RCP SANITARY SEWER
REMOVE AND REPLACE EXISTING 3.5' WIDE CONCRETE DRAINAGE FLUME, ~ 220± L.F.
PROTECT EXISTING WROUGHT IRON FENCE
EXISTING SEWER EASEMENT VOL. 1093, PG. 719
MATCHLINE STA 12+00
MATCHLINE STA 15+50
13+00
14+00
15+00
25.1'±
12.7'±
INSTALL 350.00 L.F. 78" FRP (ASTM 3262) (PS 72) SANITARY SEWER LINE
PROPOSED 30' WIDE TEMPORARY EASEMENT (P16-57T)
PROPOSED 15' WIDE TEMPORARY EASEMENT (P16-57T)
RESTORE EXISTING ASPHALT PAVEMENT W/ STRIPING, MATCH EXISTING ~ 75± S.Y.
PROTECT EXISTING CONCRETE PAVEMENT (N.S.P.I.)*
NCB 17487 BLK 1 LOT 5
AVERITT EXPRESS SUBDIVISION
VOL. 9547, PG. 107
3722 BINZ ENGLEMAN RD
ID: 656440
D.P.R.B.C.T.
WARNING
CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION



ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
202	PRIME COAT	GAL	15
203	TACK COAT	GAL	8
511.3	REPLACE WITH HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D AND 10" TYPE B)	SY	75
103.1 500.4	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	110
C69/2	CONCRETE DRAINAGE FLUME REPLACEMENT (3.5' WIDE)	LF	220
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	350
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	350
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	350

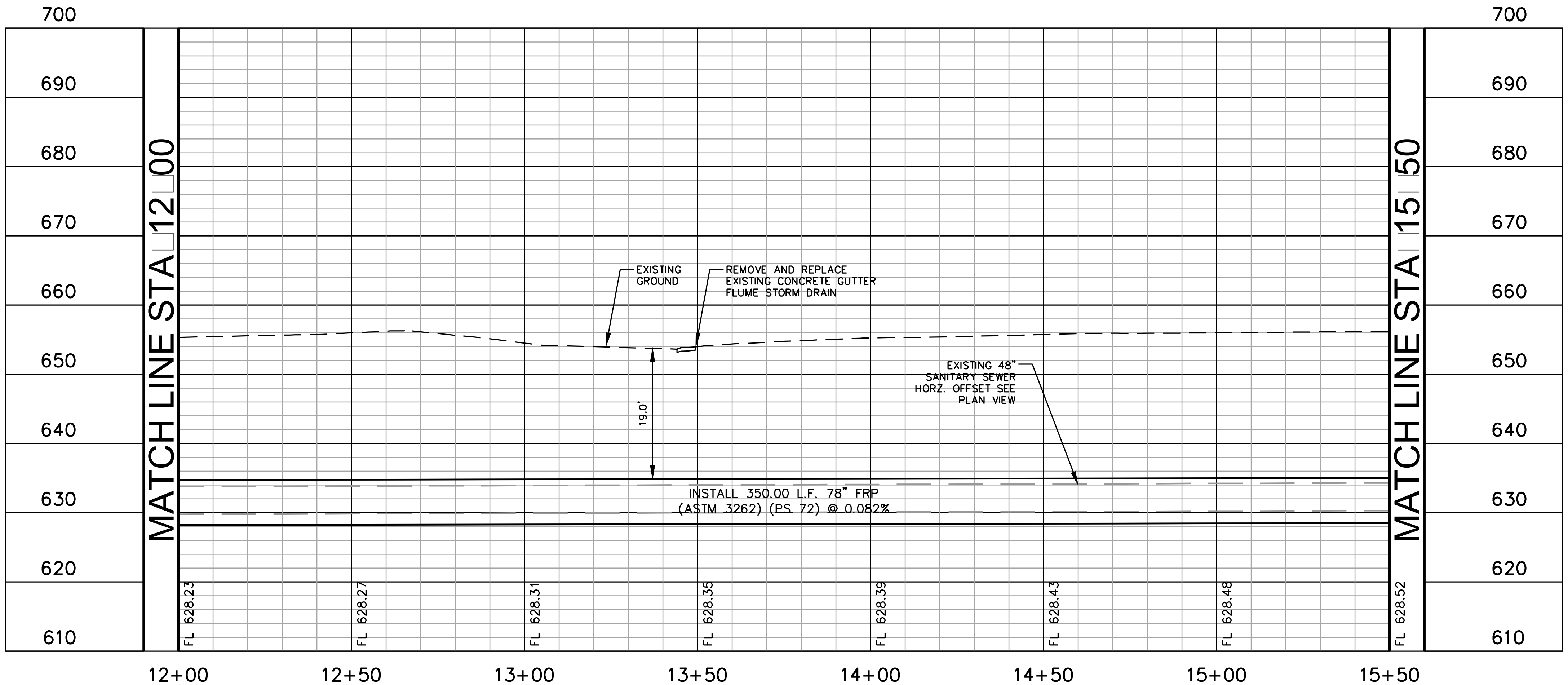
NOTES:
1. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
2. NO WORK IS ALLOWED ON THE WEEKENDS IN THE PROPOSED TEMPORARY EASEMENT ON THE EXISTING ASPHALT PAVEMENT OF THE AVERITT EXPRESS SUBDIVISION.
3. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

PROPOSED SANITARY SEWER LINE
EXISTING SANITARY SEWER LINE
EXISTING WATER LINE
EXISTING GAS LINE
PROPERTY LINE
EXISTING WIRE FENCE
EFFECTIVE 100-YR FLOOD PLAIN
EDGE OF ASPHALT
EXISTING EASEMENT LINE
PROPOSED EASEMENT LINE
EXISTING OVERHEAD ELECTRIC LINE & POLE
EXISTING WATER METER
EXISTING FIRE HYDRANT



700
690
680
670
660
650
640
630
620
610
MATCH LINE STA 12+00
MATCH LINE STA 15+50
EXISTING GROUND
REMOVE AND REPLACE EXISTING CONCRETE GUTTER FLUME STORM DRAIN
19.0'
EXISTING 48" SANITARY SEWER HORZ. OFFSET SEE PLAN VIEW
INSTALL 350.00 L.F. 78" FRP (ASTM 3262) (PS 72) @ 0.082%
FL 628.23
FL 628.27
FL 628.31
FL 628.35
FL 628.39
FL 628.43
FL 628.48
FL 628.52
12+00
12+50
13+00
13+50
14+00
14+50
15+00
15+50

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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 12+00 TO 15+50

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C4
CHECKED: DTB	KMH16157	

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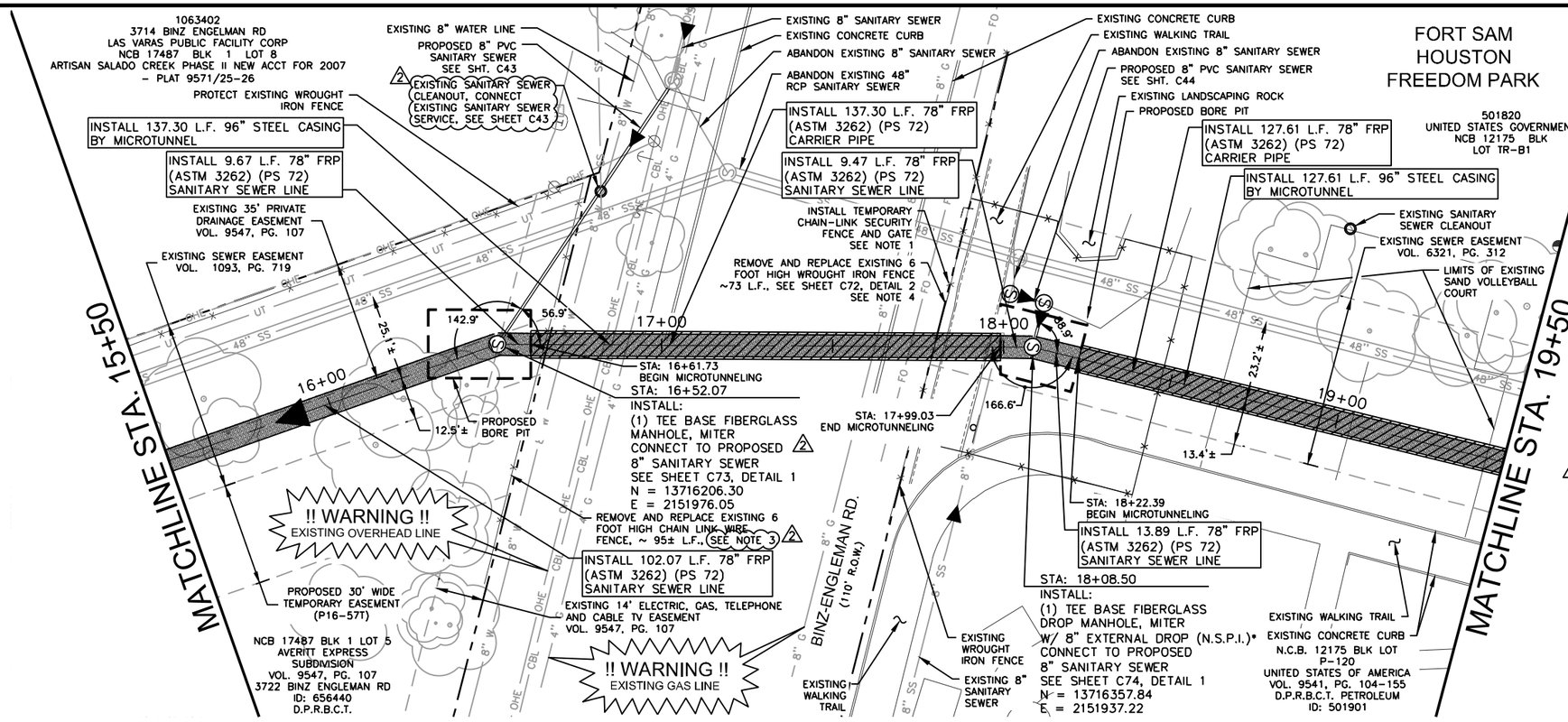


!! WARNING !!
CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

NOTES:
1. INSTALL TEMPORARY CHAIN-LINK SECURITY FENCE AND GATE CONNECT TO EXISTING SECURITY FENCE AND ISOLATE CONSTRUCTION AREA FROM FORT SAM HOUSTON FOR DURATION OF CONSTRUCTION. SEE DETAILS ON SHEET C68, AND ACCESS AND STAGING ON G20.
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
3. AT NO TIME SHALL THE AVERITT EXPRESS SITE BE LEFT UNATTENDED BY THE CONTRACTOR WITHOUT EXISTING, PROPOSED OR TEMPORARY FENCING IN PLACE. ALL TEMPORARY FENCING SHALL MATCH COSA STANDARD, ITEM 507.1 CHAIN-LINK FENCE (6' HIGH)(REMOVE/INSTALL).
4. CONTRACTOR TO REMOVE TEMPORARY CONSTRUCTION FENCING UPON COMPLETION OF CONSTRUCTION AND RESTORE PERMANENT FENCE TO ORIGINAL CONDITION.
5. FOR CONTRACTOR ACCESS AND STAGING SEE SHEET C20.
2 6. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

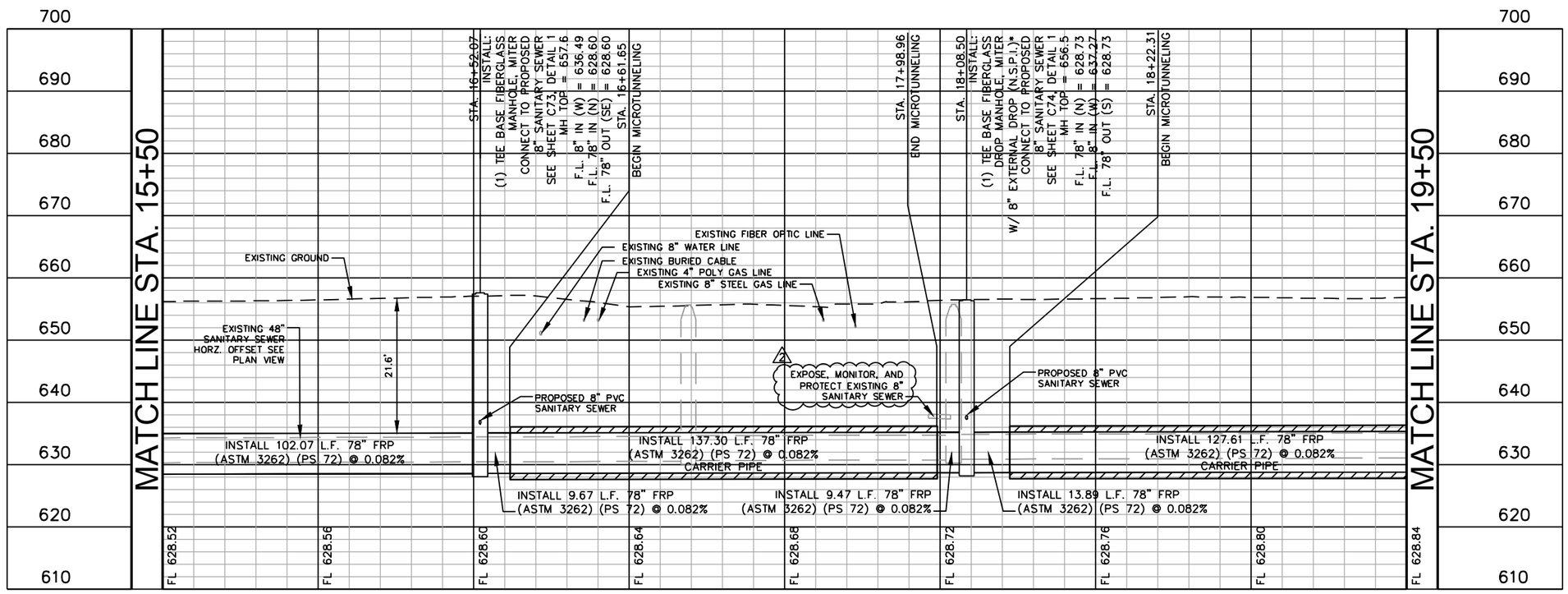
ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
507.1 507.2	CHAIN-LINK WIRE FENCE - (6 FT. HIGH) (REMOVE/INSTALL)	LF	2 95
C72/1	WROUGHT IRON FENCE (REMOVE/INSTALL)	LF	73
C68/1	FORT SAM HOUSTON TEMPORARY CHAIN-LINK SECURITY FENCE	LF	270
C68/1	FORT SAM HOUSTON TEMPORARY SECURITY GATE	EA	1
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	135
1 857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	135
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, EXTRA DEPTH (>6')	VF	1 23
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	1 22
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	265
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	265
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

• NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL	HALF SIZE (11" x 17") 1" = 20' VERTICAL

LEGEND

PROPOSED SANITARY SEWER LINE
EXISTING SANITARY SEWER LINE
EXISTING WATER LINE
EXISTING GAS LINE
PROPERTY LINE
EXISTING WIRE FENCE
EFFECTIVE 100-YR FLOOD PLAIN
EDGE OF ASPHALT
EXISTING EASEMENT LINE
PROPOSED EASEMENT LINE
EXISTING OVERHEAD ELECTRIC LINE & POLE
EXISTING WATER METER
EXISTING FIRE HYDRANT



12/5/16

STATE OF TEXAS
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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 15+50 TO 19+50

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	C5
DRAWN: DDH	FNI PROJECT NO.	
CHECKED: DTB	KMH16157	

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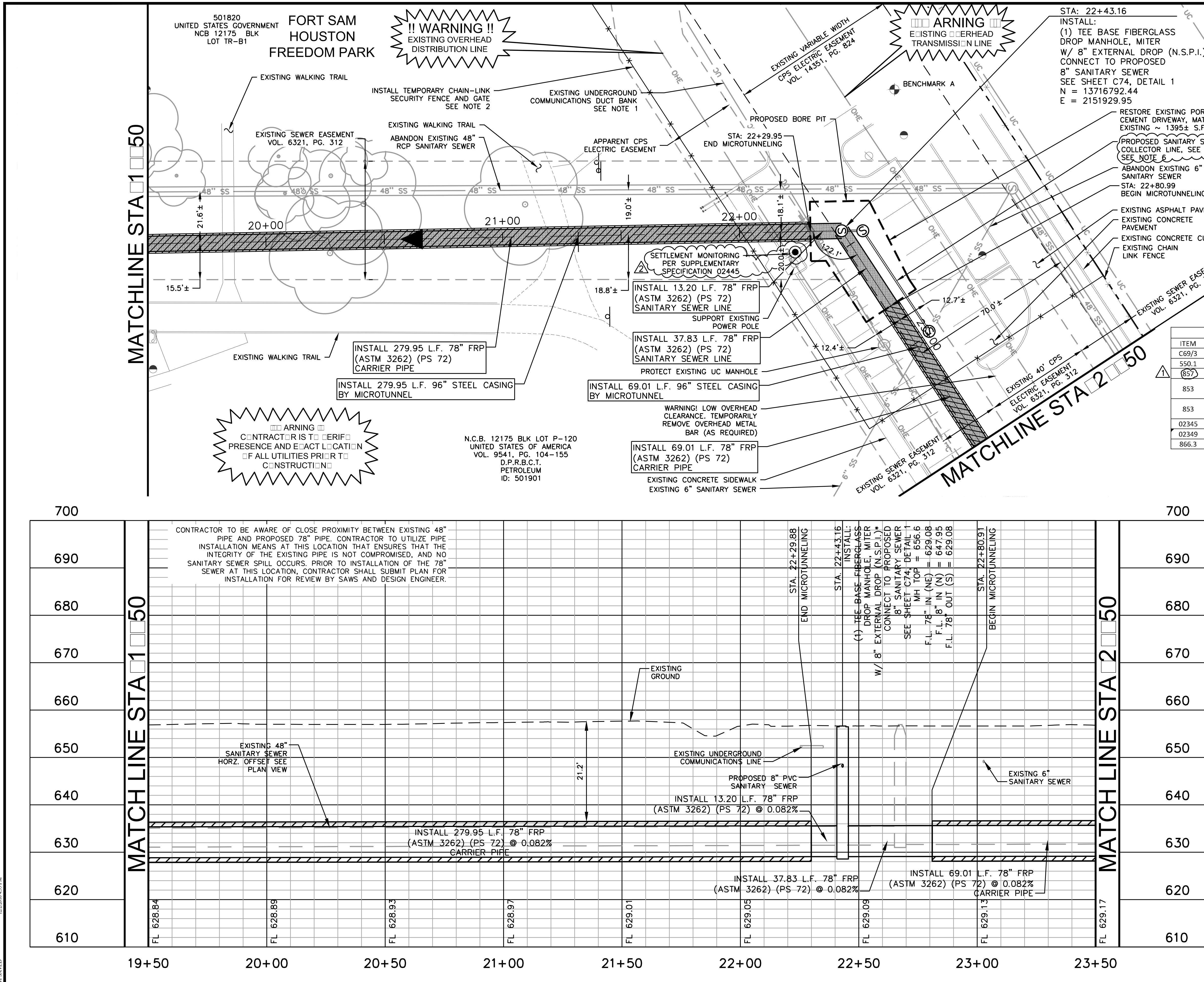
DATE/TIME LAST SAVED



501820 UNITED STATES GOVERNMENT NCB 12175 BLK LOT TR-B1
FORT SAM HOUSTON FREEDOM PARK
!! WARNING !! EXISTING OVERHEAD DISTRIBUTION LINE
WARNING EXISTING OVERHEAD TRANSMISSION LINE
STA: 22+43.16
INSTALL:
(1) TEE BASE FIBERGLASS DROP MANHOLE, MITER W/ 8" EXTERNAL DROP (N.S.P.I.)* CONNECT TO PROPOSED 8" SANITARY SEWER SEE SHEET C74, DETAIL 1
N = 13716792.44
E = 2151929.95
EXISTING WALKING TRAIL
INSTALL TEMPORARY CHAIN-LINK SECURITY FENCE AND GATE SEE NOTE 2
EXISTING UNDERGROUND COMMUNICATIONS DUCT BANK SEE NOTE 1
EXISTING VARIABLE WIDTH CPS ELECTRIC EASEMENT VOL. 14351, PG. 824
BENCHMARK A
EXISTING SEWER EASEMENT VOL. 6321, PG. 312
ABANDON EXISTING 48" RCP SANITARY SEWER
APPARENT CPS ELECTRIC EASEMENT
PROPOSED BORE PIT
STA: 22+29.95 END MICROTUNNELING
RESTORE EXISTING PORTLAND CEMENT DRIVEWAY, MATCH EXISTING ~ 1395± S.F.
PROPOSED SANITARY SEWER COLLECTOR LINE, SEE SHT. C44 SEE NOTE 6
ABANDON EXISTING 6" SANITARY SEWER
STA: 22+80.99 BEGIN MICROTUNNELING
UNION PACIFIC RAILROAD (100' R.O.W.)
EXISTING ASPHALT PAVEMENT
EXISTING CONCRETE PAVEMENT
EXISTING CONCRETE CURB
EXISTING CHAIN LINK FENCE
MATCHLINE STA 19+50
20+00
21+00
22+00
SETTLEMENT MONITORING PER SUPPLEMENTARY SPECIFICATION 02445
INSTALL 13.20 L.F. 78" FRP (ASTM 3262) (PS 72) SANITARY SEWER LINE
SUPPORT EXISTING POWER POLE
INSTALL 37.83 L.F. 78" FRP (ASTM 3262) (PS 72) SANITARY SEWER LINE
PROTECT EXISTING UC MANHOLE
INSTALL 279.95 L.F. 78" FRP (ASTM 3262) (PS 72) CARRIER PIPE
INSTALL 279.95 L.F. 96" STEEL CASING BY MICROTUNNEL
INSTALL 69.01 L.F. 96" STEEL CASING BY MICROTUNNEL
WARNING! LOW OVERHEAD CLEARANCE. TEMPORARILY REMOVE OVERHEAD METAL BAR (AS REQUIRED)
INSTALL 69.01 L.F. 78" FRP (ASTM 3262) (PS 72) CARRIER PIPE
EXISTING CONCRETE SIDEWALK
EXISTING 6" SANITARY SEWER
EXISTING 40' CPS ELECTRIC EASEMENT VOL. 6321, PG. 312
MATCHLINE STA 23+50
WARNING CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION
N.C.B. 12175 BLK LOT P-120 UNITED STATES OF AMERICA VOL. 9541, PG. 104-155 D.P.R.B.C.T. PETROLEUM ID: 501901
CONTRACTOR TO BE AWARE OF CLOSE PROXIMITY BETWEEN EXISTING 48" PIPE AND PROPOSED 78" PIPE. CONTRACTOR TO UTILIZE PIPE INSTALLATION MEANS AT THIS LOCATION THAT ENSURES THAT THE INTEGRITY OF THE EXISTING PIPE IS NOT COMPROMISED, AND NO SANITARY SEWER SPILL OCCURS. PRIOR TO INSTALLATION OF THE 78" SEWER AT THIS LOCATION, CONTRACTOR SHALL SUBMIT PLAN FOR INSTALLATION FOR REVIEW BY SAWS AND DESIGN ENGINEER.
STA. 22+29.88 END MICROTUNNELING
STA. 22+43.16 INSTALL: (1) TEE BASE FIBERGLASS DROP MANHOLE, MITER W/ 8" EXTERNAL DROP (N.S.P.I.)* CONNECT TO PROPOSED 8" SANITARY SEWER SEE SHEET C74, DETAIL 1 MH TOP = 656.6 F.L. 78" IN (NE) = 629.08 F.L. 8" IN (N) = 647.95 F.L. 78" OUT (S) = 629.08
STA. 22+80.91 BEGIN MICROTUNNELING
EXISTING GROUND
EXISTING 48" SANITARY SEWER HORZ. OFFSET SEE PLAN VIEW
EXISTING UNDERGROUND COMMUNICATIONS LINE
PROPOSED 8" PVC SANITARY SEWER
EXISTNG 6" SANITARY SEWER
INSTALL 13.20 L.F. 78" FRP (ASTM 3262) (PS 72) @ 0.082%
INSTALL 279.95 L.F. 78" FRP (ASTM 3262) (PS 72) @ 0.082% CARRIER PIPE
INSTALL 37.83 L.F. 78" FRP (ASTM 3262) (PS 72) @ 0.082%
INSTALL 69.01 L.F. 78" FRP (ASTM 3262) (PS 72) @ 0.082% CARRIER PIPE
FL 628.84
FL 628.89
FL 628.93
FL 628.97
FL 629.01
FL 629.05
FL 629.09
FL 629.13
FL 629.17
19+50
20+00
20+50
21+00
21+50
22+00
22+50
23+00
23+50
700
690
680
670
660
650
640
630
620
610

