SAN ANTONIO WATER SYSTEM
E19: SEGUIN ROAD TO NACOGDOCHES ROAD
SAWS PROJECT NO. 15-4506
SOLICITATION NO. CO-00104-DW
ADDENDUM NO. 1

November 11, 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 Modifications to Part I – CONTRACT DOCUMENTS

A. OPINION OF PROBABLE CONSTRUCTION COST (OPCC) – The estimated project construction cost has been revised to $42,555,944.

B. BID PROPOSAL – DELETE the Bid Proposal in its entirety and REPLACE with the Bid Proposal provided in Addendum No. 1. Bidders must use this version when submitting a bid for this project.

1) REVISE quantity for 104.1 – Street Excavation (12” Depth) From 8,058 to 7,293.
2) REVISE quantity for line item 202 – Prime Coat From 4,993 to 4,647.
3) REVISE quantity for line item 203 – Tack Coat From 2,773 to 2,599.
4) REVISE quantity for line item 205.2 – Hot Mix Asphaltic Pavement (10” Type B) From 24,174 to 21,879.
5) REVISE quantity for line item 205.4/535 – Hot Mix Asphaltic Pavement (2” Type D) From 26,924 to 24,629.
6) REVISE quantity for line item 103.1/500.4 – Concrete Curb and Gutter (Remove/Install) From 953 to 911.
7) REVISE quantity for line item 511.3 – Replace with Hot Mix Asphaltic Concrete Pavement (2” Type D and 10” Type B) From 782 to 1,346.
8) REVISE quantity for line item 550.1 – Trench Excavation Protection From 19,197 to 19,200.
9) REVISE quantity for line item 812 – 8-inch DR-14 (C-900) PVC Water Line From 5,824 to 6,036.
10) REVISE quantity for line item 824 – Relay Short Service (3/4” – 2”) From 11 to 12.
11) REVISE quantity for line item 828 – 8-inch Gate Valve w/Valve Box From 18 to 19.

12) REVISE quantity for line item 853 – Fiber-Reinforced Sanitary Sewer Manhole – Tee Base Fiberglass Manhole, Extra Depth (>6') From 299 to 371.
13) REVISE quantity for line item 853 – Fiber-Reinforced Sanitary Sewer Manhole – Tee Base Fiberglass Manhole, Miter w/Drop Extra Depth (>6') From 269 to 315.
14) DELETE line item 862 – Abandon Sanitary Sewer Manhole.
15) ADD line item 866A – Existing Sewer Main Television Inspection (48") and INCLUDE quantity of 16,285.
16) REVISE quantity for line item 3000 – Removal, Transport, and Disposal of AC pipe From 1,895 to 1,612.
17) REVISE unit for line item SP100 – Intermediate Demobilization/Remobilization from LS to EA, and REVISE quantity from 1 to 2.
18) REVISE line item C69/3 description from "(Unknown Width)" to "(Unknown Thickness)".

C. SPECIAL PROVISIONS – Remove SP 100 in its entirety, and replace with the SP 100 provided in Addendum No. 1. Revised SP 100 will be paid for by "each".

D. SUPPLEMENTAL CONDITIONS – ITEM 4 – BID REQUIREMENTS

1. Item 4 (A) (d) is to be deleted in its entirety and replaced with the following:

   "Record of performance form"

2. ATTACHMENT A – RECORD OF PERFORMANCE, is to be replaced in its entirety with the attached document. Bidders must use this version when submitting a bid for this project.

E. SUPPLEMENTAL SPECIFICATIONS

1. Add SPECIFICATION 866A – Existing Sewer Main Television Inspection. The specification to be added in included in Addendum No. 1.

2. Delete SS 02660 – Fiberglass Reinforced Pipe for Gravity Sanitary Sewer in its entirety, and add SS 857 – Fiberglass Reinforced Pipe for Gravity Sanitary Sewer.

3. SPECIFICATION SS 02345 – Microtunneling.

   a. Delete paragraph 1.06 (B) in its entirety, and replace with the following:

      "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 eight (8) years. The Contractor shall have completed at least three (3) individual drives exceeding 1,000 feet in length each during the same eight (8) 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 eight (8) year time period. The Contractor shall submit a description of referenced projects including owner's name and contact information, project superintendent, and machine operators."

b. Delete paragraph 3.06 – OBSTRUCTIONS, in its entirety.

4. SPECIFICATION SS 02610 – Steel Casing Pipe. Add the following sentence to the end of paragraph 1.05(D):

"Steel casing pipe installed within Union Pacific Railroad right-of-way shall have a minimum wall thickness of 1.00 inches."

3.0 Modifications to Part III – PLANS FOR CONSTRUCTION

A. ALL APPLICABLE SHEETS

1) Delete item 862 – Abandon Sanitary Sewer Manhole. Per SP 862, abandonment of sanitary sewer manholes is to be included in the per LF cost for abandonment of sanitary sewer main.

2) Delete specification reference to 848 for 48-inch and 78-inch FRP and Replace with specification reference 857.

B. SHEET G3

- Add "NSPI" to the end of Note 29, under the heading of Non-Standard Working Hours.

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

D. REMOVE – Sheets G11-G12 Project Layout (Sheet 2-3 of 4), REPLACE with revised attached Sheets G11-G12

E. SHEET G29

- Delete "Abandon Existing 48" Sanitary Sewer" callout, on top left corner of sheet.

F. SHEETS C1-C5

Add the following note to each sheet:

"At all locations where existing fencing is removed or interrupted, contractor shall secure with temporary fencing and/or security personnel so that private property is protected/preserved, no separate pay item."

G. SHEETS C2, C3, and C4

1) Delete the following line items from estimated quantities on these sheets:

a) Item 104.1 – Street Excavation (12" depth)
b) Item 205.2 – Hot Mix Asphaltic Pavement (10" Type B)
c) Item 205.4 – Hot Mix Asphaltic Pavement (2" Type D)

2) Add line Item 511.3 – Replace with Hot Mix Asphaltic Concrete Pavement (2" Type D and 10" Type D) to estimated quantities on these sheets.

H. SHEET C6

- Change concrete replacement from "Unknown Width" to "Unknown Thickness"

I. SHEET C10

- Change concrete replacement from "Unknown Width" to "Unknown Thickness"

J. SHEET C11

1) Add the following note to this sheet:

"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 (NSPI)*"

2) Add callout to this sheet to remove and relocated existing sanitary sewer metering device, reference Note 7.

K. SHEET C13

1) Add the following note to this sheet:

"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 (NSPI)*"

2) Add callout to this sheet to remove and relocated existing sanitary sewer metering device, reference Note 3.

L. SHEET C14

- REVISE vertical elevation in profile view of the "Existing Underground Communications Duct Bank, Unknown Elevation" to top of concrete of duct bank elevation equal to 659.2' and REVISE horizontal location of duct bank in plan view.

M. SHEET C40

- Remove last sentence of Note 3 and replace with the following.

  "Contractor shall submit and obtain approval from the engineer and/or owner if any changes are required to the alignment of the proposed sewer main 2 month prior to construction reaching Aina Ln. (N.S.P.I.)*"

N. SHEETS C43 and C44

- Revise references to tee base fiberglass manhole from sheet C72/Detail 1 to C73/Detail 1.

O. SHEET C59

1) Insert 8-inch gate valve south adjacent to Fire Hydrant Assembly

2) Insert line item 828 8-inch Gate Valve w/Valve Box with quantity of 1 EA

P. SHEET C61

- Change quantity for line item 3000 – Removal, Transport, and Disposal of AC Pipe, to 10 LF

Q. SHEETS C62

1) Revise quantity for line item 550.1 – Trench Excavation Safety Protection, to 561.08 LF
2) Revise quantity for line item 812 – 8-inch DR-14 (C-900) PVC Waterline, to 561.08 LF
3) Revise quantity for line item 3000 – Removal, Transport, and Disposal of AC Pipe, to 20 LF

R. SHEET 69

1) On Detail 4, modify "Flex Base Refer to Detail X/XX" to "Flex Base Refer to CoSA 503"

2) Add Note 1 to sheet and have details 3 and 4 reference note:

   "Flex base thickness per City of San Antonio specification 503 with minimum of 6-inches thickness or greater to match existing"

S. REMOVE – Sheets C63-C67 16-inch Water Line Sta. Start to End, REPLACE with revised attached Sheets C63-C67.

T. REMOVE – Sheets C75 Sewer Details (Sheet 3 of 4), REPLACE with revised attached Sheet C75

4.0 Questions and Answers

Q1: Has a materials lab been selected for this project? Will this be something paid by SAWS directly and are you taking proposals for these services?

Response: Materials testing during the construction phase of this project, will be the responsibility of the construction contractor, and will be paid for by the construction contractor.

11/11/16
Date

Signature

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

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.

E19: Seguin Road to Nacogdoches Road - Segment 1

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	HOT MIX ASPHALTIC PAVEMENT (2" TYPE D)	SY	24629	$_____	$_____
6	208	SALVAGING, HAULING, & STOCKPILING RECLAIMABLE ASPHALTIC PAVEMENT (2" DEPTH)	SY	2751	$_____	$_____
7	103.1	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	911	$_____	$_____
8	103.3	PORTLAND CEMENT CONCRETE DRIVEWAY - COMMERCIAL (REMOVE/INSTALL)	SY	125	$_____	$_____
9	503.5	GRAVEL DRIVEWAY (REMOVE/INSTALL)	SY	222	$_____	$_____
10	507.1	CHAIN-LINK WIRE FENCE - (4 FT & 6 FT. HIGH) (REMOVE/INSTALL)	LF	807	$_____	$_____
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	1444	$_____	$_____
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	19200	$_____	$_____
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	10	$_____	$_____
60	852	SANITARY SEWER DROP MANHOLE	EA	3	$_____	$_____
61	852	EXTRA DEPTH MANHOLE (>6')	VF	56	$_____	$_____
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	3100	TEMPORARY 8" WATER BYPASS	LF	1600	$_____	$_____
90	SC	CPS POLE BRACING ALLOWANCE	LS	1	$ $30,000.00	$_____
91	100.1	MOBILIZATION (MAXIMUM of 10% of LINE 1 - 90 SUB-TOTAL BASE BID AMOUNT)	LS	1	$_____	$_____
92	101.1	PREPARING RIGHT-OF-WAY (MAXIMUM of 5% of LINE 1 - 90 SUB-TOTAL BASE BID AMOUNT)	LS	1	$_____	$_____
93	SP100	INTERMEDIATE DEMOBILIZATION/REMOBILIZATION	EA	2	$_____	$_____

REVISION TO STANDARD SPECIFICATION ITEM NO. 100 (MOBILIZATION)
(Addendum No. 1)

100.1 DESCRIPTION

ADD the following section:

1. Intermediate Demobilization and Remobilization: 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

ADD the following sentence, in addition to the current sentence:

Measurement of the Item, Intermediate Demobilization and Remobilization, as specified herein, will be by "each" as the work progresses.

100.3 PAYMENTS

ADD the following section:

7. Intermediate Demobilization and Remobilization: This bid item will only be paid if prior authorized in writing by Owner, and shall be paid for by "each" occurrence of demobilization and remobilization. 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

ATTACHMENT A

RECORD OF PERFORMANCE

(Addendum No.1 - Rev. 11/11/16)

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 eight (8) 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 eight (8) 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 eight (8) 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 eight (8) 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 eight (8) 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 eight (8) 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.

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section is a supplement to Item No. 866 of the SAWS Specifications for Water and Sanitary Sewer Construction.

B. This section describes sewer main television inspection of existing sewer infrastructure, and construction of new sewer infrastructure and transfer of sewer flows into new sewer infrastructure. This television inspection is solely to identify any previously unknown lateral or main connections, before abandonment of the existing sewer infrastructure takes place.

C. The Contractor shall furnish all labor, materials, equipment, and incidentals to provide the televising and a NASSCO-(PACP) standard video, recorded in MPEG-1 format and written to DVD video, of sewer main and manholes utilizing a color, closed-circuit television inspection unit to determine their condition. The video shall include an inclinometer, visible on the video being viewed, noting the slope of the main being televised.

