

2020 BND WATER LINES REPLACEMENTS



VICINITY MAP - NOT TO SCALE

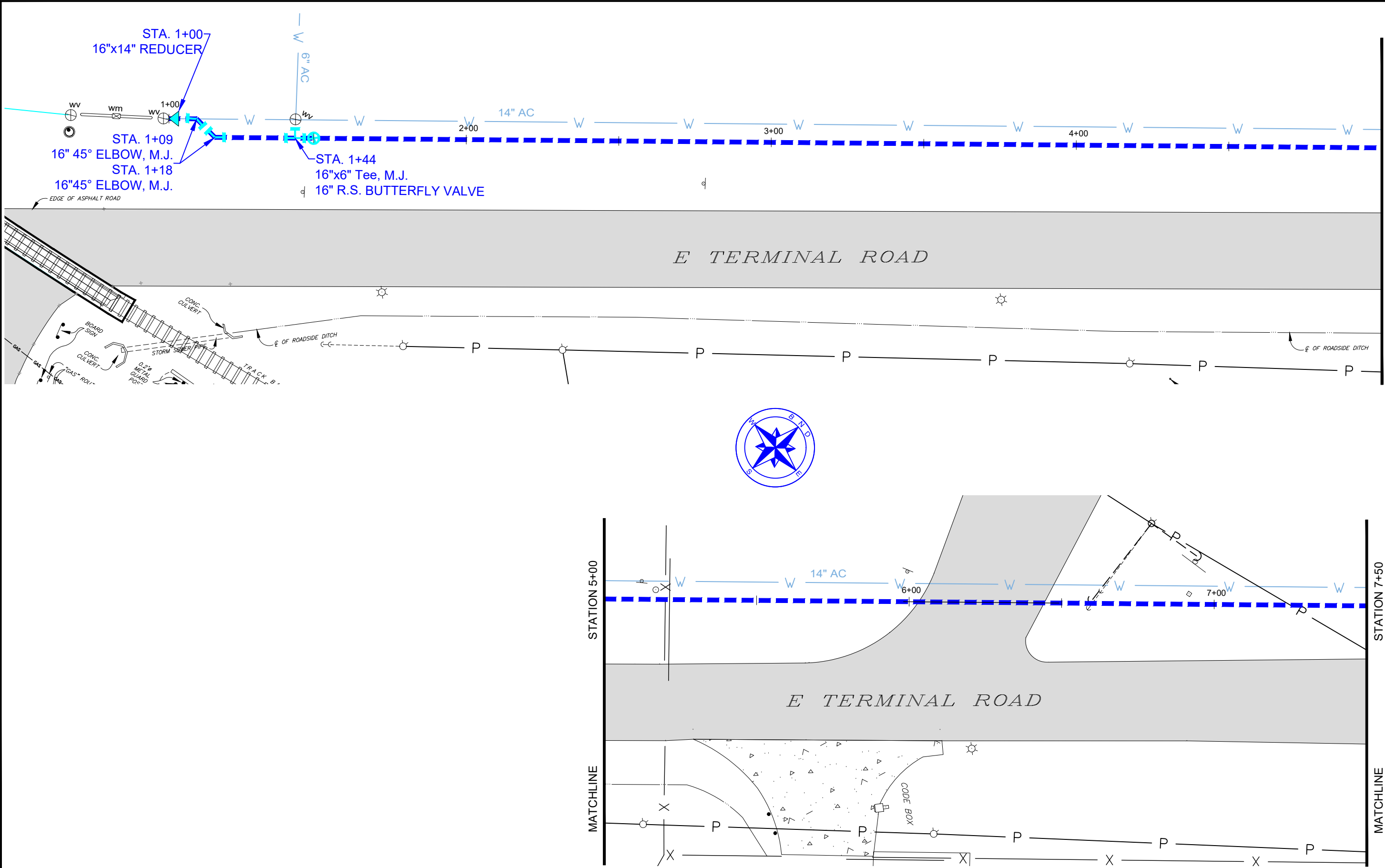
INDEX

INDEX..... SHEET 1 OF 14

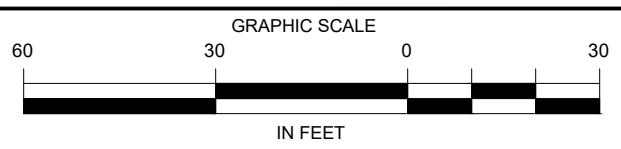
PROPOSED WATER LINE IMPROVEMENTS..... SHEET 2-13 OF 14

WATER CONSTRUCTION DETAILS SHEET 14 OF 14

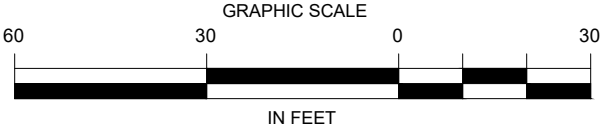
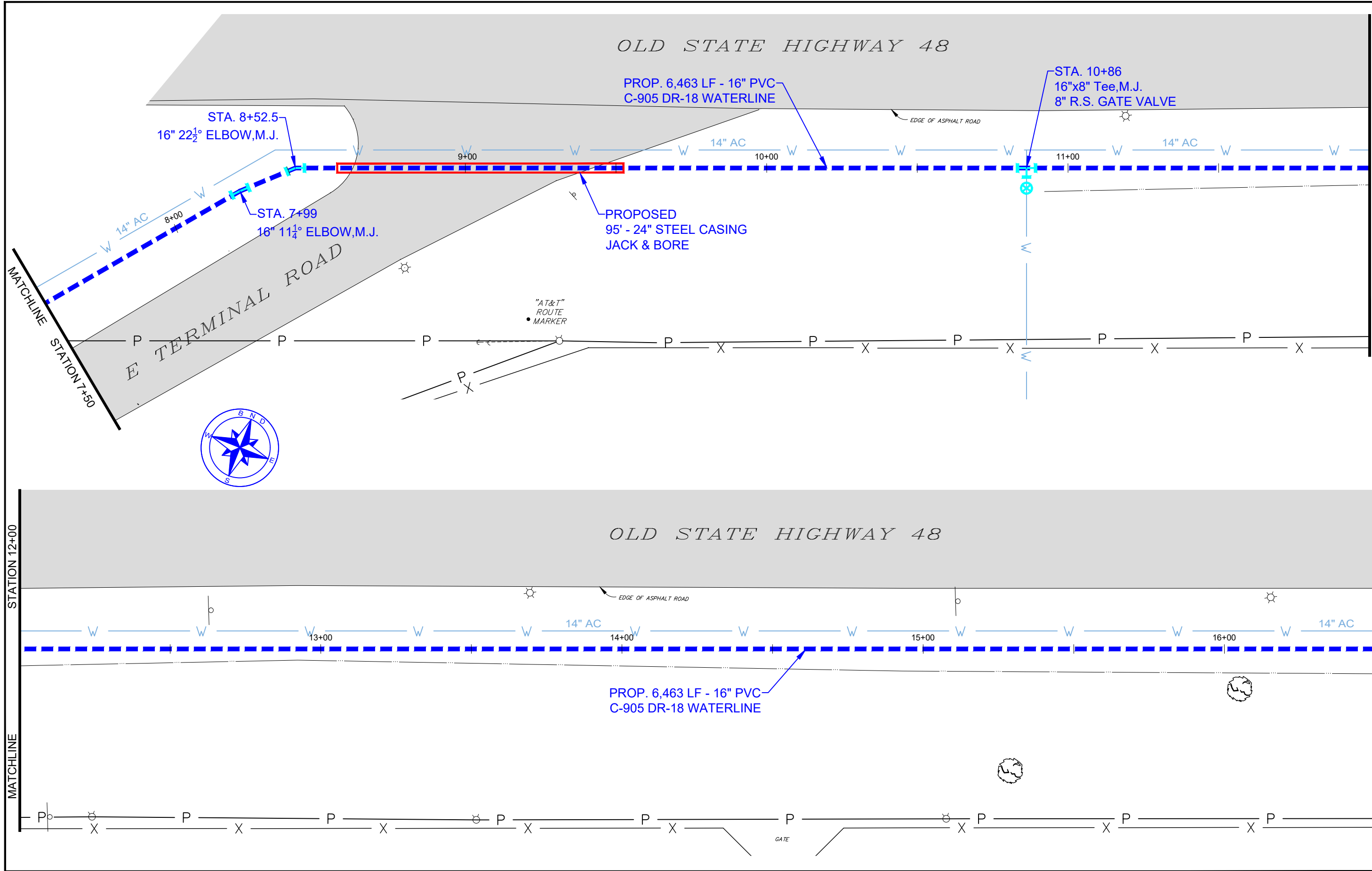
DATE	REVISION
6/22/2020	ISSUED FOR BIDS