NOTES:
1. SUPPORT AND PROTECT EXISTING UNDERGROUND COMMUNICATIONS DUCT BANK AS REQUIRED (N.S.P.I.)*.
2. INSTALL TEMPORARY CHAIN-LINK SECURITY FENCE AND GATE. CONNECT TO EXISTING SECURITY FENCE AND ISOLATE CONSTRUCTION AREA FROM FORT SAM HOUSTON FOR DURATION OF CONSTRUCTION. SEE DETAILS ON SHEET C68, AND ACCESS AND STAGING ON G20.
3. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
4. CONTRACTOR TO REMOVE TEMPORARY CONSTRUCTION FENCING UPON COMPLETION OF CONSTRUCTION AND RESTORE PERMANENT FENCE TO ORIGINAL CONDITION.
5. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION.
6. CONTRACTOR TO COORDINATE AND CONFIRM PRESENCE AND LOCATION OF ANY EXISTING SEWER LATERAL(S) WITH FORT SAM HOUSTON AND SAWS, DETERMINE IF ANY EXISTING SEWER LATERAL(S) IS STILL IN SERVICE AND COORDINATE IF REPLACEMENT AND TIE-IN CONNECTION OF ANY EXISTING SEWER LATERAL(S) IS REQUIRED.
7. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
C69/3	FORT SAM CONCRETE PAVEMENT REPLACEMENT (UNKNOWN THICKNESS)	SF	1395
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	51
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	51
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	22
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	349
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	349
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE (OHE)
- EXISTING WATER METER
- EXISTING FIRE HYDRANT

STATE OF TEXAS — DAVID T. BENNETT — 101935 — LICENSED PROFESSIONAL ENGINEER — 12/5/16

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Texas Registered Engineering Firm F-2144

No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 19+50 TO 23+50

DATE: NOVEMBER 2016	SAWS PROJECT NO. 15-4506	SHEET NO. C6
DESIGN: RWR		
DRAWN: DDH	FNI PROJECT NO. KMH16157	
CHECKED: DTB		

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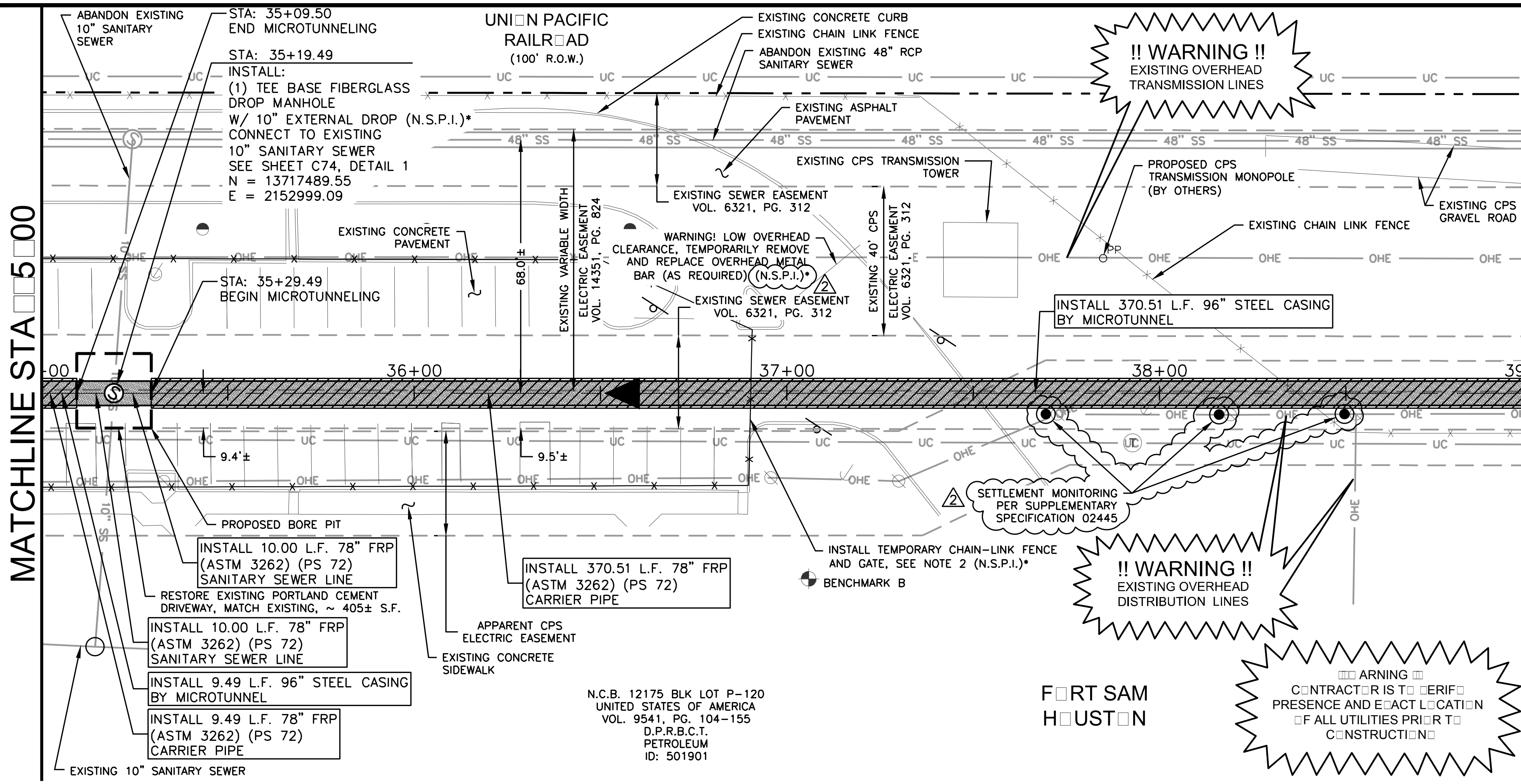


GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
C69/3	FORT SAM CONCRETE PAVEMENT REPLACEMENT (UNKNOWN THICKNESS)	SF	405
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	29
1 857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (30' TO 35')	LF	29
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	1 26
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	371
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	371
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

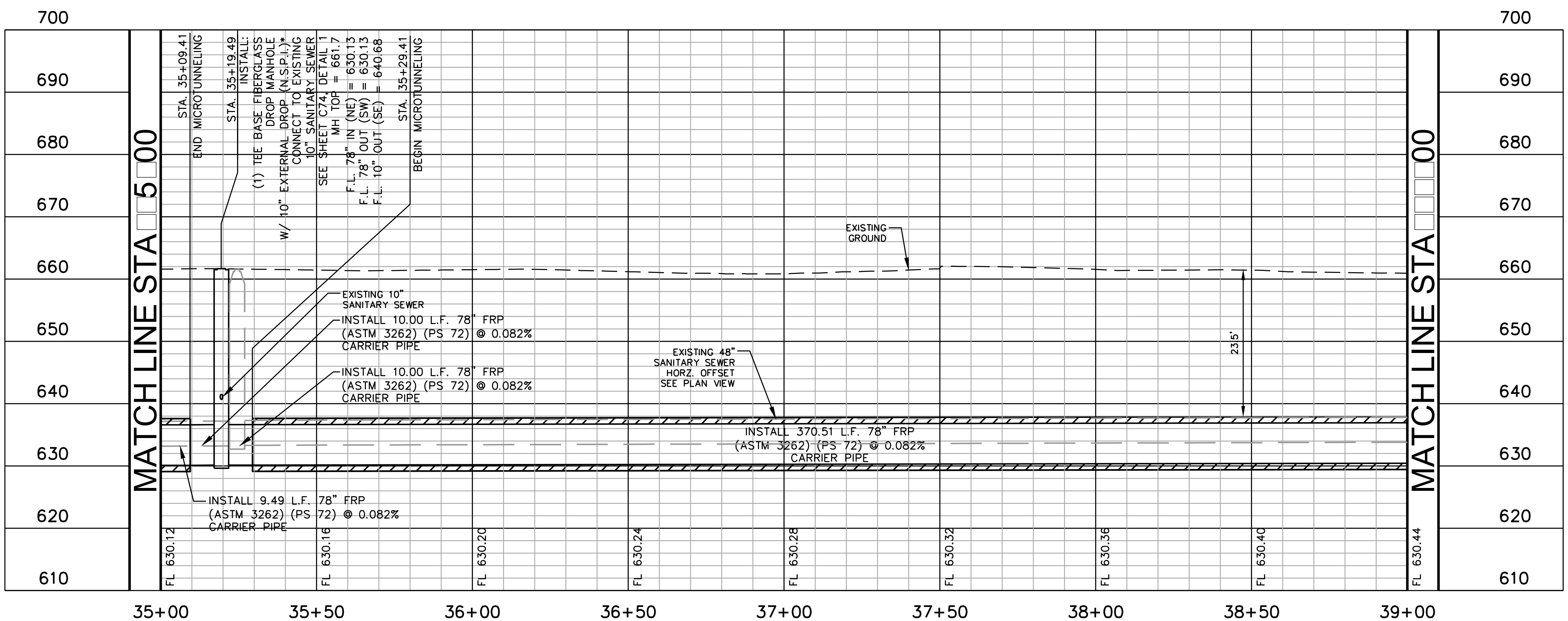
NOTES:
1. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
2. CONTRACTOR TO REMOVE TEMPORARY CONSTRUCTION FENCING UPON COMPLETION OF CONSTRUCTION.
3. FOR CONTRACTOR ACCESS AND STAGING SEE SHEET G20.
4. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION. 2
5. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT



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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

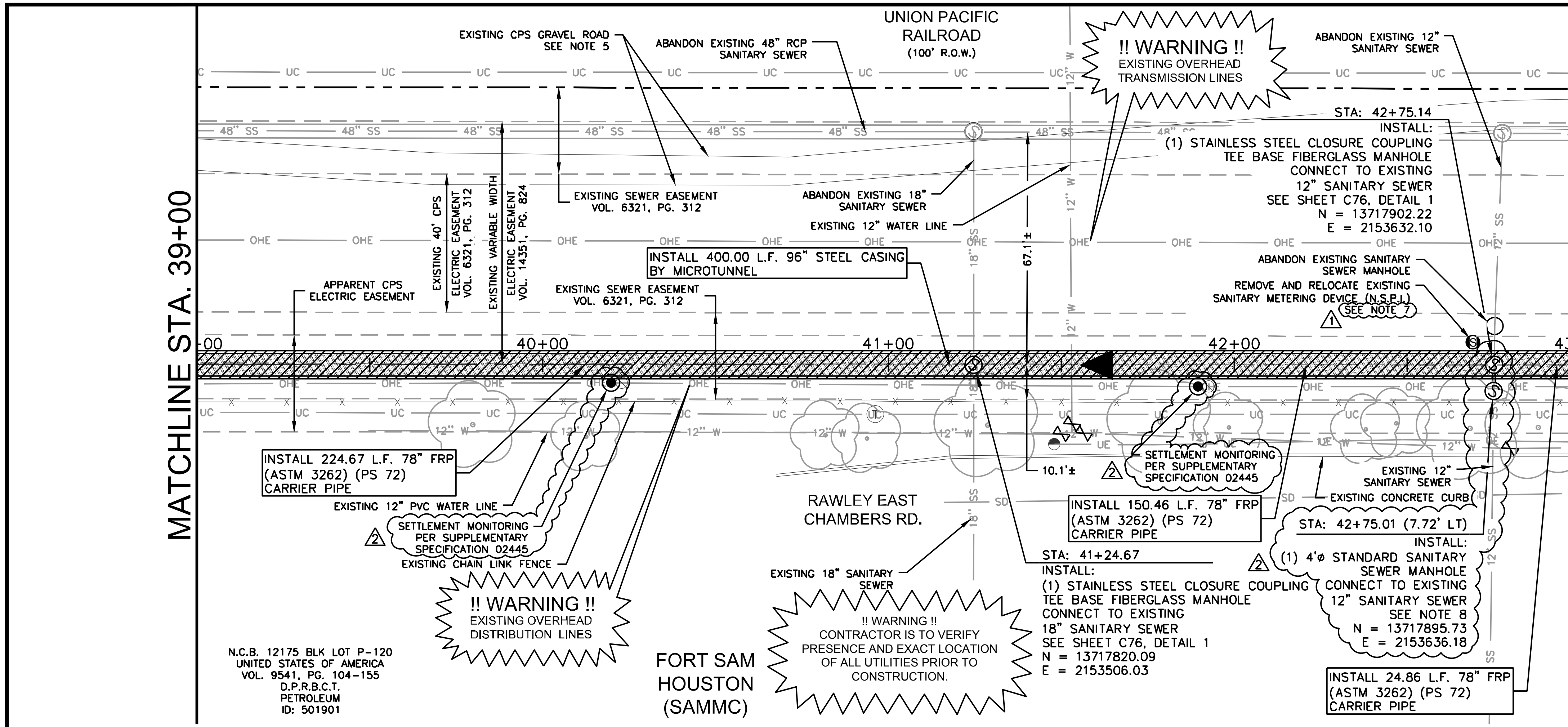
SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 35+00 TO 39+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C10
CHECKED: DTB	KMH16157	



ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
852	SANITARY SEWER MANHOLE	EA	1
852	EXTRA DEPTH MANHOLE (>6')	VF	26
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER, STAINLESS STEEL CLOSURE COUPLING	EA	2
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, EXTRA DEPTH (>6')	VF	51
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	400
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	400
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

NOTES:

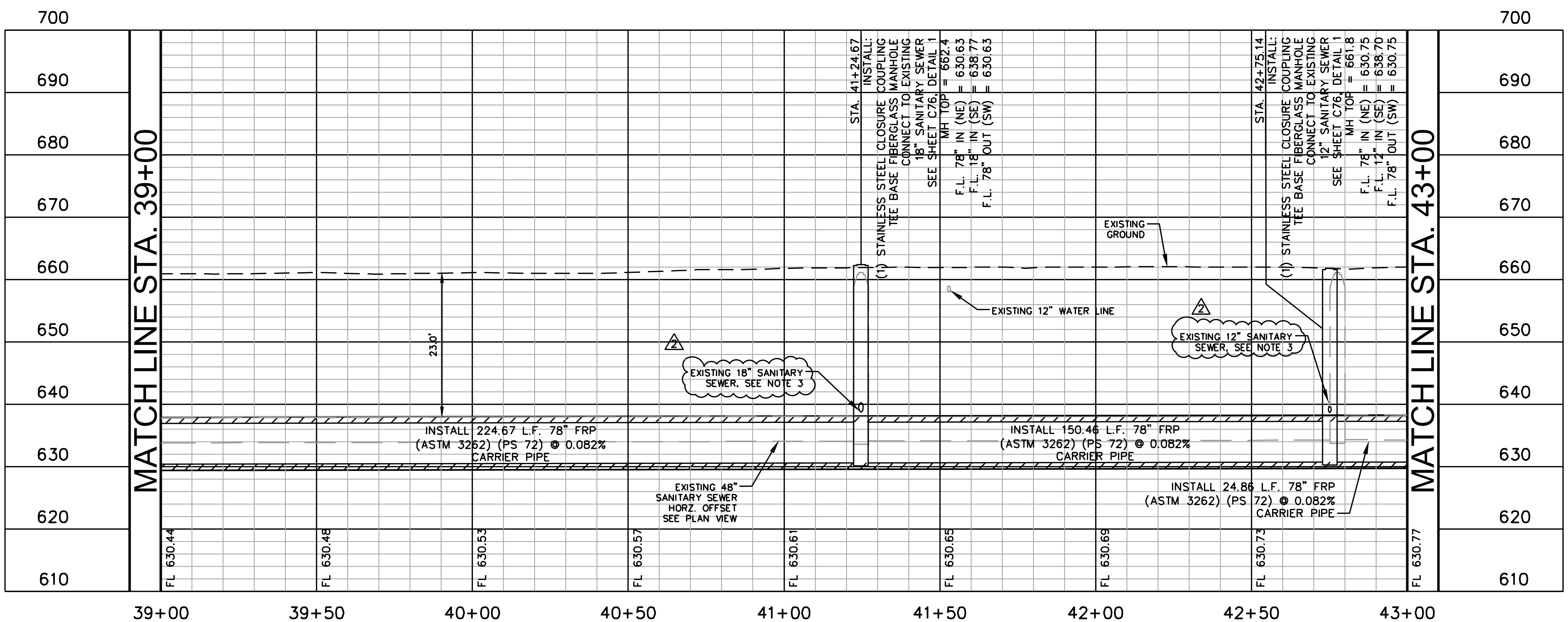
1. INSTALL TEE-BASE SANITARY SEWER MANHOLE WITH CLOSURE COUPLINGS AFTER INSTALLATION OF BORED STEEL CASING AND CARRIER PIPE IS INSTALLED, BUT BEFORE GROUTING BETWEEN CASING AND CARRIER PIPES.
2. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL LOCATION AND VERTICAL ELEVATION OF EXISTING SANITARY SEWER LATERAL PRIOR TO BEGINNING CONSTRUCTION AND PRIOR TO MANHOLE FABRICATION.
3. CONTRACTOR SHALL SUPPORT AND PROTECT EXISTING SANITARY SEWER LATERALS DURING INSTALLATION OF 96-INCH STEEL CASING PIPE BY MICROTUNNEL AND APPLY CONSTRUCTION METHODS THAT PREVENT SETTLEMENT AND KEEP THE SANITARY SEWER LATERALS IN SERVICE DURING MICROTUNNELING.
4. IN LIEU OF INSTALLING STAINLESS STEEL CLOSURE COUPLING TEE BASE FIBERGLASS MANHOLE, CONTRACTOR MAY EXCAVATE MICROTUNNEL BORE PIT AT LOCATION AND INSTALL STANDARD FWC COUPLING TEE BASE FIBERGLASS MANHOLE. N.S.P.I.*
5. CONTRACTOR TO UTILIZE EXISTING CPS GRAVEL ROAD TO ACCESS BORE PITS OUTSIDE OF EXISTING FORT SAM HOUSTON SECURITY FENCE. SEE ACCESS AND STAGING ON SHEET G21.
6. ~~REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.~~
7. FORT SAM HOUSTON OWNED FLOW MEASUREMENT METERING DEVICE TO BE REMOVED, RELOCATED, INSTALLED AND CALIBRATED TO MEASURE DISCHARGE OF EXISTING 12-INCH SANITARY SEWER LINE INTO PROPOSED 78-INCH SANITARY SEWER LINE.
8. CONTRACTOR SHALL INSTALL AND MATCH EXISTING SANITARY SEWER MANHOLE FOR METERING DEVICE PRIOR TO RELOCATING, INSTALLING AND CALIBRATING METERING DEVICE. SEQUENCE INSTALLATION OF METERING DEVICE MANHOLE WITH INSTALLATION OF TEE-BASE SANITARY SEWER MANHOLE WITH CLOSURE COUPLING. INSTALL TIE-IN CONNECTION OF 12-INCH SANITARY SEWER FROM METERING DEVICE MANHOLE TO TEE-BASE MANHOLE, N.S.P.I.*
9. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION.
10. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE (OHE)
- EXISTING WATER METER
- EXISTING FIRE HYDRANT



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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 39+00 TO 43+00

DATE: NOVEMBER 2016	SAWS PROJECT NO. 15-4506	SHEET NO. C11
DESIGN: RWR		
DRAWN: DDH	FNI PROJECT NO. KMH16157	
CHECKED: DTB		

