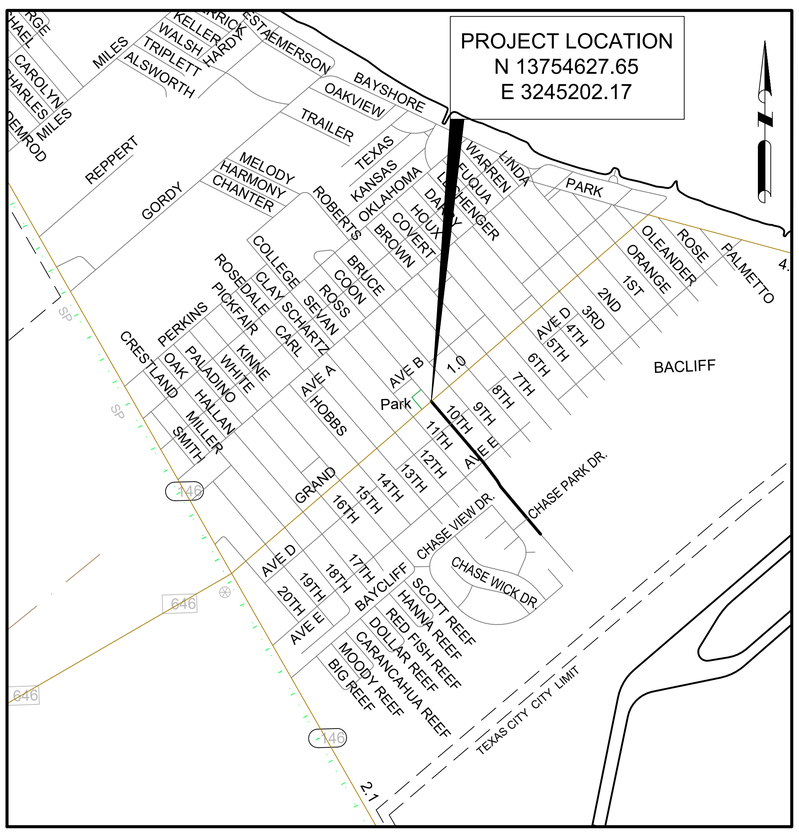
CONSTRUCTION PLANS FOR
10th STREET RECONSTRUCTION PROJECT

GALVESTON COUNTY

BID NO. B#201038



VICINITY MAP

N.T.S.

COMMISSIONER'S COURT

MARK HENRY	COUNTY JUDGE
DARRELL APFFEL	COMMISSIONER PRECINCT NO.1
JOE GIUSTI	COMMISSIONER PRECINCT NO. 2
STEPHEN HOLMES	COMMISSIONER PRECINCT NO. 3
KENNETH CLARK	COMMISSIONER PRECINCT NO. 4
MICHAEL SHANNON, PE	COUNTY ENGINEER

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Binkley & Barfield
consulting engineers

Binkley & Barfield, Inc. | TxEng F-257
1710 Seamist Dr, Houston, TX 77008
713.869.3433 | BinkleyBarfield.com

DATE: JULY 2020

NOTICE:
For your safety, you are required by Texas Law to call 811 at least 48 hours before you dig so that underground lines can be marked.
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VERIFICATION OF PRIVATE UTILITY LINES

DATE: 07/30/2020

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.

Signature Valid for six months.

DATE: 07/30/2020

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities – not to be used for conflict verification.)

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DATE: 7-23-20

AT&T
Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
07/29/2020

STATE OF TEXAS
AIMEE EDWARDS
107271
LICENSED
PROFESSIONAL ENGINEER
07/29/2020

(WATER DESIGN ONLY)

G:\180000082_10th Street Gov Co_CADD\Drawings\00C-DTcovr.dwg-COVER SHEET Plotted Aug 18, 2020 at 1:36pm by jmagic | Last Saved by: jmagic

GENERAL CONSTRUCTION NOTES

1. THERE WILL BE NO SEPARATE PAYMENT FOR WORK SHOWN ON THESE PLANS UNLESS OTHERWISE SPECIFICALLY ESTABLISHED IN BID SECTION OF CONTRACT DOCUMENTS. INCLUDE COST OF THIS WORK IN CONTRACT UNIT PRICE FOR ITEMS OF WHICH THIS WORK IS A COMPONENT OR INCIDENTAL TO.

2. UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERITY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 800-245-4545 AND LONE STAR ONE CALL AT 811 OR 800-545-6005 AT LEAST 48 HOURS (EXCLUDING WEEKENDS AND HOLIDAYS) BEFORE PROCEEDING WITH ANY EXCAVATION.

3. CONTRACTOR SHALL NOTIFY GALVESTON COUNTY IN WRITING PRIOR TO COMMENCING CONSTRUCTION.

4. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION, AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.

5. CONTRACTOR SHALL COMPLY WITH THE LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.

6. CONTRACTOR SHALL REMAIN FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING PUBLIC OR PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER MAINS, WASTEWATER COLLECTION SYSTEMS, AND STORM SEWERS, DURING CONSTRUCTION.

7. EXISTING PAVEMENTS, CURBS, SIDEWALKS, AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED PER DETAILS.

8. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB, SHALL BE AS GOOD AS OR BETTER THAN THE CONDITION PRIOR TO STARTING WORK.

9. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING FACILITIES PRIOR TO CONSTRUCTION OF PROPOSED FACILITIES. ANY DAMAGE TO EXISTING FACILITIES INCURRED AS A RESULT OF CONSTRUCTION OPERATIONS WILL BE REPAIRED AT CONTRACTOR'S EXPENSE.

10. THE GEOTECHNICAL INVESTIGATION FOR THIS PROJECT WAS CONDUCTED IN ACCORDANCE WITH ASTM STANDARDS AND METHODS AND GALVESTON COUNTY REQUIREMENTS. REPORT NO. 18G5566 WAS PREPARED BY GEOSCIENCE ENGINEERING AND TESTING, INC. DATED AUGUST 17, 2018.

11. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TEXAS MUTCD MOST RECENT EDITION AS REVISED) DURING CONSTRUCTION.

12. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.

13. ALL OPEN TRENCHES, TUNNEL SHAFTS, OR OTHER EXCAVATIONS SHALL BE SECURED IN ACCORDANCE WITH OSHA REQUIREMENTS.

14. NO FILL IS PROPOSED IN THE SPECIAL FLOOD HAZARD AREA, THE GROUND SURFACE IN THE PROJECT AREA WILL BE RESTORED TO ITS EXISTING CONDITION AND ELEVATION. NO FLOODPLAIN MITIGATION IS REQUIRED.

15. MAINTAIN LOCAL DRIVEWAY ACCESS TO RESIDENTIAL AND COMMERCIAL PROPERTIES ADJACENT TO WORK AREAS. PROVIDE TEMPORARY ACCESS IN ACCORDANCE WITH SECTION 01145 – USE OF PREMISES. COORDINATE WITH BUSINESS OWNERS AND RESIDENTS.

16. ALIGNMENT, CENTERLINE CURVE DATA AND STATIONING TO BE VERIFIED BY ON-THE-GROUND SURVEY, AND ELEVATIONS OF ALL CONNECTIONS TO EXISTING FACILITIES TO BE CONFIRMED PRIOR TO WORK START. CONTRACTOR TO NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

17. CONTRACTOR SHALL GIVE NOTICE TO ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS, OR PERSONS IN CHARGE OF PRIVATE AND PUBLIC UTILITIES OR RAILROADS AFFECTED BY HIS OPERATIONS PRIOR TO COMMENCEMENT OF WORK.

18. CONTRACTOR TO REMOVE PLUGS AND CONNECT TO EXISTING UTILITY LINES AS INDICATED ON PLANS. NO SEPARATE PAY.

19. ALL UTILITY TRENCHES TO BE BACKFILLED TO 95 PERCENT STANDARD PROCTOR DENSITY UNLESS OTHERWISE NOTED.

20. PROPOSED UTILITY FLOWLINE ELEVATIONS ARE ONLY PROVIDED FOR LINES SHOWN ON A PARTICULAR SHEET. FOR FLOWLINE ELEVATIONS OF PROPOSED UTILITIES PROFILED ON OTHER SHEETS, SEE OTHER SHEETS.

21. NO EXTRA PAY WILL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID SHEET. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM TO WHICH IT RELATES.

22. THESE PLANS DO NOT EXTEND OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. SEAL OF THE REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. CONTRACTOR SHALL INDEPENDENTLY PREPARE AND/OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS.

23. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS RECORDING AS-BUILT CONDITIONS DURING CONSTRUCTION. THESE REDLINE MARKED UP DRAWINGS WILL BE SUBMITTED TO THE DESIGN CONSULTANT WHO WILL MAKE THE CHANGES ON THE ORIGINAL TRACINGS, LABELING EACH SHEET IN THE SET AS "RECORD DRAWINGS", AND RETURNING SAME TO THE OWNER.

WATER LINE CONSTRUCTION NOTES

1. ALL NEWLY INSTALLED PIPES, COATINGS, AND RELATED PRODUCTS SHALL CONFORM TO ANSI/NSF STANDARDS AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI.

2. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL WATER MAIN TRENCHES SHALL BE BACKFILLED WITH BANK-RUN SAND TO A POINT 1-FT OVER TOP OF PIPE. REMAINING BACKFILL SHALL BE MADE WITH COMPACTED SUITABLE MATERIAL PER SPECIFICATIONS.

3. CONTACT DISTRICT OPERATOR PRIOR TO MAKING ANY CONNECTION(S) TO EXISTING WATER MAINS AND/OR ANYTIME A VALVE ON AN EXISTING WATER MAIN IS TO BE OPENED OR CLOSED.

   DISTRICT NAME: BACLIFF MUNICIPAL UTILITY DISTRICT
   OPERATOR CONTACT: MR. MICHAEL MORGAN, PLANT AND FIELD ASSISTANT
   CONTACT PHONE #: 281-339-5126 (CELL)
   281-339-1634 (OFFICE)

4. ALLOW A MINIMUM OF 1-FT VERTICAL AND 4-FT HORIZONTAL CLEARANCE BETWEEN PROPOSED WATER MAINS AND OTHER EXISTING OR PROPOSED UTILITIES, UNLESS OTHERWISE SHOWN ON DRAWINGS. WATER MAINS CROSSING STORM SEWERS SHALL HAVE A MINIMUM OF 2-FT VERTICAL CLEARANCE.

5. WHEN A WATER MAIN IS PLACED NEAR A SANITARY SEWER MANHOLE, IT SHALL HAVE A MINIMUM OF 9-FT WALL TO WALL SEPARATION. WHERE A WATER MAIN PARALLELS A SANITARY SEWER, 9-FT SEPARATION SHALL BE MAINTAINED IN ALL DIRECTIONS. IF THE 9-FT SEPARATION CANNOT BE ACHIEVED, BOTH SEWER PIPE AND JOINTS SHALL HAVE A MINIMUM PRESSURE RATING OF 150-PSI AND MANHOLES SHALL BE WATER TIGHT. VERTICAL SEPARATION SHALL BE A MINIMUM OF 2-FT BETWEEN OUTSIDE DIAMETERS AND HORIZONTAL SEPARATION SHALL BE A MINIMUM OF 4-FT BETWEEN OUTSIDE DIAMETERS.

6. ALL VALVES SHALL CLOSE CLOCKWISE AND BE EQUIPPED WITH OPERATING NUT EXTENSIONS TO WITHIN 4-FT OF NATURAL GROUND IN ACCORDANCE WITH SPECIFICATIONS.

7. INSTALL RESTRAINED JOINTS AS NECESSARY AND AS SHOWN TO ENSURE INTEGRITY OF THE WATER MAIN AT TEST PRESSURE. THIS WORK IS INCIDENTAL TO WATER MAIN INSTALLATION, NO SEPARATE PAY.

8. ALL WATER MAINS SHALL BE INSTALLED BY TRENCHLESS CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED ON PLANS OR DIRECTED BY ENGINEER.

9. PROVIDE DETECTABLE WARNING TAPE FOR NON-METALLIC PIPING, PER SPECIFICATIONS.

10. WHEN CROSSING AN EXISTING STORM SEWER USING OPEN CUT METHODS, WATER MAIN TRENCH ZONE, AS DEFINED IN THE SPECIFICATIONS AND DETAILS, SHALL BE BACKFILLED FOR 3-FT TO 5-FT EITHER SIDE OF STORM SEWER WITH CEMENT STABILIZED SAND TO SPRING LINE OF STORM SEWER.

11. MECHANICAL RESTRAINED JOINTS TO BE USED IN PLACE OF WELDED RESTRAINED JOINTS IF DUCTILE IRON PIPE (DIP) IS USED.

12. TRANSFERS OF SHORT SIDED WATER SERVICE CONNECTIONS ARE INCIDENTAL TO THE COST OF PROPOSED WATERLINE.

13. LONG SIDED WATER SERVICE CONNECTIONS TO BE REPLACED AND CONNECTED TO EXISTING WATER METERS.

AT&T TEXAS/SWBT FACILITIES

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.

2. THE CONTRACTOR SHALL CALL 1-800-344-8377 (TEXAS 811) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.

3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.

4. WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES, THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR DIRECT BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.

6. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER ROOSEVELT LEE JR. AT 713-567-4552 OR E-MAIL HIM AT rl7259@att.com, IF CABLE LOCATE REQUEST(S) ARE NOT COMPLETED FOR OUR AT&T TEXAS/SWBT FACILITIES.

CENTER POINT ENERGY NOTES

CAUTION: UNDERGROUND GAS FACILITIES

THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

-WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 207-5463 or (713) 945-8037 (7:00 AM TO 4:30 PM). FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

-WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.

-WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

-FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRICAL FACILITIES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

-ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND

-OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222.

ACTIVITIES ON/OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6348 OR (713) 207-5769.

SYMBOL LEGEND

RRM	RADIO RELAY MAST		CENTERPOINT TOWER LEG		WATER METER
TCB	TRAFFIC SIGNAL CONTROL BOX		WATER VALVE		LIGHT
	GAS LAMP		TRANSFORMER BOX		TELEPHONE POLE
	MAIL BOX		TRAFFIC LIGHT STANDARD	T	TELEPHONE JUNCTION BOX
℄	CENTER LINE OF STREET		GAS VALVE		FENCE CORNER
GT	GREASE TRAP	G	GAS METER		'B' INLET
	TREE		GAS SERVICE LINE MARKER		'B-B' INLET
	BUSH		CENTERPOINT MANHOLE		'E' INLET
	GATE		SERVICE POLE		S.W.B.T. M H
	GUY WIRE		CENTERPOINT UNDG. CABLE MARKER		UNDG. TELE. CABLE MARKER
WW	WATER WELL		ADVERTISEMENT SIGN		PUBLIC PHONE
	FENCE LINE(CHAIN LINK)		CABLE TV UNDG. MARKER		CABLE TV MARKER
	FENCE LINE(WOOD)		STREET BARRICADE	TV	CABLE TV JUNCTION BOX
	BRICK PILLAR		CORE BORE		PIPELINE MARKER
	METAL POST (BOLLARD)		EXIST. SANITARY M H		VENT PIPE
	FLAG POLE		STORM M H		SIGN STANDARD
	POWER POLE	WH	WELLHEAD	OHP	OVERHEAD POWER LINES
	STREET LIGHT STANDARD		SANITARY CLEAN OUT		
	TRAFFIC SIGN	A	CATCH BASIN		
E/B	ELECTRICAL JUNCTION BOX		FIRE HYDRANT		

ABBREVIATIONS

MH	- MANHOLE	LT.	- LEFT
SAN.	- SANITARY	C.L.	- CENTER LINE
STM.	- STORM	T.C.	- TOP OF CURB
EXIST.	- EXISTING	E.P.	- EDGE OF PAVEMENT
STA.	- STATION	W.L.	- WATER LINE
ELEV.	- ELEVATION	W	- WEST
B.L.	- BASELINE OR BUILDING LINE	E	- EAST
		S	- SOUTH
SWR.	- SEWER	N	- NORTH
DIA.	- DIAMETER	F.V.	- FLUSHING VALVE
EL.	- ELEVATION	CONC.	- CONCRETE
R.O.W.	- RIGHT-OF-WAY	PVM'T.	- PAVEMENT
L.F.	- LINEAR FEET	F.L.	- FLOW LINE
N.G.	- NATURAL GROUND	G.V.	- GATE VALVE
RT.	- RIGHT	PC	- POINT OF CURVATURE
RP	- RADIUS POINT	PT	- POINT OF TANGENCY
S.S.E.	- SANITARY SEWER EASEMENT	R	- RADIUS
W.L.E.	- WATER LINE EASEMENT	E.O.P.	- END OF PROJECT
		P.R.C.	- POINT OF REVERSE CURVE
U.E.	- UTILITY EASEMENT	P.O.C.	- POINT ON CURVE
D.E.	- DRAINAGE EASEMENT	H.C.O.P.R.R.P.	- HARRIS COUNTY OFFICIAL PUBLIC RECORDS OF REAL PROPERTY.
RED	- REDUCER		
B/F	- BLIND FLANGE	S.S.	- SIDE SLOPE
S/O	- SLIP ON		

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97594
LICENSED PROFESSIONAL ENGINEER
07/29/2020

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BinkleyBarfield.com

10TH STREET IMPROVEMENTS

LEGEND, ABBREVIATIONS, KEYED NOTES AND CONSTRUCTION NOTES

Project No.: 180000082	Scale: HORZ : VERT :	SHEET 2 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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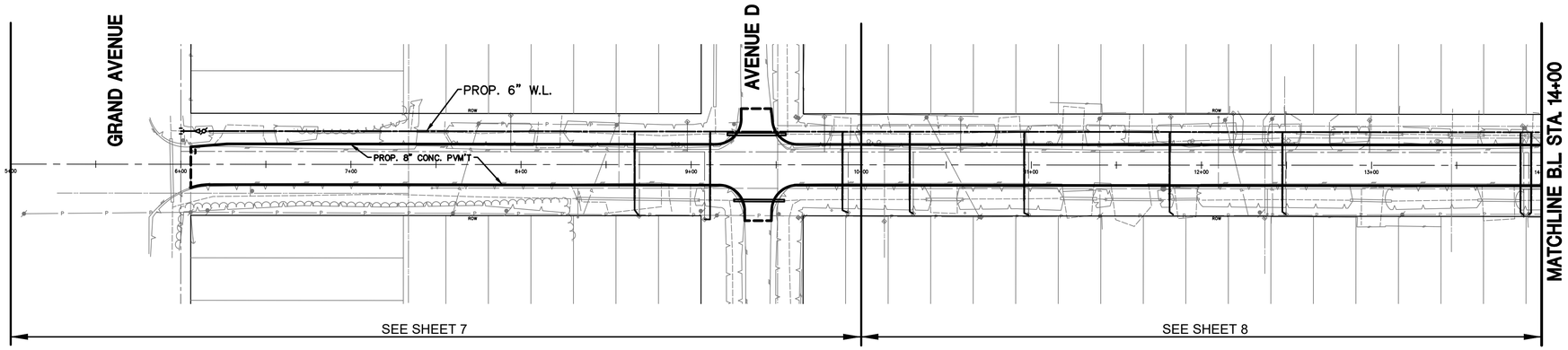

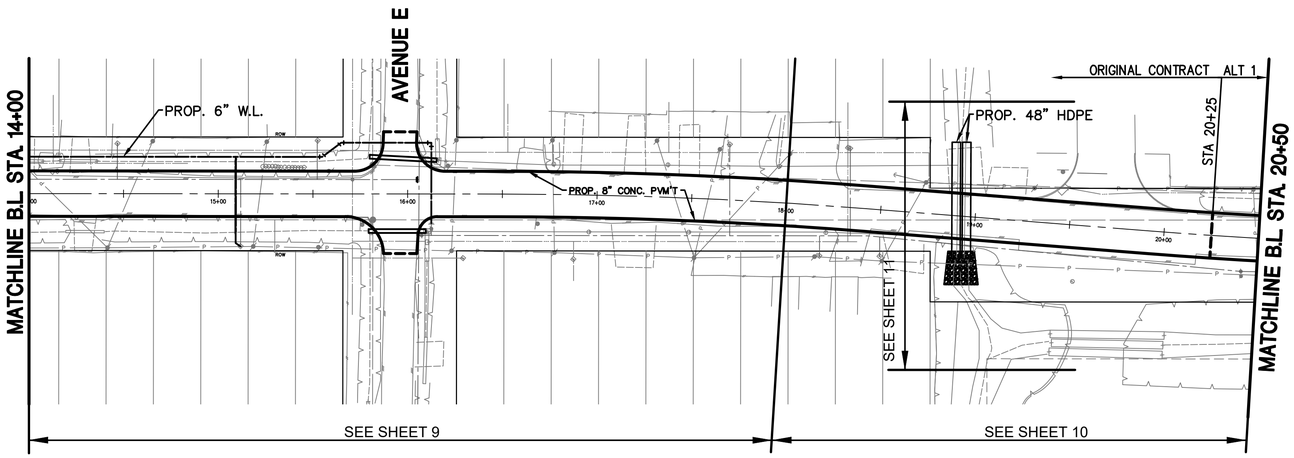

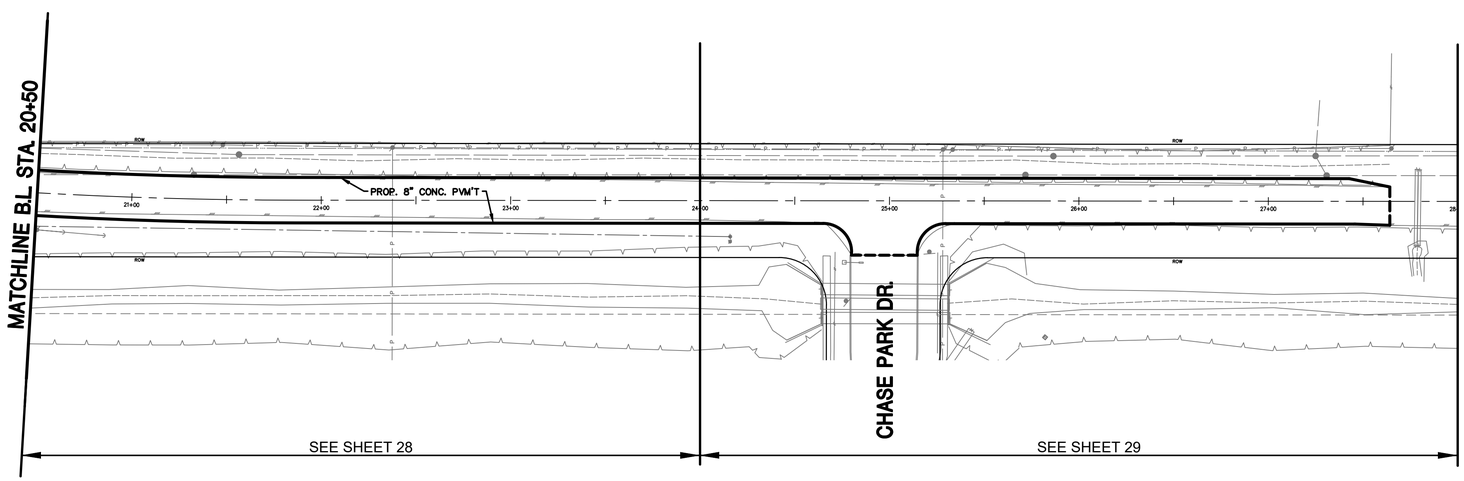

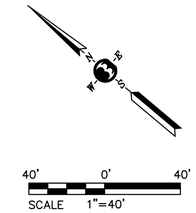

STATE OF TEXAS
AIMEE EDWARDS
107271
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07/29/2020
(WATER DESIGN ONLY)

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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

SHEET LAYOUT

Project No.: 180000082	Scale: HORZ : 1"=40' VERT :	SHEET	
Date: Jul 20, 2020		3	
Dwn By: J.R.R.		OF	29
Chkd By: J.A.A.			

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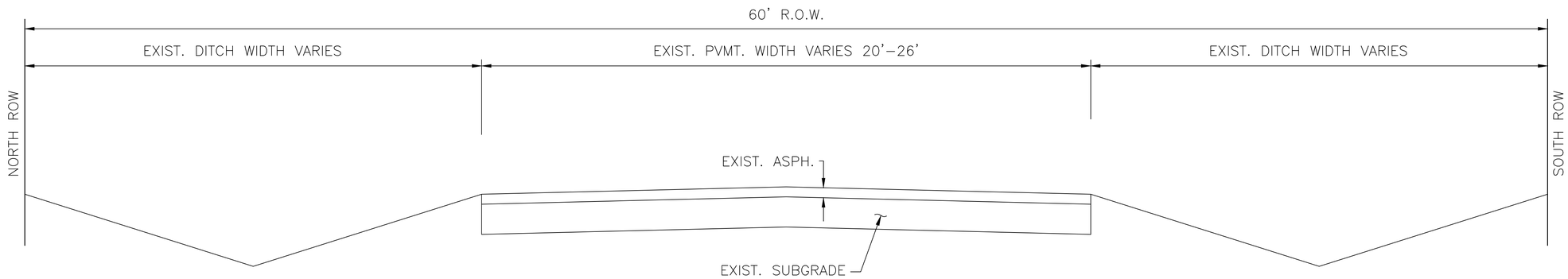
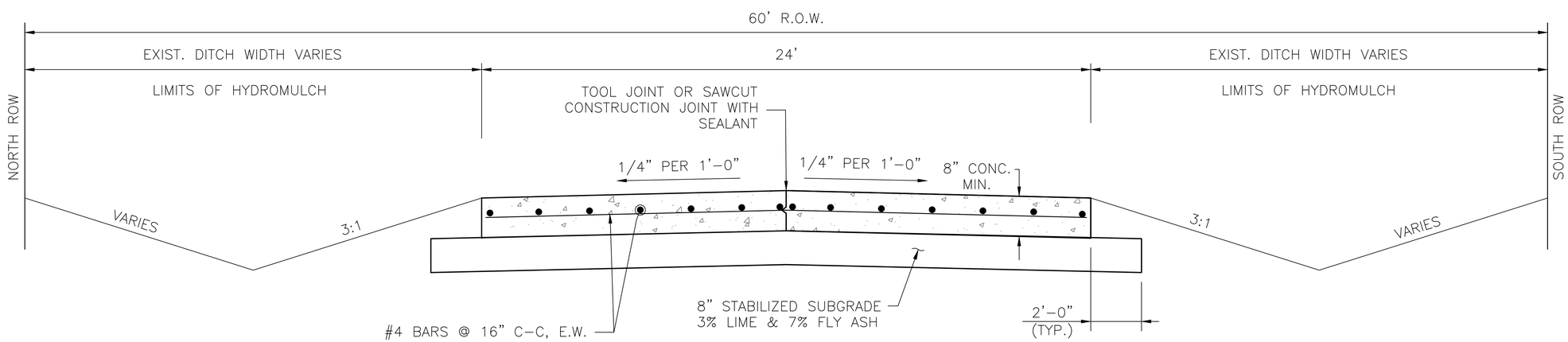


EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

MK.	DESCRIPTION	DATE	DWN.	CHK.