DRAWN BY:	APPROVED BY:
P.E.	
DATE DRAWN:	REVISION DATE:
June 2020	
CHECKED BY:	DWG. NO.
A. CHAVEZ II	
SCALE:	FILE NAME:
AS SHOWN	C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT\16in-06SH46.dwg



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com



the port that works

PROPOSED
16" WATERLINE
STA. 7+50 - 16+50

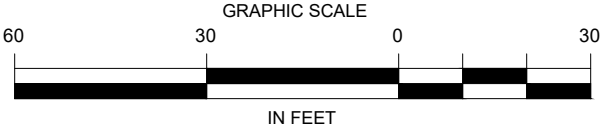
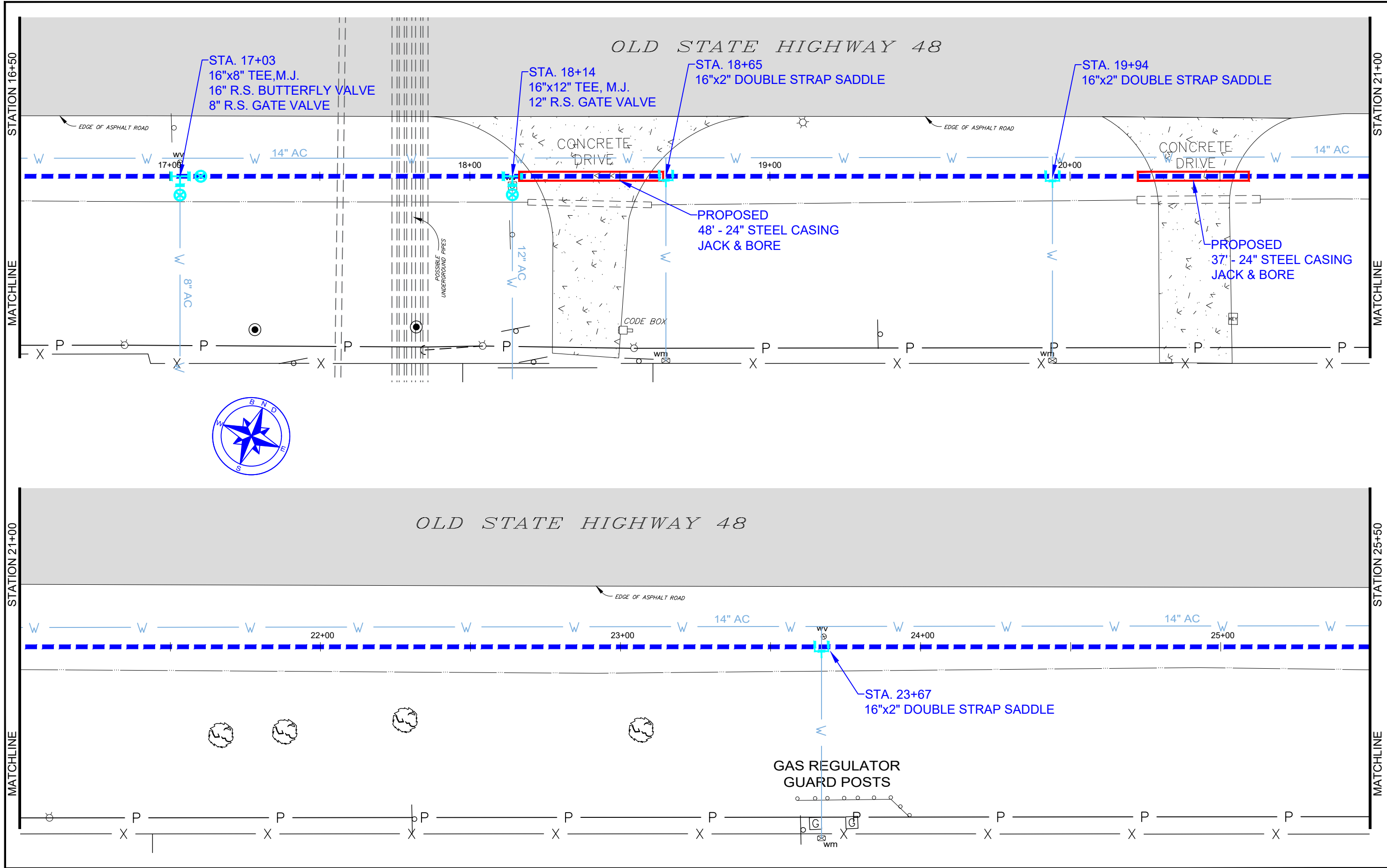
2020 BND WATER
LINES REPLACEMENT

DRAWN BY: P.E.	APPROVED BY:
DATE DRAWN: June 2020	REVISION DATE:
CHECKED BY: A. CHAVEZ II	DWG. NO.
SCALE: AS SHOWN	FILE NAME: C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT\16in-OldSH48.dwg

SHEET

3

OF 14



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com

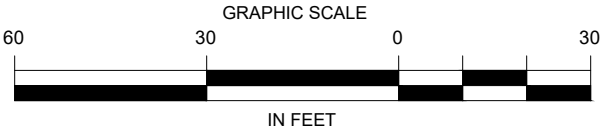
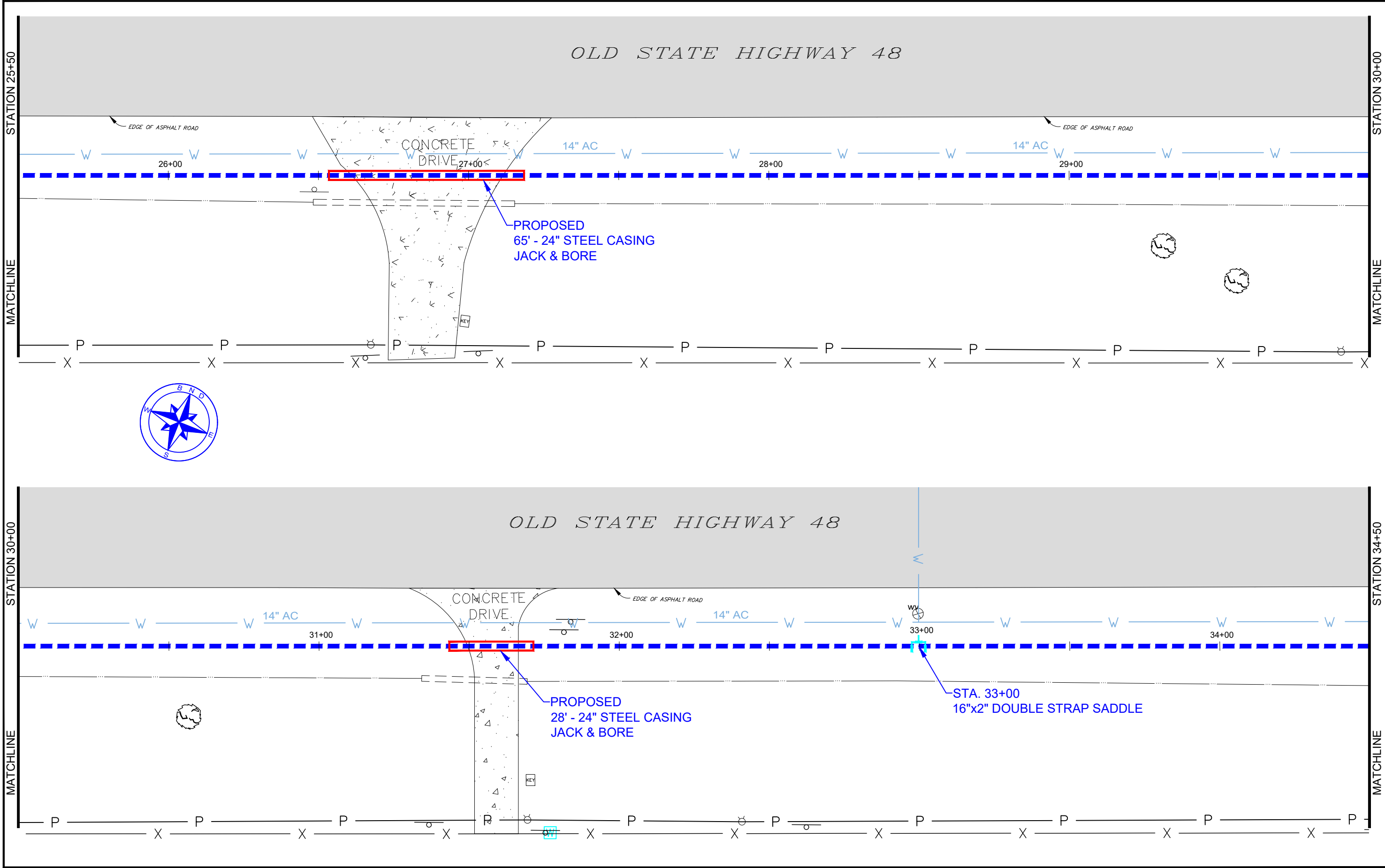
the port that works