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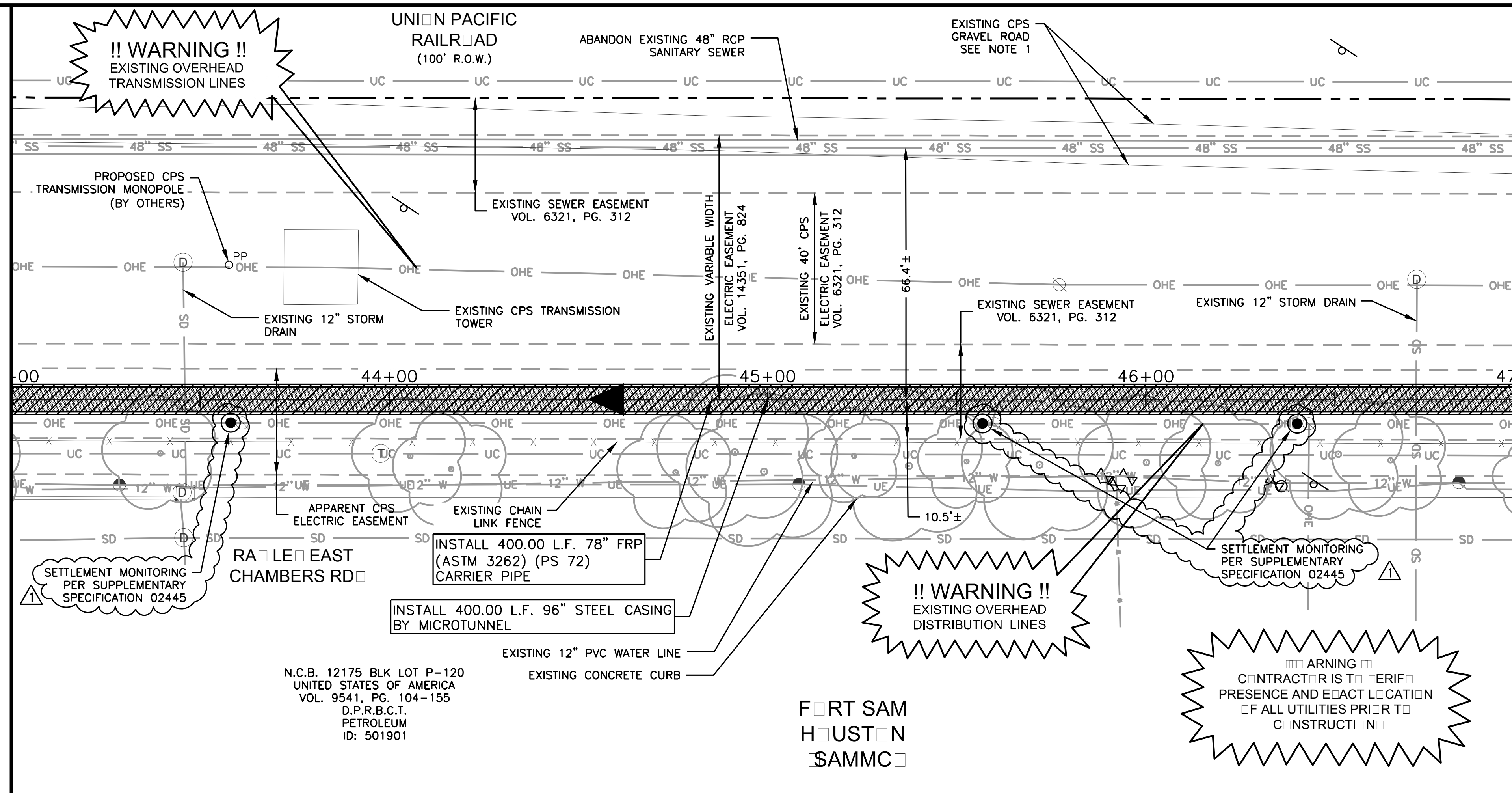


ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	400
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	400
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

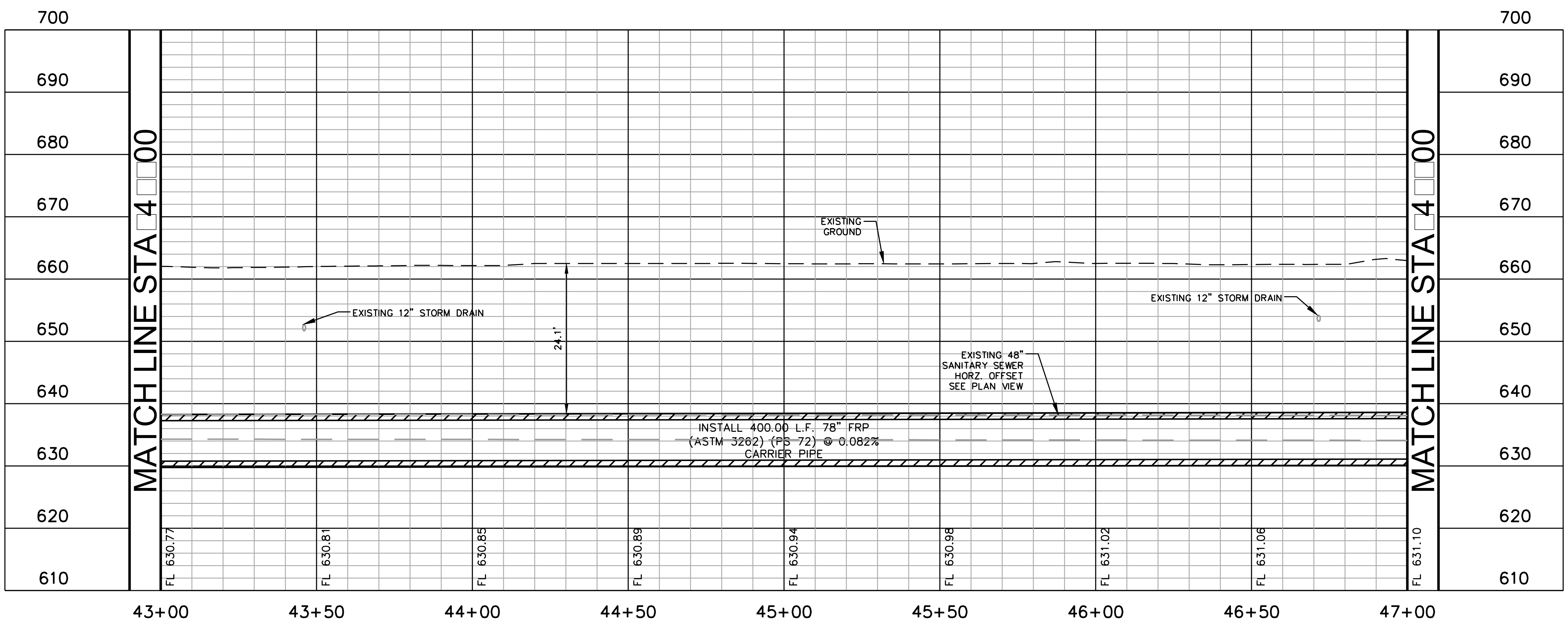
NOTES:
1. CONTRACTOR TO UTILIZE EXISTING CPS GRAVEL ROAD TO ACCESS BORE PITS OUTSIDE OF EXISTING FORT SAM HOUSTON SECURITY FENCE. SEE ACCESS AND STAGING ON SHEET G21.
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
3. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION.
4. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

PROPOSED SANITARY SEWER LINE
EXISTING SANITARY SEWER LINE
EXISTING WATER LINE
EXISTING GAS LINE
PROPERTY LINE
EXISTING WIRE FENCE
EFFECTIVE 100-YR FLOOD PLAIN
EDGE OF ASPHALT
EXISTING EASEMENT LINE
PROPOSED EASEMENT LINE
EXISTING OVERHEAD ELECTRIC LINE & POLE
EXISTING WATER METER
EXISTING FIRE HYDRANT



STATE OF TEXAS
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12/5/16

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No.	Revision	By	Date
3	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 43+00 TO 47+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C12
CHECKED: DTB	KMH16157	

PLOTTED BY JESSICA DOVERE 12/2/2016 5:15 PM
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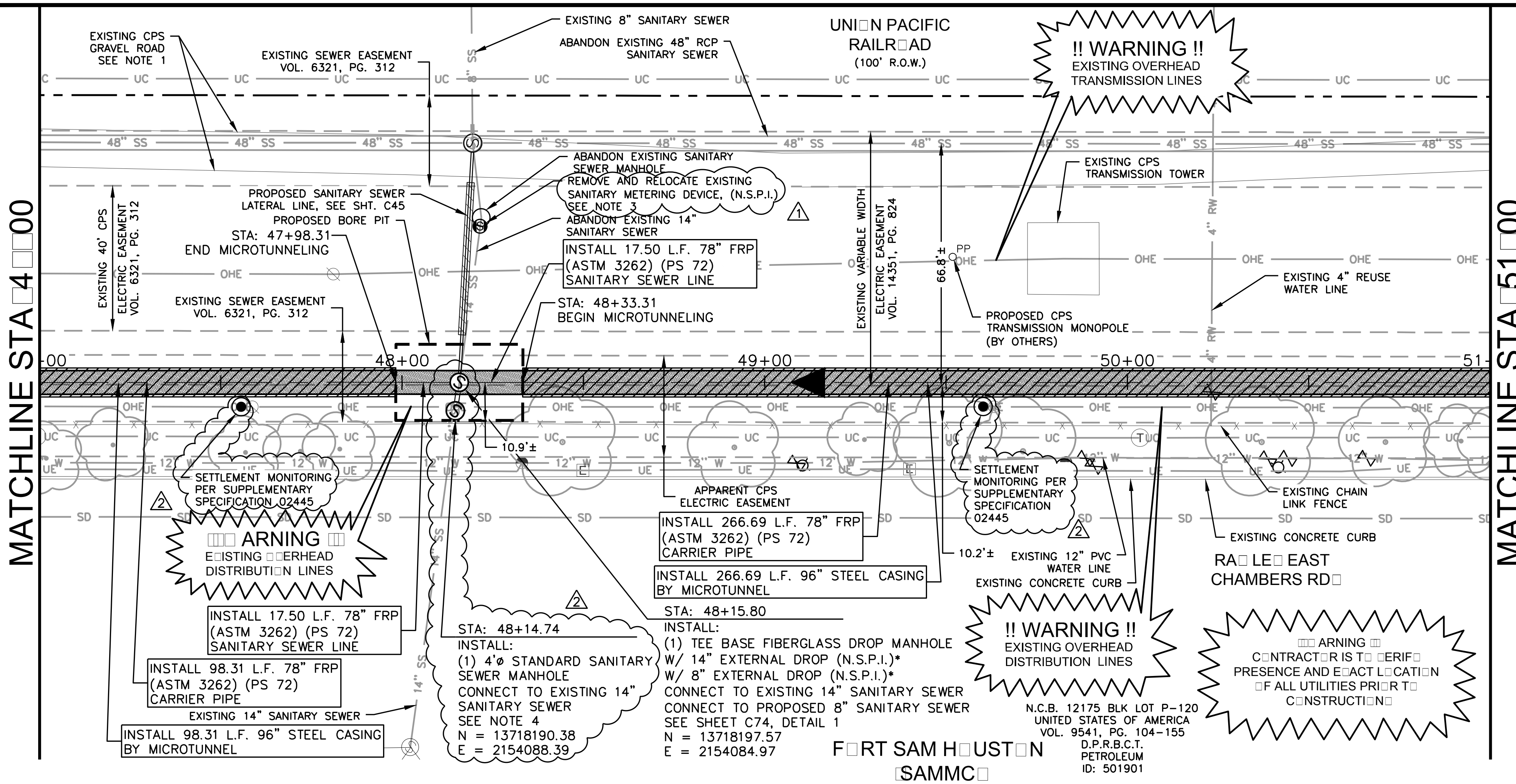
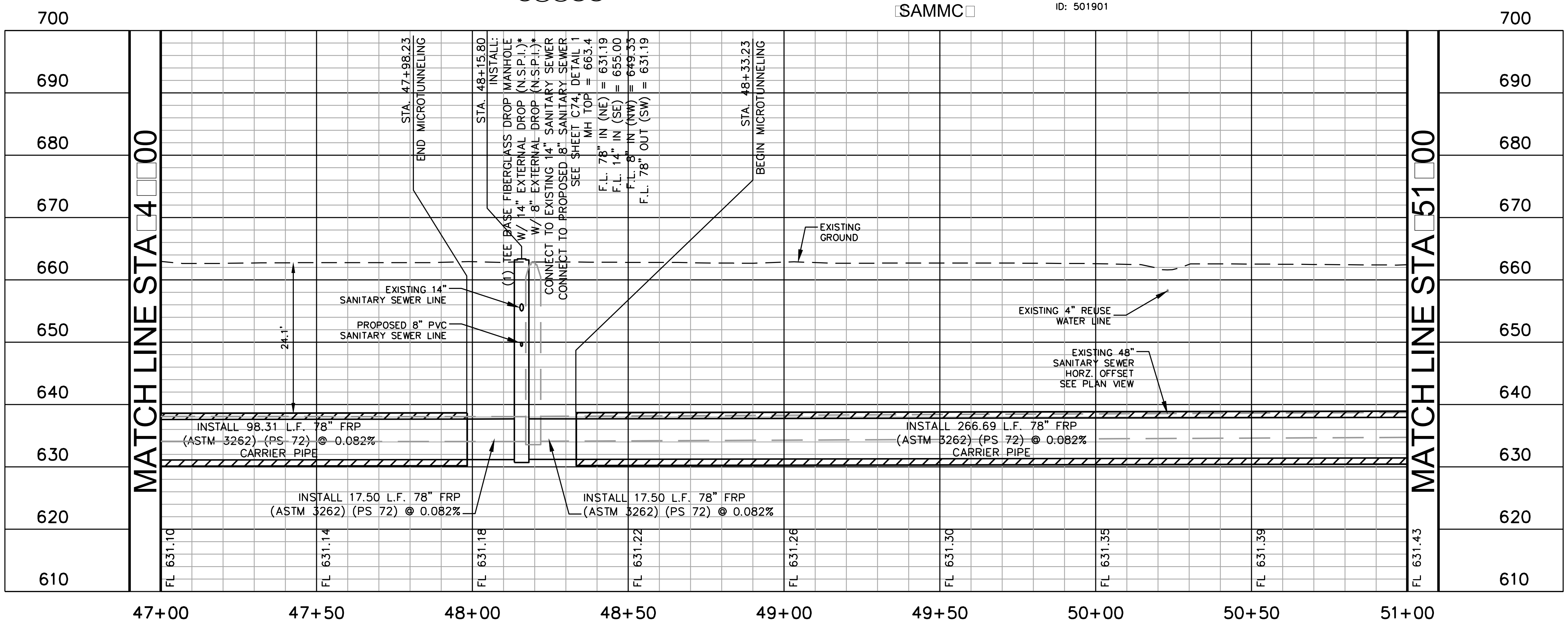
LAST SAVED 12/2/2016 1:43 PM





GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	35
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (30' TO 35')	LF	35
852	SANITARY SEWER MANHOLE	EA	1
852	EXTRA DEPTH MANHOLE (>6')	VF	26
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	26
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	365
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	365
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

NOTES:

1. CONTRACTOR TO UTILIZE EXISTING CPS GRAVEL ROAD TO ACCESS BORE PITS OUTSIDE OF EXISTING FORT SAM HOUSTON SECURITY FENCE. SEE ACCESS AND STAGING ON SHEET G21.
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
3. FORT SAM HOUSTON OWNED FLOW MEASUREMENT METERING DEVICE TO BE REMOVED, RELOCATED, INSTALLED AND CALIBRATED TO MEASURE DISCHARGE OF EXISTING 14-INCH SANITARY SEWER LINE INTO PROPOSED 78-INCH SANITARY SEWER LINE.
4. CONTRACTOR SHALL INSTALL AND MATCH EXISTING SANITARY SEWER MANHOLE FOR METERING DEVICE PRIOR TO RELOCATING, INSTALLING AND CALIBRATING METERING DEVICE. SEQUENCE INSTALLATION OF METERING DEVICE MANHOLE WITH INSTALLATION OF TEE-BASE SANITARY SEWER MANHOLE WITH CLOSURE COUPLING. INSTALL TIE-IN CONNECTION OF 14-INCH SANITARY SEWER FROM METERING DEVICE MANHOLE TO TEE-BASE MANHOLE. N.S.P.I.*
5. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION.
6. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT

STATE OF TEXAS — DAVID T. BENNETT — 101935 — LICENSED PROFESSIONAL ENGINEER — 12/5/16

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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 47+00 TO 51+00

DATE: NOVEMBER 2016	SAWS PROJECT NO. 15-4506	SHEET NO.
DESIGN: RWR		C13
DRAWN: DDH	FNI PROJECT NO. KMH16157	
CHECKED: DTB		

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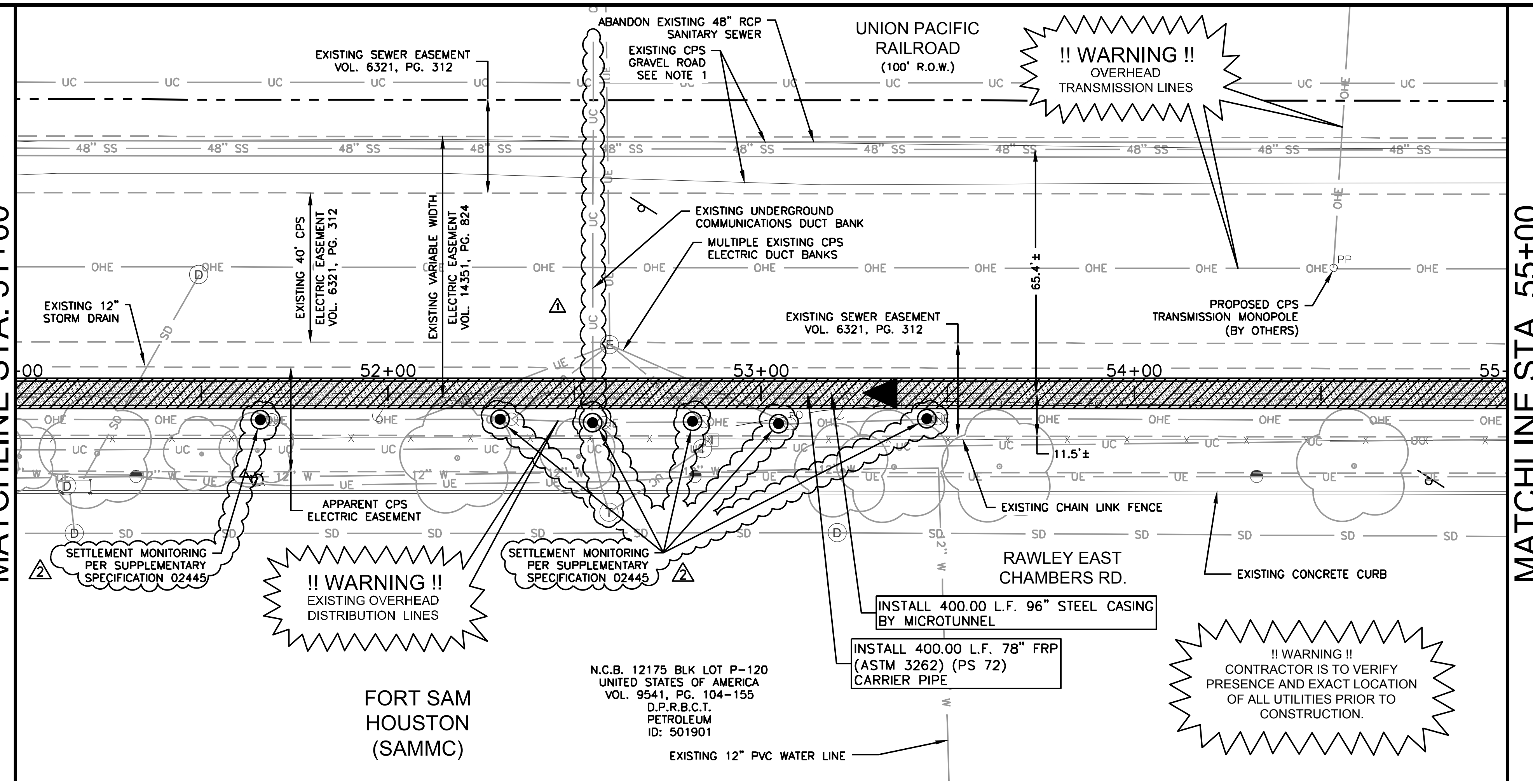

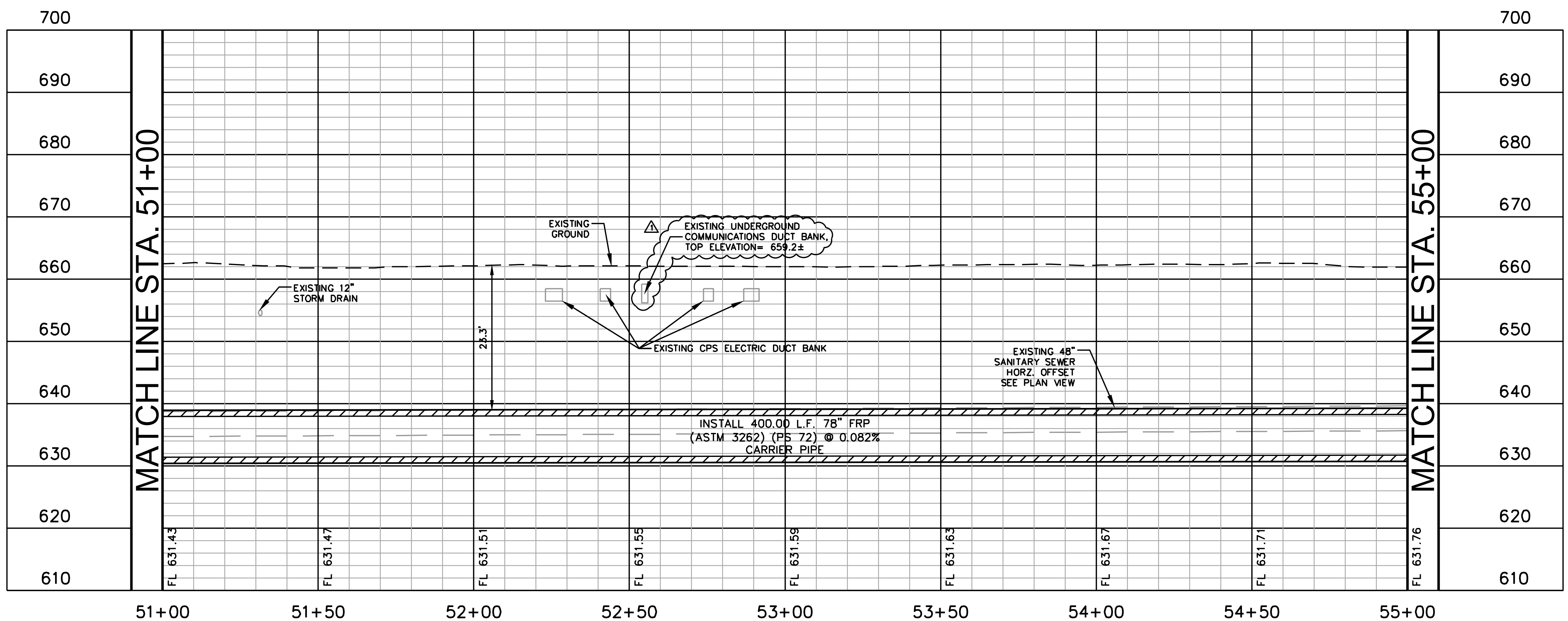

GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	400
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	400
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

