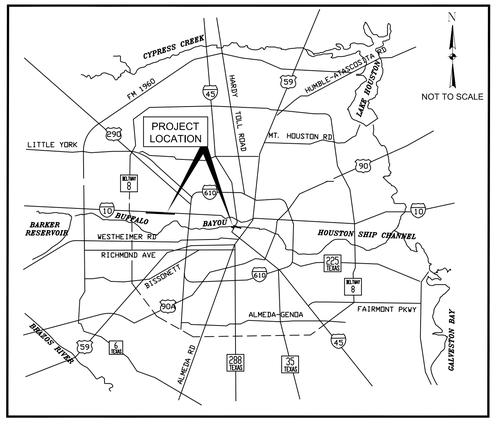
CITY OF HOUSTON

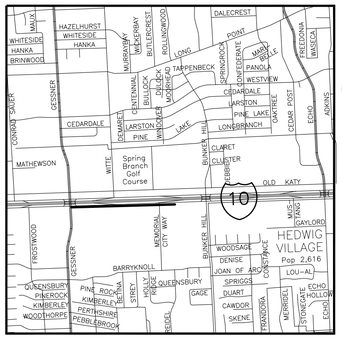
HOUSTON PUBLIC WORKS
CAPITAL PROJECTS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS PACKAGE 4

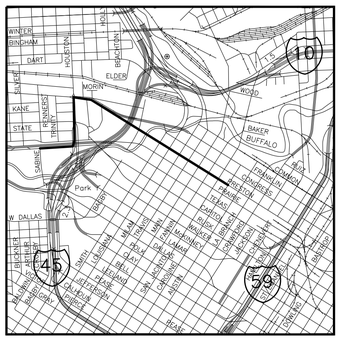
WBS NO.: S-000700-0043-4



LOCATION MAP
(NOT TO SCALE)
COUNCIL DISTRICT 'H' & 'G'



LOCATION 1 VICINITY MAP
(NOT TO SCALE)
KEY MAP NOS. 490 A & B
GIMS MAP# 4958 D & 5058 C



LOCATIONS 4 & 5 VICINITY MAP
(NOT TO SCALE)
KEY MAP NOS. 493 K, L & M
GIM MAP# 5357 B, 5427 A

TDLR EABPR#: N/A

MAYOR
JOHN WHITMIRE

CONTROLLER
CHRIS HOLLINS

DISTRICT COUNCIL MEMBERS

AMY PECK DISTRICT A	TARSHA JACKSON DISTRICT B	ABBIE KAMIN DISTRICT C	CARYOLYN EVANS-SHABAZZ DISTRICT D
FRED FLICKINGER DISTRICT E	TIFFANY D. THOMAS DISTRICT F	MARY NAN HUFFMAN DISTRICT G	MARIO CASTILLO DISTRICT H
JOAQUIN MARTINEZ DISTRICT I	EDWARD POLLARD DISTRICT J	MARTHA CASTEX-TATUM DISTRICT K	

COUNCIL MEMBERS AT-LARGE

JULIAN RAMIREZ POSITION 1	WILLIE DAVIS POSITION 2
TWILA CARTER POSITION 3	LETITA PLUMMER POSITION 4
SALLIE ALCORN POSITION 5	

NO.	DATE		APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

SURVEYED BY: KUO & ASSOCIATES, LLC.
F. B. NO. P-XXXX

PARKS-FORESTRY DEPT.

METRO

HOUSTON WATER

TRANSPORTATION & DRAINAGE OPERATIONS

CAPITAL PROJECTS

SURVEY

CITY ENGINEER DATE

DIRECTOR OF HOUSTON PUBLIC WORKS DATE

FOR CITY OF HOUSTON USE ONLY

SHT. NO.	SHEET TITLE
1	COVER SHEET, LOCATION MAP, VICINITY MAP
2	INDEX OF SHEETS
3	HARRIS COUNTY FLOOD CONTROL EXPRESS REVIEW SHEET
4	LEGEND AND ABBREVIATIONS
5	UTILITY AND GENERAL CONSTRUCTION NOTES
6	WATER LINE SHEET LAYOUT AND BORING PLAN (SHEET 1 OF 4)
7	WATER LINE SHEET LAYOUT AND BORING PLAN (SHEET 2 OF 4)
8	WATER LINE SHEET LAYOUT AND BORING PLAN (SHEET 3 OF 4)
9	WATER LINE SHEET LAYOUT AND BORING PLAN (SHEET 4 OF 4)
10	SURVEY CONTROL MAP SITE-1 (SHEET 1 OF 2)
11	SURVEY CONTROL MAP SITE-2 (SHEET 2 OF 2)
12	SURVEY CONTROL MAP SITE 4 & 5 (SHEET 1 OF 4)
13	SURVEY CONTROL MAP SITE 4 & 5 (SHEET 2 OF 4)
14	SURVEY CONTROL MAP SITE 4 & 5 (SHEET 3 OF 4)
15	SURVEY CONTROL MAP SITE 4 & 5 (SHEET 4 OF 4)
16	KATY FREE WAY-WATER LINE PLAN-BEGIN TO STA 5+50
17	KATY FREE WAY-WATER LINE PROFILE-BEGIN TO STA 5+50
18	KATY FREE WAY-WATER LINE PLAN- STA 5+50 TO STA 10+00
19	KATY FREE WAY-WATER LINE PROFILE- STA 5+50 TO STA 10+00
20	KATY FREE WAY-WATER LINE PLAN- STA 10+00 TO STA 14+00
21	KATY FREE WAY-WATER LINE PROFILE- STA 10+00 TO STA 14+00
22	KATY FREE WAY-WATER LINE PLAN- STA 14+00 TO STA 19+00
23	KATY FREE WAY-WATER LINE PROFILE- STA 14+00 TO STA 19+00
24	KATY FREE WAY-WATER LINE PLAN- STA 19+00 TO STA 24+00
25	KATY FREE WAY-WATER LINE PROFILE- STA 19+00 TO STA 24+00
26	KATY FREE WAY-WATER LINE PLAN- STA 24+00 TO STA 29+00
27	KATY FREE WAY-WATER LINE PROFILE- STA 24+00 TO STA 29+00
28	KATY FREE WAY-WATER LINE PLAN- STA 29+00 TO STA 33+00
29	KATY FREE WAY-WATER LINE PROFILE- STA 29+00 TO STA 33+00
30	KATY FREE WAY-WATER LINE PLAN- STA 33+00 TO END
31	KATY FREE WAY-WATER LINE PROFILE- STA 33+00 TO END
32	MEMORIAL WAY-WATER LINE PLAN-BEGIN TO STA 5+50
33	MEMORIAL WAY-WATER LINE PROFILE-BEGIN TO STA 5+50
34	MEMORIAL WAY-WATER LINE PLAN- STA 5+50 TO STA 10+00
35	MEMORIAL WAY-WATER LINE PROFILE- STA 5+50 TO STA 10+00
36	MEMORIAL WAY-WATER LINE PLAN- STA 10+00 TO STA 14+20
37	MEMORIAL WAY-WATER LINE PROFILE- STA 10+00 TO STA 14+20
38	HOUSTON AVE-WATER LINE PLAN-STA 1+00 TO STA 5+00
39	HOUSTON AVE-WATER LINE PROFILE-STA 1+00 TO STA 5+00
40	HOUSTON AVE-WATER LINE PLAN- STA 5+00 TO STA 9+50
41	HOUSTON AVE-WATER LINE PROFILE- STA 5+00 TO STA 9+50
42	HOUSTON AVE-WATER LINE PLAN- STA 9+50 TO STA 13+00
43	HOUSTON AVE-WATER LINE PROFILE- STA 9+50 TO STA 13+00
44	HOUSTON AVE-WATER LINE PLAN- STA 13+00 TO STA 16+80
45	HOUSTON AVE-WATER LINE PROFILE- STA 13+00 TO STA 16+80
46	WASHINGTON AVE-WATER LINE PLAN-BEGIN TO STA 4+00
47	WASHINGTON AVE-WATER LINE PROFILE-BEGIN TO STA 4+00
48	WASHINGTON AVE-WATER LINE PLAN- STA 4+00 TO STA 8+50
49	WASHINGTON AVE-WATER LINE PROFILE- STA 4+00 TO STA 8+50
50	PRESTON STREET-WATER LINE PLAN-STA 1+20 TO STA 5+00
51	PRESTON STREET-WATER LINE PROFILE-STA 1+20 TO STA 5+00
52	PRESTON STREET-WATER LINE PLAN- STA 5+00 TO STA 8+50
53	PRESTON STREET-WATER LINE PROFILE- STA 5+00 TO STA 8+50
54	PRESTON STREET-WATER LINE PLAN- STA 8+50 TO STA 13+00
55	PRESTON STREET-WATER LINE PROFILE- STA 8+50 TO STA 13+00
56	PRESTON STREET-WATER LINE PLAN- STA 13+00 TO STA 17+00
57	PRESTON STREET-WATER LINE PROFILE- STA 13+00 TO STA 17+00
58	PRESTON STREET-WATER LINE PLAN- STA 17+00 TO STA 22+00
59	PRESTON STREET-WATER LINE PROFILE- STA 17+00 TO STA 22+00
60	PRESTON STREET-WATER LINE PLAN- STA 22+00 TO STA 27+00
61	PRESTON STREET-WATER LINE PROFILE- STA 22+00 TO STA 27+00
62	PRESTON STREET-WATER LINE PLAN- STA 27+00 TO STA 31+50
63	PRESTON STREET-WATER LINE PROFILE- STA 27+00 TO STA 31+50
64	PRESTON STREET-WATER LINE PLAN- STA 31+50 TO STA 35+00
65	PRESTON STREET-WATER LINE PROFILE- STA 31+50 TO STA 35+00
66	PRESTON STREET-WATER LINE PLAN- STA 35+00 TO STA 39+00
67	PRESTON STREET-WATER LINE PROFILE- STA 35+00 TO STA 39+00
68	PRESTON STREET-WATER LINE PLAN- STA 39+00 TO STA 44+00
69	PRESTON STREET-WATER LINE PROFILE- STA 39+00 TO STA 44+00
70	PRESTON STREET-WATER LINE PLAN- STA 44+00 TO STA 47+40
71	PRESTON STREET-WATER LINE PROFILE- STA 44+00 TO STA 47+40
72	CONSTRUCTION SIGN
73	STANDARD LDWL PIPE DETAILS (SHEET 1 OF 2)
74	STANDARD LDWL PIPE DETAILS (SHEET 2 OF 2)
75	STANDARD LDWL HEAVY DUTY MANHOLE FRAME AND COVER DETAILS
76	STANDARD LDWL ACCESS MANHOLE DETAILS
77	STANDARD LDWL EXTRA DEPTH MANHOLE
78	STANDARD LDWL BUTTERFLY VALVE AND OPERATOR MANHOLE DETAILS
79	STANDARD LDWL DRAIN LINE VALVE DETAILS

SHT. NO.	SHEET TITLE
80	STANDARD LDWL COMBINATION AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAILS
81	STANDARD LDWL AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAILS
82	STANDARD LDWL TUNNEL AND CASING DETAILS
83	STANDARD LDWL EXCAVATION AND BACKFILL DETAILS
84	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR JOINT BONDING (SHEET 1 OF 2)
85	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR JOINT BONDING (SHEET 2 OF 2)
86	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS (SHEET 1 OF 3)
87	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS (SHEET 2 OF 3)
88	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS (SHEET 3 OF 3)
89	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS AND ANODES
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91	STANDARD SMALL DIAMETER WATER LINE DETAILS (SHEET 2 OF 3)
92	STANDARD SMALL DIAMETER WATER LINE DETAILS (SHEET 3 OF 3)
93	STANDARD SANITARY SEWER DETAILS
94	STANDARD SANITARY SEWER AND STORM SEWER DETAILS BEDDING & BACKFILL DETAILS
95	STANDARD STREET PAVING AND SIDEWALK DETAILS (SHEET 1 OF 2)
96	STANDARD STREET PAVING AND SIDEWALK DETAILS (SHEET 2 OF 2)
97	COH STANDARD STREET CUT PAVEMENT REPLACEMENT DETAILS
98	COH STANDARD PAVEMENT MARKING DETAILS (SHEET 1 OF 4)
99	COH STANDARD PAVEMENT MARKING DETAILS (SHEET 2 OF 4)
100	COH STANDARD PAVEMENT MARKING DETAILS (SHEET 3 OF 4)
101	COH STANDARD PAVEMENT MARKING DETAILS (SHEET 4 OF 4)
102	SLIPLINNING DETAILS
103	TCP NOTES CHANNELIZING DEVICES AND BARRICADES (SHEET 1 OF 26)
104	SITE 1 – KATY FREEWAY OVERALL TCP LAYOUT -1 (SHEET 2 OF 26)
105	SITE 4 & 5 – OVERALL TCP LAYOUT -2 (SHEET 3 OF 26)
106	SITE 4 & 5 – OVERALL TCP LAYOUT -3 (SHEET 4 OF 26)
107	SITE 1 – KATY FREEWAY OVERALL PHASING PLAN – 1 (SHEET 5 OF 26)
108	SITE 4 & 5 OVERALL PHASING PLAN – 2 (SHEET 6 OF 26)
109	SITE 4 & 5 OVERALL PHASING PLAN – 3 (SHEET 7 OF 26)
110	SITE 1 – KATY FREEWAY TRAFFIC CONTROL PLAN STA 1+00 TO END (SHEET 8 OF 26)
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113	SITE 4 & 5 TRAFFIC CONTROL PLAN – PHASE 2 SHEET 1 OF 2 (SHEET 11 OF 26)
114	SITE 4 & 5 TRAFFIC CONTROL PLAN – PHASE 2 SHEET 2 OF 2 (SHEET 12 OF 26)
115	SITE 4 & 5 TRAFFIC CONTROL PLAN – PHASE 3 SHEET 1 OF 3 (SHEET 13 OF 26)
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117	SITE 4 & 5 TRAFFIC CONTROL PLAN – PHASE 3 SHEET 3 OF 3 (SHEET 15 OF 26)
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125	ONE LANE CLOSURE PHASE 1 & 2 (SHEET 23 OF 26)
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131	SITE 1 – KATY FREEWAY STORM WATER POLLUTION PREVENTION PLAN – 2 (SHEET 3 OF 14)
132	SITE 4 & 5 – KATY FREEWAY STORM WATER POLLUTION PREVENTION PLAN – 3 (SHEET 4 OF 14)
133	SITE 4 & 5 – KATY FREEWAY STORM WATER POLLUTION PREVENTION PLAN – 4 (SHEET 5 OF 14)
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137	SWPPP DETAIL – 1 (SHEET 9 OF 14)
138	SWPPP DETAIL – 2 (SHEET 10 OF 14)
139	SWPPP DETAIL – 3 (SHEET 11 OF 14)
140	SWPPP DETAIL – 4 (SHEET 12 OF 14)
141	SWPPP DETAIL – 5 (SHEET 13 OF 14)
142	SWPPP DETAIL – 6 (SHEET 14 OF 14)
143	TREE PROTECTION PLAN SHEET (1 OF 11)
144	TREE PROTECTION PLAN SHEET (2 OF 11)
145	TREE PROTECTION PLAN SHEET (3 OF 11)
146	TREE PROTECTION PLAN SHEET (4 OF 11)
147	TREE PROTECTION PLAN SHEET (5 OF 11)
148	TREE PROTECTION PLAN SHEET (6 OF 11)
149	TREE PROTECTION PLAN SHEET (7 OF 11)
150	TREE PROTECTION PLAN SHEET (8 OF 11)
151	TREE PROTECTION PLAN SHEET (9 OF 11)
152	TREE PROTECTION PLAN SHEET (10 OF 11)
153	TREE PROTECTION DETAILS (11 OF 11)

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

INDEX OF SHEETS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 2 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\2-INDEX OF SHEETS.dwg plotted on Sep 21, 2025 - 10:48am

1. PAVING

(FOR H.C. PUBLIC R.O.W. ONLY)

CONCRETE

DESIGN THICKNESS OF PAVING	STABILIZED SUBGRADE DEPTH	DESIGN STRENGTH OF CONCRETE	STEEL SPACING		REINFORCE STEEL SIZE
			LONG.	TRANS.	
(IN.)	(IN.)	(PSI)	(IN.)	(IN.)	(#4 MIN.)
MATCH EXIST	8" STABILIZED SUBGRADE	3,500	18	18	5

ASPHALT

DESIGN SURFACE COURSE THICKNESS	DESIGN SURFACE COURSE TYPE	DESIGN BASE COURSE THICKNESS	DESIGN BASE COURSE TYPE	STABILIZED SUBGRADE THICKNESS	STABILIZED SUBGRADE TYPE
(IN.)	(MATERIAL)	(IN.)	(MATERIAL)	(IN.)	(MATERIAL)
N/A					

DRIVEWAYS (in H.C. ROW only)

