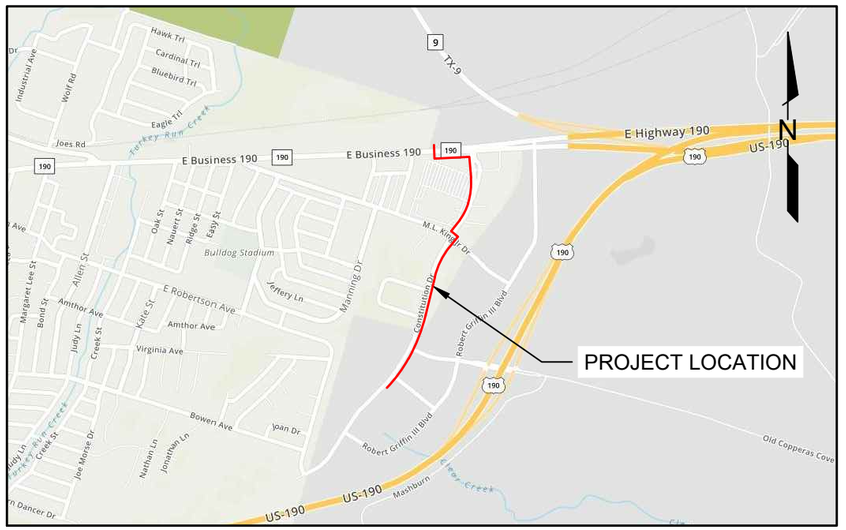
GAS UTILITY INSTALLATION PLAN

GAS UTILITY INSTALLATION
PROPOSED HDPE PIPELINE
COPPERAS COVE BUSINESS AND TECH. PARK - OFFSITE
CITY OF COPPERAS COVE, CORYELL COUNTY, TEXAS

OWNER: ATMOS ENERGY
5420 LBJ FREEWAY
DALLAS, TEXAS 75240

REV. NO. DRAWING INDEX



LOCATION MAP
N.T.S.

STATE OF TEXAS
RAY W. HOLLIDAY
127032
LICENSED
PROFESSIONAL ENGINEER

I, RAY W. HOLLIDAY, A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, HEREBY CERTIFY THAT THE CIVIL AND MECHANICAL DESIGN OF THE PIPELINE AND RELATED ASSEMBLIES MEETS OR EXCEEDS THE REQUIREMENTS OF THE CODE OF FEDERAL REGULATIONS, TITLE 49, PART 192, "TRANSPORTATION OF NATURAL AND OTHER GAS BY PIPELINE" LATEST EDITION. THIS CERTIFICATION MAKES NO GUARANTEE THAT THIS DRAWING CONTAINS COMPLETE OR CONCLUSIVE INFORMATION. THE CONSTRUCTION CONTRACTOR MUST CONTACT THE STATE "ONE CALL" SYSTEM PRIOR TO ANY EXCAVATION. THESE DOCUMENTS ARE RELEASED FOR THE PURPOSE OF BIDDING ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION.

Ray W. Holliday 7/10/20

RAY W. HOLLIDAY
TEXAS P.E. NO. 127032

DATE

NO	DATE	REVISION
A	03/23/20	ISSUE FOR BID

ATMOS energy

UniversalPegasus INTERNATIONAL
A Subsidiary of Huntington Ingalls Industries

PROJ. MGR.: SHAWN KELLEY		
PROJECT NO.: 080.22149		UEI JOB NO.: 25026
DRAWN BY: JMM	CHECKED BY: WWR	APPROVED BY: RWH
UPI DOC. CONTROL NO.: 25026-507-GNW-0001		DATE: 03/23/20

GAS UTILITY INSTALLATION
PROPOSED ATMOS ENERGY PIPELINE
COPPERAS COVE BUS. & TECH. PARK - OFFSITE
CITY OF COPPERAS COVE
COVER SHEET / INDEX

CORYELL COUNTY TEXAS

SCALE: AS SHOWN	SHEET 1 OF 12	REV
DRAWING NO. UEI-080.22149-25026-1101		A

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HDPE NOTES:

1. CONSTRUCT IN ACCORDANCE WITH CFR TITLE 49, PART 192 AND COMPANY'S GENERAL SPECIFICATIONS AND PROCEDURES.
2. CROSSINGS AT PUBLIC ROADS AND HIGHWAYS WILL MEET REQUIREMENTS OF TxDOT UAP/UAR (IF APPLICABLE).
3. MINIMUM COVER REQUIREMENTS TO TOP OF PIPE.

   HDPE

   PARALLEL TO RIGHT-OF-WAY: 36" BELOW SOIL NOT TO EXCEED: 42" BELOW SOIL
   HIGHWAY CROSSING: 30" BELOW PAVEMENT NOT TO EXCEED: 60" BELOW PAVEMENT
   X-ING BAR DITCHES: 30" BELOW SOIL NOT TO EXCEED: 48" BELOW SOIL
   WHERE PRACTICABLE
4. INHIBITOR: ___ GAL. METHANOL: ___ GAL.(ENTIRE LINE)
5. CATHODIC PROTECTION:
   - ☐ ANODES: INSTALL ___, ___ LB. ANODES PER DWG. STD.
   - ☐ RECTIFIER TO BE INSTALLED AFTER PROJECT COMPLETION.
   - ☐ EXISTING CATHODIC PROTECTION TO BE USED.
   - ☐ RECTIFIER TO BE INSTALLED AS PART OF CONSTRUCTION PROJECT.
   - ■ POLY SYSTEM, CATHODIC PROTECTION NOT REQUIRED.
6. ALL DISTANCES SHOWN ARE HORIZONTAL SURFACE DISTANCES.
7. PROPOSED AND KNOWN EXISTING PIPELINES ALONG WITH ALL KNOWN UNDERGROUND OBSTRUCTIONS TO BE STAKED PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PREVIOUSLY UNDISCOVERED UNDERGROUND OBSTRUCTIONS.
8. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 18" OPEN CUT/48" BORE OR HORIZONTAL DIRECTIONAL DRILL (HDD) CLEARANCE BETWEEN PIPELINE AND ALL UNDERGROUND OBSTRUCTIONS. IF ALL UNDERGROUND UTILITIES CAN BE LOCATED BY POT HOLING, THEN BORE OR HDD CLEARANCE MAY BE WAIVED TO 18" MINIMUM BY THE ON-SITE ATMOS ENERGY REPRESENTATIVE.
9. NO DISTURBANCE WITHIN 3 FEET HORIZONTALLY OF EXISTING ATMOS ENERGY PIPELINES WITHOUT PRIOR APPROVAL BY ATMOS ENERGY. AN ATMOS ENERGY REPRESENTATIVE MUST BE PRESENT DURING ANY CONSTRUCTION ACTIVITIES AROUND OR OVER ATMOS ENERGY PIPELINES.
10. UNIVERSAL ENSCO, INC. MAKES NO WARRANTY (EXPRESS, IMPLIED OR OTHERWISE) THAT THE INFORMATION CONTAINED HEREIN IS ACCURATE OR COMPLETE AS TO ANY AND ALL SUBSURFACE CONDITIONS. ANY RELIANCE CONTRACTOR PLACES ON THE INFORMATION CONTAINED HEREIN AS TO SUCH CONDITIONS IS DONE SO AT CONTRACTOR'S OWN RISK AND EXPENSE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE STATE "ONE CALL" SYSTEM PRIOR TO ANY EXCAVATION.
11. THE CONTRACTOR SHALL CONTACT ATMOS ENERGY REPRESENTATIVE ROBERT BIGLEY (OFFICE: 254-953-1607) AT LEAST 72 HOURS (3 BUSINESS DAYS) BEFORE COMMENCING WORK THAT WOULD AFFECT ANY UNDERGROUND UTILITIES. THE CONTRACTOR SHALL NOTIFY THE CITY FOR LOCATION OF WATER AND SANITARY SERVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION OF ALL UNDERGROUND UTILITIES.
12. THE CONTRACTOR SHALL CONTACT THE STATE ONE CALL SYSTEM AT 1-800-545-6005 AND DIG TESS AT 1-800-344-8377 AT LEAST 48 HOURS (2 BUSINESS DAYS) BEFORE COMMENCING WORK THAT WOULD AFFECT ANY UNDERGROUND UTILITIES.
13. CONTRACTOR TO GATHER AND DELIVER X-Y-Z AS-BUILT DIMENSIONS FOR ALL POINTS OF INFLECTION AND TIE-INS.
14. CONTRACTOR SHALL INSTALL APPROVED TRACING WIRE ALONG THE ENTIRE LENGTH AND ADJACENT TO POLYETHYLENE PIPE. TRACER WIRE TO BE INSTALLED APPROXIMATELY TWO TO FOUR INCHES FROM PIPE AND ON SAME APPROXIMATE ELEVATION AS PIPE. TRACER SHALL BE INSTALLED ALONG WITH POLYETHYLENE PIPE IN DIRECTIONAL BORES. CONTRACTOR SHALL INSTALL ATMOS ENERGY SUPPLIED TRACER WIRE TEST BOXES APPROXIMATELY EVERY 500 FEET AS DIRECTED BY THE ON-SITE ATMOS ENERGY REPRESENTATIVE.
15. CONTRACTOR SHALL INSTALL ATMOS ENERGY SUPPLIED PIPELINE MARKERS (T-POST WITH BOLT ON SIGNS) APPROXIMATELY EVERY 400 FEET AS DIRECTED BY THE ON-SITE ATMOS ENERGY REPRESENTATIVE.
16. CONTRACTOR TO COORDINATE WITH THE ON-SITE ATMOS ENERGY REPRESENTATIVE FOR IMPLEMENTATION OF THE SWPPP (IF REQUIRED).
17. THESE DRAWINGS ARE FOR REFERENCE ONLY. GAS LINE LOCATIONS AND OTHER MEASUREMENTS SHOWN ON THESE MAPS ARE APPROXIMATE. ATMOS ENERGY DOES NOT GUARANTEE THE ACCURACY OF THESE MAPS NOR DOES ATMOS ENERGY ASSUME ANY RESPONSIBILITY OR LIABILITY FOR RELIANCE THEREON. ANY RELIANCE ON THIS INFORMATION IS DONE AT CONTRACTOR'S OWN RISK.
18. UNIVERSAL ENSCO, INC. ADDED THE PROPOSED ATMOS ENERGY PIPELINE TO THE EXISTING DRAWINGS PROVIDED BY RONALD CARROLL SURVEYORS, INC.
19. IF VOIDS ARE ENCOUNTERED, EXCAVATION SHOULD STOP IMMEDIATELY AND CONTACT ATMOS REPRESENTATIVE MARY JOHNSON (OFFICE: 214-206-2863, CELL: 972-754-6220) TO PERFORM AN INVESTIGATION OF THE VOIDS.
20. CONTRACTOR SHALL PROVIDE ALL MATERIALS REQUIRED TO FILL FALSE HOLES CREATED FROM DIRECTIONAL DRILLS AFTER PIPE REMOVAL WITH FLOWABLE FILL.
21. CONTRACTOR SHALL VERIFY THE LOCATION, RELOCATION, ABANDONMENT, AND/OR TEMPORARY SUPPORT OF ALL UTILITIES AFFECTED BY THE CONSTRUCTION OF THE STRUCTURE AND EMBANKMENT AND COORDINATE THESE ACTIVITIES WITH THE APPROPRIATE UTILITY COMPANIES, AGENCIES, AND/OR AUTHORITIES. FOR INFORMATION ON, AND RELOCATION OF, FIBER OPTIC CABLE, CALL 1-800-336-9193. SEE EXISTING UTILITY SHEETS.
22. IF ROAD CONSTRUCTION IS UNDERWAY, PIPELINE CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR TO VERIFY FINAL GRADES AND LOCATIONS OF PROPOSED UTILITY LINES.
23. CONTRACTOR TO INSTALL MONITOR TAPS, BYPASS TAPS, AND PURGE TAPS PER ATMOS ENERGY CONSTRUCTION PROCEDURES.
24. CONTRACTOR SHALL INSTALL CASING VENTS SUPPLIED BY ATMOS ENERGY AND PER ATMOS ENERGY STANDARD STD. 01-003-01 AT LOCATIONS THAT ARE APPROVED IN ADVANCE BY THE ON-SITE ATMOS ENERGY REPRESENTATIVE.