NOTES:
1. CONTRACTOR TO UTILIZE EXISTING CPS GRAVEL ROAD TO ACCESS BORE PITS OUTSIDE OF EXISTING FORT SAM HOUSTON SECURITY FENCE. SEE ACCESS AND STAGING ON SHEET G21.
2. REFERENCE TREE PROTECTION PLAN FOR TREE ~~REMOVAL SHEETS TP-1 TO TP-35.~~
3. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION.
4. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL	HALF SIZE (11" x 17") 1" = 20' VERTICAL

LEGEND

PROPOSED SANITARY SEWER LINE	(S)
EXISTING SANITARY SEWER LINE	48" SS (S) 48" SS
EXISTING WATER LINE	6" W
EXISTING GAS LINE	4" G
PROPERTY LINE	
EXISTING WIRE FENCE	X X X X
EFFECTIVE 100-YR FLOOD PLAIN	
EDGE OF ASPHALT	
EXISTING EASEMENT LINE	
PROPOSED EASEMENT LINE	
EXISTING OVERHEAD ELECTRIC LINE & POLE	OHE
EXISTING WATER METER	(W)
EXISTING FIRE HYDRANT	

12/5/16
STATE OF TEXAS
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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

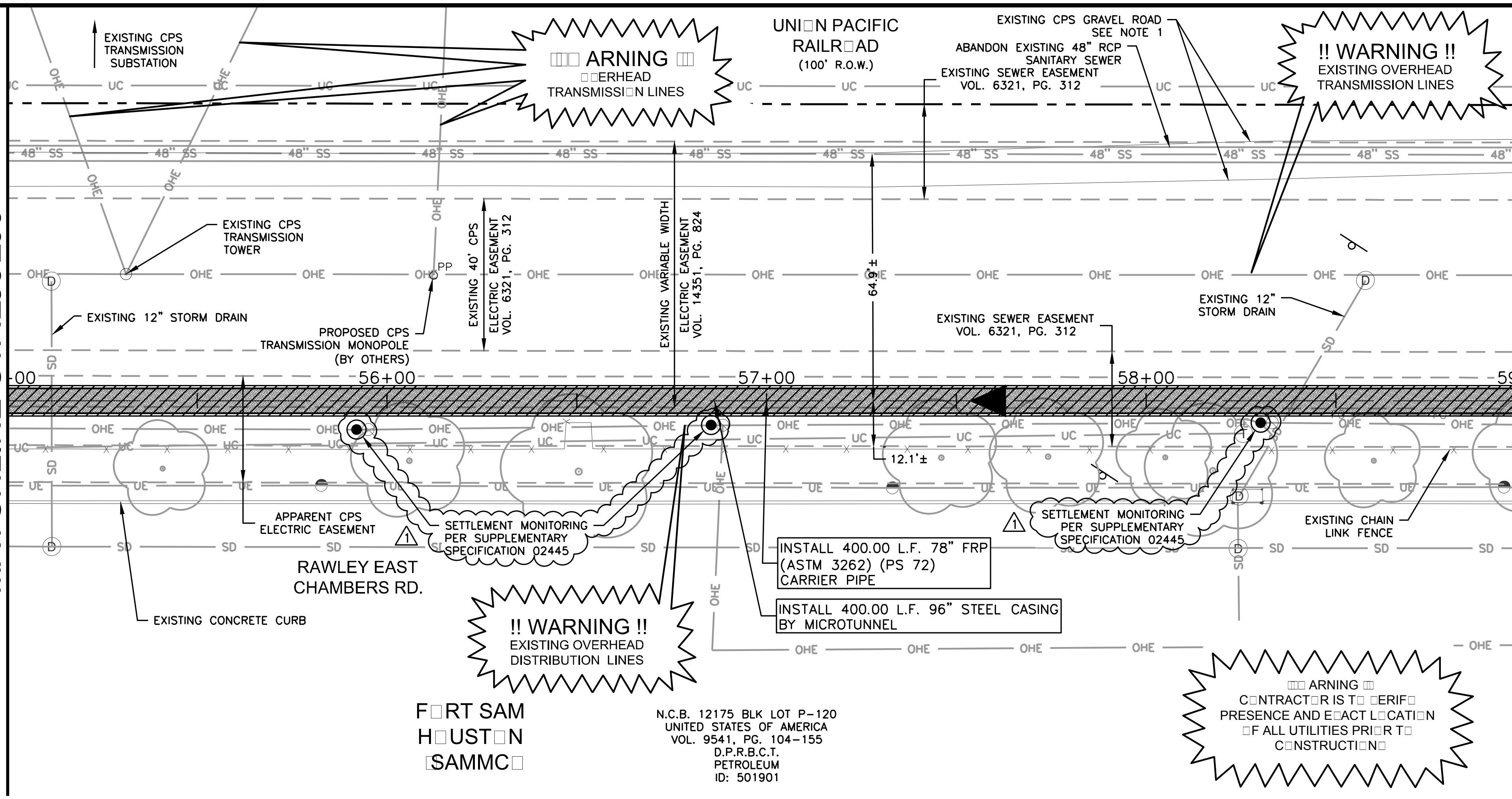
SAN ANTONIO WATER SYSTEM

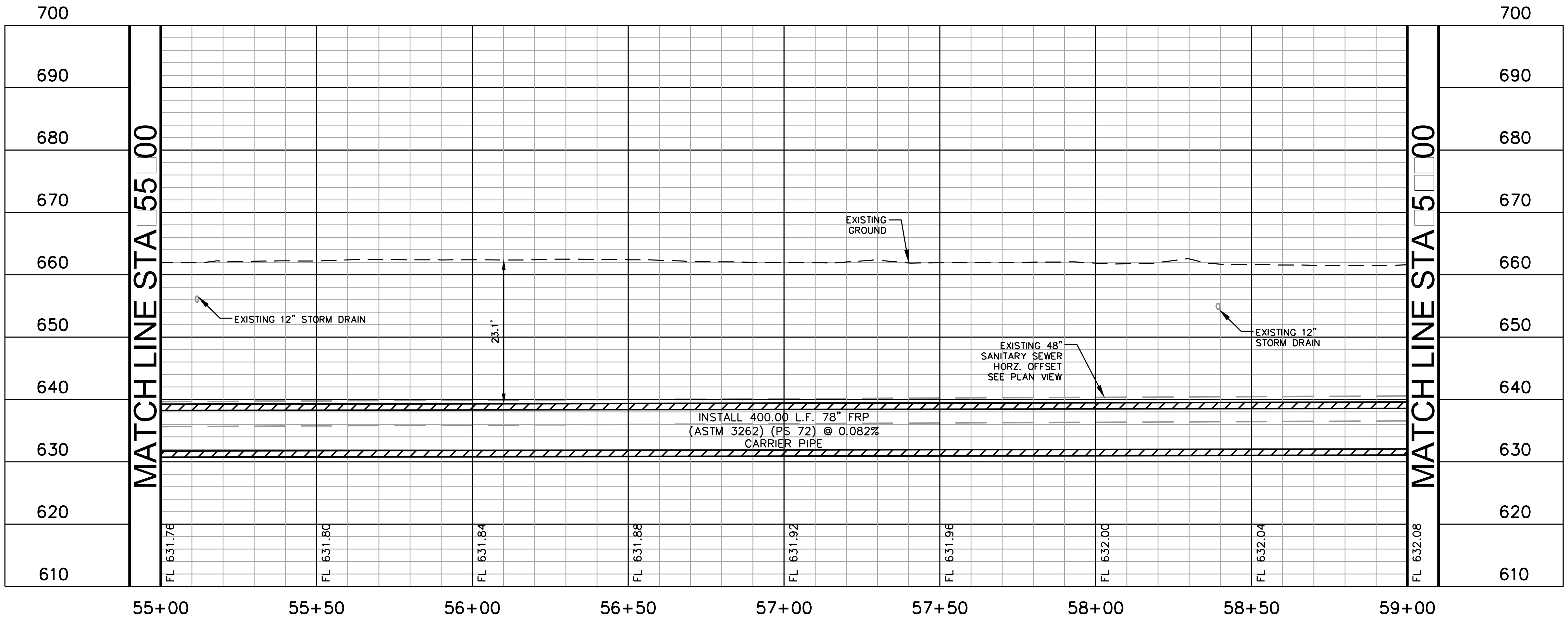
E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 51+00 TO 55+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C14
CHECKED: DTB	KMH16157	





GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	400
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	400
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

NOTES:
1. CONTRACTOR TO UTILIZE EXISTING CPS GRAVEL ROAD TO ACCESS BORE PITS OUTSIDE OF EXISTING FORT SAM HOUSTON SECURITY FENCE. SEE ACCESS AND STAGING ON SHEET G21.
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
3. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION. (1)
4. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 10' VERTICAL	1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE (OHE)
- EXISTING WATER METER
- EXISTING FIRE HYDRANT

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No.	Revision	By	Date
1	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 55+00 TO 59+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C15
CHECKED: DTB	KMH16157	

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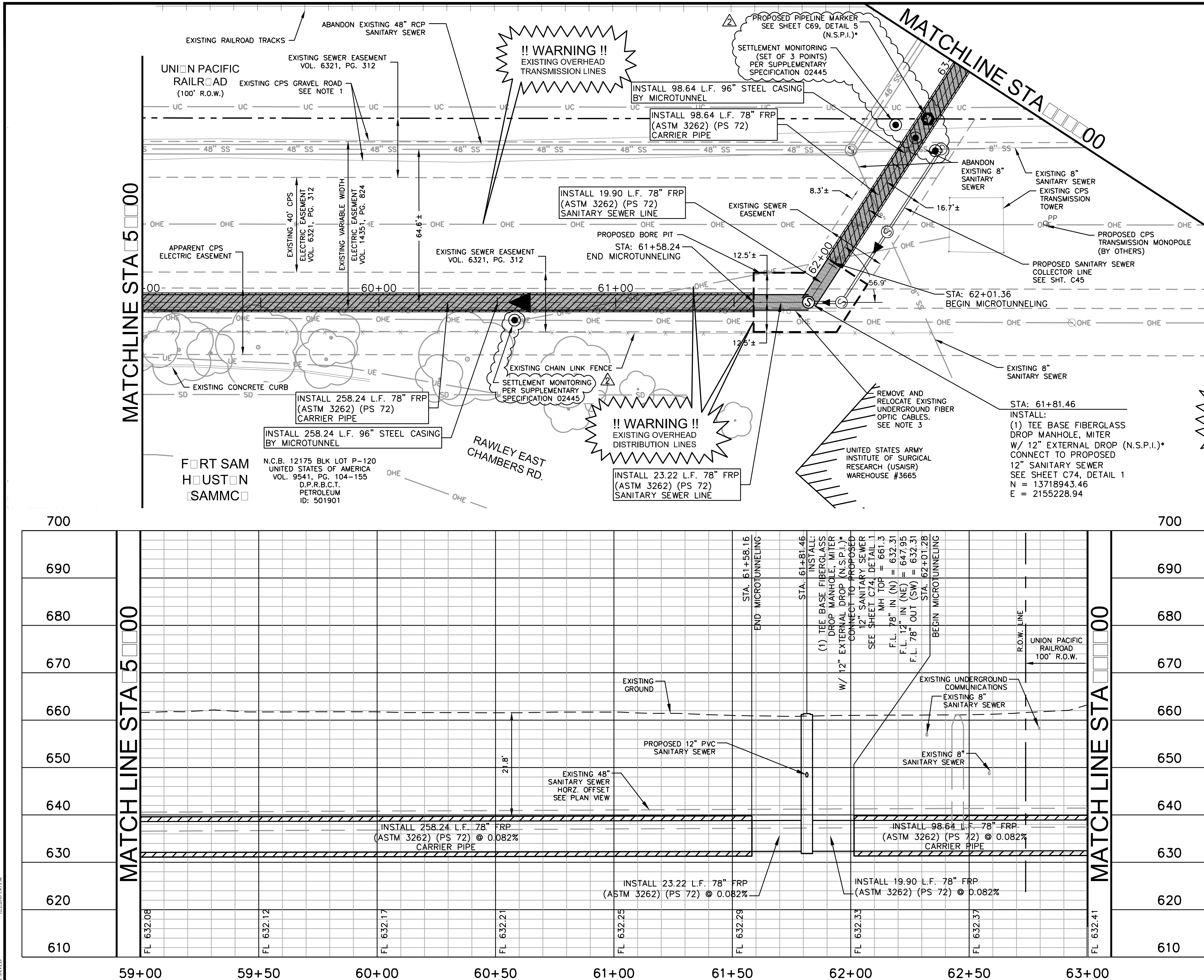

GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

NOTES:
1. CONTRACTOR TO UTILIZE EXISTING CPS GRAVEL ROAD TO ACCESS BORE PITS OUTSIDE OF EXISTING FORT SAM HOUSTON SECURITY FENCE. SEE ACCESS AND STAGING ON SHEET G21.
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
3. CONTRACTOR SHALL COORDINATE WITH LEVEL 3 COMMUNICATIONS (877-253-8353) TO COORDINATE RELOCATION OF EXISTING FIBER OPTIC CONDUITS AS NECESSARY. CONTRACTOR IS RESPONSIBLE FOR ALL COSTS AND TIME ASSOCIATED WITH RELOCATION.
4. FOR ALL WORK WITHIN UNION PACIFIC RAILROAD R.O.W., SEE UPRR GENERAL NOTES ON SHEET G4.
5. CONTRACTOR TO COORDINATE WITH CPS REGARDING ANY POTENTIAL CPS CONSTRUCTION OF REPLACING OVERHEAD TRANSMISSION TOWERS THAT MAY BE ONGOING DURING SEWER LINE CONSTRUCTION.
6. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	43
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	43
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	23
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	357
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	357
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

WARNING
CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL
HALF SIZE (11" x 17") 1" = 20' VERTICAL

LEGEND

- PROPOSED SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- PROPERTY LINE
- EXISTING WIRE FENCE
- EFFECTIVE 100-YR FLOOD PLAIN
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING OVERHEAD ELECTRIC LINE & POLE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT

12/5/16
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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 59+00 TO 63+00

DATE: NOVEMBER 2016
DESIGN: RWR
DRAWN: DDH
CHECKED: DTB
SAWS PROJECT NO. 15-4506
FNI PROJECT NO. KMH16157
SHEET NO. C16

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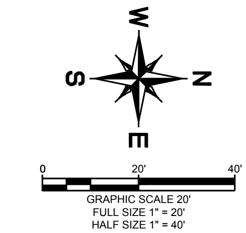
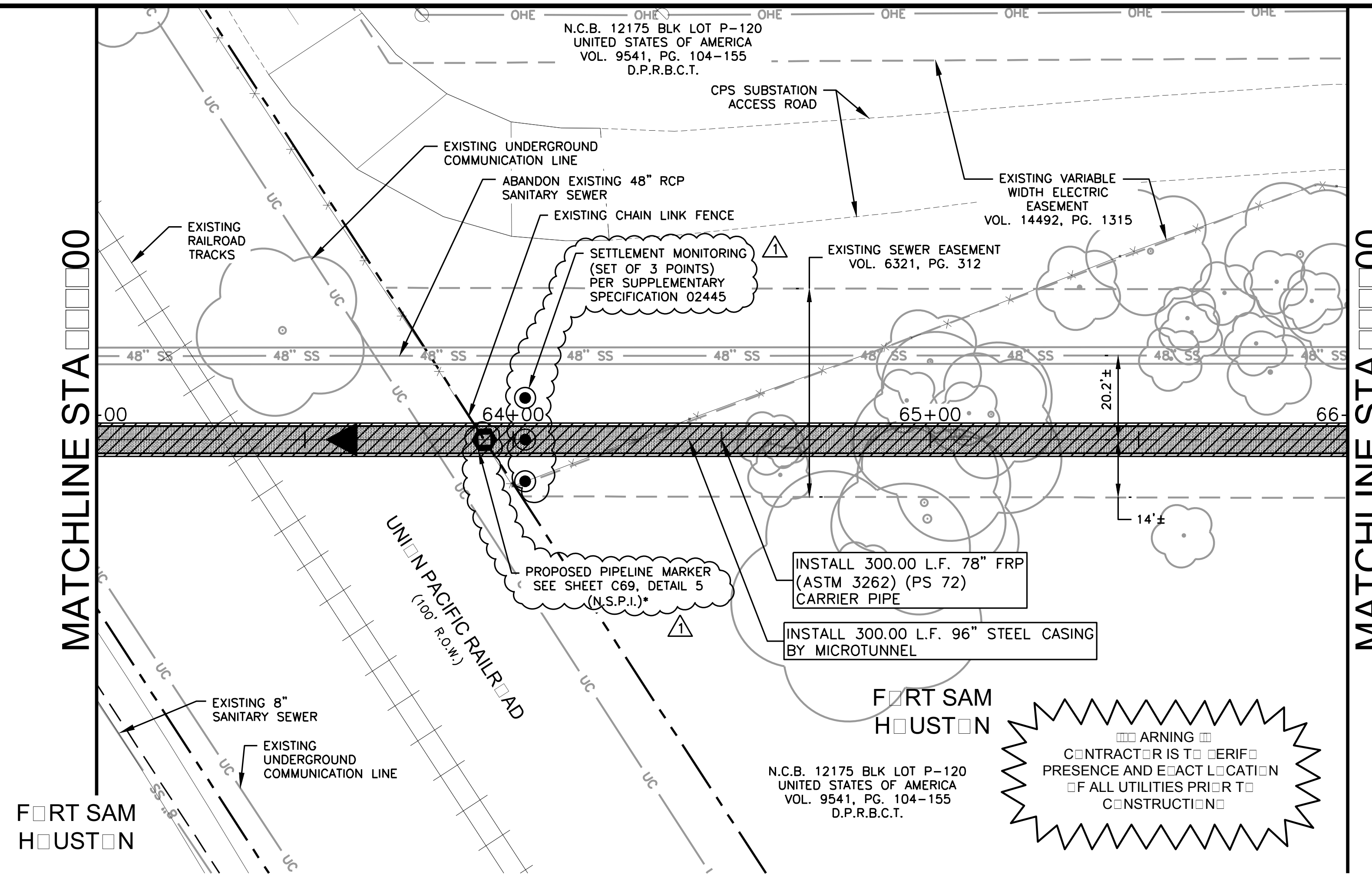


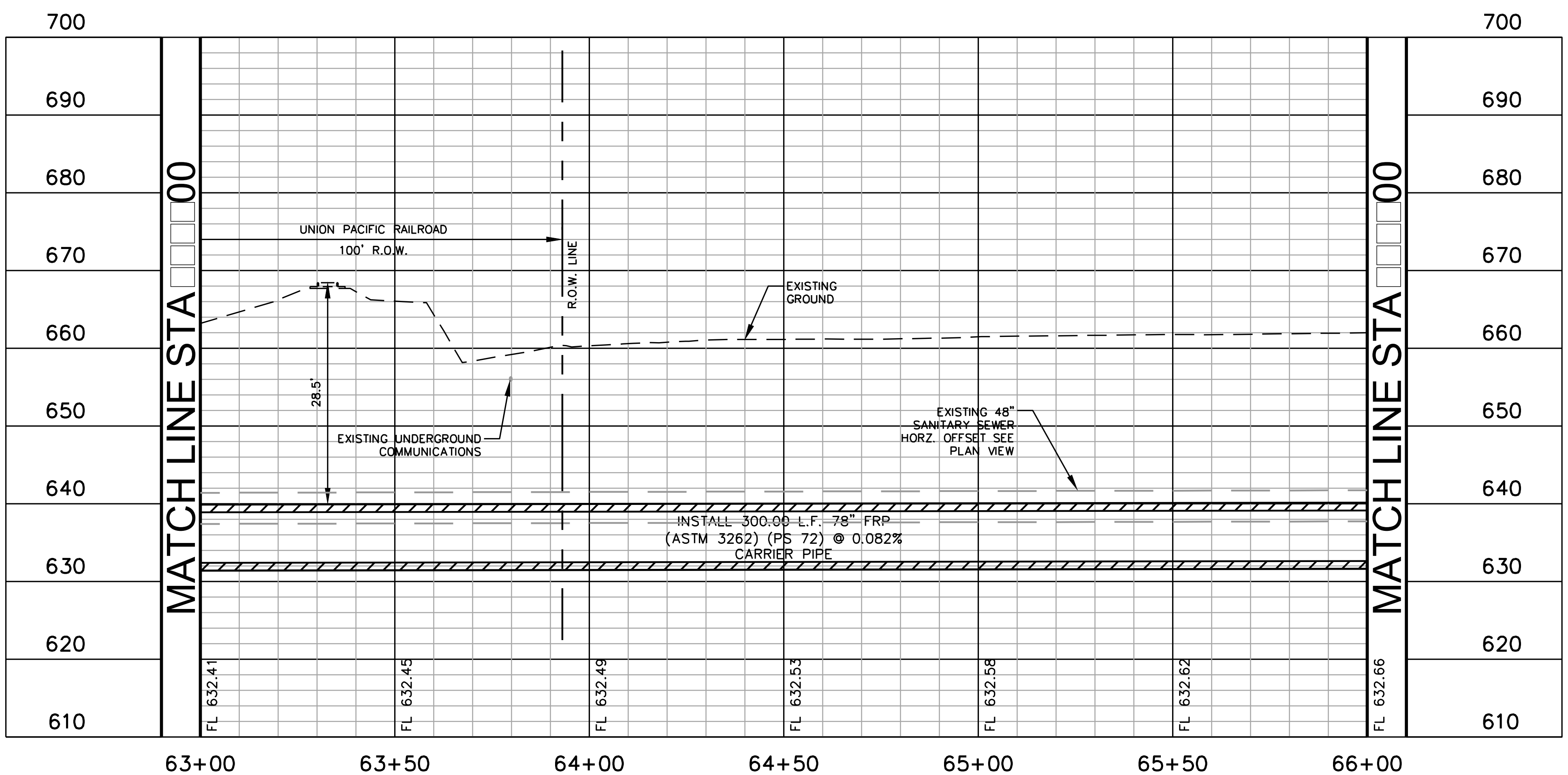


ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	350
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	350
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	350