1.02 GENERAL

A. After completion of the work specified in the contract documents, and prior to abandonment of the existing sewer main being replaced, the existing sanitary sewer main shall be televised immediately upon cleaning. Televising shall be observed by the Inspector or Engineer and contractor, as the camera is run through the system. Any lateral sewer services or sewer mains noted that were previously unknown, shall be immediately brought to the attention of SAWS and the Project Engineer.

1.03 EXECUTION

A. The Contractor shall provide a DVD and log of the televised system for review and approval. If the Contractor provides a DVD of such poor quality that it cannot be properly evaluated, the Contractor shall re-televise as necessary and provide a DVD of good quality at no additional cost to SAWS. If the Contractor cannot provide a DVD of such good quality that can be reviewed by SAWS, SAWS may elect to televise the line at the Contractor's expense.

B. The television unit shall also have the capability of displaying in color, on DVD, pipe inspection observations such as pipe defects, sags, points of root intrusion, offset joints, service connection locations, and any other relevant physical attributes. Each DVD shall be permanently labeled with the following:

1. Project name / SAWS Job # / Work Order #;
2. Date of television inspection;
3. Station to station location and size of sanitary sewer;
4. Street/easement location;
5. Name of Contractor;
6. Date DVD submitted;

7. DVD number;
8. SAWS Inspector Name.

C. The Contractor shall provide a line diagram area sketch and written log for each completed segment of DVD sewer main describing the section being televised, camera direction, and position of any service connections noted.

D. The television inspection equipment shall have an accurate footage counter which displays on the monitor the exact distance of the camera from the center of the starting manhole. A camera with rotating and panning lens capabilities is required. The camera height shall be centered in the conduit being televised. The speed of the camera through the conduit shall not exceed 40 feet per minute. The produced video shall also have an inclinometer that displays the slope of the sewer main being televised.

E. The Contractor shall be required to have all materials, equipment, and labor force necessary to complete all videotaping on the job site prior to isolating the sewer manhole segment and beginning videotaping operations.

F. Television inspection shall be done one section between two manholes at a time.

G. There may be occasions during the televised inspection of a manhole section when the camera will be unable to pass an obstruction. At that time, and prior to proceeding, the Contractor shall contact the Inspector. If the length of sewer main cannot be televised because of obstructions, the Contractor shall clean the system as is necessary. If, in the opinion of the Inspector, the obstruction is attributed to a collapsed main or pipe deflection, televising shall be suspended, payment shall be made based on the actual televised length, and the remaining televising of the sewer line shall be continued upon successful correction of the blockage by the Contractor at his expense. No additional payment shall be made for additional setups required due to obstructions encountered during televising.

H. The method(s) used for securing passage of the camera are at the discretion of the Contractor, and as approved by the Inspector.

I. No sanitary sewer main televising effort shall commence until all pertinent permits or required approvals have been obtained by SAWS.

J. No separate and/or additional payment will be made for any excavation, man entry, or any other method which may be required to retrieve video equipment that may have been hung up, destroyed, and/or lost during the operation.

1.04 TRAFFIC CONSIDERATIONS

A. The Contractor shall to not cause undue interference with the use of streets, private driveways, and alleys to include the possible temporary trenching of force mains at critical intersections. Traffic management shall be done under the approval of respective City, County, or State Traffic, Barricade, and Signalization Departments.

1.05 PUMP OPERATIONS

A. The Contractor shall plug off and pump down the sewer manhole and/or main segment in the immediate work area and shall maintain the sanitary sewer system so that surcharging does not occur. The Contractor shall coordinate with all property owners to ensure that no damage will be caused to their property during any and all sewer rehabilitation work.

B. In the event that sewage accidentally drains into the drainage system or is spilled within the project, the Contractor shall immediately stop the overflow, notify the Inspector, and take the necessary action to clean up and disinfect the spillage using an HTH, or other equal chemical, at no additional cost to SAWS. Contractor related lapses that result in any fines or penalties, will also be the sole responsibility to the contractor.

1.06 MEASUREMENT AND PAYMENT

A. Measurement and payment will be made for the work to be done on the basis of the unit bid price per linear foot and shall be considered full compensation for all labor, materials, equipment, tools, logging, and incidentals necessary to complete the work.

END OF SECTION

PART 1 – GENERAL

1.01 DESCRIPTION

A. This item shall govern the furnishing, installation, adjustment, or replacement of large diameter (18 inch and greater) gravity sanitary sewer pipe of the size and type specified in the contract documents.

1.02 REFERENCES

A. Reference standards cited in this Specification Item No. 857 refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification Item No. 857, unless a date is specifically cited.

1. San Antonio Water System (SAWS):
   a. Specifications for Water and Sanitary Sewer Construction (2014)
   b. SAWS Materials Specifications
2. Texas Commission of Environmental Quality (TCEQ) Chapter 217 Design Criteria for Domestic Wastewater Systems
3. American Society for Testing and Materials (ASTM) International:
   a. D3236, Standard Test Method for Apparent Viscosity of Hot Melt Adhesives and Coating Materials
   b. D3262, Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
   c. D3681, Standard Test Method for Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition
   d. D4161, Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
   e. F477, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
4. American Water Works Association (AWWA)
   a. AWWA C950-13 Fiberglass Pressure Pipe
   b. AWWA M45 Fiberglass Pipe Design
5. International Organization of Standardization (ISO)
   a. ISO9001

1.03 SUBMITTALS

A. All submittals shall be in accordance with Owner’s requirements and submittals shall be approved by the Owner prior to delivery.

B. Shop Drawings:
   1. Catalog Data Sheets for all materials.
   2. Details of all piping system components confirming that the pipe and fittings conform to the specified requirements.
   3. Fabrication drawings showing:
      a. Wall thickness.
      b. Pipe length.
      c. Pipe joint.

d. Design of pipe and fittings.
e. Gasket details.

4. Shop drawings shall include fittings and specials that are to be installed.
5. Pipeline layout and profile drawings showing location, station, and invert elevation of pipe sections, fittings, closure pieces and test closures.
6. Test methods and results including certification that pipe exceeds the minimum requirements of ASTM D2412, ASTM D2992, and ASTM D3262 as appropriate and International Organization of Standardization (ISO) 9001 certification.
7. Design calculations to meet all loadings: In-situ, service, handling, and jacking pressure. Calculations confirming the pipe will handle anticipated loading signed and sealed by a Licensed Professional Engineer in Texas
8. Manufacturer shall verify that pipe stiffness provided meets conditions as represented in the Contract Documents. If computer calculations are used, include example calculations to show the logic employed.
9. Manufacturer shall provide a certificate of compliance to these specifications referencing project name and location. Manufacturer shall provide ISO 9001 certificate by a third party.
10. Test reports: Furnish an affidavit certifying that all Fiberglass Reinforced Pipe meets the provisions of this Section and has been tested and submit reports from tests in accordance with ASTM D3262 and ASTM D4161.
11. A copy of the full ASTM D3681 Strain Corrosion test report verifying that the proposed FRP meets the long-term corrosion resistance required for Septic Sanitary Sewer service when tested using 1N Sulfuric Acid.
12. The test report and all data shall be from sample production pipe from the plant which will be supplying pipe to this project.
13. Data from other sites, or report with mix data are subject to rejection by the Owner.
14. Manufacturer shall provide a certificate confirming that it meets the required experience levels for years of production and footages and sizes as described in the specifications.
15. Manufacturer's written instructions for handling, transporting, storage, and installation of pipe.
16. Manufacturer shall provide as a Shop Drawing; recommendations for embedment, manhole connection details, encasement details, and any repair details.
17. A video of pipe before and after line cleaning must be submitted by Contractor to pipe manufacture to certify that pipe has been installed with no defects.

1.04 MATERIALS

A. General
1. The work to be performed in this section includes design calculations, detailing, and fabrication of FRP for the conveyance of raw sanitary sewage. Pipe design calculations will be required for open-trench and tunneling installation methods.
2. Other work performed under this section includes: shop testing;
3. Fabrication of fittings and appurtenances; handling, storage and protection; and loading and transportation of completed fittings and appurtenances to the construction site.
4. All pipes shall be manufactured specifically for this project and no pipe shall be furnished from stock unless approved by the Owner.

B. Pipe
1. Performance / Design Criteria

a. Design in accordance with ASTM D3262 including the appendix and subsequent specifications, and in accordance with SAWS specifications. Depths shall comply with requirement of ASTM D3681.
b. Design pipe for service loads that include:
    i. External groundwater and earth loads
    ii. Jacking/pushing loads (Acceptable Manufacturer only)
    iii. The allowable jacking/pushing capacity shall not exceed 40 percent of the ultimate compressive strength or the maximum allowable compressive strength recommended by the manufacturer, whichever is less.
    iv. Traffic loads
        (a) Practical considerations for handling, shipping and other construction operations.
c. Design is to be conducted under the supervision of a Professional Engineer licensed in the State of Texas, who shall seal and sign the design. Standard lay length of 20 feet, except for special fittings or closure pieces necessary to comply with the Plans.
d. Design of pipe is to include the determination of design pressures up to 25 psi, stresses, external loads, pressure class (PN), and pipe stiffness class (SN).
e. Stiffness (SN) class that satisfies design requirement on the Plans.
f. All lines must be able to withstand a high-velocity cleaning with a water jet capable of producing a minimum volume of 50 gpm with a pressure of 1500 psi at the nozzle. Install a gauge to indicate working pressure on the discharge of high-pressure water pumps. The jet angle of the outlet must be no greater than 30o relative to the pipe axis. A video of pipe before and after line cleaning must be submitted of all installed lines. No delamination should occur.
g. In no case shall pipe be installed deeper than its design allows.
h. Pipe markings shall meet the minimum requirements of ASTM 3236. Minimum pipe markings shall be as follows:
    i. Manufacturer
    ii. Manufacturer Number (identifies factory, location, date manufactured, shift and sequence)
    iii. Nominal diameter
    iv. Beam load
    v. Laying length
    vi. ASTM designation

C. Gaskets
1. Supply from approved gasket manufacturer in accordance with ASTM F477 and suitable for service intended.
2. Affix gaskets to pipe by means of suitable adhesive or install in a manner so as to prevent gasket from rolling out of pre-cut groove in pipe or sleeve coupling.
3. Provide the following gaskets in potentially contaminated areas.
    a. Petroleum (diesel, gasoline) – Viton
    b. Other contaminants – Manufacturer recommendation

D. Joints
1. Joints for pipe and fitting shall conform to the material and performance requirements of ASTM D4161. Depths shall comply with requirements of ASTM D3681.
2. Field connect pipe with fiberglass sleeve couplings that utilize elastomeric sealing gaskets as sole means to maintain joint water tightness.

E. Connections
   1. Use only manufactured fittings. Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber reinforced overlays. For pipe diameters 18 inches or larger, lateral openings 6 inch or greater in size shall be made using inserta-tee conforming to ASTM D3034 service connections, approved by Engineer and found in SAWS' Material Specifications.

F. Dimensional Tolerances
   1. Inside diameter
      a. Pipe shall not vary more than 1/8 inch from the nominal inside diameter.
   2. Roundness
      a. The difference between the major and minor outside diameters shall not exceed 0.1 percent of the nominal outside or ¼ inch, whichever is less.
   3. Wall thickness
      a. Provide minimum single point thickness no less than 98 percent of stated design thickness.
   4. End Squareness
      a. Provide pipe ends square to pipe axis with maximum tolerance of 1/8 inch.
   5. Fittings
      a. Provide tolerance of angle of elbow and angle between main and leg of wye or tee to ±2 degrees.
      b. Provide tolerance of laying length of fitting to ±2 inches.

G. Acceptable Manufacturer
      a. Vendors must have approval through SAWS Standards Committee prior to product use and must meet all requirements set forth in this Specification Item No. 857.