TxDOT NOTES:

1. WHILE WORKING WITHIN THE RIGHT-OF-WAY, THE CONTRACTOR WILL BE REQUIRED TO COORDINATE HIS INSTALLATION ACTIVITIES THROUGH TxDOT'S CONSTRUCTION INSPECTOR IN CHARGE OF UTILITIES, [name listed on permit] ([ph. no. listed on permit]); AT LEAST 48 HOURS PRIOR TO WORKING IN RIGHT-OF-WAY.
2. THE UTILITY COMPANY AND/OR ITS CONTRACTOR MUST LOCATE EXISTING UTILITY LINES PRIOR TO DOING ANY GROUND WORK LIKE BORING, DIGGING, TRENCHING OR DRILLING WITHIN THE RIGHT-OF-WAY TO INSURE THAT THE LOCATION IS NOT ALREADY OCCUPIED BY ANOTHER UTILITY AND THAT NO DAMAGE WILL BE DONE TO EXISTING UTILITIES. IF THERE ARE TRAFFIC SIGNALS OR STREET LIGHTING WITHIN 1000' OF UTILITY COMPANY'S APPROVED ASSIGNMENT THE CONTRACTOR WILL NEED TO NOTIFY THE TxDOT TRAFFIC SIGNAL DEPT. AT 817-370-6500 TO LOCATE UTILITY LINES OWNED AND MAINTAINED BY TxDOT.
3. UTILITY COMPANIES AND/OR THEIR CONTRACTORS CAN WORK WITHIN THE RIGHT-OF-WAY (ROW) DURING DAYLIGHT HOURS BETWEEN 6:00 AM AND 7:00 PM MONDAY THRU FRIDAY. NO CONSTRUCTION WORK WITHIN THE ROW OUTSIDE OF THOSE TIMES WILL BE ALLOWED WITHOUT WRITTEN PERMISSION.
4. TRAFFIC CONTROL MUST CONFORM TO TxDOT REQUIREMENTS AND RECOMMENDATIONS, AND SHOULD MEET OR EXCEED THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
5. LANE CLOSURES ARE NOT ALLOWED IN INCLEMENT WEATHER OR IF THE PAVEMENT IS WET OR ICY.
6. LANE CLOSURES WILL ONLY BE ALLOWED BETWEEN 9:00 AM AND 4:00 PM MONDAY THRU FRIDAY. A 48 HOUR NOTIFICATION PRIOR TO SET UP IS REQUIRED.
7. THE UTILITY COMPANY OR ITS CONTRACTOR WILL BE HELD RESPONSIBLE FOR KEEPING THE STATE ROADWAY FREE OF MUD, ROCKS, AND GENERAL DEBRIS.
8. NO CONSTRUCTION EQUIPMENT RELATIVE TO A UTILITY LINE INSTALLATION WILL BE ALLOWED ON THE ROADWAY OR SHOULDER, UNLESS SPECIFICALLY AUTHORIZED BY TxDOT. EXCAVATED MATERIALS SHALL BE KEPT OFF THE PAVEMENT AT ALL TIMES.
9. WORK CREWS AND EQUIPMENT SHALL BE CONFINED TO AREAS OUTSIDE OF THE ROADWAY SHOULDER AND OFF THE EDGE OF PAVEMENT. THIS INCLUDES FIELD CREW VEHICLES.
10. CONSTRUCTION EQUIPMENT LEFT OVERNIGHT IN THE RIGHT-OF-WAY MUST BE SECTIONED OFF WITH ORANGE PLASTIC MESH FENCING, AND BE PLACED AT LEAST 30' OFF THE EDGE OF PAVEMENT. EQUIPMENT LOCATED CLOSER THAN 30' MUST BE PROTECTED BY CONCRETE TRAFFIC BARRIERS (CTB).
11. ALL ASPHALT AND CONCRETE DRIVEWAYS LOCATED WITHIN THE STATE RIGHT-OF-WAY MUST BE BORED. AN EXCEPTION TO THIS RULE WILL BE ALLOWED, ONLY IF THE OWNER OF THE DRIVEWAY IS WILLING TO PROVIDE TxDOT A LETTER GRANTING THE CONTRACTOR PERMISSION TO OPEN CUT THEIR DRIVEWAY. THE LETTER MUST BE SIGNED AND REFLECT THE PROPERTY OWNER'S NAME, ADDRESS, AND PHONE NUMBER. TxDOT MAY CONTACT OWNER TO VERIFY THE LETTER'S ACCURACY.
12. BORE PITS LOCATED WITHIN 10' FROM THE EDGE OF PAVEMENT MUST BE REINFORCED WITH WOOD OR STEEL TO INSURE THAT THE EXISTING ROADWAY OR PIT WALLS DON'T COLLAPSE. REINFORCED WALL SHORING AND/OR TRENCH BOX PROTECTION IS REQUIRED FOR ALL HOLES, PITS, AND TRENCHES DEEPER THAN 5'. BORE PITS LOCATED CLOSER THAN 30' FROM THE EDGE OF PAVEMENT SHOULD BE PROTECTED BY CONCRETE TRAFFIC BARRIERS. OPEN PITS MUST BE SEALED OFF BY ORANGE PLASTIC MESH FENCING, CONES, AND DRUMS.
13. THE CONTRACTOR WILL BE REQUIRED TO RESTORE THE GROUND TO ITS ORIGINAL LINES, GRADES, AND CONTOURS BY TAMPING DOWN BACKFILLED AREAS BY MEANS OF POUNDING OR COMPACTING IN 6" HORIZONTAL LAYERS TO A DENSITY EQUAL TO THAT OF THE SURROUNDING SOIL, SHAPING AND REVEGETATING ALL DISTURBED AREAS TO THE EXTENT PRACTICABLE. DAMAGED AREAS ON WHICH UTILITY CONSTRUCTION HAS CEASED TEMPORARILY OR PERMANENTLY SHALL BE REVEGETATED WITHIN 14 DAYS UNLESS CONSTRUCTION IS SCHEDULED TO RESUME WITHIN 21 DAYS.
14. GAS FACILITIES ABANDONED WITHIN TxDOT R.O.W. WILL BE REMOVED IF THE PIPELINE IS NOT LOCATED UNDER EXISTING PAVEMENT AND REMOVAL WILL NOT CAUSE DAMAGE TO EXISTING UNDERGROUND UTILITIES. IF REMOVAL IS NOT POSSIBLE, THE RETIRED GAS MAIN WILL BE GROUT-FILLED AND ABANDONED IN PLACE.

STEEL PIPE TABLE

MARK	NOMINAL PIPE SIZE (INCHES)	O.D. (In.)	WALL THKNS. (In.)	PIPE GRADE	CLASS LOC.	DESIGN FACTOR	PSIG @ 100% S.M.Y.S.	EXISTING MAOP (PSIG)	SYSTEM DESIGN PRESS (PSIG)	PIPE SEAM	INTERNAL HOOP STRESS % S.M.Y.S.	MAX TESTING REQUIREMENTS: MIN. TEST PRESSURE (PSIG)	MAX. TEST PRESSURE (PSIG)	TEST DURATION (HOUR)	X-RAY %	COATING SPEC.	FIELD JOINT COATING	PIPE LENGTH (FEET)
B	10	10.75	–	B	CASING	–	–	–	–	ERW	–	–	–	–	–	ARO (30-40 MILS)	BARE	133
C	2	2.375	–	B	VENT	–	–	–	–	ERW	–	–	–	–	–	ARO (30-40 MILS)	BARE	10

WELDING SPECIFICATION : WPS-S42GA

HDPE PIPE TABLE

MARK	NOMINAL PIPE SIZE (INCHES)	D: O.D. (In.)	t: MIN. W.T. (In.)	DIAMETER RATIO D/R	S: MIN. YIELD (PSI)	MAX. DESIGN PRESSURE (PSIG)	DESIGN MAOP (PSIG)	PSIG @ 100% S.M.Y.S.	MINIMUM TEST PRESSURE (PSIG)	MAXIMUM TEST PRESSURE (PSIG)	MINIMUM TEST DURATION HOURS	% S.M.Y.S.	PIPE LENGTH (FEET)
A	6	6.625	0.602	11.0	1600	102	60	320	153	163	*	18.75	5224

*TESTING SPECIFICATIONS: CONSTRUCTION PROCEDURES, CHAPTER 6, LATEST EDITION.
FUSION SPECIFICATIONS: CONSTRUCTION PROCEDURES, CHAPTER 3, LATEST EDITION.

PRINCIPAL DESIGN EQUATION (BARLOW'S) FOR HDPE PIPE

$$P = 2 \times S \times \frac{t}{D-t} \times .32$$

WHERE:

P = DESIGN PRESSURE (PSIG)
S = MINIMUM YIELD STRENGTH (PSI)
D = NOMINAL OUTSIDE DIAMETER (IN.)
t = NOMINAL WALL THICKNESS OF PIPE (IN.)
MAOP = MAXIMUM ALLOWABLE OPERATING PRESSURE (PSIG)

6" HDPE

$$P = 2 \times 1600 \times \frac{0.602 \text{ IN.}}{6.625 \text{ IN.} - 0.602 \text{ IN.}} \times .32$$

P = 102 PSIG ALLOWABLE BY CALCULATION
P = 60 PSIG ACTUAL DESIGN MAOP

LIST OF MATERIALS			
ITEM	QTY	UNIT	DESCRIPTION
1	5224	FT	PIPE, HDPE, 6" PE 3408 SDR 11
2	100	FT	PIPE, 10.75" X 0.365" WT, API 5L-B, ERW, BARE CASING
3	11	EA	WIRE, #12 CU YLM SOLID THHN 500 FT
4	130	EA	6" ELECTROFUSION COUPLING
5	1	EA	6" TRANSITION FITTING
6	1	EA	6" HDPE TEE
7	1	EA	6" 3-WAY STEEL TEE
8	1	EA	6" X 4" HDPE REDUCER
9	5	EA	6" 90° HDPE ELL
10	1	EA	6" HDPE CAP
11	1	EA	4" HDPE TEE
12	11	EA	GAS PIPELINE MARKER
13	11	EA	MARKER BALL
14	11	EA	5# ANODE
15	2	EA	TEST STATION