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TOMMY V. CROMER
97594
LICENSED PROFESSIONAL ENGINEER
07/29/2020

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713.869.3433
BinkleyBarfield.com

THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TYPICAL ROADWAY SECTION

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 4 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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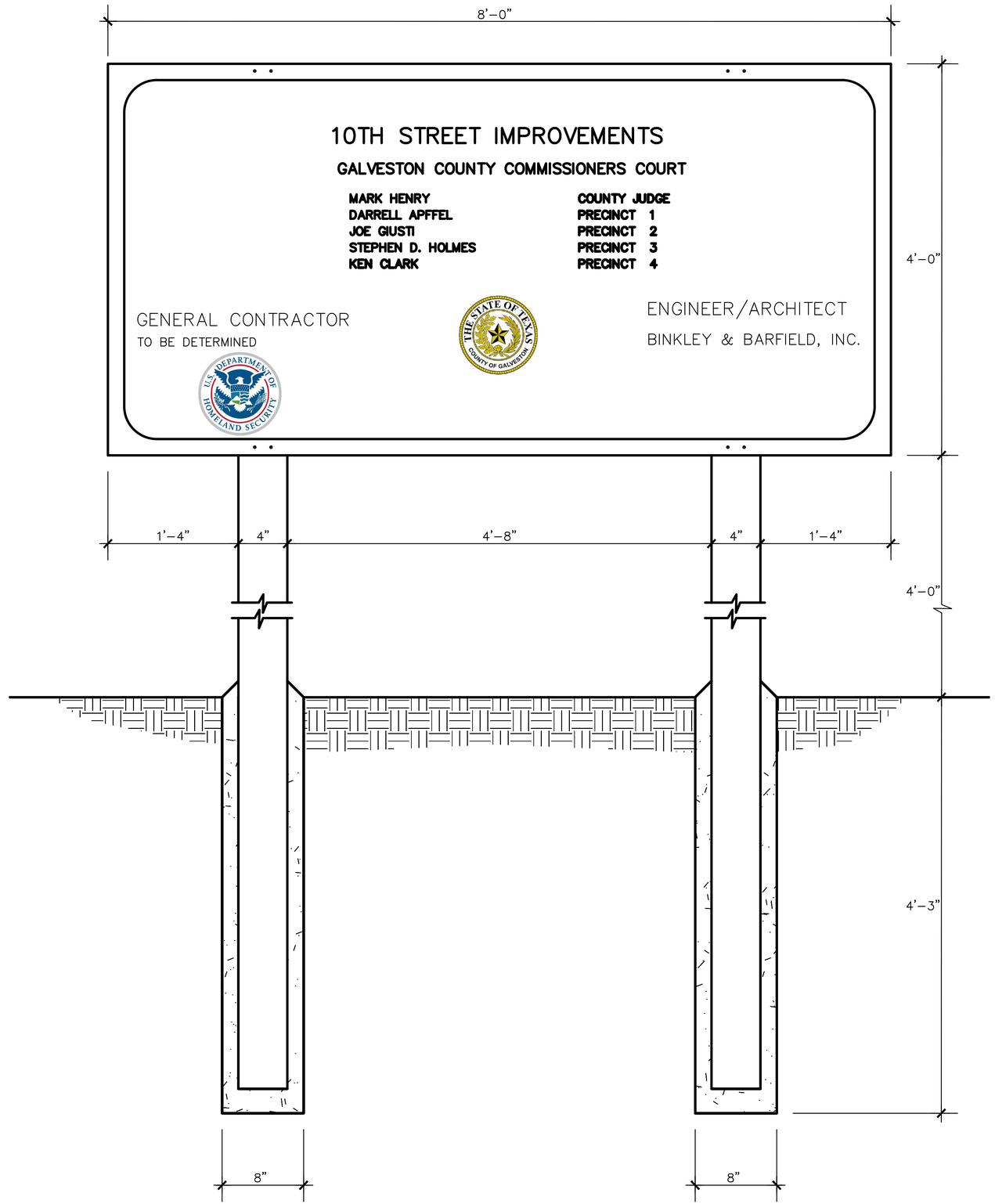

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STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER

Tommy V. Cromer
07/29/2020

Binkley & Barfield
consulting engineers

Binkley & Barfield, Inc.
TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

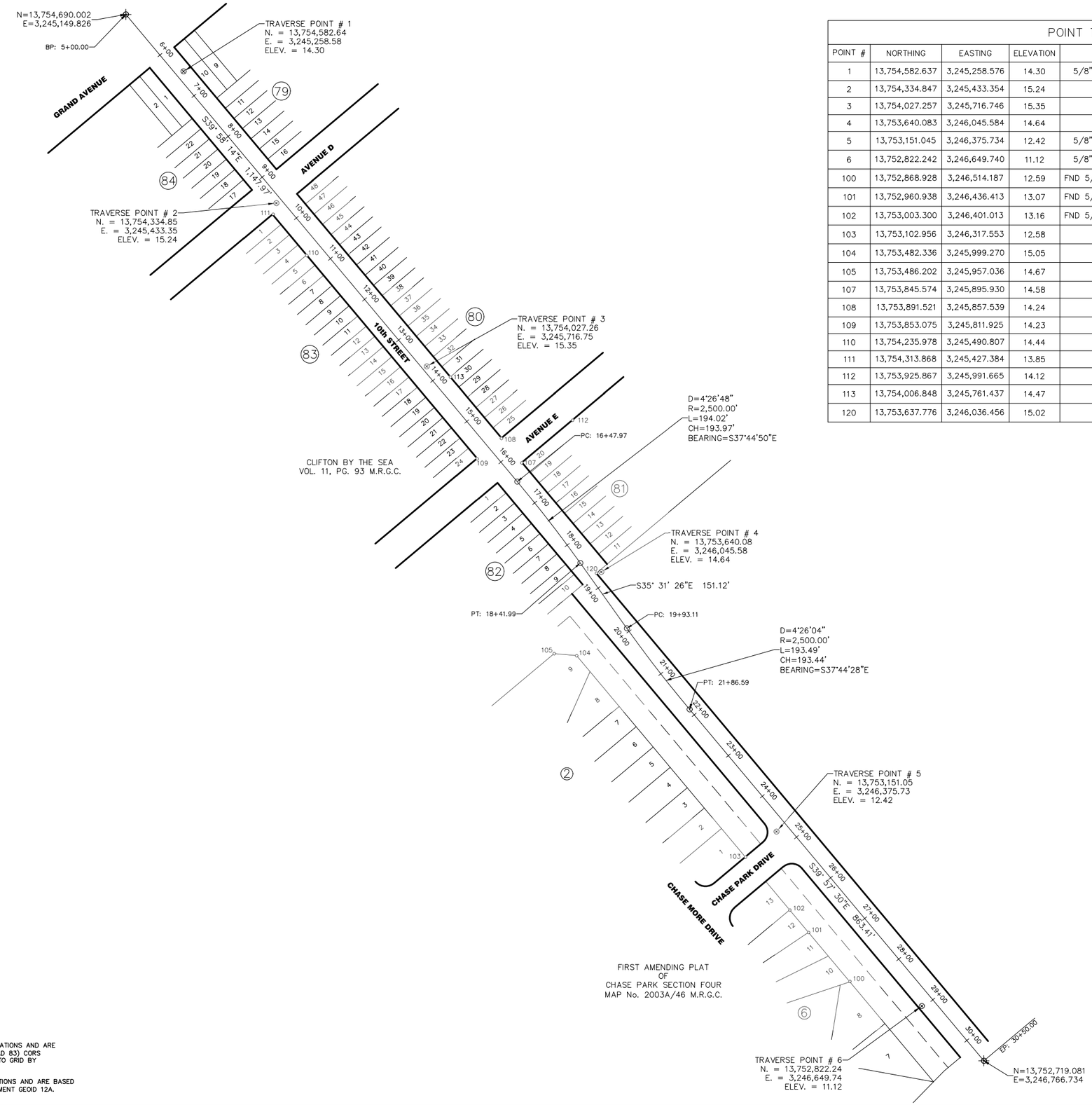
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

PROJECT SIGN

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 5 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\001C-DTsign.dwg-001C-DTsign Plotted Jul 20, 2020 at 12:24pm by Plott | Last Saved by: Plott



POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	STATION	OFFSET
1	13,754,582.637	3,245,258.576	14.30	5/8" IR WITH CONTROL CAP	6+52.14	14.37' LT.
2	13,754,334.847	3,245,433.354	15.24	MAG NAIL	9+54.32	10.86' RT.
3	13,754,027.257	3,245,716.746	15.35	MAG NAIL	13+72.10	8.73' LT.
4	13,753,640.083	3,246,045.584	14.64	60D NAIL	18+78.62	22.46' LT.
5	13,753,151.045	3,246,375.734	12.42	5/8" IR WITH CONTROL CAP	24+67.78	22.29' RT.
6	13,752,822.242	3,246,649.740	11.12	5/8" IR WITH CONTROL CAP	28+95.79	23.42' RT.
100	13,752,868.928	3,246,514.187	12.59	FND 5/8" IR W/CAP "ILLEGIBLE"	27+72.95	97.34' RT.
101	13,752,960.938	3,246,436.413	13.07	FND 5/8" IR W/CAP "ILLEGIBLE"	26+52.47	97.87' RT.
102	13,753,003.300	3,246,401.013	13.16	FND 5/8" IR W/CAP "ILLEGIBLE"	25+97.27	97.80' RT.
103	13,753,102.956	3,246,317.553	12.58	FND 5/8" IR	24+67.28	97.77' RT.
104	13,753,482.336	3,245,999.270	15.05	FND 5/8" IR	19+80.10	106.89' RT.
105	13,753,486.202	3,245,957.036	14.67	FND 5/8" IR	19+52.41	139.02' RT.
107	13,753,845.574	3,245,895.930	14.58	FND 1" IRON PIPE	16+26.44	29.34' LT.
108	13,753,891.521	3,245,857.539	14.24	FND 3/4" IR	15+66.57	29.43' LT.
109	13,753,853.075	3,245,811.925	14.23	FND 1" IRON PIPE	15+66.73	30.22' RT.
110	13,754,235.978	3,245,490.807	14.44	FND 1" IRON PIPE	10+67.00	30.34' RT.
111	13,754,313.868	3,245,427.384	13.85	FND 1" IRON PIPE	9+66.56	28.91' RT.
112	13,753,925.867	3,245,991.665	14.12	FND 1" IRON PIPE	16+26.41	154.29' LT.
113	13,754,006.848	3,245,761.437	14.47	FND 1/4" IR	14+16.45	29.87' LT.
120	13,753,637.776	3,246,036.456	15.02	FND 5/8" IR	18+75.20	13.69' LT.

COORDINATES SHOWN HEREON WERE DERIVED FROM REDUNDANT RTK GPS OBSERVATIONS AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) (NAD 83) CORS ADJUSTMENT. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999871051420.

ELEVATIONS SHOWN HEREON WERE DERIVED FROM REDUNDANT RTK GPS OBSERVATIONS AND ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) CORS ADJUSTMENT GEOID 12A.

MK.	DESCRIPTION	DATE	DWN.	CHK.

BASELINE
BASELINE CORPORATION
Professional Surveyors
1750 SEAMIST DR., SUITE 160 HOUSTON, TEXAS 77008
PH: 713-869-0155 TBPLS FIRM No. 10030200

Binkley & Barfield, Inc.
consulting engineers
Texas Registration Number F-257
1710 Seamist Drive Houston, Texas 77008 (713) 869-3433

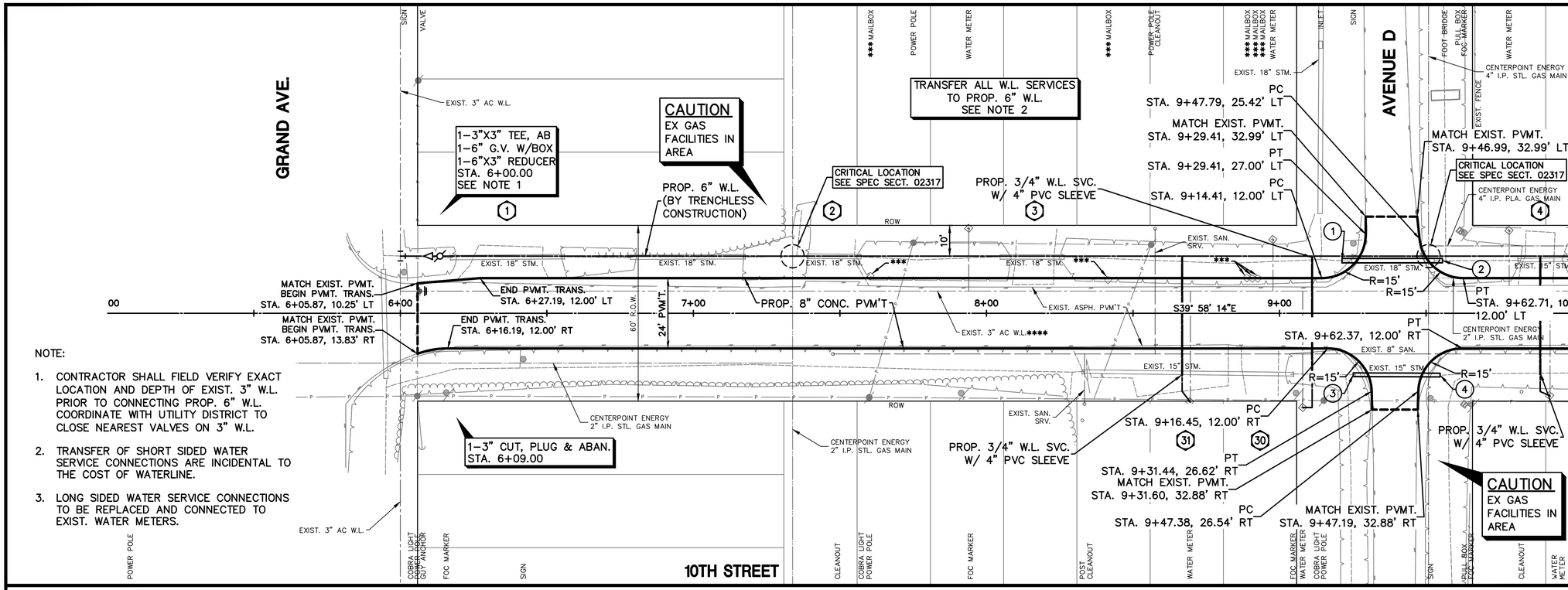
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

SURVEY CONTROL MAP

Project No.: 18-037	Scale: HORZ: 1" = 100' VERT: NA	SHEET 6 OF 28
Date: December, 2008		
Dwn By: Keith Thompson		
Chkd By: Steve Williams		

H:\2018\18037 10th Street Survey Bonifir Galveston County\Data\Vars\18037 10th Street Bonifir control map-dwg-Model Printed Dec 13, 2018 at 8:26am by OKT | Last Saved by: OKT



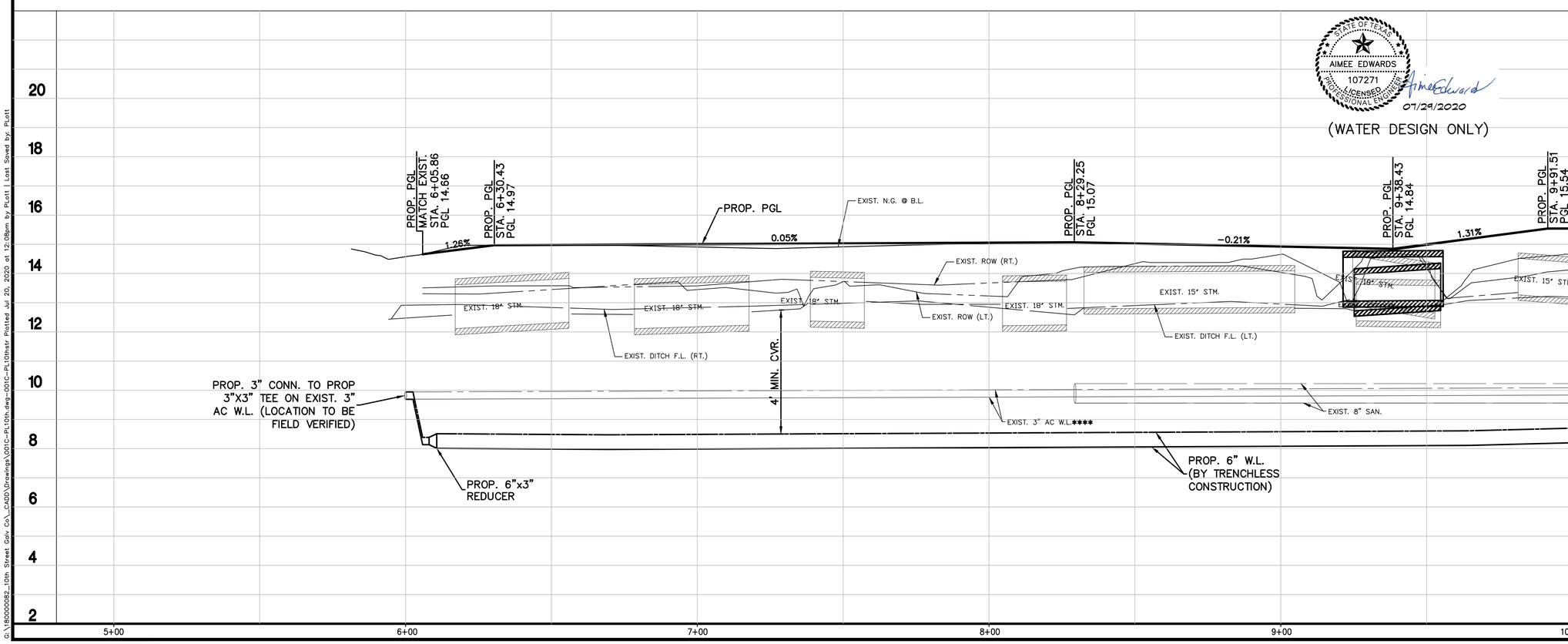
NOTE:

1. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND DEPTH OF EXIST. 3" W.L. PRIOR TO CONNECTING PROP. 6" W.L. COORDINATE WITH UTILITY DISTRICT TO CLOSE NEAREST VALVES ON 3" W.L.
2. TRANSFER OF SHORT SIDED WATER SERVICE CONNECTIONS ARE INCIDENTAL TO THE COST OF WATERLINE.
3. LONG SIDED WATER SERVICE CONNECTIONS TO BE REPLACED AND CONNECTED TO EXIST. WATER METERS.

LEGEND:

- ---- PROP. SAWCUT
- * TO BE REMOVED AND REPLACED
- ** ADJUST TO FINISH GRADE
- *** TO BE REMOVED AND RELOCATED
- **** TO BE ABANDONED IN PLACE

1. STA. 9+21.33, 17.96' LT BEGIN PROP. 18" RCP
2. STA. 9+55.60, 17.97' LT END PROP. 18" RCP
3. STA. 9+25.17, 20.97' RT BEGIN PROP. 15" RCP
4. STA. 9+54.81, 21.08' RT END PROP. 15" RCP



STATE OF TEXAS
AIMEE EDWARDS
107271
LICENSED PROFESSIONAL ENGINEER
07/29/2020

(WATER DESIGN ONLY)

NOTICE:
For your safety, you are required by Texas Law to call 811 at least 48 hours before you dig so that underground lines can be marked. This signature does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

DATE: 07/30/2020

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.

Signature Valid for six months.

DATE: 07/30/2020

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities – not to be used for conflict verification.)

Signature Valid for six months

DATE: 1-23-20

AT&T
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MK.	DESCRIPTION	DATE	DWN.	CHK.

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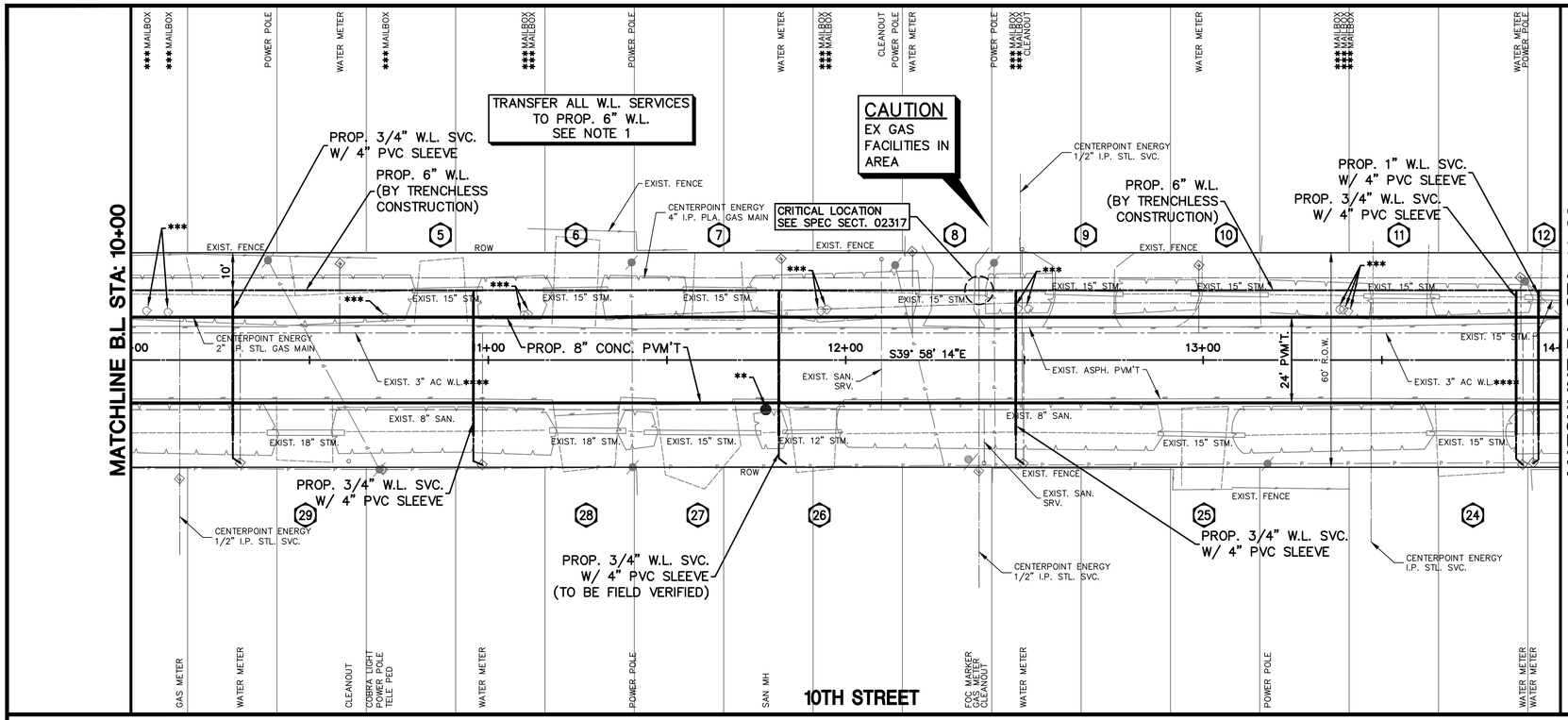
THE STATE OF TEXAS COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

10TH STREET
PLAN & PROFILE
B.L. STA: 5+00 TO B.L. STA: 10+00

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 7 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\001C-PL10th.dwg-001C-PL10th Plotted Jul 20, 2020 at 12:08pm by Plott | Last Saved by: Plott



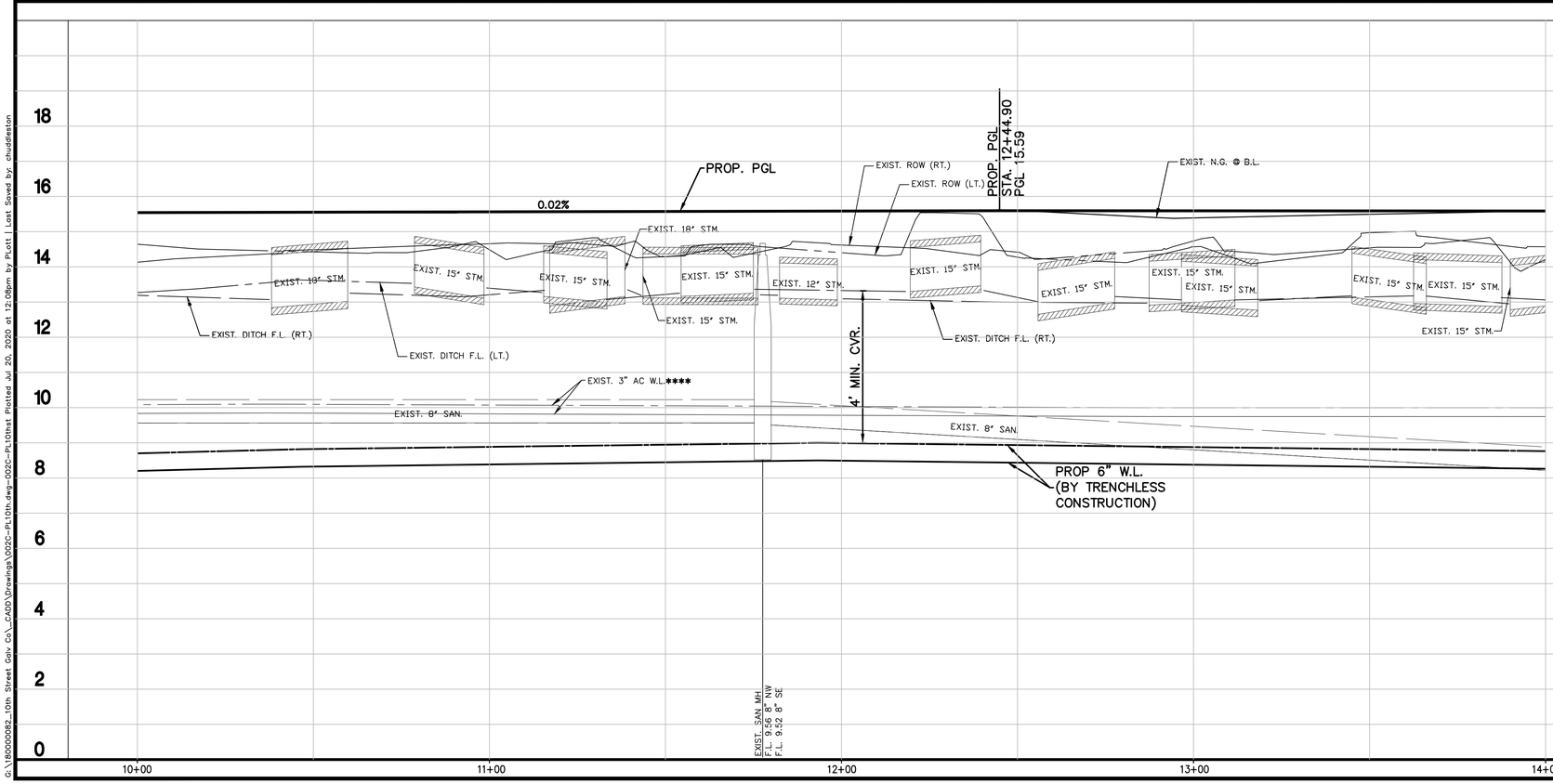
NOTE:

1. TRANSFER OF SHORT SIDED WATER SERVICE CONNECTIONS ARE INCIDENTAL TO THE COST OF WATERLINE.
2. LONG SIDED WATER SERVICE CONNECTIONS TO BE REPLACED AND CONNECTED TO EXIST. WATER METERS.

20' 0' 20'
SCALE 1"=20'

LEGEND:

----	PROP. SAWCUT
*	TO BE REMOVED
**	ADJUST TO FINISH GRADE
***	TO BE REMOVED AND RELOCATED
****	TO BE ABANDONED IN PLACE



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07/29/2020
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VERIFICATION OF PRIVATE UTILITY LINES

DATE: 07/30/2020

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DATE: 07/30/2020

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Signature Valid for six months

DATE: 1-23-20

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MK.	DESCRIPTION	DATE	DWN.	CHK.