I. NUMBER OF DRIVEWAY APPROACHES PROPOSED INCLUDE WIDENING OR REPAVING EXISTING DRIVEWAYS AS WELL AS NEW DRIVEWAYS

DRWY	WIDTH	MATERIAL	CULVERT?	CULVERT LENGTH	NEAREST X-STREET	DIST. TO X-STREET
N/A	N/A	N/A	N/A	N/A	N/A	N/A

II. HARRIS COUNTY STANDARD DRIVEWAY DETAIL APPEARS ON SHEET _____

FIRE APPARATUS ACCESS ROAD

☐ REQUIRED AND SHOWN ON SHEET(S) _____
☐ NOT REQUIRED DUE TO _____

CURBING

I. ISLANDS, MEDIANS AND ALL AREAS NOT TAKING DIRECT DRIVEWAY ACCESS REQUIRES STANDARD 6" CURBING

II. ☐ STANDARD 6" CURBING PROPOSED
☐ 4" x 12" CURBING PROPOSED EXCEPT AT MEDIANS AND ISLANDS

TRAFFIC CONSIDERATIONS

I. MEDIAN CUTS
☒ NO MEDIAN CUT OR RELOCATION IS PROPOSED
☐ MEDIAN MODIFICATIONS ARE SHOWN ON SHEET _____

II. LEFT / RIGHT TURN LANE
☒ NO LEFT / RIGHT TURN LANE IS PROPOSED
☐ LEFT / RIGHT TURN LANE IS SHOWN ON SHEET _____

III. TRAFFIC CONTROL PLAN
☐ NO WORK IN THE RIGHT OF WAY IS PROPOSED THAT WOULD INTERFERE WITH TRAFFIC FLOW
☒ TRAFFIC CONTROL SHOWN ON SHEET 220-238

IV. TRAFFIC SIGNAL
☒ NO TRAFFIC SIGNAL IS EXISTING / PROPOSED
☐ EXISTING TRAFFIC SIGNAL DEVICES (T.C. BOXES AND LOOPS) SHOWN ON SHEET _____
☐ PROPOSED TRAFFIC SIGNAL (BY OTHERS)

V. TRAFFIC IMPACT ANALYSIS
☒ NO TRAFFIC IMPACT ANALYSIS IS REQUIRED
☐ TRAFFIC IMPACT ANALYSIS HAS BEEN APPROVED ON DATE:_____
PLAN TITLE: _____
HCPID PROJECT NO.: _____

5. DESCRIPTION OF PROPERTY

I. LEGAL DESCRIPTION
A. ACREAGE: _____
B. ☐ SUBDIVISION: _____
_____
☐ SURVEY & ABSTRACT: _____
_____
C. ADJACENT ROADS: CYPRESS ROSEHILL ROAD, HUFFMEISTER ROAD CYPRESSWOOD DRIVE, PALOS PARK DRIVE, ARBORMONT DRIVE

II. PLATTING
A. SUBDIVISION PLAT
☐ PROPOSED PLAT / REPLAT
☐ RECORDED PLAT / REPLAT
PLAT NAME: _____
B. STREETS PROPOSED
☐ PUBLIC
☐ PRIVATE
☐ PUBLIC & PRIVATE
☒ NONE

III. JURISDICTIONS
☐ CITY OF_____
☒ ETJ, CITY OF HOUSTON
☐ ETJ, CITY OF _____
☐ NO ETJ

IV. HCAD ACCOUNT NOS. (ALL) KEY MAP PAGE _____

V. UNOBSTRUCTED VISIBILITY EASEMENT (U.V.E.)
☐ REQUIRED AND SHOWN ON SHEET(S) _____
☐ NOT REQUIRED

NOTE: ALL APPROVED, FINAL PLATS AND ASSOCIATED CPC101 FORMS MUST BE INCLUDED WITH PLAN SUBMITTAL.

☐ CONFORMING SUBDIVISION
☐ NON-CONFORMING SUBDIVISION
☐ PARTIALLY NON-CONFORMING SUBDIVISION

2. RESIDENTIAL / SUBDIVISION DRAINAGE

I. PROPOSED DRAINAGE SYSTEM TYPE
☐ STORM SEWER
☐ ROADSIDE DITCH
☐ LOW IMPACT DEVELOPMENT (LID)

II. DESIGN METHOD USED
☐ CITY OF HOUSTON ____ YEAR FREQUENCY
☐ OTHER: _____

III. DRAINAGE SYSTEM OUTFALLS DIRECTLY TO EXISTING
☐ DETENTION POND (APPROVED H.C. PRJ NO.): _____
DETENTION POND MAINTAINED BY: _____
☐ HCFCD DRAINAGE DITCH UNIT NO.: _____
☐ H.C. ROADSIDE DITCH (ROAD NAME): _____
☐ H.C. STORM SEWER (APPROVED H.C. PRJ NO.): _____

IV. H.C. OUTFALL CALCULATIONS
☐ ROADSIDE DITCH OUTFALL:
ALLOWABLE OUTFALL RATE: 0.0027 x _____ LF Frontage = _____ (CFS)
PROPOSED OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET ___
☐ STORM SEWER OUTFALL
CAPACITY ALLOCATED TO TRACT FROM D. A. MAP: _____ (CFS)
FROM DRAINAGE AREA MAP DATED: _____
PREPARED BY: _____
APPROVED H.C. PROJECT NO.: _____
ACTUAL OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET ___

V. DETENTION PROVIDED BY
☐ DETENTION BASIN IS PART THIS PLAN SET. SERVICE AREA MAP IS ON SHEET ___
☐ REGIONAL DETENTION BASIN SYSTEM (APPROVED H.C. PRJ NO.): _____

PROPOSED STORM SEWER IS SUBMERGED (AGREEMENT MUST BE PROVIDED). STATIC W.S.E. @ OUTFALL IS _____

OFFSITE SHEET FLOW: (100 YEAR)

OFFSITE SHEET FLOW MAPPING, TOTAL DISCHARGE CALCULATIONS, AND DESIGN ACCOMODATIONS ARE SHOWN ON SHEET _____ OR, AS PRESENTED IN THE APPROVED DRAINAGE STUDY ENTITLED _____.

TOTAL ACREAGE = ____
TOTAL DISCHARGE = ____

NOTE: ALL OFFSITE SHEET FLOW FROM ADJACENT PROPERTIES MUST BE IDENTIFIED AND PROPERLY ACCOUNTED FOR IN THE PROJECT. THE SIGNING ENGINEER HEREBY CERTIFIES THAT THESE AREAS HAVE BEEN ADDRESSED.

3. COMMERCIAL / OTHER SITE DRAINAGE

I. PROPOSED DRAINAGE AREA
☐ NEW DEVELOPMENT AREA: _____
☐ RE-DEVELOPMENT AREA (NET NEW DEVELOPED AREA): _____
☐ LOW IMPACT DEVELOPMENT (LID)

II. DETENTION VOLUME
NEW AREA_____ x * = _____ACRE FEET
DETENTION REQUIRED
* ☐ .65 (CHANNEL)
* ☐ .76 (STM SWR)
* ☐ 1.00 (RD. DITCH)
* ☐ OTHER: _____
PROPOSED DETENTION VOLUME = _____ ACRE FEET
PROPOSED DETENTION VOLUME CALCULATIONS ARE SHOWN ON SHEET _____
DETENTION VOLUME PROVIDED BY EXISTING DETENTION POND
APPROVED H.C. PROJECT NO.:
DETENTION POND SERVICE AREA MAP IS PROVIDED ON SHEET ____

III. OUTFALL
OUTFALL TO ☐ H.C. ROADSIDE DITCH
☐ EXISTING H.C. STORM SEWER
☐ OTHER _____
☐ ROADSIDE DITCH OUTFALL:
ALLOWABLE OUTFALL RATE: 0.0027 x _____ LF Frontage = _____ (CFS)
PROPOSED OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET ___
☐ STORM SEWER OUTFALL
CAPACITY ALLOCATED TO TRACT FROM D. A. MAP: _____ (CFS)
FROM DRAINAGE AREA MAP DATED: _____
PREPARED BY: _____
APPROVED H.C. PROJECT NO.: _____
ACTUAL OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET ___

IV. PUMPED DETENTION FACILITIES
VOLUME THAT GRAVITY FLOWS: _____ ACRE FEET
VOLUME THAT IS PUMPED: _____ ACRE FEET
ENTRANCE VELOCITY INTO ROADSIDE DITCH OR STORM SEWER: _____
PUMP SPECIFICATIONS AND AUTOMATIC SHUTOFF PLAN FOR ROADSIDE DITCH & STORM SEWER OUTFALLS APPEAR ON SHEET _____

V. FLOW RESTRICTOR SIZE
OUTFALL PIPE SIZE: _____
RESTRICTOR PIPE SIZE: _____

NOTE: ALL ROADSIDE DITCH OUTFALLS REQUIRE EROSION CONTROL MEASURES. RIPRAP IS NOT ALLOWED AS AN EROSION CONTROL MEASURE IN HARRIS COUNTY ROW. ALL PUMPED DETENTION OUTFALLS TO ROADSIDE DITCHES REQUIRE MANHOLE W/ LEADS.

4. WATER AND WASTEWATER

I. COMMERCIAL PROJECTS

DOES PROPERTY HAVE EXISTING AND/OR PROPOSED UTILITIES?
☐ YES ☐ NO

IF YES, CHECK THE BOX THAT APPLIES TO THIS PROJECT
☐ PUBLIC WATER & SANITARY
☐ PRIVATE WATER WELL & SEPTIC SYSTEM
☐ PUBLIC WATER & PRIVATE SEPTIC SYSTEM
☐ PRIVATE WATER WELL & PUBLIC SANITARY

NOTE: PUBLIC UTILITIES REQUIRE A LETTER FROM THE DISTRICT/ MUNICIPALITY AUTHORIZING SERVICE & CONNECTION. THIS IS REQUIRED FOR PLAN APPROVAL.

UTILITY DISTRICT/MUNICIPALITY NAME: _____

NOTE: SEPTIC SYSTEMS REQUIRE H.C. WASTE WATER REVIEW

H.C. SEPTIC PERMIT/REQUEST NO. _____

NOTE: ALL EXISTING AND PROPOSED UTILITIES MUST BE ACCURATELY SHOWN & LABELED ON THE SITE PLANS.

II. SUBDIVISION PROJECTS

☐ UTILITY DISTRICT/MUNICIPALITY NAME: _____
☐ PRIVATE WATER & WASTE WATER SYSTEMS
☐ PRIVATE WATER & INDIVIDUAL OSSF
☐ INDIVIDUAL WATER WELL & OSSF

NOTE: A COPY OF TCEQ APPROVAL FOR PRIVATE WATER & WASTE WATER SYSTEMS IS REQUIRED FOR PLAN APPROVAL.

NOTE: DEDICATED UNDERGROUND FIRE LINES MUST BE SUBMITTED TO THE HARRIS COUNTY FIRE PROTECTION GROUP FOR REVIEW AND PERMITTING BY THE UNDERGROUND FIRE LINE CONTRACTOR. CIVIL REHVIEW DOES NOT REVIEW OR APPROVE UNDERGROUND FIRE LINES FOR THE FIRE PROTECTION SYSTEMS.

WASTEWATER TREATMENT PLANTS

H.C. WWTP REVIEW:

IS THE PROPOSED PROJECT A NEW WWTP SITE OR A REHAB/EXPANSION OF AN EXISTING WWTP SITE? YES ☐ NO ☐

IF YES, IS A HARRIS COUNTY DOMESTIC WASTEWATER TREATMENT PLANT EXPRES REVIEW SHEET ATTACHED AND COMPLETED ACCORDING TO INSTRUCTIONS? YES ☐ NO ☐

REFER TO:
WWW.ENG.HCTX.NET/PERMITS/WASTEWATER/REGULATIONS-STANDARDS-DETAILS / FOR DOMESTIC WWTP ERS FORM

10. PERMITS REQUIRED

DOES THE PROPERTY HAVE ANY VIOLATIONS? IF SO PLEASE PROVIDE ALL VIOLATION NUMBERS. _____

☐ STORM WATER QUALITY
☐ SEPTIC (EXISTING) ☐ SEPTIC (PROPOSED)
☐ CIVIL SITE WORK (PHASE II PERMIT CLASS I (non-floodplain))
☒ CIVIL SITE WORK (PHASE II PERMIT CLASS II (floodplain))
☐ DRIVEWAY WITH CULVERT _____ CURB AND GUTTER _____
☐ BUILDING PERMITS (NO. OF BUILDINGS = _____) ☐ CRITICAL FACILITY
☐ SUBDIVISION INFRASTRUCTURE PHASE II (NO. OF LOTS = _____)
☐ NOTICE OF DETENTION AFFIDAVIT REQUIRED
☐ MUD MAINTENANCE AGREEMENT REQUIRED
NOTES: _____

WORK IN HARRIS COUNTY R.O.W.

☒ UTILITY WORK 24/16/12-INCH WATER LINE CONSTRUCTION
☐ TURN LANE _____
☒ OTHER CONSTRUCTION PAVEMENT REMOVAL & REPLACEMENT ALONG CLINTON DR, & MAYO SHELL RD

NOTES:
A PERMIT IS REQUIRED FOR EACH SCOPE OF WORK ON SITE.
A R.O.W. NOTIFICATION IS REQUIRED FOR EACH SCOPE OF WORK IN HC OR HCFCD ROW.
REFER TO www.eng.hctx.net/permits FOR EACH SCOPE OF WORK IN HC OR IN HCFCD ROW.

6. STORMWATER QUALITY

I. SWPPP: CONSTRUCTION MEASURES. (Complete for ALL projects)
☒ DISTURBS >1AC. SITE PLAN & DETAILS ON SHEET(S)_____XXX-XXX
☐ DISTURBS <1AC. N/A

II. APPLICABILITY FOR PERMANENT FEATURES. (must be completed on all projects)

EXEMPT NEW DEVELOPMENT:
☐ PROJECT IS ON A PARCEL (A COMMON PLAN OF DEVELOPMENT) LESS THAN 5 ACRES. (must be verified with plat)

EXEMPT REDEVELOPMENT:
☒ PROJECT DOES NOT MEET THE DEFINITION OF SIGNIFICANT REDEVELOPMENT (Part A, Sec. 2.39 of Regulations of Harris County, Texas for Stormwater Quality Management)

EXEMPT GRANDFATHERED:
☐ PROJECT'S DRAINAGE TIES DIRECTLY INTO AN EXISTING DRAINAGE SYSTEM PRIOR TO OCTOBER 1, 2001.
(FOR VERIFICATION: PROVIDE ORIGINAL DRAINAGE AREA MAP INCLUDING CALCULATIONS)

GENERAL:
☒ PROJECT'S SWQ REQUIREMENTS FALL WITHIN THE JURISDICTION OF: HARRIS COUNTY

☐ STORMWATER QUALITY PERMIT REQUIREMENT IS COVERED BY AN EXISTING SWQMP WITHIN PROJECT TITLE: _____
HARRIS COUNTY PROJECT NO._____ & SWQ PERMIT NO. _____

STORMWATER QUALITY MANAGEMENT PLAN:
☐ SITE PLAN ON SHEET(S) _____

III. PERMANENT SWQ FEATURES. (COMPLETE IF NOT EXEMPT)
☐ VEGETATIVE CONTROLS USED: (FILTER STRIP, GRASSY SWALE, URBAN FORESTRY) DETAILS AND CALCULATIONS APPEAR ON SHEET(S)_____
☐ POND STRUCTURE USED (WET, DRY, WETLANDS) DETAILS AND CALCULATIONS APPEAR ON SHEET(S) _____
☐ HYDRODYNAMIC TYPE SEPARATOR MODEL: _____
☐ OTHER(S): _____

7. FLOOD PLAIN STATUS

I. GENERAL INFORMATION
FIRM PANEL(S) FOR PROPERTY: 48201C0405M & 48201C0410M
FIRM PANEL(S) DATE: OCTOBER 16, 2013
STATUS OF PROPERTY ON MAP
☐ ENTIRELY LOCATED IN UNSHADED ZONE "X"
☒ LOCATED PARTIALLY OR ENTIRELY IN ANY "A" ZONE OR SHADED ZONE "X", DELINEATE FLOODPLAIN BOUNDARY ON CONSTRUCTION DRAWINGS
(DRAINAGE LAYOUT PG. NO. N/A) (1% BASE FLOOD LEVEL 0)
(0.2% BASE FLOOD LEVEL 0)
☐ SITE REMOVED FROM FLOODPLAIN BY LOMR, LOMR-F, LOMA CASE NO._____ REVISED FLOODPLAIN IS SHOWN ON SHEET____

ELEVATION INFORMATION
BENCHMARK USED
☒ NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY REFERENCE MARK
☐ HARRIS-GALVESTON COASTAL SUBSIDENCE DISTRICT BENCHMARK (FOR COASTAL AREAS)
DESCRIPTION OF BENCHMARK INCLUDING ELEVATION, DATUM AND YEAR OF ADJUSTMENT *(2001 ADJ.)* NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY ALUMINUM DISK IN CONCRETE CALLED "MON. #1159" LOCATED ON THE TOP OF THE DITCH APPROXIMATELY 650 FEET NORTH OF DRAKE BROOK LANE ELEV. 154.29 FT (NAVD 88)

II. FLOOD PLAIN DETERMINATION BASED ON GROUND ELEVATION
☐ PROPERTY LIES ENTIRELY ABOVE THE BASE FLOOD LEVEL AND IN SHADED ZONE "X"
☐ PROPERTY LIES PARTIALLY OR ENTIRELY BELOW THE BASE FLOOD LEVEL

III. FLOODPLAIN STORAGE SUMMARY (APPLIES ONLY TO PORTION OF LAND LOCATED WITHIN FLOODPLAIN AS DELINEATED BY FIRM PANEL).
A. TOTAL VOLUME OF MATERIAL PROPOSED TO BE MOVED OR PLACED WITHIN THE FIRM DELINEATED FLOODPLAIN (FILL, BASE, CONCRETE, ASPHALT, ETC.):
BELOW 0.2% BASE FLOOD ELEVATION _____ (2001 ADJ.) 0 CUBIC YARDS
B. TOTAL VOLUME OF MATERIAL PROPOSED TO BE REMOVED FROM THE FIRM DELINEATED FLOODPLAIN:
BELOW 0.2% BASE FLOOD ELEVATION _____ (2001 ADJ.) 0 CUBIC YARDS
C. FILL AREA & VOLUME CALCULATIONS ARE SHOWN ON SHEET N/A

IV. ☐LOMR REQUIRED ☐LOMR REQUIRED VERIFIED BY: _____

8. CURB RAMPS

A. ARE CURB RAMPS THAT CONNECT TO PUBLIC STREETS PROPOSED IN THIS SET OF PLANS? [ ] YES [X] NO

9. LANDSCAPING

☐ REQUIRED AND SHOWN ON SHEET(S) _____
☒ NOT REQUIRED

BENCHMARK REQUIREMENTS FOR PROPOSED BRIDGES AND OR NEW RESIDENTIAL SUBDIVISIONS

When the County Engineer has determined that a new benchmark will be required to be established for the proposed project, the developer shall be required to install a benchmark per section 8.0, part 2 of the Harris County Infrastructure Regulations.