LEGEND

- PROPOSED ATMOS ENERGY PIPELINE
- G — EXISTING ATMOS ENERGY PIPELINE
- EXISTING RIGHT OF WAY
- EXISTING RIGHT OF WAY CENTERLINE
- EXISTING ROADS AND DRIVEWAYS
- EXISTING EASEMENT
- EX. T — EXISTING BURIED TELEPHONE LINE
- EX. SS — EXISTING SANITARY SEWER LINE
- EX. SW — EXISTING STORM SEWER LINE
- EX. W — EXISTING WATER LINE
- EX. OH — EXISTING OVERHEAD ELECTRIC
- PROPOSED CASING
- TP — TIE POINT
- PROPOSED CAP
- PROPOSED TRANSITION FITTING
- PROPOSED ELECTROFUSION COUPLING
- PROPOSED REDUCER
- EXISTING REDUCER
- C/L — CENTERLINE
- P.U.E — PUBLIC UTILITY EASEMENT

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Ray W. Holliday 7/10/20

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GAS UTILITY INSTALLATION
PROPOSED ATMOS ENERGY PIPELINE
COPPERAS COVE BUS. & TECH. PARK - OFFSITE
CITY OF COPPERAS COVE
GENERAL NOTES / PIPE DATA
CORYELL COUNTY TEXAS

SCALE: NONE	SHEET 2 OF 12	REV
DRAWING NO. UEI-080.22149-25026-1202		A

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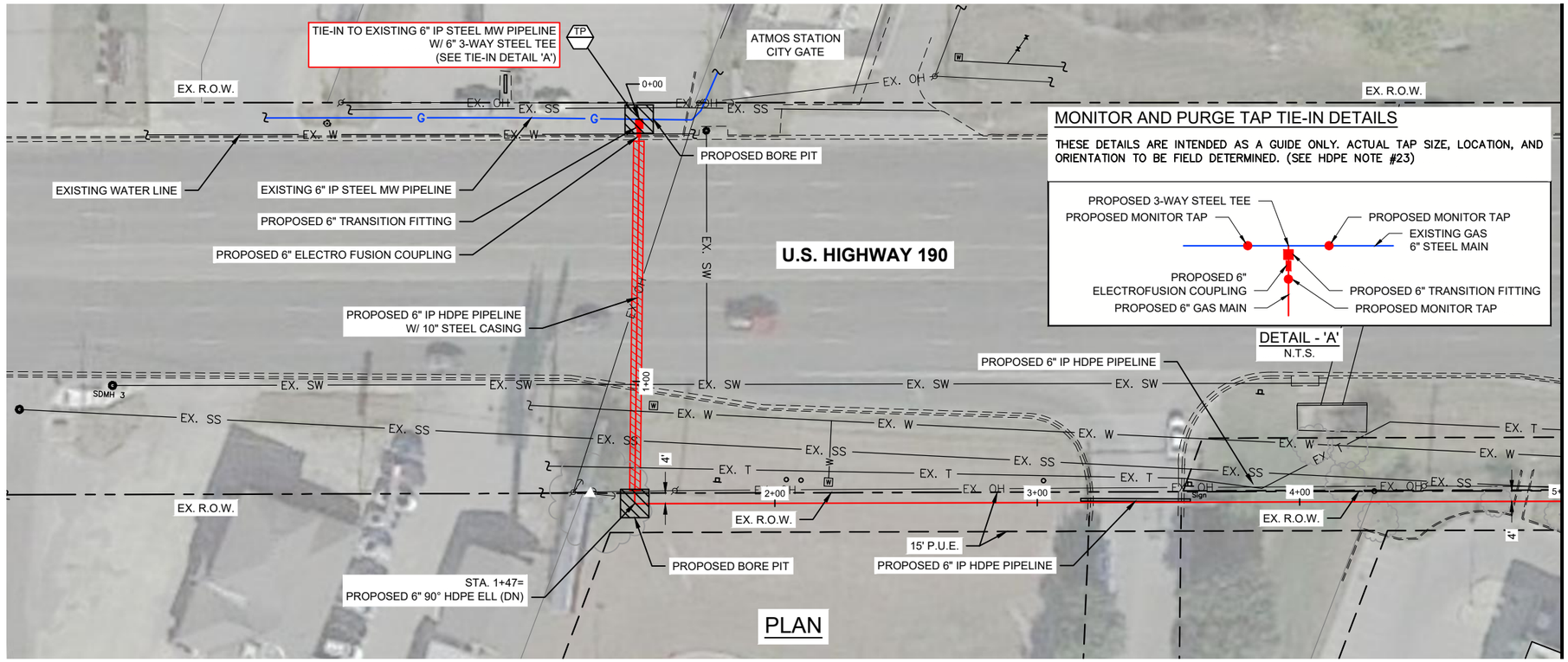
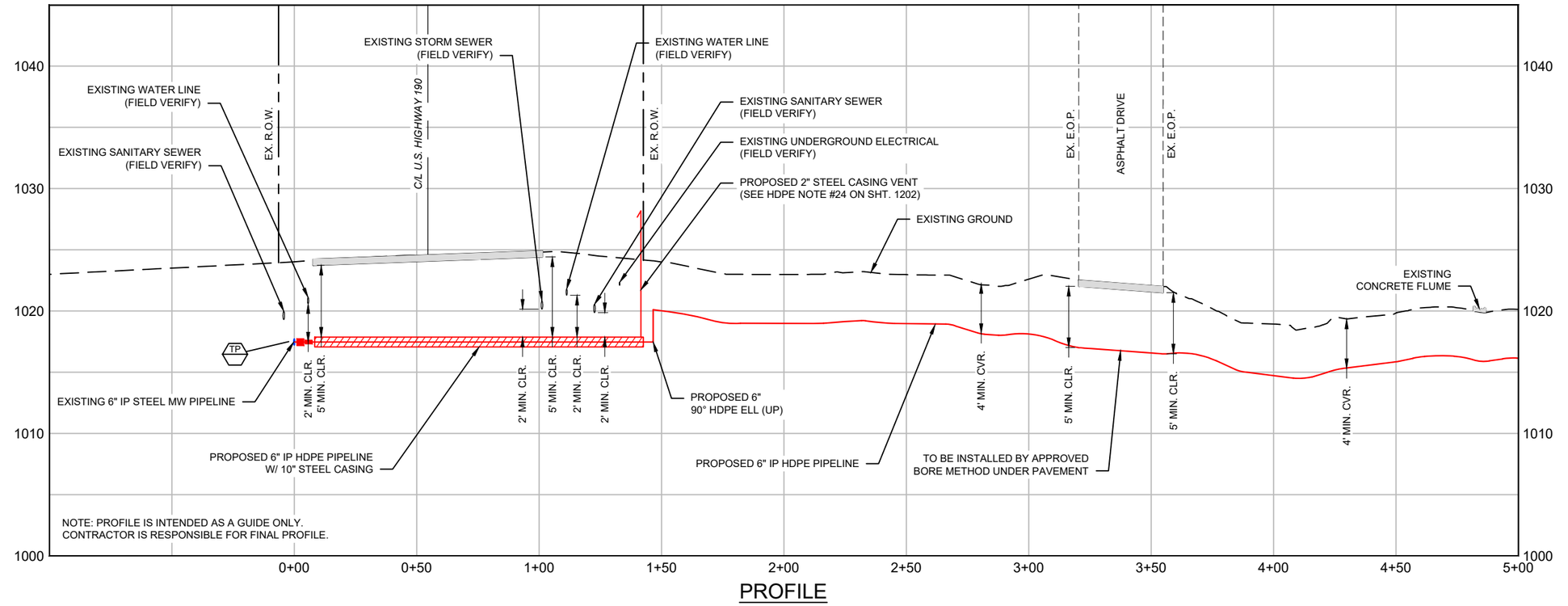
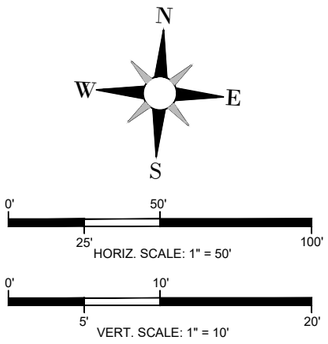
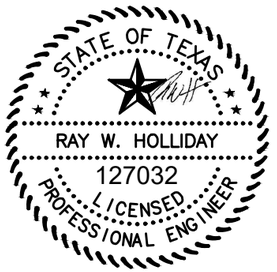




PROFILE





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GAS UTILITY INSTALLATION
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COPPERAS COVE BUS. & TECH. PARK - OFFSITE
CITY OF COPPERAS COVE
PLAN & PROFILE - STA. 0+00 TO STA. 5+00
CORYELL COUNTY TEXAS

SCALE: AS SHOWN	SHEET 3 OF 12	REV
DRAWING NO. UEI-080.22149-25026-1303		A

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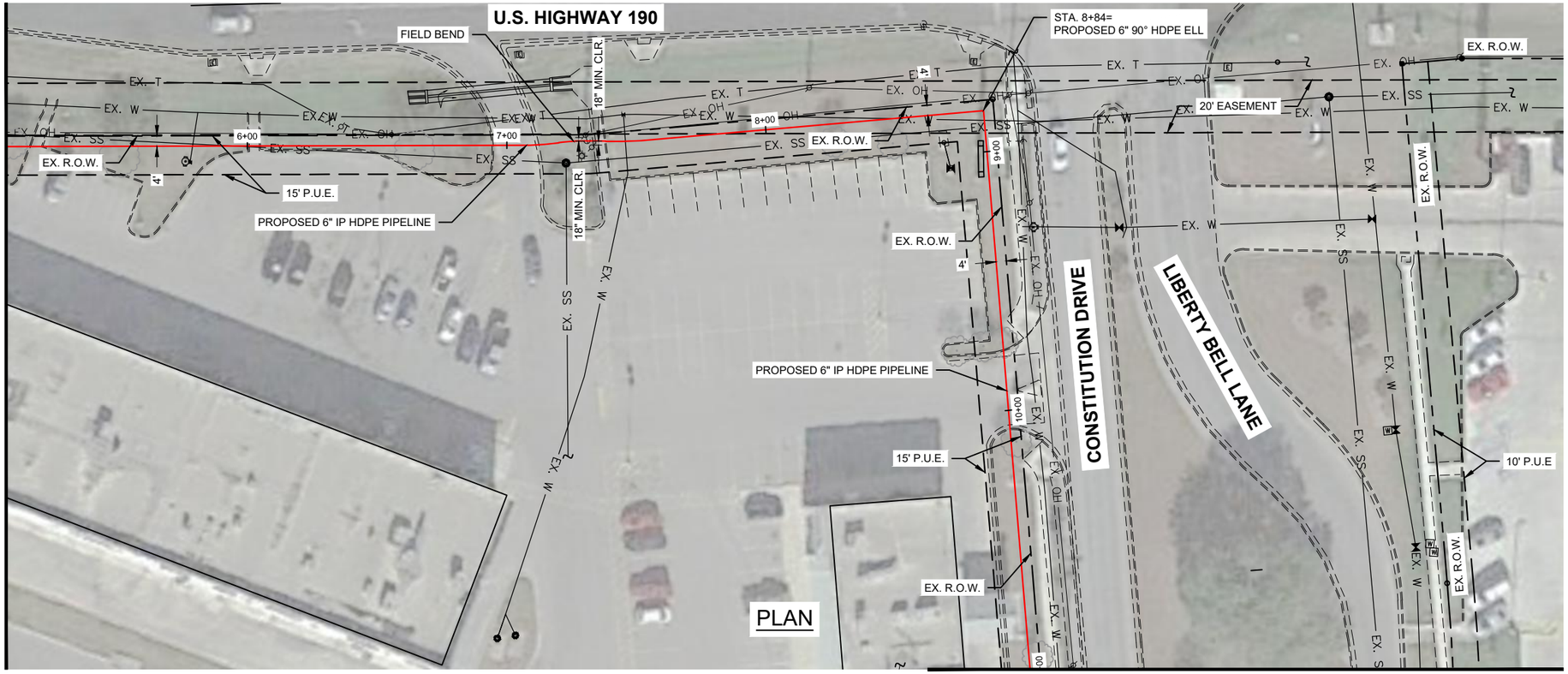