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07/29/2020

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BinkleyBarfield.com

THE STATE OF TEXAS COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

10TH STREET
PLAN & PROFILE
B.L. STA: 10+00 TO B.L. STA: 14+00

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 8 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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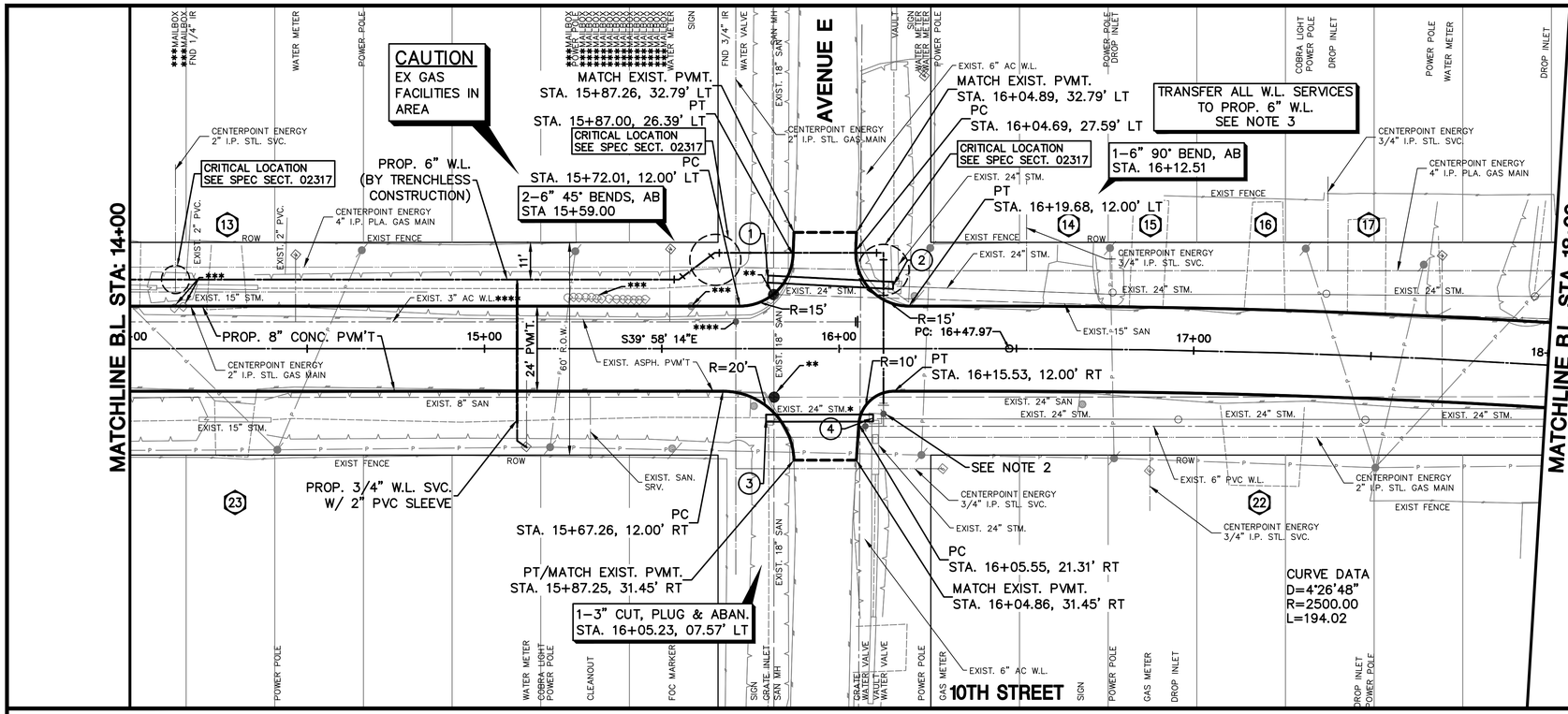
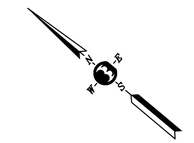




20' 0' 20'
SCALE 1"=20'

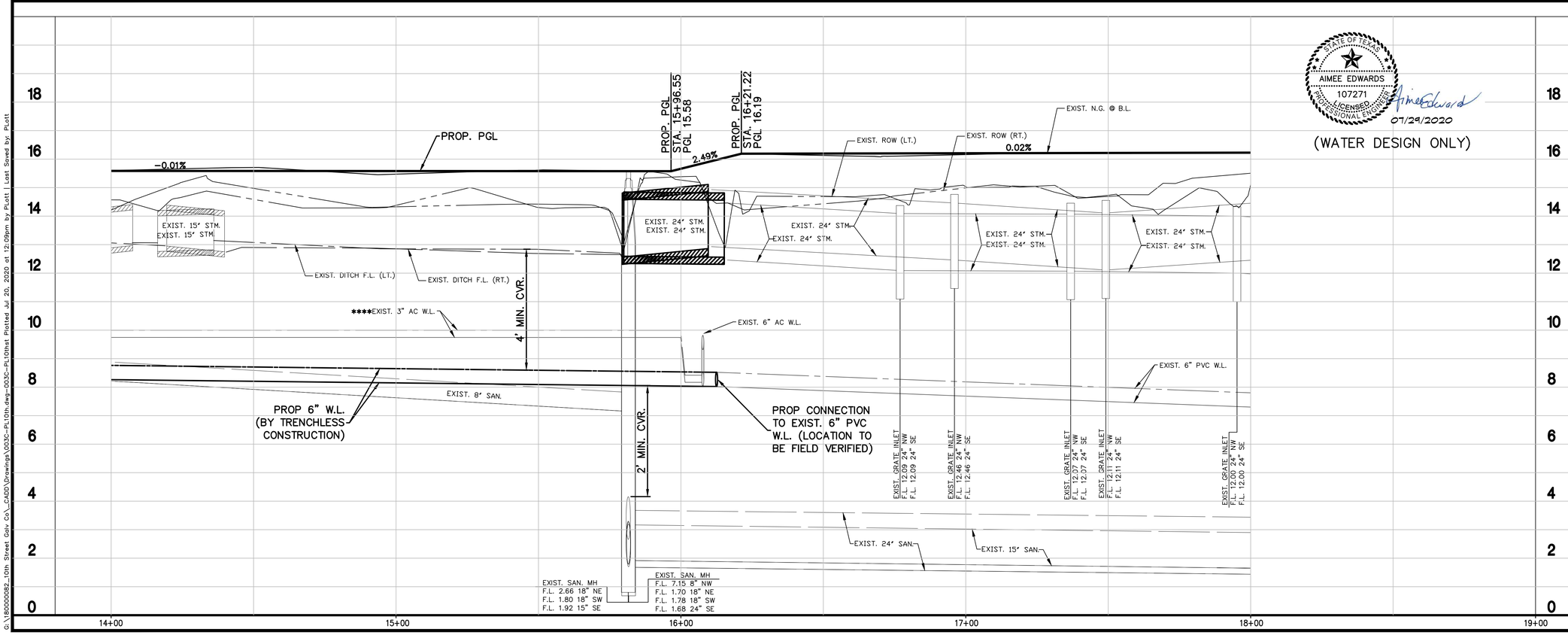
NOTE:

1. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND DEPTH OF EXIST. 6" W.L. PRIOR TO CONNECTING PROP. 6" W.L. COORDINATE WITH UTILITY DISTRICT TO CLOSE NEAREST VALVES ON 6" W.L.
2. CONTRACTOR TO REMOVE EXIST. 6" PLUG AND CONNECT PROP. 6" W.L. TO EXIST. 6" W.L.
3. TRANSFER OF SHORT SIDED WATER SERVICE CONNECTIONS ARE INCIDENTAL TO THE COST OF WATERLINE.
4. LONG SIDED WATER SERVICE CONNECTIONS TO BE REPLACED AND CONNECTED TO EXIST. WATER METERS.

(1) STA. 15+79.94, 19.62' LT BEGIN PROP. 24" RCP
(2) STA. 16+15.24, 17.82' LT END PROP. 24" RCP. CONNECT TO EXISTING JUNCTION BOX.
(3) STA. 15+79.42, 19.60' RT BEGIN PROP. 24" RCP
(4) STA. 16+09.58, 19.62' RT END PROP. 24" RCP. CONNECT TO EXISTING JUNCTION BOX.

LEGEND:

----	PROP. SAWCUT
*	TO BE REMOVED AND REPLACED
**	ADJUST TO FINISH GRADE
***	TO BE REMOVED AND RELOCATED
****	TO BE ABANDONED IN PLACE



STATE OF TEXAS
AIMEE EDWARDS
107271
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07/29/2020
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VERIFICATION OF PRIVATE UTILITY LINES
DATE: 07/30/2020
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Signature Valid for six months.
DATE: 07/30/2020
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(This signature verifies existing underground facilities – not to be used for conflict verification.)
Signature Valid for six months
DATE: 1-23-20
AT&T
Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.

MK.	DESCRIPTION	DATE	DWN.	CHK.

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07/29/2020

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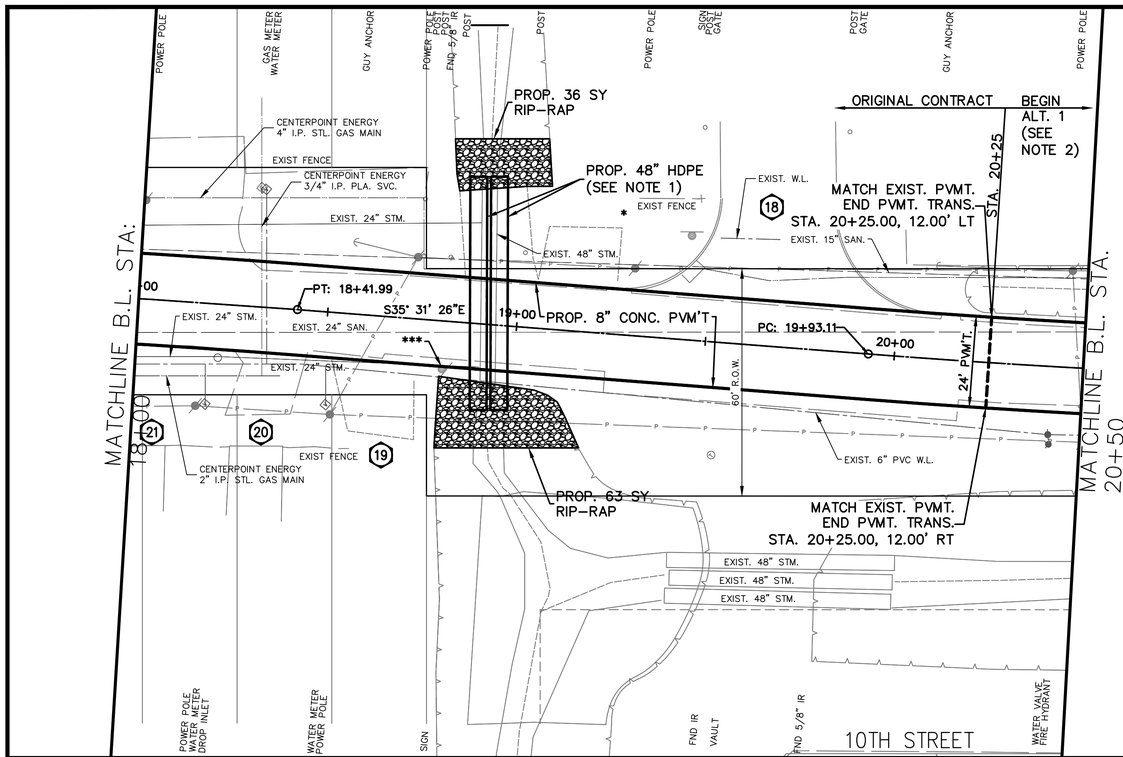
THE STATE OF TEXAS COUNTY OF GALVESTON

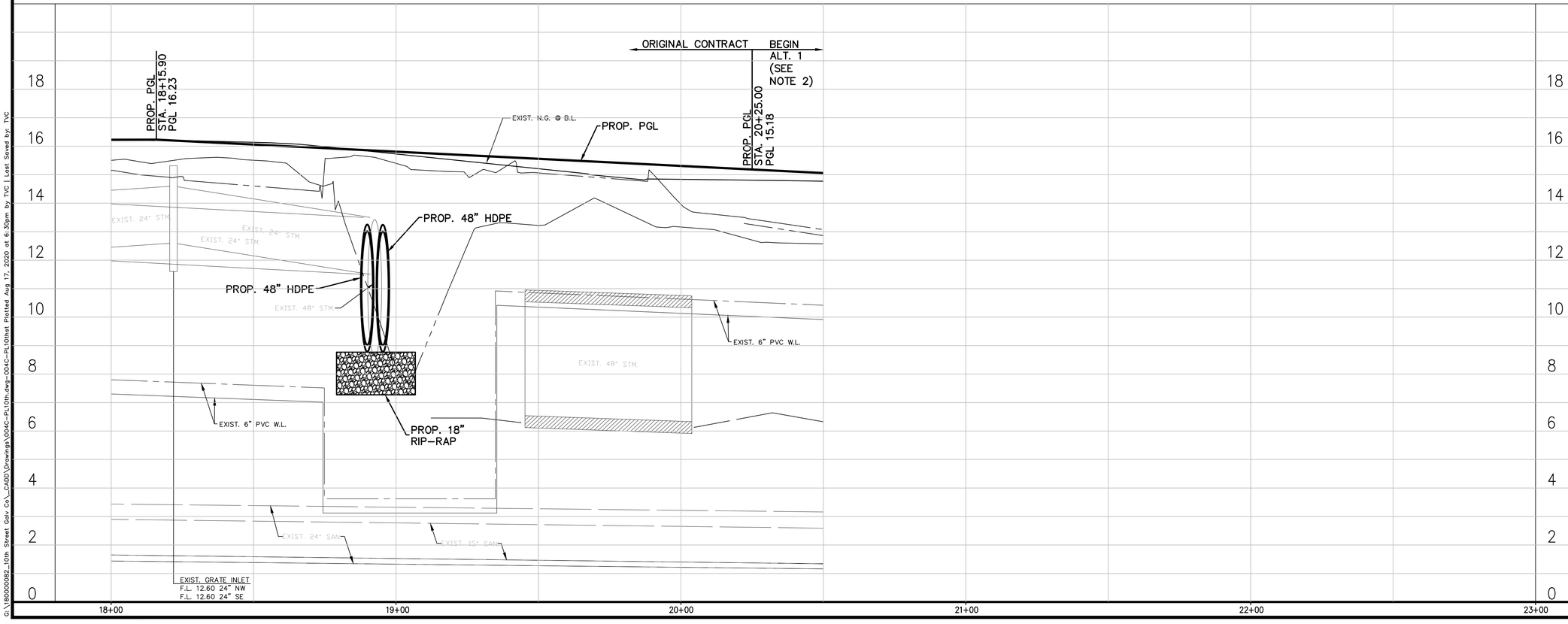
10TH STREET IMPROVEMENTS

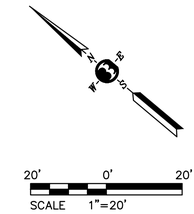
10TH STREET
PLAN & PROFILE
B.L. STA: 14+00 TO B.L. STA: 18+00

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 9 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\003C-PL10th.dwg-003C-PL10thst Plotted Jul 20, 2020 at 12:09pm by PLott | Last Saved by: PLott







LEGEND:

----	PROP. SAWCUT
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**	ADJUST TO FINISH GRADE
***	TO BE REMOVED AND RELOCATED
****	TO BE ABANDONED IN PLACE

NOTE:

1. FOR PLAN AND PROFILE FOR PROP. 48" HDPE PIPE CROSSING, SEE SHEET 11.
2. FOR PLAN AND PROFILE OF ALT 1, SEE SHEET 28

NOTICE:
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VERIFICATION OF PRIVATE UTILITY LINES

DATE:
CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.
Signature Valid for six months.

DATE:
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DATE:
AT&T
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Signature valid for one year.

MK.	DESCRIPTION	DATE	DWN.	CHK.

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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

10TH STREET
PLAN & PROFILE
B.L. STA: 18+00 TO B.L. STA: 20+50

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 10 OF 29
Date: Aug 17, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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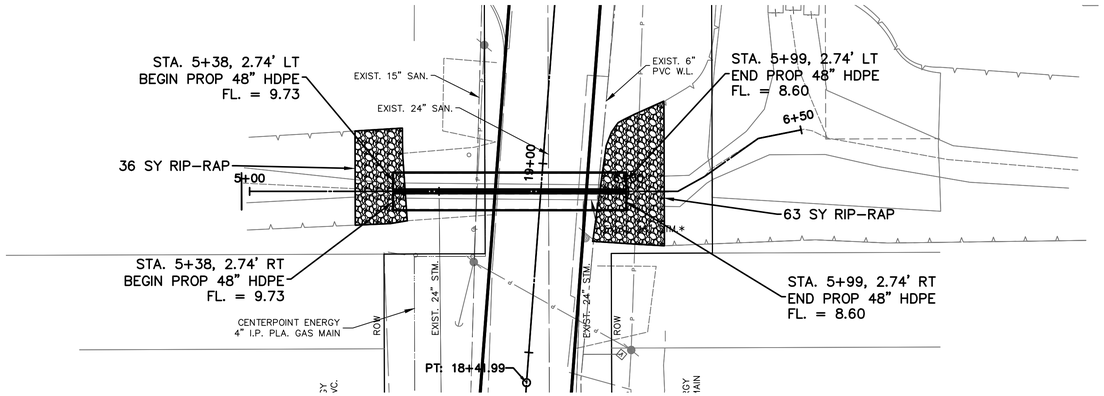

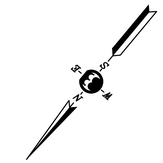

20' 0' 20'
SCALE 1"=20'

LEGEND:

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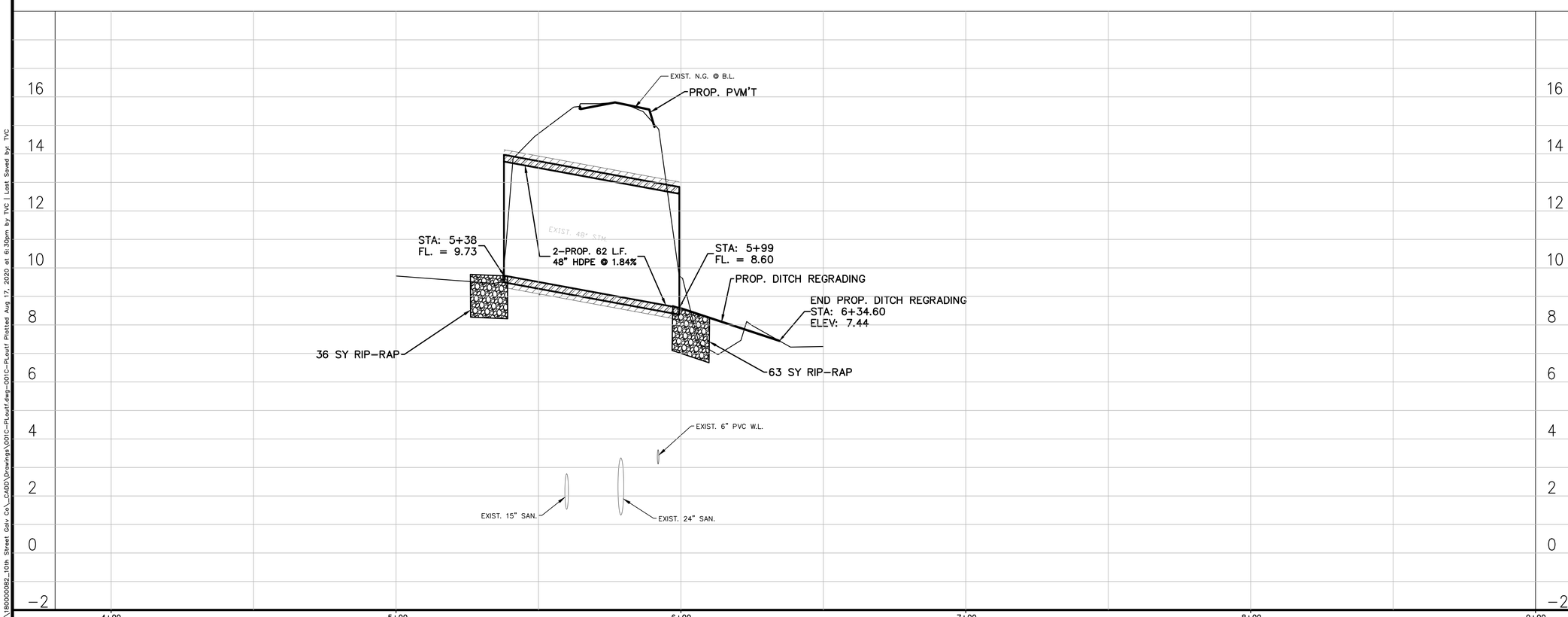

MK.	DESCRIPTION	DATE	DWN.	CHK.

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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

OUTFALL
PLAN & PROFILE
B.L. STA: 5+00 TO B.L. STA: 6+50

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 11 OF 29
Date: Aug 17, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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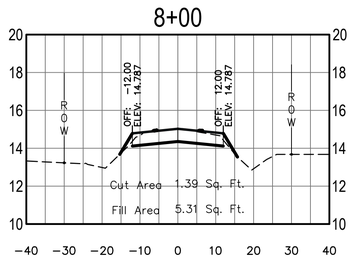

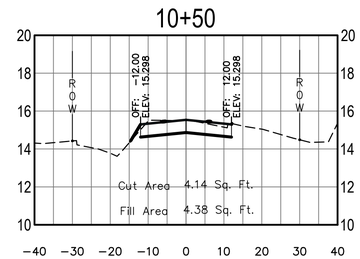

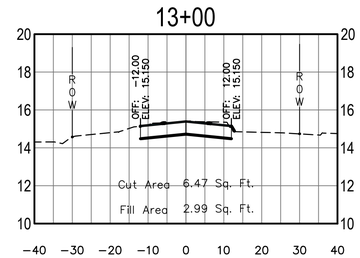

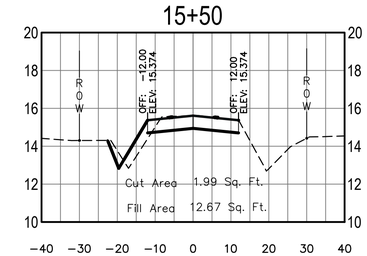

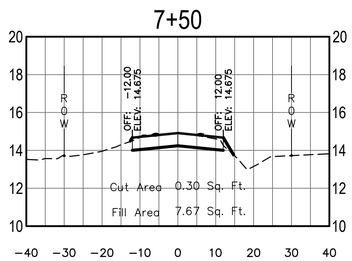

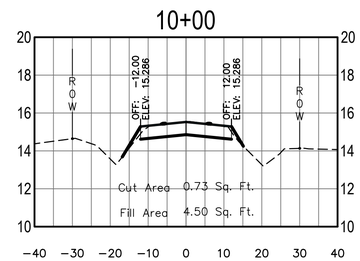

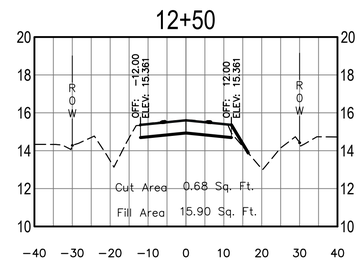

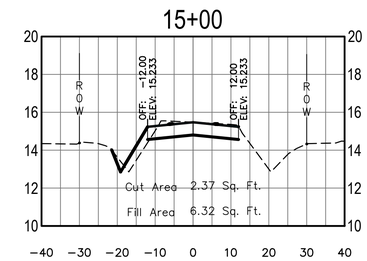

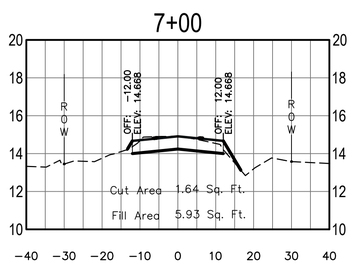

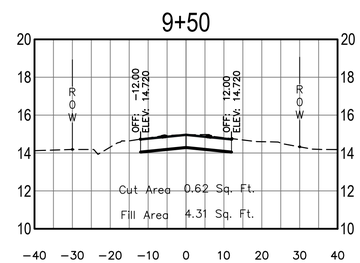

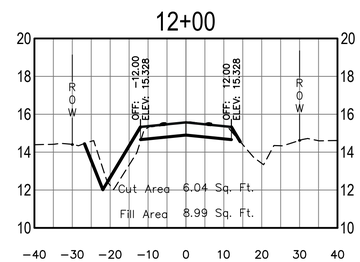

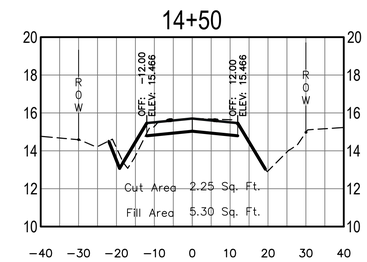

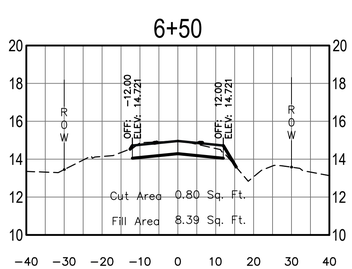

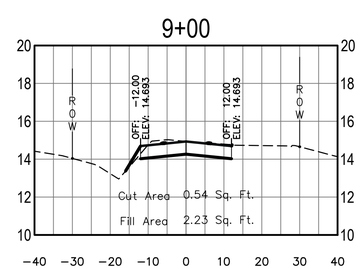

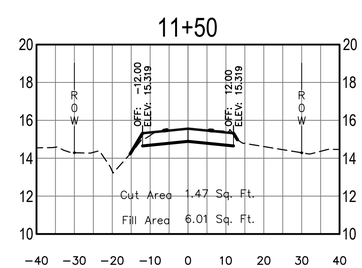

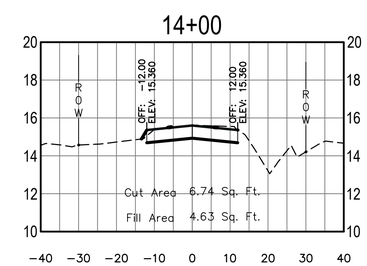

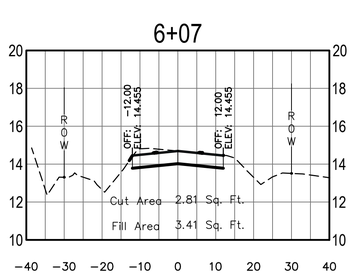

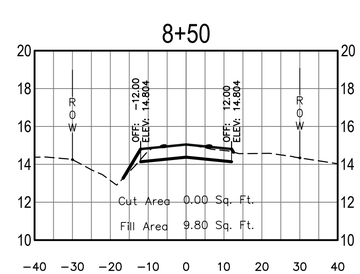

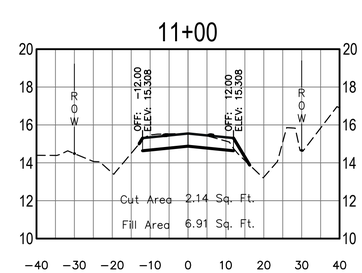

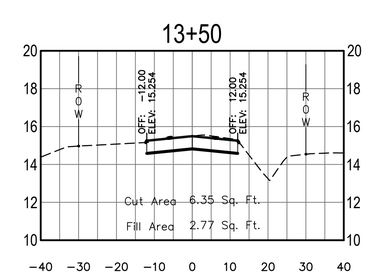

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER

Tommy V. Cromer
07/29/2020

Binkley & Barfield consulting engineers

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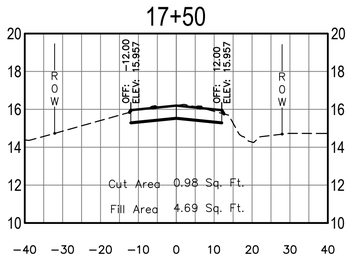
THE STATE OF TEXAS
COUNTY OF GALVESTON

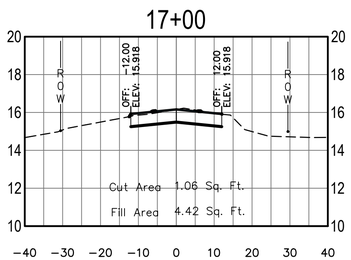
10TH STREET IMPROVEMENTS

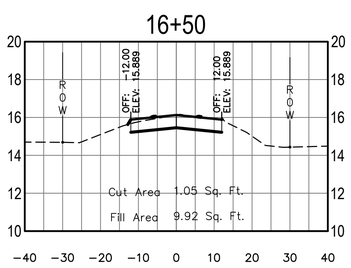
10TH STREET
CROSS SECTIONS

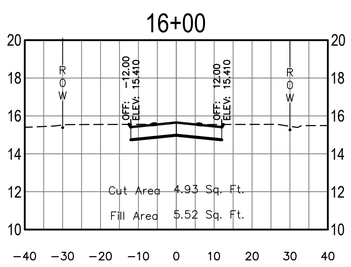
Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 12 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

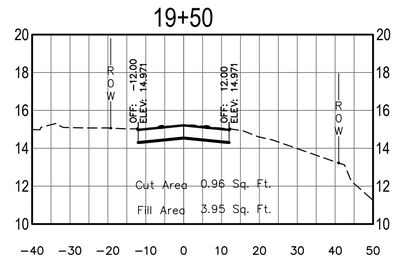
G:\180000082_10th Street Galv Co_CADD\Drawings\001C-XS10th.dwg-Cross Sections Plotted Jul 20, 2020 at 12:10pm by Plott | Last Saved by: jmagic

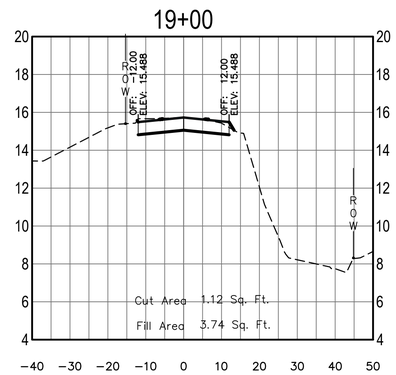


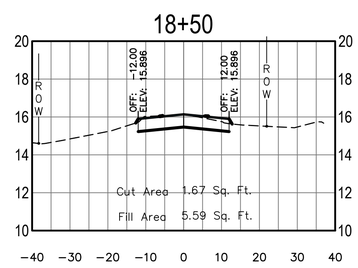


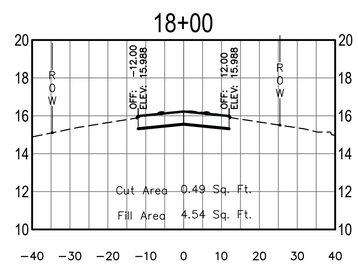


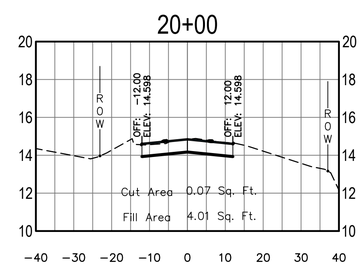












Total Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
6+07	3.41	2.81	0.00	0.00	0.00	0.00
6+50	8.39	0.80	9.33	2.85	9.33	2.85
7+00	5.93	1.64	13.26	2.25	22.59	5.11
7+50	7.67	0.30	12.60	1.79	35.18	6.90
8+00	5.31	1.39	12.02	1.57	47.20	8.47
8+50	9.80	0.00	13.99	1.29	61.19	9.76
9+00	2.23	0.54	11.13	0.50	72.32	10.26
9+50	4.31	0.62	6.06	1.07	78.38	11.33
10+00	4.50	0.73	8.16	1.25	86.54	12.58
10+50	4.38	4.14	8.22	4.50	94.76	17.08
11+00	6.91	2.14	10.45	5.81	105.21	22.89
11+50	6.01	1.47	11.96	3.34	117.18	26.23
12+00	8.99	6.04	13.89	6.96	131.07	33.19
12+50	15.90	0.68	23.05	6.22	154.12	39.41
13+00	2.99	6.47	17.49	6.62	171.61	46.03
13+50	2.77	6.35	5.33	11.87	176.94	57.90
14+00	4.63	6.74	6.85	12.12	183.80	70.02
14+50	5.30	2.25	9.19	8.33	192.99	78.35
15+00	6.32	2.37	10.76	4.28	203.75	82.63
15+50	12.67	1.99	17.58	4.05	221.33	86.68
16+00	5.52	4.93	16.84	6.41	238.18	93.09
16+50	9.92	1.05	14.30	5.53	252.47	98.63
17+00	4.42	1.06	13.28	1.97	265.75	100.59
17+50	4.69	0.98	8.41	1.90	274.16	102.49
18+00	4.54	0.49	8.54	1.36	282.70	103.85
18+50	5.59	1.67	9.38	2.00	292.08	105.85
19+00	3.74	1.12	8.64	2.59	300.72	108.44
19+50	3.95	0.96	7.12	1.93	307.84	110.37
20+00	4.01	0.07	7.37	0.96	315.21	111.32

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

10TH STREET
CROSS SECTIONS

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 13 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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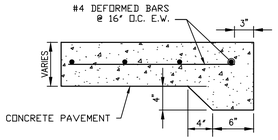
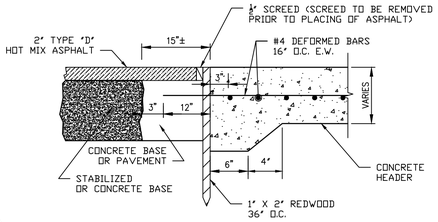
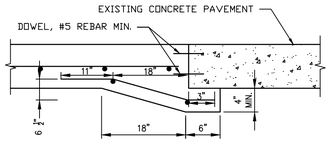


CONCRETE PAVING HEADER



ASPHALT PAVING HEADER

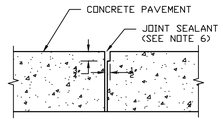
PAVING HEADER



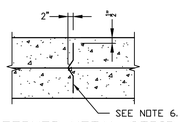
UNDERCUT DETAIL

NOTES:

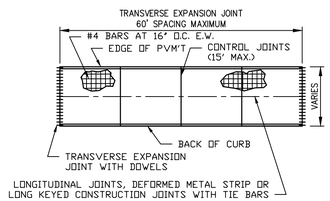
1. FOR PAVING USE #4 REBAR ON SIXTEEN (16) INCH CENTERS EACH WAY.
2. ALL REINFORCING BAR SHALL CONFORM TO ASTM A15-54T AND A305-53T.
3. THE LOCATION OF CONSTRUCTION JOINTS, CONTROL JOINTS AND DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE GALVESTON COUNTY, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. THE MAXIMUM LENGTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'-0".
4. ALL PAVEMENT CROSS SECTION SHALL EITHER BE HYPERBOLIC OR TANGENT CROWN. MINIMUM SLOPE SHALL BE ONE-QUARTER (¼) INCH PER FOOT.