Is a new Benchmark required for this project? (*to be determined by Harris County*) [__] yes [__] no

If a new Benchmark is required, the proposed benchmark information is shown on sheets ____

FOR PROJECTS LOCATED IN ANY FLOODPLAIN

Development constructed or placed in accordance with these plans will comply with all provisions of the Regulations of Harris County, Texas for Floodplain Management.

No net fill is allowed in the flood plain and no fill is allowed in the floodway.

FOUNDATION NOTES: (*Applies to only buildings or building additions requiring a class II permit*)

All water heaters, furnaces, air conditioning units, electrical distribution panels, and any other mechanical or electrical equipment must be elevated in accordance with Section 4.05 of Harris County Floodplain regulations.

Any electrical circuit serving a light switch or outlet located below the base (100-year) flood elevation shall be dropped from above and be on a separate breaker.

All materials used below the (100-year) base flood elevation are on approved FEMA Technical Bulletin 2-08 as Class 5 water-resistant, and approved in accordance with FEMA Technical Bulletin 1-08 for foundation openings.

Critical facilities located in the 0.2% or 500yr floodplain or 1% or 100yr floodplain shall have the lowest floor elevated to 3 feet or more above the 0.2% flood elevation, or 24 inches above the crown of the adjacent road, which ever results in a higher elevation.

Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters.

Access routes elevated to or above the level of the base flood shall be provided to all critical facilities to the extent possible.

A completed as-built certificate must be submitted after the structure is complete and before it is occupied.

The County Engineer's Office will post a final inspection notice on the structure once all requirements have been met.

No fill may be used to elevate structures in the 1% or 100yr flood plain. Structures may be constructed on an open foundation, such as piers, or on continuous foundation walls with properly sized and located openings. All foundations are required to be designed by a registered professional engineer.

All structures shall be designed to withstand a three second gust basic wind speed of 120mph.

*Completed **"Elevation Certificates** to be submitted: one at permitting, a second after the slab is poured or sub-floor is installed and before the framing starts, and a third is required once construction is finished. "(PER CURRENT FIRM PANEL) to the Harris County Engineering Department, 10555 Northwest Freeway, Suite 120, Houston, TX 77092*

HARRIS COUNTY ENGINEERING DEPARTMENT - PERMIT OFFICE NOTE:

THE PERMIT MANAGER SIGNATURE REPRESENTS THE FOLLOWING:
- THE COMPLETION OF REVIEW OF THESE PLANS
- INTERPOSE NO OBJECTION TO THE PROPOSED DESIGN ON PRIVATE PROPERTY
- APPROVAL OF WORK IN HARRIS COUNTY MAINTAINED RIGHT OF WAY
- APPROVAL OF WORK IN PROPOSED HARRIS COUNTY RIGHT OF WAY THAT IS TO BE ACCEPTED BY THE COUNTY

HCED SIGNATURE BLOCK:

THE PROJECT WAS REVIEWED, HOWEVER, THIS DOES NOT MEAN THE ENTIRE PROJECT, INCLUDING ALL SUPPORTING DATA AND CALCULATIONS HAVE BEEN COMPLETELY CHECKED AND VERIFIED. THESE DRAWINGS ARE SIGNED, DATED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS, WHICH THEREFORE CONVEYS THE ENGINEER'S RESPONSIBILITY AND ACCOUNTABILITY. THIS DOES NOT RELIEVE ANY PARTY FROM COMPLYING WITH APPROPRIATE FEDERAL, STATE AND LOCAL ENVIRONMENTAL RULES, LAWS, AND REGULATIONS AND ANY OTHER LEGALLY ADOPTED REGULATION OR ORDINANCE RELATED TO LAND DEVELOPMENT. IF THE CITY SIGNATURES ARE REQUIRED BY ORDINANCE, COUNTY PERMITS WILL NOT BE ISSUED UNTIL SUCH SIGNATURES ARE OBTAINED. PLAN APPROVAL EXPIRATION TO BE IN ACCORDANCE WITH LOCAL GOVERNMENT CODE CH. 245.

ENGINEER'S CERTIFICATION

I, DIAMEEN CHOWDHURY , A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE INFORMATION PRESENTED ON THIS SHEET IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM NOT VIOLATING ANY PROVISION OF THE CURRENT TEXAS ENGINEERING PRACTICE ACT AND RULES CONCERNING THE PRACTICE OF ENGINEERING AND PROFESSIONAL ENGINEERING LICENSURE. I CERTIFY TO THE BEST OF MY KNOWLEDGE THAT THE PLANS IN THEIR ENTIRETY ARE DESIGNED PER THE HARRIS COUNTY ENGINEERING STANDARDS, REGULATIONS, AND GUIDELINES UNLESS PROVIDED A VARIANCE BY THE COUNTY ENGINEER OR HIS DESIGNEE. SHOULD IT BE DEEMED BY HCED STAFF, THAT THE PLANS DO NOT MEET THE COUNTY'S STANDARDS, REGULATIONS AND GUIDELINES AND DID NOT RECEIVE AN APPROVED VARIANCE, THE APPROVAL OF SAID PLANS BECOMES NULL AND VOID AND THE DESIGN PLANS MUST BE CORRECTED AT NO CHARGE TO THE COUNTY.

THE COMPLETED PROJECT CONSISTS OF DRAWING SHEETS 1 THRU XXX

SIGNATURE — xx/xx/xxx DATE

SEAL

REVISIONS

NOTE: REVISION BLOCK IS TO BE USED ONLY FOR CHANGES MADE AFTER PLANS HAVE BEEN APPROVED BY HARRIS COUNTY.

DATE	SHEET NO.	DESCRIPTION	P.E. INITIAL	H.C. APPROVED DATE

HC PROJECT NO. 2405020046 HCFCD PROJECT NO. 2405020039 SHEET NUMBER ___ OF ___

HARRIS COUNTY
ENGINEERING DEPARTMENT
REVIEW SHEET

VERSION 20.0 MAY 27, 2020

NO.	DATE	REVISION	APP.

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

HARRIS COUNTY EXPRESS REVIEW SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 3 OF 153	

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EXISTING PLAN VIEW

- WATER METER
- WATER VALVE (GATE)
- WATER VALVE (BUTTERFLY)
- FIRE HYDRANT/FLUSHING VALVE
- TAPPING SLEEVE & VALVE
- REDUCER
- ROUND CONNECTION
- SANITARY SEWER CLEANOUT & MANHOLE
- STORM SEWER MANHOLE
- STORM SEWER INLETS
- CULVERT PIPE AND HEADWALL
- TOP OF CURB ELEVATION
- GUTTER ELEVATION
- TOP OF PAVEMENT ELEVATION
- CONTOUR LINE
- ROW LINE
- PROPERTY LINE
- LOT LINES
- EASEMENT LINE
- CENTER LINE OF ROW
- TRANSIT LINE
- EDGE OF DITCHES
- CENTER LINE OF DITCHES
- EDGE OF DITCHES
- FENCE LINE, WOOD
- FENCE LINE, CHAIN LINK
- FENCE LINE, BARBED WIRE
- FENCE LINE, HOG WIRE
- EDGE OF CONCRETE
- CURB LINE
- CONCRETE WALK
- EDGE OF ASPHALT
- EDGE OF SHELL OR GRAVEL
- DIMENSION LINE
- AERIAL POWER LINE
- UNDERGROUND POWER LINE
- GAS LINE
- UNKNOWN UNDERGROUND LINE
- OIL PIPELINE
- UNDERGROUND TELECOMM LINE W/VAULT
- AERIAL TELECOMM LINE
- RAILROAD LINE
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- SANITARY SEWER FORCE MAIN
- RECLAIMED WATER LINE
- NON–POTABLE WATER LINE
- GAS METER
- GAS VALVE
- PROPANE LINE
- STEAM LINE
- MISC UNDERGROUND PIPELINE LABLE

PROPOSED PLAN VIEW

- WATER METER
- WATER VALVE (GATE)
- WATER VALVE (BUTTERFLY)
- FIRE HYDRANT/FLUSHING VALVE
- TAPPING SLEEVE & VALVE
- REDUCER
- ROUND CONNECTION
- SANITARY SEWER CLEANOUT & MANHOLE
- STORM SEWER MANHOLE
- STORM SEWER INLETS
- CULVERT PIPE AND HEADWALL
- TOP OF CURB ELEVATION
- GUTTER ELEVATION
- TOP OF PAVEMENT ELEVATION
- CONTOUR LINE
- ROW LINE
- PROPERTY LINE
- LOT LINES
- EASEMENT LINE
- CENTER LINE OF ROW
- TRANSIT LINE
- EDGE OF DITCHES
- CENTER LINE OF DITCHES
- EDGE OF DITCHES
- FENCE LINE, WOOD
- FENCE LINE, CHAIN LINK
- FENCE LINE, BARBED WIRE
- FENCE LINE, HOG WIRE
- EDGE OF CONCRETE
- CURB LINE
- CONCRETE WALK
- EDGE OF ASPHALT
- EDGE OF SHELL OR GRAVEL
- DIMENSION LINE
- AERIAL POWER LINE
- UNDERGROUND POWER LINE
- GAS LINE
- UNKNOWN UNDERGROUND LINE
- OIL PIPELINE
- UNDERGROUND TELECOMM LINE W/ VAULT
- AERIAL TELECOMM LINE
- RAILROAD LINE
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- SANITARY SEWER FORCE MAIN
- RECLAIMED WATER LINE
- NON–POTABLE WATER LINE
- GAS METER
- GAS VALVE
- PROPANE LINE
- STEAM LINE
- MISC UNDERGROUND PIPELINE LABLE
- MATCH LINE

EXISTING PLAN VIEW

- PAVING HEADER
- BUILDING, RESIDENTIAL
- BUILDING, COMMERCIAL
- TREE
- HEDGE
- IRON PIPE OR IRON ROD MONUMENT
- POINT OF INTERSECTION (PI)
- POINT OF CURVE (PC)
- POINT OF TANGENCY (PT)
- POWER POLE
- POWER POLE W/DOWN GUY

EXISTING PROFILE VIEW

- NORTH OR EAST PROPERTY LINE
- SOUTH OR WEST PROPERTY LINE
- NORTH OR EAST CURB
- SOUTH OR WEST CURB
- NORTH OR EAST DITCH
- SOUTH OR WEST DITCH
- NORTH OR EAST NATURAL GROUND
- SOUTH OR WEST NATURAL GROUND
- NORTH OR EAST CULVERT
- SOUTH OR WEST CULVERT
- CENTERLINE OF ROW
- CENTERPOINT ENERGY CONDUIT
- GAS LINE
- WESTERN UNION
- AT&T CONDUIT
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- SANITARY SEWER FORCE MAIN
- RECLAIMED WATER LINE
- NON–POTABLE WATER LINE
- CENTERPOINT ENERGY MANHOLE
- AT&T MANHOLE
- WATER LINE MANHOLE
- SANITARY SEWER MANHOLE & CLEANOUT
- STORM SEWER MANHOLE
- STORM SEWER INLET

PROPOSED PLAN VIEW

- PAVING HEADER
- BUILDING, RESIDENTIAL
- BUILDING, COMMERCIAL
- TREE
- HEDGE
- IRON PIPE OR IRON ROD MONUMENT
- POINT OF INTERSECTION (PI)
- POINT OF CURVE (PC)
- POINT OF TANGENCY (PT)
- POWER POLE
- POWER POLE W/DOWN GUY

PROPOSED PROFILE VIEW

- NORTH OR EAST PROPERTY LINE
- SOUTH OR WEST PROPERTY LINE
- NORTH OR EAST CURB
- SOUTH OR WEST CURB
- NORTH OR EAST DITCH
- SOUTH OR WEST DITCH
- NORTH OR EAST NATURAL GROUND
- SOUTH OR WEST NATURAL GROUND
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- AT&T MANHOLE
- WATER LINE MANHOLE
- SANITARY SEWER MANHOLE & CLEANOUT
- STORM SEWER MANHOLE
- STORM SEWER INLET

MISC STANDARD ELEMENTS

- COH NORTH ARROW
- COH BAR SCALE (0' 10' 20' 40'; SCALE: 1"=20')
- REVISION CLOUD/DELTA
- DETAIL/SECTION TITLE (1 VIEW TITLE; SCALE: 1:1)
- SECTION CALLOUT (1 / XX)
- DETAIL CALLOUT (1 / XX)

KUO & ASSOCIATES
ENGINEERING • SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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ON 09/22/2025
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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

LEGEND AND ABBREVIATIONS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 4 OF 153	

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CENTERPOINT ENERGY

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. 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 PIPELINE MARKINGS ARE NOT VISIBLE, CALL (713) 207-5463 OR (713) 945-8037 (7:00 A.M. TO 4:30 P.M.) 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) 659-2111 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 AND RIGHT OF WAY DIVISION AT (713) 207-6348 OR (713) 207-5769

WARNING: UNDERGROUND ELECTRICAL 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.

- ALL INFORMATION CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTORS ARE RESPONSIBLE MAKING THEIR OWN DETERMINATIONS AS TO TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND PIPELINES, CONDUITS, AND STRUCTURES BY CONTACTING OWNERS OF UNDERGROUND UTILITIES OR BY EXCAVATING IN ADVANCE OF CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES WHEN AND WHERE THEY FALL IN THE PATH OF CONSTRUCTION.
- THE CONTRACTOR IS ALSO RESPONSIBLE FOR CONTACTING THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 AND TEXAS ONE CALL AT 1-800-245-4545, FORTY-EIGHT (48) HOURS PRIOR TO ANY CONSTRUCTION.
- THE LOCATION OF ANY CENTERPOINT ENERGY UTILITIES ARE SHOWN IN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. THEY AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.
- ALL PROPOSED FACILITIES SHALL MAINTAIN 12" CLEAR FROM ALL EXISTING UTILITIES.

COMCAST OF HOUSTON, LLC

THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND FACILITIES BEFORE COMMENCING WORK AND AGREE TO BE FULLY RESPONSIBLE FOR ALL DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND FACILITIES.

FLOOD PLAIN NOTE:

ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S PRELIMINARY FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 48201C0880M, REVISED JANUARY 06, 2017 AND PANEL NUMBER 48201C0860L, REVISED JUNE 18, 2017, THE ENTIRE PROJECT LIMITS LIES WITHIN THE UNSHADED ZONE "X", WHICH IS DETERMINED TO BE OUTSIDE THE 500-YR FLOOD ZONE.

METRO

THE CONTRACTOR SHALL CONTACT METRO BUS OPERATIONS, A MINIMUM OF SEVEN (7) TO TEN (10) BUSINESS DAYS PRIOR TO CONSTRUCTION CHANGES. THE CONTACT INFORMATION IS CARL TAYLOR, CARL.TAYLOR@RIDEMETRO.ORG, 713-615-7219 OR SHIRLEY MITCHELL, SHIRLEY.MITCHELL@RIDEMETRO.ORG, 713-615-7212.

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 ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS 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 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 MR. KEVIN RAY AT (713) 614-1983 OR E-MAIL HIM AT kr7896@att.com, IF CABLE LOCATE REQUESTS ARE NOT COMPLETED FOR OUR AT&T TEXAS/SWBT FACILITIES.

GENERAL NOTES

1. THE FLOW LINES AND LOCATIONS OF ALL UNDERGROUND UTILITIES MUST BE LOCATED BY WHATEVER MEANS MAY BE REQUIRED (METAL DETECTION EQUIPMENT, PROBES, EXCAVATION, SURVEY, COORDINATION WITH UTILITY COMPANIES) BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ALL FIELD VERIFICATION WORK AND UTILITY ADJUSTMENTS SHALL BE COMPLETED PRIOR TO EXCAVATION FOR PROPOSED UTILITIES. NO SEPARATE PAY; INCLUDE COST IN UNIT PRICE FOR WORK IN APPROPRIATE SECTIONS.

2. SERVICES ARE TO BE TRANSFERRED BETWEEN EXISTING AND PROPOSED WATER LINES WITH MINIMUM DISRUPTION OF SERVICE. EXISTING WATER LINES MUST BE MAINTAINED IN SERVICE UNTIL SERVICE TRANSFER IS DONE.

3. CALL THE TRAFFIC MANAGEMENT AND MAINTENANCE DIVISION OF THE CITY OF HOUSTON PUBLIC WORKS AND ENGINEERING DEPARTMENT WHEN WORK IS SCHEDULED NEAR SIGNAL CONDUITS WITHIN THE CITY OF HOUSTON (713) 837-7280. CALL AT LEAST FIVE WORKING DAYS IN ADVANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING TRAFFIC SIGNAL CABLES AS A RESULT OF CONSTRUCTION ACTIVITIES FOR THE PROJECT. NO SEPARATE PAYMENT FOR REPAIR TO SIGNAL CONDUIT.