1.05 CONSTRUCTION

A. All sanitary sewer mains shall be constructed in accordance with the specification herein outlined and in conformity with the required lines, grades, and details shown in the contract documents and as directed by the Engineer.
   1. Quality Control
      a. All project pipes shall be provided by a single manufacturer
      b. Only the pipe and fittings that will be installed during a single work day will be allowed to be stored within the barricaded work area
      c. Pipe manufacturing operations shall be performed under the control of the manufacturer.
      d. All pipe furnished shall be in conformance with this Specification Item No. 857 and ASTM D3262.
   2. Delivery of Materials
      a. Provide adequate strutting during transport to prevent damage to the pipe, fittings and appurtenances.
   3. Storage Requirements
      a. Gravity pipe shall be stored and handled in accordance with the manufacturer's guidelines or Engineers recommendations.

b. All products shall be stored above the ground upon platforms, pallets, skids, or other supports supplied by the Contractor. Products shall be kept free from dirt and other foreign matter.
c. All products shall be stored to permit ready access for identification and inspection by the Inspector.
d. If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or replaced as required by the Inspector or Engineer at the Contractor's expense, before proceeding further. Deliver, store, and handle other materials as required to prevent damage.
e. Pipe laid directly on the ground shall be placed on an area free of loose stones or sharp objects
f. Engineer or Inspector may request to be present during delivery and unloading of pipe.

4. Pipe Handling
   a. The Contractor shall abide by the required handling techniques specified by the Manufacturer.
   b. The Contractor shall provide suitable quantities of all lifting equipment to handle the pipe. In no case shall any equipment be used that is not rated to handle the intended loading or conditions of use to which it will be subjected, or which will damage or gouge the pipe.
   c. Dragging or dropping the pipe shall not be allowed.
   d. Haul and distribute pipe and fittings at the project site.
   e. Handle piping with care to avoid damage.
   f. Inspect each joint of pipe and reject or repair any damaged pipe prior to lowering into the trench.
   g. Use only nylon ropes, slings or other lifting devices that will not damage the surface of the pipe for handling pipe.
5. Pipe Installation
   a. Engineer and/or Inspector may request to inspect pipe prior to installation.
   b. Install pipe, fittings, specials and appurtenances as specified herein, and in accordance with the pipe manufacturer’s recommendations or Engineers requirements.
   c. Must follow manufacture recommendation for initial and bedding.
   d. Lay pipe to the lines and grades as indicated in the Plans.
   e. Excavate and backfill trenches in accordance with the SAWS Standard Specification Item No. 804.
   f. Pipe Separation: Sewer pipe separation distances shall be maintained in accordance with TCEQ rules 30 §217.53.
   g. Laser Beams: The use of laser beams for vertical control shall be required.
   h. Contractor shall also make available to the Inspector, when requested, a level and rod, of sufficient sensitivity, to accurately determine differences in elevation between points 300 feet apart with one instrument set-up.
   i. The use of laser beams for vertical control shall be required. Contractor shall also make available to the Inspector, when requested, a level and rod, of sufficient sensitivity, to accurately determine differences in elevation between points 300 feet apart with one instrument set-up. Contractor shall provide a written summary to the Inspector of all elevations that all installed, repaired, or replaced sewer main enter and exit a manhole or structure.

j. No pipe shall be installed in tunnels except as noted in the contract documents or by approval of the Engineer. If the Contractor finds it necessary to install pipe in tunnels not provided in the contract documents, he shall submit to the Engineer a detailed outline of procedures, methods, and use of materials depending on existing soil conditions. This information requires review and approval prior to the commencement of work. Only SAWS Product Standards Committee approved pipe manufacturer will be allowed for tunneling.
k. No horizontal or vertical curves shall be permitted in conformance with appropriate regulatory agency requirements.
l. Before leaving the work unattended, the upper ends of all pipelines shall be securely closed with a tight fitting plug or closure.
m. The interior of laid pipe shall be kept free from dirt, silt, gravel, or foreign material at all times.
n. <u>All pipes in place must be approved by the Inspector before backfilling.</u>
o. When replacing an existing system in place, Contractor shall maintain screens to prevent the entrance of construction debris into the sewer system. Ensure properly temporarily connected or maintain continuous by-pass.
p. <u>At the close of each operating day:</u>
    a. Keep the pipe clean and free of debris, dirt, animals and trash – during and after the laying operation.
    b. Effectively seal the open end of the pipe using a gasketed night cap. When not temporarily connected.

1.06 TESTING

A. Successful passage of the air test and mandrel test as described under TCEQ Chapter 217 Criteria. Shall be required for acceptance of the mains.

B. The Contractor shall perform a low- pressure air test, or an infiltration/exfiltration test, and a mandrel test before the installed work shall be considered accepted. If a gravity collection main is composed of flexible pipe, a deflection test will also be required. Flexible pipe is defined as pipe that will deflect at least 2% without structural distress. Contractor shall insure that all testing is performed in the presence of the Inspector, with copies of all written test results made available to the Inspector. Tests shall conform to the following requirements:

1. Low-Pressure Air Test: For sections of pipe less than 27-inch average inside diameter the following procedure for the low-pressure air test shall apply and test shall conform to the procedures described in ASTM C828, ASTM C924, and ASTM F1417 (or other appropriate procedures), except for testing times. The test times shall be as outlined in this section. The pipe shall be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be computed from the following equation:

$$T = \frac{0.085 \times D \times K}{Q}$$

Where:

T = Time for pressure to drop 1.0 pound per square inch gauge in seconds;

K = 0.000419 x D x L, but not less than 1.0;

D = Average inside pipe diameter, in inches;

L = Length of line of same pipe size being tested, in feet;

Q = Rate of loss, 0.0015 cubic feet per minute per square foot internal surface shall be used since a K value of less than 1.0 shall not be used.

The minimum testing times for each pipe diameter is as follows:

Pipe Diameter	Minimum Time	Length for Minimum Time	Time for Longer Length
Inches	Seconds	Feet	Seconds/Ft
18	1,020	133	7.693
21	1,190	114	10.471
24	1,360	100	13.676
27	1,530	88	17.309

* Note: Test time starts after the required 60 seconds of stabilization time has transpired.

2. The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined above or until failure.
3. Mains with a 27 inch average inside diameter and larger must be air tested at each joint. If the joint test is used, a visual inspection of the joint shall be performed immediately after testing. The pipe is to be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure has stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be 10 seconds.
4. Infiltration/Exfiltration Test: The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of main per 24 hours, at a minimum test head of 2 feet above the crown of the main at an upstream manhole. The Contractor shall use an infiltration test in lieu of an exfiltration test when mains are installed below the ground water level. In such cases, the total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of main 24 hours at a minimum test head of 2 feet above the crown of the main at an upstream manhole, or at least 2 feet above the existing groundwater level, whichever is greater. For construction work occurring within a 25-year floodplain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of main per 24 hours at the same minimum test head as stated in the previous sentence. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, the Contractor shall propose to the Engineer, and receive approval therefrom, all necessary remedial action, solely at the

Contractor's own cost, in order to reduce the infiltration or exfiltration to an amount within the limits specified herein.

5. Deflection Testing: As stated in the 30 TAC § 217, deflection test shall be performed on all flexible pipe installed.
   1) For mains with inside diameters less than 27 inches, a rigid mandrel shall be used to measure deflection.
   2) For main with an inside diameter 27 inches and greater, a method approved by the Engineer shall be used to test for vertical deflections. A manufacturers approved Go-No-Go deflection rod can be utilized for deflection testing.
   3) The deflection test must be accurate to within + 0.2% deflection. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of five percent. If a pipe should fail to pass the deflection test, the problem shall be corrected and a second test shall be conducted after the failed area's final backfill has been in place an additional 30 days. The tests shall be performed without mechanical pulling devices. The Engineer should recognize that this is a maximum deflection criterion for all pipes and a deflection test less than 5% may be more appropriate for specific types and sizes of pipe. Upon completion of construction, the Engineer or other Texas Registered Professional Engineer appointed by the owner shall certify to the Inspector, that the entire installation has passed the deflection test. This certification may be made in conjunction with the notice of completion required in 30 TAC § 217.14. (1) of this title (relating to General Provisions). This certification shall be provided for the Owner to consider the requirements of the approval have been met.
      a. Mandrel Sizing. The rigid mandrel shall have an outside diameter (O.D.) not less than 95% of the inside diameter (I.D.) of the pipe. The inside diameter of the pipe, for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter minus two minimum wall thicknesses for O.D. controlled pipe and the average inside diameter for I.D. controlled pipe. All dimensions shall be per appropriate standard. Statistical or other "tolerance packages" shall not be considered in mandrel sizing.
      b. Mandrel Design: The rigid mandrel shall be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed. The mandrel shall have nine or more "runners" or "legs" as long as the total number of legs is an odd number. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe. A proving ring shall be provided and used for each size mandrel in use.
      c. Method Options: Adjustable or flexible mandrels are prohibited. A television inspection is not a substitute for the deflection test.
   4) Test Reports: Submit reports from tests in accordance with ASTM D3262 and ASTM D4161.

1.07 MEASUREMENT

A. All sewer pipes will be measured from center of manhole to center of manhole. Measurement will be continuous through any fittings in the main, even though the fittings are pay items of the contract.

1.08 PAYMENT

A. Sewer pipe will be paid for at the contract bid price per linear foot complete in place for the types, size and depth constructed. Said price shall be full compensation for furnishing all materials, including pipe, couplings, trenching, pumping, concrete, plugs, laying and jointing, backfilling, select bedding and initial backfill material, tamping, water, labor, tools, equipment, testing, temporary all weather surface in accordance with Specification Item No. 804 and other incidentals necessary to complete the work.

B. Any fittings required to connect to FRP will be incidental to pipe cost.

C. Pay cuts will be measured from the top of ground prior to the Contractor's operation and along the centerline of the pipe to the invert of the pipe.

D. Contractor to provide cut-sheets with centerline pay cuts.

END OF SECTION

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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	807
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	1444
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	19200
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

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
848	10-INCH SDR-26 (ASTM D-3034) PVC SANITARY SEWER LINE (10' TO 14')	LF	16
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	10
852	SANITARY SEWER DROP MANHOLE	EA	3
852	EXTRA DEPTH MANHOLE (>6')	VF	56
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 02610	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
100.1	MOBILIZATION	LS	1
101.1	PREPARING RIGHT-OF-WAY	LS	1
SP100	INTERMEDIATE DEMOBILIZATION/REMOBILIZATION	EA	2

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Texas Registered Engineering Firm F-2144

No.	Revision	By	Date
1	ADDENDUM 1	DTB	11/11/2016

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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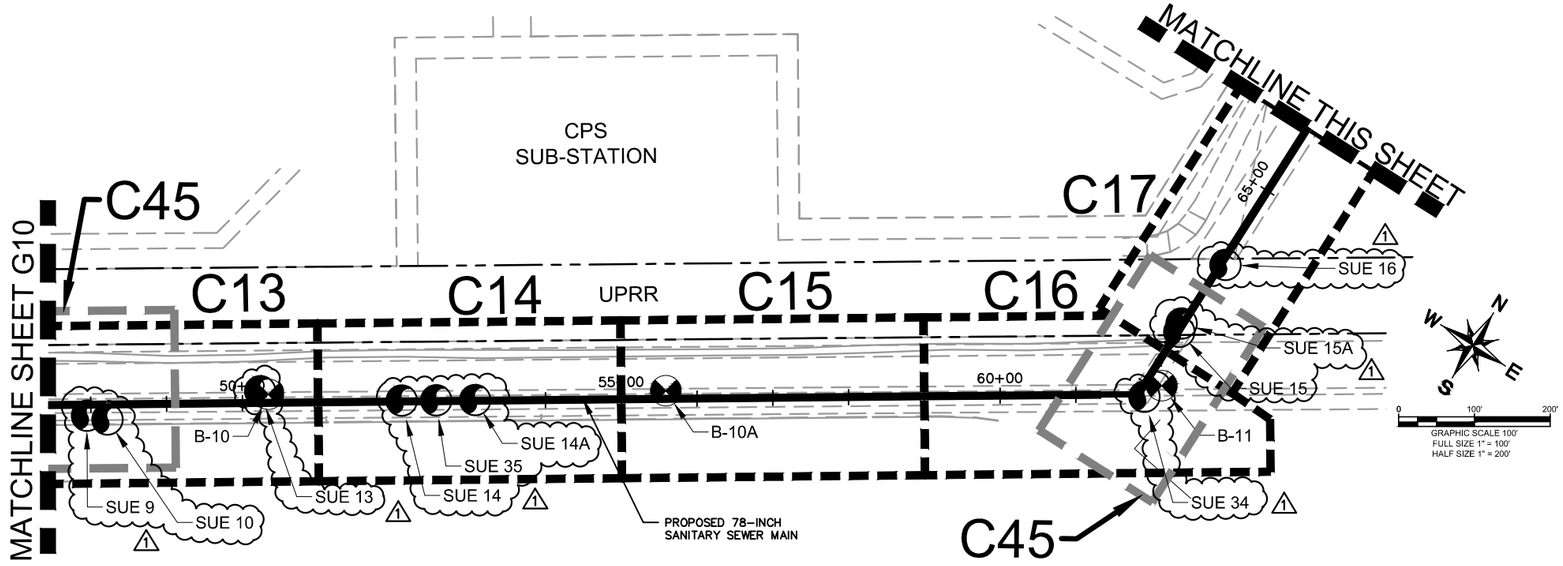