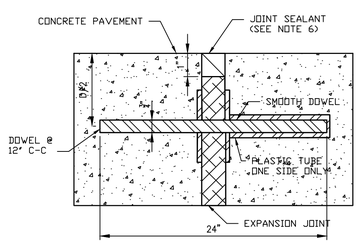
CONSTRUCTION JOINT



DEFORMED METAL STRIP



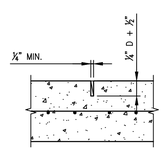
PAVING DETAIL



DOWEL EXPANSION JOINT

NOTES:

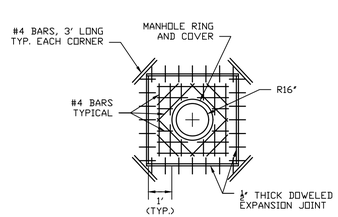
1. CANTILEVER TYPE, CAST MALLEABLE IRON LOAD TRANSMISSION UNIT-STARLUG MODEL D-27 OR EQUAL ON 22" o.c. ARE ACCEPTABLE ALTERNATIVES.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED A MINIMUM OF 60'-0" APART. MATCH TO EXPANSION JOINTS IN PAVING PANELS.
3. STAKES FOR TRANSVERSE JOINTS SHALL NOT BE PLACED CLOSER THAN 6" TO A LONGITUDINAL JOINT. THE TOP OF STAKE SHALL NOT BE LESS THAN 1½" BELOW THE FINISH SURFACE.
4. LOCATION OF CONSTRUCTION JOINTS AND DEFORMED STRIPS MAY BE VARIED WITH THE APPROVAL OF THE CITY, TO SUIT PROPOSED CONSTRUCTION OF THE CONTRACTOR.
5. CONTROL JOINTS SHALL BE SPACED AT A MAXIMUM OF 15'-0".
6. JOINTS AND SEALANTS SHALL ADHERE TO GALVESTON COUNTY SPECIFICATIONS.



CONTRACTION JOINT

NOTES:

1. D = DEPTH OF CONCRETE.
2. SAW-CUT CONTRACTION JOINT TO DIMENSIONS SHOWN.



MANHOLE BLOCKOUT

PAVING CONSTRUCTION NOTES:

1. PAVEMENT AND SUBGRADE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE GALVESTON COUNTY STANDARD DETAILS AND TECHNICAL SPECIFICATIONS, LATEST REVISION.
2. CONTRACTOR SHALL NOTIFY THE GALVESTON COUNTY OWNER'S REPRESENTATIVE A MINIMUM OF TWENTY-FOUR (24) HOURS PRIOR TO ALL STABILIZATION AND PAVING OPERATIONS.
3. ALL TURN-OUTS SHALL HAVE A TWENTY-FIVE (25) FOOT RADIUS AT BACK OF CURB UNLESS OTHERWISE NOTED.
4. GUIDELINES SET FORTH IN THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD), LATEST EDITION, SHALL BE OBSERVED.
5. ALL FILL IN EXISTING RIGHT-OF-WAY, INCLUDING BACKDRESSING BEHIND THE CURB, SHALL BE PLACED IN MAXIMUM LOOSE LIFTS TO TWELVE (12) INCHES OR LESS AND COMPACTED TO A NINETY-FIVE (95) PERCENT STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF PLUS (+) OR MINUS (-) THREE PERCENT (3%) OF OPTIMUM MOISTURE.
6. MINIMUM PAVEMENT REINFORCEMENT REQUIREMENT SHALL BE GRADE 60, NO. 4 REBAR, SPACED AT SIXTEEN (16) INCHES ON CENTER, EACH WAY.
7. PAVING EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM SIXTY (60) FEET INTERVALS.
8. ALL CONCRETE USED FOR PAVEMENT SHALL BE "CLASS A" CONCRETE, MINIMUM OF 5.0 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE, 3000 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS.
9. CONTRACTOR SHALL INSTALL STREET SIGNS AND STOP SIGNS PER GALVESTON COUNTY STANDARD DETAILS AND TECHNICAL SPECIFICATIONS, LATEST EDITION.
10. FOR ALL CONCRETE TO BE REMOVED, A MINIMUM TWO (2) INCH DEEP SAW CUT SHALL BE PROVIDED PRIOR TO REMOVAL.
11. REPRESENTATIVES FROM GALVESTON COUNTY, THE OWNER, AND THE TESTING LABORATORY SHALL BE PRESENT FOR ALL GRADATIONS, DENSITY TESTING, STABILIZATION OPERATIONS, AND PLACEMENT OF CONCRETE OR ASPHALT PAVING.
12. UNDER NO CIRCUMSTANCES SHALL WATER BE ADDED TO A CONCRETE LOAD AFTER SLUMP TEST HAVE BEEN TAKEN.
13. BLUE REFLECTORIZED RAISED PAVEMENT MARKERS SHALL BE PLACED ADJACENT TO FIRE HYDRANT LOCATIONS AT A POINT OFFSET SIX (6) INCHES FROM THE CENTERLINE OF THE ROADWAY (REFLECTORS SHALL FACE TRAFFIC FLOW).
14. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION, OR OTHER CONSTRUCTION. CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS, AND ANY OTHER SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL, AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHT-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.

DRIVEWAY SCHEDULE

ID No.	DW Material	High Early Strength Concrete
1	Gravel	
2	Gravel	
3	Gravel	
4	Gravel	
5	Gravel	
6	Gravel	
7	Gravel	
8	Concrete	No
9	Concrete	No
10	Gravel	
11	Gravel	
12	Gravel	
13	Gravel	
14	Asphalt	
15	Gravel	
16	Gravel	
17	Concrete	No
18	Concrete	Yes
19	Gravel	
20	Gravel	
21	Gravel	
22	Gravel	
23	Gravel	
24	Gravel	
25	Gravel	
26	Gravel	
27	Gravel	
28	Gravel	
29	Gravel	
30	Gravel	
31	Gravel	

MK.	DESCRIPTION	DATE	DWN.	CHK.

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Binkley & Barfield
consulting engineers
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713.869.3433
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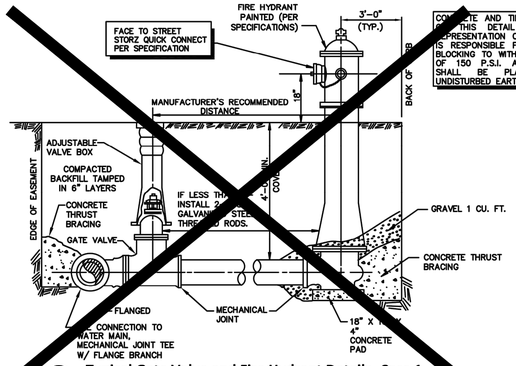
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

PAVEMENT DETAILS

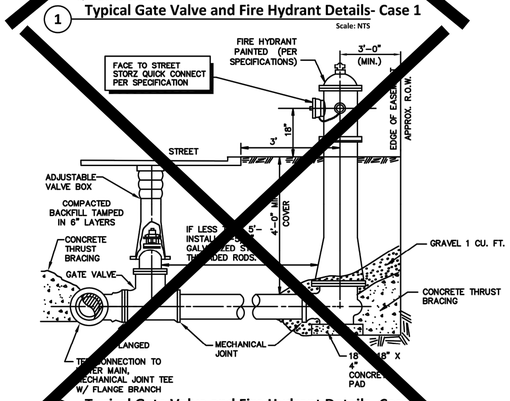
Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 14 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Gov Ca_CADD\Drawings\001C-DTpave.dwg-001C-DTpave Plotted Jul 20, 2020 at 12:11pm by Plott | Last Saved by: jmagic



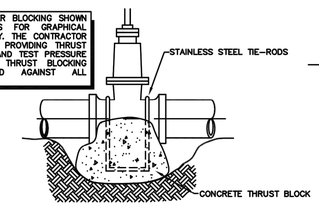
1 Typical Gate Valve and Fire Hydrant Details- Case 1

Scale: NTS



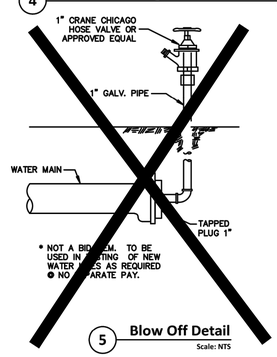
2 Typical Gate Valve and Fire Hydrant Details- Case 2

Scale: NTS



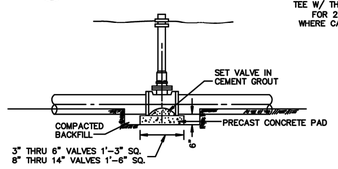
4 Thrust Blocking of In Line Valve Detail

Scale: NTS



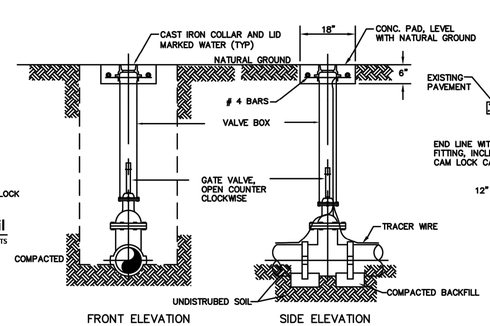
5 Blow Off Detail

Scale: NTS



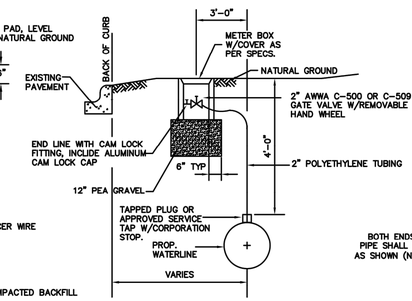
6 Blocking for Valves 14" and Smaller

Scale: NTS



8 Gate Valve Installation Detail

Scale: 1:1

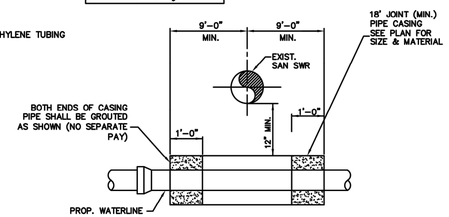


12 Blow Off Detail

Scale: NTS

MIN. WALL THICKNESS PIPE and FITTINGS	
4" –	0.250"
6" –	0.280"
8" –	0.322"
12" –	0.375"
and Larger	

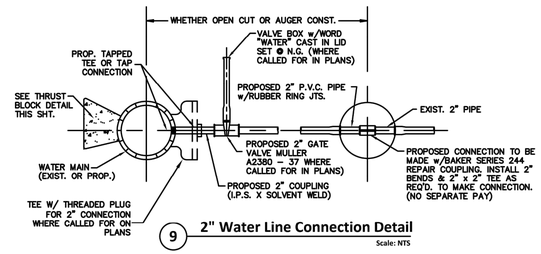
All Materials and Coatings to be in accordance with the Specifications. Insulated joint to be made up using Insulating Gaskets, Plastic Bolt Sleeves and Washers of Insulating Gaskets material backed with Cad-Plated Washers, or other methods approved by the Engineer.



13 Water Line Casing Pipe Detail for Sewer Crossings Clearance

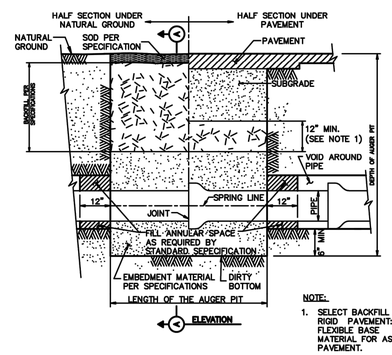
(TO BE USED FOR CROSSING OVER OR UNDER EXISTING OR PROP. SANITARY SEWER MAIN WHERE 2' MIN. CLEARANCE CAN'T BE ACHIEVED OR AS CALLED FOR ON PLANS.)

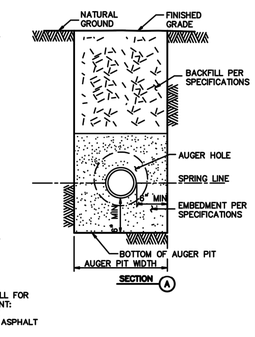
Scale: NTS



9 2" Water Line Connection Detail

Scale: NTS



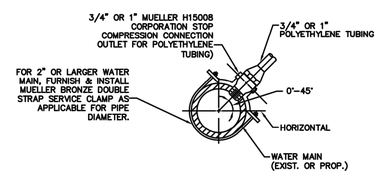


NOTE:

1. SELECT BACKFILL FOR RIGID PAVEMENT: FLEXIBLE BASE MATERIAL FOR ASPHALT PAVEMENT.

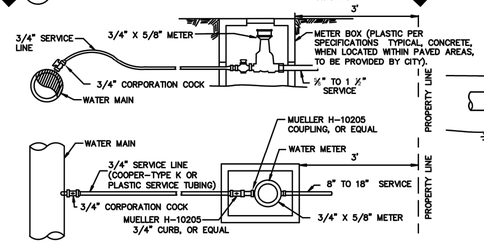
14 BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE

Scale: NTS



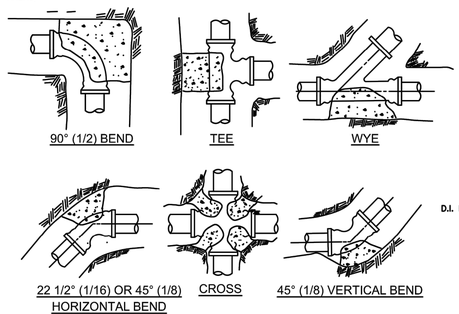
10 Service Clamp & Tap Detail

Scale: NTS



3 Small Meter Installation (Up to 1 1/2")

Scale: NTS

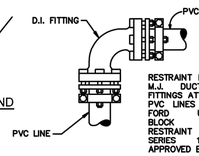


7 Typical Thrust Blocks

Scale: NTS

THRUST BLOCKING NOTES:

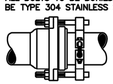
1. Size of Thrust Block to Be Adequate For Two Times, Test Pressure; That Is 250 P.S.I. No Separate Pay for Thrust Blocking.
2. Restrained Joint Piping Shall Be Used In All Areas Where New Pipe Has Less Than 4' Cover. All Vertical Bends Shall Have Restrained Joints.



RESTRAINT DEVICE FOR M.J. DUCTILE IRON FITTINGS ATTACHING TO PVC LINES SHALL BE FORD UNI-FLANGE BLOCK BUSTER RESTRAINT DEVICE SERIES 1300 OR APPROVED EQUAL.

JOINT RESTRAINT DEVICE DETAILS FOR CAST IRON & DUCTLE IRON

NOTE:
ALL BOLTS TO BE BURIED SHALL BE TYPE 304 STAINLESS STEEL.

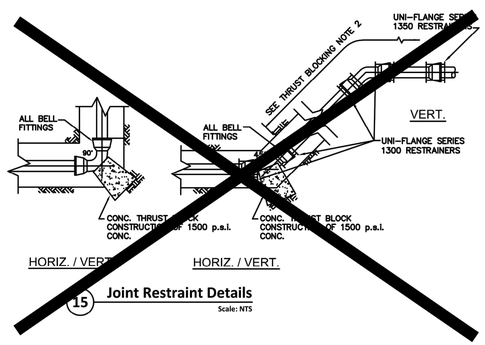


RESTRAINT DEVICE FOR PVC PIPE BELL JOINTS SHALL BE FORD UNI-FLANGE BLOCK BUSTER SERIES 1350 OR APPROVED EQUAL.

RESTRAINT FOR PVC PIPE BELL JOINTS

11 Mechanical Joint Fitting and PVC Pipe

Scale: NTS



15 Joint Restraint Details

Scale: NTS

GENERAL NOTES

1. WATER SERVICE NEEDS TO EXTEND BEHIND THE CURB AND TERMINATE AT THE METER BOX.
2. TAPPING SADDLES FOR WATER MAINS NEED TO BE SMITH-BLAIR STAINLESS STEEL TAPPING SLEEVE OR APPROVED EQUAL
3. IF WATER SERVICES ARE BEING SPLIT BETWEEN 2 RESIDENTIAL PROPERTIES, THEY SHOULD BE A MINIMUM OF 1-1/2" .
4. NO BUILT IN METER COUPLING ON THE CITY SIDE OF THE METER; IT SHOULD BE COMPRESSION BY IRON PIPE THREADS.

MK.	DESCRIPTION	DATE	DWN.	CHK.

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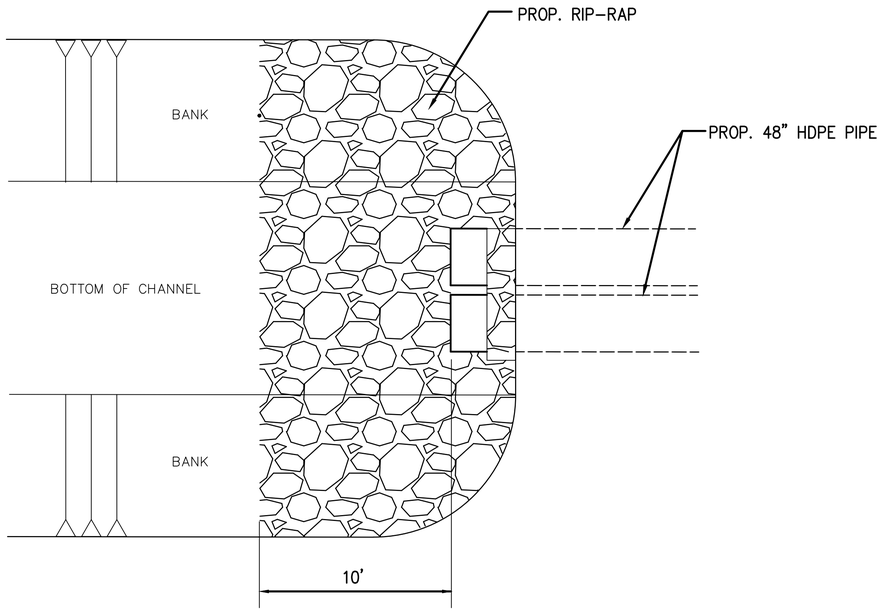
THE STATE OF TEXAS
COUNTY OF GALVESTON

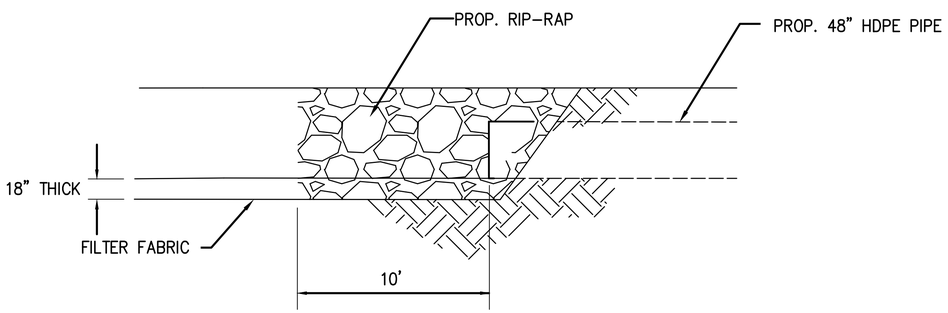
10TH STREET IMPROVEMENTS

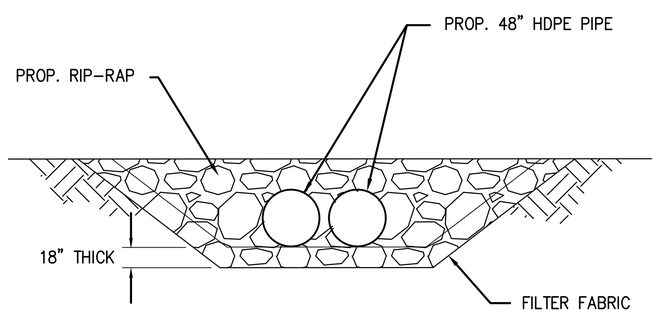
WATER LINE DETAILS

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 15 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\00TC-DTwater.dwg-15 Water Line Construction Details Plotted Jul 20, 2020 at 12:11pm by PLott | Last Saved by: chuddleston

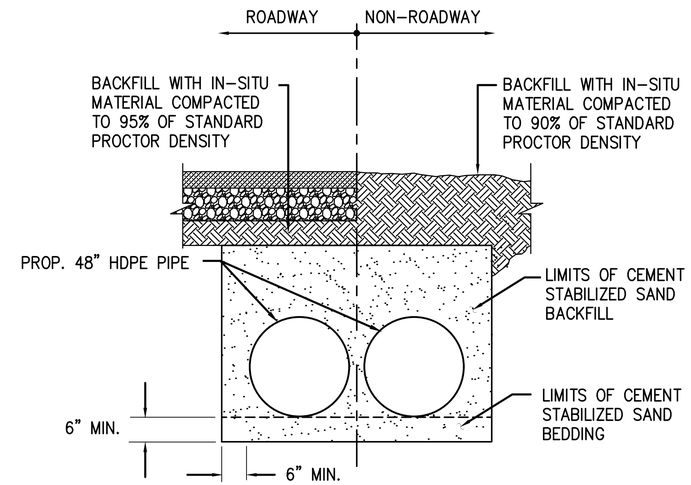






HPDE CULVERT OUTFALL DETAIL

N.T.S.



HDPE BACKFILL AND BEDDING DETAIL

N.T.S.

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
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07/29/2020

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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

STORM SEWER OUTFALL
STRUCTURE DETAILS

Project No.: 180000082	Scale: HORZ : N/A VERT : N/A	SHEET 16 OF 29
Date: Aug 17, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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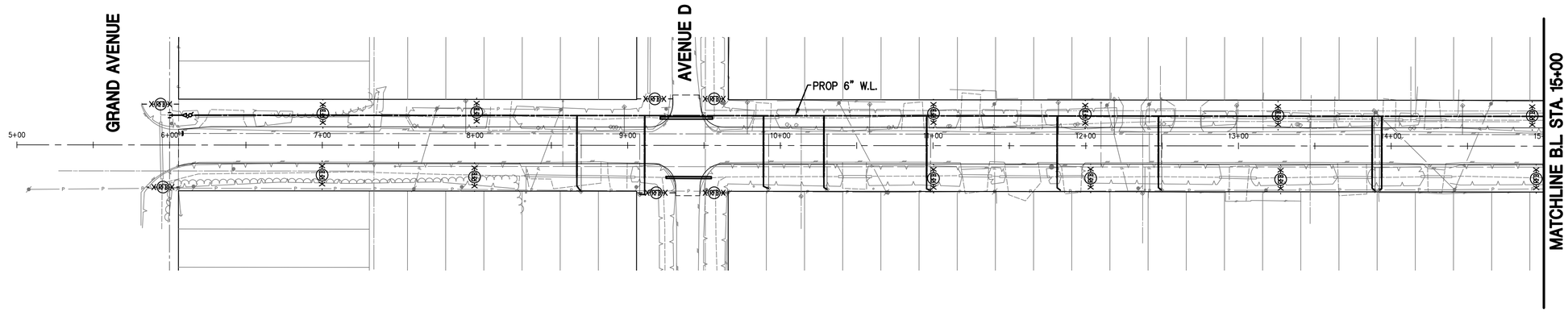

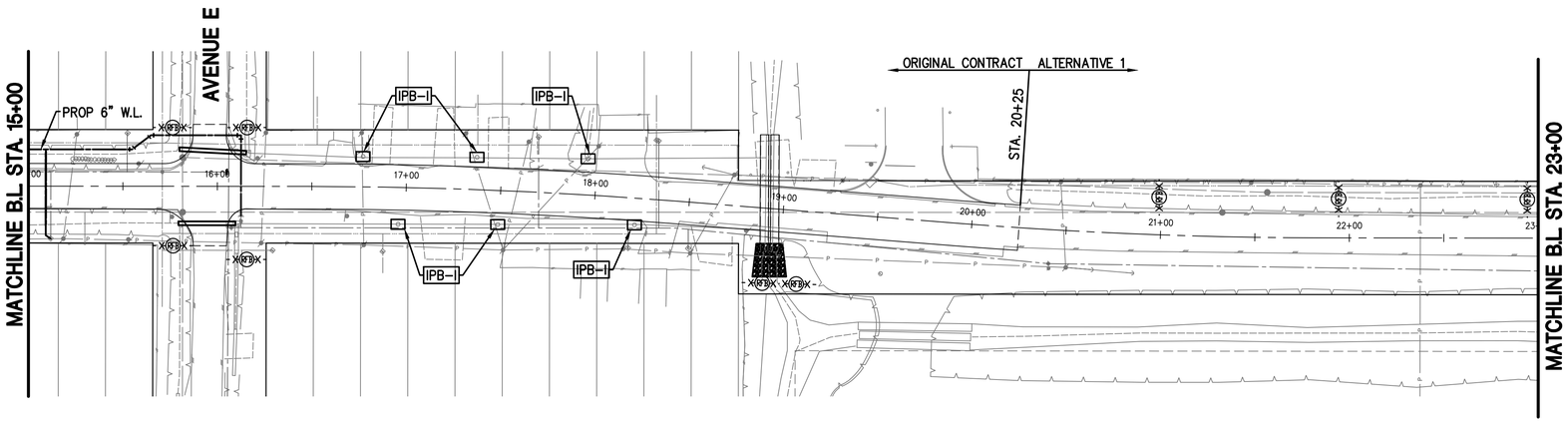

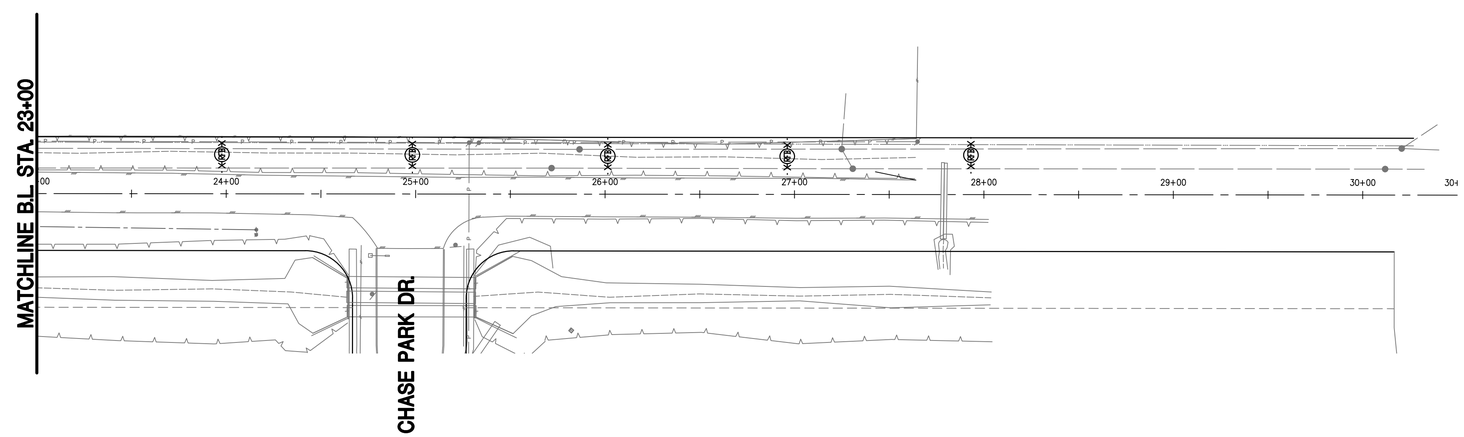

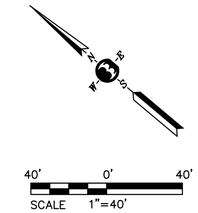

LEGEND

-XRFBX-	REINFORCED FILTER FABRIC BARRIER
IPB-I	STAGE I INLET PROTECTION BARRIER

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

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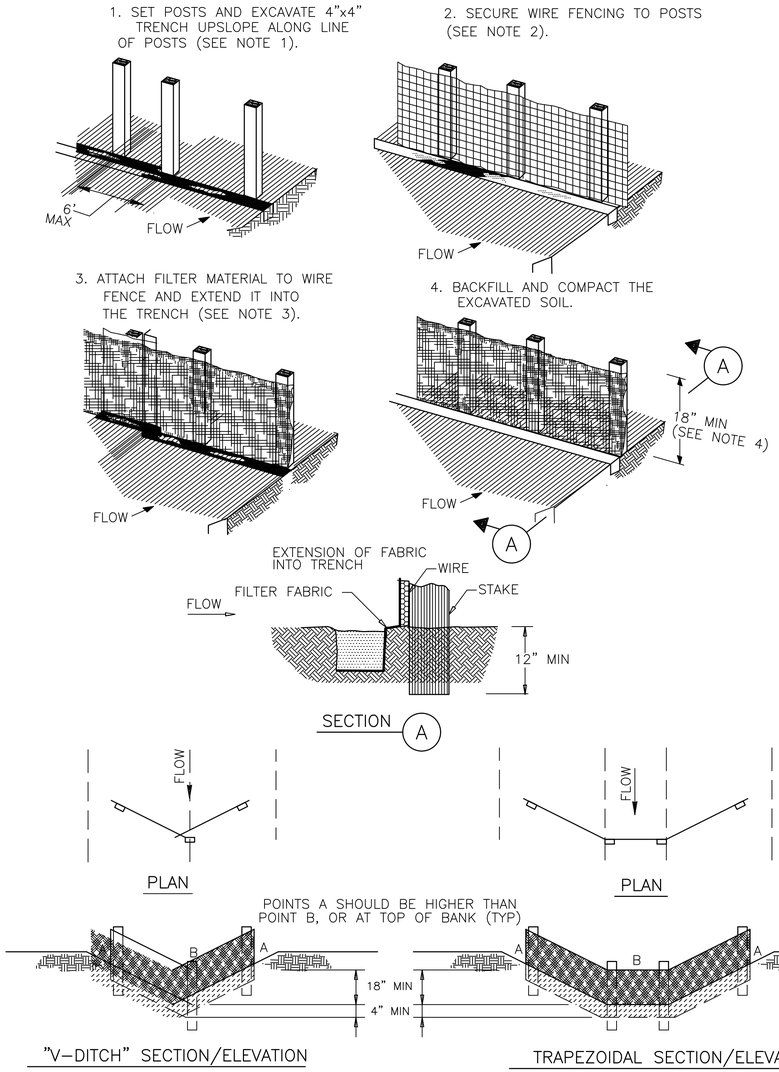
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