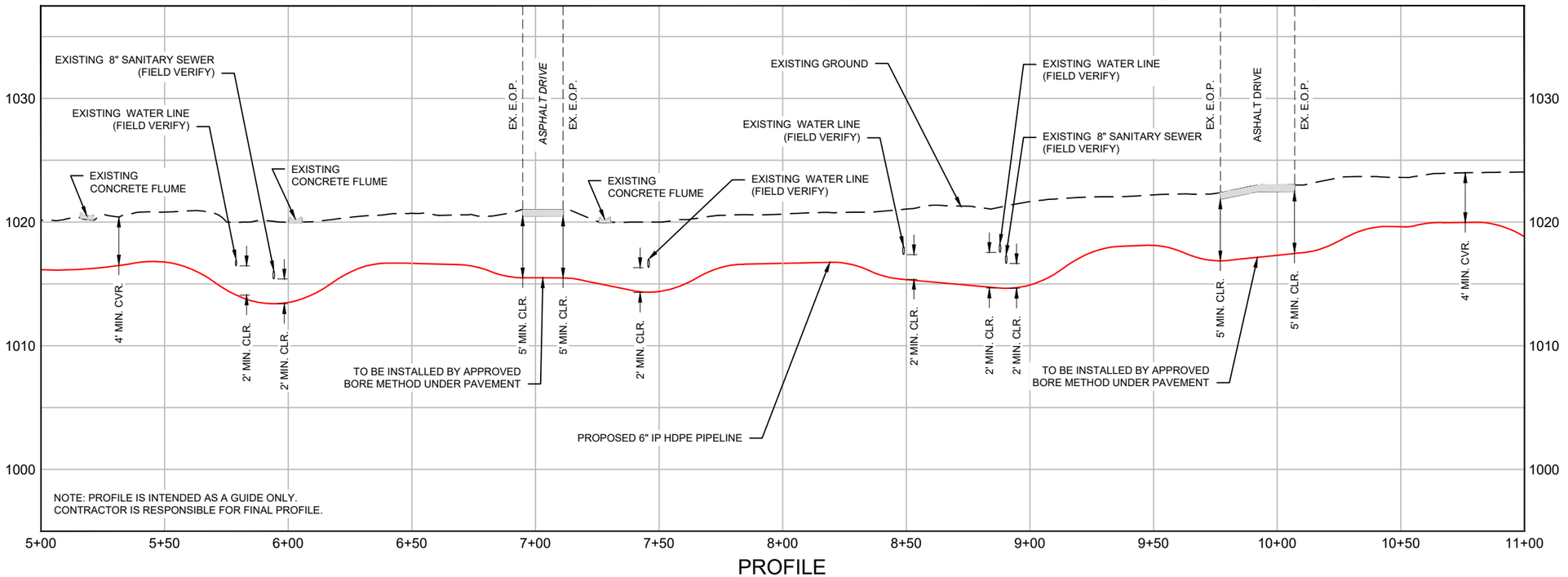

PROFILE

N
W
E
S

0' 50'
25' HORIZ. SCALE: 1" = 50' 100'

0' 10'
5' VERT. SCALE: 1" = 10' 20'

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SCALE: AS SHOWN	SHEET 4 OF 12	REV
DRAWING NO. UEI-080.22149-25026-1304		A

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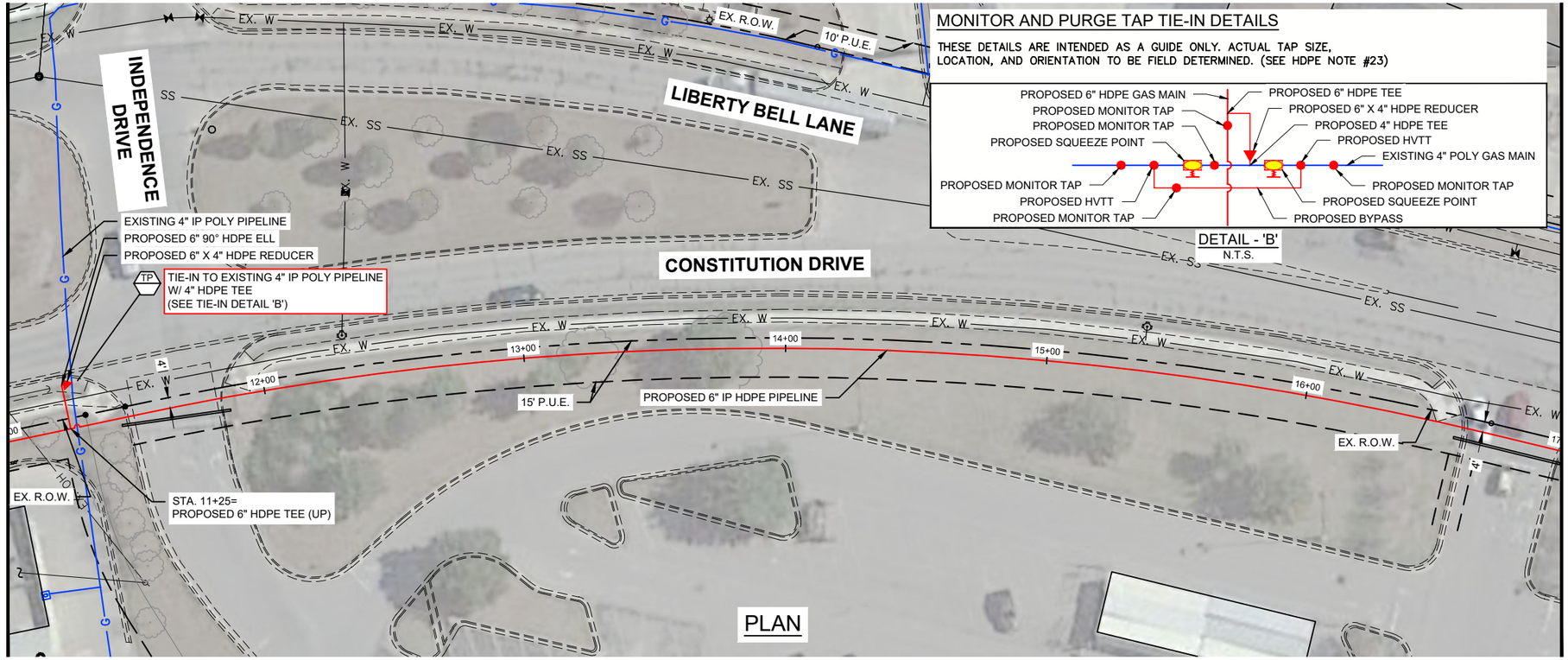
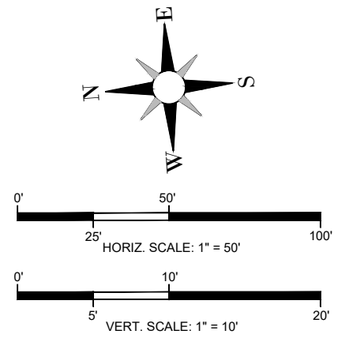
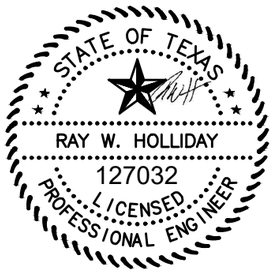


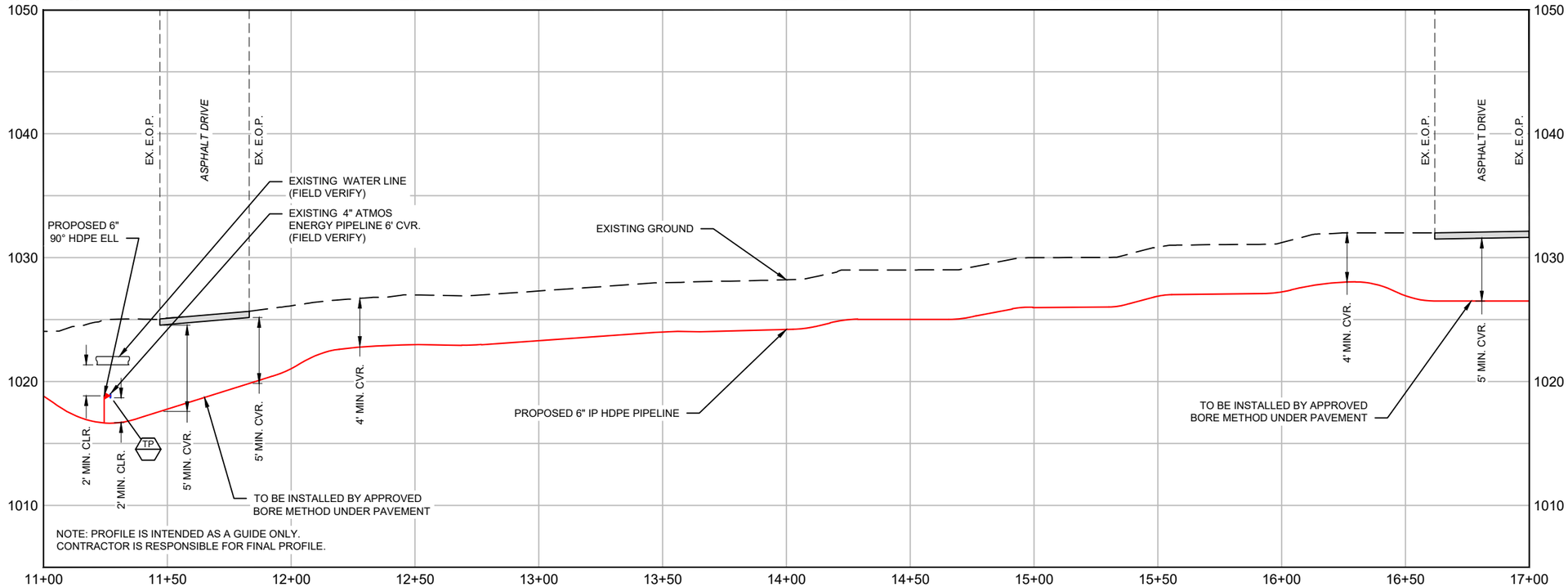
MONITOR AND PURGE TAP TIE-IN DETAILS

THESE DETAILS ARE INTENDED AS A GUIDE ONLY. ACTUAL TAP SIZE, LOCATION, AND ORIENTATION TO BE FIELD DETERMINED. (SEE HDPE NOTE #23)

DETAIL - 'B'
N.T.S.