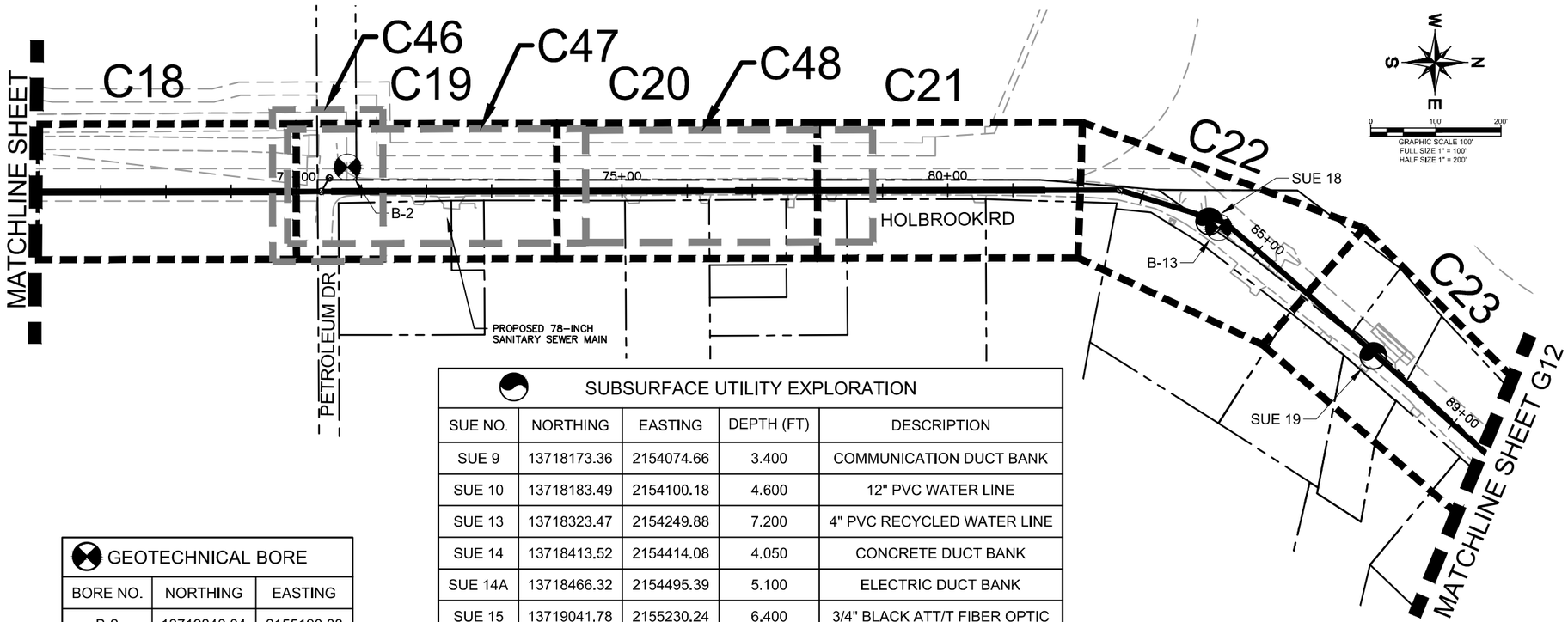

GEOTECHNICAL BORE

BORE NO.	NORTHING	EASTING
B-2	13719840.04	2155190.88
B-10	13718325.89	2154261.34
B-10A	13718611.86	2154701.03
B-11	13718969.54	2155249.36
B-13	13721176.95	2155284.53

SUBSURFACE UTILITY EXPLORATION

SUE NO.	NORTHING	EASTING	DEPTH (FT)	DESCRIPTION
SUE 9	13718173.36	2154074.66	3.400	COMMUNICATION DUCT BANK
SUE 10	13718183.49	2154100.18	4.600	12" PVC WATER LINE
SUE 13	13718323.47	2154249.88	7.200	4" PVC RECYCLED WATER LINE
SUE 14	13718413.52	2154414.08	4.050	CONCRETE DUCT BANK
SUE 14A	13718466.32	2154495.39	5.100	ELECTRIC DUCT BANK
SUE 15	13719041.78	2155230.24	6.400	3/4" BLACK ATT/T FIBER OPTIC
SUE 15A	13719052.70	2155227.14	5.800	1.5" BLACK LEVEL 3 FIBER
SUE 16	13719148.93	2155234.24	3.500	2" MCI FIBER OPTIC
SUE 18	13721162.43	2155275.33	6.450	48" RCP SEWER LINE
SUE 19	13721414.24	2155482.51	4.500	6" PVC WATER LINE
SUE 34	13718944.90	2155237.81	4.100	(2) 2" LEVEL 3 FIBER OPTIC
SUE35	13718438.22	2154452.22	2.600	CONCRETE DUCT BANK

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11/11/16

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

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

PROJECT LAYOUT (SHEET 2 OF 4)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: MAV	15-4506	
DRAWN: DPF	KHA PROJECT NO.	G11
CHECKED: GAG	068665018	

PLOTTED BY: FURDOCK, DANIEL
DRAWING NAME: K:\SAN_LFD\068665018-SAWS LFD\CADD\SEGMENT 1\SHEETS\PROJECT LAYOUT-SEG1-068665018.DWG
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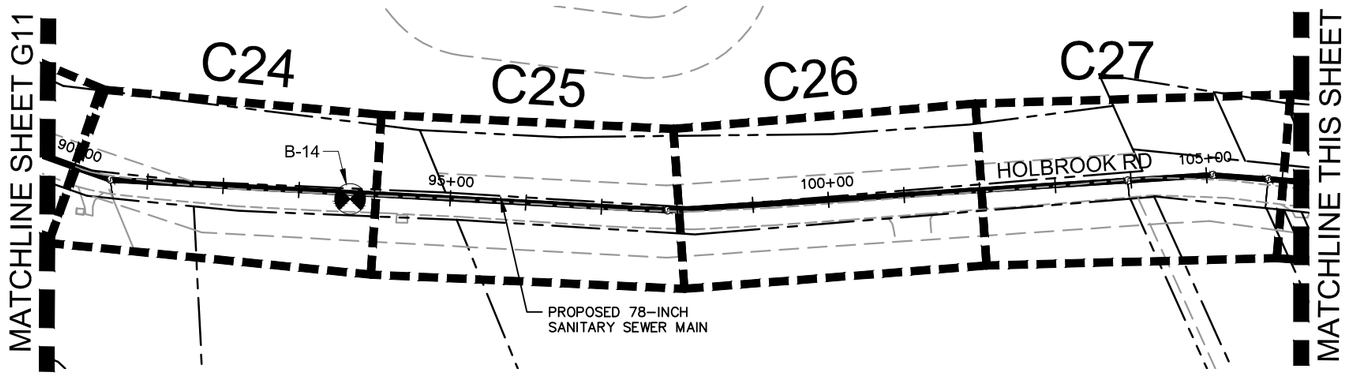

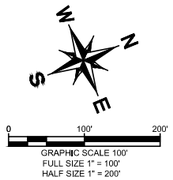

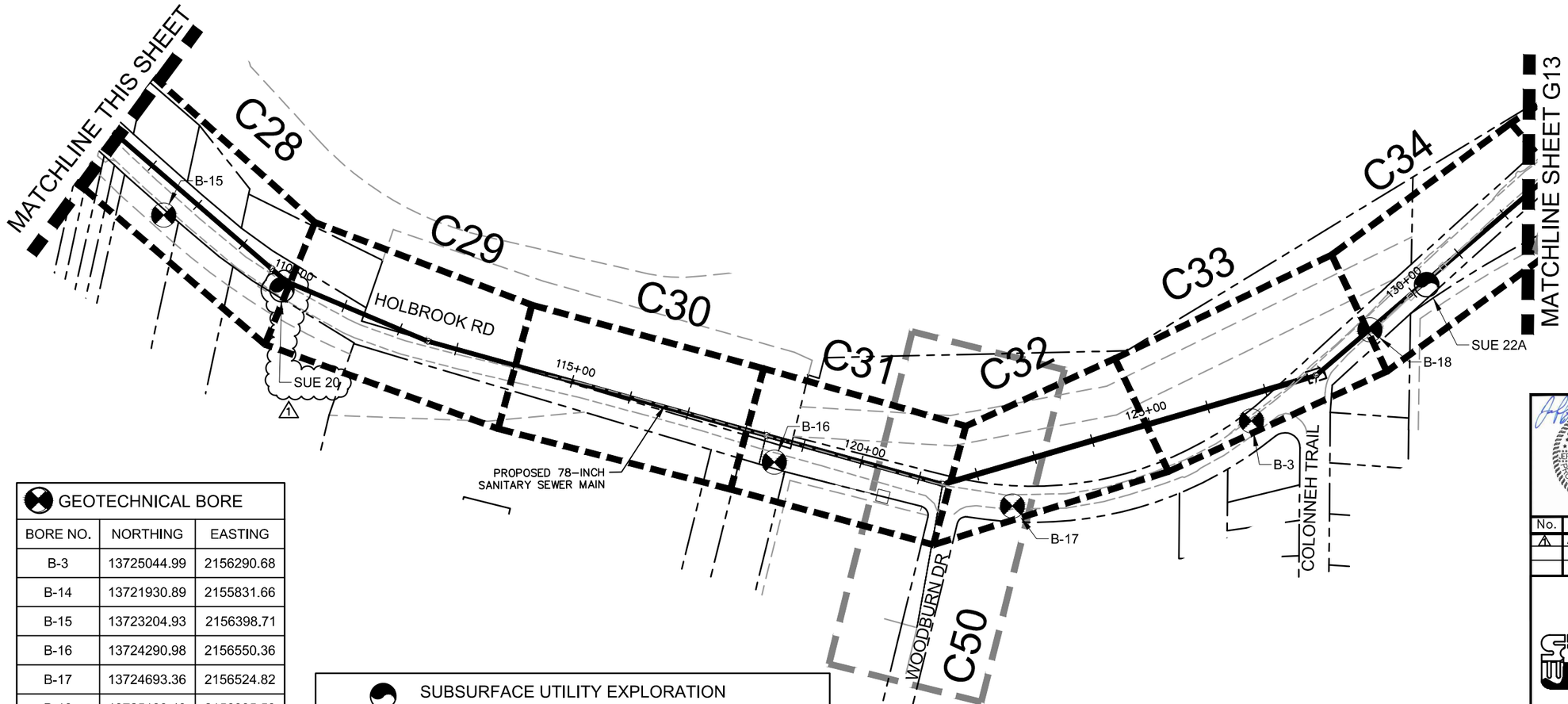

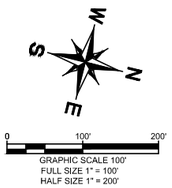

GEOTECHNICAL BORE		
BORE NO.	NORTHING	EASTING
B-3	13725044.99	2156290.68
B-14	13721930.89	2155831.66
B-15	13723204.93	2156398.71
B-16	13724290.98	2156550.36
B-17	13724693.36	2156524.82
B-18	13725199.49	2156095.59