STORM WATER POLLUTION PREVENTION PLAN

Project No.: 180000082	Scale: HORZ : 1"=40' VERT :	SHEET 17 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\001C-PLs+3s.dwg-SWPPP Layout Plotted Jul 20, 2020 at 12:11pm by PLott | Last Saved by: PLott

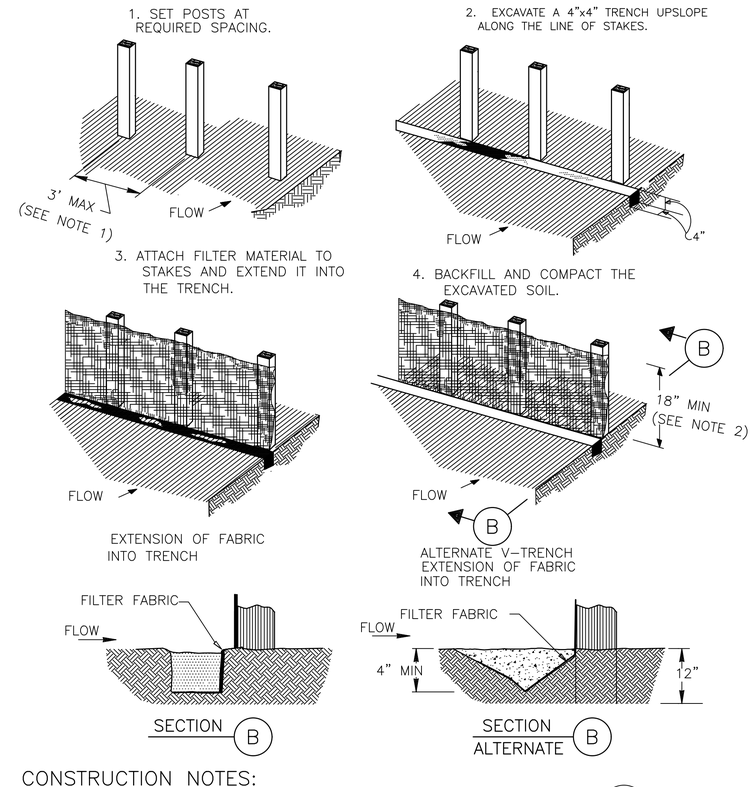


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX. OF 6 FT APART AND EMBEDDED A MIN. OF 12 INCHES
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH STAPLES
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTIONS.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAX. OF 36 INCHES ABOVE NATURAL GROUND
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED
6. SEE SPECIFICATION FOR FILTER FABRIC BARRIER

X — RFB — X
SYMBOL

REINFORCED FILTER FABRIC BARRIER

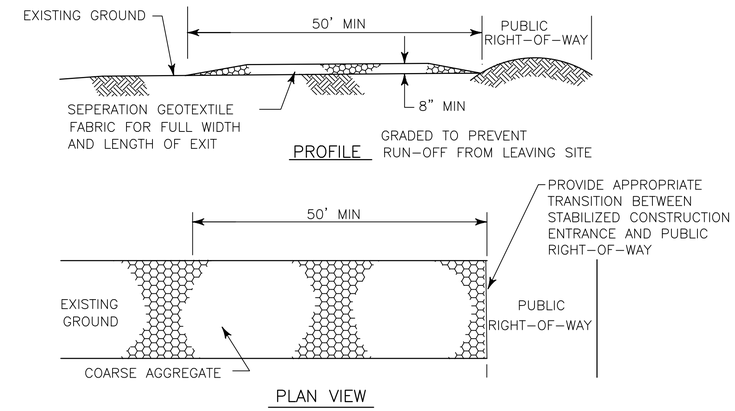


CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FT AND EMBEDDED A MIN OF 8 INCHES. IF PRE-ASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FT MAX.
2. ATTACHED FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC FENCE SHALL HAVE A MIN. HEIGHT OF 18 INCHES AND MAX. HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
4. SEE SPECIFICATION FOR FILTER FABRIC FENCE

X — FF — X
SYMBOL

FILTER FABRIC FENCE

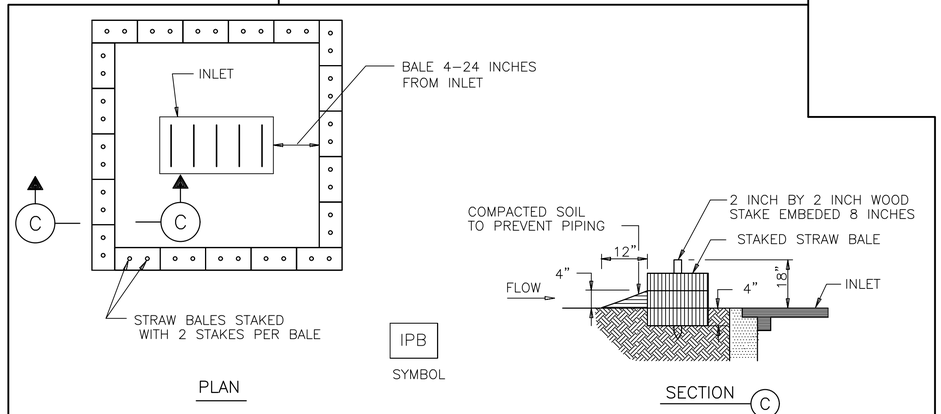


CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THANK 50 FT
2. THICKNESS SHALL BE NOT LESS THANK 8 INCHES
3. WIDTH SHALL NOT BE LESS THANK FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND SHOWN ON THE CONSTRUCTION DRAWINGS
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE A TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA
6. SEE SPECIFICATION FOR STABILIZED CONSTRUCTION EXIT
7. STABILIZED CONSTRUCTION EXIST SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT

SC
SYMBOL

STABILIZED CONSTRUCTION EXIT

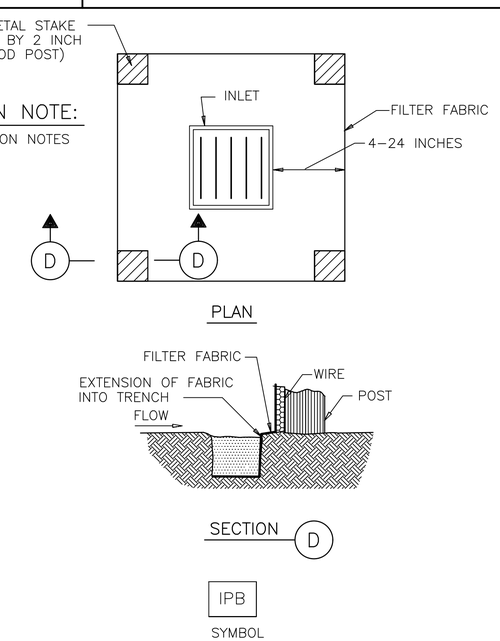


IPB
SYMBOL

STRAW BALE DROP INLET PROTECTION BARRIER

CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.



IPB
SYMBOL

SILT FENCE INLET PROTECTION BARRIER

MK.	DESCRIPTION	DATE	DWN.	CHK.

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TOMMY V. CROMER
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07/29/2020

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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

STORM WATER POLLUTION DETAILS

Project No.: 180000082	Scale: HORZ : VERT :	SHEET	
Date: Jul 20, 2020		18	
Dwn By: J.R.R.		OF 29	
Chkd By: J.A.A.			

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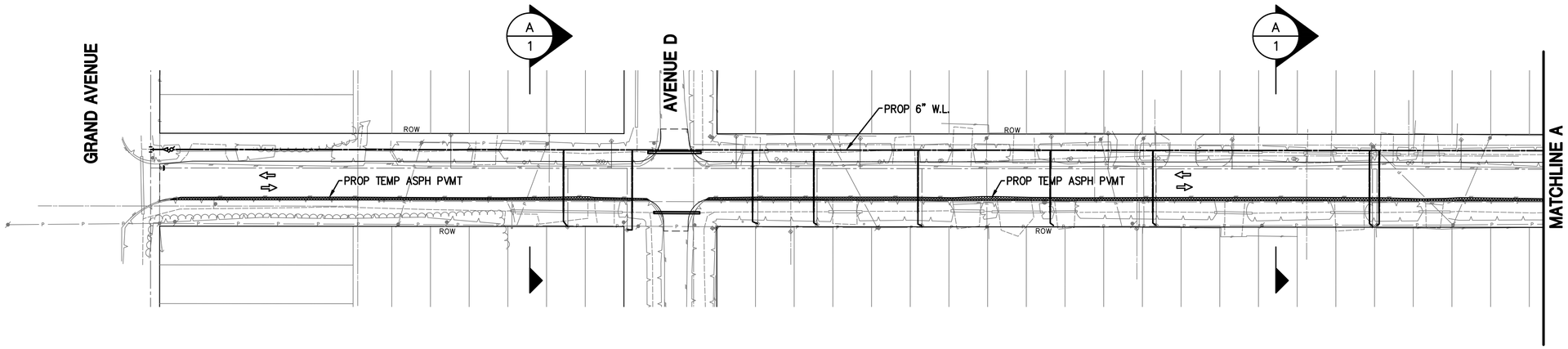
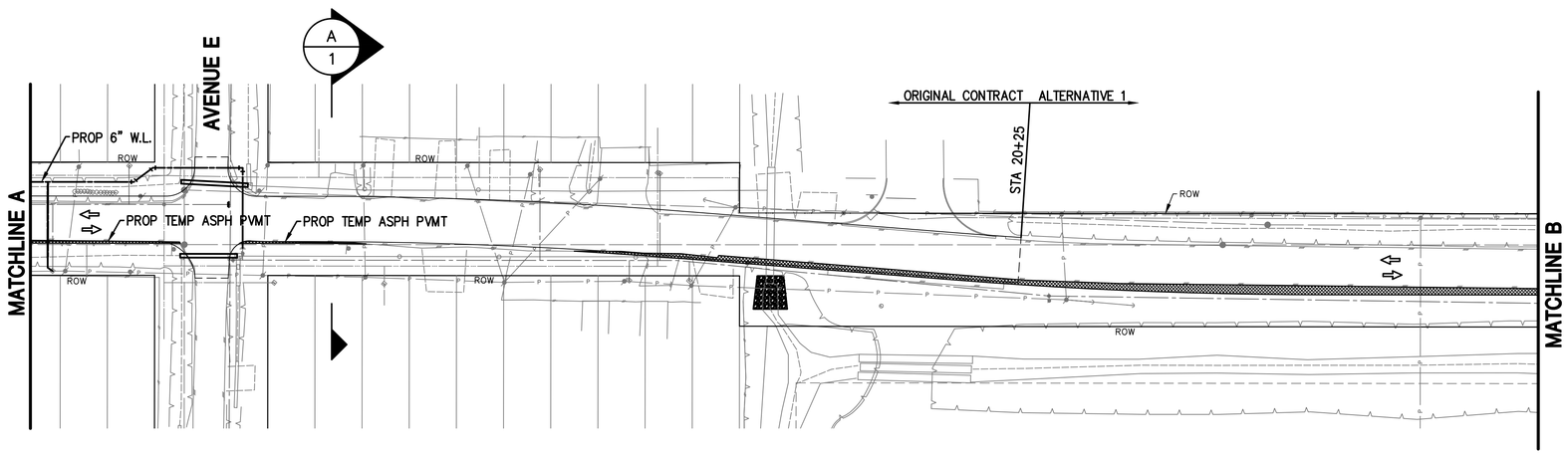
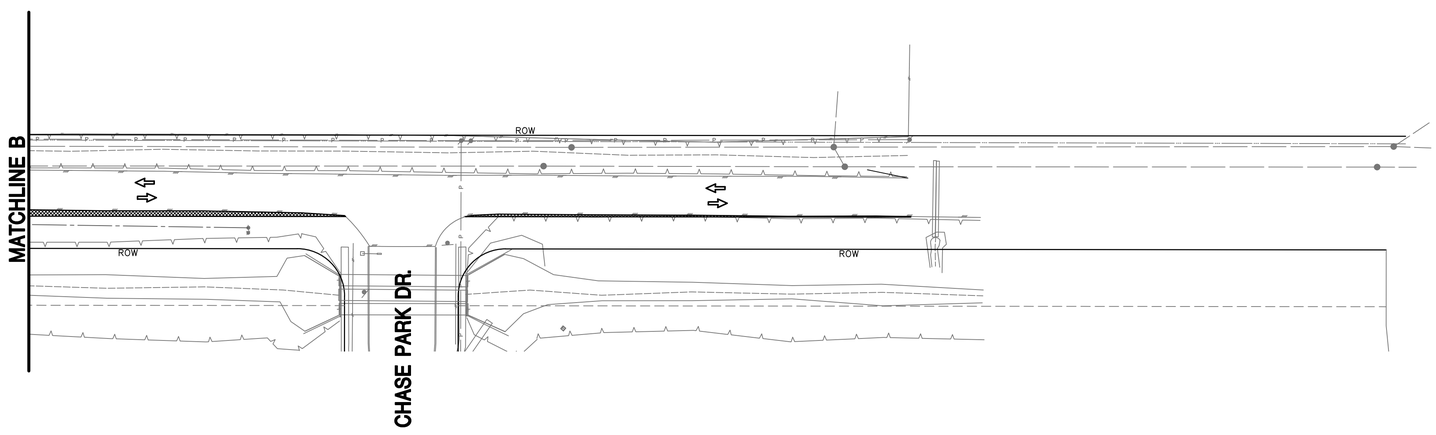
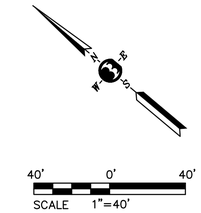








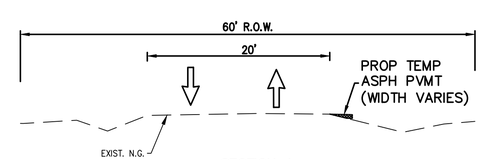
LEGEND:

⇨ TRAVEL LANE

▨ TEMP. ASPH. PVM'T

NOTES:

1. USE HIGH EARLY STRENGTH CONCRETE AT INTERSECTIONS AND AS DIRECTED BY OWNER'S REPRESENTATIVE.
2. CONTRACTOR SHALL PROVIDE TEMPORARY DRIVEWAYS AND/OR ENSURE THAT ADEQUATE ON STREET PARKING IS PROVIDED FOR THE RESIDENTS.
3. CONTRACTOR SHALL NOT PROCEED TO NEXT PHASE UNTIL RESTORATION FOR CURRENT PHASE IS AT LEAST 70% COMPLETE AS DETERMINED BY OWNER'S REPRESENTATIVE.
4. CONTRACTOR HAS THE OPTION TO CONSTRUCT INTERSECTIONS IN HALF OR QUARTER SECTIONS, UNLESS NOTED OTHERWISE. CONTRACTOR SHALL NOT CLOSE MORE THAN ONE INTERSECTION AT ANY GIVEN TIME. REFER TO DETOUR PLANS AND/OR TCP INTERSECTION DETAILS SHEET 25, 26, AND 27 FOR ADDITIONAL TRAFFIC CONTROL MEASURES.
5. THE CONTRACTOR TO DISTURB NO MORE THAN 650 LF AT ONE TIME



SECTION A
PHASE 1 STEP 1

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
07/29/2020

Binkley & Barfield consulting engineers
Binkley & Barfield, Inc.
TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

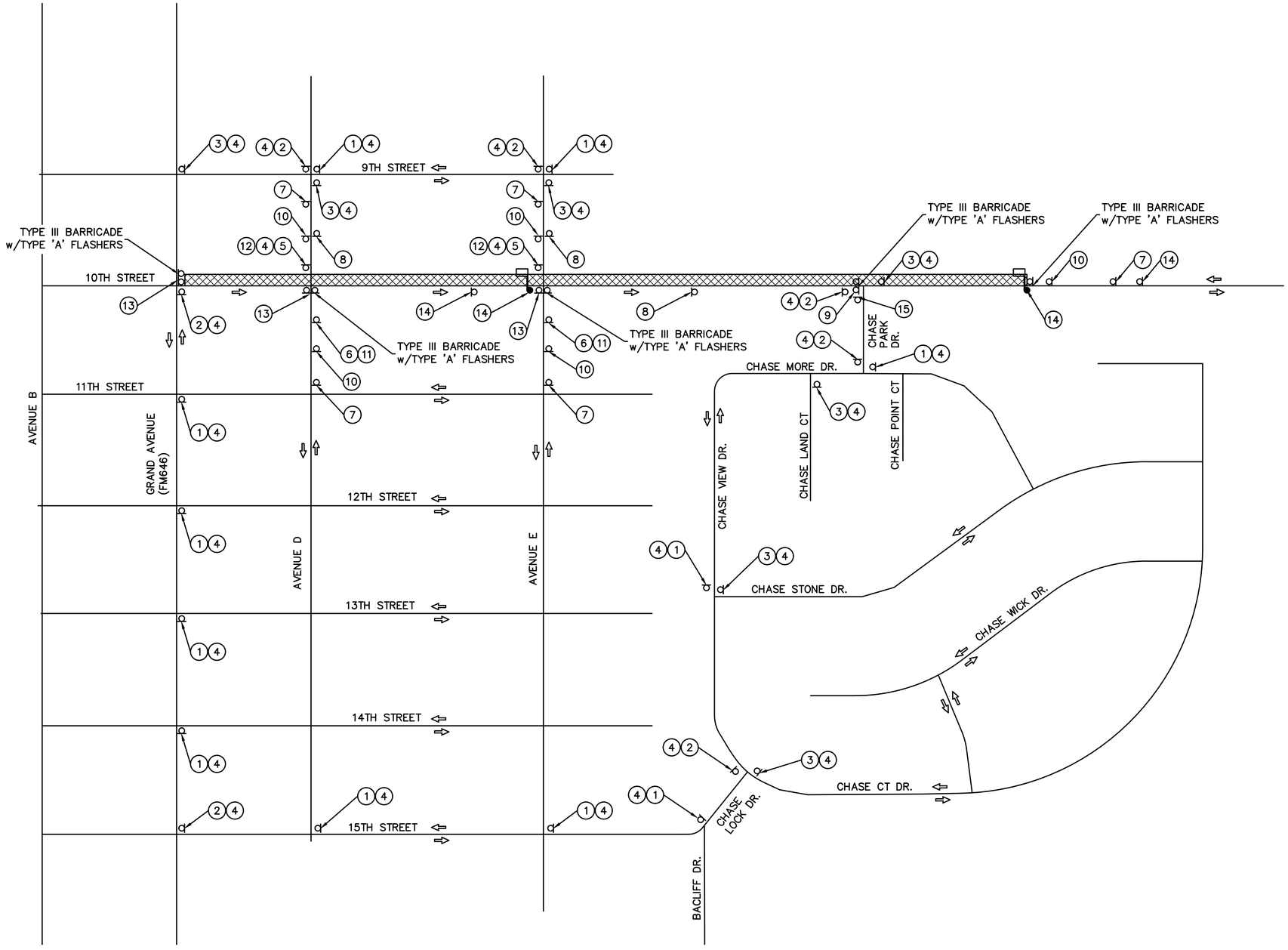
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL PLAN
PHASE 1 STEP 1

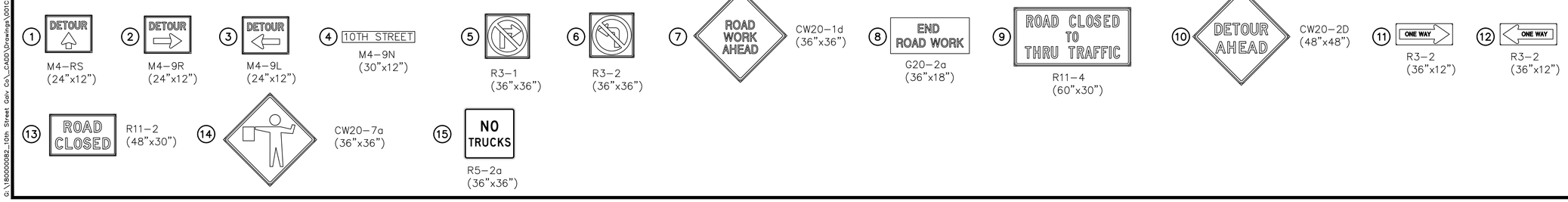
Project No.: 180000082	Scale: HORZ : 1"=40' VERT :	SHEET 19 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\001C-SPtraf.dwg-Traffic Control Plan Plotted Jul 20, 2020 at 12:12pm by PLott | Last Saved by: PLott



LEGEND:

- WORK ZONE
- TRAVEL LANE
- FLAGGER
- SIGN



MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED PROFESSIONAL ENGINEER
07/29/2020

Binkley & Barfield consulting engineers
Binkley & Barfield, Inc.
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713.869.3433
BinkleyBarfield.com

THE STATE OF TEXAS COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

DETOUR PLAN
PHASE 1 STEP 2

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 20 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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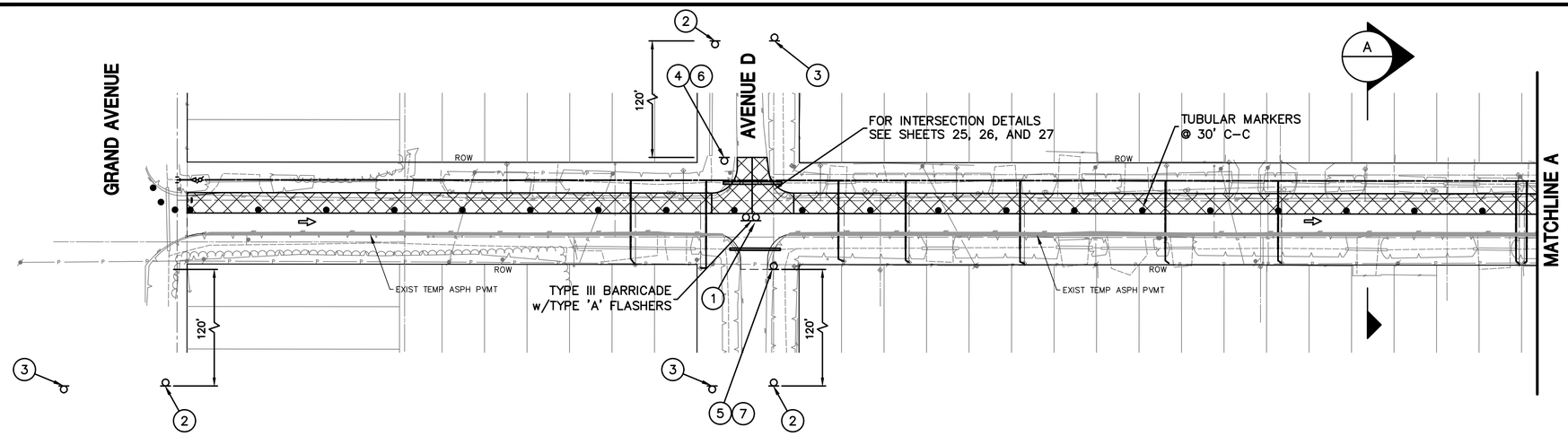

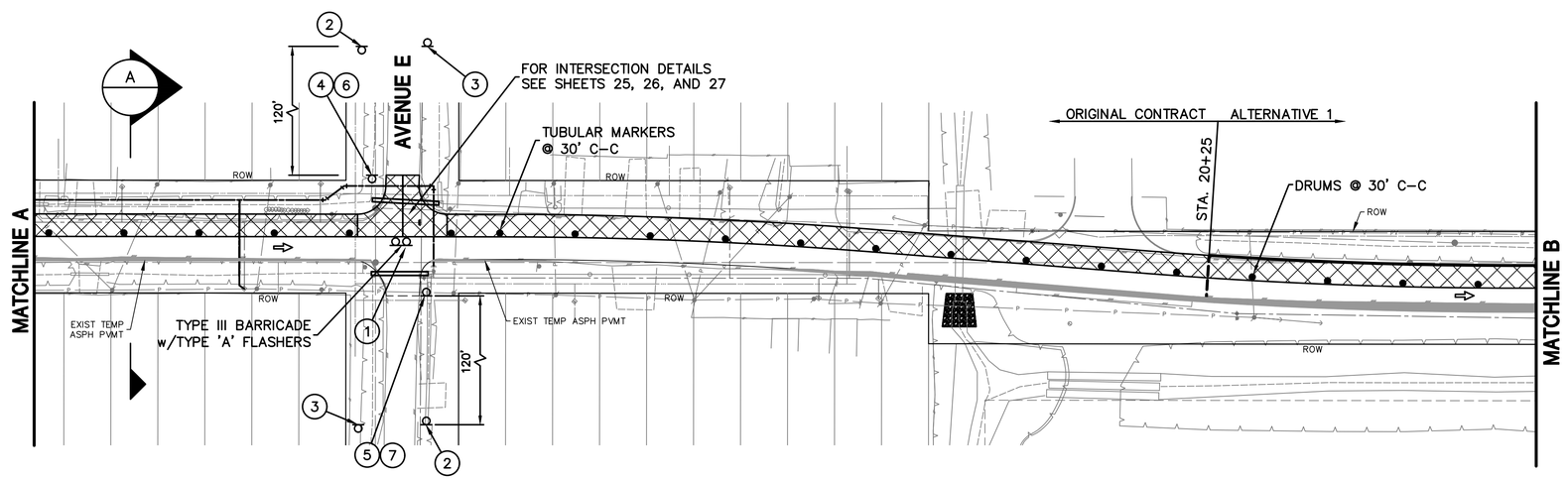

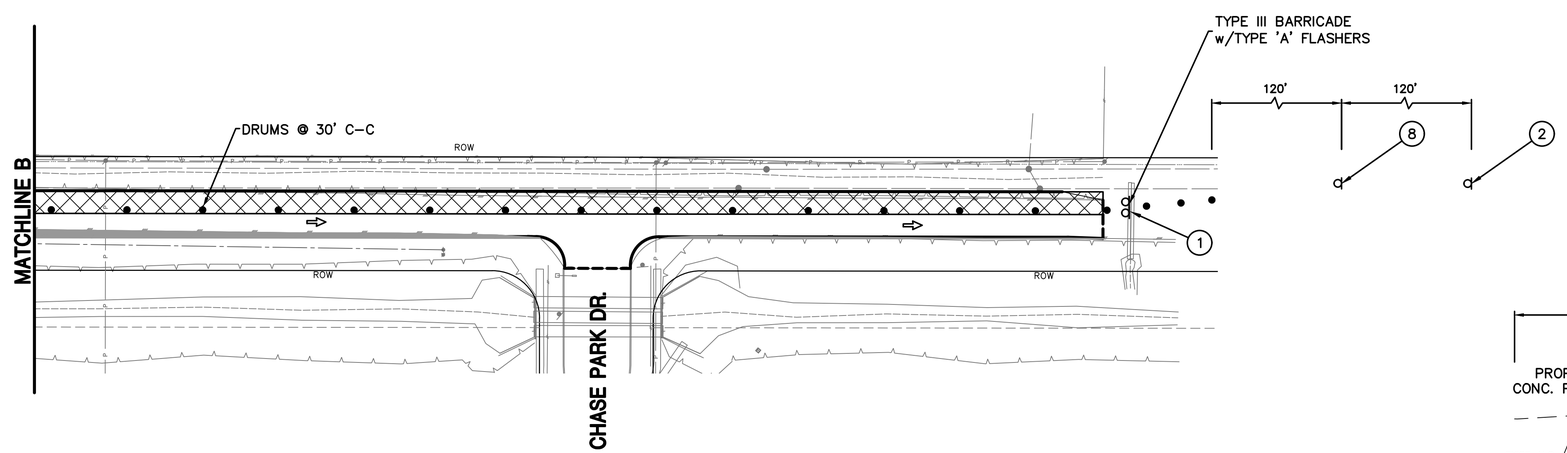

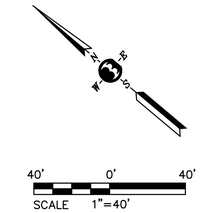

LEGEND:

- TUBULAR MARKERS, CONES OR DRUMS
- TYPE III BARRICADES W/TYPE 'A' FLASHERS
- WORK ZONE
- TEMP. ASPH. PVM'T
- TRAVEL LANE
- SIGN

1. ROAD CLOSED — R11-2 (48"x30")
2. ROAD WORK AHEAD — CW20-1d (36"x36")
3. END ROAD WORK — G20-2a (36"x18")
4. R3-1 (36"x36")
5. R3-2 (36"x36")
6. ONE WAY — R3-2 (36"x12")
7. ONE WAY — R3-2 (36"x12")
8. ROAD CLOSED TO THRU TRAFFIC — R11-4 (60"x30")

NOTES:

1. USE HIGH EARLY STRENGTH CONCRETE AT INTERSECTIONS AND AS DIRECTED BY OWNER'S REPRESENTATIVE.
2. CONTRACTOR SHALL PROVIDE TEMPORARY DRIVEWAYS AND/OR ENSURE THAT ADEQUATE ON STREET PARKING IS PROVIDED FOR THE RESIDENTS.
3. CONTRACTOR SHALL NOT PROCEED TO NEXT PHASE UNTIL RESTORATION FOR CURRENT PHASE IS AT LEAST 70% COMPLETE AS DETERMINED BY OWNER'S REPRESENTATIVE.
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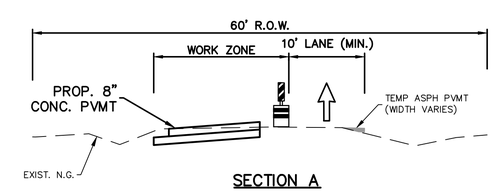
5. THE CONTRACTOR TO DISTURB NO MORE THAN 650 LF AT ONE TIME



SECTION A
PHASE 1 STEP 2

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS — TOMMY V. CROMER — 97594 — LICENSED PROFESSIONAL ENGINEER

Tommy V. Cromer
07/29/2020

Binkley & Barfield consulting engineers
Binkley & Barfield, Inc.
TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

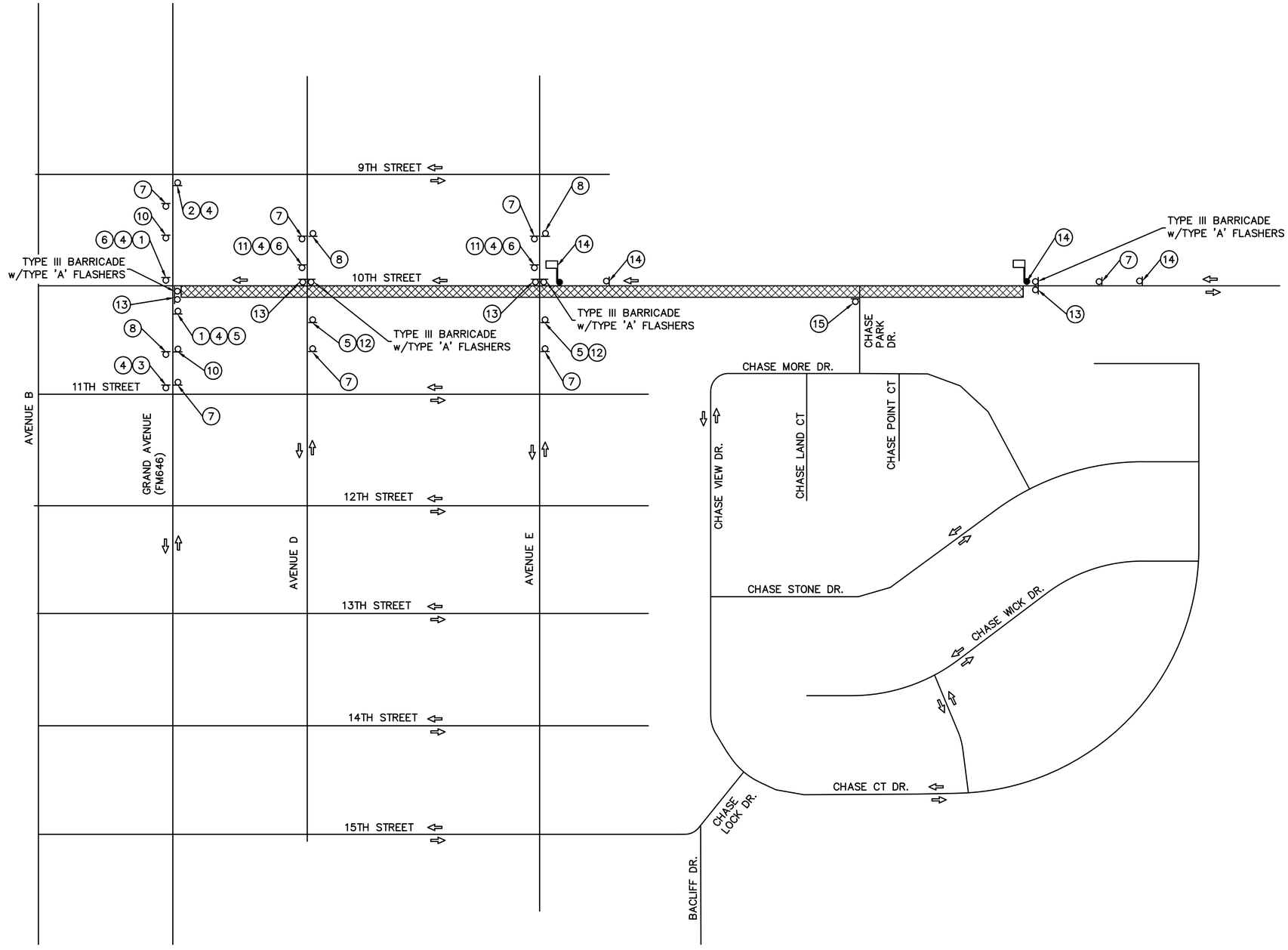
THE STATE OF TEXAS — COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL PLAN
PHASE 1 STEP 2

Project No.: 180000082	Scale: HORZ : 1"=40' VERT :	SHEET 21 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\002C-SPtraf.dwg-Traffic Control Plan Plotted Jul 20, 2020 at 12:12pm by Plott | Last Saved by: Plott



LEGEND:

- WORK ZONE
- TRAVEL LANE
- FLAGGER
- SIGN

1. DETOUR — M4-RS (24"x12")
2. DETOUR — M4-9R (24"x12")
3. DETOUR — M4-9L (24"x12")
4. 10TH STREET — M4-9N (30"x12")
5. R3-1 (36"x36")
6. R3-2 (36"x36")
7. ROAD WORK AHEAD — CW20-1d (36"x36")
8. END ROAD WORK — G20-2a (36"x18")
9. ROAD CLOSED TO THRU TRAFFIC — R11-4 (60"x30")
10. DETOUR AHEAD — CW20-2D (48"x48")
11. ONE WAY — R3-2 (36"x12")
12. ONE WAY — R3-2 (36"x12")
13. ROAD CLOSED — R11-2 (48"x30")
14. CW20-7a (36"x36")
15. NO TRUCKS — R5-2a (36"x36")

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

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1710 Seamist Dr
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713.869.3433
BinkleyBarfield.com

10TH STREET IMPROVEMENTS

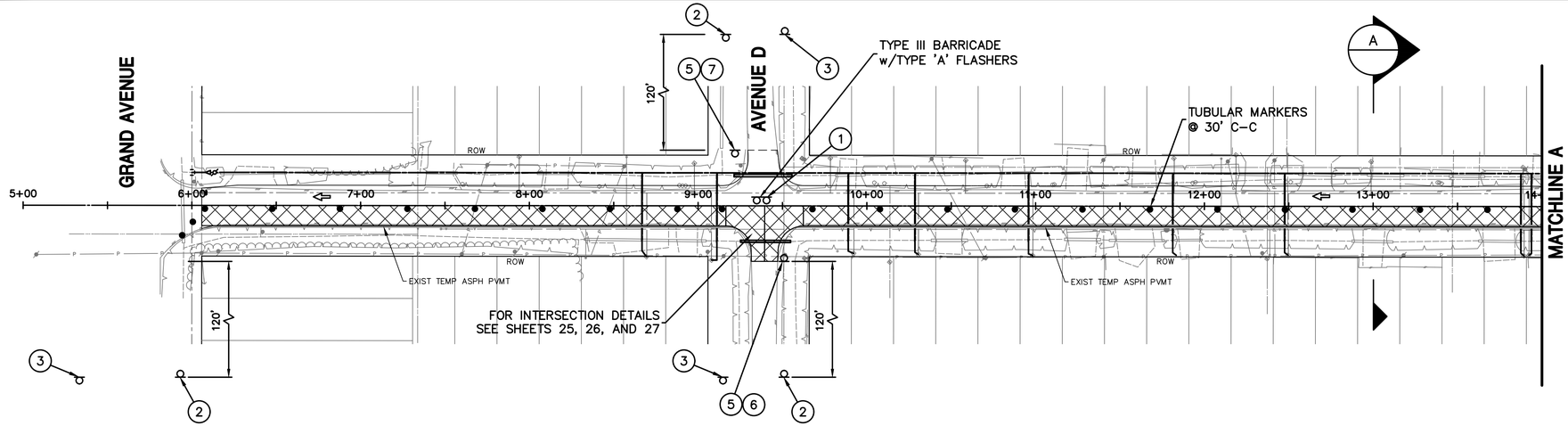
DETOUR PLAN
PHASE 1 STEP 3

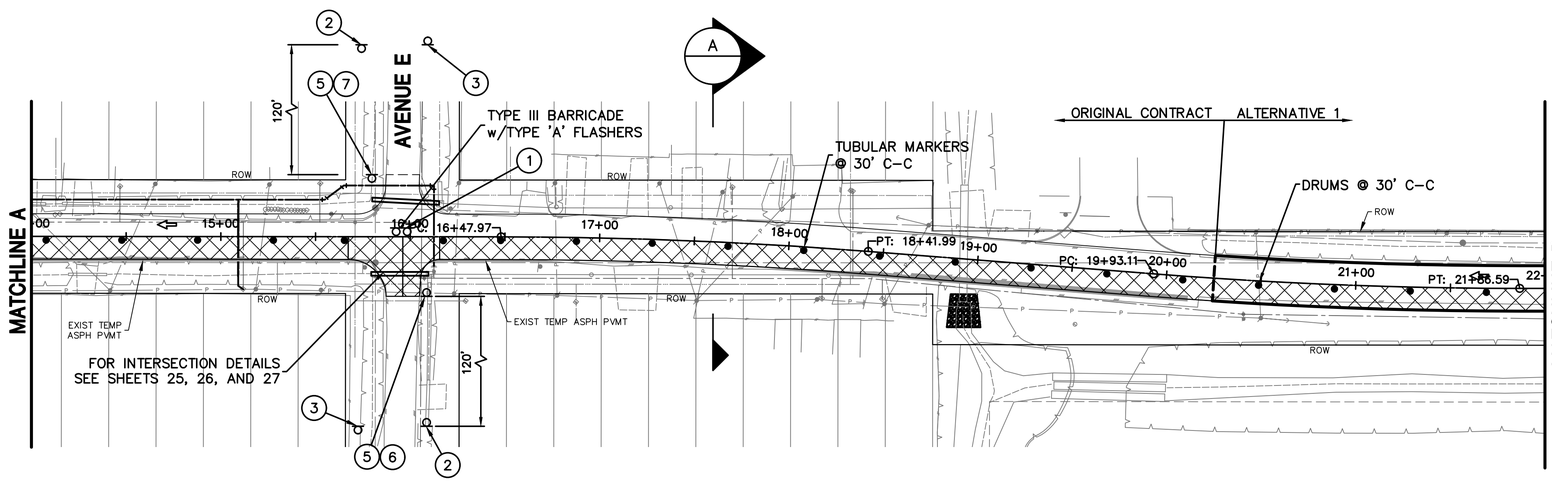
Project No.:	180000082
Date:	Jul 20, 2020
Dwn By:	J.R.R.
Chkd By:	J.A.A.

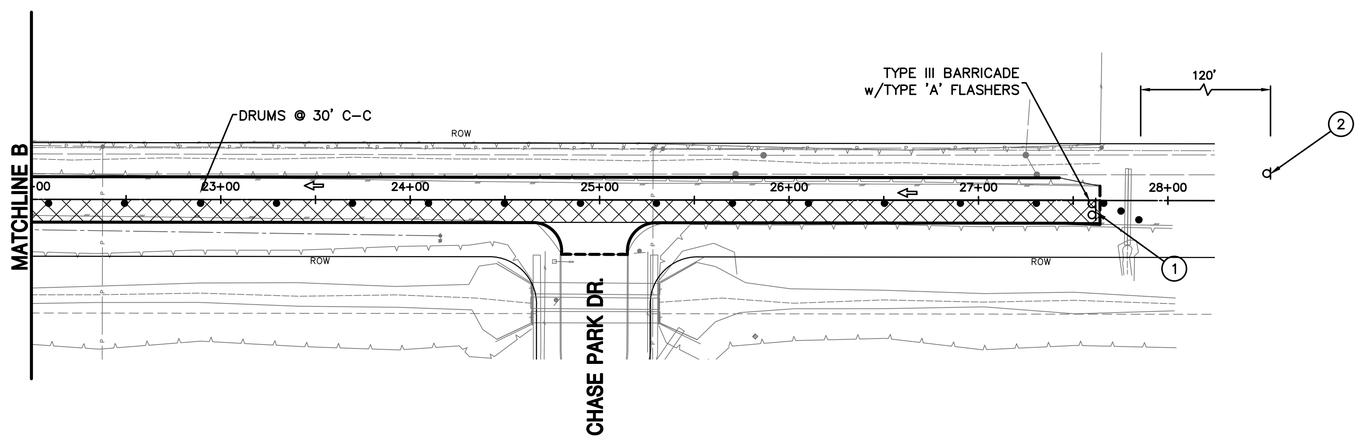
Scale:
HORZ : N.T.S.
VERT :

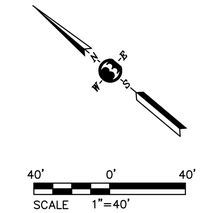
SHEET 22 OF 29

G:\180000082_10th Street Galv CO_CADD\Drawings\002C-Pldtour.dwg-Detour Plan Phase 1 Step 3 Plotted Jul 20, 2020 at 12:13pm by Plott | Last Saved by: jmagic









LEGEND:

- TUBULAR MARKERS, CONES OR DRUMS
- TYPE III BARRICADES W/TYPE 'A' FLASHERS
- WORK ZONE
- TEMP. ASPH. PVM'T
- TRAVEL LANE
- SIGN

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NOTES:

1. USE HIGH EARLY STRENGTH CONCRETE AT INTERSECTIONS AND AS DIRECTED BY OWNER'S REPRESENTATIVE.
2. CONTRACTOR SHALL PROVIDE TEMPORARY DRIVEWAYS AND/OR ENSURE THAT ADEQUATE ON STREET PARKING IS PROVIDED FOR THE RESIDENTS.
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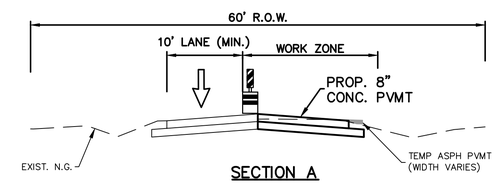


SECTION A
PHASE 1 STEP 3

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

Binkley & Barfield
consulting engineers
Binkley & Barfield, Inc.
TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

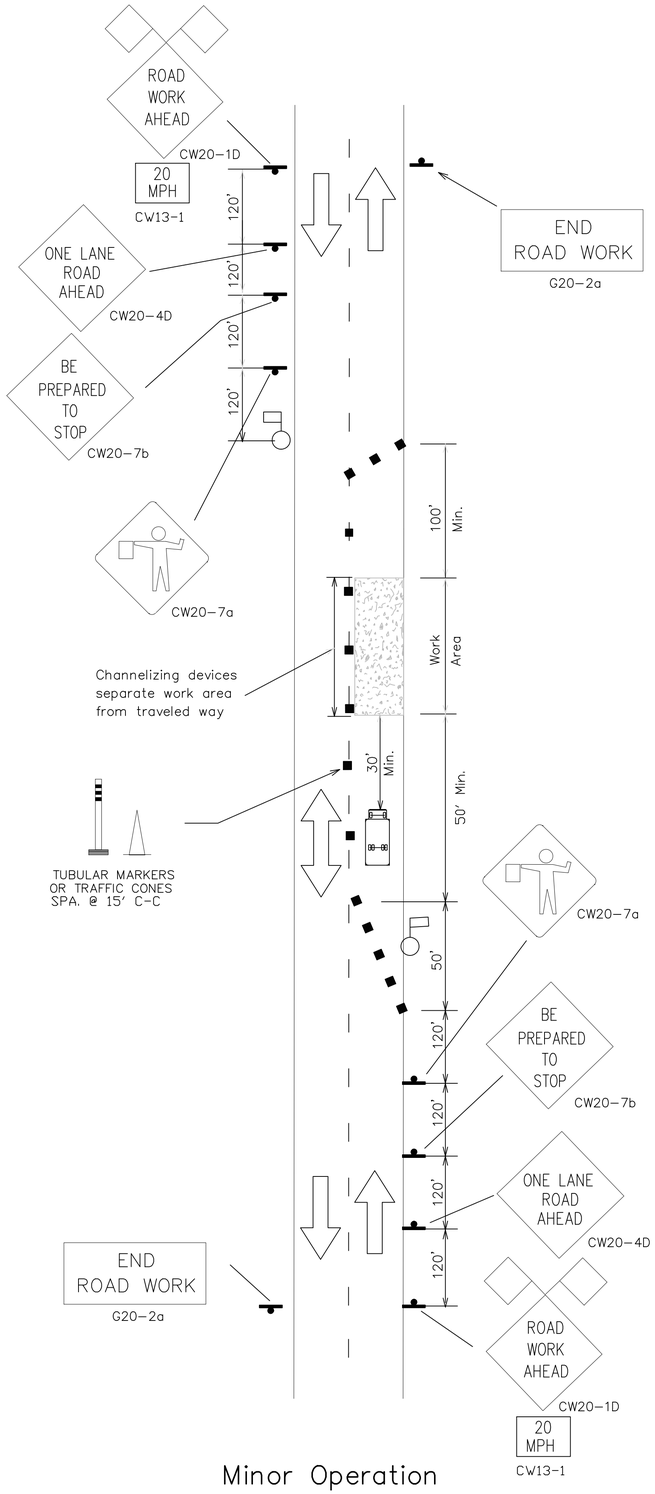
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL PLAN

Project No.: 180000082	Scale: HORZ : 1"=40' VERT :	SHEET 23 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\023C-SPtrcf.dwg-Traffic Control Plan Plotted Jul 20, 2020 at 12:13pm by PLott | Last Saved by: PLott



Minor Operation Where One Lane Is Closed With Adequate Field of View

TYPICAL TRANSITION LENGTHS AND SUGGESTED MAXIMUM SPACING OF DEVICES

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'–75'
35		205'	225'	245'	35'	70'–90'
40		265'	295'	320'	40'	80'–100'
45	L=WS	450'	495'	540'	45'	90'–110'
50		500'	550'	600'	50'	100'–125'
55		550'	605'	660'	55'	110'–140'
60		600'	660'	720'	60'	120'–150'
65		650'	715'	780'	65'	130'–175'

* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit.
** Taper lengths have been rounded off.

CONSTRUCTION WARNING SIGN SPACING

Posted Speed or 85% Speed (MPH)	X Min. Distance (feet)
30 or less	120
35	160
40	240
45	320
50	400
55	500
65	750

X=SIGN SPACING
L=TAPER
2XL=TANGENT

General Notes

1. ROAD WORK AHEAD Sign may be installed at two or more locations on the approach to the work zone if visibility or the work zone is less than 1500 feet.
2. Flaggers should use two-way radios or other method to communicate.
3. Length of work area should be based on the ability of flaggers to communicate.

LEGEND

- CONSTRUCTION AREA
- OPEN TO TRAFFIC
- HEAVY WORK VEHICLE
- FLASHING ARROW BOARD
- SIGN POST
- TUBULAR MARKERS ,CONES OR DRUMS
- FLAGGER

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

Binkley & Barfield consulting engineers
Binkley & Barfield, Inc.
TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

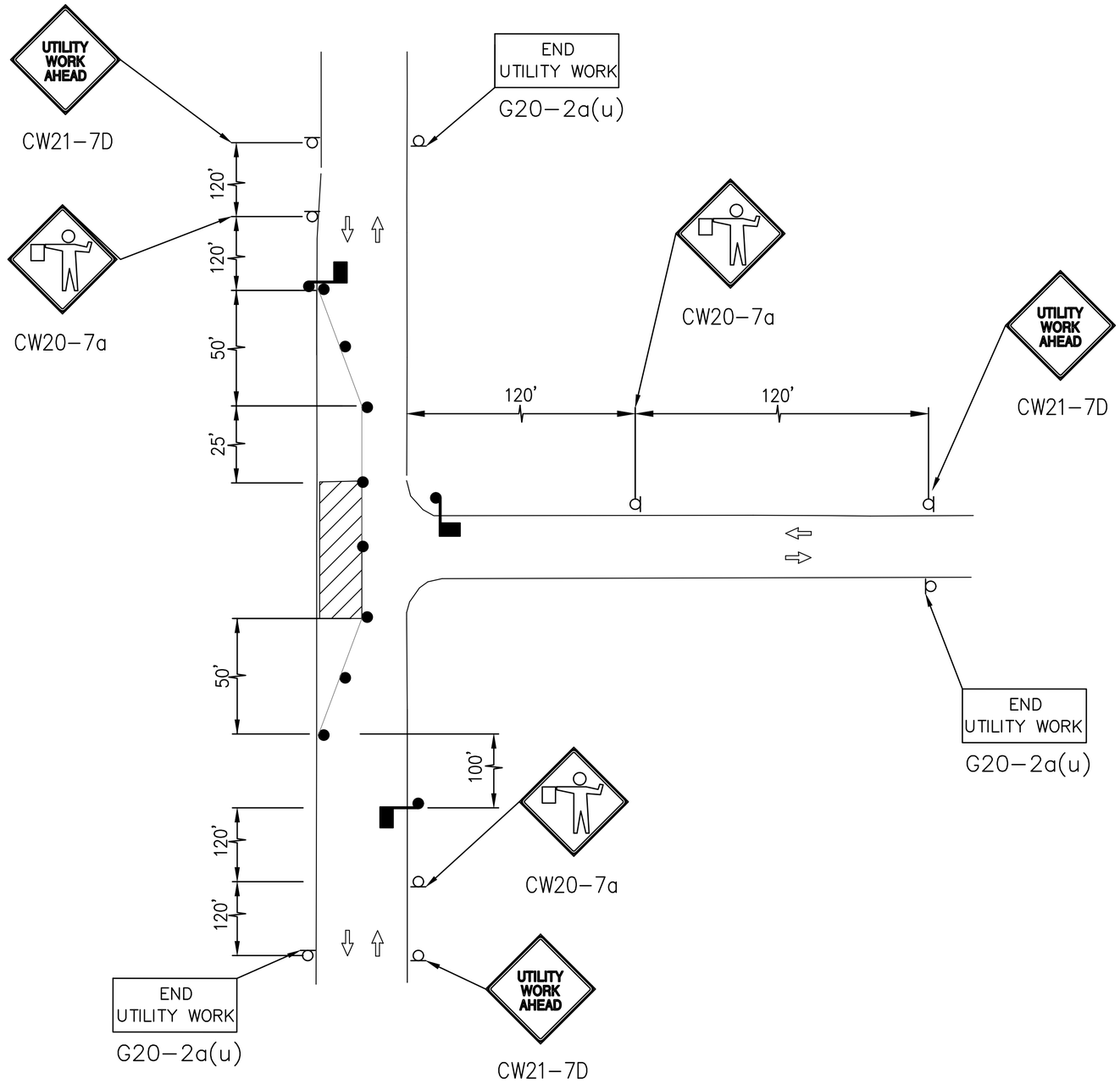
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL
ONE LANE CLOSURE

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 24 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\001C-DTonel.dwg-One Lane Closure Plotted Jul 20, 2020 at 12:13pm by PLott | Last Saved by: jmagic



LEGEND

- CONSTRUCTION AREA
- OPEN TO TRAFFIC
- HEAVY WORK VEHICLE
- FLASHING ARROW BOARD (OPTIONAL)
- SIGN POST
- TUBULAR MARKERS ,CONES OR DRUMS
- FLAGGER

NOTE:

1. SEE SHEET 19, 21, OR 23 FOR TRAFFIC NOTES.

PROJECT SPECIFIC LOCATIONS

ALTERNATE BID ITEM: 10TH STREET / CHASE PARK DR.