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RAY W. HOLLIDAY
TEXAS P.E. NO. 127032

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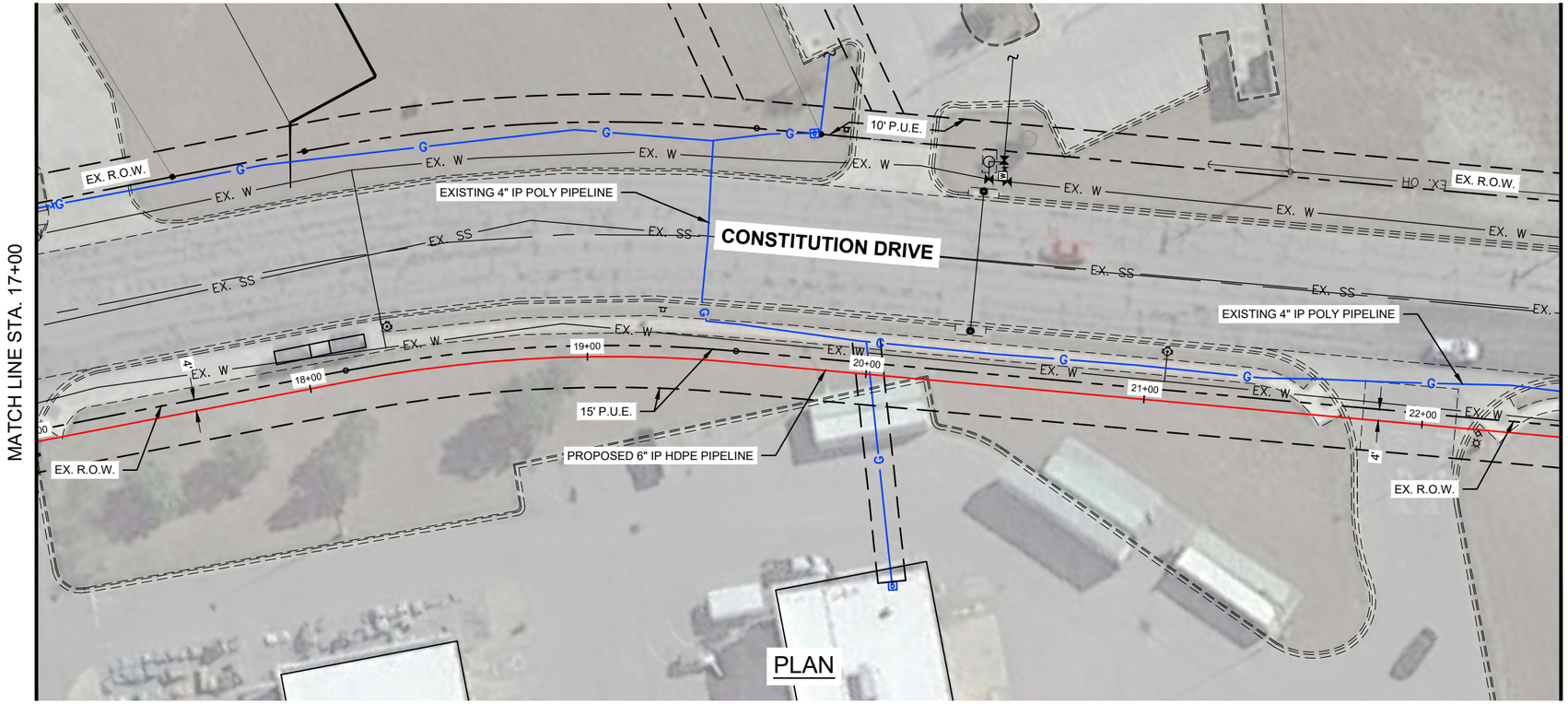

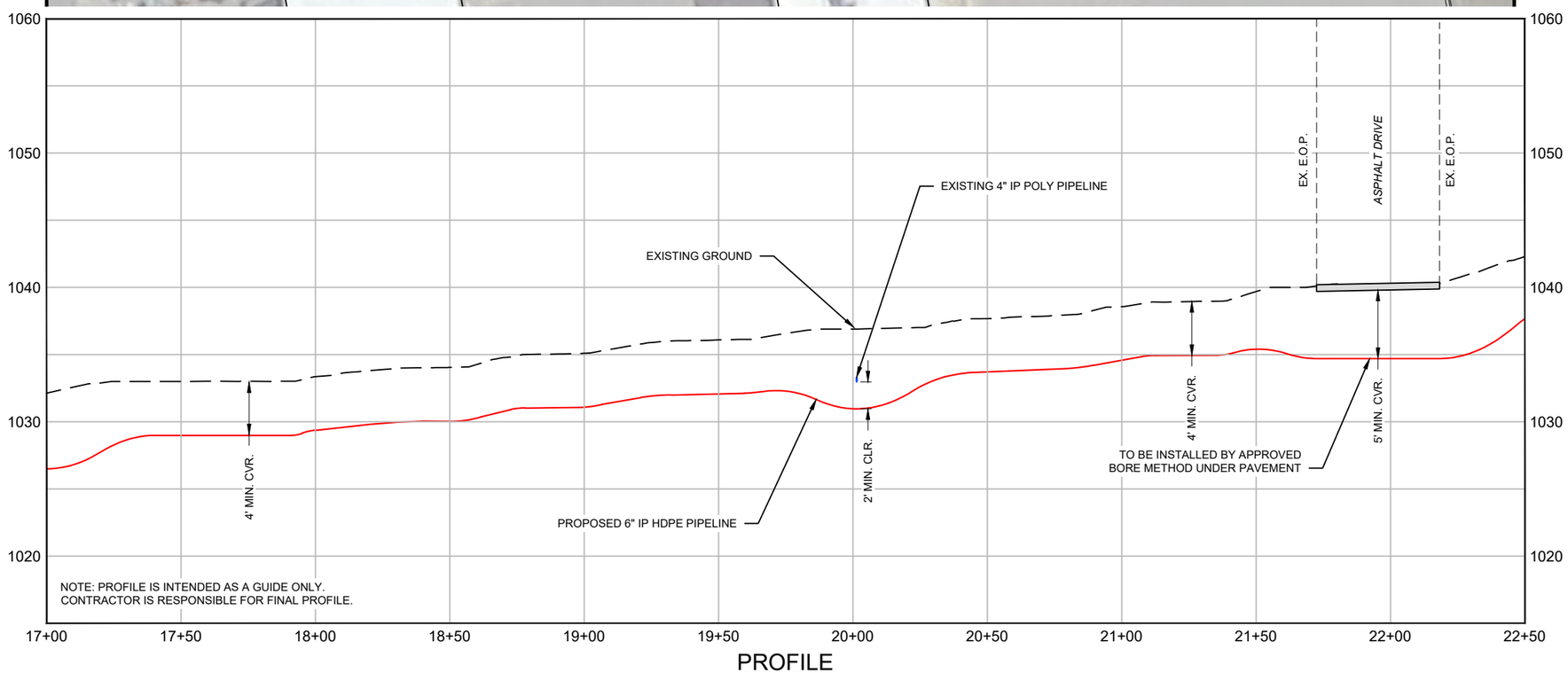

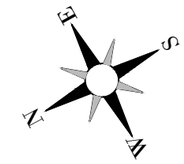

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127032
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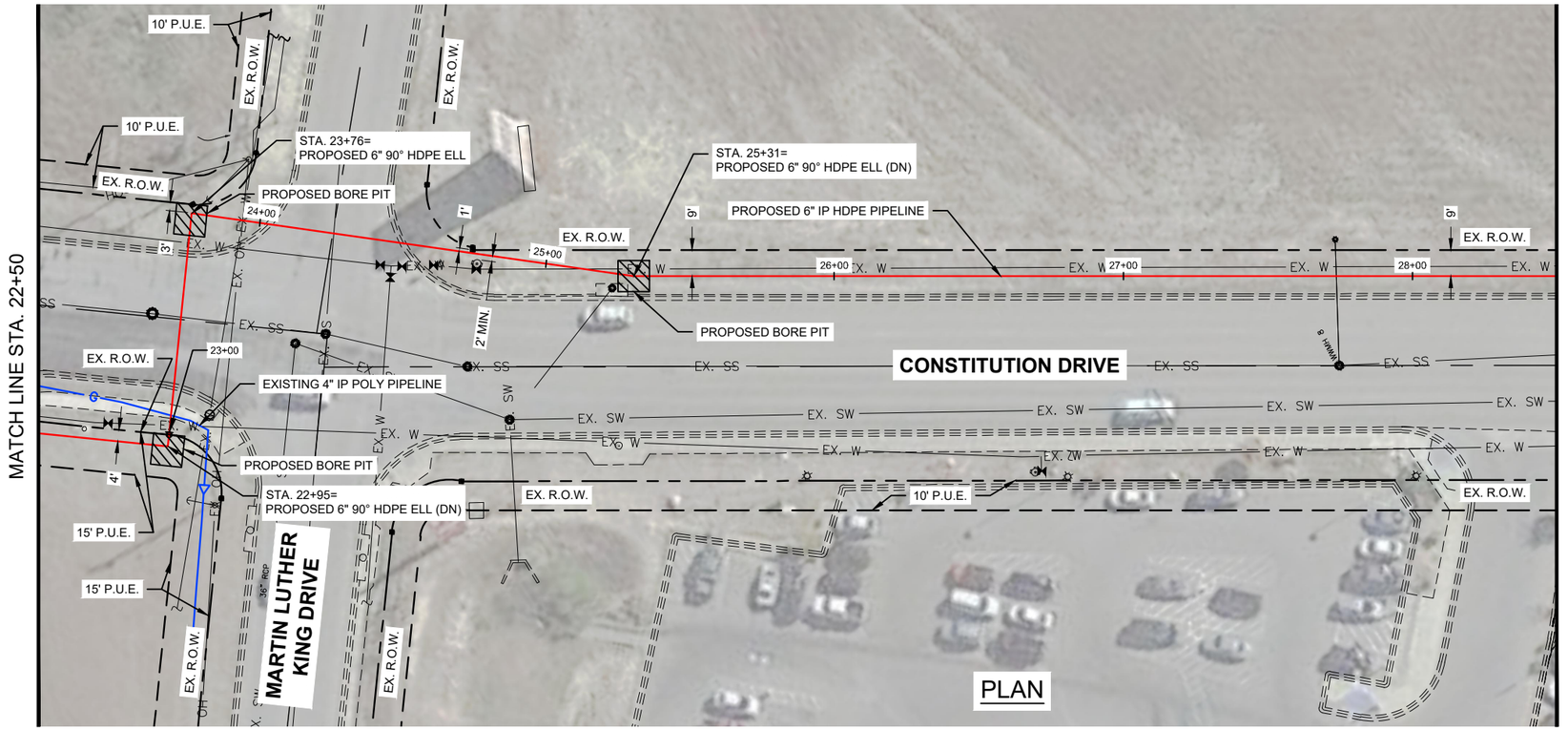