SUBSURFACE UTILITY EXPLORATION				
SUE NO.	NORTHING	EASTING	DEPTH (FT)	DESCRIPTION
SUE 20	13723425.96	2156471.19	1.750	48" SEWER LINE
SUE 22A	13725272.90	2156000.02	1.050	2" TELEPHONE CABLE

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11/11/16

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

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

PROJECT LAYOUT (SHEET 3 OF 4)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: MAV	15–4506	G12
DRAWN: DPF	KHA PROJECT NO.	
CHECKED: GAG	068665018	

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DRAWING NAME
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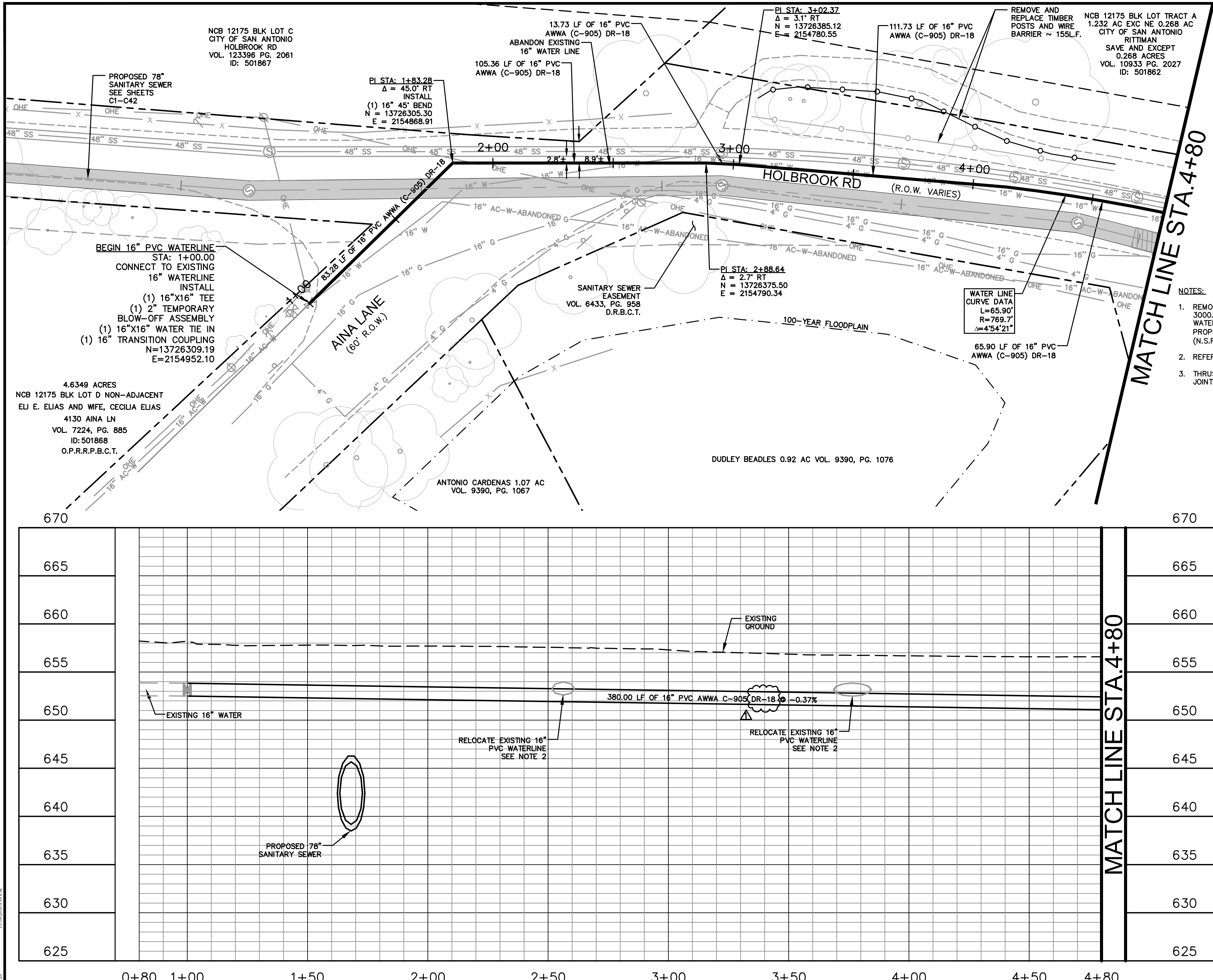

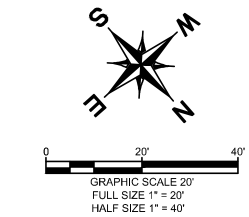

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	380.00
812	16-INCH DR-18 (C-905) PVC WATER LINE	LF	380.00
836	DUCTILE IRON FITTINGS	TON	0.20
840	16-INCH X 16-INCH WATER TIE-IN	EA	1.00
844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (12-16-INCH MAINS)	EA	1.00
3000	REMOVAL, TRANSPORT, AND DISPOSAL OF AC PIPE	LF	26 (1)

NOTES:

1. REMOVAL AND DISPOSAL OF ASBESTOS PIPE SHALL BE PAID FOR UNDER LINE ITME 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 SUBSIDIZING 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.

LEGEND

* 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
- 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
- EXISTING FIRE HYDRANT
- EXISTING OVERHEAD ELECTRIC LINE & PP — OHE

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

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

16–INCH WATER LINE STA. START TO 4+80

DATE: NOVEMBER 2016	SAWS PROJECT NO. 15-4506	SHEET NO. C63
DESIGN: JAF		
DRAWN: DPF	KHA PROJECT NO. 068665018	
CHECKED: GAG		

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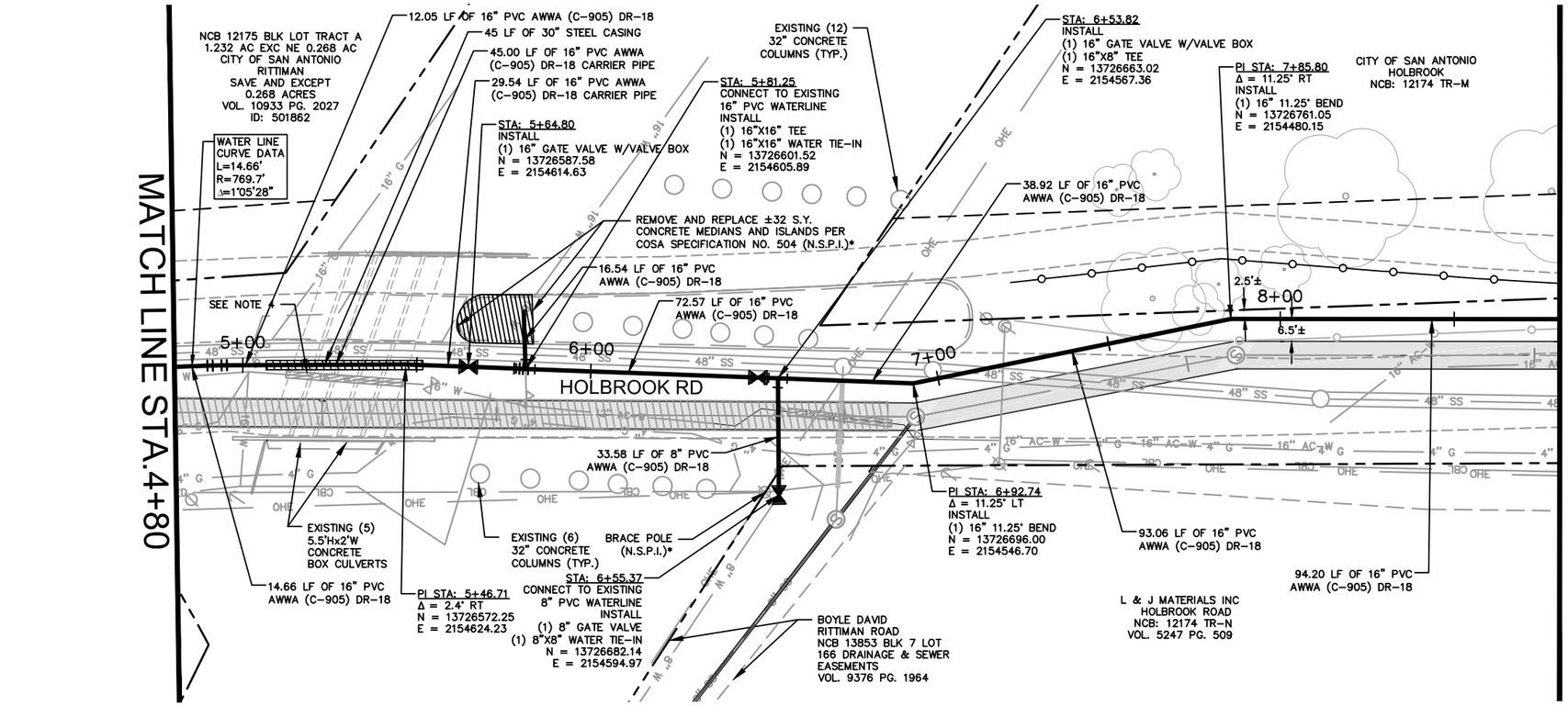

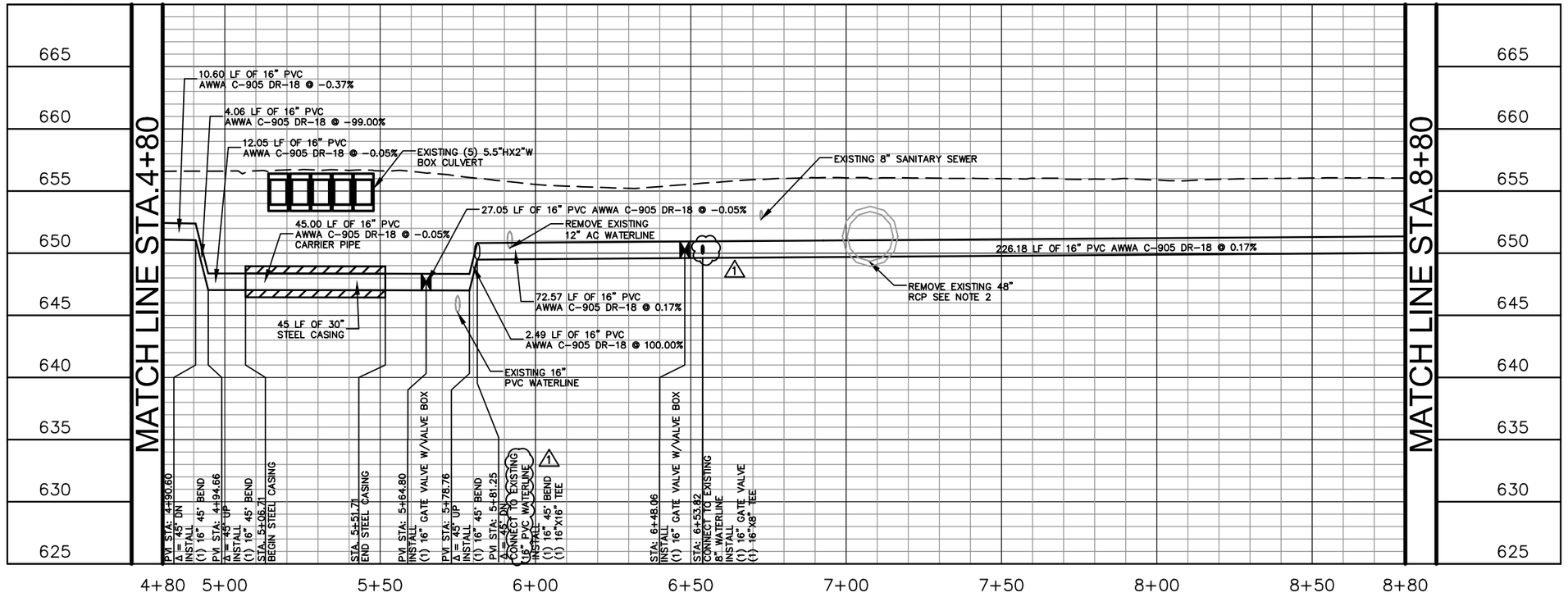

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
103.1 500.4	CONCRETE CURB AND GUTTER (REMOVE/INSTALL)	LF	10.00
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	405.12
812	8-INCH DR-14 (C-900) PVC WATER LINE	LF	33.58
812	16-INCH DR-18 (C-905) PVC WATER LINE	LF	371.54
828	8-INCH GATE VALVE W/VALVE BOX	EA	1.00
828	16-INCH GATE VALVE W/VALVE BOX	EA	2.00
836	DUCTILE IRON FITTINGS	TON	2.00
840	8-INCH X 8-INCH WATER TIE-IN	EA	1.00
840	16-INCH X 16-INCH WATER TIE-IN	EA	1.00
856	JACKING, BORING, OR TUNNELING - (30") INCLUSIVE OF CASING	LF	45.00
856	16-INCH PVC DR-18 (C-905) CARRIER PIPE (INSTALL)	LF	45.00
1 3000	REMOVAL, TRANSPORT, AND DISPOSAL OF AC PIPE	LF	26

NOTES:

1. REMOVAL AND DISPOSAL OF ASBESTOS PIPE SHALL BE PAID FOR UNDER LINE ITME 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 SUBSIDIZING 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.
4. CONTRACTOR SHALL LOCATE ABANDONED EXISTING 48" SANITARY SEWER AND EXISTING 16" WATERLINE IN 30" STEEL CASING PRIOR TO BORE. CONTRACTOR SHALL NOTIFY OF ANY CONFLICT AND PROVIDE LOCATION AND DEPTH OF UTILITIES TO PROJECT ENGINEER TWO WEEKS IN ADVANCE OF BORING OPERATION.