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

Binkley & Barfield consulting engineers
Binkley & Barfield, Inc.
TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

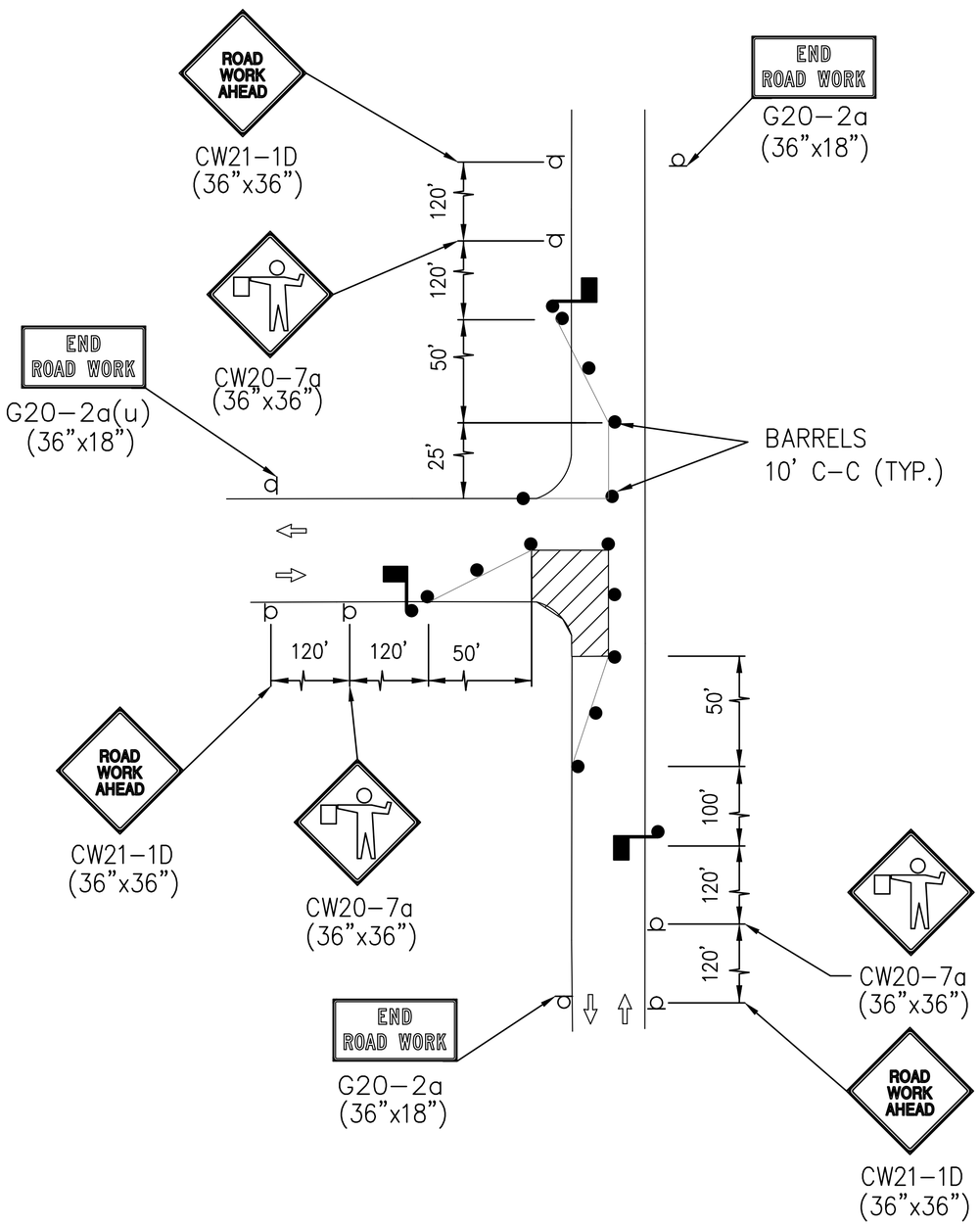
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL
INTERSECTION DETAILS

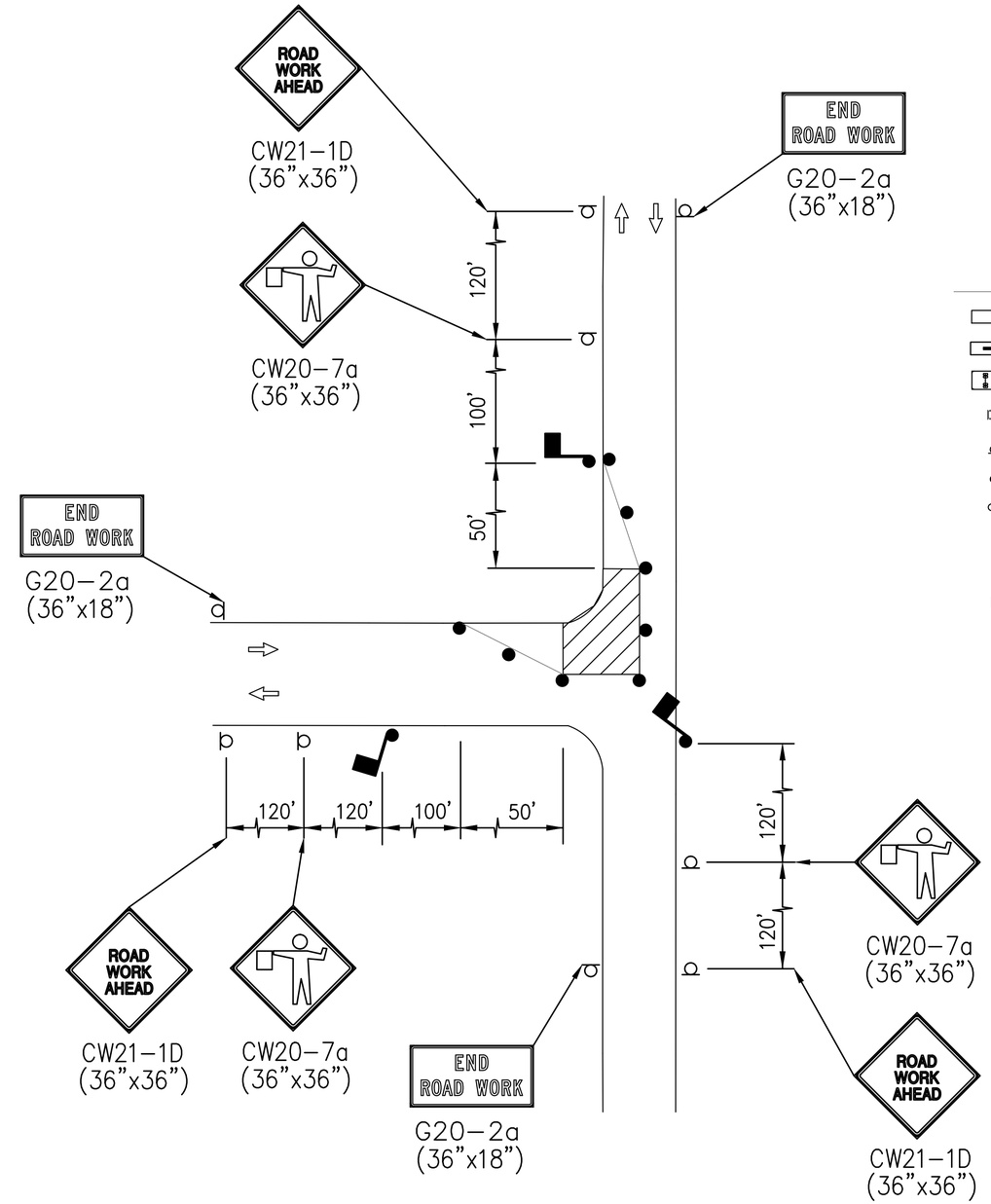
Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 25 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\0010-DTtraf.dwg-Intersection 3 Way Plotted Jul 20, 2020 at 12:13pm by PLott | Last Saved by: plott



PROJECT SPECIFIC LOCATIONS

ALTERNATE BID ITEM: 10TH STREET / CHASE PARK DR.



PROJECT SPECIFIC LOCATIONS

ALTERNATE BID ITEM: 10TH STREET / CHASE PARK DR.

LEGEND

- CONSTRUCTION AREA
- OPEN TO TRAFFIC
- HEAVY WORK VEHICLE
- FLASHING ARROW BOARD (OPTIONAL)
- SIGN POST
- TUBULAR MARKERS ,CONES OR DRUMS
- FLAGGER

NOTE:

1. SEE SHEET 19, 21, OR 23 FOR TRAFFIC NOTES.

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED PROFESSIONAL ENGINEER
07/29/2020

Binkley & Barfield consulting engineers
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TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

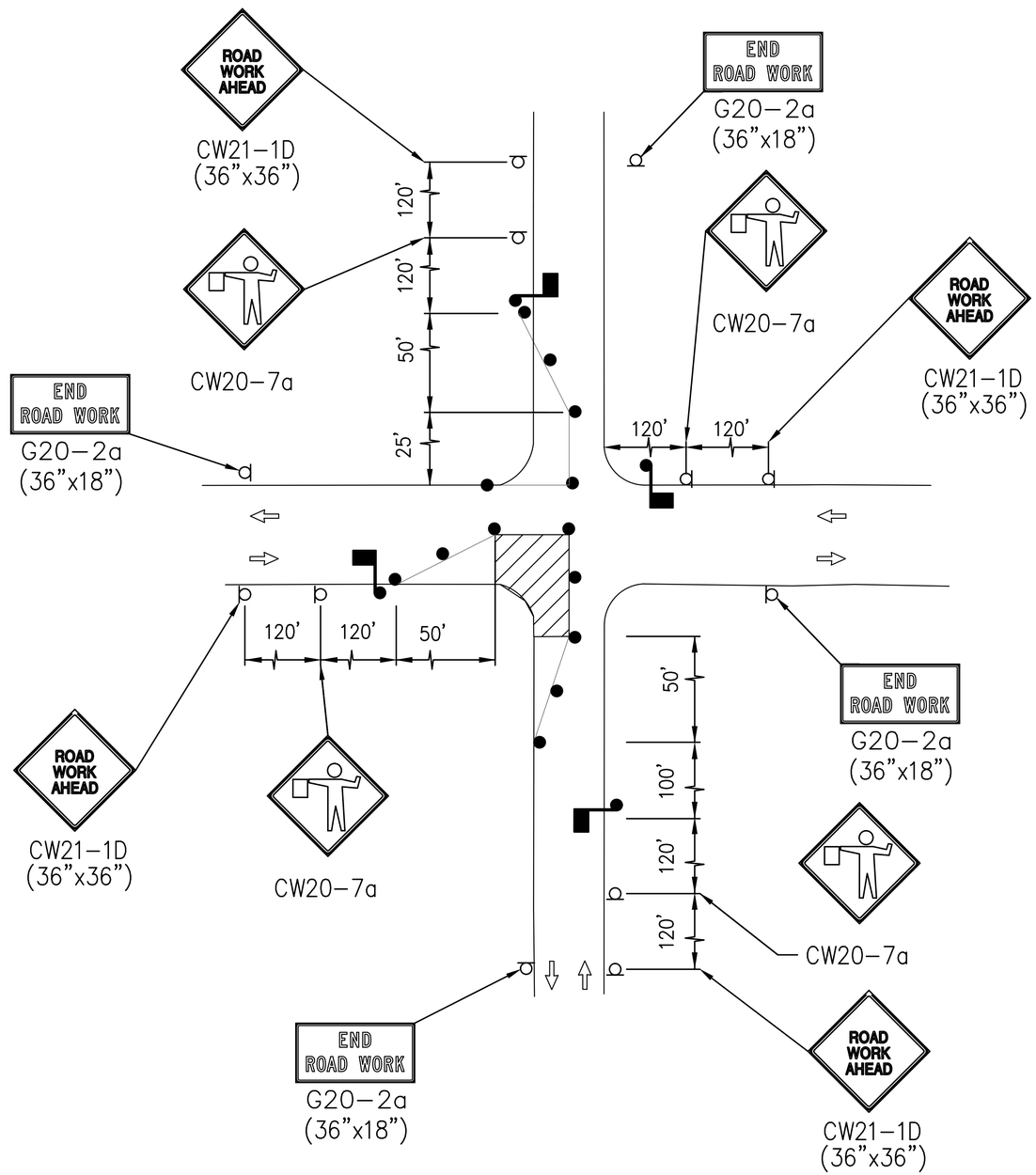
THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL
INTERSECTION DETAILS

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 26
Date: Jul 20, 2020		OF 29
Dwn By: J.R.R.		
Chkd By: J.A.A.		

G:\180000082_10th Street Galv Co_CADD\Drawings\001C-DTrcf.dwg-Intersection 3 Way (2) Plotted Jul 20, 2020 at 12:13pm by PLott | Last Saved by: plott



LEGEND

- CONSTRUCTION AREA
- OPEN TO TRAFFIC
- HEAVY WORK VEHICLE
- FLASHING ARROW BOARD (OPTIONAL)
- SIGN POST
- TUBULAR MARKERS ,CONES OR DRUMS
- FLAGGER

NOTE:

1. SEE SHEET 19, 21, OR 23 FOR TRAFFIC NOTES.

PROJECT SPECIFIC LOCATIONS

10TH STREET / AVENUE D
10TH STREET / AVENUE E

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

Binkley & Barfield
consulting engineers
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TxEng F-257
1710 Seamist Dr
Houston, TX 77008
713.869.3433
BinkleyBarfield.com

THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

TRAFFIC CONTROL
INTERSECTION DETAILS

Project No.: 180000082	Scale: HORZ : N.T.S. VERT :	SHEET 27 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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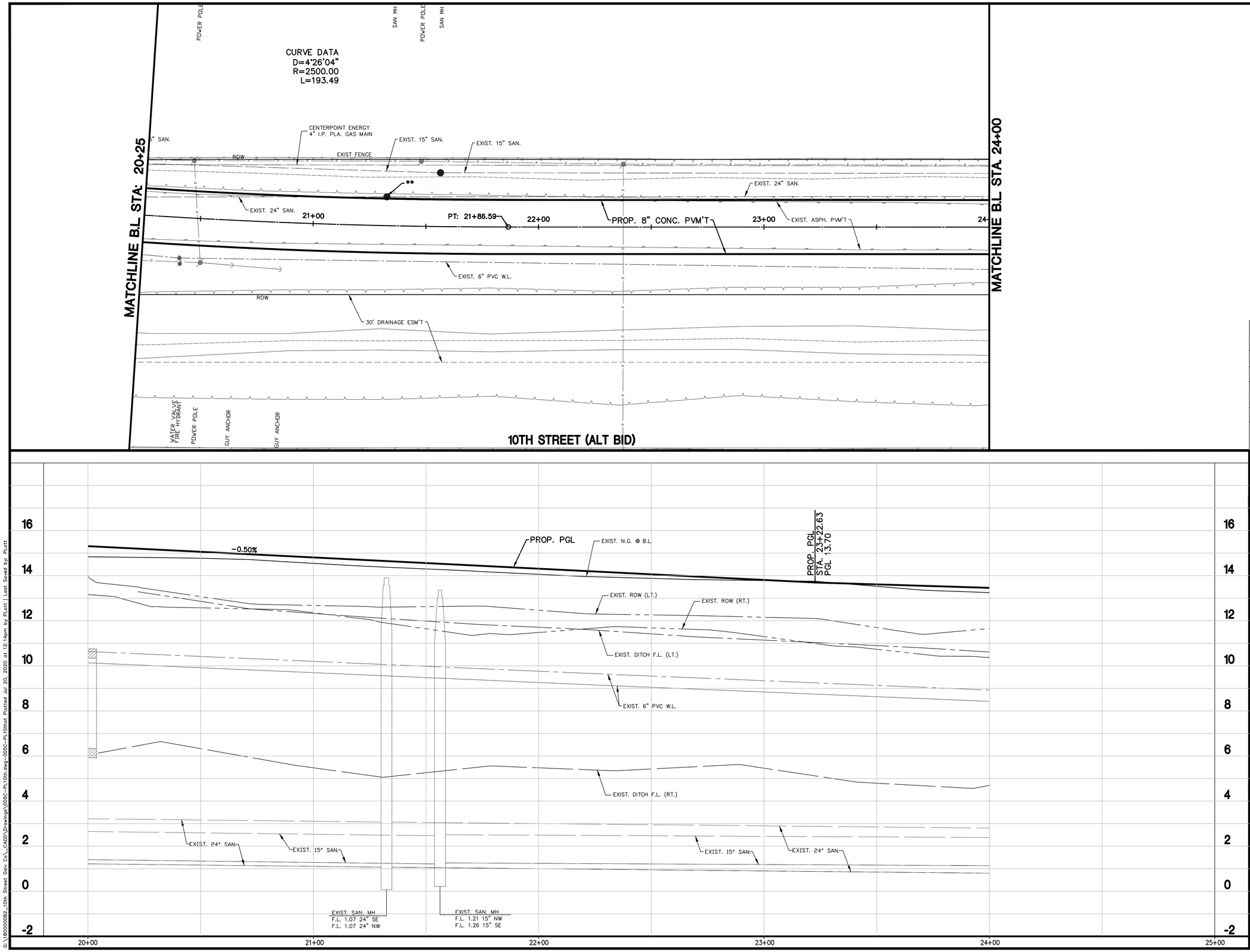

NOTICE:
For your safety, you are required by Texas Law to call 811 at least 48 hours before you dig so that underground lines can be marked.
This signature does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

DATE: 07/30/2020

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.

Signature Valid for six months.

DATE: 07/30/2020

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities – not to be used for conflict verification.)

Signature Valid for six months

DATE: 1-23-20

AT&T
Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

Binkley & Barfield
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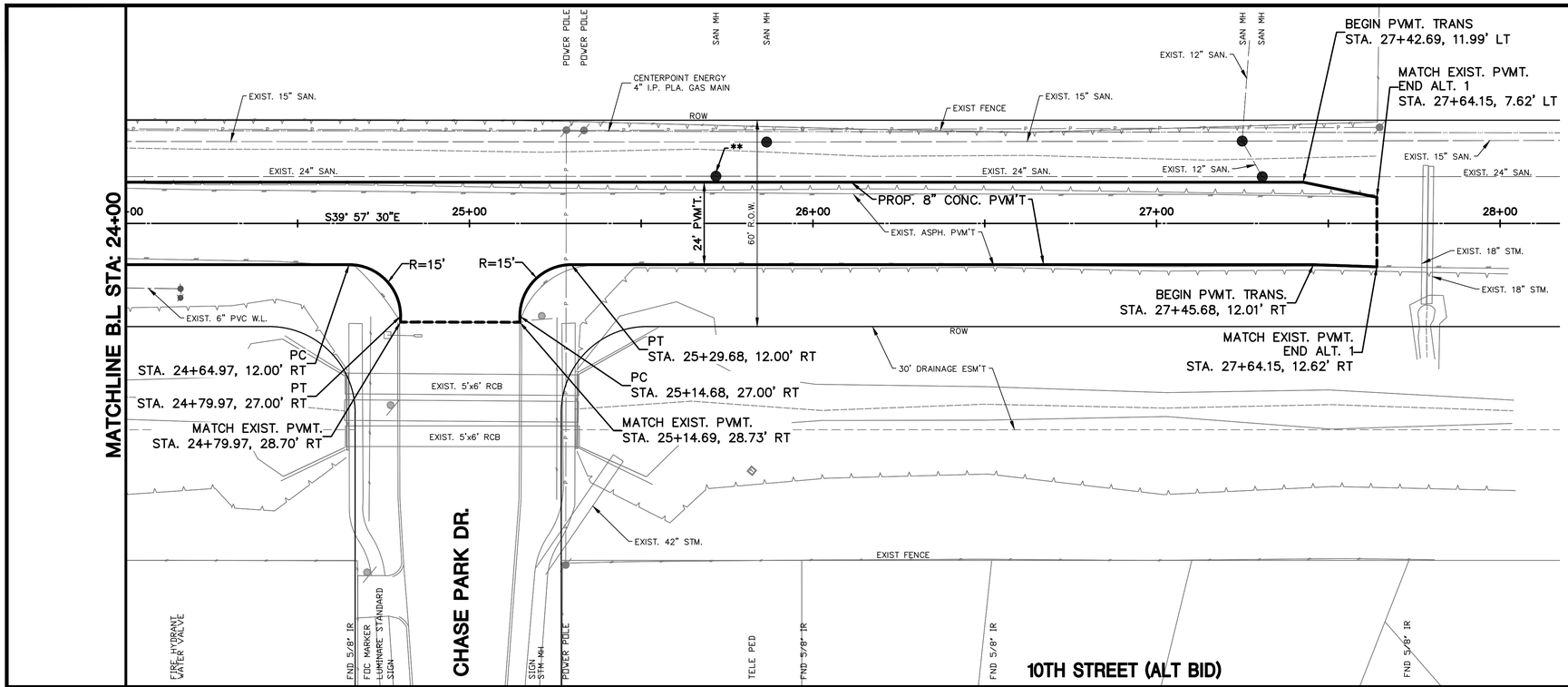
THE STATE OF TEXAS
COUNTY OF GALVESTON

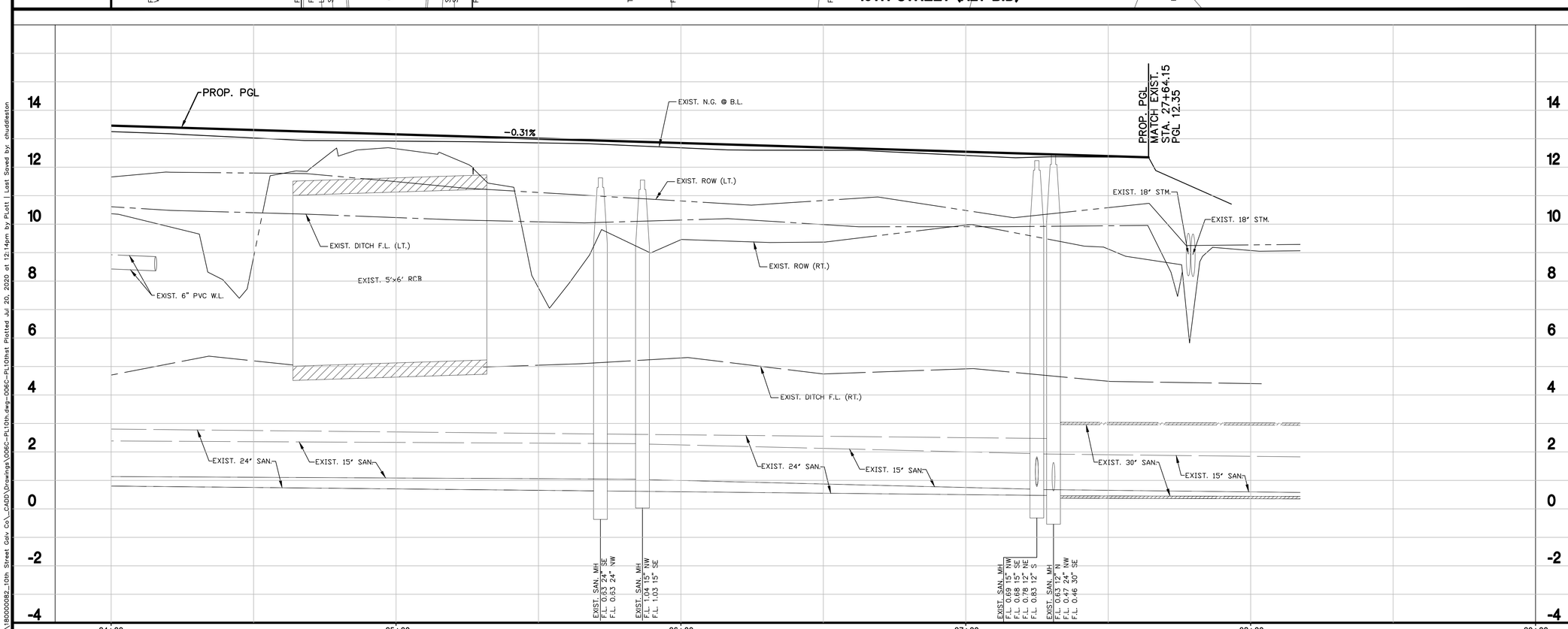
10TH STREET IMPROVEMENTS

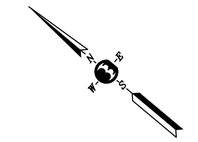
10TH STREET (ALT BID)
PLAN & PROFILE
B.L. STA: 20+25 TO B.L. STA: 24+00

Project No.: 180000082
Date: Jul 20, 2020
Dwn By: J.R.R.
Chkd By: J.A.A.
Scale: HORZ : 1"=20' VERT : 1"=2'
SHEET 28 OF 29

G:\180000082_10th Street Galv Co_CADD\Drawings\005C-PL10th.dwg-005C-PL10th.tab Plotted Jul 20, 2020 at 12:14pm by Plott | Last Saved by: Plott







20' 0' 20'
SCALE 1"=20'

LEGEND:

----	PROP. SAWCUT
*	TO BE REMOVED AND REPLACED
**	ADJUST TO FINISH GRADE
***	TO BE REMOVED AND RELOCATED
****	TO BE ABANDONED IN PLACE

NOTICE:
For your safety, you are required by Texas Law to call 811 at least 48 hours before you dig so that underground lines can be marked.
This signature does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

DATE: 07/30/2020

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.

Signature Valid for six months.

DATE: 07/30/2020

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities – not to be used for conflict verification.)

Signature Valid for six months

DATE: 1-23-20

AT&T
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER

Tommy V. Cromer
07/29/2020

Binkley & Barfield
consulting engineers
Binkley & Barfield, Inc.
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Houston, TX 77008
713.869.3433
BinkleyBarfield.com

THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

10TH STREET (ALT BID)
PLAN & PROFILE
B.L. STA: 24+00 TO B.L. STA: 28+00

Project No.: 180000082	Scale: HORZ : 1"=20' VERT : 1"=2'	SHEET 29 OF 29
Date: Jul 20, 2020		
Dwn By: J.R.R.		
Chkd By: J.A.A.		

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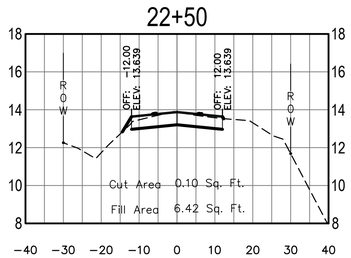

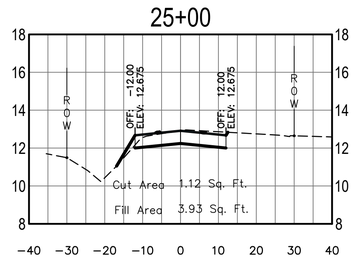

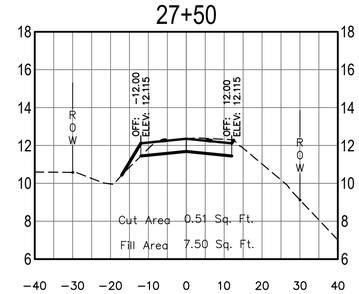

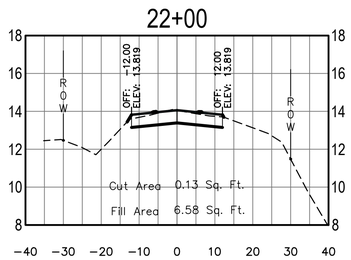

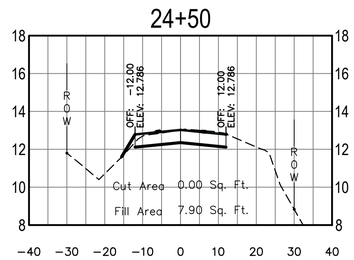

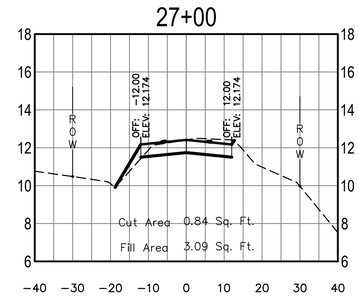

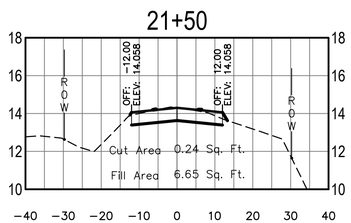

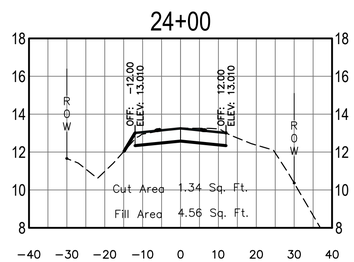

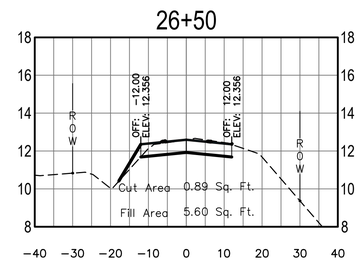

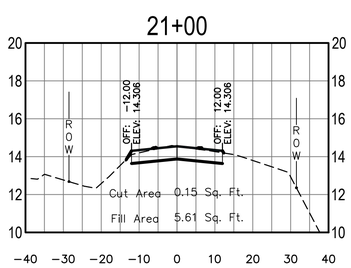

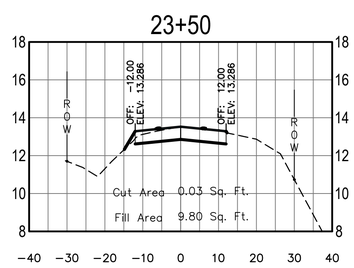

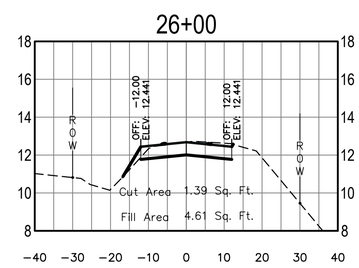

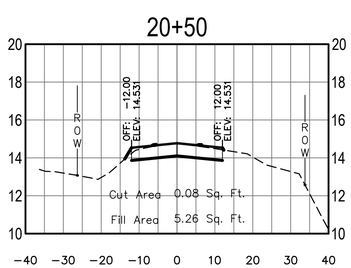

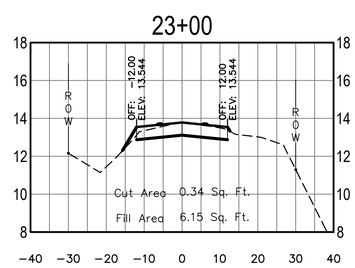

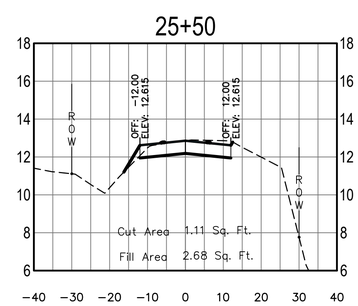

Total Volume Table

Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
20+50	5.26	0.08	0.00	0.00	0.00	0.00
21+00	5.61	0.15	10.09	0.21	10.09	0.21
21+50	6.65	0.24	11.37	0.36	21.46	0.57
22+00	6.58	0.13	12.25	0.34	33.71	0.91
22+50	6.42	0.10	12.04	0.21	45.75	1.12
23+00	6.15	0.34	11.64	0.41	57.38	1.53
23+50	9.80	0.03	14.76	0.34	72.15	1.87
24+00	4.56	1.34	13.29	1.27	85.44	3.14
24+50	7.90	0.00	11.54	1.25	96.98	4.39
25+00	3.93	1.12	10.95	1.04	107.93	5.42
25+50	2.68	1.11	6.11	2.06	114.05	7.49
26+00	4.61	1.39	6.74	2.31	120.79	9.80
26+50	5.60	0.89	9.45	2.11	130.24	11.90
27+00	3.09	0.84	8.04	1.60	138.28	13.51
27+50	7.50	0.51	9.80	1.26	148.08	14.76

MK.	DESCRIPTION	DATE	DWN.	CHK.

STATE OF TEXAS
TOMMY V. CROMER
97594
LICENSED
PROFESSIONAL ENGINEER
Tommy V. Cromer
07/29/2020

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THE STATE OF TEXAS
COUNTY OF GALVESTON

10TH STREET IMPROVEMENTS

10TH STREET (ALT BID)
CROSS SECTIONS

Project No.: 180000082
Date: Jul 20, 2020
Dwn By: J.R.R.
Chkd By: J.A.A.