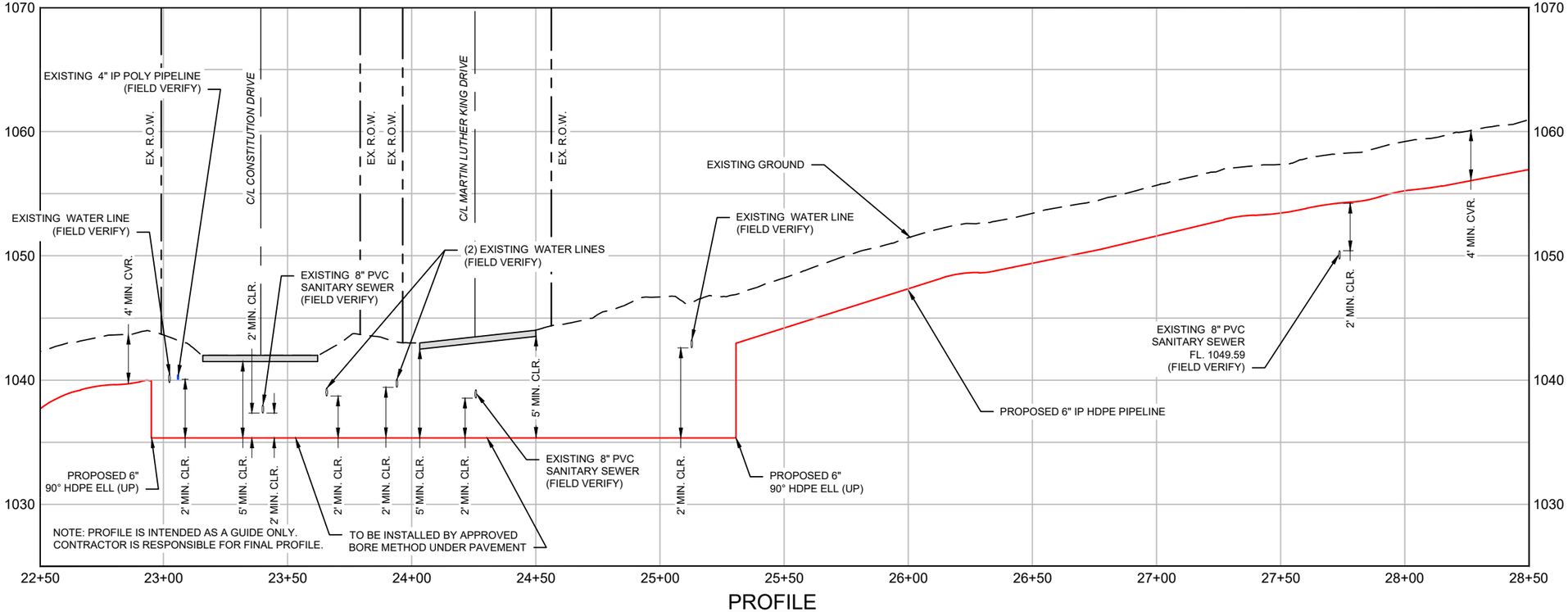

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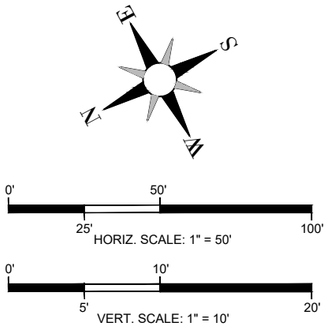

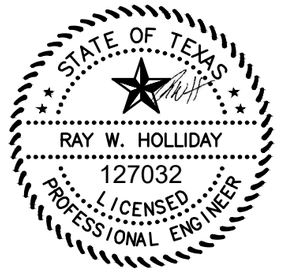

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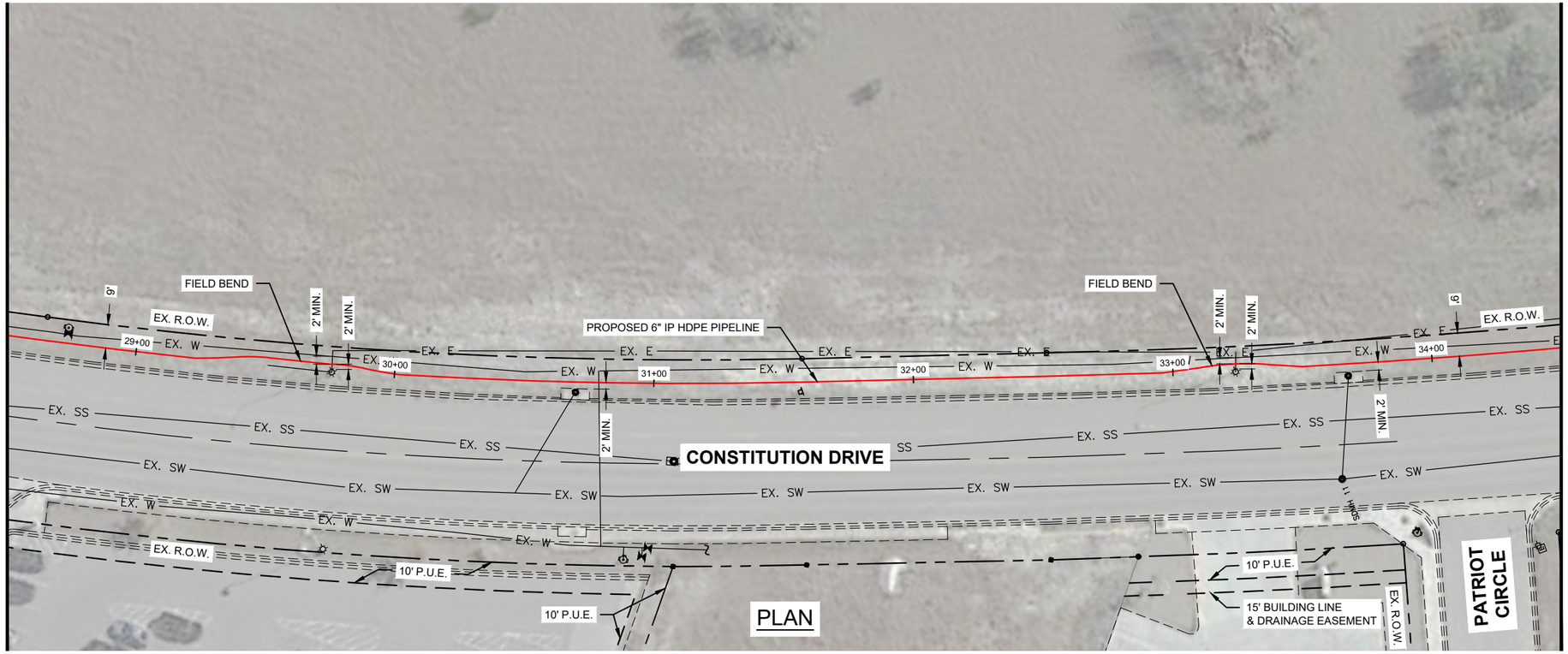

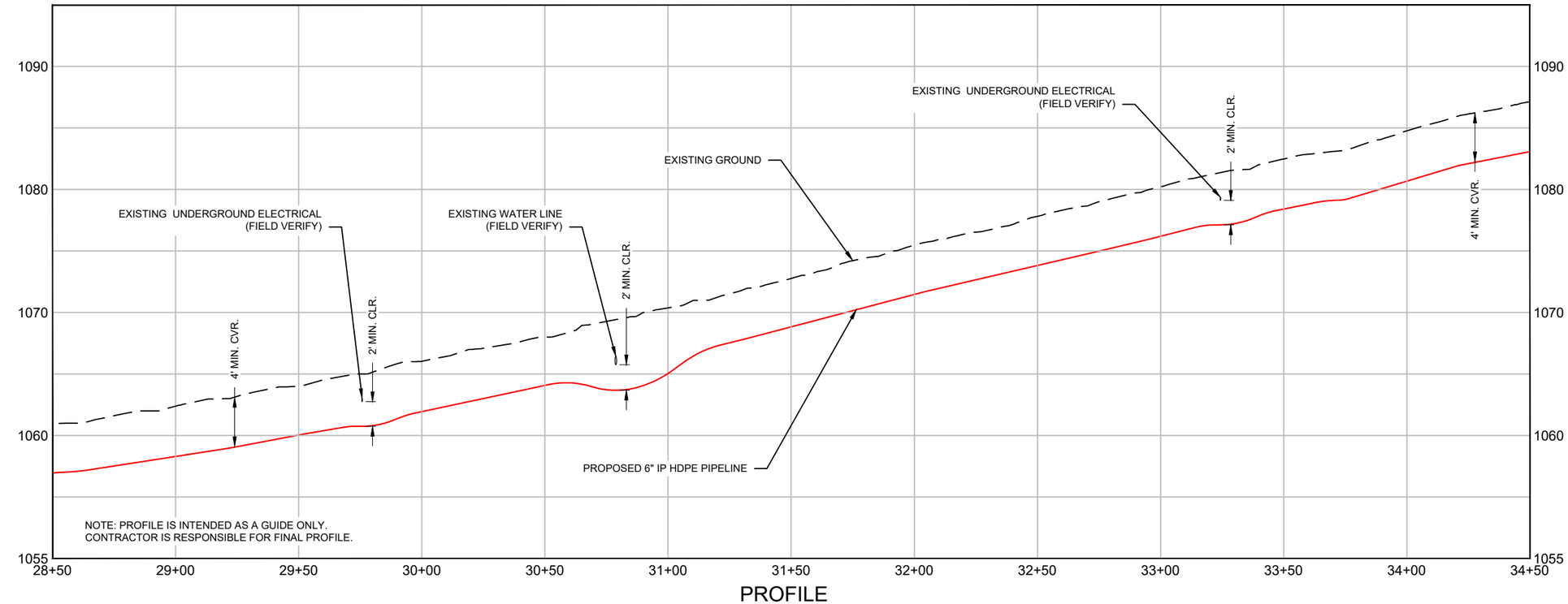

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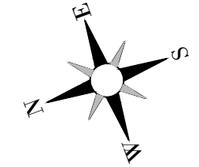

0' 50'
25' 100'
HORIZ. SCALE: 1" = 50'

0' 10'
5' 20'
VERT. SCALE: 1" = 10'