NOTES:
1. FOR ALL WORK WITHIN UNION PACIFIC RAILROAD R.O.W., SEE UPRR GENERAL NOTES ON SHEET G4.
2. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL	HALF SIZE (11" x 17") 1" = 20' VERTICAL



LEGEND

PROPOSED SANITARY SEWER LINE	——(S)——
EXISTING SANITARY SEWER LINE	— 48" SS —(S)— 48" SS —
EXISTING WATER LINE	6" W
EXISTING GAS LINE	4" G
PROPERTY LINE	
EXISTING WIRE FENCE	— X — X —
EFFECTIVE 100-YR FLOOD PLAIN	
EDGE OF ASPHALT	
EXISTING EASEMENT LINE	
PROPOSED EASEMENT LINE	
EXISTING OVERHEAD ELECTRIC LINE & POLE	OHE
EXISTING WATER METER	(W)
EXISTING FIRE HYDRANT	

12/5/16
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No.	Revision	By	Date
1	ADDENDUM 3	DTB	12/05/2016

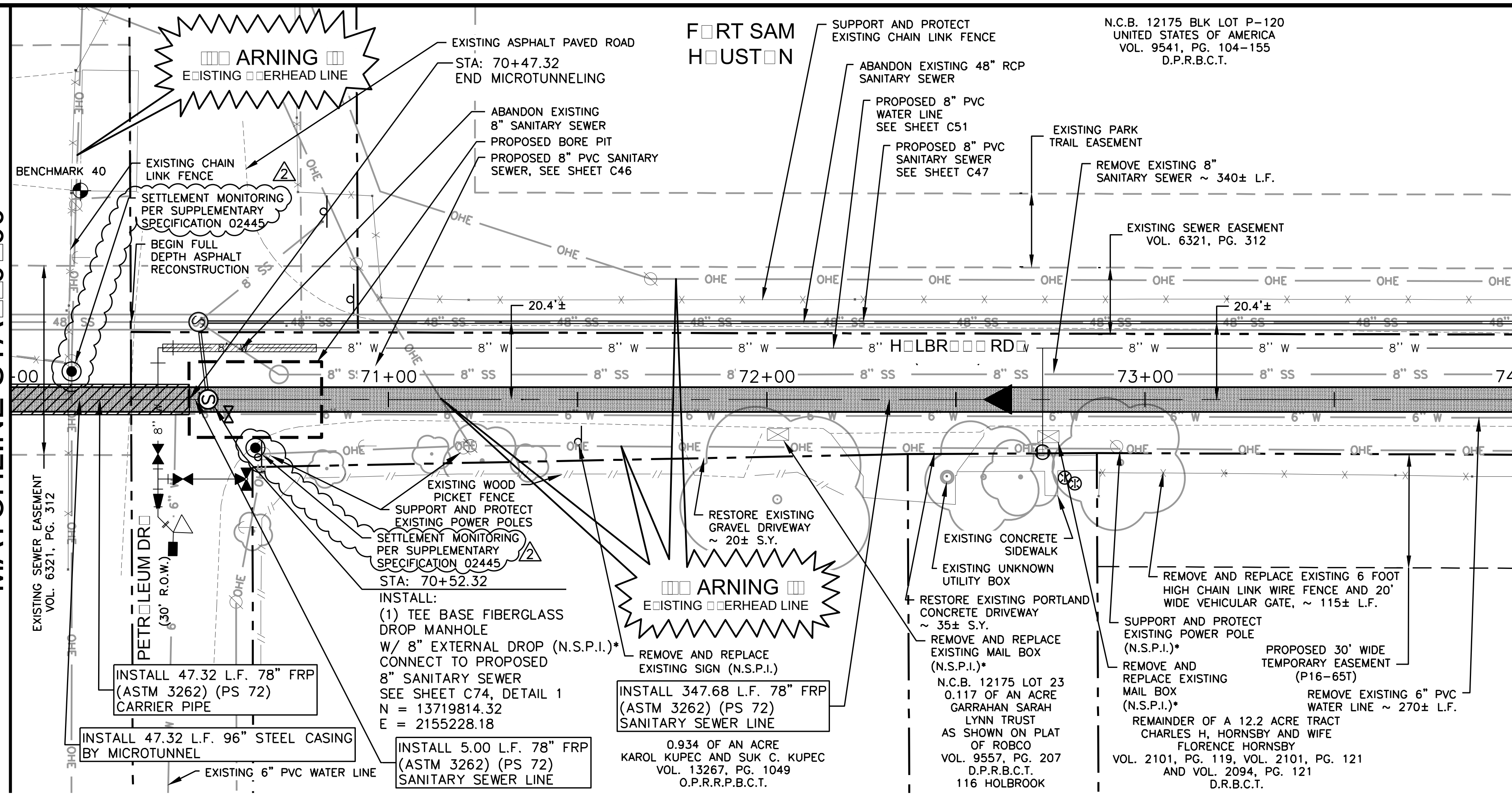
SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 63+00 TO 66+00

DATE: NOVEMBER 2016	SAWS PROJECT NO. 15-4506	SHEET NO.
DESIGN: RWR		
DRAWN: DDH	FNI PROJECT NO. KMH16157	C17
CHECKED: DTB		



ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
202	PRIME COAT	GAL	200
203	TACK COAT	GAL	100
205.2	HOT MIX ASPHALTIC PAVEMENT (10" TYPE B)	SY	1000
205.4	HOT MIX ASPHALTIC PAVEMENT (2" TYPE D)	SY	1000
104.1	STREET EXCAVATION (12" DEPTH)	CY	333
103.3 503.2	PORTLAND CEMENT CONCRETE DRIVEWAY - COMMERCIAL (REMOVE/INSTALL)	SY	35
503.5	GRAVEL DRIVEWAY (REMOVE/INSTALL)	SY	20
507.1 507.2	CHAIN-LINK WIRE FENCE - (6 FT. HIGH) (REMOVE/INSTALL)	LF	115
507.5	CHAIN-LINK WIRE FENCE VEHICULAR GATE (REMOVE/INSTALL)	EA	1
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	353
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	353
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	24
02345	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	47
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	47
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400

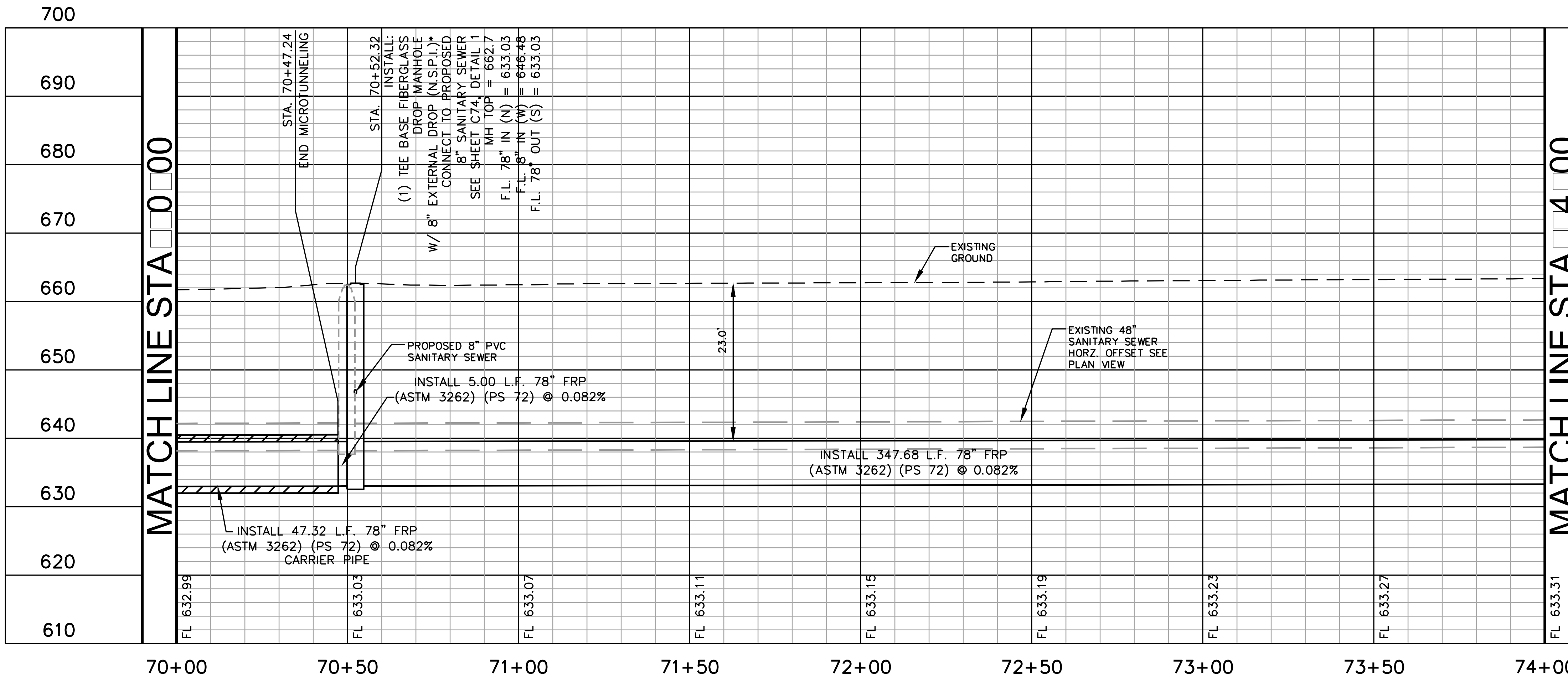
NOTES:

1. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL SHEETS TP-1 TO TP-35.
2. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION (N.S.P.I.)*

WARNING
CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL	HALF SIZE (11" x 17") 1" = 20' VERTICAL



LEGEND

PROPOSED SANITARY SEWER LINE	
EXISTING SANITARY SEWER LINE	48" SS
EXISTING WATER LINE	6" W
EXISTING GAS LINE	4" G
PROPERTY LINE	
EXISTING WIRE FENCE	
EFFECTIVE 100-YR FLOOD PLAIN	
EDGE OF ASPHALT	
EXISTING EASEMENT LINE	
PROPOSED EASEMENT LINE	
EXISTING OVERHEAD ELECTRIC LINE & POLE	OHE
EXISTING WATER METER	
EXISTING FIRE HYDRANT	

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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 70+00 TO 74+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C19
CHECKED: DTB	KMH16157	

PLOTTED BY JESSICA DOVERE 12/2/2016 5:39 PM
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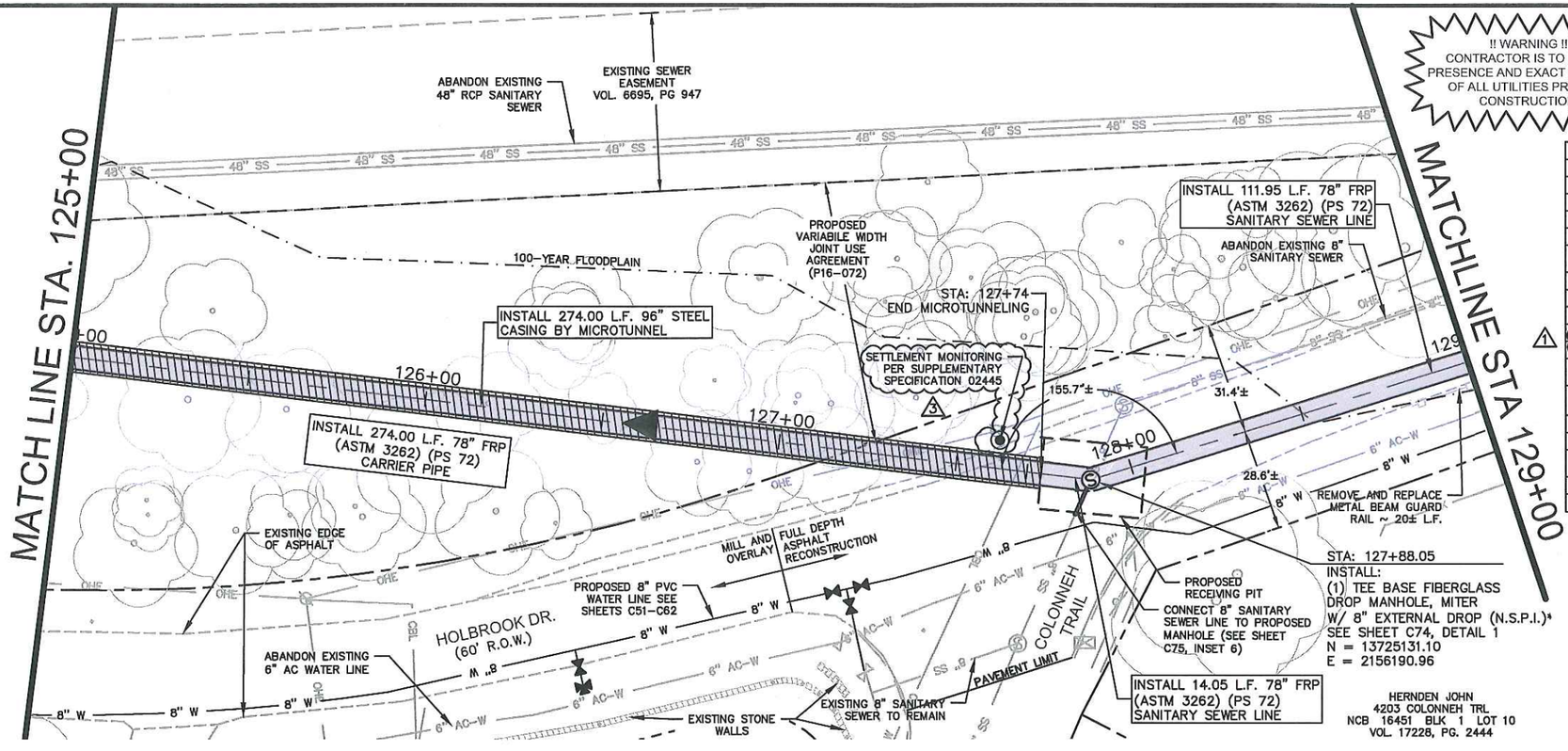


!! WARNING !!
CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'

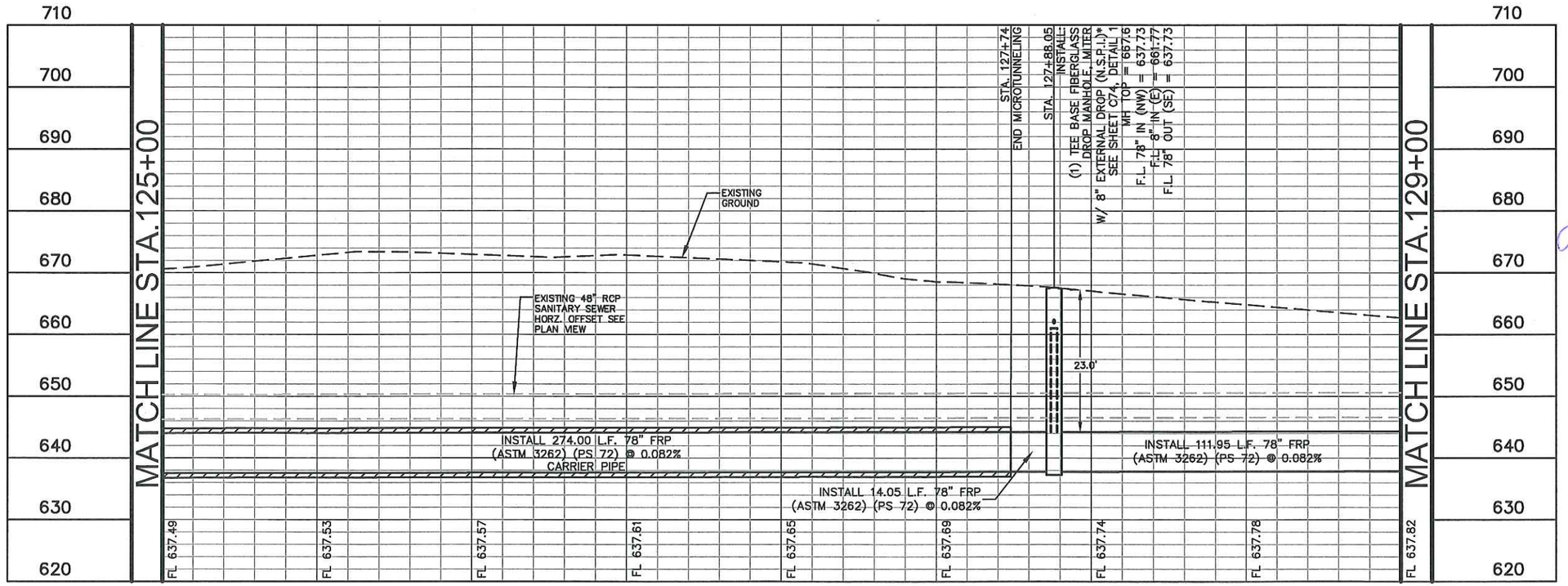
ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
104.1	STREET EXCAVATION (12" DEPTH)	CY	233.33
202	PRIME COAT	GAL	140.00
203	TACK COAT	GAL	122.00
205.2	HOT MIX ASPHALTIC PAVEMENT (10" TYPE B)	SY	700.00
205.4 535	HOT MIX ASPHALTIC PAVEMENT (2" TYPE D)	SY	1219.00
208	SALVIGING, HAULING, & STOCKPILING RECLAIMABLE ASPHALTIC PAVEMENT (2" DEPTH)	SY	519.00
509.1	METAL BEAM GUARD RAIL	LF	20.00
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	126.00
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (25' TO 30')	LF	114.90
857	78-INCH FRP (ASTM D-3262) (PS 72) SANITARY SEWER LINE (30' TO 35')	LF	11.10
853	FIBER-REINFORCED SANITARY SEWER DROP MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER	EA	1.00
853	FIBER-REINFORCED SANITARY SEWER MANHOLE - TEE BASE FIBERGLASS MANHOLE, MITER W/DROP EXTRA DEPTH (>6')	VF	23.87
854	SANITARY SEWER LATERAL - (4"-8")	LF	25.00
854	SANITARY SEWER TWO-WAY CLEANOUT (4"-8")	EA	1.00
02345 02610	MICROTUNNELING - (96") INCLUSIVE OF CASING	LF	274.00
02349	78-INCH FRP (ASTM D-3262) (PS 72) CARRIER PIPE (INSTALL)	LF	274.00
866.3	SEWER MAIN POST TELEVISION INSPECTION (30" OR LARGER)	LF	400.00

NOTES:

1. REMOVAL AND DISPOSAL OF ASBESTOS PIPE SHALL BE PAID FOR UNDER LINE ITEM NO. 3000. OTHERWISE, CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF 6-INCH WATERLINE OR APPURTENANCES THAT ARE IN DIRECT CONFLICT WITH INSTALLATION OF PROPOSED SEWER MAIN WORK. CONTRACTOR SHALL PLUG ABANDONED 6-INCH WATERLINE AT ENDS (N.S.P.I.)*
2. REFERENCE TREE PROTECTION PLAN FOR TREE REMOVAL, SHEETS TP1-1 TO TP-35.

* NO SEPARATE PAY ITEM (N.S.P.I.)