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

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

FULL SIZE (22" x 34")	HALF SIZE (11" x 17")
1" = 5' VERTICAL	1" = 10' VERTICAL

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

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

16-INCH WATER LINE STA. 4+80 TO 8+80

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: JAF	15-4506	C64
DRAWN: DPF	KHA PROJECT NO.	
CHECKED: GAG	068665018	

PLOTTED BY: DANIEL TURCOTTE
LAST SAVED: 11/10/2016 6:16 PM
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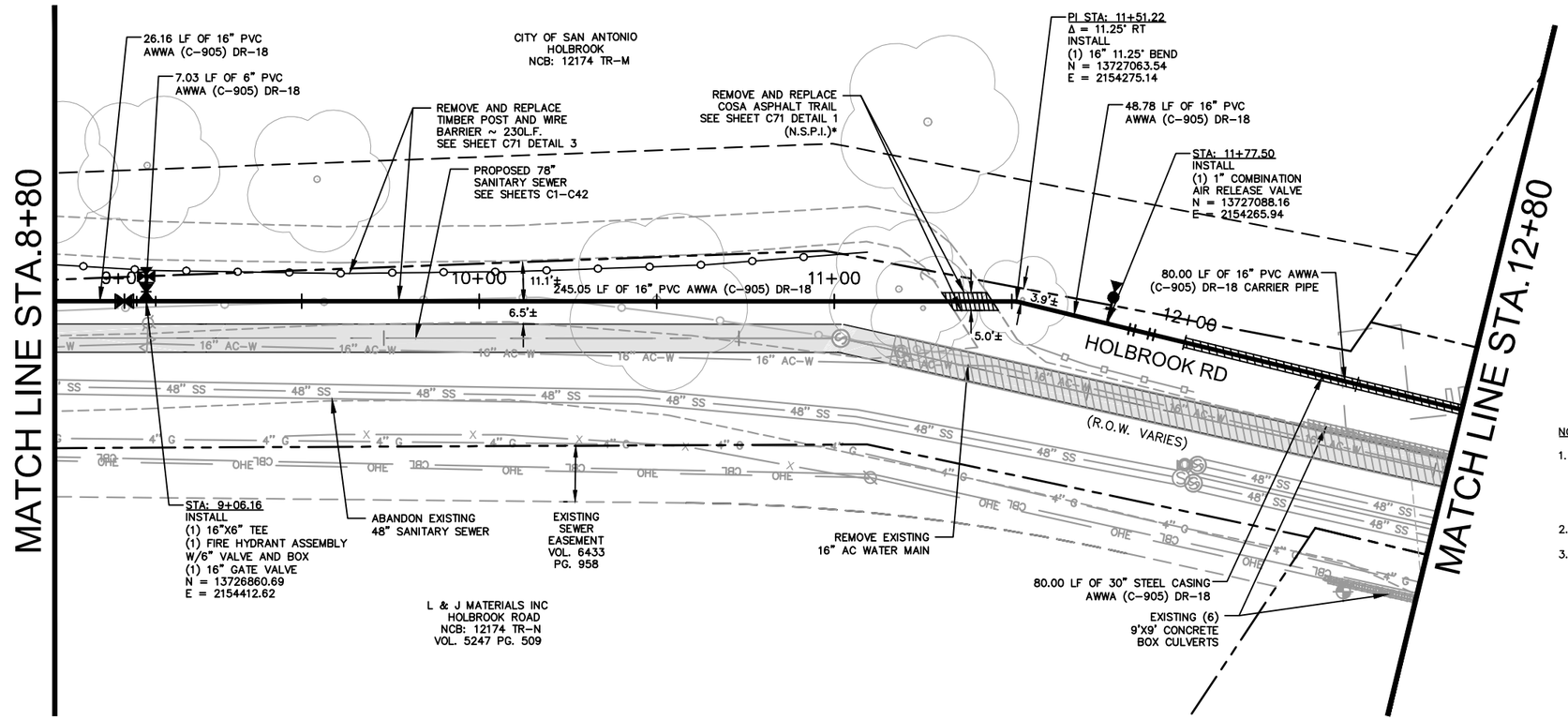
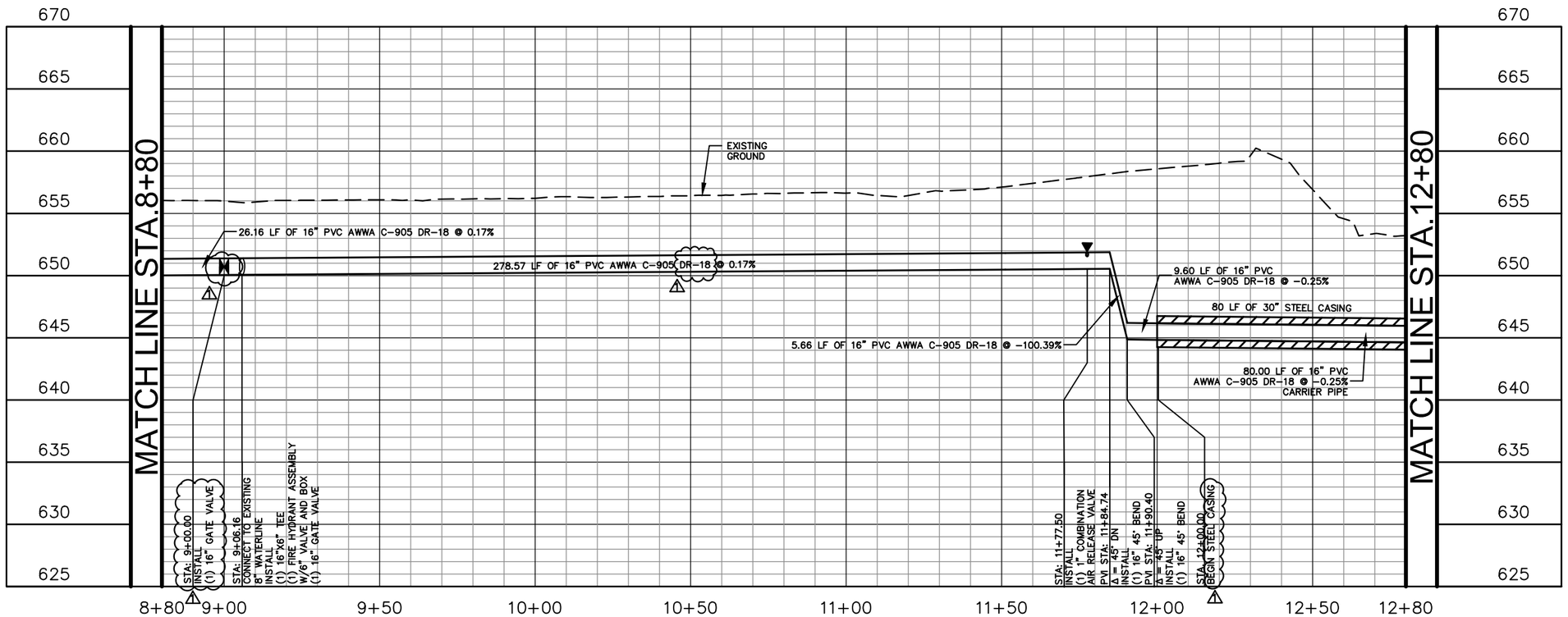
BY: DURDOCK, DANIEL





ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	320.00
812	16-INCH DR-18 (C-905) PVC WATER LINE	LF	320.00
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	1.10
846	COMBINATION AIR RELEASE ASSEMBLY (1-INCH)	EA	1.00
856	JACKING, BORING, OR TUNNELING - (30") INCLUSIVE OF CASING	LF	80.00
856	16-INCH PVC DR-18 (C-905) CARRIER PIPE (INSTALL)	LF	80.00

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.

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

FULL SIZE (22" x 34") 1" = 5' VERTICAL	HALF SIZE (11" x 17") 1" = 10' VERTICAL

LEGEND

- 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
- EXISTING OVERHEAD ELECTRIC LINE & PP (OHE)

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

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

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

16-INCH WATER LINE STA. 8+80 TO 12+80

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: JAF	15-4506	C65
DRAWN: DPF	KHA PROJECT NO.	
CHECKED: GAG	068665018	