4. SERVICE LINE INSTALLATION COULD BE HINDERED BY THE CEMENT STABILIZED SAND BACKFILL. INCLUDE COST OF CROSSING CEMENT STABILIZED BACKFILL IF ENCOUNTERED DURING SERVICE LINE INSTALLATION IN THE UNIT PRICE OF SERVICES.

5. THE CONTRACTOR TO PROVIDE CUT SHEETS (GROUND ELEVATIONS AND PROPOSED LINE INVERTS WITH AMOUNT OF CUT, LOCATION OF BENDS, FIRE HYDRANTS, VALVES AND OTHER FITTINGS AT EVERY 100 FEET IN TABULAR FORMAT) ON EACH STREET TO THE CITY FOR APPROVAL PRIOR TO CONSTRUCTION AT NO ADDITIONAL COST TO THE CITY.

6. CONTRACTOR MUST REFER TO THE CITY OF HOUSTON STANDARD DETAIL DRAWINGS INCLUDED IN THE CITY OF HOUSTON'S "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING" DATED OCTOBER, 2002, FOR ANY OTHER DETAILS NOT INCLUDED IN THE CONSTRUCTION DRAWINGS.

7. CONTRACTOR SHALL COORDINATE AHEAD OF TIME WITH BUSINESS OWNERS AND RESIDENTS FOR INSTALLATION OF WATER LINES IN ENCROACHED AREAS OF THE PUBLIC RIGHT-OF-WAY. NO SEPARATE PAY.

METRO NOTES:

1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL SECURE "TRACK ALLOCATION PERMITS" ISSUED BY METRO RAIL OPERATIONS. CONTACT EDDIE ESPINOSA (EDDIE.ESPINOSA@RIDEMETRO.ORG, 832-392-0758) FOR TRACK ALLOCATION REQUESTS AND TRACK ACCESS PROCEDURES.
2. ALL CONTRACTORS MUST SUCCESSFULLY COMPLETE THE ROADWAY WORKER PROTECTION TRAINING PRIOR TO CONSTRUCTION. THE COURSE IS HELD AT THE SERVICE AND INSPECTION FACILITY (S&I) LOCATED AT 5880 TEXAS STREET, HOUSTON, TEXAS 77011, ROOM #107 AND IS OFFERED IN BOTH ENGLISH AND SPANISH. CONTRACTOR MUST EMAIL TRACK.SAFETY@RIDEMETRO.ORG TO SCHEDULE THE CLASS. TRACK SAFETY CERTIFICATION FOR CONTRACTOR IS VALID FOR 1 YEAR.
3. TRACKWAY ALLOCATION REQUEST FORM MUST BE SUBMITTED BY 5:00 PM TUESDAY PRIOR TO THE WEEK OF THE SCHEDULED WORK.
4. WORK ACTIVITIES WITHIN TEN FEET OF THE OVERHEAD CONTACT SYSTEM (OCS) REQUIRE A RED TAG IN ADDITION TO A METRO RAIL WORK PERMIT. THE SUPERINTENDENT, RAIL CONTROL, OR DESIGNEE MAY ALSO REQUIRE A RED TAG DUE TO OTHER SPECIAL CONDITIONS OR SITUATIONS (E.G., CRANES, AREAS OF HEAVY CONSTRUCTION, ETC.).
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS TO ANY METRO FACILITIES DAMAGED DURING CONSTRUCTION. IF THE CONTRACTOR CANNOT IMMEDIATELY MAKE THE REPAIRS TO METRO'S SATISFACTION, METRO WILL MAKE THE REPAIRS AND BILL THE COST TO THE CONTRACTOR.
6. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY IN THE FIELD THAT THERE ARE NO CONFLICTS WITH OUR FIBER OPTICS, COMMUNICATION, SIGNALING, ELECTRICAL POWER, HIGH VOLTAGE CABLES OR ANY OTHER METRO INFRASTRUCTURE.
7. THE CONTRACTOR SHALL CONTACT THE DIRECTOR OF PRECONSTRUCTION, CASEY MCKAY, BY EMAIL AT CASEY.MCKAY@RIDEMETRO.ORG OR BY PHONE 713-750-4236 ONE WEEK PRIOR TO CONSTRUCTION. THE CONSTRUCTION DEPARTMENT MAY ASSIGN AN INSPECTOR TO ASSURE NO DAMAGES ARE MADE TO METRO'S FACILITIES.
8. THE CONTRACTOR SHALL "HAND EXCAVATE" IN THE VICINITY OF COMMUNICATION AND POWER LINES FEEDING THE METRO SYSTEM.
9. AUGER BORE PITS SHALL BE LOCATED AT A MINIMUM DISTANCE OF THIRTY-FIVE FEET (35') FROM CENTERLINE OF TRACKS.
10. THE CONTRACTOR SHALL CONTACT METRO BUS OPERATIONS A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO CONSTRUCTION CHANGES. THE CONTACT INFORMATION IS JULIO RIVERA, JR122@RIDEMETRO.ORG, 713-615-7219.
11. THE CONTRACTOR SHALL PROVIDE ANY TEMPORARY BUS STOP FACILITIES NEEDED, EXCEPT FOR BUS STOP SIGNS, AT NO COST TO METRO AND SHALL RESTORE ANY AFFECTED BUS STOP TO ITS ORIGINAL CONDITION AND MEET CURRENT AMERICAN DISABILITY ACT (ADA) REQUIREMENTS AS REQUIRED BY LOCAL, STATE, AND FEDERAL CODE AND REQUIREMENTS. NO BUS STOP SHALL BE PERMANENTLY REMOVED WITHOUT APPROVAL FROM METRO.
12. THE CONTRACTOR SHALL CONTACT THE DIRECTOR OF UNIVERSAL ACCESSIBILITY, TIM MILLS BY EMAIL AT TM14@RIDEMETRO.ORG OR BY PHONE 713-739-6861 ONE WEEK PRIOR TO CONSTRUCTION. METRO MAY ASSIGN AN INSPECTOR TO ASSURE NO DAMAGES ARE MADE TO METRO'S FACILITIES. UNIVERSAL ACCESSIBILITY WILL COORDINATE ANY PERMANENT OR TEMPORARY IMPACT ON BUS STOPS, SHELTERS, AND SIDEWALK TO MAINTAIN ACCESSIBILITY

GENERAL CONSTRUCTION NOTES

1. CONSTRUCT WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING IN ACCORDANCE WITH THE LATEST EDITION OF THE PUBLICATIONS STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING, AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING PUBLISHED BY HOUSTON PUBLIC WORKS.
2. THE GEOTECHNICAL INVESTIGATION FOR THIS PROJECT WAS CONDUCTED IN ACCORDANCE WITH CHAPTER 11 OF THE LATEST EDITION OF THE PUBLICATION INFRASTRUCTURE DESIGN MANUAL, PUBLISHED BY HOUSTON PUBLIC WORKS. SOILS REPORT WAS PREPARED BY AVILES ENGINEERING, CORP., REPORT NO. G147-17 (Revision 1), DATED DECEMBER, 2021.
3. UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 713-223-4567/811 OR 800-344-8377 AND LONE STAR NOTIFICATION CENTER AT 800-669-8344 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION. UTILITIES MARKED WITHIN THE PUBLIC RIGHT OF WAY OR IN EASEMENTS SHALL COMPLY WITH TAC TITLE 16, PART 1, CHAPTER 18, RULE §18.6 AND THE AMERICAN PUBLIC WORKS ADMINISTRATION (APWA) UNIFORM COLOR CODE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE HOUSTON PUBLIC WORKS, STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, AND STREET PAVING AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING, REFERENCED ABOVE, AT NO ADDITIONAL COST.
5. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, HOUSTON PUBLIC WORKS @ 832-394-9098 OR VIA FAX AT 832-395-4424 FOR INSPECTION AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
6. 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.
7. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
8. CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
9. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD 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, LABEL EACH SHEET IN THE SET AS "RECORD DRAWINGS", AND RETURN IT TO THE OFFICE OF THE CITY ENGINEER.
10. THIS PROJECT SHALL BE BUILT BY MEANS OF OPEN CUT EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATION OF BORE PITS IN FIELD FOR TRENCHLESS CONSTRUCTION. LOCATION OF BORE PITS ARE SUBJECT TO THE CITY ENGINEER'S APPROVAL.
11. THE SIZES OF WATER METERS SHOWN BUT NOT SPECIFICALLY CALLED OUT IN THIS PROJECT ARE ONE INCH OR SMALLER STANDARD CITY OF HOUSTON WATER METERS. ALL OTHER SIZES LARGER THAN ONE INCH ARE SPECIFICALLY CALLED OUT ON THESE DRAWINGS.
12. SERVICES ARE TO BE TRANSFERRED BETWEEN EXISTING AND PROPOSED WATER LINES WITH MINIMUM DISRUPTION OF SERVICE. EXISTING WATER LINES MUST BE MAINTAINED IN SERVICE UNTIL SERVICE TRANSFER IS DONE.
13. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, PARK AND RECREATION DEPARTMENT AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION, IN ORDER FOR THEM TO SUSPEND OR RESCHEDULE MOWING OPERATION IN THE MEDIAN OF THE CONSTRUCTION ZONE AREA.

STREET AND BRIDGE CONSTRUCTION NOTES

1. HOUSTON PUBLIC WORKS "STANDARD CONSTRUCTION SPECIFICATIONS" AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING" UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN IS CONSISTENT WITH THE MINIMUM STANDARDS ESTABLISHED IN THE "INFRASTRUCTURE DESIGN MANUAL" REFERENCED AT: https://www.houstonpermittingcenter.org/media/2276/download
2. FILL AREAS ON PLANS SHALL BE FILLED IN LAYERS NOT EXCEEDING 8" IN DEPTH AND EACH COMPACTED TO NOT LESS THAN 95% STANDARD PROCTOR DENSITY PRIOR TO INSTALLATION OF WATER LINE AND FILL AREA SHALL BE SEEDED AND FERTILIZED WITHIN 10 WORKING DAYS.
3. UTILITY CONTRACTOR SHALL PROVIDE TEMPORARY SILT BARRIER FENCE ON ALL NON-CURBED INLETS WHICH WILL REMAIN IN PLACE AFTER UNDERGROUND CONTRACT IS COMPLETE.
4. CONTRACTOR SHALL PROVIDE SILT BARRIER FENCE ON ALL STAGE 1 CURB INLETS.
5. EXISTING PAVEMENTS, CURBS, DRIVEWAYS, AND SIDEWALKS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO CITY OF HOUSTON STANDARDS, WITH LATEST ADDENDA AND AMENDMENTS THERETO.
6. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY UPON COMPLETION OF JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.
7. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO SATISFACTION OF THE OWNING AUTHORITY.
8. EXPOSED 15" OF REINFORCING STEEL AT PROPOSED SAWED JOINT IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE #6 BARS 24" LONG 24" C-C DRILLED AND EMBEDDED 8" INTO THE CENTER OF THE EXISTING SLAB WITH "PO ROC" OR EQUAL.
9. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG AREAS OF EXCAVATION.
10. CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAWS CONCERNING EXCAVATION, TRENCHING AND SHORING AS SPECIFIED IN CITY OF HOUSTON ORDINANCE #87-1457.
11. WHEEL CHAIR RAMPS SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF HOUSTON STANDARDS AT ALL INTERSECTIONS WHERE SIDEWALKS EXIST AND THE EXISTING CURB OR SIDEWALK IS DAMAGED OR REMOVED DURING CONSTRUCTION.
12. WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE HOUSTON PUBLIC WORKS "STANDARD CONSTRUCTION SPECIFICATIONS" AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS. WATER LINES, STORM DRAINAGE AND STREET PAVING" UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN SHOULD BE CONSISTENT WITH THE MINIMUM STANDARD ESTABLISHED IN THE "DESIGN MANUAL FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORMS DRAINAGE AND STREET PAVING".
13. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES TO EXISTING WATER, WASTEWATER, STORM SEWER AND TRAFFIC SIGNAL CONDUITS, ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE HOUSTON PUBLIC WORKS "STANDARD CONSTRUCTION SPECIFICATIONS" WITH LATEST ADDENDA AND AMENDMENTS THERETO, AT NO COST TO THE CITY OF HOUSTON.
14. PRIOR TO STREET CONSTRUCTION, THE CONTRACTOR SHALL CONTACT HOUSTON PUBLIC WORKS AT (PHONE) 832-394-9578 AND COMPLY WITH ALL REQUIREMENTS FOR THE ISSUANCE OF NECESSARY PERMITS/WORK ORDERS FOR STREET CONSTRUCTION.
15. DOUBLE REFLECTORIZED BLUE TRAFFIC MARKERS SHALL BE PLACED 6-INCHES OFFSET OF THE CENTERLINE OF ALL FIRE HYDRANT LOCATIONS BY THE PAVING CONTRACTOR. HYDRANTS LOCATED AT INTERSECTIONS SHALL HAVE A BUTTON PLACED ON EACH STREET.

NO.	DATE	REVISION	APP.

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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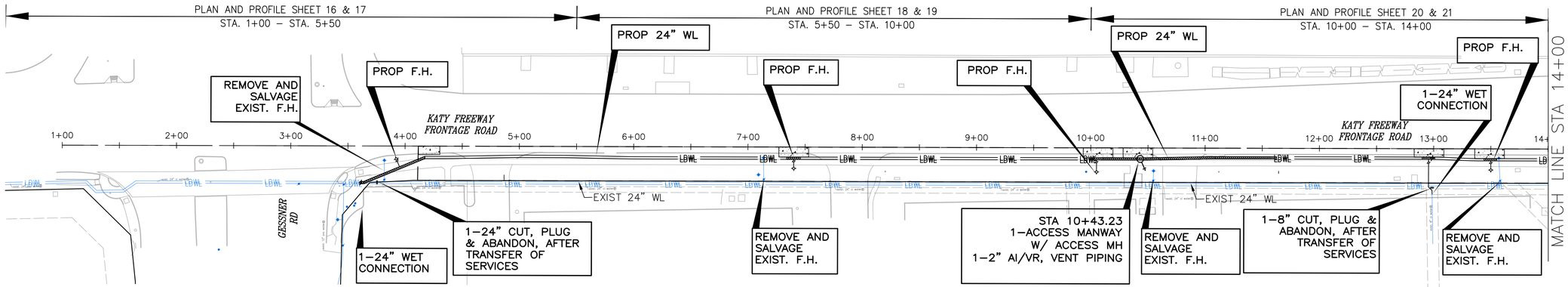
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

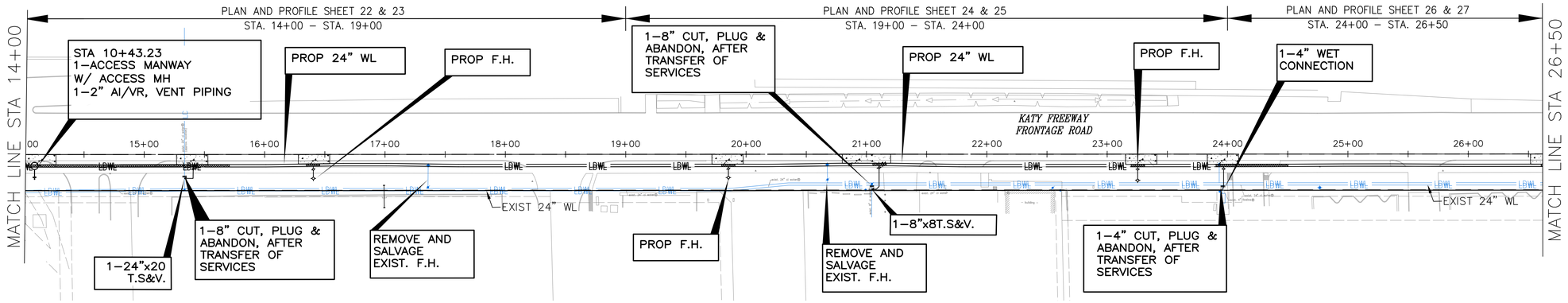
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

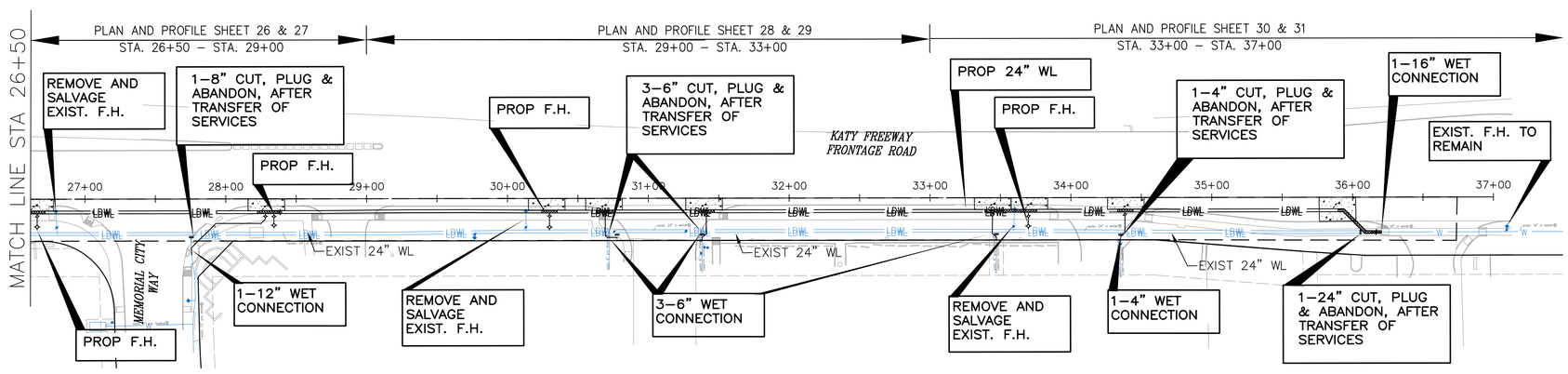
UTILITY AND GENERAL CONSTRUCTION NOTES

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 5 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\4-UTILITY AND GENERAL CONSTRUCTION NOTES.dwg plotted on Sep 21, 2025 - 10:59am







N

0' 50' 100'
HORIZ:1"=50'

NO.	DATE	REVISION	APP.