FULL SIZE (22" x 34") 1" = 10' VERTICAL	HALF SIZE (11" x 17") 1" = 20' VERTICAL



LEGEND

PROPOSED SANITARY SEWER LINE	S
EXISTING SANITARY SEWER LINE	48" SS S 48" SS
EXISTING WATER LINE	6" W
EXISTING GAS LINE	4" G
PROPERTY LINE	
EXISTING WIRE FENCE	X X X X
EFFECTIVE 100-YR FLOOD PLAIN	
EDGE OF ASPHALT	
EXISTING EASEMENT LINE	
PROPOSED EASEMENT LINE	
EXISTING OVERHEAD ELECTRIC LINE & POLE	OHE
EXISTING WATER METER	W
EXISTING FIRE HYDRANT	

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STATE OF TEXAS
JEFFREY A. FARNSWORTH
80190
REGISTERED PROFESSIONAL ENGINEER
11/29/16

No.	Revision	By	Date
1	ADDENDUM 1	JAF	11/11/2016
3	ADDENDUM 3	JAF	11/30/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

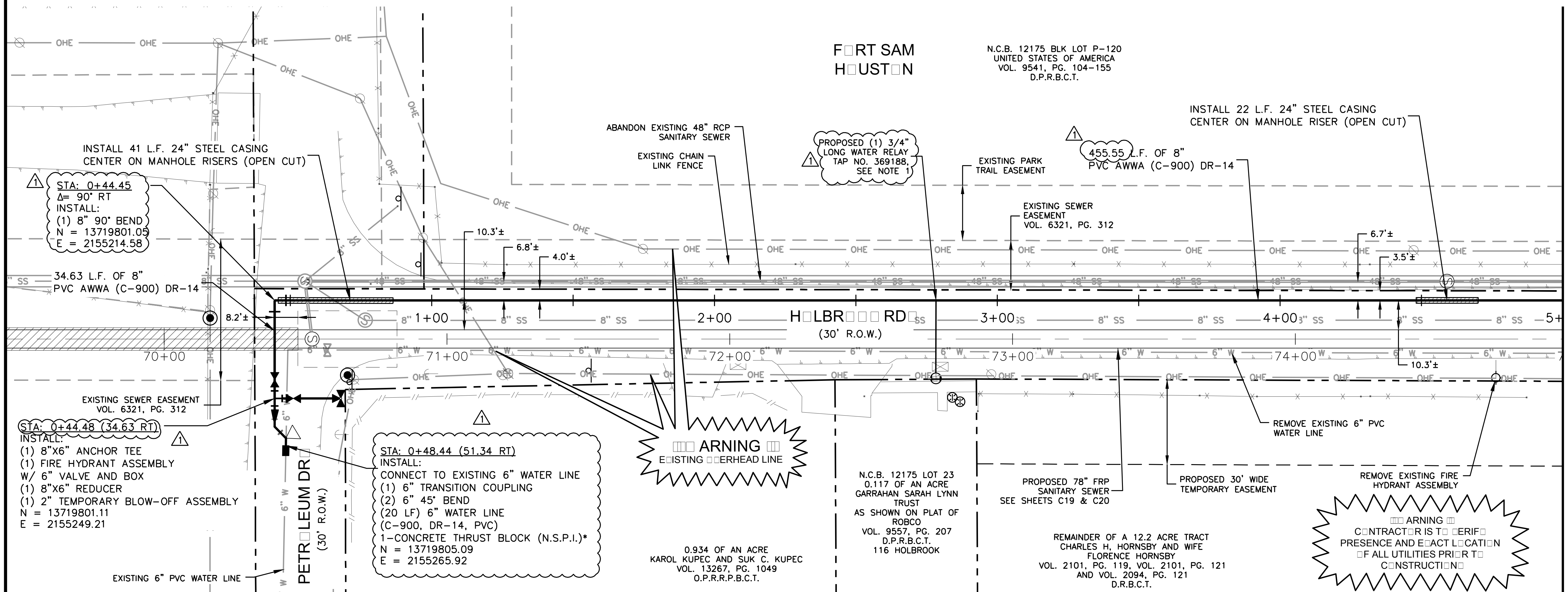
SHEET

78-INCH SANITARY SEWER PLAN & PROFILE STA. 125+00 TO 129+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: MAV	15-4506	C33
DRAWN: DPF	KHA PROJECT NO.	
CHECKED: GAG	068665018	

PLOTTED BY: FURDOCK, DANIEL
DWG NAME: L:\SAWS\068665018 - SAWS E19\CAD\SEGMENT 1\SHEETS\PLAN & PROFILE - STA 125+00 TO 129+00.DWG
LAST SAVED: 11/29/2016 3:52 PM

GRAPHIC SCALE 20'
FULL SIZE 1" = 20'
HALF SIZE 1" = 40'



NOTES:

1. CONTRACTOR TO CONNECT PROPOSED WATER SERVICES TO EXISTING METERS ONCE LINE IS TESTED AND APPROVED BY SAWS (N.S.P.I.)*
2. CONTRACTOR SHALL REMOVE AND SALVAGE ALL FIRE HYDRANTS AND WATER APPURTENANCES. CONTRACTOR SHALL COORDINATE WITH SAWS (N.S.P.I.)*
3. THRUST RESTRAINTS ARE REQUIRED AT ALL MECHANICAL JOINT (MJ) FITTINGS AND BELL JOINTS. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE LINE.
4. MINIMUM 5 FEET SEPARATION FROM FACE OF ELECTRIC POLE AND TRENCH WALL SHALL BE MAINTAINED AT ALL TIMES. OTHERWISE COORDINATE WITH CPS TO BRACE POLE.
5. NEW WATER MAIN CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO EXISTING WATER LINE. CONTRACTOR SHALL USE CAUTION AND MAINTAIN EXISTING WATER LINE IN SERVICE AT ALL TIMES.
6. CONTRACTOR SHALL DISINFECT PROPOSED WATER LINES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 847.

• NO SEPARATE PAY ITEM (N.S.P.I.)

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	490
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	427
828	8-INCH GATE VALVE W/VALVE BOX	EA	2
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	1
840	8-INCH X 6-INCH WATER TIE-IN	EA	1
824	RELAY LONG SERVICE (3/4" - 2")	EA	1
844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (6-8-INCH MAINS)	EA	1
856	STEEL CASING PIPE BY OPEN-CUT - (24")	LF	63
856	8-INCH PVC DR-14 (C-900) CARRIER PIPE (INSTALL)	LF	63
836	DUCTILE IRON FITTINGS	TON	0.3

LEGEND

• NO SEPARATE PAY ITEM (N.S.P.I.)

- PROPOSED WATER LINE WITH VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED 78" SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE WITH VALVE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EFFECTIVE 100-YR FLOOD PLAIN
- EXISTING FENCE
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT (OHE)

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No.	Revision	By	Date
1	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

8-INCH WATERLINE PLAN - START TO 5+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	C51
DRAWN: RWK	FNI PROJECT NO.	
CHECKED: DTB	KMH16157	

PLOTTED BY JESSICA DOVERE 12/2/2016 5:30 PM
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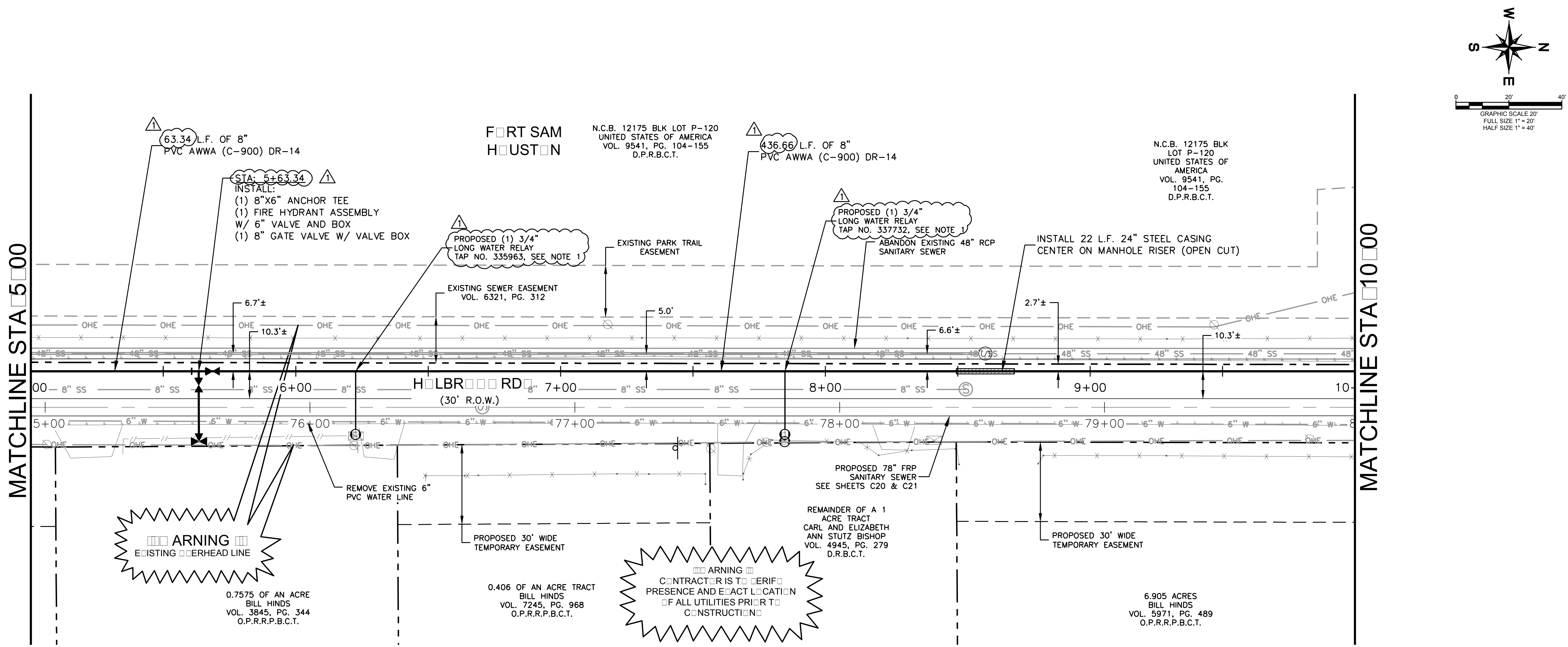
LAST SAVED 12/2/2016 1:41 PM



NOTES:

1. CONTRACTOR TO CONNECT PROPOSED WATER SERVICES TO EXISTING METERS ONCE LINE IS TESTED AND APPROVED BY SAWS (N.S.P.I.)*
2. CONTRACTOR SHALL REMOVE AND SALVAGE ALL FIRE HYDRANTS AND WATER APPURTENANCES. CONTRACTOR SHALL COORDINATE WITH SAWS (N.S.P.I.)*
3. THRUST RESTRAINTS ARE REQUIRED AT ALL MECHANICAL JOINT (MJ) FITTINGS AND BELL JOINTS. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE LINE.
4. MINIMUM 5 FEET SEPARATION FROM FACE OF ELECTRIC POLE AND TRENCH WALL SHALL BE MAINTAINED AT ALL TIMES. OTHERWISE COORDINATE WITH CPS TO BRACE POLE.
5. NEW WATER MAIN CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO EXISTING WATER LINE. CONTRACTOR SHALL USE CAUTION AND MAINTAIN EXISTING WATER LINE IN SERVICE AT ALL TIMES.
6. CONTRACTOR SHALL DISINFECT PROPOSED WATER LINES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 847.

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	500
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	478
828	8-INCH GATE VALVE W/VALVE BOX	EA	1
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	1
824	RELAY LONG SERVICE (3/4" - 2")	EA	2
856	STEEL CASING PIPE BY OPEN-CUT - (24")	LF	22
856	8-INCH PVC DR-14 (C-900) CARRIER PIPE (INSTALL)	LF	22
836	DUCTILE IRON FITTINGS	TON	0.1

LEGEND

• NO SEPARATE PAY ITEM (N.S.P.I.)

- PROPOSED WATER LINE WITH VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED 78" SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE WITH VALVE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EFFECTIVE 100-YR FLOOD PLAIN
- EXISTING FENCE
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- OHE

STATE OF TEXAS — DAVID T. BENNETT — 101935 — LICENSED PROFESSIONAL ENGINEER — 12/5/16

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No.	Revision	By	Date
3	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

8-INCH WATERLINE PLAN - STA 5+00 TO 10+00

DATE: NOVEMBER 2016	SAWS PROJECT NO. 15-4506	SHEET NO. C52
DESIGN: RWR		
DRAWN: RWK	FNI PROJECT NO. KMH16157	
CHECKED: DTB		

PLOTTED BY JESSICA DOVERE 12/2/2016 5:30 PM
DWG NAME N:\WTU\DRAWINGS\WTU-E19-WL-PP01.DWG
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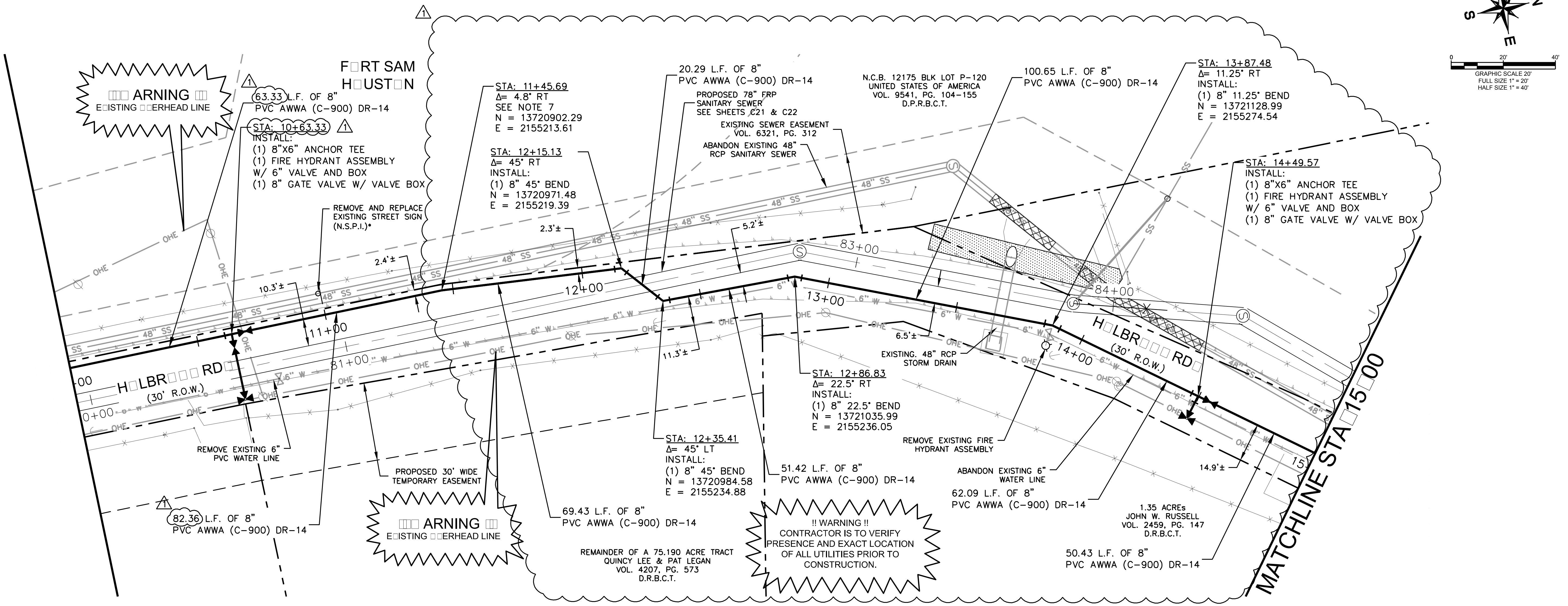

NOTES:

1. CONTRACTOR TO CONNECT PROPOSED WATER SERVICES TO EXISTING METERS ONCE LINE IS TESTED AND APPROVED BY SAWS (N.S.P.I.)*
2. CONTRACTOR SHALL REMOVE AND SALVAGE ALL FIRE HYDRANTS AND WATER APPURTENANCES. CONTRACTOR SHALL COORDINATE WITH SAWS (N.S.P.I.)*
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4. MINIMUM 5 FEET SEPARATION FROM FACE OF ELECTRIC POLE AND TRENCH WALL SHALL BE MAINTAINED AT ALL TIMES. OTHERWISE COORDINATE WITH CPS TO BRACE POLE.
5. NEW WATER MAIN CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO EXISTING WATER LINE. CONTRACTOR SHALL USE CAUTION AND MAINTAIN EXISTING WATER LINE IN SERVICE AT ALL TIMES.
6. CONTRACTOR SHALL DISINFECT PROPOSED WATER LINES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 847.
7. DEFLECT JOINTS AS REQUIRED TO ACHIEVE BENDS AS SHOWN. ALLOWABLE JOINT DEFLECTION SHALL BE NO GREATER THAN 75% OF PIPE MANUFACTURER'S RECOMMENDED MAXIMUM.

LEGEND

• NO SEPARATE PAY ITEM (N.S.P.I.)

- PROPOSED WATER LINE WITH VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED 78" SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE (48" SS)
- EXISTING WATER LINE WITH VALVE (6" W)
- EXISTING GAS LINE (4" G)
- PROPERTY LINE
- EFFECTIVE 100-YR FLOOD PLAIN
- EXISTING FENCE
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- OHE

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	500
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	500
828	8-INCH GATE VALVE W/VALVE BOX	EA	2
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	2
836	DUCTILE IRON FITTINGS	TON	0.6

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No.	Revision	By	Date
1	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

8-INCH WATERLINE PLAN – STA 10+00 TO 15+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	C53
DRAWN: RWK	FNI PROJECT NO.	
CHECKED: DTB	KMH16157	

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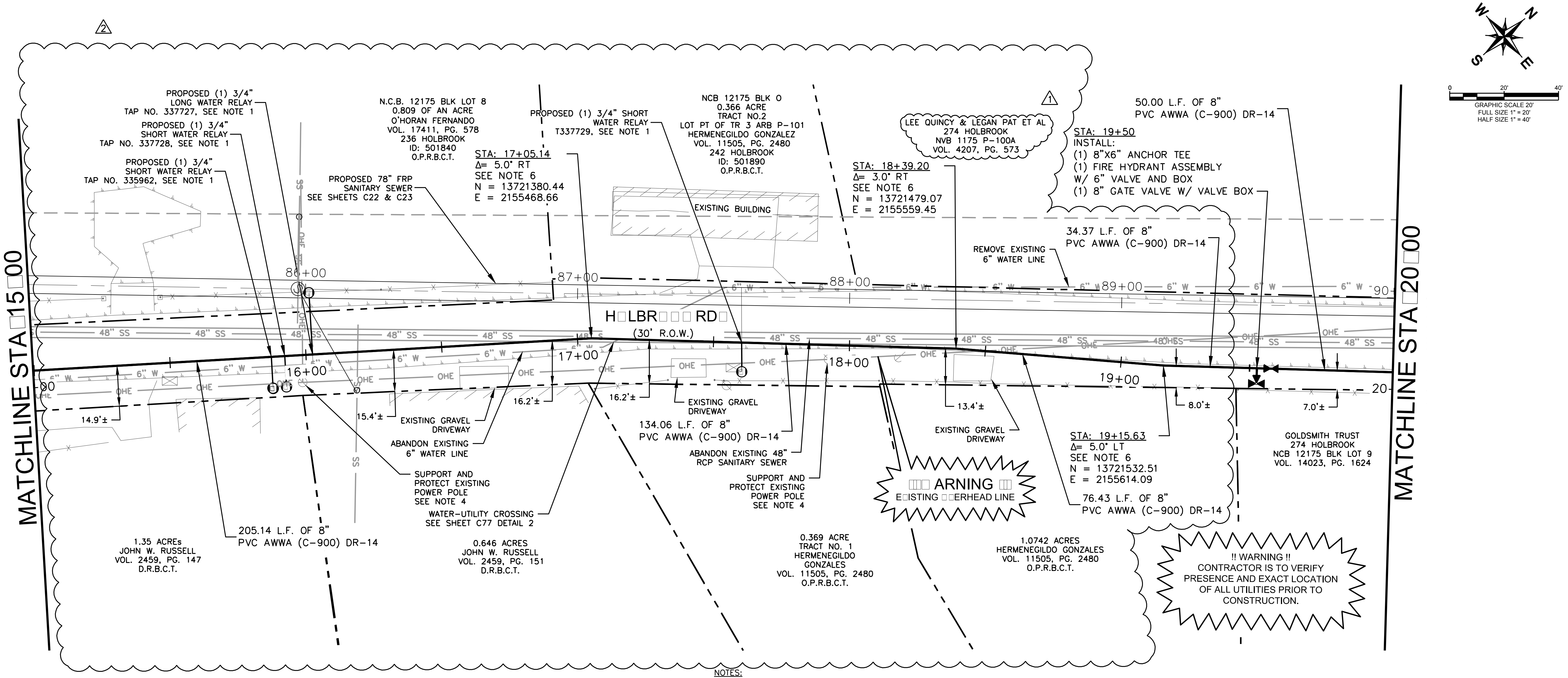

NOTES:

1. CONTRACTOR TO CONNECT PROPOSED WATER SERVICES TO EXISTING METERS ONCE LINE IS TESTED AND APPROVED BY SAWS (N.S.P.I.)*
2. CONTRACTOR SHALL REMOVE AND SALVAGE ALL FIRE HYDRANTS AND WATER APPURTENANCES. CONTRACTOR SHALL COORDINATE WITH SAWS (N.S.P.I.)*
3. THRUST RESTRAINTS ARE REQUIRED AT ALL MECHANICAL JOINT (MJ) FITTINGS AND BELL JOINTS. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE LINE.
4. MINIMUM 5 FEET SEPARATION FROM FACE OF ELECTRIC POLE AND TRENCH WALL SHALL BE MAINTAINED AT ALL TIMES. OTHERWISE COORDINATE WITH CPS TO BRACE POLE.
5. NEW WATER MAIN CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO EXISTING WATER LINE. CONTRACTOR SHALL USE CAUTION AND MAINTAIN EXISTING WATER LINE IN SERVICE AT ALL TIMES.
6. DEFLECT JOINTS AS REQUIRED TO ACHIEVE BENDS AS SHOWN. ALLOWABLE JOINT DEFLECTION SHALL BE NO GREATER THAN 75% OF PIPE MANUFACTURER'S RECOMMENDED MAXIMUM.
7. CONTRACTOR SHALL DISINFECT PROPOSED WATER LINES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 847.

LEGEND

* NO SEPARATE PAY ITEM (N.S.P.I.)