PROPOSED
16" WATERLINE
STA. 16+50 - 25+50

2020 BND WATER
LINES REPLACEMENT

DRAWN BY:	APPROVED BY:	DATE DRAWN:	REVISION DATE:	DWG. NO.	FILE NAME: C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT\16in-OldSH48.dwg
CHECKED BY:					
A. CHAVEZ II					
SCALE:	AS SHOWN				

SHEET
4
OF 14



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com

PROPOSED
16" WATERLINE
STA. 25+50 - 34+50

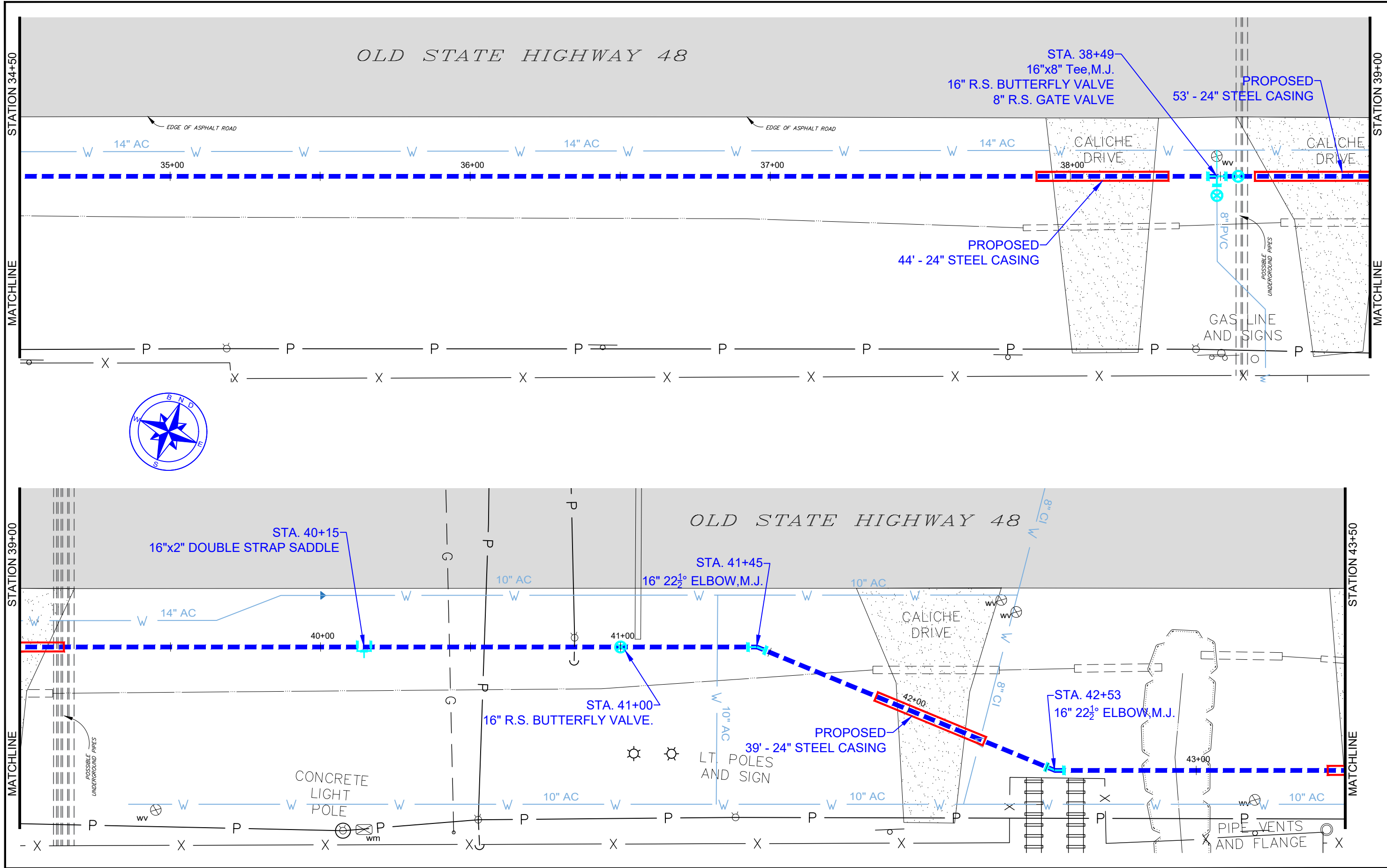
2020 BND WATER
LINES REPLACEMENT

DRAWN BY:	P.E.	APPROVED BY:
DATE DRAWN:	June 2020	REVISION DATE:
CHECKED BY:	A. CHAVEZ II	DWG. NO.
SCALE:	AS SHOWN	FILE NAME: C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT\16in-ODSH48.dwg

SHEET

5

OF 14





PORT OF BROWNSVILLE
the port that works

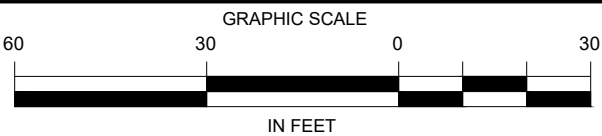
PROPOSED
16" WATERLINE
STA. 34+50 - 43+50