LEGEND:

- PROP. FIRE HYDRANT, GATE VALVE WITH BOX
- PROP. TAPPING SLEEVE AND VALVE WITH BOX
- PROP. CUT, PLUG & ABAND.
- PROP. REDUCER
- PROP. GATE VALVE
- PROP. WATER LINE
- EXIST. WATER LINE
- DESIGN BASE LINE
- EXIST. FIRE HYDRANT TO REMAIN IN SERVICE
- PIEZOMETER
- BOREHOLE

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

WATER LINE SHEET LAYOUT SITE–1 SHEET 1 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 6 OF 153	

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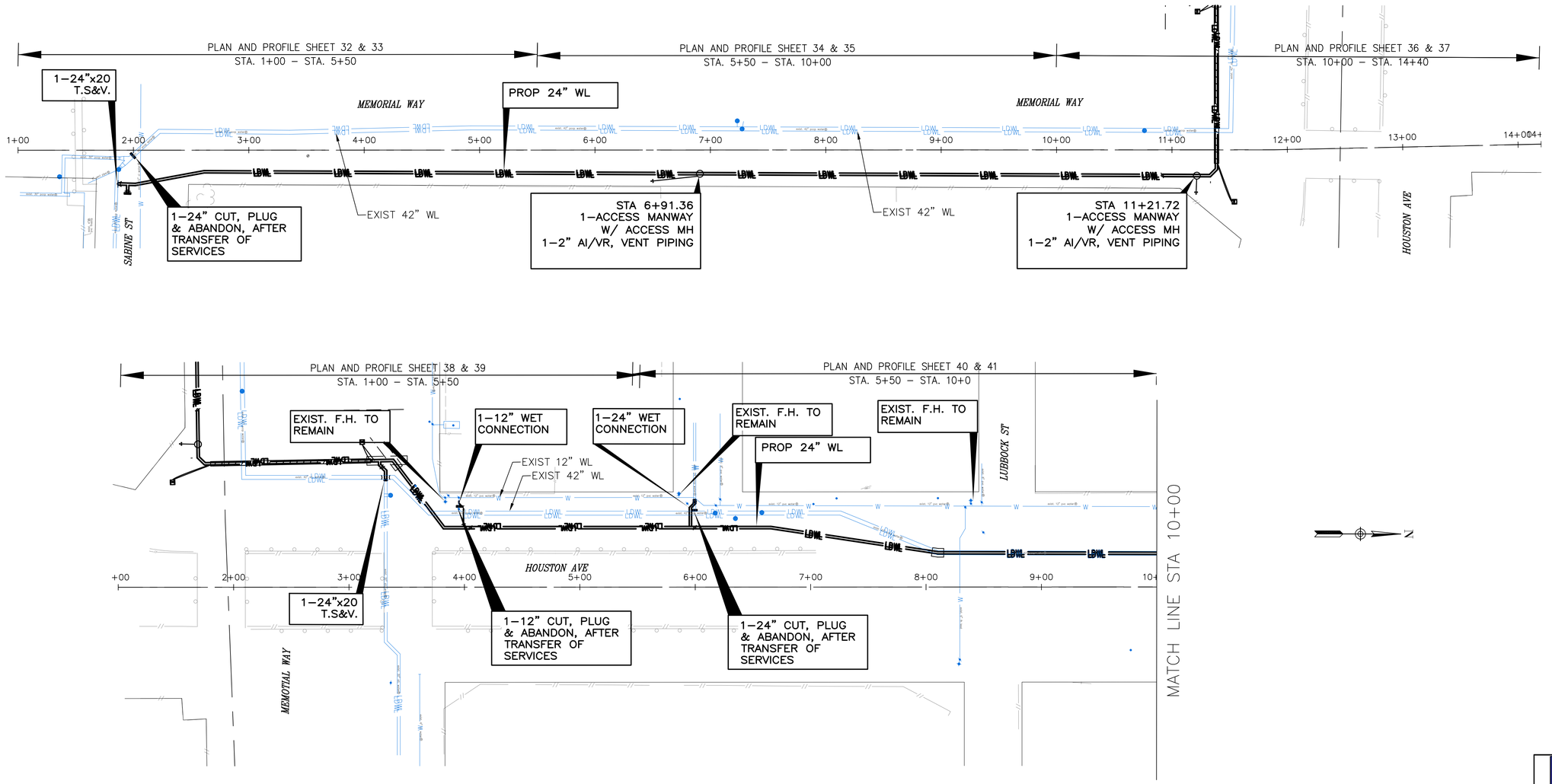

NO.	DATE	REVISION	APP.

LEGEND:

- PROP. FIRE HYDRANT, GATE VALVE WITH BOX
- PROP. TAPPING SLEEVE AND VALVE WITH BOX
- PROP. CUT, PLUG & ABAND.
- PROP. REDUCER
- PROP. GATE VALVE
- PROP. WATER LINE
- EXIST. WATER LINE
- 3+00 DESIGN BASE LINE
- EXIST. FIRE HYDRANT TO REMAIN IN SERVICE
- PIEZOMETER
- BOREHOLE

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

WATER LINE SHEET LAYOUT SITE–4 SHEET 2 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 7 OF 153	

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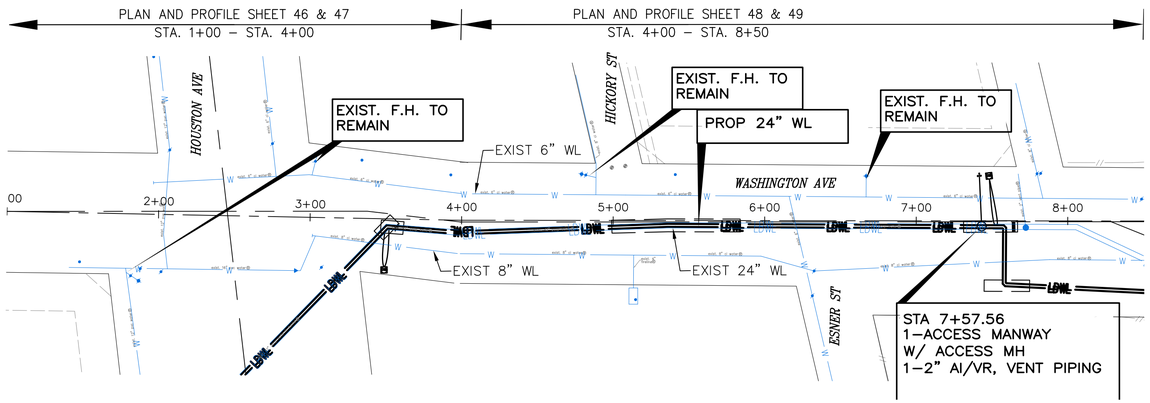

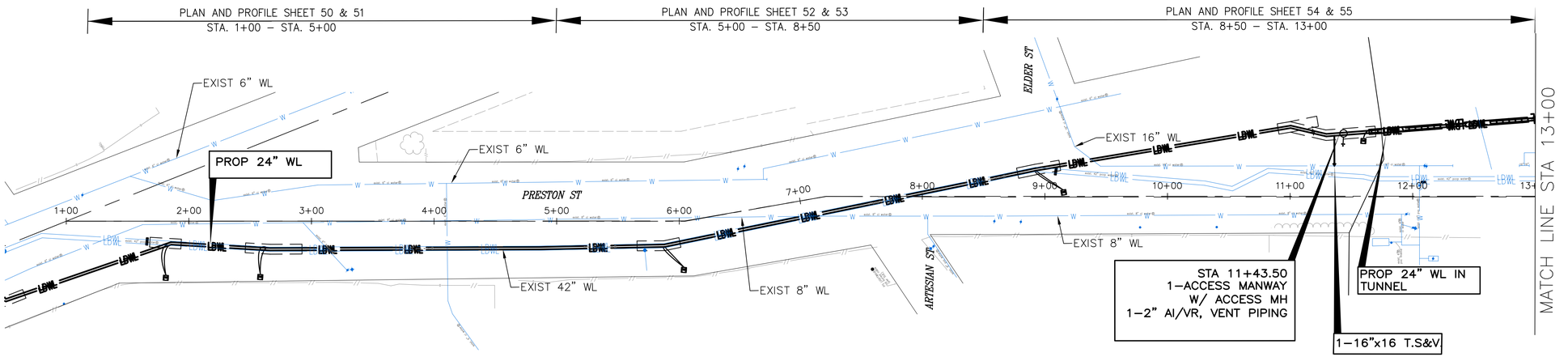

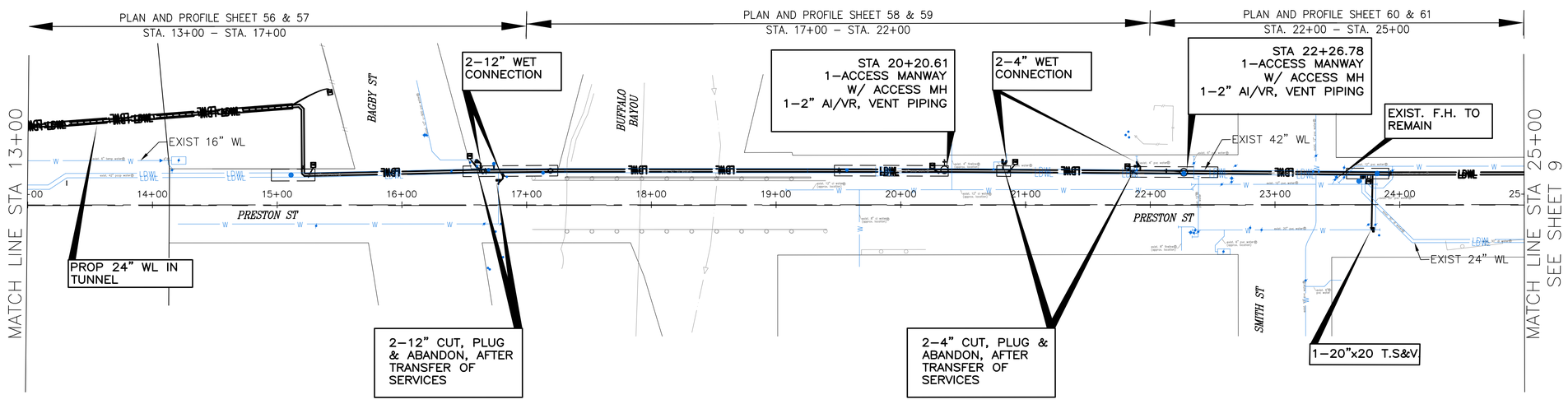

0' 50' 100'
HORIZ:1"=50'

NO.	DATE	REVISION	APP.

LEGEND:

- PROP. FIRE HYDRANT, GATE VALVE WITH BOX
- PROP. TAPPING SLEEVE AND VALVE WITH BOX
- PROP. CUT, PLUG & ABAND.
- PROP. REDUCER
- PROP. GATE VALVE
- PROP. WATER LINE (LDWL)
- EXIST. WATER LINE (LDWL)
- DESIGN BASE LINE (3+00)
- EXIST. FIRE HYDRANT TO REMAIN IN SERVICE
- PIEZOMETER
- BOREHOLE

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

WATER LINE SHEET LAYOUT SITE–4 SHEET 3 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 8 OF 153	

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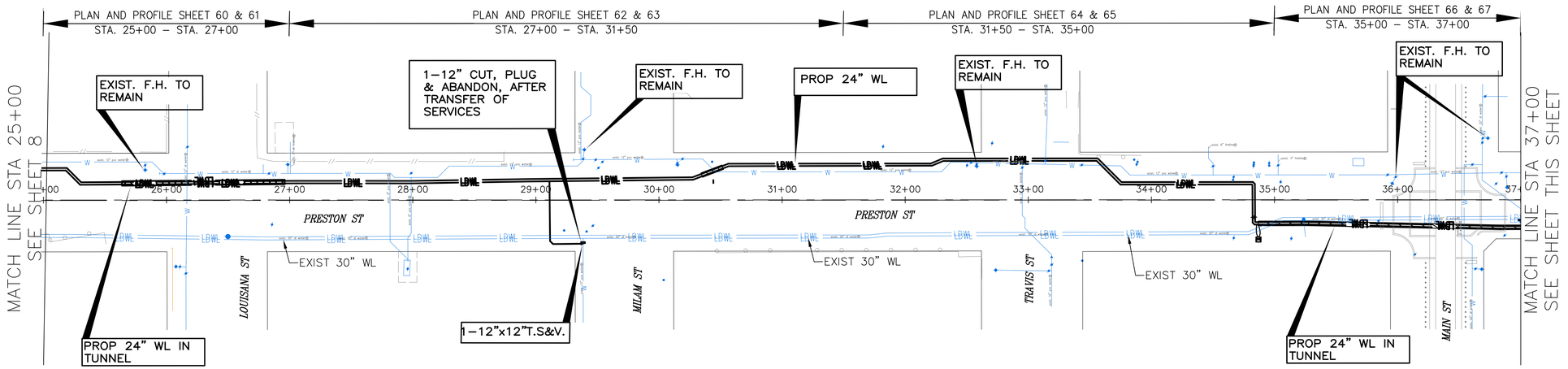

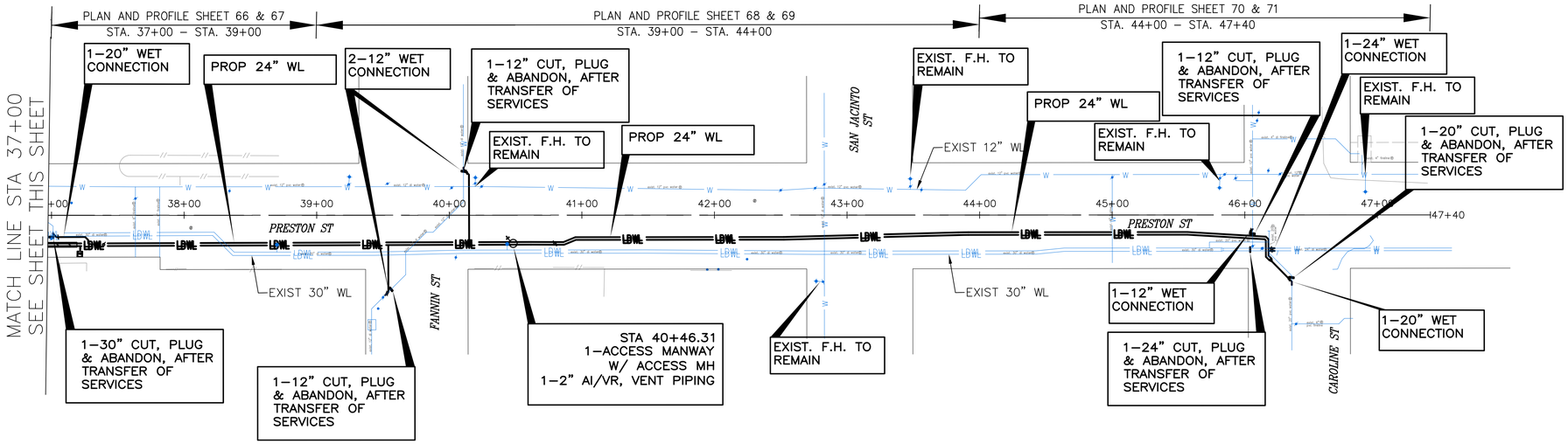

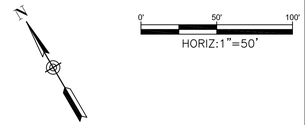

NO.	DATE	REVISION	APP.