PROPOSED WATER LINE WITH VALVE
PROPOSED FIRE HYDRANT
PROPOSED 78" SANITARY SEWER LINE
EXISTING SANITARY SEWER LINE (48" SS)
EXISTING WATER LINE WITH VALVE (6" W)
EXISTING GAS LINE (4" G)
PROPERTY LINE
EFFECTIVE 100-YR FLOOD PLAIN
EXISTING FENCE
EDGE OF ASPHALT
EXISTING EASEMENT LINE
PROPOSED EASEMENT LINE
EXISTING WATER METER
EXISTING FIRE HYDRANT
OHE

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	500
824	RELAY SHORT SERVICE (3/4" - 2")	EA	3
824	RELAY LONG SERVICE (3/4" - 2")	EA	1
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	500
828	8-INCH GATE VALVE W/VALVE BOX	EA	1
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	1
836	DUCTILE IRON FITTINGS	TON	0.2

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No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

8-INCH WATERLINE PLAN – STA 15+00 TO 20+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.	
DESIGN: RWR	15-4506		
DRAWN: RWK	FNI PROJECT NO.	C54	
CHECKED: DTB	KMH16157		

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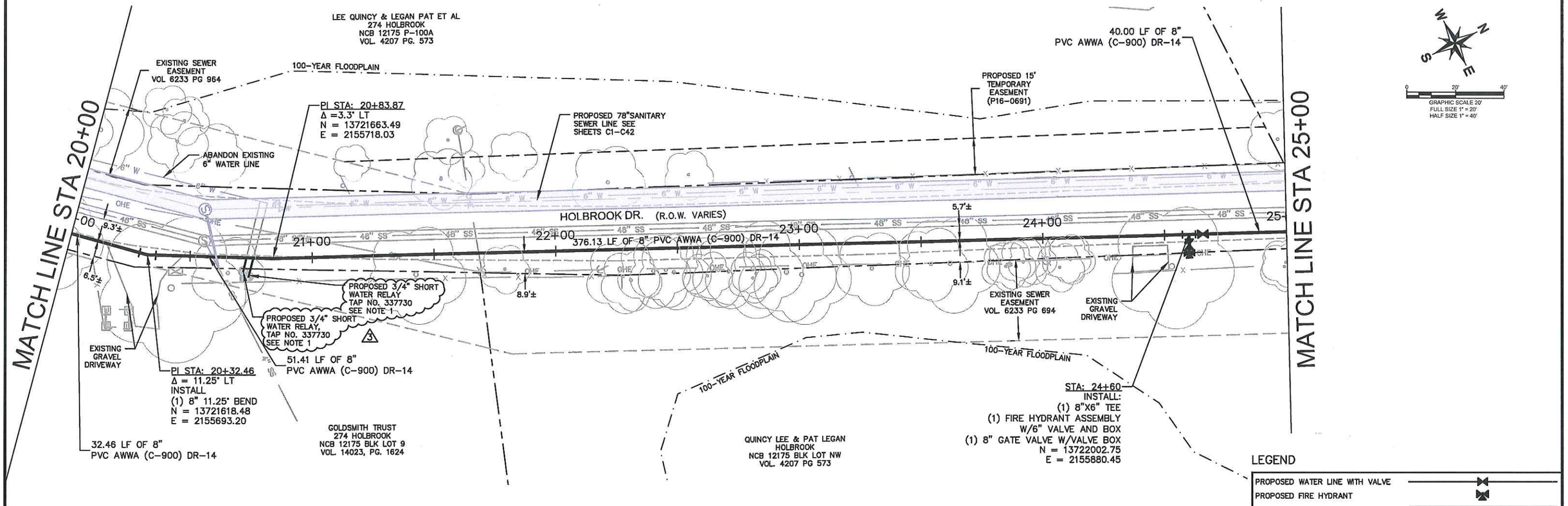

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
503.5	GRAVEL DRIVEWAY (REMOVE/INSTALL)	SY	25.00
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	500.00
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	500.00
824	RELAY SHORT SERVICE (3/4" - 2")	EA	2.00
828	8-INCH GATE VALVE W/VALVE BOX	EA	1.00
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	1.00
836	DUCTILE IRON FITTINGS	TON	0.20

NOTES:

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5. NEW WATER MAIN CONSTRUCTION IS TO OCCUR IN CLOSE PROXIMITY TO EXISTING WATERLINE. CONTRACTOR SHALL USE CAUTION AND MAINTAIN EXISTING WATERLINE IN SERVICE AT ALL TIMES.
6. CONTRACTOR SHALL DISINFECT PROPOSED WATER LINES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 847.

LEGEND

- PROPOSED WATER LINE WITH VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED 78" SANITARY SEWER LINE
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE WITH VALVE
- EXISTING GAS LINE
- PROPERTY LINE
- EFFECTIVE 100-YR FLOOD PLAIN
- EXISTING FENCE
- EDGE OF ASPHALT
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- EXISTING OVERHEAD ELECTRIC LINE & PP

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11/29/16

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No.	Revision	By	Date
2	ADDENDUM 2	JAF	11/22/2016
3	ADDENDUM 3	JAF	11/30/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

8-INCH WATER LINE PLAN STA. 20+00 TO 25+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: JAF	15-4508	
DRAWN: DPF	KHA PROJECT NO.	C55
CHECKED: GAG	068665018	

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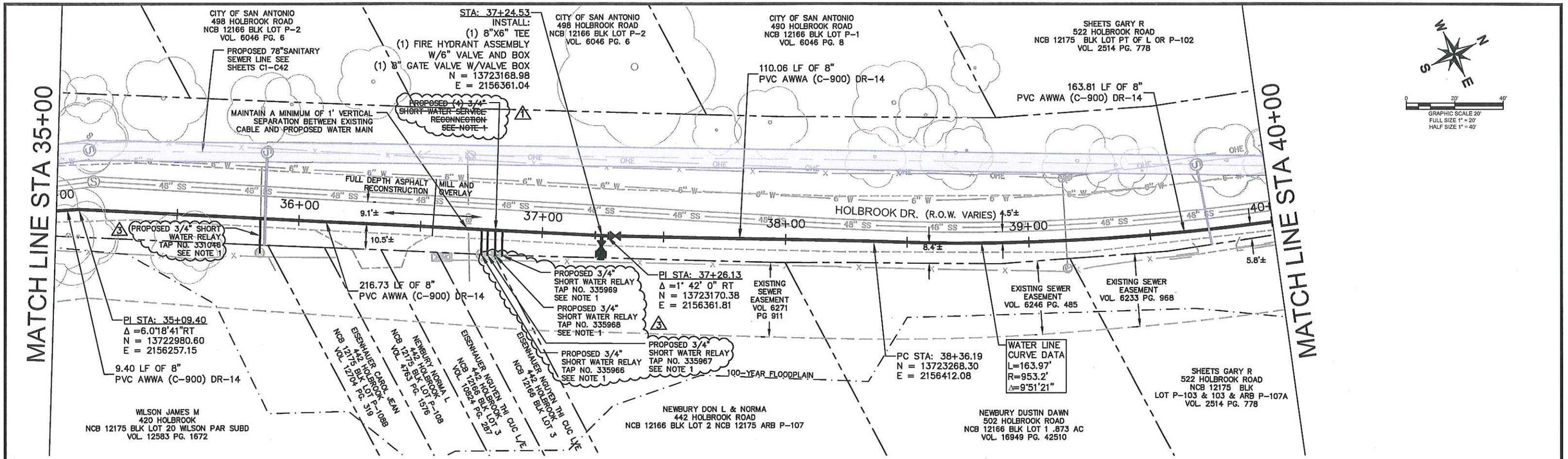

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
202	PRIME COAT	GAL	38.00
203	TACK COAT	GAL	19.00
511.3	REPLACE WITH HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D AND 10" TYPE B)	SY	192.00
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	500.00
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	500.00
824	RELAY SHORT SERVICE (3/4" - 2")	EA	5.00
828	8-INCH GATE VALVE W/VALVE BOX	EA	1.00
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	1.00
836	DUCTILE IRON FITTINGS	TON	0.20

NOTES:

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LEGEND

PROPOSED WATER LINE WITH VALVE	
PROPOSED FIRE HYDRANT	
PROPOSED 78" SANITARY SEWER LINE	S
EXISTING SANITARY SEWER LINE	48" SS
EXISTING WATER LINE WITH VALVE	6" W
EXISTING GAS LINE	4" G
PROPERTY LINE	
EFFECTIVE 100-YR FLOOD PLAIN	
EXISTING FENCE	X
EDGE OF ASPHALT	
EXISTING EASEMENT LINE	
PROPOSED EASEMENT LINE	
EXISTING WATER METER	W
EXISTING FIRE HYDRANT	
EXISTING OVERHEAD ELECTRIC LINE & PP	OHE

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No.	Revision	By	Date
1	ADDENDUM 1	JAF	11/11/2016
2	ADDENDUM 2	JAF	11/22/2016
3	ADDENDUM 3	JAF	11/30/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

8-INCH WATER LINE PLAN STA. 35+00 TO 40+00

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: JAF	15-4506	C58
DRAWN: DPF	KHA PROJECT NO.	
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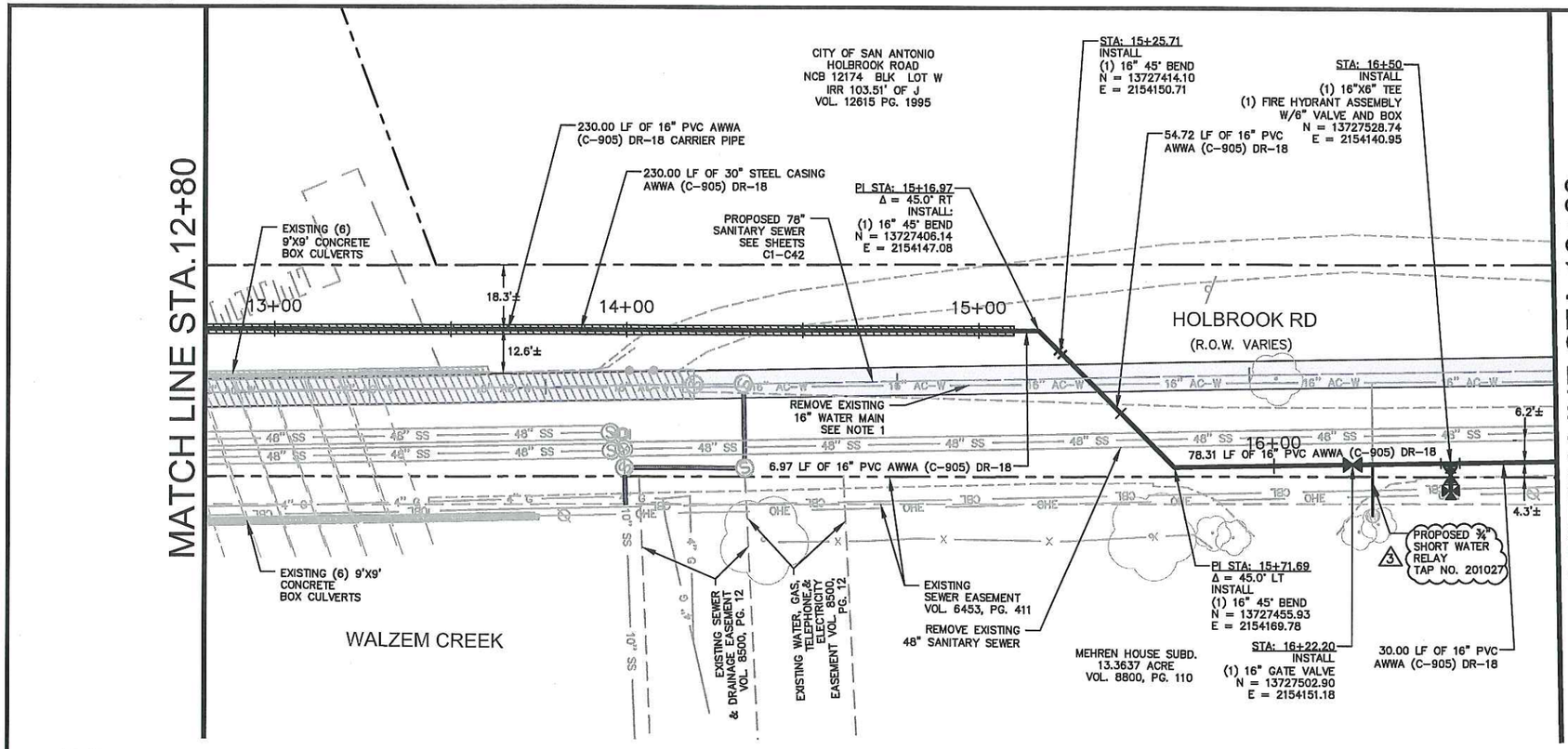

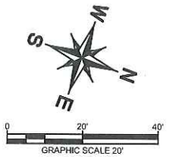

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	170.00
812	16-INCH DR-18 (C-905) PVC WATER LINE	LF	170.00
824	RELAY SHORT SERVICE (3/4" - 2")	EA	1.00
828	16-INCH GATE VALVE W/VALVE BOX	EA	1.00
834.1	FIRE HYDRANT ASSEMBLY W/6-INCH VALVE AND BOX	EA	1.00
836	DUCTILE IRON FITTINGS	TON	1.00
856	JACKING, BORING, OR TUNNELING - (30") INCLUSIVE OF CASING	LF	230.00
856	16-INCH PVC DR-18 (C-905) CARRIER PIPE (INSTALL)	LF	230.00

NOTES:

1. REMOVAL AND DISPOSAL OF ASBESTOS PIPE SHALL BE PAID FOR UNDER LINE ITEM NO. 3000. OTHERWISE, CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF 16-INCH WATERLINE OR APPURTENANCES THAT ARE IN DIRECT CONFLICT WITH INSTALLATION OF PROPOSED 16" WATERLINE. WORK SHALL BE SUBSIDIARY TO WATERLINE INSTALLATION (N.S.P.I.)*
2. REFERENCE CONSTRUCTION SEQUENCING SHEETS G16 TO G19 FOR PHASING.
3. THRUST RESTRAINTS ARE REQUIRED AT ALL MECHANICAL JOINT (MJ) FITTINGS AND BELL JOINTS. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE LINE.
2. 4. CONTRACTOR SHALL DISINFECT PROPOSED WATER LINES IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 847.

* NO SEPARATE PAY ITEM (N.S.P.I.)

LEGEND

	FULL SIZE (22" x 34") 1" = 5' VERTICAL	HALF SIZE (11" x 17") 1" = 10' VERTICAL
PROPOSED WATER LINE WITH VALVE		
PROPOSED FIRE HYDRANT		
PROPOSED 78" SANITARY SEWER LINE		
EXISTING SANITARY SEWER LINE	48" SS	48" SS
EXISTING WATER LINE WITH VALVE		6" W
EXISTING GAS LINE		4" G
PROPERTY LINE		
EFFECTIVE 100-YR FLOOD PLAIN		
EXISTING FENCE	X X X X	
EDGE OF ASPHALT		
EXISTING EASEMENT LINE		
PROPOSED EASEMENT LINE		
EXISTING WATER METER		
EXISTING FIRE HYDRANT		
EXISTING OVERHEAD ELECTRIC LINE & PP	OHE	

STATE OF TEXAS
JEFFREY A. FARNSWORTH
80190
REGISTERED
PROFESSIONAL ENGINEER
11/30/16

Kimley»Horn
Texas Registered Firm, No. 928
601 NW Loop 410 Suite 350 San Antonio, TX 78216
Tel No. 210-541-9166 Fax No. 210-541-8699

No.	Revision	By	Date
1	ADDENDUM 1	JAF	11/11/2016
2	ADDENDUM 2	JAF	11/22/2016
3	ADDENDUM 3	JAF	11/30/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

16-INCH WATER LINE STA. 12+80 TO 16+80

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: JAF	15-4506	C66
DRAWN: DPF	KHA PROJECT NO.	
CHECKED: GAG	068665018	

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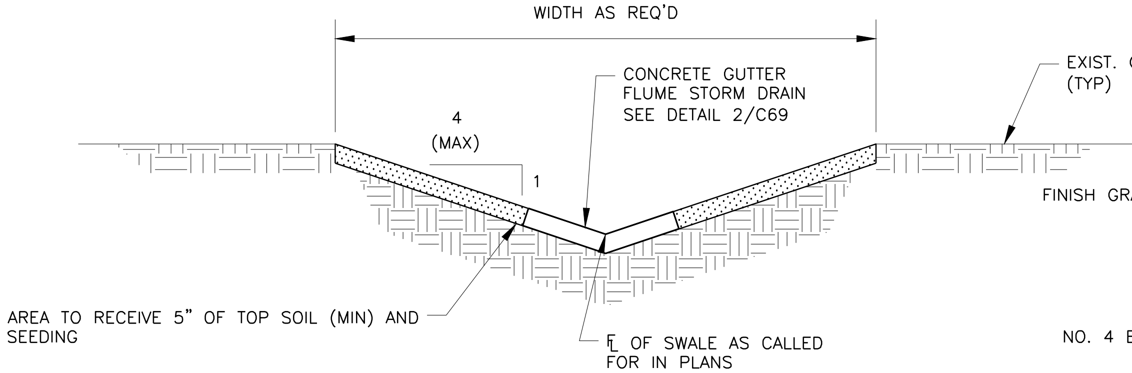
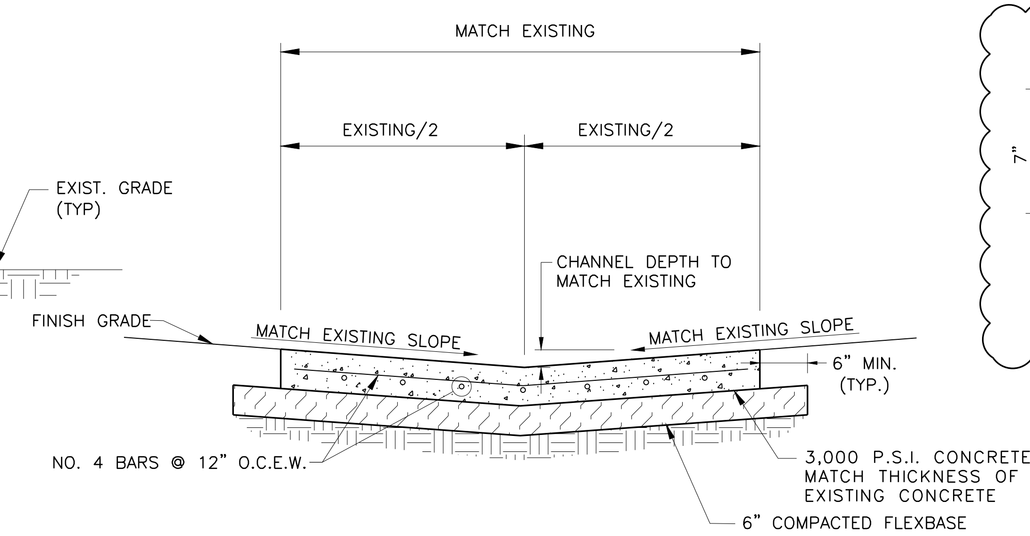
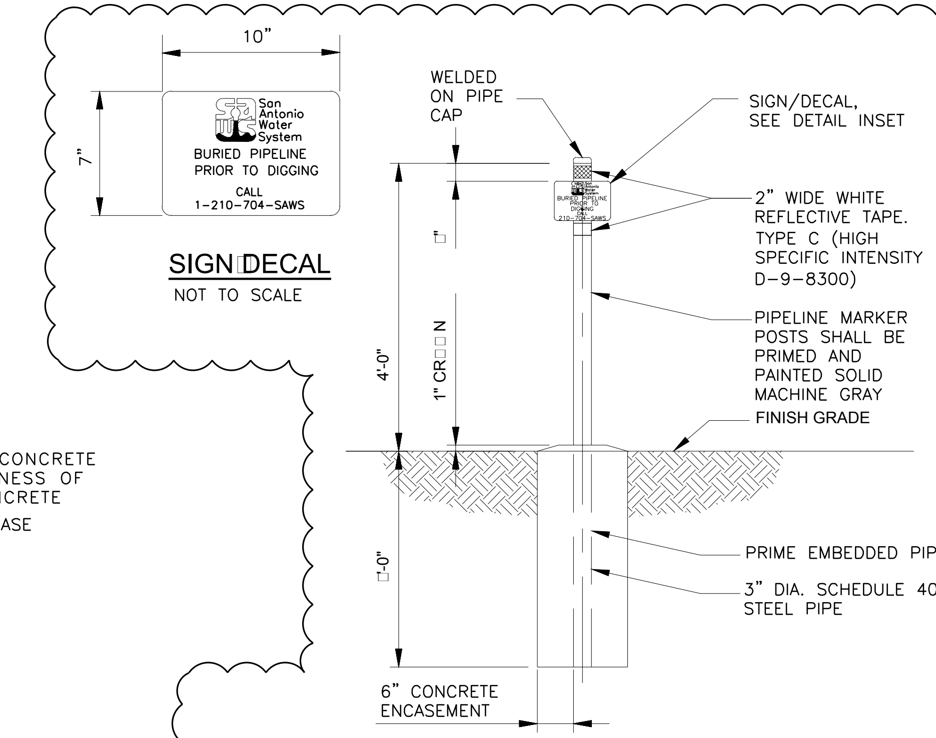


T□PICAL SECTI□N
□-SHAPED DRAINAGE DITCH
1 SCALE: NTS



C□NCRETE GUTTER FLUME
ST□RM DRAIN
2 SCALE: NTS



PIPELINE MAR□ER
NOT TO SCALE

SIGN□DECAL N□TES□

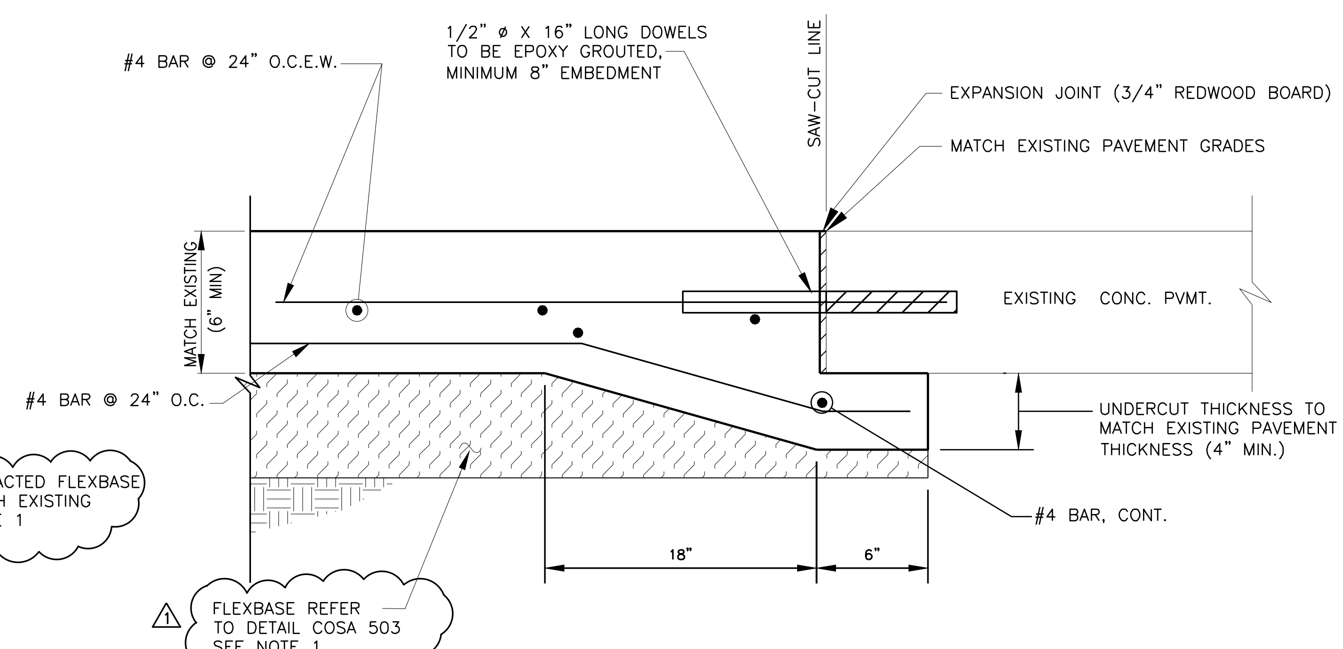
1. SIGNS AND DECALS SHALL BE WHITE BACKGROUND WITH DARK BLUE LETTERING. FINISH SHALL BE DESIGNED FOR LONG TERM OUTDOOR USE AND SHALL BE UV RESISTANT AND WATER DAMAGE RESISTANT.
2. SIGNS SHALL BE FABRICATED FROM 14 GAUGE ALUMINUM. PREDRILL SIGNS FOR MOUNTING BOLTS.
3. BLUE LETTERING SHALL BE 2 MIL CAST VINYL BY ARKON OR EQUAL.
4. SIGNS SHALL BE MOUNTED TO MARKER POSTS WITH 2-3/8" DIA. THROUGH-BOLTS AND TAMPER-PROOF NUTS. SIGNS SHALL BE MOUNTED TO GUARD POSTS WITH STAINLESS STEEL BANDING.