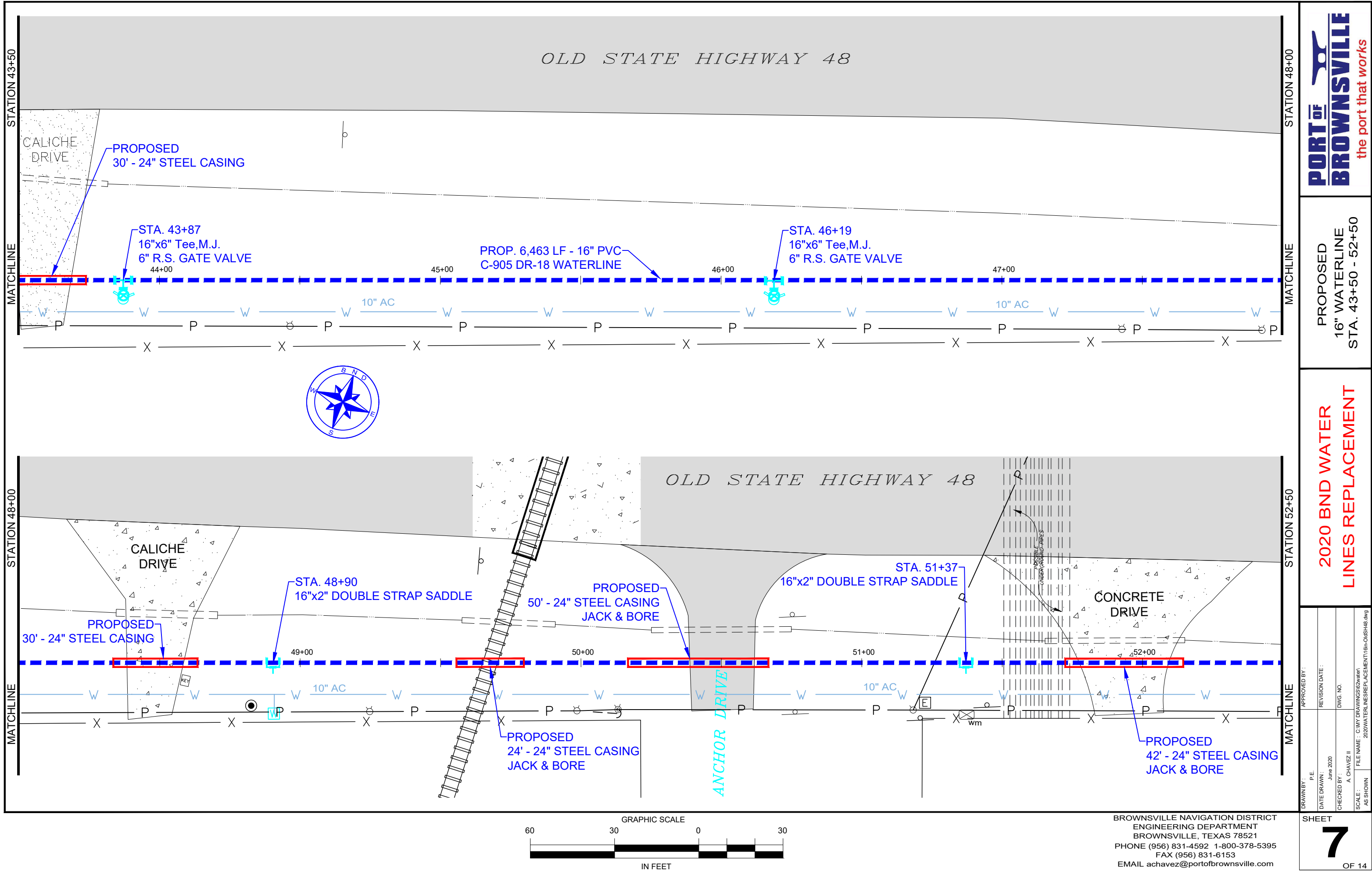
2020 BND WATER
LINES REPLACEMENT

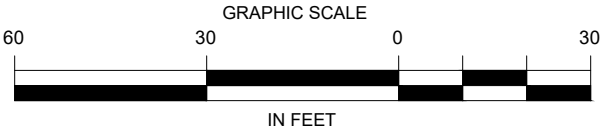
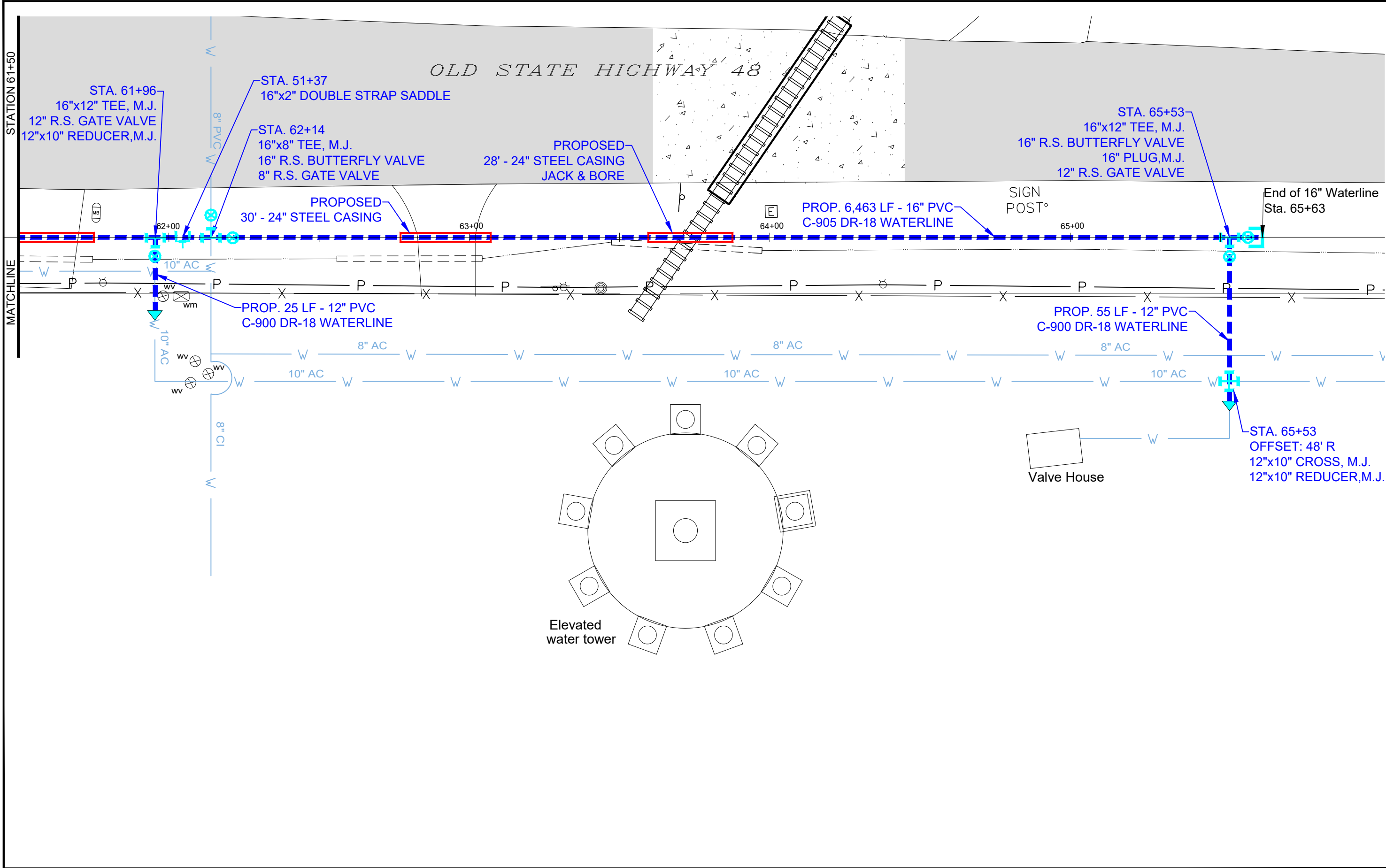
DRAWN BY: P.E.	APPROVED BY:
DATE DRAWN: June 2020	REVISION DATE:
CHECKED BY: A. CHAVEZ II	DWG. NO.
SCALE: AS SHOWN	FILE NAME: C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT16in-OldSH48.dwg

BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com

SHEET
6
OF 14







BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com



the port that works

PROPOSED
16" WATERLINE
STA. 61+50 - 65+63

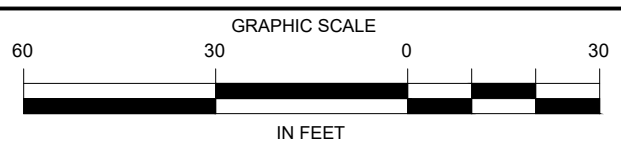
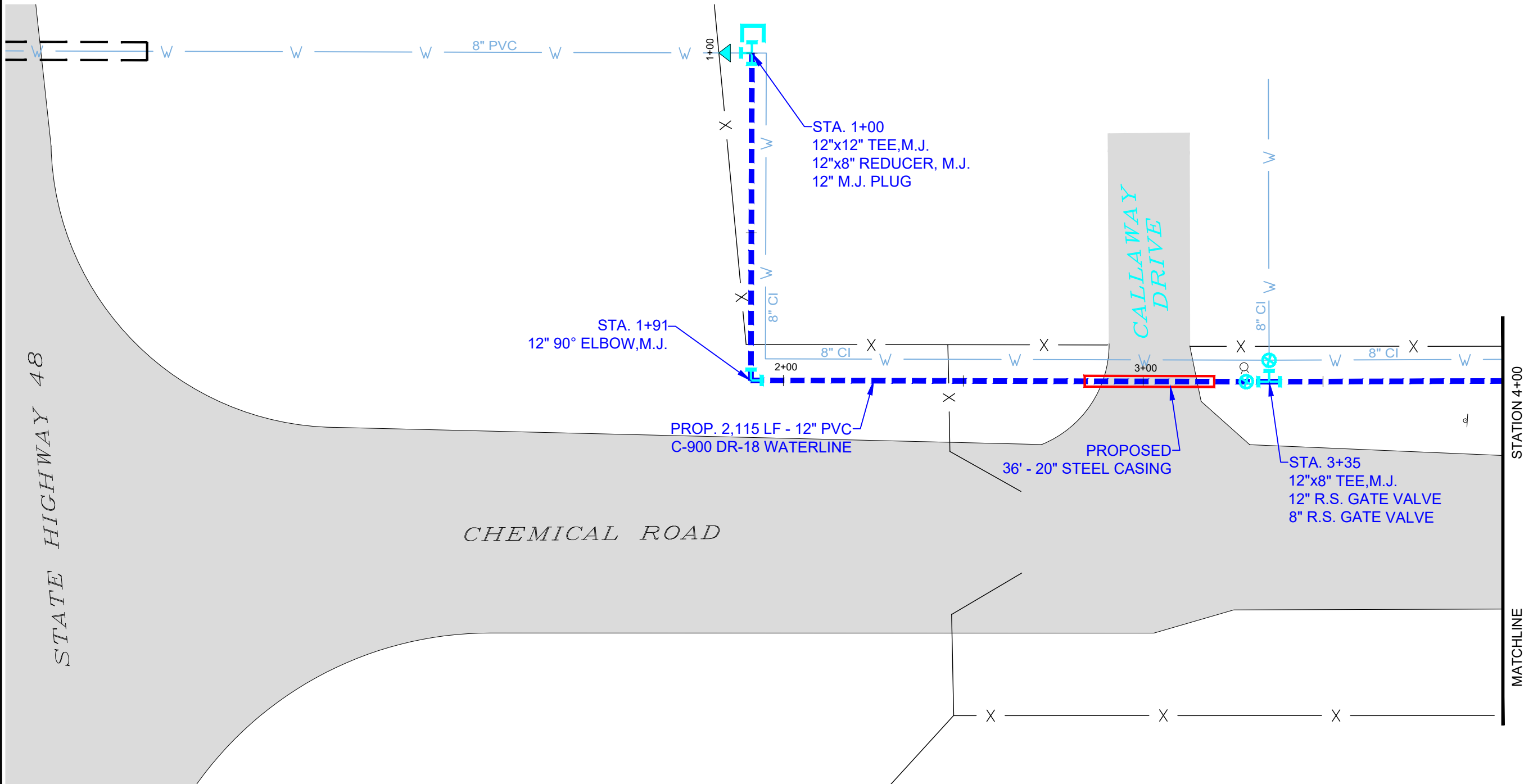
2020 BND WATER
LINES REPLACEMENT

DRAWN BY:	APPROVED BY:
P.E.	
DATE DRAWN:	REVISION DATE:
June 2020	
CHECKED BY:	DWG. NO.
A. CHAVEZ II	
SCALE:	FILE NAME:
AS SHOWN	C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT\16in-OldSH48.dwg

SHEET

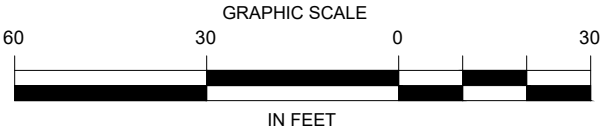
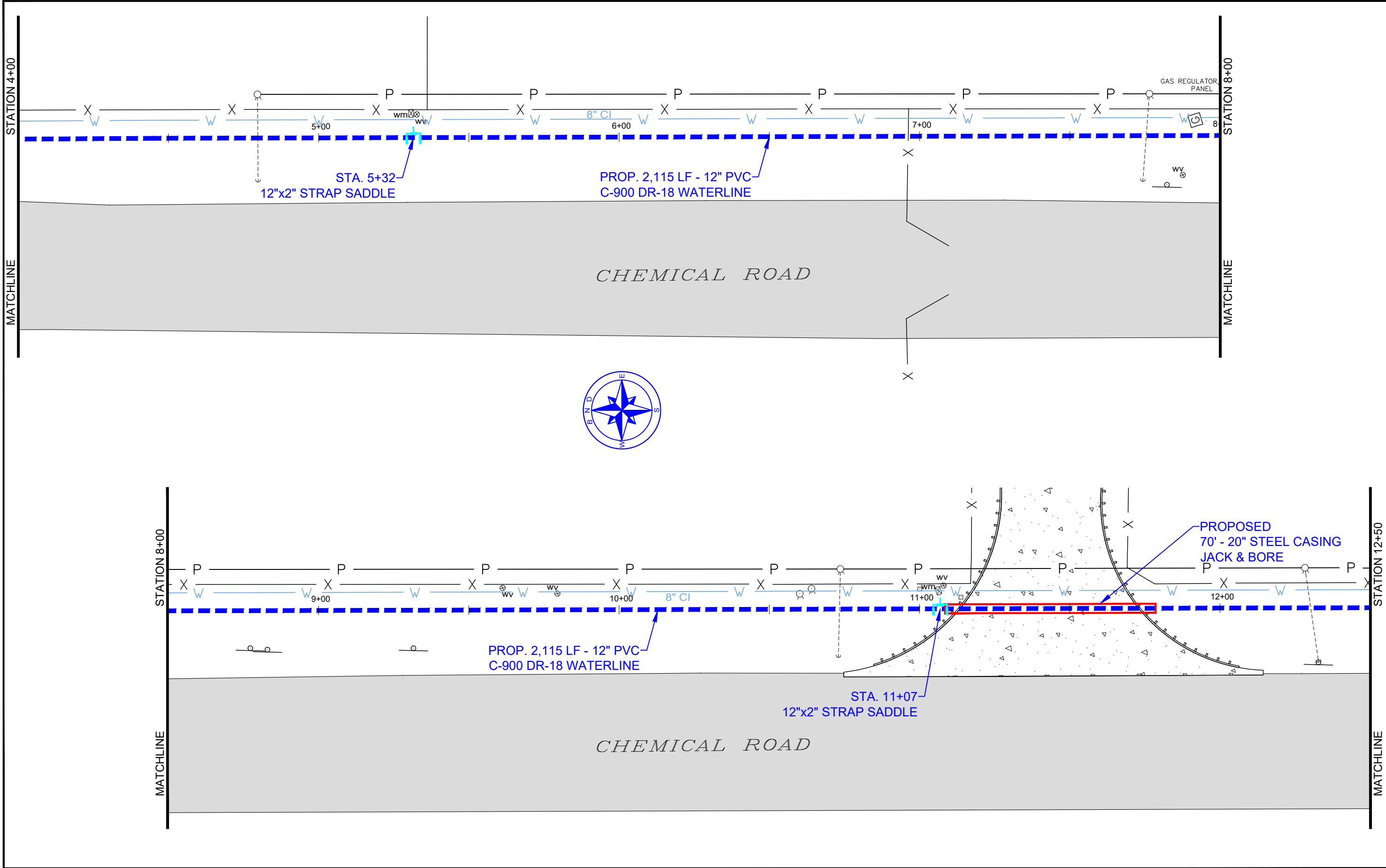
9