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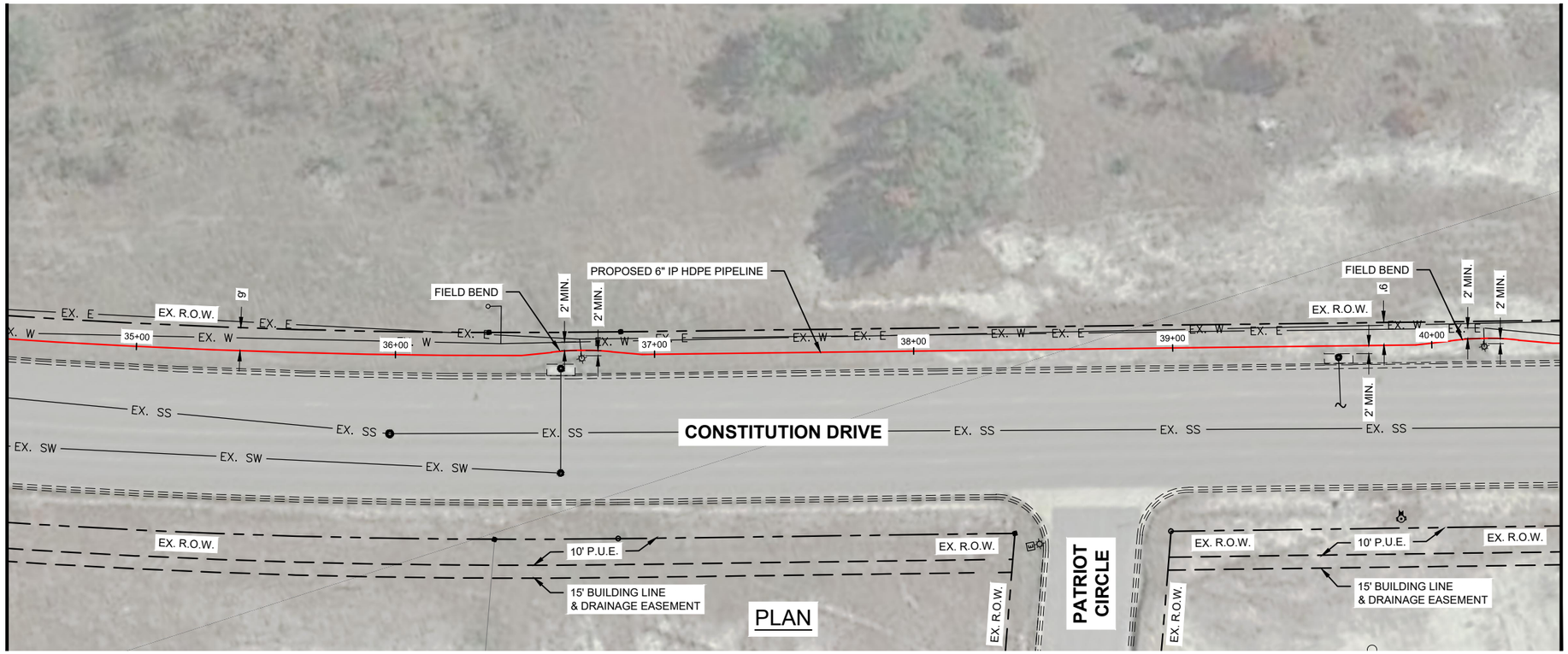

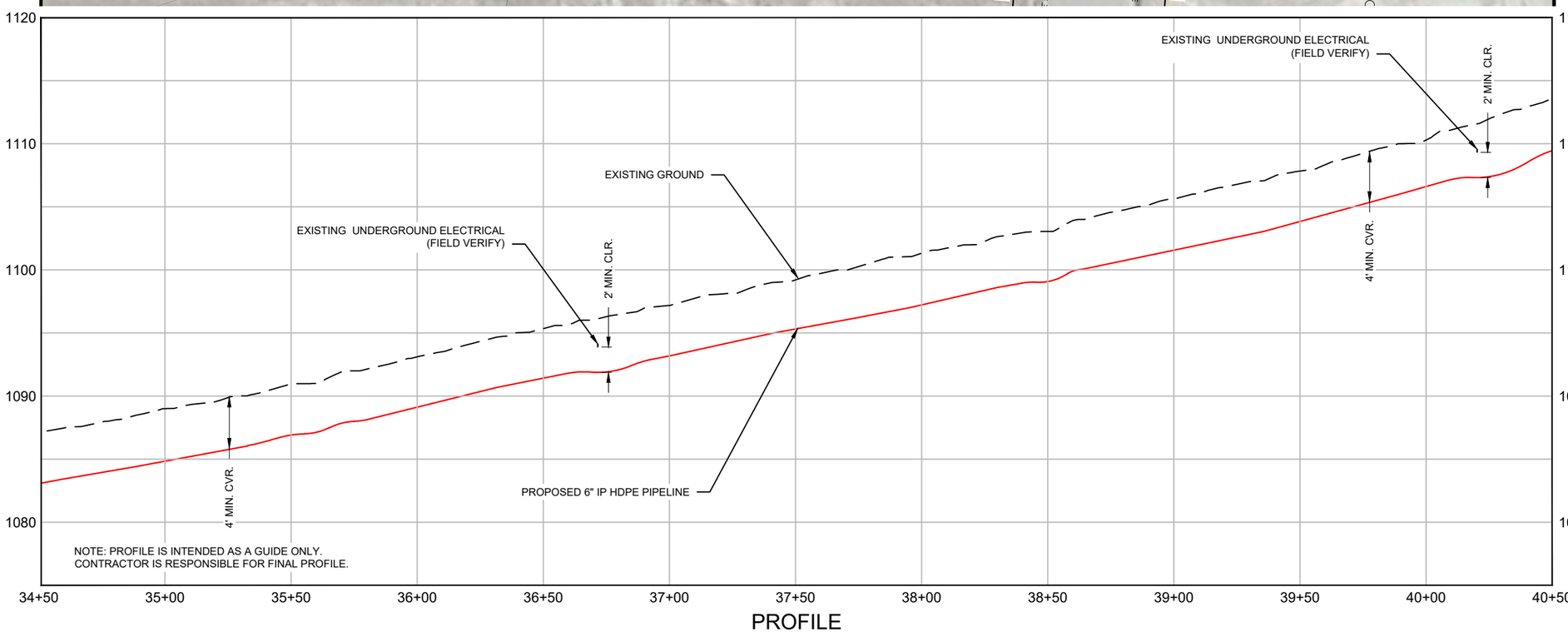

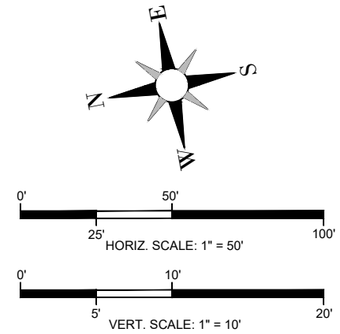

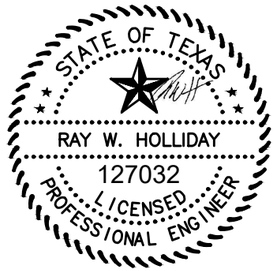

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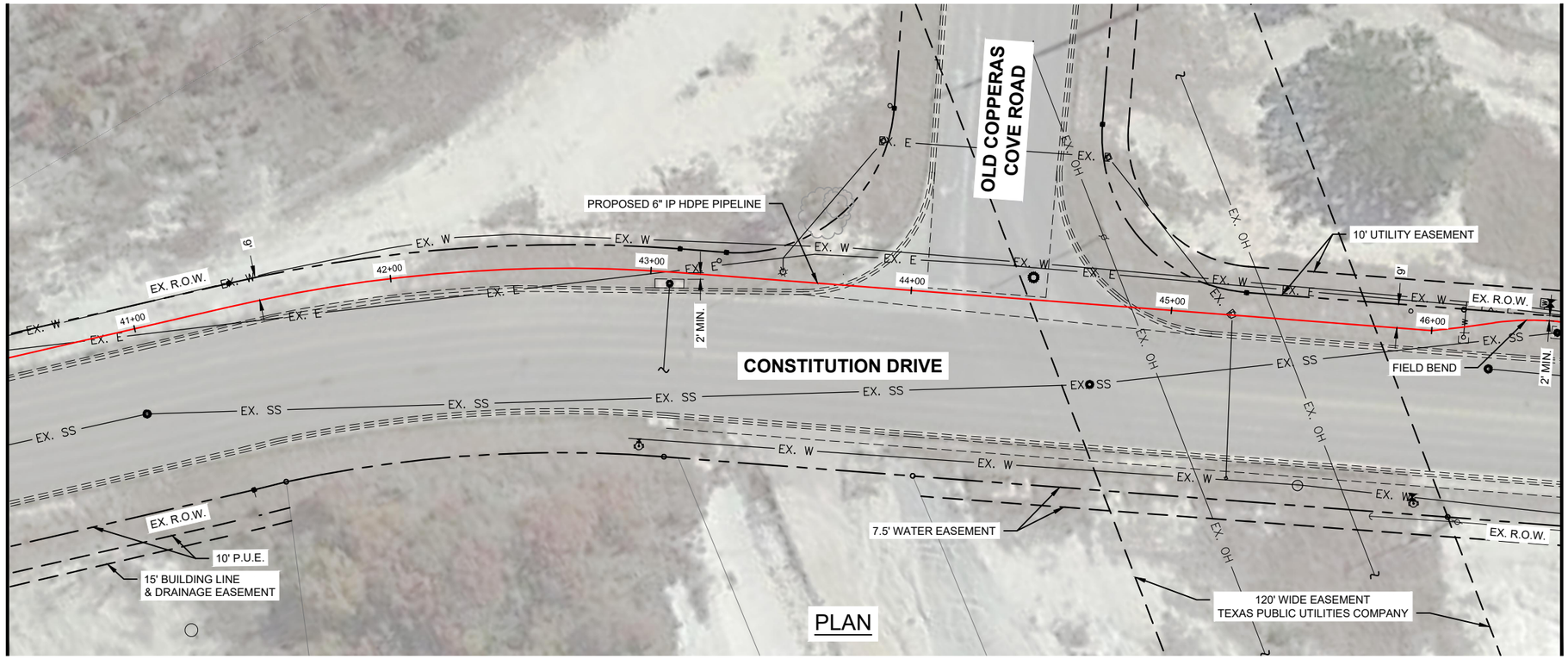