LEGEND:

- PROP. FIRE HYDRANT, GATE VALVE WITH BOX
- PROP. TAPPING SLEEVE AND VALVE WITH BOX
- PROP. CUT, PLUG & ABAND.
- PROP. REDUCER
- PROP. GATE VALVE
- LDWL — PROP. WATER LINE
- LDWL — EXIST. WATER LINE
- 3+00 — DESIGN BASE LINE
- EXIST. FIRE HYDRANT TO REMAIN IN SERVICE
- PIEZOMETER
- BOREHOLE

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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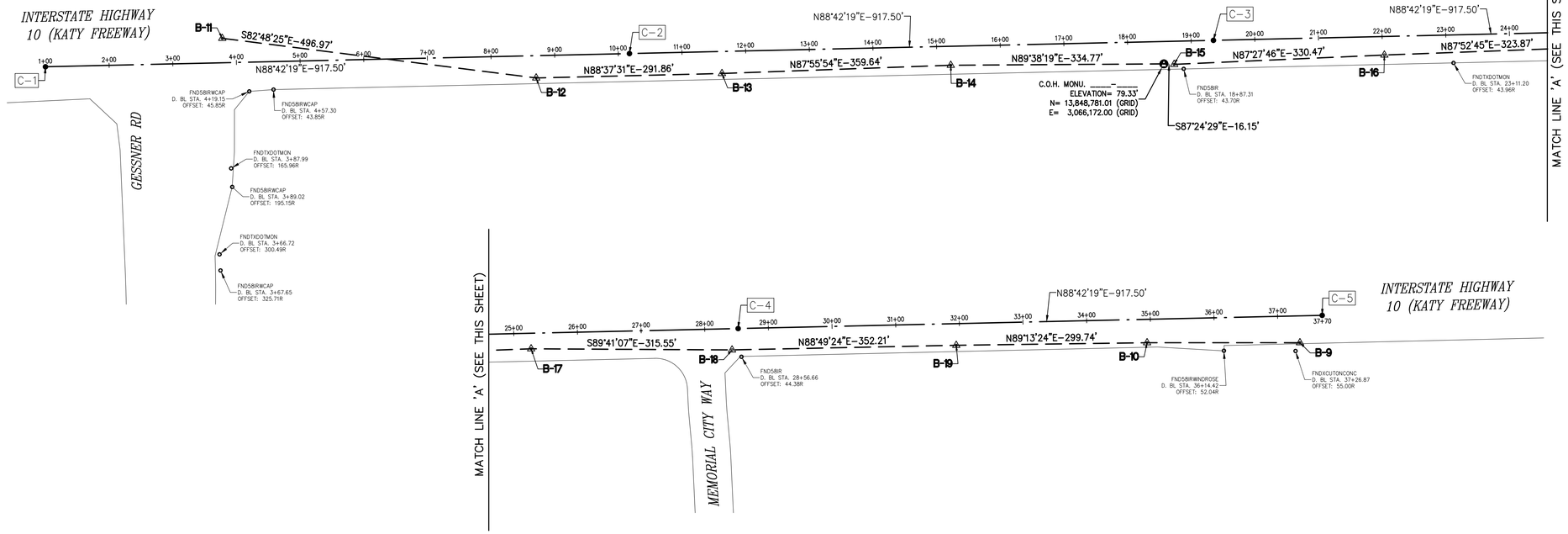
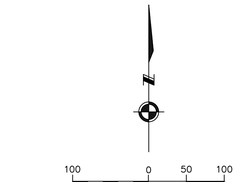
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
WATER LINE SHEET LAYOUT SITE–5
SHEET 4 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H1" 1=50'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 9 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\11 – Overall layout–Site–1, 4&5.dwg plotted on Sep 21, 2025 – 10:39am





	APP.
	REVISION
	NO. DATE

BENCHMARK:

CITY OF HOUSTON MONUMENT ____-____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV. 79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

NOTE:

ALL BEARINGS AND DISTANCES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83. ALL DISTANCES ARE IN SURFACE.

THE COORDINATES SHOWN HEREON ARE TEXAS SOUTH CENTRAL ZONE NO. 4204 STATE PLANE GRID COORDINATES (NAD83) AND MAY BE BROUGHT TO SURFACE BY DIVIDING BY THE COMBINED SCALE FACTOR 0.999870017.

LEGEND:

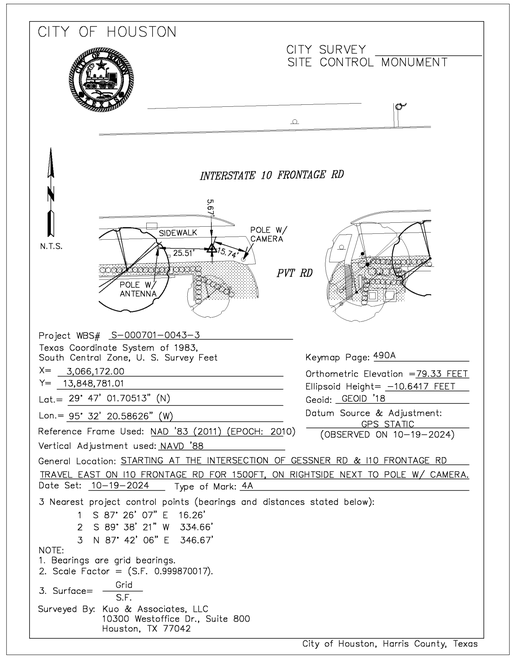
B-X	SURVEY CONTROL POINT NUMBER
C-X	DESIGN BASELINE POINT NUMBER
◬	SURVEY CONTROL POINT
●	DESIGN BASELINE POINT
Ⓐ	CITY OF HOUSTON MONUMENT
D. BL:	DESIGN BASELINE ——·——
S. BL:	SURVEY BASELINE — — —

SURVEY BASELINE POINTS DATA (TEMPORARY BENCHMARK)

POINT No.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)	ELEVATION	D. BL STA.	OFFSET	DESCRIPTION
B-9	13,850,616.83	3,068,448.03	13,848,816.49	3,068,049.18	77.24'	37+34.10	42.12R	SET 'X' CUT ON CONC.
B-10	13,850,616.80	3,068,207.93	13,848,816.45	3,067,809.11	78.37'	34+94.06	36.73R	SET 1/2" I.R. W/CAP
B-11	13,850,621.49	3,065,091.59	13,848,821.14	3,064,693.18	81.47'	3+78.63	38.37L	SET 'X' CUT ON PAVER
B-12	13,850,559.26	3,065,584.65	13,848,758.92	3,065,186.18	79.91'	8+70.16	34.99R	SET 1/2" I.R. W/CAP
B-13	13,850,566.26	3,065,876.44	13,848,765.92	3,065,477.92	80.02'	11+62.03	34.58R	SET 1/2" I.R. W/CAP
B-14	13,850,579.24	3,066,235.84	13,848,778.90	3,065,837.28	80.91'	15+21.63	29.72R	SET 'X' CUT ON CONC.
B-15	13,850,580.62	3,066,586.74	13,848,780.28	3,066,188.13	79.20'	18+72.47	36.27R	SET 1/2" I.R. W/CAP
B-16	13,850,595.25	3,066,916.89	13,848,794.91	3,066,518.24	78.94'	22+02.87	29.10R	SET 1/2" I.R. W/CAP
B-17	13,850,607.23	3,067,240.53	13,848,806.89	3,066,841.84	78.27'	25+26.70	24.43R	SET 'X' CUT ON CONC.
B-18	13,850,605.50	3,067,556.08	13,848,805.16	3,067,157.35	77.71'	28+42.13	33.30R	SET 'X' CUT ON CONC.
B-19	13,850,612.73	3,067,908.21	13,848,812.39	3,067,509.44	78.70'	31+94.33	34.02R	SET 1/2" I.R. W/CAP

DESIGN BASELINE POINTS DATA

POINT No.	D. BL STA.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)
C-1	1+00.00	13,850,576.83	3,064,813.90	13,848,776.49	3,064,415.53
C-2	10+17.50	13,850,597.56	3,065,731.17	13,848,797.22	3,065,332.67
C-3	19+35.00	13,850,618.29	3,066,648.43	13,848,817.95	3,066,249.82
C-4	28+52.50	13,850,639.02	3,067,565.70	13,848,838.68	3,067,166.97
C-5	37+70.00	13,850,659.75	3,068,482.96	13,848,859.40	3,068,084.11



T.B.M. B-10
SET 1/2" I.R. W/CAP
ELEV.=78.37
D. BL STA. 34+94.06 OFFSET: 36.73R

T.B.M. B-9
SET 'X' CUT ON CONC.
ELEV.=77.26
D. BL STA. 37+34.10 OFFSET: 42.12R

T.B.M. B-11
SET 'X' CUT ON PAVER
ELEV.=81.47
D. BL STA. 3+78.63 OFFSET: 38.37L

T.B.M. B-12
SET 1/2" I.R. W/CAP
ELEV.=79.91
D. BL STA. 8+70.16 OFFSET: 34.99R

T.B.M. B-13
SET 1/2" I.R. W/CAP
ELEV.=80.02
D. BL STA. 11+62.03 OFFSET: 34.58R

T.B.M. B-14
SET 'X' CUT ON CONC.
ELEV.=80.91
D. BL STA. 15+21.63 OFFSET: 29.72R

T.B.M. B-15
SET 1/2" I.R. W/CAP
ELEV.=79.20
D. BL STA. 18+72.47 OFFSET: 36.27R

T.B.M. B-16
SET 1/2" I.R. W/CAP
ELEV.=78.94
D. BL STA. 22+02.87 OFFSET: 29.10R

T.B.M. B-17
SET 'X' CUT ON CONC.
ELEV.=78.27
D. BL STA. 25+26.70 OFFSET: 24.43R

T.B.M. B-18
SET 'X' CUT ON CONC.
ELEV.=77.701
D. BL STA. 28+42.13 OFFSET: 33.30R

T.B.M. B-19
SET 1/2" I.R. W/CAP
ELEV.=78.70
D. BL STA. 31+94.33 OFFSET: 34.02R

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KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
DATE: SEPTEMBER 22, 2025

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER LINE REPLACEMNT IN MEMORIAL CITY AREA SITE 1

SURVEY CONTROL MAP (SHEET 1 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-3	
DRAWING SCALE	
1" = 100'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 10 OF 153	

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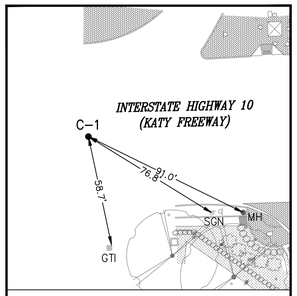

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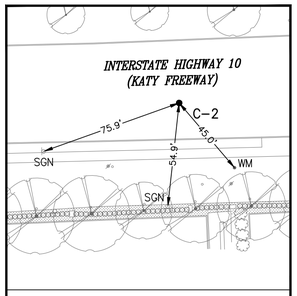

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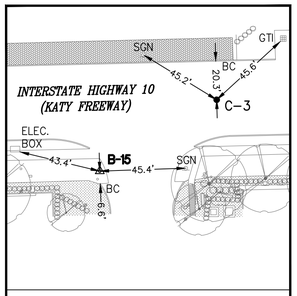

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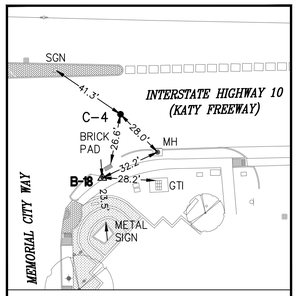

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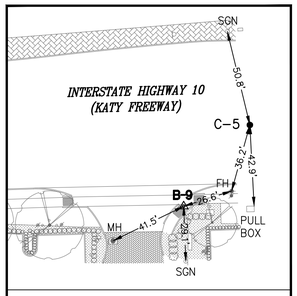

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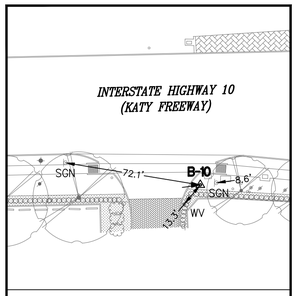

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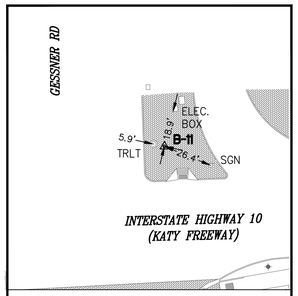

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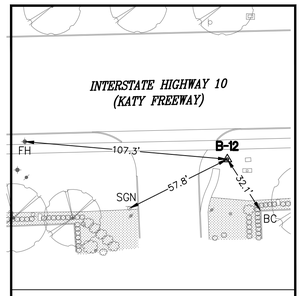

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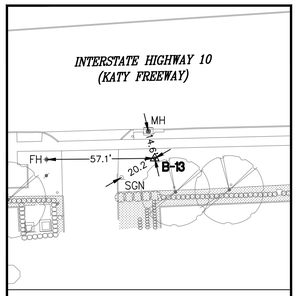

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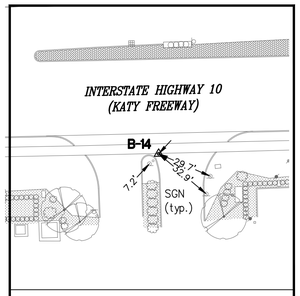

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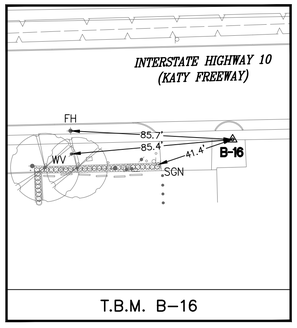

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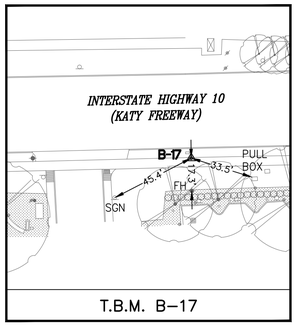

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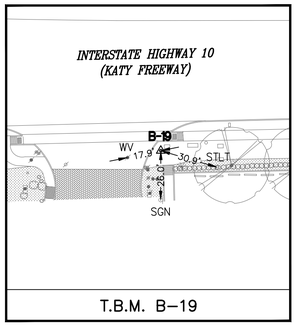

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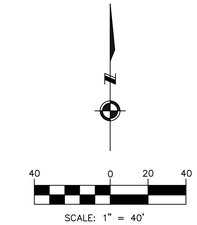

NO.	DATE	REVISION	APP.

EXIST. TOPOGRAPHIC LEGEND

- ASPHALT SYMBOL
- B OR BB INLET
- BUSH
- C INLET
- CLEANOUT
- brick column
- DOWN GUY
- E INLET
- ELEC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GATE
- GRATE INLET
- GRATE INLET
- MAIL BOX
- STORM MANHOLE
- SANITARY MANHOLE
- PLANTER
- POWER POLE
- POWER POLE W/LT.
- SIGN
- SIGNAL POLE
- SPRINKER VALVE
- SPRINKLER HEAD
- STREET LIGHT/FLOOD LIGHT
- STREET LIGHT/PARKING LIGHT
- TREE
- TREE STUMP
- TREE-CREPE MYRTLE
- TREE-PINE
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE

ABBREVIATIONS

FH – FIRE HYDRANT
FC – FENCE CORNER
LT – LIGHT POLE
MB – MAIL BOX
MH – MANHOLE
PP – POWER POLE
PP/LT – POWER POLE W/LIGHT
SGN – SIGN
TRLT– TRAFFIC LIGHT
WM – WATER METER

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KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
DATE: SEPTEMBER 22, 2025

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

WATER LINE REPLACEMNT IN MEMORIAL CITY AREA SITE 1

SURVEY CONTROL MAP (SHEET 2 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-3	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 11 OF 153	

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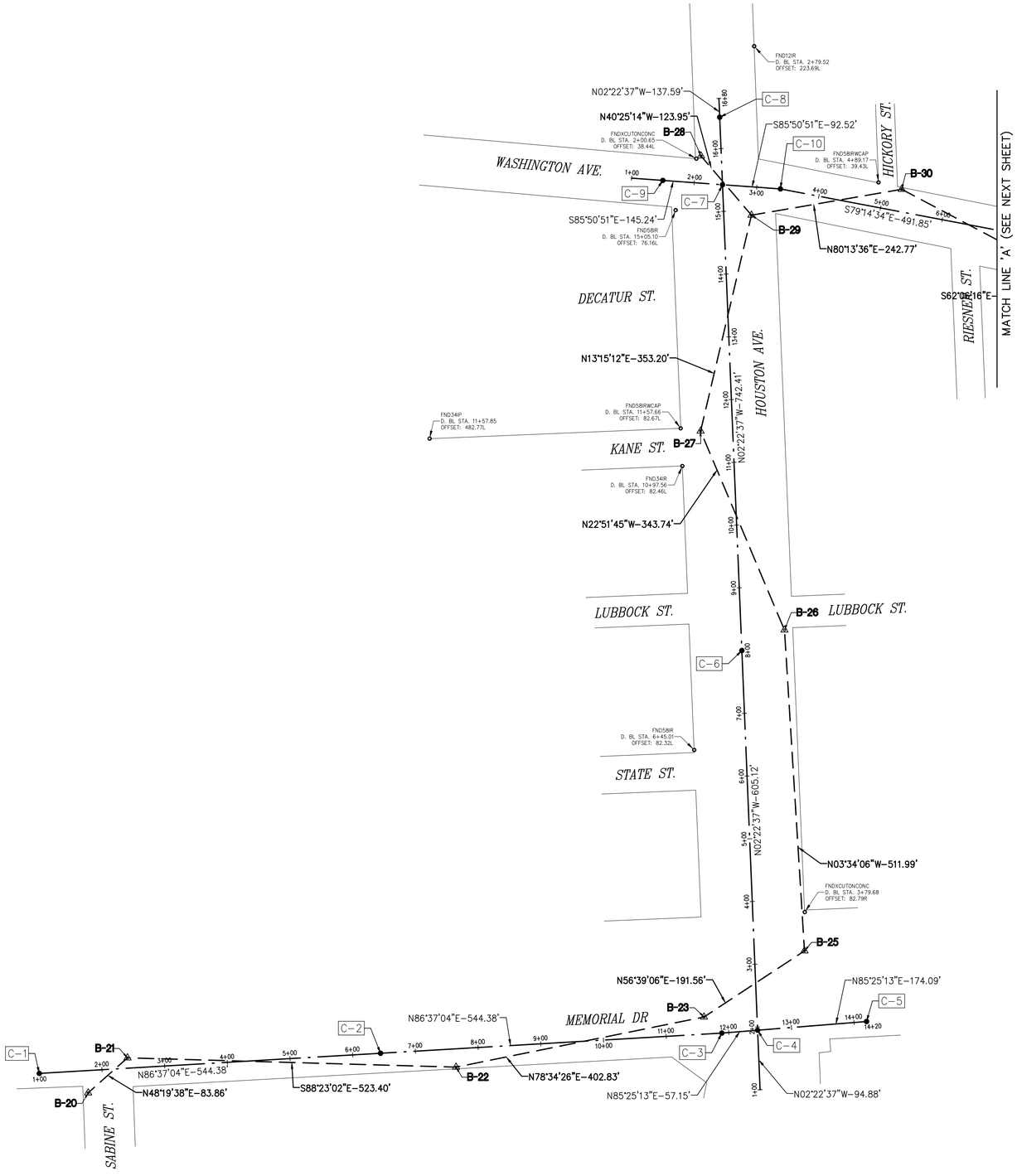
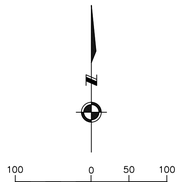