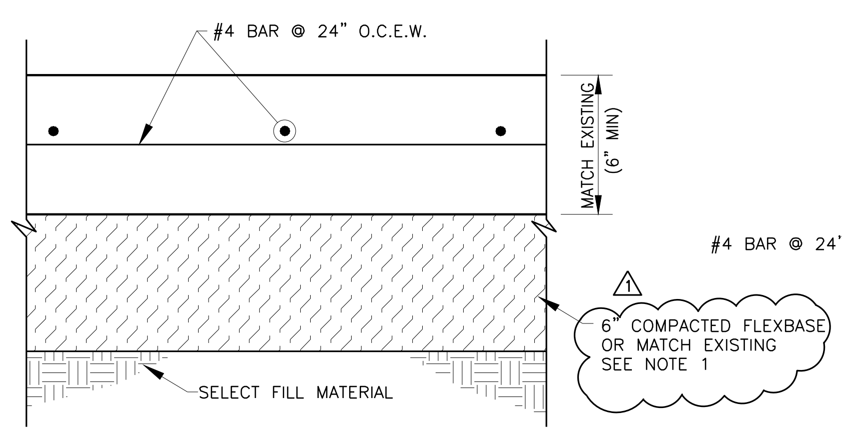
PIPELINE MAR□ER N□TE□

1. PIPELINE MARKER POSTS SHALL BE INSTALLED AT EACH SIDE OF WHERE THE PIPE CROSSES, RAILROADS AND OTHER LOCATIONS AS INDICATED ON PLANS.

PIPELINE MAR□ER
AND SIGN□DECAL DETAILS
5 SCALE: NTS

2





T□PICAL SECTI□N
C□NCRETE PA□EMENT
□ SCALE: NTS

1

NOTES:

1. FLEXBASE THICKNESS PER CITY OF SAN ANTONIO SPECIFICATION 503 WITH MINIMUM OF 6-INCHES THICKNESS OR GREATER TO MATCH EXISTING.

4 UNDERCUT DETAIL □ITH HEADER
SCALE: NTS

STATE OF TEXAS
DAVID T. BENNETT
101935
LICENSED
PROFESSIONAL ENGINEER
12/5/16

FREESE AND NICHOLS
4040 Broadway Street, Suite 600
San Antonio, Texas 78209-6350
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Texas Registered Engineering Firm F-2144

No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016
2	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

GENERAL DETAILS
(SHEET 2 OF 5)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	
DRAWN: DDH	FNI PROJECT NO.	C69
CHECKED: DTB	KMH16157	

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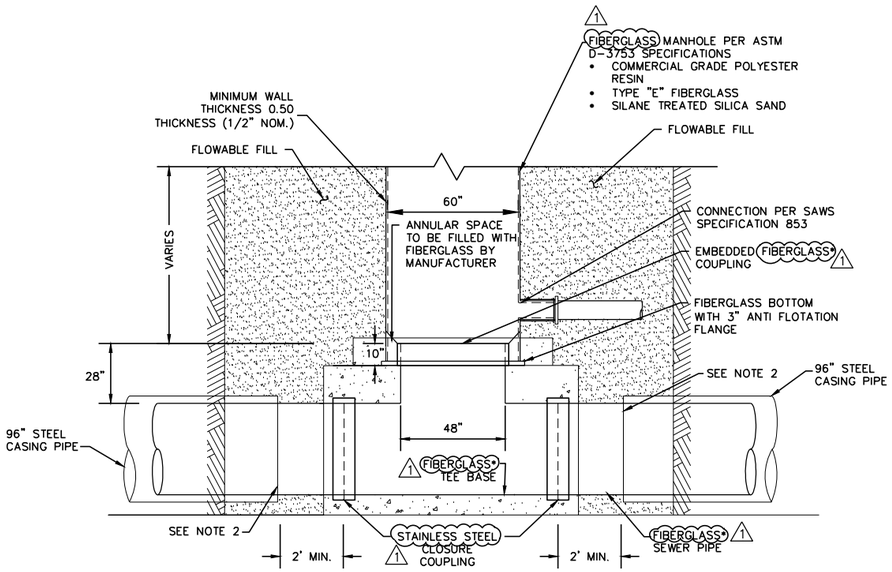


SECTION VIEW

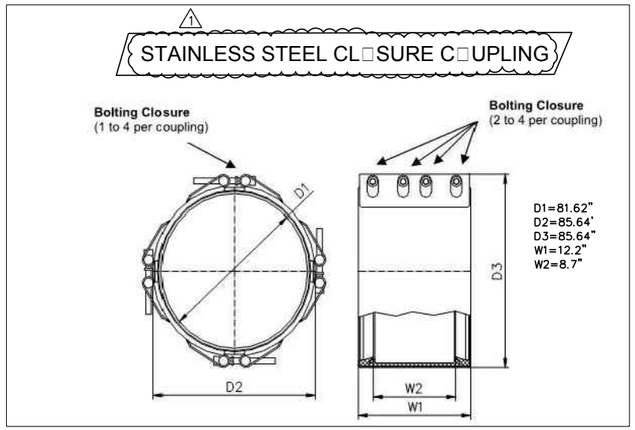
NOTES:

1. CONTRACTOR TO DETERMINE EXCAVATION METHOD AND SHORING REQUIRED TO INSTALL MANHOLE AND CUT-IN TEE AFTER TUNNELING AND INSTALLATION OF CARRIER PIPE.
2. CONTRACTOR TO SAW-CUT AND REMOVE SECTION OF CASING PIPE AFTER TUNNELING AND INSTALLATION OF CARRIER PIPE. CONTRACTOR TO TAKE ALL PRECAUTIONS NECESSARY TO PREVENT DAMAGE TO CARRIER PIPE.
3. ALL TEE BASE FIBERGLASS MANHOLE INSTALLATION, MATERIALS, EMBEDMENT PER SHEET C73, DETAIL 1.

* FIBERGLASS (FRP) SEWER PIPE MEETING THE REQUIREMENTS OF ASTM 03743 FOR DIRECT BURY INSTALLATION

FORT SAM HOUSTON CLOSURE COUPLING TEE BASE FIBERGLASS MANHOLE DETAIL

1 SCALE: NTS



NOTES:

1. STAINLESS STEEL CLOSURE COUPLING MANHOLES TO BE INSTALLED AT STATIONS 41+24.67 AND 42+75.14 ON SHEET C11.
2. CASING SHALL BE 316 SS.
3. SCREWS AND BOLTS SHALL BE 316L SS OR EQUAL.
4. SEALING SLEEVE SHALL BE EPDM OR NBR RUBBER.
5. SEE DETAIL 1 ON SHEET C72 FOR CONCRETE ENCASEMENT REINFORCING.
6. MAXIMUM GAP OF FRP CARRIER PIPES EQUAL TO 1.5".

12/5/16

STATE OF TEXAS
DAVID T. BENNETT
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No.	Revision	By	Date
1	ADDENDUM 3	DTB	12/05/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD - SEGMENT 1

SHEET

SEWER DETAILS (SHEET 4 OF 4)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: RWR	15-4506	C76
DRAWN: DDH	FNI PROJECT NO.	
CHECKED: DTB	KMH16157	

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12/2/2016 1:51 PM

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E-19 : Seguin Road to Nacogdoches Road – Segment 1

*Project Permits***

Addendum No. 3

Entity	Permit	Status	Contact Information
Union Pacific Railroad (UPRR)	Non-flammable Pipeline Crossing Permit	Under Review	Sandra Gomez, P.E. San Antonio Water System Ph. 210-233-3483 Email: Sandra.gomez@saws.org
City of San Antonio	Tree Permit	Under Review	Sandra Gomez, P.E. San Antonio Water System Ph. 210-233-3483 Email: Sandra.gomez@saws.org
City of San Antonio	Floodplain development Permit	Under Review	Sandra Gomez, P.E. San Antonio Water System Ph. 210-233-3483 Email: Sandra.gomez@saws.org
City of San Antonio	Right-of-way Use Permit	To Be Submitted by Contractor	City of San Antonio Ph. 210-207-6949
Fort Sam Houston	Dig Permit	To Be Submitted by Contractor	Charles F. (Chip) Baish III, P.E. JBSA – Fort Sam Houston Ph. 210-295-4784 Email: Charles.f.baish2.civ@mail.mil
Fort Sam Houston	Hot work Permit	To Be Submitted by Contractor	Charles F. (Chip) Baish III, P.E. JBSA – Fort Sam Houston Ph. 210-295-4784 Email: Charles.f.baish2.civ@mail.mil

**Project permit list is for informational purposes only and shall include but are not limited to permits listed above. Contractor is required to acquire all permits required by Ft. Sam Houston and other agencies/entities.

PART 1 - GENERAL

1.01 REQUIREMENTS

A. This section is a supplement to Item No. 804 of the SAWS Specification for Water and Sanitary Sewer Construction.

B. This Section describes the requirements for control of contaminated soil or contaminated water if encountered during the course of the Work and shall include monitoring, characterization by sampling and testing, segregation and temporary storage, removal, transportation and ultimate disposal of contaminated soil or water in accordance with all applicable federal, state and local regulations.

C. The Contractor shall notify the Owner and all required federal, state, and local agencies if contaminated materials including soils or water are encountered. The Contractor shall comply with all federal, state, and local licensing and certification requirements, as applicable, and obtain all necessary permits, approvals, and manifests in conjunction with contaminated waste material hauling and disposition as may be required.

D. The Contractor shall dispose of contaminated soil or contaminated water only at facilities accepted by the Owner and that are licensed by the State of Texas to accommodate such waste and in compliance with 30 TAC 334 or 335 requirements, and with 40 CFR, Part 261, Subpart D.

1.02 REFERENCE STANDARDS

A. This section includes references to the following standards. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements affording the greatest protection to the Owner shall apply, as determined by the Engineer.
   1. Department of Labor Regulations.
      a. 29 CFR Part 1910 - Occupational Safety and Health Standards
      b. 29 CFR Part 1518 - Safety and Health Regulations for Construction
   2. United States Environmental Protection Agency (EPA) Publications
      a. 40 CFR 257 - Criteria for Development of Solid Waste Disposal Facilities
      b. 40 CFR 258 - Criterion for Municipal Solid Waste Landfills
      c. 40 CFR 260 - Hazardous Waste Management System: General
      d. 40 CFR 261 - Identification and Listing of Hazardous Waste
      e. 40 CFR 263 - Transporters of Hazardous Waste
      f. 40 CFR 264 - Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
      g. 40 CFR 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
      h. EPA/SW 846 - Test Methods for Evaluating Solid Waste Physical/Chemical Methods, latest revision
      i. EPA 600/4-79/20 - Methods for Chemical Analysis of Water and Wastes, latest revision
      j. EPA 600/4-79-019 - Handbook for Analytical Quality Control in Water and Wastewater Laboratories

k. EPA 600/4-84-076 - Characterization of Hazardous Waste Sites - A Methods Manual: Volume 11, Available Sampling Methods, latest edition.

3. Department of Transportation (DOT)
   a. 49 CFR 172 - Transportation of Hazardous Materials
4. Texas Commission on Environmental Quality (TCEQ)
   a. 30 TAC 335 - Industrial Solid Waste and Municipal Hazardous Waste.

B. Other sections, not referenced herein, may be related to the proper performance of the Work. It is the Contractor's responsibility to perform all the Work required by the Contract Documents.

1.03 SUBMITTALS

A. In the event contaminated soil or contaminated water is encountered, submit the following prior to beginning screening, sampling, testing, removal, segregation, transportation, or ultimate disposal.
   1. Submit proof of registration as a TCEQ Registered Corrective Action Specialist (RCAS) for record.
   2. Submit copies of all notifications required by TCEQ, EPA, and other agencies prior to commencing work for record.
   3. Submit laboratory qualifications for contaminated soil and water testing.
   4. Submit for approval qualifications of sampling personnel.
   5. Submit all records associated with waste classification; waste coding, shipping and disposal of petroleum substances, Class 1, Class 2 (non-hazardous), or hazardous wastes encountered as part of this Work on a daily basis.
   6. Submit Contractor, transporter, and disposal facility certifications for proper handling, transporting and disposal of contaminated materials.
   7. Submit name and location of soil disposal facility and ultimate disposal location.

B. Submit for the following plans for review and acceptance. Plans must be submitted at least 30 days prior to commencement of trenching operations and shall comply with the provisions of 30 TAC 334. It must address procedures associated with storage, transportation, and disposal of contaminated materials encountered:
   1. Temporary Storage and Disposal of Petroleum Substance Wastes.
   2. Temporary Storage and Disposal of Class 1, Class 2 (non-hazardous), or Hazardous Wastes.

C. Submit a written work plan documenting the handling of contaminated soil or contaminated water, if encountered during the Work.

D. Submit a Sampling and Analysis Plan prior to conducting any testing. Submit copies of results for all testing conducted for record.

E. Submit Product Data for:
   1. Geosynthetic Membrane Liner
   2. Detection Devices

F. Submit Contractor’s Summary Report and Certification

1.04 QUALITY CONTROL

A. The services of a qualified independent environmental laboratory will be engaged by the Contractor. The laboratory shall have a minimum of five years of experience in providing testing services associated with water and soils contaminated with petrochemicals.

B. Samples shall be taken by qualified personnel under the direct control of the testing laboratory. Sampling personnel shall have a minimum of 2 years of experience collecting hazardous waste samples with the applicable methods and procedures.

C. A Registered Corrective Action Specialist (RCAS) shall be defined as being registered by the Texas Commission on Environmental Quality (TCEQ) to perform regulated corrective action services including any assessment (with the exception of an initial site assessment), monitoring, or remedial activities undertaken to investigate the extent of, and to remediate contamination.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Geosynthetic Membrane Liner shall be provided to isolate contaminated soil from the surrounding environment. Liner shall have a minimum thickness of 10 mils.

B. Detection devices shall include: photo-ionization detector (PID), flame ionization detector, or organic vapor analyzer/meter (OVM).

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. Monitor all excavations and dewatering performed for this Work for the possible presence of contaminated soil or contaminated water and monitor trenches for the presence of petroleum vapors and potential hazardous atmospheres. Potentially contaminated soil or water shall be identified by odor, stain, discoloration from native earth materials and by utilizing field detection devices:
   1. Observe for visual, olfactory, or texture indications of contamination. These indications may include, but are not limited to: petroleum, oil, fuel, or gasoline odor, other unusual odors, mottled or gray appearance, unusual color, sheen, staining, debris, or other non-native material. Record observations in daily report.
   2. Perform headspace measurement using an accepted PID or OVM on a representative soil sample every 400 cubic yards of excavated soil. Record observations in daily report.
   3. Monitor for petroleum vapors and potential hazardous atmosphere in trenches where works are present.

B. In the event that contaminated soil or contaminated water is encountered, the Contractor shall stop work in the area and notify the Owner.

3.02 SAMPLING CONTAMINATED SOILS

A. The Contractor shall take samples and perform the required testing in order to properly classify waste materials before disposal activities are initiated.

B. All sampling data shall be recorded and include the following minimum information:
   1. Date and time of sampling

2. Date and time of excavation
3. Sample identification and location, including station
4. Stockpile or water volume
5. Sample depth
6. Visual description of material sampled
7. Description of sampling methods and equipment used
8. Description of sample handling techniques (containers, preservation, chain of custody)
9. Field instrumentation readings
10. Weather conditions
11. Printed name of sampling personnel

C. Potentially contaminated soil shall be sampled in accordance with the following schedule:
   1. Total Petroleum Hydrocarbon (TPH) testing - One sample shall be taken for every 50 cubic yards of excavated materials.
   2. Toxicity Characteristic Leaching Procedure (TCLP) for benzene and lead - One sample shall be taken for every 200 cubic hundred yards of excavated materials.
   3. Groundwater seepage or surface water inflow that collects into known or suspected areas of contamination in quantities large enough to require its removal must be sampled at a frequency equal to one per 5,000 gallons unless otherwise indicated by the Owner or required by the disposal facility.

D. Reinstate water used in washing equipment used in known or suspected contaminated areas shall be collected, sampled, and analyzed for characterization and disposal. Sampling and testing frequency shall be equal to that specified for groundwater seepage or surface water inflow.

E. All sampling equipment shall be cleaned immediately prior to use with a laboratory grade non-phosphate detergent solution followed by rinses with distilled de-ionized water. Sampling tools shall consist of stainless steel trowels or other sampling devices consistent with the required analysis.

F. Excavated soils shall be sampled in the stockpiles to obtain a representative coverage of all the materials for the full depth of the stockpiles. Water samples shall be collected with a stainless steel or teflon bailer, dipper, pond sampler, or similar device.

G. Care shall be exercised to capture any observed floating oils so as to collect representative samples. Each sample container shall be clearly identified with a label that shows the field sample number, date/time of sampling, sample location, and names of sampling personnel. All information shown on the label must be written in indelible ink.

H. Containers shall be placed in zip-lock bags and stored in an iced cooler. The samples must remain in a refrigerated condition at all times, including transportation. Field and trip blanks shall be included in accordance with the Sampling and Analysis Plan procedures. Chain of custody documentation shall accompany each sample group or shipment.

3.03 TESTING

A. Hazardous substances and concentration levels shall be in accordance with 30 TAC 335.431 and the Texas Risk Reduction Program (TRRP) http://www.tceq.state.tx.us/remediation/trrp/trrppcls.html.

B. All test methods shall conform to TCEQ and EPA requirements.

C. Data shall be submitted to the Owner as they are received, but at least within four weeks of sample collection. A series of periodic (weekly) data submittals may result. Unanticipated results shall be reported to the Owner immediately.

D. Data submittals shall include the results of all analyses, including duplicate sample results and any unusual observations. Minimum data reporting shall include laboratory sample IDs which match field sample IDs. Supplemental quality control and related information (method blanks, etc.) shall be made available upon request.

3.04 TEMPORARY STORAGE OF CONTAMINATED SOILS

A. The Contractor shall establish the location and security measures for an exclusion zone to prevent unauthorized entrance to stockpiled soils.

B. Soils suspected to be contaminated shall be stockpiled in areas of sufficient size to permit and facilitate sorting and staging, as well as sampling and waste classification activities.

C. Stockpiles shall be isolated from the environment using impervious geosynthetic membrane liners beneath and over the contaminated soil and rock. Berms shall also be constructed around the stockpiles to contain the soils and to prevent contamination of storm water runoff that may flow adjacent to the site.

D. Contamination shall be confirmed and characterized prior to removal and disposal activities. Soils identified as being contaminated shall be separated from uncontaminated soils. If stockpiles are not properly protected and separated, any materials potentially contaminated shall be removed and properly disposed of at the Contractor's expense.

3.05 DISPOSAL OF CONTAMINATED WATER

A. If water within excavations is known or suspected to be contaminated, it shall be removed, sampled, tested, classified, and then properly disposed of. Water removed from excavations shall be placed in containers provided by the Contractor and disposed of at an approved disposal facility.

3.06 TRANSPORT OF CONTAMINATED SOILS

A. The Contractor shall utilize appropriate vehicles and operating practices to prevent spillage of contaminated or hazardous soils during loading and hauling. All operations for loading and hauling shall be in accordance with appropriate U.S. Department of Transportation regulations and TCEQ regulations.

B. The Owner will sign the required manifest as the generator of the waste. The Contractor shall immediately notify SAWS of any problems completing shipment and disposal. Copies of all documents relating to the shipment and transportation of contaminated soils shall be provided to the Owner for record on a daily basis.

3.07 REPORTING AND CERTIFICATION REQUIREMENTS

A. The Contractor shall prepare a written summary report documenting the handling of the contaminated soil or water during the completion of the Work. This report, as a minimum, shall contain the following information:
   1. Field notes documenting the date of removal and volume of soil or water. Notes must include documentation indicating concurrence of the Owner regarding the quantities that were measured.
   2. All acquired laboratory data.
   3. Labeled photographs that document monitoring, sampling, excavation, and disposal.
   4. Copies of all manifests and chain of custody documents.

B. Upon completion of the Work, the Contractor shall submit a Contractor Certification to the Owner. The Certification shall include the following minimum information:
   1. Written certification, signed by the Contractor, that all contaminated soil and water encountered during installation of the Work were removed from the site as specified and in accordance with all applicable rules and regulations.
   2. The shipper's certification that the soil or water was transported in accordance with all rules and regulations and under the proper federal, state, and local transportation permits.
   3. Written certification from the facility receiving the contaminated soil or water that it is licensed by the State of Texas to accommodate such waste.
   4. Completed manifests documenting signatures by the generator, transporter, and disposal facility within 5 days after final disposal.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Measurement for removal of contaminated soils, if encountered, shall be made by the Lump Sum for soil deemed by testing to be contaminated and required to be removed from the site. The import of non-contaminated soils that are replacing the exported contaminated soils shall be included in this item, NSPI.

B. Removal of contaminated water will not be measured for payment.

4.02 PAYMENT

A. Payments for removal of contaminated soils, if encountered, will be made in accordance with negotiations between SAWS and Contractor in accordance with Article VI – CONTRACT CHANGES, in the General Conditions.

B. The import of non-contaminated soils that replacing the exported contaminated soils will be paid for as part of the Lump Sum price for soil removal.

C. The Owner may elect to use a third party to accomplish the work described in this Section,to expedite this project.

D. All sampling and testing shall be done at the expense of the Contractor by qualified personnel and a qualified independent certified environmental laboratory.

E. Payment for removal of contaminated water shall be included in the applicable contract price for which the work pertains. No direct payment shall be made for costs associated with Contaminated Water.

END OF SECTION