Scale:
HORZ : 1"=20'
VERT : 1"=2'

SHEET 30 OF 29

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GEOTECHNICAL INVESTIGATION
10th Street Pavement Reconstruction – 2200 feet
(Grand Ave to 64 Acre park)
Bacliff, Texas

Reported to:
Binkley & Barfield, Inc
Houston, Texas

Prepared by:
Geoscience Engineering and Testing, Inc.
Houston, Texas

PROJECT NO: 18G5566

August 2018

GEOSCIENCE
ENGINEERING & TESTING, INC.

405 E. 20th Street
Houston, Texas 77008
713.861.9700
713.861.4477 Fax

HOUSTON THE WOODLANDS

August 17, 2018

Binkley & Barfield, Inc
1710 Seamist Drive
Houston, Texas 77008

Attention: Mr. Todd Calvin, PE

Reference: Geotechnical Investigation
10th Street Pavement Reconstruction – 2200 feet
(Grand Ave to 64 Acre Park)
Bacliff, Texas
GETI NO: 18G5566

Dear Mr. Calvin:

GEOSCIENCE ENGINEERING & TESTING, INC. (GETI) is pleased to submit this report for the above referenced project. This study was authorized by Mr. David A. Hamilton, P.E on July 24, 2018. This report briefly describes the procedures employed in our investigation and presents the conclusions and recommendations of our studies.

We appreciate the opportunity to work with you on this phase of the project. If you have any question concerning this report or require additional information, please contact us.

With Kindest Regards,
GeoScience Engineering & Testing, Inc.

Kishor Rawal, MSCE, E.I.T
Project Engineer

Telfryn L. John, PE
Vice President

F-4802

Copies Submitted: (1)

I. INTRODUCTION AND PROJECT INFORMATION

Geoscience Engineering and Testing, Inc. (GETI) hereby submits this report of geotechnical investigation of subsurface conditions for the proposed 10th Street pavement reconstruction (Grand Avenue to 64-acre Park) at Bacliff, Texas. GETI's investigation was authorized by Mr. David A. Hamilton, P.E., Executive Vice President with Binkley & Barfield, Inc.

The purpose of the geotechnical investigation was to determine the existing asphalt pavement thickness and new pavement design recommendations.

II. SUBSURFACE EXPLORATION

1. General / Scope of Work

Our work included a reconnaissance of the immediate site, geologic desktop review, subsurface exploration, field and laboratory testing, with an engineering analysis and evaluation of the subsurface materials. The purpose of this subsurface exploration and analysis was to determine soil profile components, the engineering characteristics of the subsurface materials and to provide criteria for use by design engineers in preparing new pavement design.

The exploration and analysis of the subsurface conditions reported herein are considered in sufficient detail and scope to form a reasonable basis for the recommendations. These recommendations are based on available soil information from this investigation and preliminary design details furnished by Mr. David A. Hamilton, P.E., with Binkley & Barfield, Inc.

Any revision in plans for the proposed 10th Street pavement reconstruction project (Grand Avenue to 64-acre Park) from those enumerated in this report should be brought to the attention of the soil engineer, so that he may determine if changes in the recommendations are required. If deviations from the noted subsurface conditions are encountered during construction, they should also be brought to the attention of the soil engineer.

The project consists of the following proposed improvements:

- ✓ Assess 2200 lineal feet of the existing asphalt pavement thickness to be removed.
- ✓ Provide generalized subsurface and ground water conditions
- ✓ Develop geotechnical design parameters for new pavement section
- ✓ Provide construction recommendation for the chosen design.

GETI Scope of Work includes fieldwork borings, laboratory testing and an engineering report, prepared, signed and sealed by a registered engineer, which will present the results of the field and laboratory data together with the analyses of the results and recommendations.

The report addresses:

- ✓ Existing soil and groundwater condition
- ✓ Pavement design thickness recommendation for 10th Street.
- ✓ Subgrade stabilization recommendation
- ✓ Material and compaction recommendations
- ✓ Construction considerations related to soil and groundwater conditions

2. Description of the Site / Geology

The site has overall relatively level topography. The existing pavement consists of 8-inches of asphalt and base layer. The soils underlying the existing pavement system were primarily fill materials (silty sand) except boring B-5 and B-6, which consists of sandy fat clay and fat clay at the time of our drilling operation. Please refer to the boring logs for details.

The site is generally in the geographic area which corresponds to the outcrop area of the Beaumont Formation, Quaternary Period, and Holocene, Pleistocene Epoch or Series[1]. The Beaumont Formation is also described as having mostly clay, silt and sand; concretions of calcium carbonate with iron oxide and iron-manganese oxides in the zone of weathering.

3. Field Investigation

The field investigation was undertaken on July 08, 2018, with the intent to explore and determine the engineering characteristics of the subsurface materials. This included a reconnaissance of the project site, drilling the exploratory borings, and recovering the representative soil samples.

Subsurface soil conditions were explored by advancing six soil borings. Borings B-1 through B-6 were drilled to a depth of 15-feet each, respectively.

The approximate soil boring locations are shown on the attached Soil Boring Plan, Plate No. 1.

Sample depth and description of soil classification (based on the Unified Soil Classification System) are presented on the Soil Boring Logs, Plate No. 2 through 7.

Keys to Terms and Symbols used on the Soil Boring Logs are shown on Plate No. 8.

Site Photographs appear on Plate 9.

The soil borings were of 3-inch nominal diameter. All relatively undisturbed and disturbed soil samples were obtained at 2-feet intervals continuously to a depth of 12-feet, and 13 to 15-feet thereafter. The soil borings were performed with a drilling rig equipped with rotary head conventional solid-stem augers used to advance the holes. Representative disturbed or undisturbed soil samples were obtained employing thin-walled sampling procedures in accordance with ASTM D1587.

[1] Note: USGS, TNRIS, UTBEG, GEOLOGIC ATLAS OF TEXAS

Soil samples were identified according to the boring number and depth and wrapped in aluminum foil and polyethylene plastic wrapping bags to prevent moisture loss and disturbance. All of the samples were transported to our geotechnical laboratory for examination, testing and analysis. All borings were backfilled with the soil cuttings accumulated during the drilling operation, after final water readings were obtained, then cold patch asphalt was used to restore the pavement surface.

4.1 Field Strength Tests

During the field boring operation, samples of cohesive soil from the thin-walled tube were frequently tested in compression by use of a calibrated soil penetrometer to provide a measure of shear strength to aid in characterizing the soil consistency.

4.2 Water Level Measurement

The information in this report summarizes conditions as found on the date the borings were drilled. Ground water was not encountered during the drilling operation. Long-term monitoring of the ground water level was beyond the scope of this study. It should be noted that the ground water table may be expected to fluctuate with environmental variations such as frequency and magnitude of rainfall and the time of the year when construction begins.

4. Surface Fault

A fault assessment was conducted based on current guidelines for Geological Fault Studies contained in the March 1985 Houston Geological Society (HFS) Bulletin. We reviewed several available sources of published literature on faulting in the area, USGS fault maps and performed a site reconnaissance. According to the "Principal Faults in Houston, Texas, Metropolitan Area" by Sachin D. Shah and Jennifer Lanning-Ruch, no faults were documented nearby the proposed site location. Fault activities and major signs of fractures/distress were not observed at the time of the site reconnaissance.

5. Laboratory Testing

Complementing the field investigation, a supplemental laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials necessary in analyzing their behavior under the proposed loading conditions. Laboratory tests are performed on selected concrete and soil samples to provide the physical and engineering properties of the materials in accordance with the prescribed ASTM standards and methods.

The standard tests performed are as follows:

LABORATORY TEST	TEST STANDARD
Moisture Content of Soils	ASTM D2216
Moisture Content and In Situ Dry Density of Soils	ASTM D2937
Unconfined Compressive Strength of Cohesive Soils	ASTM D2166
Liquid Limit, Plastic Limit, and Plasticity Index of Soils	ASTM D4318

Strength properties of the soils were determined by means of unconfined compression tests performed on undisturbed samples.

The type and number of laboratory tests performed for this investigation are:

DESCRIPTIONS	No. of Test	DESCRIPTIONS	No. of Test
Hand Penetrometer Test	34	Dry Density Test	3
Moisture Content Test	42	Unconfined Compressive Test	3
Atterberg Limits	11		

Laboratory Test Data is shown on the Soil Boring Logs presented on Plate Nos. 2 through 7.

III. GENERAL DESCRIPTION OF SUBSURFACE MATERIALS

The specific subsurface stratigraphy as determined by the field exploration at individual boring locations is shown in detail on the soil boring logs herein. However, the stratigraphy can be generalized as follows:

STRATUM NUMBER	RANGE OF DEPTH, Ft.	BORING NUMBER	SOIL DESCRIPTION (Below 8-inches of Asphalt and Base layer)
I	0 – 2’	B-1 through B-4	Fill: light gray; SILTY SAND
II	8’ – 10’	B-3 & B-4	Soft to stiff; tan LEAN CLAY (CL)*
II	0 – 15’	B-1, B-2, B-5 & B-6	Firm to very stiff; dark gray; tan; gray and brown; tan and light gray; SANDY FAT CLAY (CH) / FAT CLAY (CH)*
	0’ – 8’	B-3 & B-4	
	8’ – 15’		

* Classification is in accordance with the Unified Soil Classification System

Laboratory tests results for the soils indicate that the Liquid Limits range from LL = 38 to 81 percent, the Plastic Limits range from PL = 18 to 28 percent and the Plasticity Indices range from PI = 20 to 53. Soil moisture content ranged from 7 to 31 percent. The borings show the silty sands with non-plastic fines.

1. Swell Potential

Based on plasticity index results, the fill material (silty sand), lean clay, sandy fat clay and fat clay, are characterized as having medium to extremely high shrink/swell potential. The fat clay has a very high shrink/swell potential while the silty sand has negligible shrink/swell potential.

When the moisture content of clay soil increases, the volume increases; conversely, when the moisture content of this type of soils decreases, the soil volume decreases. The volume changes can result in pavement movement and stresses.

2. Potential Vertical Rise (PVR)

The magnitude of the moisture induced vertical movement, potential vertical rise, was calculated using the Texas Department of Transportation Method Tex-124-E in conjunction with our evaluation of the current moisture profile.

The potential vertical rise (PVR) at the locations of the test Borings B-1 through B-6 drilled is estimated to be approximately 2-inches at their existing moisture condition. More movement may occur in areas where the soil dries, and water subsequently ponds during or after construction. Site grading may also influence the potential for movement.

IV. PAVEMENT RECOMMENDATIONS

2.1 Subgrade

Based on our field investigation and test results in drilled borings, the surficial soils were primarily fill materials (silty sand), lean clay, sandy fat clay and fat clay. Therefore, these surface soils can be easily handled, retain compaction, and minimize or eliminate rutting, if stabilized.

GETI recommends the upper 8-inches of the exposed soil final subgrade be stabilized by the addition of 3% lime and 7% fly ash or at the following rate of treatment based on a soil dry weight of 112 pcf.

Item	Percent	Range Per Square Yard
Lime	3 %	20-25 lbs.
Fly Ash	7 %	45-50 lbs.

Please note lime by itself can react with soils as little as 7 percent clay and plasticity indices as low as 10. However, some borings (B-1 through B-4) shows existing top soil being not sufficiently reactive enough, we recommend lime can be combined with fly ash or other additional source of silica and alumina.

The actual stabilization requirements may vary in the field depending on conditions at the time of construction and should be established by running tests on the exposed subgrade soils. The required quantity of lime and fly ash for use in stabilization as provided above is an estimated value only. The actual quantity should be based on tests performed on the soils used at the time of construction.

The stabilized subgrade should be compacted to a minimum 95% of the Standard Proctor maximum dry density (ASTM D 698). Harris County standard specification for construction and maintenance of road and bridges 2017, Item 223 should be used as a procedural guide for lime and fly ash stabilization of the subgrade soils.

The lime is applied and initially mixed. After mellowing a minimum of 48-hours, the treated soil should be pulverized where 100, 85 and 60 percent pass the 1-3/4 inch, ¾-inch, and No. 4 sieve, respectively. After satisfactory remixing, the fly ash is added and mixed.

2.2 Rigid / Concrete Pavement (Heavy Truck Traffic and Service vehicles)

Based on a Portland Cement Association (PCA) procedure reported by Yoder and Witczak, "Principles of Pavement Design", 2nd Edition, for a modulus of subgrade reaction defined as 100 lbs./in^3 that can be provided with an eight (8) inch stabilized subgrade.

Reinforcement for rigid pavement with a concrete thickness of **7.0 inches** should consist of No. 3 bar placed at 12-inches on center in each direction or a No. 4 bar placed at 24-inches on center in each direction; and with a concrete thickness of **8.0 inches**, No. 4 bar placed at 18-inches on center in each direction. Control joints should not exceed 15-feet on center, and expansion joints should not exceed 60-feet on center. (Grade 60 for all reinforcing steel.)

- A 7-inch concrete pavement with a modulus of rupture of 600 psi (corresponding compressive strength exceeds 4500 psi) should provide for a pavement life defined as 2,500 tandem axle load repetitions of 40 kips or less in conjunction with 37,500 single axle load repetitions of 20 kips or less, for a period of 20 years.

- An 8-inch concrete pavement with a modulus of rupture of 600 psi (corresponding compressive strength exceeds 4500 psi) should provide for a pavement life defined as 75,000 tandem axle load repetitions of 40 kips or less in conjunction with 400,000 single axle load repetitions of 20 kips or less, for a period of 20 years.

GETI recommends that construction of pavement be conducted in general accordance with Galveston County requirements.

Note: GETI was not provided with estimated "Total Design Equivalent Single Axle Loads (ESAL) over the life of the pavement to apply AASTHO Empirical equations for structural design of rigid pavements.

V. OPEN DRAINAGE DITCHES

1. **Ditch Slope -** Should sufficient ROW remain to handle increased drainage flows and volumes, GETI recommends an exposed slope that does not exceed 3.5(H):1(V) should be satisfactory.

2. **Erosion Control -** Erosion Control Blankets may be used as means of controlling ditch erosion. Erosion Control Blankets (ECBs) are well-suited to the relatively short-term challenges of establishing vegetation in low to moderate erosion applications; whereas, Turf Reinforcement Mats (TRMs) are intended for immediate, long-term erosion protection. Sod and/or hydro-mulch with geofabric can also be used to provide reasonable soil erosion protection.

VI. GENERAL CONSTRUCTION CONSIDERATIONS

1. Site Preparation

Our recommendations for site preparations are summarized below:

1.1 In general, remove all vegetation, tree roots, organic topsoil and any undesirable materials from the construction area. Tree trunks and roots pavement areas should be removed to a root size of less than 0.5-inch. We recommend that the stripping depth be evaluated at the time of construction by a soil technician.

1.2 Any on-site fill soils, encountered in the paved areas during construction, must have records of successful compaction tests signed by a registered professional engineer that confirms the use of the fill and record of construction and earthwork testing. These tests must have been performed on all the lifts for the entire thickness of the fill. If no compaction test results are available, the fill soil must be removed, processed and re-compacted in accordance with our recommendations of "Structural Fill and Subgrade Preparation".

1.3 Excavation should extend at least 2-feet beyond the paved area and should the fill be used to elevate the existing grade, then the top of the fill area should extend to 2-feet or to the distance equal to the height of fill above the existing grade, whichever is greater. Alternatively, the existing fill soils should be tested comprehensively to evaluate the degree of compaction in the fill soils.

1.3 The subgrade areas should be proof-rolled with a tandem axle, fully-loaded dump truck, 15-ton roller, or other equivalent suitable equipment as approved by the engineer. The proof-rolling serves to compact surficial soils and to detect any soft or loose zones. Any soils deflecting excessively under moving loads should be undercut to firm soils and re-compacted. The proof-rolling operations should be observed by an experienced geotechnician.

2. Structural Fill and Subgrade Preparation

It is recommended that the subgrade and fill be prepared as follow:

2.1 The site should be stripped to suitable depth to remove all existing pavement and miscellaneous fill material. The exposed subgrade surface should then be proof-rolled. All soft or loose soils should be removed and replaced with select fill materials.

2.2 The natural subgrade should be scarified to a minimum depth of 6-inches. The scarified soils should then be recompacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor Density Test (ASTM D698). The moisture content should range +1% to +3% of optimum moisture.

2.3 Structural Select Fill should consist of a clean Sandy Clay with Liquid Limit, LL < 35 and a Plasticity Index, PI ~ 10-20. Specifications should require a uniform thickness throughout the paved area.

2.4 Structural Select Fill material should be placed in maximum of 8-inch loose lift and compacted to a minimum of 95 percent of the maximum dry density as per ASTM D698. The moisture content should be with +1% to +3% of optimum moisture.

2.5 In cut areas, the soils should be excavated to grade and the surface soils proof rolled and scarified to a minimum depth of 6-inches and recompacted to the previously mentioned density tests at the time of construction.

3. Surface Drainage

It is recommended that site drainage be well developed. Surface water should be directed away from the pavement subgrade soils. No ponding of surface water should be allowed.

VII. DISCLAIMER

The information and recommendation contained in the report summarized conditions found at the site of proposed 10th Street pavement reconstruction (Grand Avenue to 64-acre Park) in Bacliff, Texas specified and on the date the field exploration was completed. The attached soil boring logs are a true representation of the soils encountered at the stratigraphy as found during the field exploration and drilling of the subject site.

Reasonable variations from the subsurface information presented in this report are assumed. If conditions encountered during construction are significantly different than those presented in this preliminary report, GETI should be notified immediately. The report was prepared for the sole and exclusive use by our client, based on specific and limited objectives. GETI assumes no responsibility or obligation for the unauthorized use of this report beyond the stated project objectives and work limitations.

In addition, the construction process may itself alter site soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures and all conditions encountered. We recommend that the owner retain Geoscience Engineering and Testing, Inc. to provide this service as well as the construction material and testing and inspection required during the construction phase of the project.

The standard of care for all professional engineering and related services performed by Geoscience Engineering & Testing, Inc. (GETI) corresponds to other geotechnical firms under similar circumstances in the project locality. GETI makes no warranties, express or implied, under this agreement or about any services performed or furnished by us.

We would welcome the opportunity to discuss our recommendation with you and hope we may have the opportunity to provide any additional studies or service to complete this project.

The following illustrations are attached and complete this report:

ILLUSTRATIONS	PLATE NUMBERS
Boring Location Plan	1
Boring Logs	2-7
Symbols and Terms used on Boring Logs	8
Site Pictures	9

N

Approximate Boring Location

LOCATION

10th Street Pavement Reconstruction –2200 ft.
(Grand Ave to 64 Acre Park)
Bacliff, Texas
GETI NO.: 18G5566

NOT TO SCALE

PLATE NO.: 1

PROJECT: **10th Street Pavement Reconstruction – 2200 ft.**
(Grand Ave to 64 Acre Park)
Bacliff, Texas

CLIENT: **Binkley & Barfield, Inc**
Houston,Texas

BORING NO.: **B-1** DEPTH: **15'**

PROJECT NO. 18G5566 DATE: August 8, 2017

Water was not encountered **during drilling operation**

FIELD DATA | LABORATORY DATA | DRILLING METHOD (S)

Continuous Flight Auger & Intermittent Sampling

Legend

Clay | Sandy Clay / Silty Clay | Silty Sand / Sandy Silt

Fill | Clayey Sand | Silty Clayey Sand

DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM (Below 8" thick Asphalt & Base Layer)
			B				12							Fill: Light gray SILTY SAND
			P=1.5				23		68	24	44			Stiff, dark gray FAT CLAY (CH)
5			P=1.75				26							
			P=1.25				25							Stiff, tan FAT CLAY (CH)
			P=1.25				26		65	26	39			
10			P=1.25				28							
			P=1.25				26	97					0.70	
15														
20														
25														
30														

N- STANDARD PENETRATION TEST RESISTANCE
T- TXDOT CONE PENETRATION RESISTANCE
P- POCKET PENETROMETER RESISTANCE
R- PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

GEOSCIENCE ENGINEERING & TESTING, INC.

PLATE NO. 2

PROJECT: **10th Street Pavement Reconstruction – 2200 ft.**
(Grand Ave to 64 Acre Park)
Bacliff, Texas

CLIENT: **Binkley & Barfield, Inc**
Houston,Texas

BORING NO.: **B-2** DEPTH: **15'**

PROJECT NO. 18G5566 DATE: August 8, 2017

Water was not encountered **during drilling operation**

FIELD DATA | LABORATORY DATA | DRILLING METHOD (S)

Continuous Flight Auger & Intermittent Sampling

Legend

Clay | Sandy Clay / Silty Clay | Silty Sand / Sandy Silt

Fill | Clayey Sand | Silty Clayey Sand

DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM (Below 8" thick Asphalt & Base Layer)
			B				7							Fill: Light gray SILTY SAND
			P=3.25				24							Very stiff, dark gray FAT CLAY (CH)
5			P=2.25				26							
			P=1.25				28		69	27	42			Tan FAT CLAY (CH) - stiff from 6' to 10'
			P=1.25				26							
10			P=1.0				24							- firm to stiff from 10' to 12'
			P=0.75				28							- firm from 13' to 15'
15														
20														
25														
30														

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GEOSCIENCE ENGINEERING & TESTING, INC.

PLATE NO. 3

PROJECT: **10th Street Pavement Reconstruction – 2200 ft.**
(Grand Ave to 64 Acre Park)
Bacliff, Texas

CLIENT: **Binkley & Barfield, Inc**
Houston,Texas

BORING NO.: **B-3** DEPTH: **15'**

PROJECT NO. 18G5566 DATE: August 8, 2017

Water was not encountered **during drilling operation**

FIELD DATA | LABORATORY DATA | DRILLING METHOD (S)

Continuous Flight Auger & Intermittent Sampling

Legend

Clay | Sandy Clay / Silty Clay | Silty Sand / Sandy Silt

Fill | Clayey Sand | Silty Clayey Sand

DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM (Below 8" thick Asphalt & Base Layer)
			B				12		Non-plastic					Fill: Light gray SILTY SAND (SM) - with rocks
			P=2.25				22							Gray and brown FAT CLAY (CH) - very stiff from 2' to 4' - stiff from 4' to 6'
5			P=1.75				20							
			P=1.0				20							Tan LEAN CLAY (CL) - firm to stiff from 6' to 8' - soft to firm from 8' to 10'
			P=0.5				22		38	18	20			
10			B				18							Tan and light gray FAT CLAY (CH)
			P=1.25				31	100					0.60	- stiff from 13' to 15'
15														
20														
25														
30														

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GEOSCIENCE ENGINEERING & TESTING, INC.

PLATE NO. 4

PROJECT: **10th Street Pavement Reconstruction – 2200 ft.**
(Grand Ave to 64 Acre Park)
Bacliff, Texas

CLIENT: **Binkley & Barfield, Inc**
Houston,Texas

BORING NO.: **B-4** DEPTH: **15'**

PROJECT NO. 18G5566 DATE: August 8, 2017

Water was not encountered **during drilling operation**

FIELD DATA | LABORATORY DATA | DRILLING METHOD (S)

Continuous Flight Auger & Intermittent Sampling

Legend

Clay | Sandy Clay / Silty Clay | Silty Sand / Sandy Silt

Fill | Clayey Sand | Silty Clayey Sand

DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM (Below 8" thick Asphalt & Base Layer)
			B				7							Fill: Light gray SILTY SAND (SM) - with rocks
			P=2.0				21		53	21	32			Gray and brown FAT CLAY (CH) - stiff to very from 2' to 4' - stiff from 4' to 6'
5			P=1.5				19							
			P=1.0				16							Tan LEAN CLAY (CL) - firm to stiff from 6' to 8' - soft to firm from 8' to 10'
			P=0.5				20							
10			B				20							Tan and light gray FAT CLAY (CH)
			P=1.0				30		81	28	53			- firm to stiff from 13' to 15'
15														
20														
25														
30														

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GEOSCIENCE ENGINEERING & TESTING, INC.

PLATE NO. 5

PROJECT: **10th Street Pavement Reconstruction – 2200 ft.**
(Grand Ave to 64 Acre Park)
Bacliff, Texas

CLIENT: **Binkley & Barfield, Inc**
Houston,Texas

BORING NO.: **B-5** DEPTH: **15'**

PROJECT NO. 18G5566 DATE: August 8, 2017

Water was not encountered **during drilling operation**

FIELD DATA | LABORATORY DATA | DRILLING METHOD (S)

Continuous Flight Auger & Intermittent Sampling

Legend

Clay | Sandy Clay / Silty Clay | Silty Sand / Sandy Silt

Fill | Clayey Sand | Silty Clayey Sand

DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM (Below 8" thick Asphalt & Base Layer)
			P=1.25				23		57	22	35			Stiff, gray SANDY FAT CLAY (CH) - with concretions
			P=1.5				24							Stiff, dark gray FAT CLAY (CH)
5			P=1.25				24							
			P=1.75				21							
			P=1.0				23		56	23	33			Firm to stiff, gray FAT CLAY (CH)
10			B				27							Gray and tan FAT CLAY (CH)
			P=1.0				26	98					0.60	- firm to stiff from 13' to 15'
15														
20														
25														
30														

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GEOSCIENCE ENGINEERING & TESTING, INC.

PLATE NO. 6

PROJECT:	**10th Street Pavement Reconstruction – 2200 ft.** (Grand Ave to 64 Acre Park) Bacliff, Texas	BORING NO.: **B-6**	DEPTH: **15'**
		PROJECT NO. 18G5566	DATE: August 8, 2017
CLIENT:	**Binkley & Barfield, Inc** Houston,Texas	Water was not encountered **during drilling operation**	

DRILLING METHOD (S)

Continuous Flight Auger & Intermittent Sampling

Legend

Clay | Sandy Clay / Silty Clay | Silty Sand / Sandy Silt

Fill | Clayey Sand | Silty Clayey Sand

DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM (Below 8" thick Asphalt & Base Layer)
			P=1.5				23							Dark gray FAT CLAY (CH) - stiff from 0' to 4'
			P=1.5				23		59	22	37			
5			P=2.0				25							- stiff to very stiff from 4' to 6'
			P=1.25				22							- stiff from 6' to 8'
			P=1.25				22							Stiff, gray FAT CLAY (CH)
10			B				27							Gray and tan FAT CLAY (CH)
			P=1.0				26		59	22	37			- firm to stiff from 13' to 15'
15														
20														
25														
30														

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T- TXDOT CONE PENETRATION RESISTANCE
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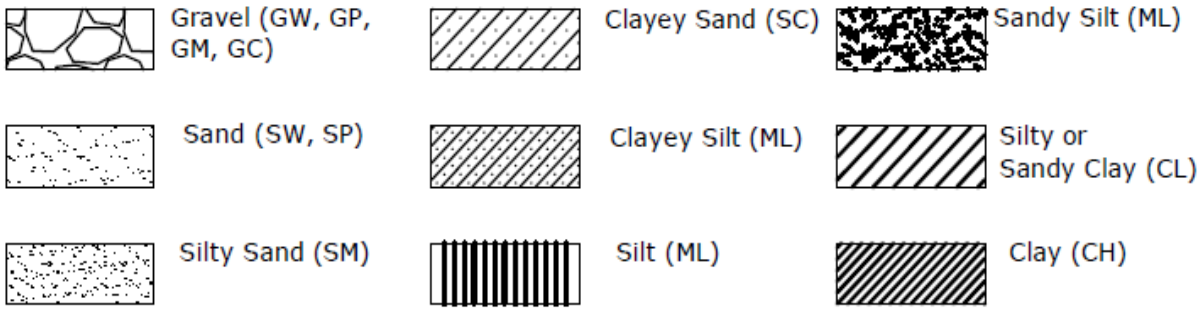
GEOSCIENCE ENGINEERING & TESTING, INC.

PLATE NO. 7

KEY TO SOIL CLASSIFICATION AND SYMBOLS



CONSISTENCY OF COHESIVE SOILS

Description	Shear Strength KSF	Penetration Resistance Blows/ Ft
Very Soft	Less than 0.25	0 - 2
Soft	0.25 - 0.5	2 - 4
Firm	0.5 - 1.00	4 - 8
Stiff	1.00 - 2.00	8 - 15
VeryStiff	2.00 - 4.00	15 - 30
Hard	Greater than 4.00	>30

RELATIVE DENSITY OF COHESIONLESS SOILS

Description	Penetration Resistance Blows / Ft	Relative Density %
Very Loose	0 - 4	0 - 15
Loose	4 - 10	15 - 35
Medium dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	>50	85 - 100

Soil Structure

CALCAREOUS NODULES	-- Nodules of Calcium Carbonate
FERROUS NODULES	-- Nodules of Ferrous Material
SLICKENSIDED	-- Having inclined planes of weakness that are slick and glossy
BLOCKY	-- Having inclined planes of weakness that are frequent and rectangular in pattern
LAMINATED	-- Composed of thin layers of varying soil type and texture
FISSURERD	-- Containing shrinkage cracks frequently filled with fine sand
INTERBEDDED	-- Composed of alternate layers of different soil types

Shelby Tube Sample | Standard Penetration Test | Auger or Wash Sample | No Recovery

GROUNDWATER

(24 hOurs) - Water Level after drilling (time increment after drilling)

- Free Water observed during drilling

FAILURE DESCRIPTION (COMPRESSION TEST)

B - Bulge
S - Shear
M/S - Multiple Shear

SLS - Failure surface occuring along slickensided plane
SAS - Failure surface occuring along or in sand seam
SS - Failure surface occuring in or along other secondary structure such as calcareous pockets

PLATE NO. 8

Project No.: 18G5566
PLATE NO.: 9