T.B.M. B-20 SET 'X' CUT ON CONC. ELEV.=38.58 D. BL STA. 1+75.82 OFFSET: 35.49R	T.B.M. B-27 SET 'X' CUT ON CONC. ELEV.=44.13 D. BL STA. 11+51.91 OFFSET: 51.11L	T.B.M. B-35 FND 'X' CUT ON CONC. ELEV.=40.60 D. BL STA. 9+20.39 OFFSET: 3.64L	T.B.M. B-42 FND 'X' CUT ON CONC. ELEV.=44.90 D. BL STA. 32+61.76 OFFSET: 27.81L
T.B.M. B-21 SET 1/2" I.R. W/CAP ELEV.=38.33 D. BL STA. 2+41.64 OFFSET: 16.47L	T.B.M. B-28 SET 'X' CUT ON CONC. ELEV.=44.13 D. BL STA. 2+07.74 OFFSET: 43.27L	T.B.M. B-36 SET MAGNAIL W/SHINER ELEV.=38.59 D. BL STA. 12+59.39 OFFSET: 6.31L	T.B.M. B-43 FND 'X' CUT ON CONC. ELEV.=45.66 D. BL STA. 36+78.83 OFFSET: 9.22L
T.B.M. B-22 FND 5/8" I.R. ELEV.=39.30 D. BL STA. 7+63.05 OFFSET: 29.13R	T.B.M. B-29 SET 'X' CUT ON CONC. ELEV.=44.36 D. BL STA. 2+94.73 OFFSET: 45.03R	T.B.M. B-37 SET 'X' CUT ON PAVERS ELEV.=30.93 D. BL STA. 16+46.90 OFFSET: 27.98R	T.B.M. B-44 SET 'X' CUT ON CONC. ELEV.=43.73 D. BL STA. 39+43.92 OFFSET: 28.07L
T.B.M. B-23 SET 1/2" I.R. W/CAP ELEV.=38.01 D. BL STA. 11+61.93 OFFSET: 27.24L	T.B.M. B-30 SET 'X' CUT ON CONC. ELEV.=43.42 D. BL STA. 5+27.54 OFFSET: 35.46L	T.B.M. B-38 SET 'X' CUT ON PAVERS ELEV.=32.98 D. BL STA. 19+64.23 OFFSET: 25.88L	T.B.M. B-45 SET 'X' CUT ON CONC. ELEV.=42.72 D. BL STA. 43+43.72 OFFSET: 20.97L
T.B.M. B-25 SET 'X' CUT ON CONC. ELEV.=34.28 D. BL STA. 3+18.02 OFFSET: 79.83R	T.B.M. B-32 SET 1/2" I.R. W/CAP ELEV.=42.02 D. BL STA. 8+14.92 OFFSET: 53.16R	T.B.M. B-39 SET 'X' CUT ON CONC. ELEV.=36.44 D. BL STA. 23+44.86 OFFSET: 27.19R	T.B.M. B-46 SET 'X' CUT ON CONC. ELEV.=40.58 D. BL STA. 46+19.94 OFFSET: 21.45R
T.B.M. B-24 FND 5/8" I.R. ELEV.=39.38 D. BL STA. 13+32.33 OFFSET: 103.64R	T.B.M. B-33 SET 5/8" I.R. W/CAP ELEV.=41.23 D. BL STA. 3+49.67 OFFSET: 36.90L	T.B.M. B-40 SET 'X' CUT ON CONC. ELEV.=38.02 D. BL STA. 26+01.60 OFFSET: 25.20L	
T.B.M. B-26 SET 'X' CUT ON CONC. ELEV.=40.12 D. BL STA. 8+29.91 OFFSET: 69.18R	T.B.M. B-34 SET MAGNAIL W/SHINER ELEV.=39.69 D. BL STA. 7+24.10 OFFSET: 32.32L	T.B.M. B-41 SET 'X' CUT ON CONC. ELEV.=43.51 D. BL STA. 30+10.07 OFFSET: 18.64R	



NO.	DATE	REVISION	APP.

BENCHMARK:

CITY OF HOUSTON MONUMENT 5457-7413, A BRASS DISK IN CONCRETE, LOCATED AT SOUTHWEST CORNER OF THE INTERSECTION OF MAIN ST AND COMMERCE ST.

ELEV. 37.34 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED JUNE 1, 2024.

VERTICAL DATUM ADJUSTMENT:

THE ELEVATION DIFFERENCE IN BETWEEN THE FLOODPLAIN REFERENCE MARK'S (RM 201148) PUBLISHED DATUM NAVD 1988, 2001 ADJUSTMENT AND DATUM NAVD 1988, (GEOID '18) IS 0.30'.

NAVD 1988, 2001 ADJ. ELEVATION
= NAVD 1988 (GEOID '18) ELEVATION – 0.30 FT

NOTE:

ALL BEARINGS AND DISTANCES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83. ALL DISTANCES ARE IN SURFACE.

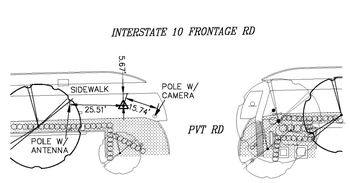
THE COORDINATES SHOWN HEREON ARE TEXAS SOUTH CENTRAL ZONE NO. 4204 STATE PLANE GRID COORDINATES (NAD83) AND MAY BE BROUGHT TO SURFACE BY DIVIDING BY THE COMBINED SCALE FACTOR 0.999870017.

LEGEND:

B-X	SURVEY CONTROL POINT NUMBER
C-X	DESIGN BASELINE POINT NUMBER
⚠	SURVEY CONTROL POINT
●	DESIGN BASELINE POINT
⚠	CITY OF HOUSTON MONUMENT
D. BL:	DESIGN BASELINE ——·——
S. BL:	SURVEY BASELINE — — —

CITY OF HOUSTON

CITY SURVEY
SITE CONTROL MONUMENT



Project WBS# S-000701-0043-3
Texas Coordinate System of 1983,
South Central Zone, U. S. Survey Feet
X= 3,066,172.00
Y= 13,848,781.01
Lat.= 29° 47' 01.70513" (N)
Lon.= 95° 32' 20.58626" (W)
Reference Frame Used: NAD '83 (2011) (EPOCH: 2010)
Vertical Adjustment used: NAVD '88
General Location: STARTING AT THE INTERSECTION OF GESSNER RD & I10 FRONTAGE RD TRAVEL EAST ON I10 FRONTAGE RD FOR 1500FT, ON RIGHTSIDE NEXT TO POLE W/ CAMERA.
Date Set: 10-19-2024 Type of Mark: 4A

Keymap Page: 490A
Orthometric Elevation =79.33 FEET
Ellipsoid Height= -10.6417 FEET
Geoid: GEOID '18
Datum Source & Adjustment:
GPS STATIC
(OBSERVED ON 10-19-2024)

3 Nearest project control points (bearings and distances stated below):
1 S 87° 26' 07" E 16.26'
2 S 89° 38' 21" W 334.66'
3 N 87° 42' 06" E 346.67'

NOTE:
1. Bearings are grid bearings.
2. Scale Factor = (S.F. 0.999870017).
3. Surface= Grid / S.F.

Surveyed By: Kuo & Associates, LLC
10300 Westoffice Dr., Suite 800
Houston, TX 77042

City of Houston, Harris County, Texas

KUO & ASSOCIATES
ENGINEERING • SURVEYING
10300 Westoffice Dr., Suite 800, Houston, Texas 77042
Tel: 713-975-8769, Fax: 713-975-0920, www.kuoassociates.com
TBPELS Engineering Firm Reg. No. F-4578
TBPELS Surveying Firm Reg. No. 10075600

SURVEYED BY: KUO & ASSOC.
FB NO.

INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE.
NOT INTENDED FOR PERMIT, BIDDING OR CONSTRUCTION.
KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
DATE: SEPTEMBER 22, 2025

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER LINE REPLACEMNT IN
MEMORIAL CITY AREA
SITE 4 & 5

SURVEY CONTROL MAP
(SHEET 1 OF 4)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-3	
DRAWING SCALE	
1" = 100'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 12 OF 153	

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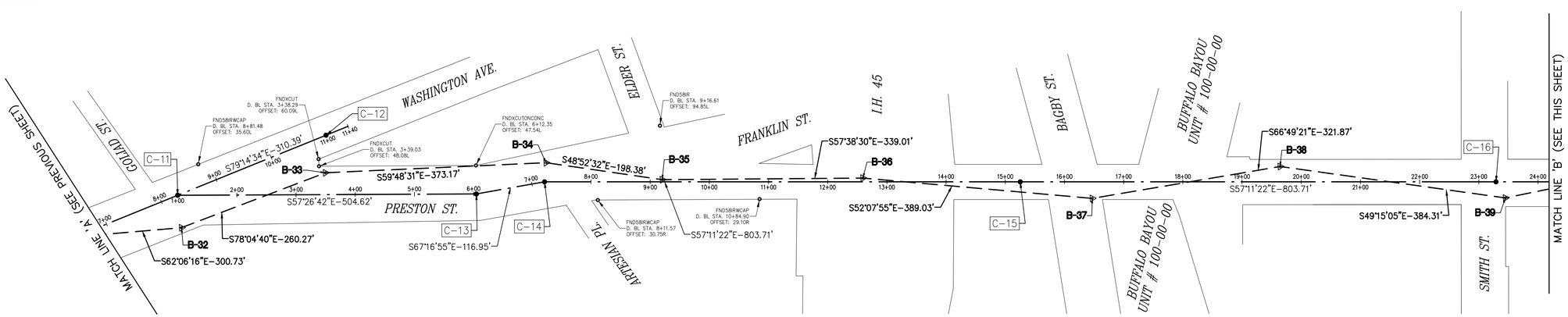
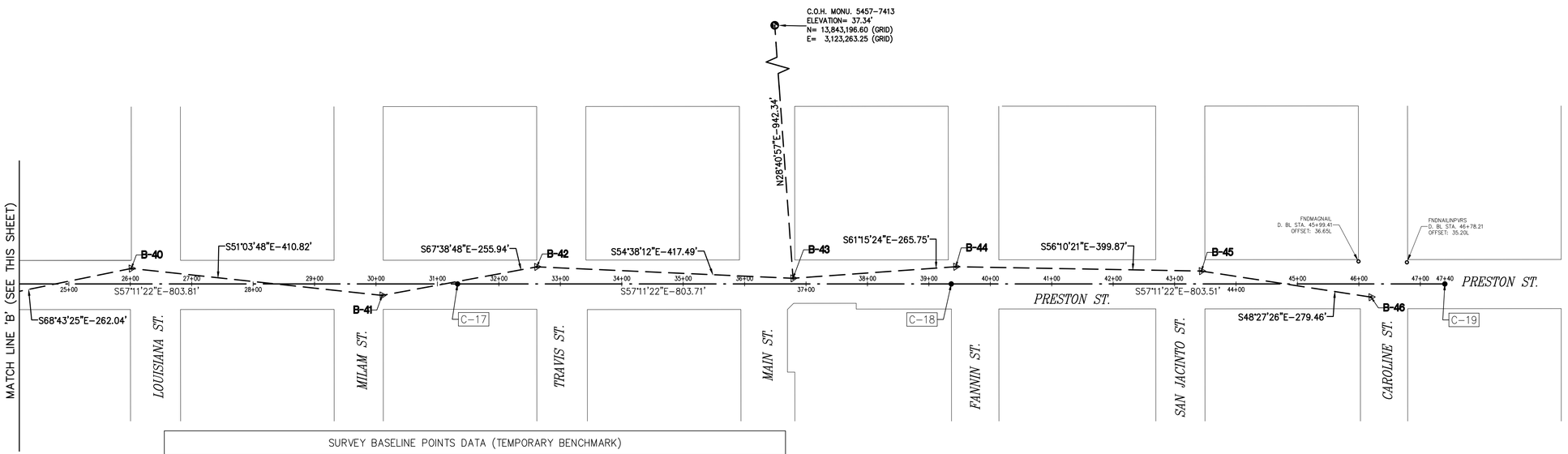
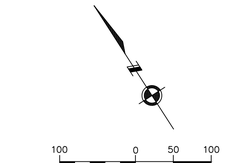




SURVEY BASELINE POINTS DATA (TEMPORARY BENCHMARK)								
POINT No.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)	ELEVATION	D. BL STA.	OFFSET	DESCRIPTION
B-20	13,844,733.28	3,118,607.66	13,842,933.70	3,118,202.30	38.58'	1+75.82	35.49R	SET 'X' CUT ON CONC.
B-21	13,844,789.03	3,118,670.30	13,842,989.44	3,118,264.93	38.33'	2+41.64	16.47L	SET 1/2" I.R. W/CAP
B-22	13,844,774.27	3,119,193.50	13,842,974.68	3,118,788.05	39.30'	7+63.05	29.13R	FND 5/8" I.R.
B-23	13,844,854.07	3,119,588.35	13,843,054.48	3,119,182.85	38.01'	11+61.93	27.24L	SET 1/2" I.R. W/CAP
B-25	13,844,959.38	3,119,748.36	13,843,159.77	3,119,342.85	34.28'	3+18.02	79.83R	SET 'X' CUT ON CONC.
B-26	13,845,470.38	3,119,716.50	13,843,670.70	3,119,310.99	40.12'	8+29.91	69.18R	SET 'X' CUT ON CONC.
B-27	13,845,787.12	3,119,582.95	13,843,987.40	3,119,177.46	44.13'	11+51.91	51.11L	SET 'X' CUT ON CONC.
B-28	13,846,225.27	3,119,583.55	13,844,425.50	3,119,178.06	44.13'	2+07.74	43.27L	SET 'X' CUT ON CONC.
B-29	13,846,130.91	3,119,663.92	13,844,331.15	3,119,258.42	44.36'	2+94.73	45.03R	SET 'X' CUT ON CONC.
B-30	13,846,172.12	3,119,903.17	13,844,372.35	3,119,497.63	43.42'	5+27.54	35.46L	SET 'X' CUT ON CONC.
B-32	13,846,031.42	3,120,168.95	13,844,231.67	3,119,763.38	42.02'	8+14.92	53.16R	SET 1/2" I.R. W/CAP
B-33	13,845,977.65	3,120,423.61	13,844,177.91	3,120,018.01	41.23'	3+49.67	36.90L	SET 5/8" I.R. W/CAP
B-34	13,845,789.99	3,120,746.16	13,843,990.27	3,120,340.51	39.69'	7+24.10	32.32L	SET MAGNAIL W/SHINER
B-35	13,845,659.52	3,120,895.59	13,843,859.82	3,120,489.93	40.60'	9+20.39	3.64L	FND 'X' CUT ON CONC.
B-36	13,845,478.08	3,121,181.96	13,843,678.40	3,120,776.25	38.59'	12+59.39	6.31L	SET MAGNAIL W/SHINER
B-37	13,845,239.27	3,121,489.07	13,843,439.63	3,121,083.33	30.93'	16+46.90	27.98R	SET 'X' CUT ON PAVERS
B-38	13,845,112.59	3,121,784.96	13,843,312.96	3,121,379.18	32.98'	19+64.23	25.88L	SET 'X' CUT ON PAVERS
B-39	13,844,861.74	3,122,076.10	13,843,062.14	3,121,670.28	36.44'	23+44.86	27.19R	SET 'X' CUT ON CONC.
B-40	13,844,766.65	3,122,320.28	13,842,967.07	3,121,914.43	38.02'	26+01.60	25.20L	SET 'X' CUT ON CONC.
B-41	13,844,508.47	3,122,639.83	13,842,708.92	3,122,233.94	43.51'	30+10.07	18.64R	SET 'X' CUT ON CONC.
B-42	13,844,411.13	3,122,876.53	13,842,611.60	3,122,470.61	44.90'	32+61.76	27.81L	FND 'X' CUT ON CONC.
B-43	13,844,169.51	3,123,216.99	13,842,370.00	3,122,811.03	45.66'	36+78.83	9.22L	FND 'X' CUT ON CONC.
B-44	13,844,041.71	3,123,450.00	13,842,242.22	3,123,044.00	43.73'	39+43.92	28.07L	SET 'X' CUT ON CONC.
B-45	13,843,819.11	3,123,782.18	13,842,019.65	3,123,376.14	42.72'	43+43.72	20.97L	SET 'X' CUT ON CONC.
B-46	13,843,633.78	3,123,991.34	13,841,834.34	3,123,585.27	40.58'	46+19.94	21.45R	SET 'X' CUT ON CONC.