FURDOCK, DANIEL 11/10/2016 6:34 PM
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11/10/2016 6:16 PM
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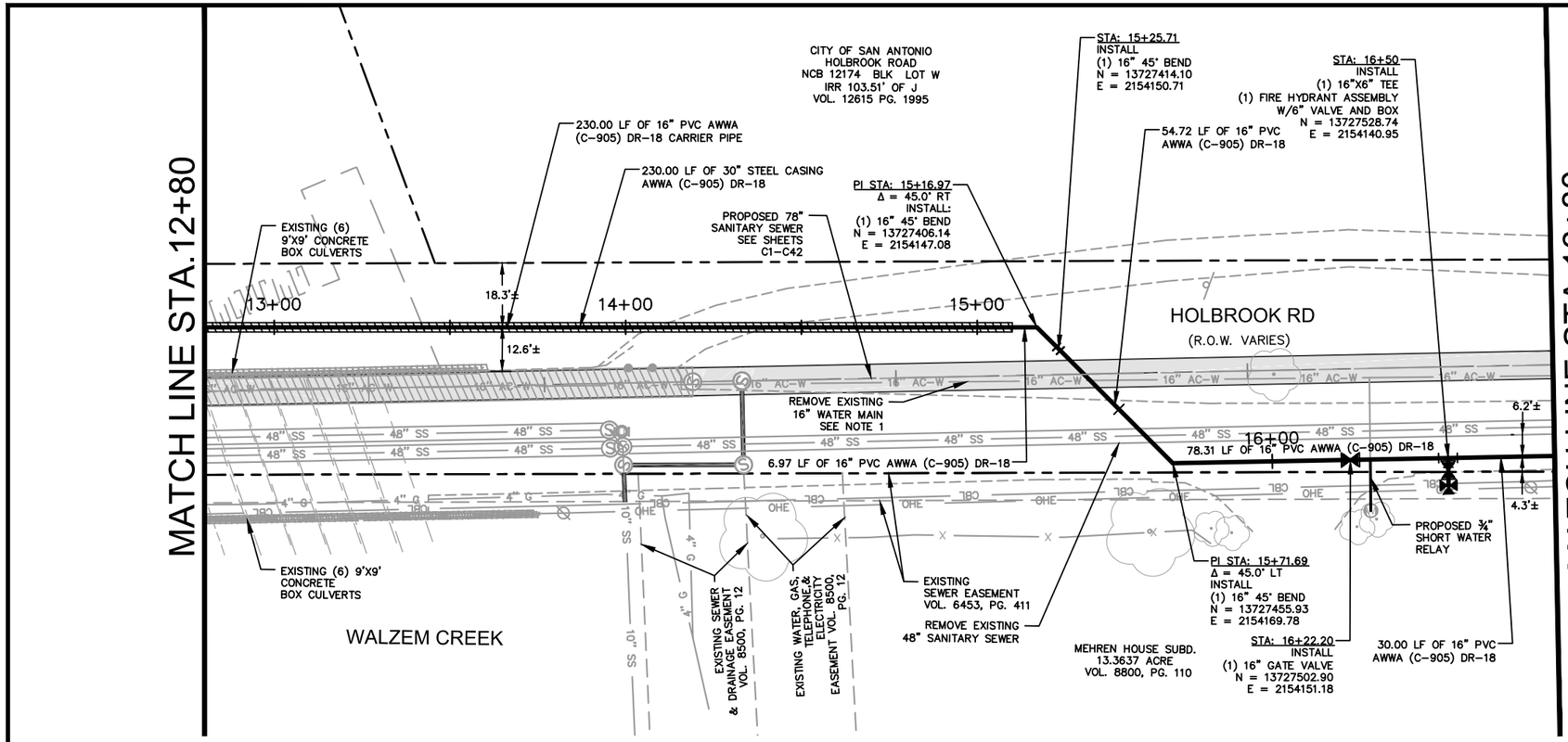
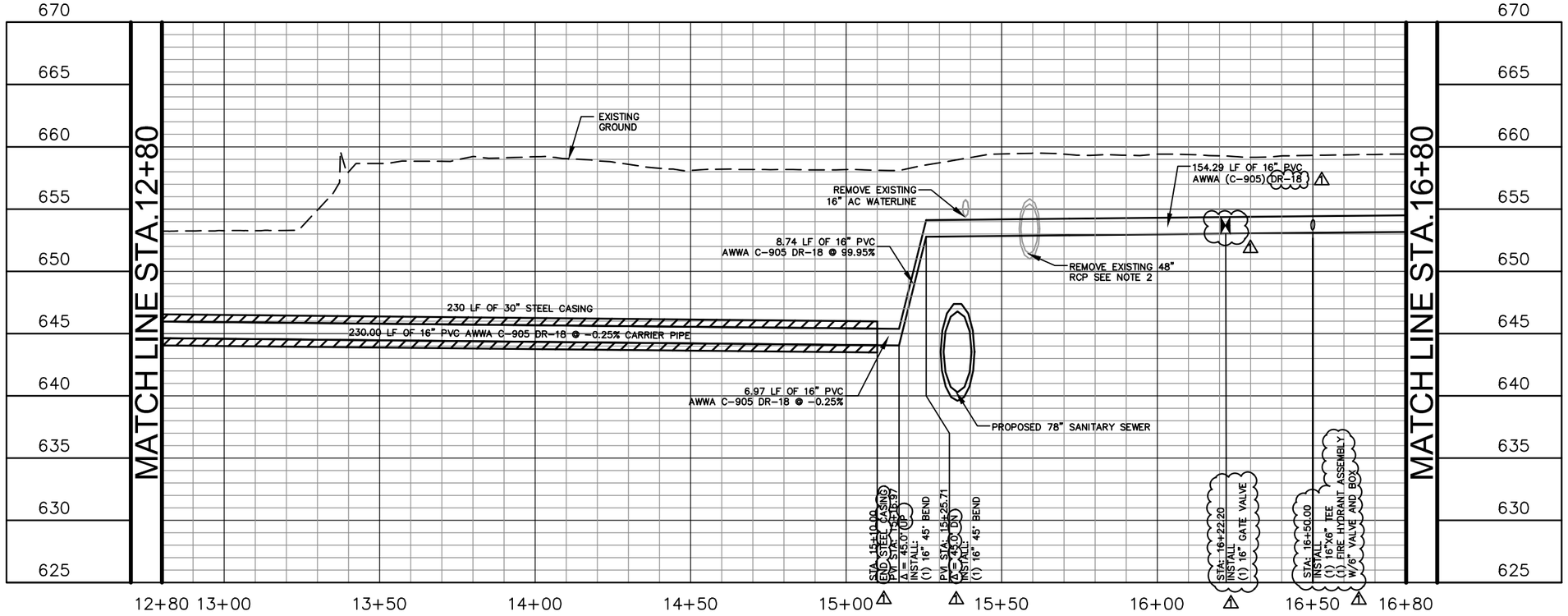
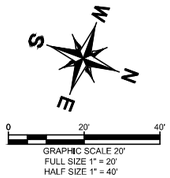
LAST SAVED







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.

* 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	

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

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	

FURDOCK, DANIEL 11/10/2016 6:34 PM
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11/10/2016 6:16 PM
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LAST SAVED

MATCH LINE STA.16+80

CITY OF SAN ANTONIO
HOLBROOK ROAD
NCB 12174 BLK LOT W
IRR 103.51' OF J
VOL. 12615 PG. 1995

END 16" PVC WATERLINE
STA: 20+61.16
INSTALL
(1) 16" GATE VALVE W/VALVE BOX
(1) 16"X16" WATER TIE-IN
(1) 16" TRANSITION COUPLING
N=13727886.70
E=2153961.22

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

STA: 20+06.99
INSTALL
(1) 1" COMBINATION
AIR RELEASE VALVE
N = 13727858.50
E = 2154004.26

9.94 LF OF 16" PVC
AWWA (C-905) DR-18

PROPOSED 78"
SANITARY SEWER
SEE SHEETS
C1-C42

HOLBROOK RD (R.O.W. VARIES)

STA: 20+51.22
Δ = 45.0° DN
INSTALL
(1) 16" 45° BEND
N = 13727878.09
E = 2153966.20

38.76 LF OF 16" PVC
AWWA (C-905) DR-18

17+00 18+00 19+00 20+00

320.00 LF OF 16" PVC AWWA (C-905) DR-18

6.4'±

5.7'±

13.4'±

PI STA: 17+65.25
Δ = 1°21'6" LT
N = 13727635.90
E = 2154098.52

EXISTING
SEWER EASEMENT
VOL. 6453, PG. 411

REMOVE EXISTING
48" SANITARY SEWER

STA: 20+00
INSTALL
(1) 16"X6" TEE
(1) FIRE HYDRANT ASSEMBLY
W/6" VALVE AND BOX
N = 13727852.07
E = 2154006.98

PI STA: 20+12.47
Δ = 45.0° LT
INSTALL
(1) 16" 45° BEND
N = 13727863.54
E = 2154002.12

6.99 LF OF 16" PVC
AWWA (C-905) DR-18

MEHREN HOUSE SUBD.
13.3637 ACRE
VOL. 8800, PG. 110

RIVERA JO ANN MARKS
1006 HOLBROOK
NCB: 12174 TR-K (8.11AC) P-103(1.84AC)&
P-105 .303AC & LOT 11 (13.367AC), GIS 23.62 AC
VOL. 5207 PG. 1407

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
550.1	TRENCH EXCAVATION SAFETY PROTECTION	LF	381.00
812	16-INCH DR-18 (C-905) PVC WATER LINE	LF	381.00
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	1.30
840	16-INCH X 16-INCH WATER TIE-IN	EA	1.00
844	2-INCH TEMPORARY BLOW-OFF ASSEMBLY - (12-16-INCH MAINS)	EA	1.00
846	COMBINATION AIR RELEASE ASSEMBLY (1-INCH)	EA	1.00
3000	REMOVAL, TRANSPORT, AND DISPOSAL OF AC PIPE	LF	26.00 (1)

NOTES:

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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.

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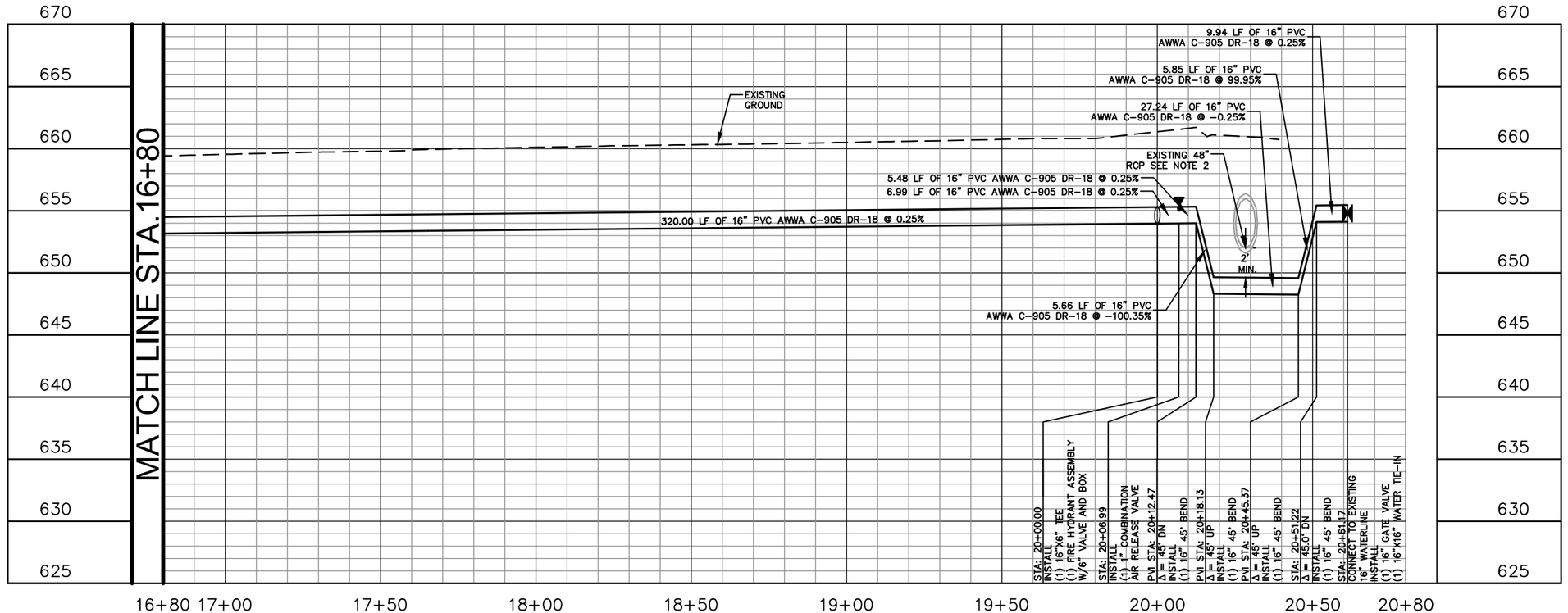
LEGEND

- 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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No.	Revision	By	Date
1	ADDENDUM 1	JAF	11/11/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET

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

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: JAF	15-4506	
DRAWN: DPF	KHA PROJECT NO.	C67
CHECKED: GAG	068665018	