OF 14



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com

DRAWN BY:	APPROVED BY:
P.E.	
DATE DRAWN:	REVISION DATE:
June 2020	
CHECKED BY:	DWG. NO.
A. CHAVEZ II	
SCALE:	FILE NAME:
AS SHOWN	C:\MY DRAWINGS\2020\water\2020WATERLINESREPLACEMENT\12in-Chemical.dwg



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com

the port that works

PROPOSED
12" WATERLINE
STA. 4+00 - 12+50

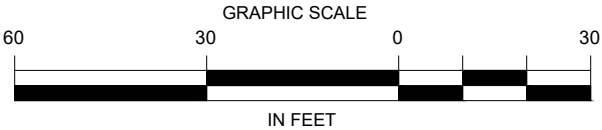
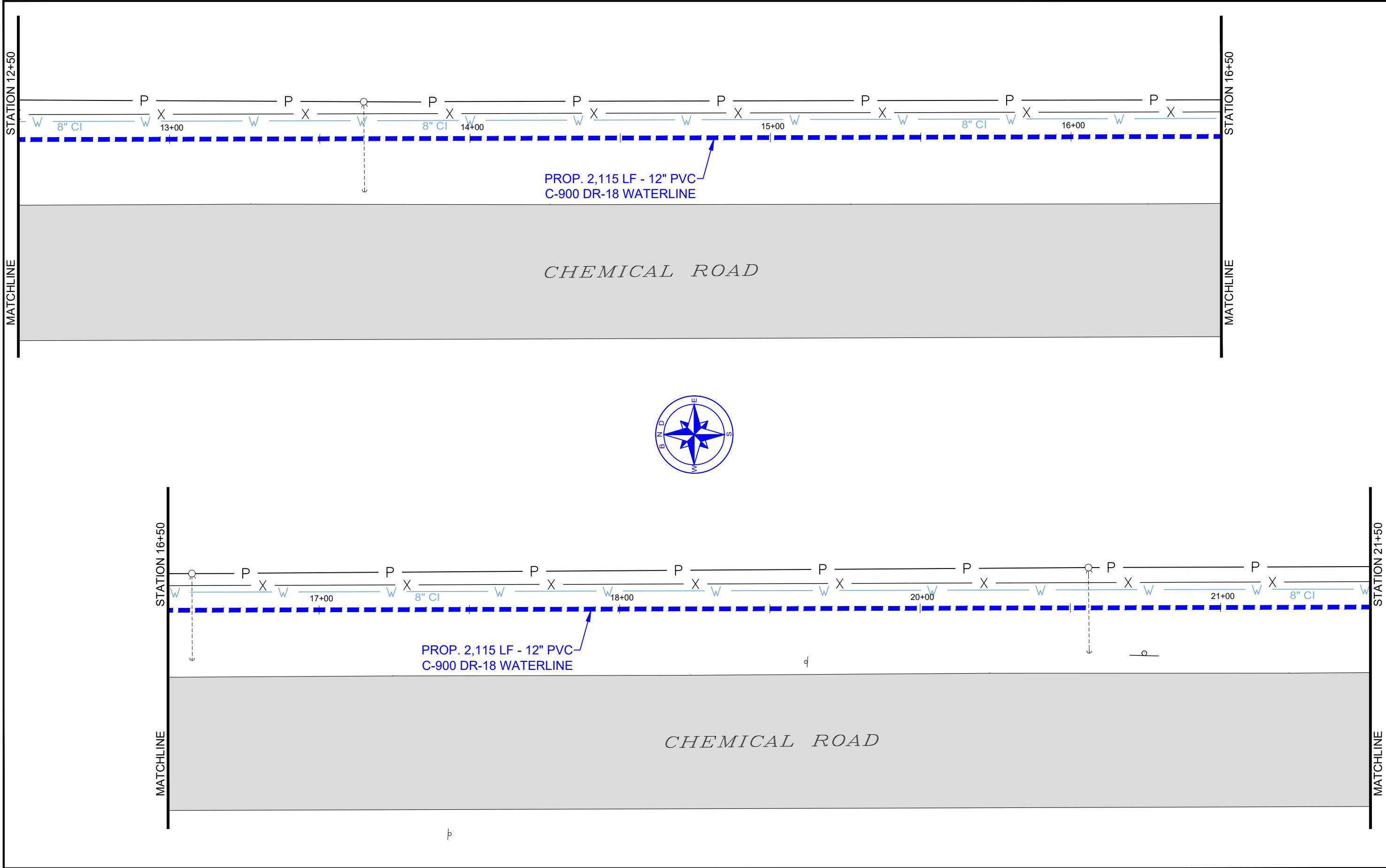
2020 BND WATER
LINES REPLACEMENT

DRAWN BY:	APPROVED BY:
P.E.	
DATE DRAWN:	REVISION DATE:
June 2020	
CHECKED BY:	DWG. NO.
A. CHAVEZ II	
SCALE:	FILE NAME:
AS SHOWN	C:\MY DRAWINGS\62water\2020WATERLINESREPLACEMENT\12in-Chemical.dwg

SHEET

11

OF 14



BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com



PROPOSED
12" WATERLINE
STA. 12+50 - 21+50

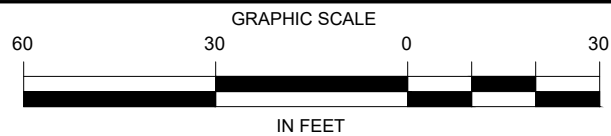
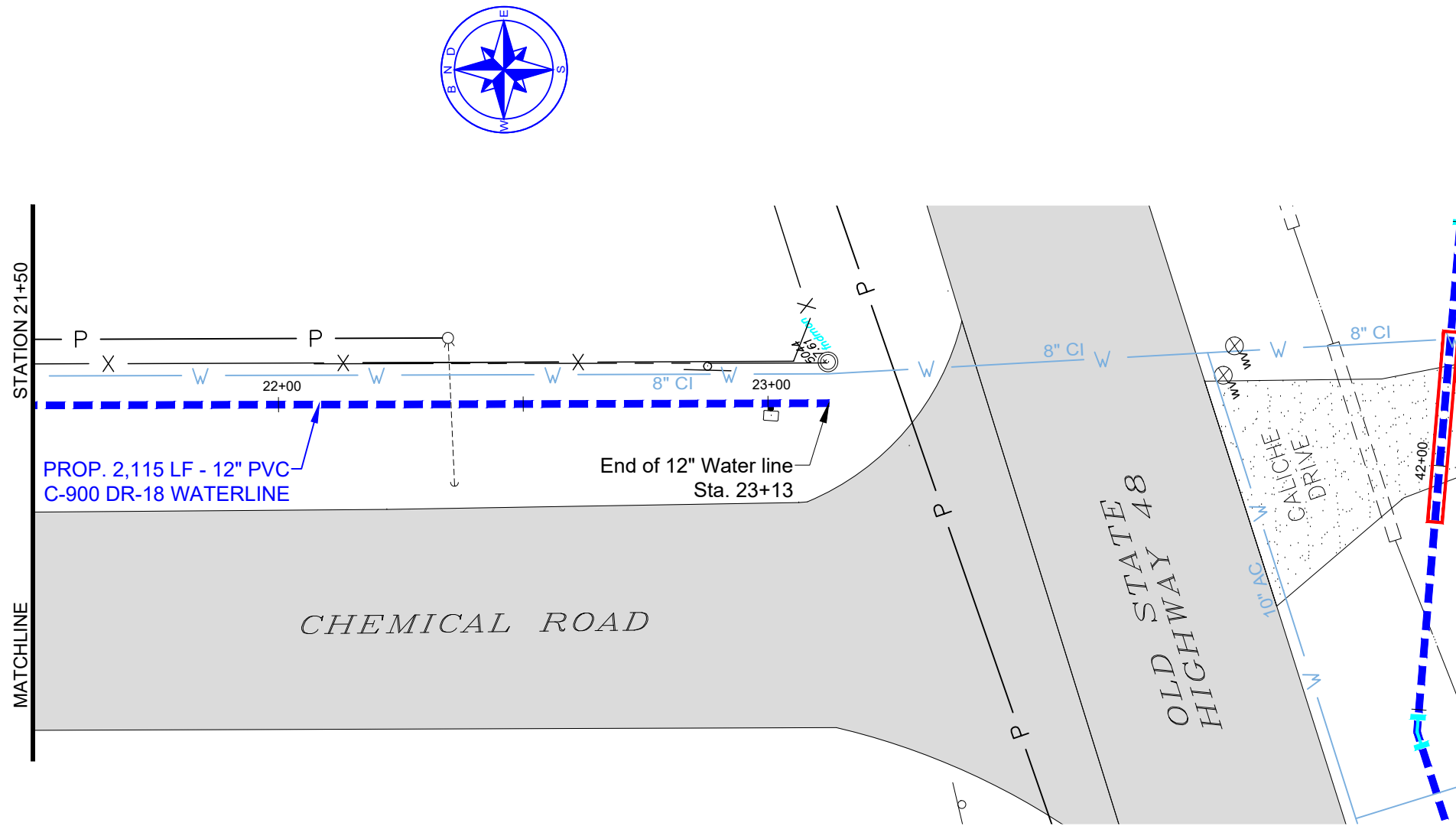
2020 BND WATER
LINES REPLACEMENT