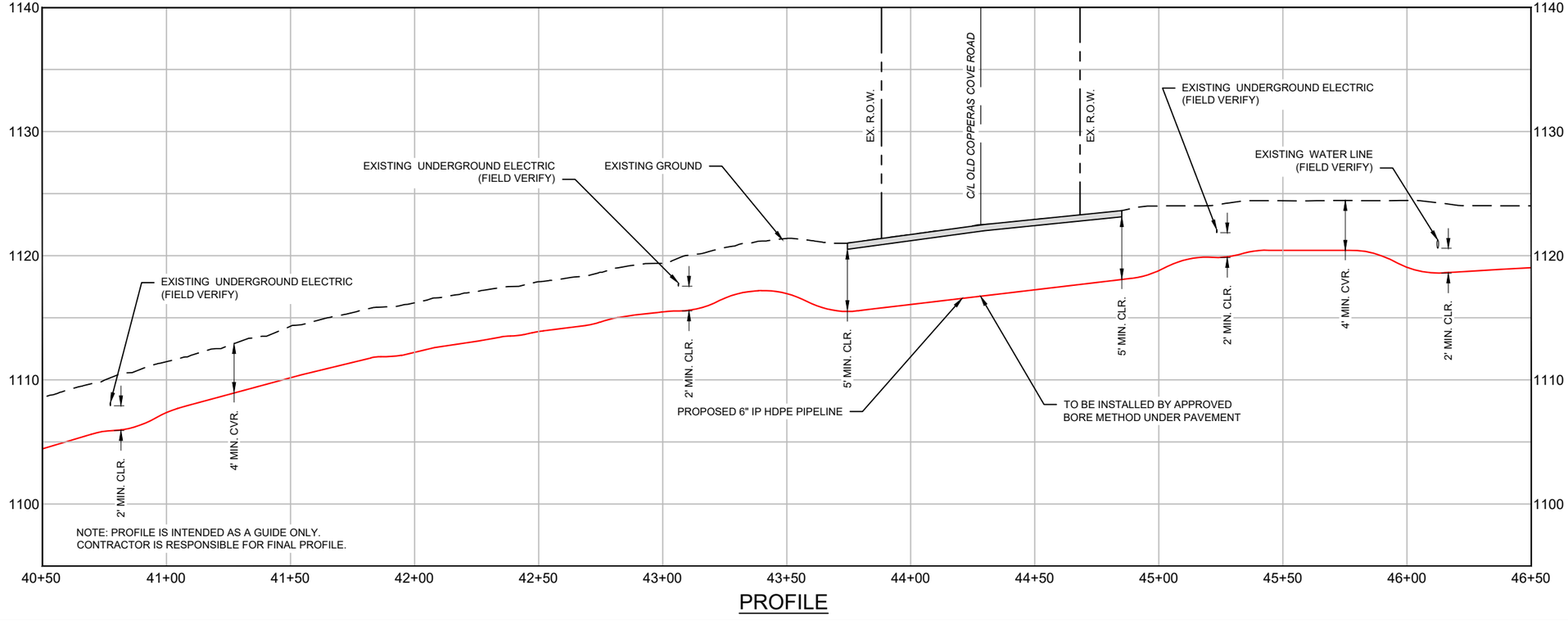

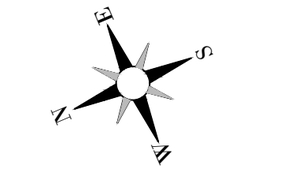

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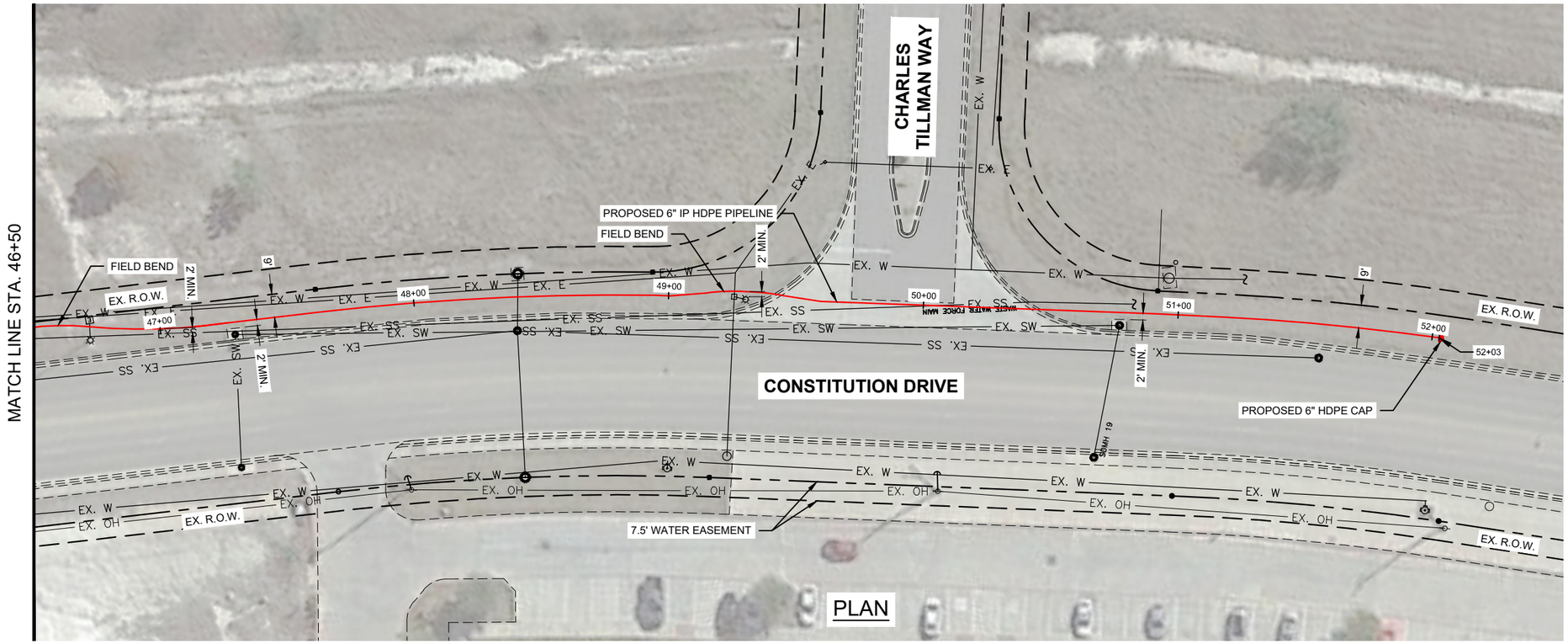

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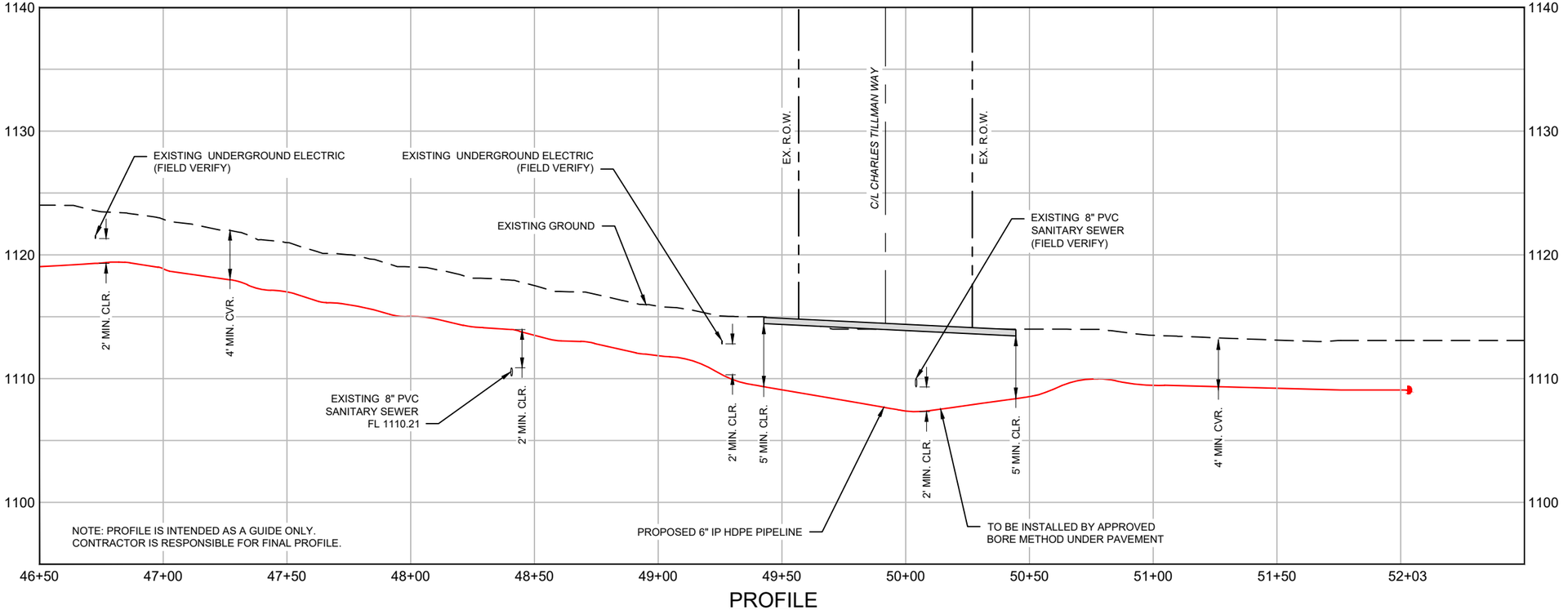

PROFILE

0' 50'
25' 100'
HORIZ. SCALE: 1" = 50'

0' 10'
5' 20'
VERT. SCALE: 1" = 10'

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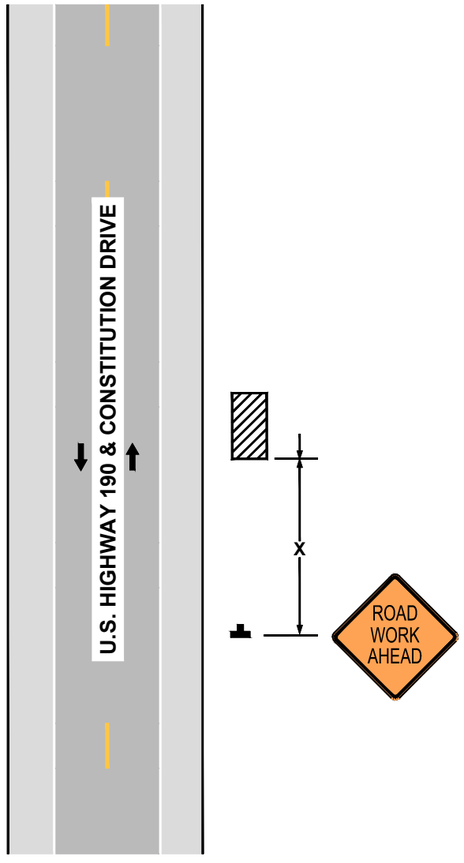
Figure 6H-1. Work Beyond the Shoulder (TA-1)



Typical Application 1

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

Arrow board	Shadow vehicle
Arrow board support or trailer (shown facing down)	Sign (shown facing left)
Changeable message sign or support trailer	Surveyor
Channelizing device	Temporary barrier
Crush cushion	Temporary barrier with warning sign
Direction of temporary traffic detour	Traffic or pedestrian signal
Direction of traffic	Truck-mounted attenuator
Flagger	Type 3 barricade
High-level warning device (Flag tree)	Warning light
Longitudinal channelizing device	Work space
Luminaire	Work vehicle
Pavement markings that should be removed for a long term project	

Table 6H-3. Suggested Advance Warning Sign Spacing

Road Classification	Posted Speed (MPH)	Sign Spacing "X" (Feet)
Conventional Highway	25	100
	30	120
	35	160
	40	240
	45	320
	50	400
	55*	500
	60*	600
	65*	700
	70*	800
	75*	900
	80*	1000
Expressway or Freeway	All Speeds	See Typical Applications**

* Distance between signs should be increased to have 1500 feet advance warning. (See Section 6C.04.07)
** Distance between signs should be increased to have 1/2 mile or more advance warning. (See Section 6C.04.05)

Table 6H-4. Merging Taper Lengths and Spacing of Channelizing Devices

		* Minimum Desirable Taper Lengths			Suggested maximum Spacing of Channelizing Devices	
Posted Speed	Formula	10' Offset	11' Offset	12' Offset	On a taper	On a tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

* Taper lengths have been rounded off.
L = Length of Taper (Feet) W = Width of Offset (Feet) S = Posted Speed (MPH)

Notes for Figure 6H-1 - Typical Application 1
Work Beyond the Shoulder

Guidance:

1. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

Option:

2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. The ROAD WORK AHEAD sign may be omitted where the work space is behind a barrier, more than 24 in behind the curb, or 15 ft or more from the edge of any roadway.
4. For short-term, short-duration or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

6. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

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PROJ. MGR.: SHAWN KELLEY		
PROJECT NO.: 080.22149		UEI JOB NO.: 25026
DRAWN BY: JMM	CHECKED BY: WWR	APPROVED BY: RWH
UPI DOC. CONTROL NO.: 25026-415-PMW-0012		DATE: 03/23/20

GAS UTILITY INSTALLATION
PROPOSED ATMOS ENERGY PIPELINE
COPPERAS COVE BUS. & TECH. PARK - OFFSITE
CITY OF COPPERAS COVE
TRAFFIC CONTROL PLAN (TA-1)
CORYELL COUNTY TEXAS

SCALE: AS SHOWN	SHEET 12 OF 12	REV
DRAWING NO. UEI-080.22149-25026-1412		A