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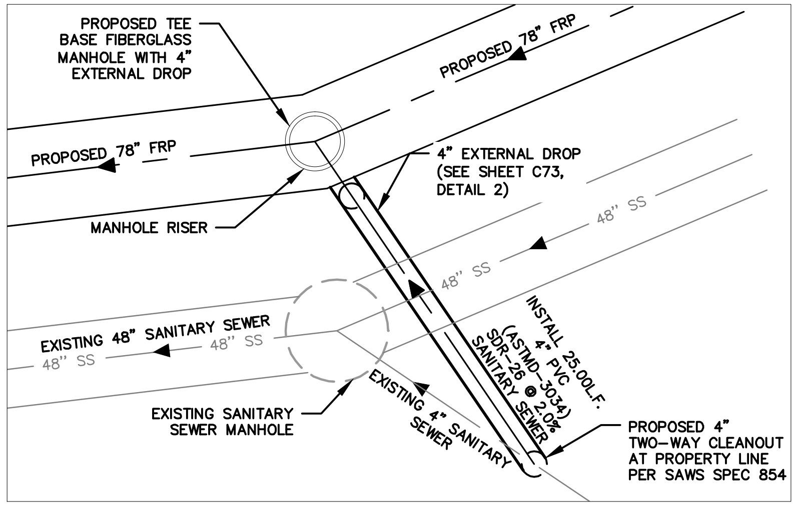
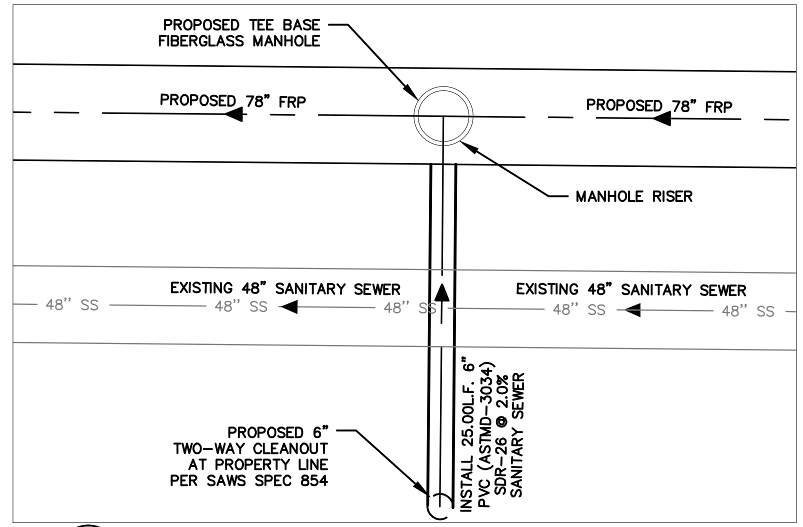
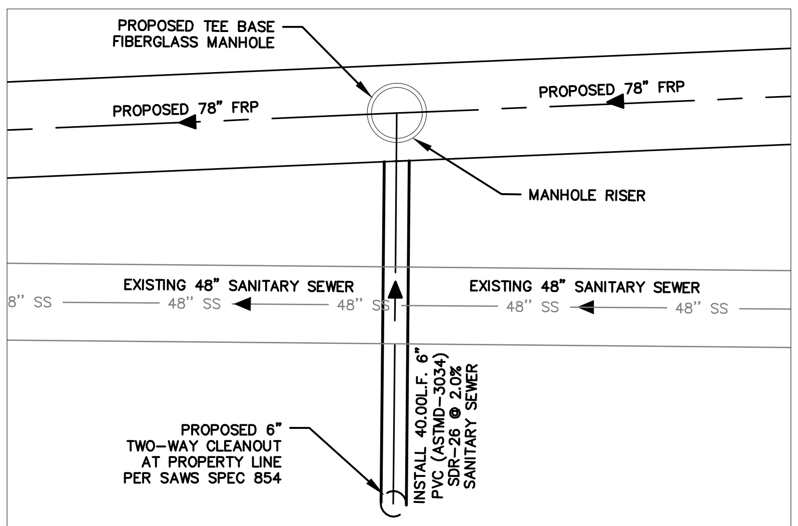


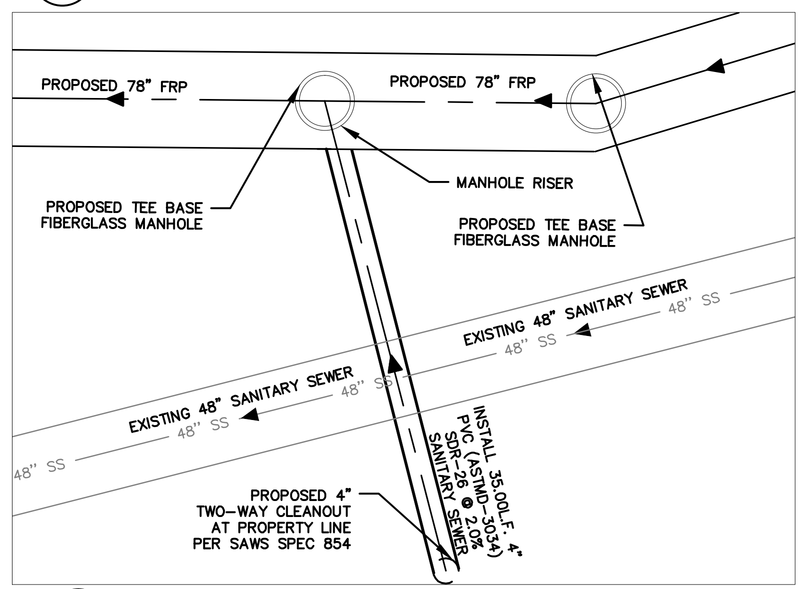
1 INSET 1
C24 SCALE: NTS



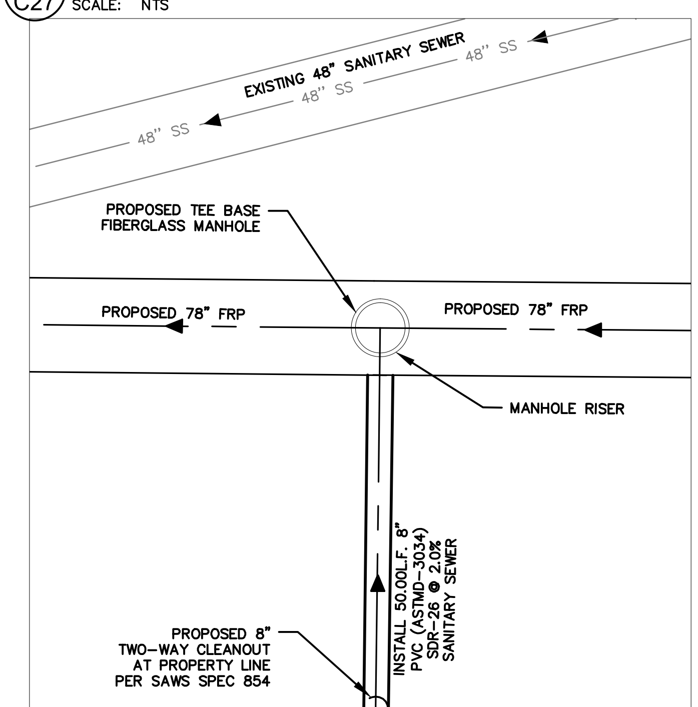
2 INSET 2
C27 SCALE: NTS



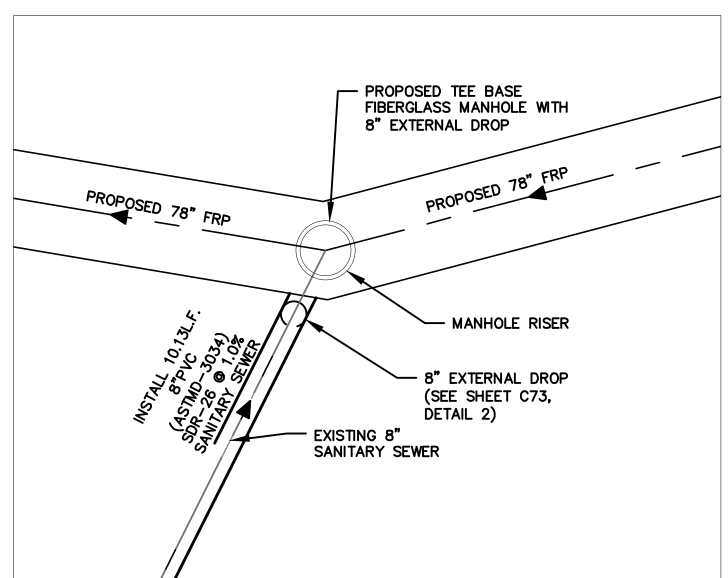
3 INSET 3
C27 SCALE: NTS



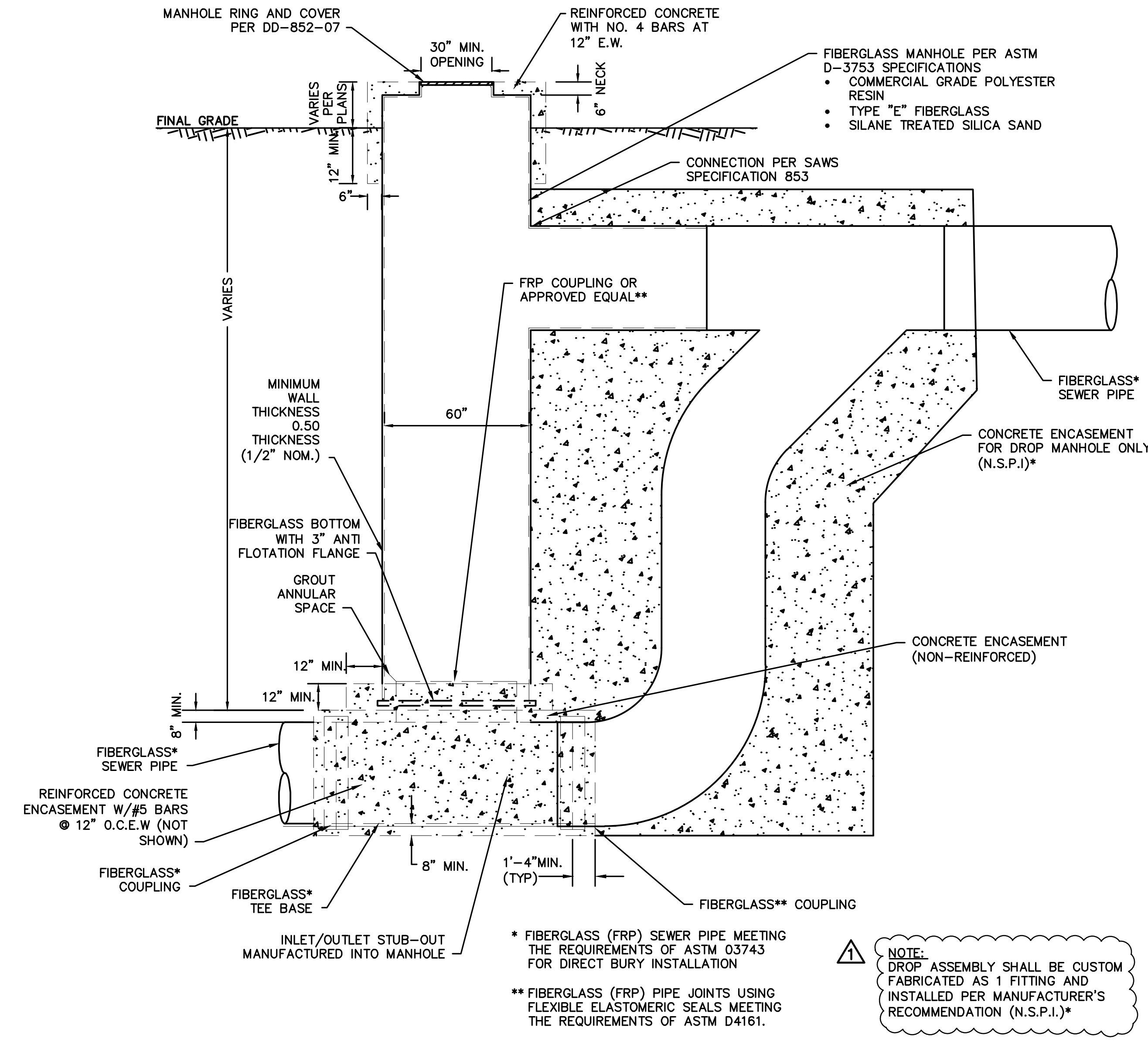
4 INSET 4
C28 SCALE: NTS



5 INSET 5
C31 SCALE: NTS



6 INSET 6
C33 SCALE: NTS



7 FIBERGLASS DROP MANHOLE DETAIL
SCALE: NTS

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1	ADDENDUM 1	JAF	11/11/2016

SAN ANTONIO WATER SYSTEM

E19: SEGUIN TO NACOGDOCHES ROAD – SEGMENT 1

SHEET
SEWER DETAILS (SHEET 3 OF 4)

DATE: NOVEMBER 2016	SAWS PROJECT NO.	SHEET NO.
DESIGN: MAV	15-4506	
DRAWN: DPF	KHA PROJECT NO.	C75
CHECKED: GAG	068665018	

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