DRAWN BY:	P.E.	APPROVED BY:
DATE DRAWN:	June 2020	REVISION DATE:
CHECKED BY:	A. CHAVEZ II	DWG. NO.
SCALE:	AS SHOWN	FILE NAME: C:\MY DRAWINGS\62water\2020WATERLINESREPLACEMENT12in-Chemical.dwg

SHEET

12

OF 14

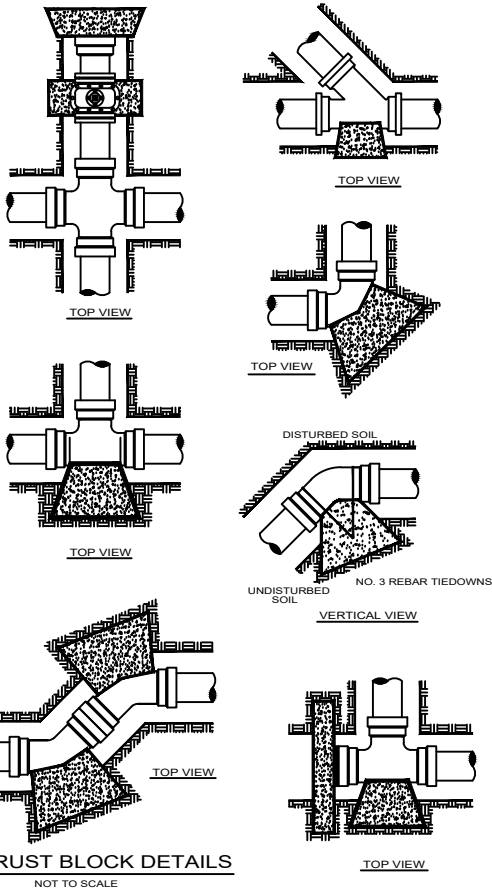


BROWNSVILLE NAVIGATION DISTRICT
ENGINEERING DEPARTMENT
BROWNSVILLE, TEXAS 78521
PHONE (956) 831-4592 1-800-378-5395
FAX (956) 831-6153
EMAIL achavez@portofbrownsville.com

PROPOSED
12" WATERLINE
STA. 21+50 - 23+13

2020 BND WATER
LINES REPLACEMENT

DRAWN BY:	APPROVED BY:
P.E.	
DATE DRAWN:	REVISION DATE:
June 2020	
CHECKED BY:	DWG. NO.
A. CHAVEZ II	
SCALE:	FILE NAME:
AS SHOWN	C:\MY DRAWINGS\62water\2020WATERLINESREPLACEMENT\12in-Chemical.dwg

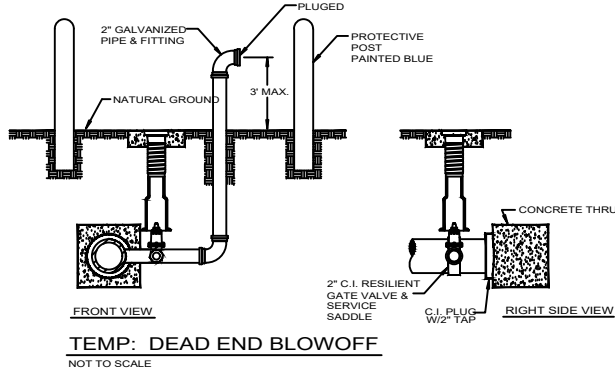


ALL MJ FITTINGS WILL REQUIRE RESTRAINERS (MEGA LUGS) WITH THRUST BLOCKS

NOTES ON THRUST BLOCKING

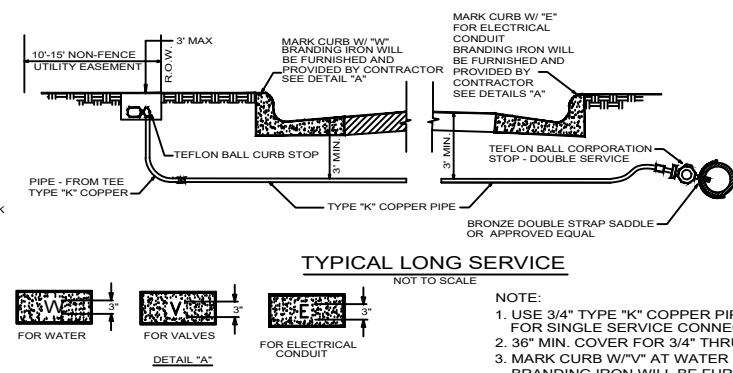
1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED HAND DUG SOIL AND SHALL BE CONCRETE HAVING A MINIMUM 28 DAY STRENGTH OF 2000 LBS. PER SQUARE INCH
2. THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100 % OF TEST PRESSURE. $THRUST = 2 AP SIN \frac{1}{2} \phi$ WHERE A = AREA OF PIPE, P = WATER PRESSURE, ϕ = DEFLECTION ANGLE.
3. VERTICAL UPLIFT BLOCKS SHALL BE DESIGNED ON THE BASIS OF 150 LBS. PER CU. FT. FOR CONCRETE AND SOIL AT 120 LBS. PER CU. FT. OVER THE AREA OF BLOCK.
4. VERTICAL DOWN THRUST BLOCKS SHALL BE DESIGNED ON THE BASIS OF 2000 LBS. PER SQ. FT. ALLOWABLE SOIL BEARING PRESSURE. DIMENSION MAY BE DECREASED WITH APPROVAL OF THE ENGINEER IF MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO ALLOWABLE BEARING VALUE.
5. THRUST BLOCKS ON HORIZONTAL BENDS, TEES, CROSSES, AND REDUCERS SHALL BE SIZED BASED ON 24000 LBS. PER SQ. FT. OF BLOCKING SURFACE AREA IN CONTACT WITH UNDISTURBED SOIL. BLOCK DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE ENGINEER IF MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO THE ALLOWABLE BEARING VALUE.
6. ALL BLOCKING SHALL HAVE A MINIMUM SOIL COVER OF 1 FT.
7. ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.

PIPE SIZE	GENERAL DATA FOR BLOCKING STANDARD FITTING					
	PLUG	TEE	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	0.63	0.63	0.89	0.48	0.25	0.12
6"	1.40	1.40	2.00	1.08	0.55	0.28
8"	2.50	2.50	3.55	1.92	0.98	0.49
10"	3.93	3.93	5.55	3.00	1.53	0.77
12"	5.65	5.65	8.00	4.33	2.21	1.11
14"	7.70	7.70	10.88	5.89	3.00	1.51
16"	10.05	10.05	14.21	7.69	3.85	1.97
18"	12.70	12.70	17.99	9.74	4.96	2.49
20"	15.71	15.71	22.22	12.02	6.13	3.08
24"	22.67	22.67	32.00	17.31	8.83	4.43
27"	28.63	28.63	40.48	21.91	11.17	5.61
30"	35.35	35.35	50.00	27.08	13.79	6.93
36"	50.90	50.90	72.96	38.95	19.89	9.98
42"	69.27	69.27	97.97	53.02	27.03	13.58
48"	90.48	90.48	127.96	69.25	35.30	17.74
54"	114.51	114.51	161.94	87.64	44.68	22.45



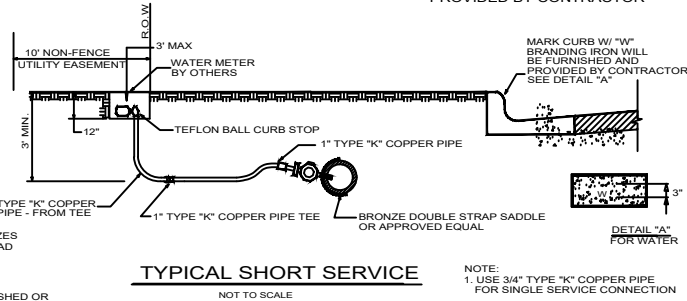
NOTE

1. A BLOWOFF TAP, AS SHOWN ON THE DETAIL HEREON SHALL BE PROVIDED AT ALL DEAD ENDS FOR RELEASING TRAPPED AIR TO AID IN FLUSHING, AND FOR SAMPLING FOR TESTING.
2. CONCRETE THRUST BLOCKS SHALL BE REQUIRED AT PLUGS, AS WELL AS AT ALL OTHER LOCATIONS AS NOTED HEREON.



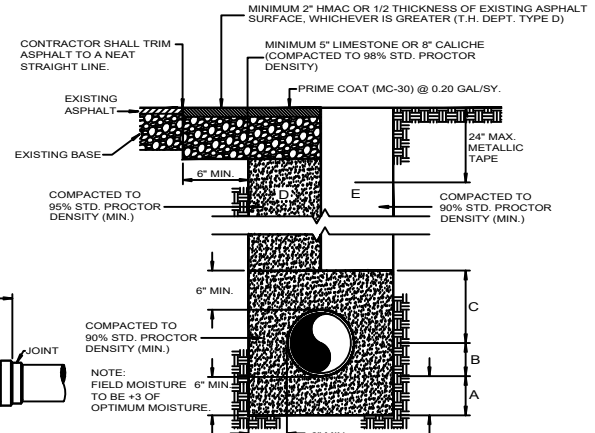
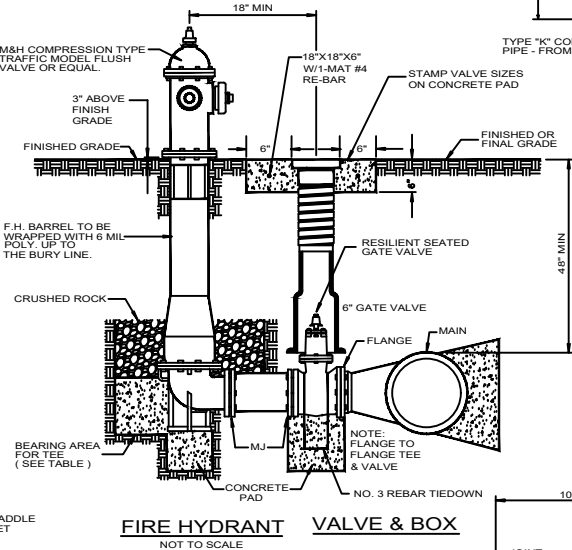
NOTE:

1. USE 3/4" TYPE "K" COPPER PIPE FOR SINGLE SERVICE CONNECTION
2. 36" MIN. COVER FOR 3/4" THRU 2" SERVICES
3. MARK CURB W/ "W" AT WATER VALVE LOCATIONS. BRANDING IRON WILL BE FURNISHED AND PROVIDED BY CONTRACTOR



NOTE:

1. USE 3/4" TYPE "K" COPPER PIPE FOR SINGLE SERVICE CONNECTION



TYPICAL PIPE BEDDING AND TRENCH BACKFILL DETAIL

- A SAND BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE (MIN. THICKNESS = 6").
- B SAND BACKFILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE (4" LIFTS, HAND TAMPED).
- C SAND BACKFILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE (6" LIFTS, HAND TAMPED).
- D SAND BACKFILL, CLASS "A" (6" LIFTS, MECHANICAL COMPACTION).
- E EARTH BACKFILL, CLASS "B" (12" LIFTS, MECHANICAL COMPACTION).
- FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 6". STRUCTURE BACKFILL MATERIAL SHALL BE SAND, APPROVED SITE SOIL, OR OTHER APPROVED SUBSTITUTE.

ADJUSTMENTS

NOT TO SCALE

SPECIAL CONDITION LINE ADJUSTMENTS
5/8" GALV. ALL THREAT RODS WITH EYELET BOLTS FOR ASSEMBLY WITH THRUST BLOCKS

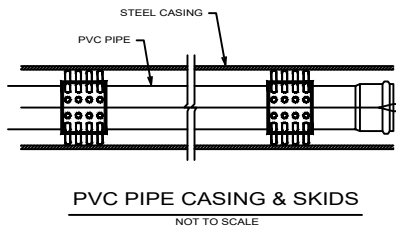
METHOD FOR FILLING AND FLUSHING NEW WATER LINES

NOTE:

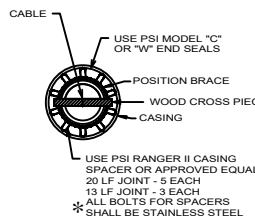
WATER USAGE FOR ALL INITIAL TESTING WILL NOT BE BILLED TO THE CONTRACTOR. ANY RE-TESTING NEEDED WILL BE THE RESPONSIBILITY OF THE CONTRACTOR INCLUDING PAYMENT OF ADDITIONAL WATER NEEDED. CONTRACTOR WILL BE ALLOWED TO FLUSH THE WATERLINE INITIALLY FOR A MAXIMUM OF 12-24 HRS. OR AS DETERMINED BY THE ENGINEER. IF FLUSHING IS DETERMINED TO BE LONGER, THE ENGINEER WILL BE REQUIRED TO DUMP THE PROPER DOCUMENTATION AND CALCULATIONS TO SUPPORT SUCH FINDINGS.

AMOUNT OF FLOW TO BE USED FOR FLUSHING WILL BE MONITORED AND REGULATED BY THE BPUB INSPECTORS. CONTRACTOR WILL NOT BE ALLOWED TO TIE-IN TO EXISTING WATER LINE UNTIL ALL TEST ON NEW LINES HAVE BEEN COMPLETED AND APPROVED.

STEEL CASING WALL THICKNESS CHART	
MINIMUM THICKNESS	DIAMETER OF CASING PIPE
1/4"	12" OR LESS
5/16"	OVER 12"-18"
3/8"	OVER 18"-22"
7/16"	OVER 22"-28"
1/2"	OVER 28"-34"
9/16"	OVER 34"-42"
5/8"	OVER 42"-48"
OVER 48" MUST BE APPROVED BY B.P.U.B. NOTE: THIS CHART IS ONLY FOR SMOOTH STEEL CASING PIPES WITH MINIMUM YIELD STRENGTH OF 35,000 PSI	



NOMINAL PIPE SIZE	CASING SIZE	NO. OF SKIDS
6"	12"	4
8"	16"	4
12"	20"	4
16"	24"	5



DRAWN BY:	APPROVED BY:
P.E.	
DATE DRAWN:	REVISION DATE:
June 2020	
CHECKED BY:	DWG. NO.
A. CHAVEZ II	
SCALE:	FILE NAME: C:\MY DRAWINGS\2020water\2020WATERLINESREPLACEMENT\WaterDetails.dwg
AS SHOWN	