DESIGN BASELINE POINTS DATA					
POINT No.	D. BL STA.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)
C-1	1+00.00	13,844,764.23	3,118,529.88	13,842,964.65	3,118,124.52
C-2	6+44.38	13,844,796.35	3,119,073.31	13,842,996.76	3,118,667.89
C-3	11+88.77	13,844,828.47	3,119,616.75	13,843,028.88	3,119,211.25
C-4	12+45.91	13,844,833.03	3,119,673.71	13,843,033.44	3,119,268.21
C-5	14+20.00	13,844,846.93	3,119,847.24	13,843,047.34	3,119,441.72
C-6	8+00.00	13,845,437.63	3,119,648.61	13,843,637.96	3,119,243.11
C-7	15+42.41	13,846,179.40	3,119,617.82	13,844,379.63	3,119,212.33
C-8	16+50.00	13,846,286.90	3,119,613.37	13,844,487.12	3,119,207.88
C-9	1+50.00	13,846,186.29	3,119,522.83	13,844,386.52	3,119,117.35
C-10	3+37.76	13,846,172.70	3,119,710.10	13,844,372.94	3,119,304.59
C-11	8+29.61	13,846,080.90	3,120,193.31	13,844,281.15	3,119,787.74
C-12	11+00.00	13,846,030.43	3,120,458.95	13,844,230.68	3,120,053.34
C-13	6+04.62	13,845,809.36	3,120,618.64	13,844,009.64	3,120,213.01
C-14	7+21.57	13,845,764.20	3,120,726.52	13,843,964.48	3,120,320.88
C-15	15+25.27	13,845,328.70	3,121,402.00	13,843,529.04	3,120,996.28
C-16	23+28.98	13,844,893.20	3,122,077.49	13,843,093.60	3,121,671.68
C-17	31+32.79	13,844,457.64	3,122,753.06	13,842,658.10	3,122,347.16
C-18	39+36.49	13,844,022.14	3,123,428.55	13,842,222.66	3,123,022.56
C-19	47+40.00	13,843,586.75	3,124,103.87	13,841,787.32	3,123,697.79



BENCHMARK:

CITY OF HOUSTON MONUMENT 5457-7413, A BRASS DISK IN CONCRETE, LOCATED AT SOUTHWEST CORNER OF THE INTERSECTION OF MAIN ST AND COMMERCE ST.

ELEV. 37.34 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED JUNE 1, 2024.

VERTICAL DATUM ADJUSTMENT:

THE ELEVATION DIFFERENCE IN BETWEEN THE FLOODPLAIN REFERENCE MARK'S (RM 201148) PUBLISHED DATUM NAVD 1988, 2001 ADJUSTMENT AND DATUM NAVD 1988, (GEOID '18) IS 0.30'.

NAVD 1988, 2001 ADJ. ELEVATION
= NAVD 1988 (GEOID '18) ELEVATION – 0.30 FT

NOTE:

ALL BEARINGS AND DISTANCES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83. ALL DISTANCES ARE IN SURFACE.

THE COORDINATES SHOWN HEREON ARE TEXAS SOUTH CENTRAL ZONE NO. 4204 STATE PLANE GRID COORDINATES (NAD83) AND MAY BE BROUGHT TO SURFACE BY DIVIDING BY THE COMBINED SCALE FACTOR 0.999870017.

LEGEND:

B-X	SURVEY CONTROL POINT NUMBER
C-X	DESIGN BASELINE POINT NUMBER
△	SURVEY CONTROL POINT
●	DESIGN BASELINE POINT
Ⓐ	CITY OF HOUSTON MONUMENT
D. BL:	DESIGN BASELINE
S. BL:	SURVEY BASELINE

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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Tel: 713-975-9769, Fax: 713-975-0920, www.kuoassociates.com
TBPELS Engineering Firm Reg. No. F-4578
TBPELS Surveying Firm Reg. No. 10075600

SURVEYED BY: KUO & ASSOC.
FB NO.

INTERIM REVIEW ONLY

DOCUMENT INCOMPLETE. NOT INTENDED FOR PERMIT, BIDDING OR CONSTRUCTION.

KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
DATE: SEPTEMBER 22, 2025

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER LINE REPLACEMNT IN MEMORIAL CITY AREA SITE 4 & 5

SURVEY CONTROL MAP (SHEET 2 OF 4)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-3	
DRAWING SCALE	
1" = 100'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 13 OF 153	

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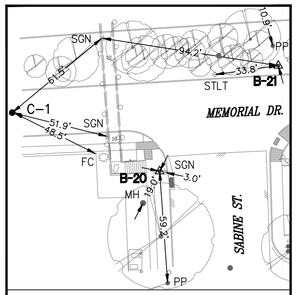
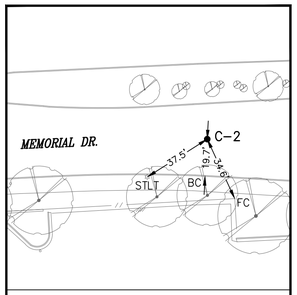


C-1 & T.B.M. B-20



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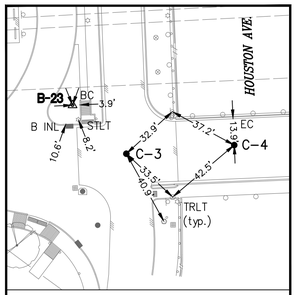

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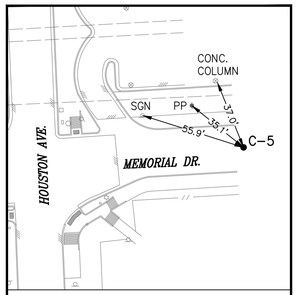

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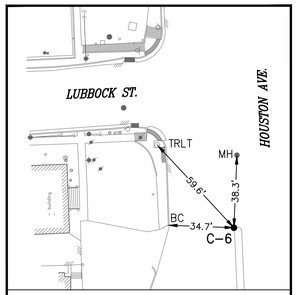

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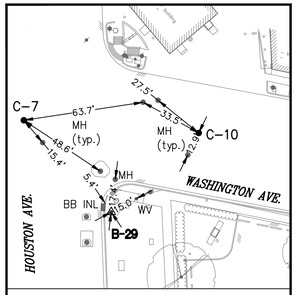
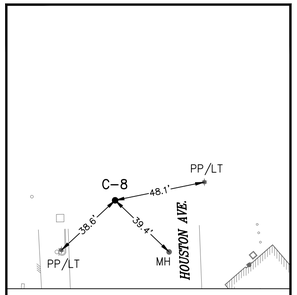


C-7, C-10 & T.B.M. B-29



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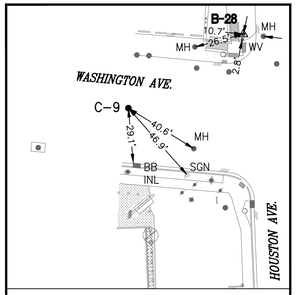

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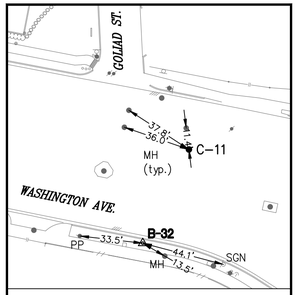

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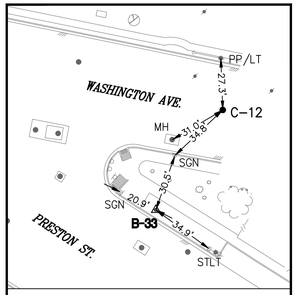

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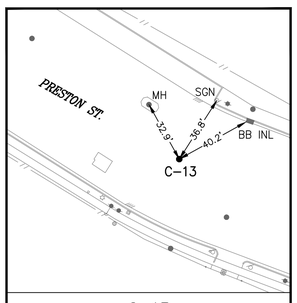

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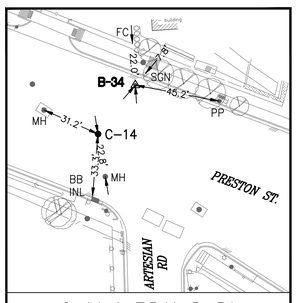

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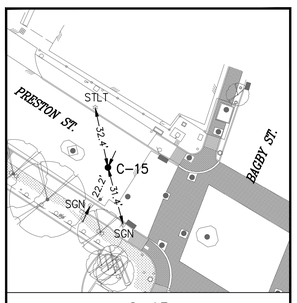

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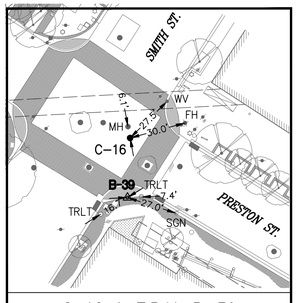

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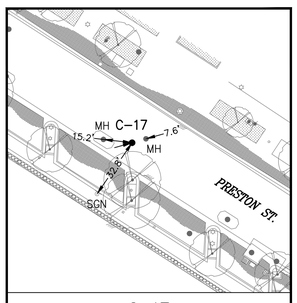

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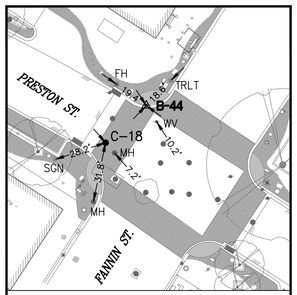
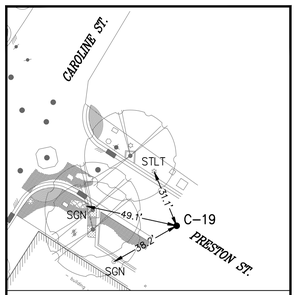
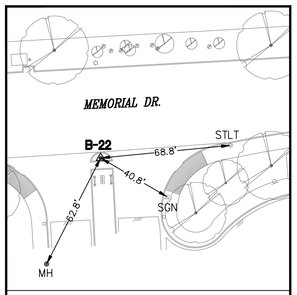


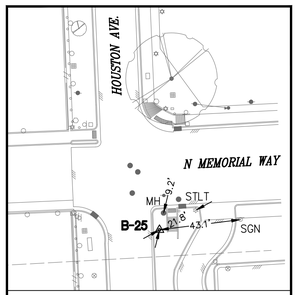
C-18 & T.B.M. B-44



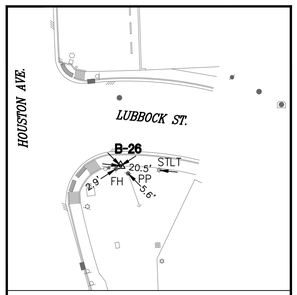
C-19



T.B.M. B-22



T.B.M. B-25



T.B.M. B-26

NO.	DATE	REVISION	APP.

EXIST. TOPOGRAPHIC LEGEND

- ASPHALT SYMBOL
- B OR BB INLET
- BUSH
- C INLET
- CLEANOUT
- brick column
- DOWN GUY
- E INLET
- ELEC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GATE
- GRATE INLET
- GRATE INLET
- MAIL BOX
- STORM MANHOLE
- SANITARY MANHOLE
- PLANTER
- POWER POLE
- POWER POLE W/LT.
- SIGN
- SIGNAL POLE
- SPRINKLER VALVE
- SPRINKLER HEAD
- STREET LIGHT/FLOOD LIGHT
- STREET LIGHT/PARKING LIGHT
- TREE
- TREE STUMP
- TREE-CREPE MYRTLE
- TREE-PINE
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE

ABBREVIATIONS

FH – FIRE HYDRANT
FC – FENCE CORNER
INL – INLET
LT – LIGHT
MB – MAIL BOX
MH – MANHOLE
PP – POWER POLE
PP/LT – POWER POLE W/LIGHT
SGN – SIGN
STLT – STREET LIGHT
WM – WATER METER

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 Westoffice Dr., Suite 800, Houston, Texas 77042
Tel: 713-975-8769, Fax: 713-975-0920, www.kuoassociates.com
TBPELS Engineering Firm Reg. No. F-4578
TBPELS Surveying Firm Reg. No. 10075600

INTERIM REVIEW ONLY

DOCUMENT INCOMPLETE.
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BIDDING OR CONSTRUCTION.

KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
DATE: SEPTEMBER 22, 2025

SURVEYED BY: KUO & ASSOC.
FB NO.

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

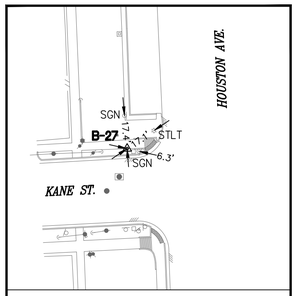
WATER LINE REPLACEMNT IN MEMORIAL CITY AREA SITE 4 & 5

SURVEY CONTROL MAP (SHEET 3 OF 4)

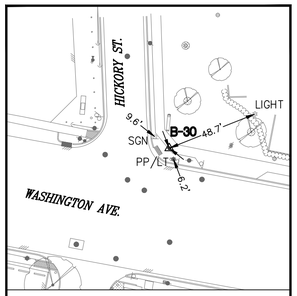
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-3	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 14 OF 153	

PLOT STYLE: LARGE_FORMAT_BW.CTB PLOTTED: 9/22/2025 10:05 AM
FILE PATH: S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\SCM\Site 2\24057-Swingties-Site 2.dwg

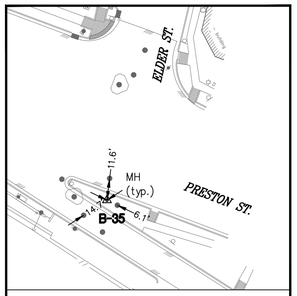
PLOT STYLE: LARGE_FORMAT_BW.CTB PLOTTED: 9/22/2025 10:06 AM



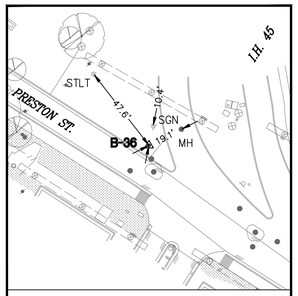
T.B.M. B–27



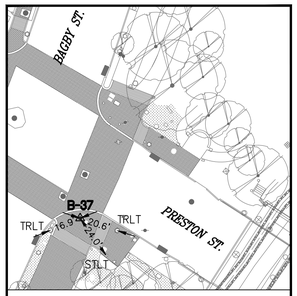
T.B.M. B–30



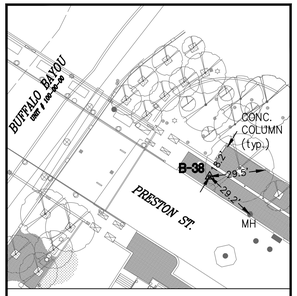
T.B.M. B–35



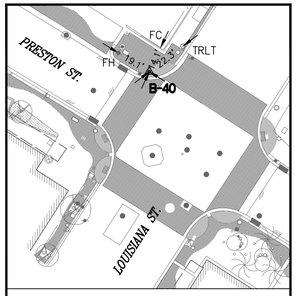
T.B.M. B–36



T.B.M. B–37



T.B.M. B–38



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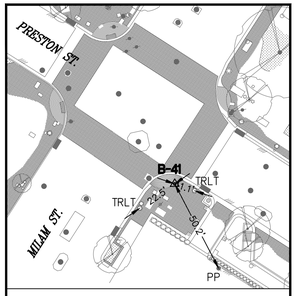

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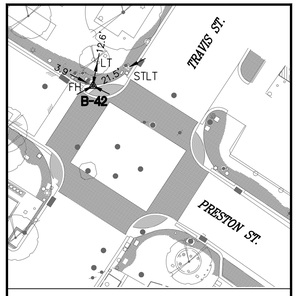

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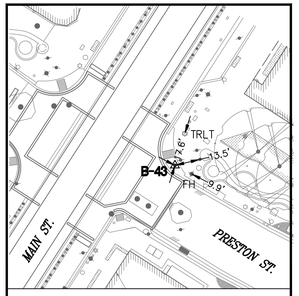

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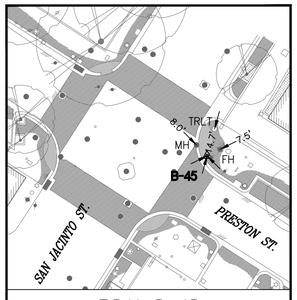
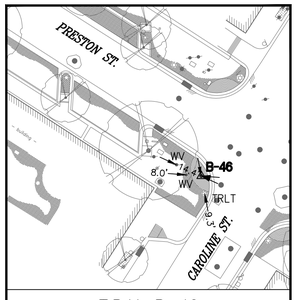


T.B.M. B–45



T.B.M. B–46

NO.	DATE	REVISION	APP.

EXIST. TOPOGRAPHIC LEGEND

- ASPHALT SYMBOL
- B OR BB INLET
- BUSH
- C INLET
- CLEANOUT
- brick column
- DOWN GUY
- E INLET
- ELEC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GATE
- GRATE INLET
- GRATE INLET
- MAIL BOX
- STORM MANHOLE
- SANITARY MANHOLE
- PLANTER
- POWER POLE
- POWER POLE W/LT.
- SIGN
- SIGNAL POLE
- SPRINKER VALVE
- SPRINKLER HEAD
- STREET LIGHT/FLOOD LIGHT
- STREET LIGHT/PARKING LIGHT
- TREE
- TREE STUMP
- TREE–CREPE MYRTLE
- TREE–PINE
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE

ABBREVIATIONS

FH – FIRE HYDRANT
FC – FENCE CORNER
INL – INLET
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PP – POWER POLE
PP/LT – POWER POLE W/LIGHT
SGN – SIGN
STLT – STREET LIGHT
WM – WATER METER

KUO & ASSOCIATES
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Tel: 713-975-8769, Fax: 713-975-0920, www.kuoassociates.com
TBPELS Engineering Firm Reg. No. F-4578
TBPELS Surveying Firm Reg. No. 100756600

SURVEYED BY: KUO & ASSOC.
FB NO.

INTERIM REVIEW ONLY

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BIDDING OR CONSTRUCTION.

KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
DATE: SEPTEMBER 22, 2025

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

WATER LINE REPLACEMNT IN MEMORIAL CITY AREA SITE 4 & 5

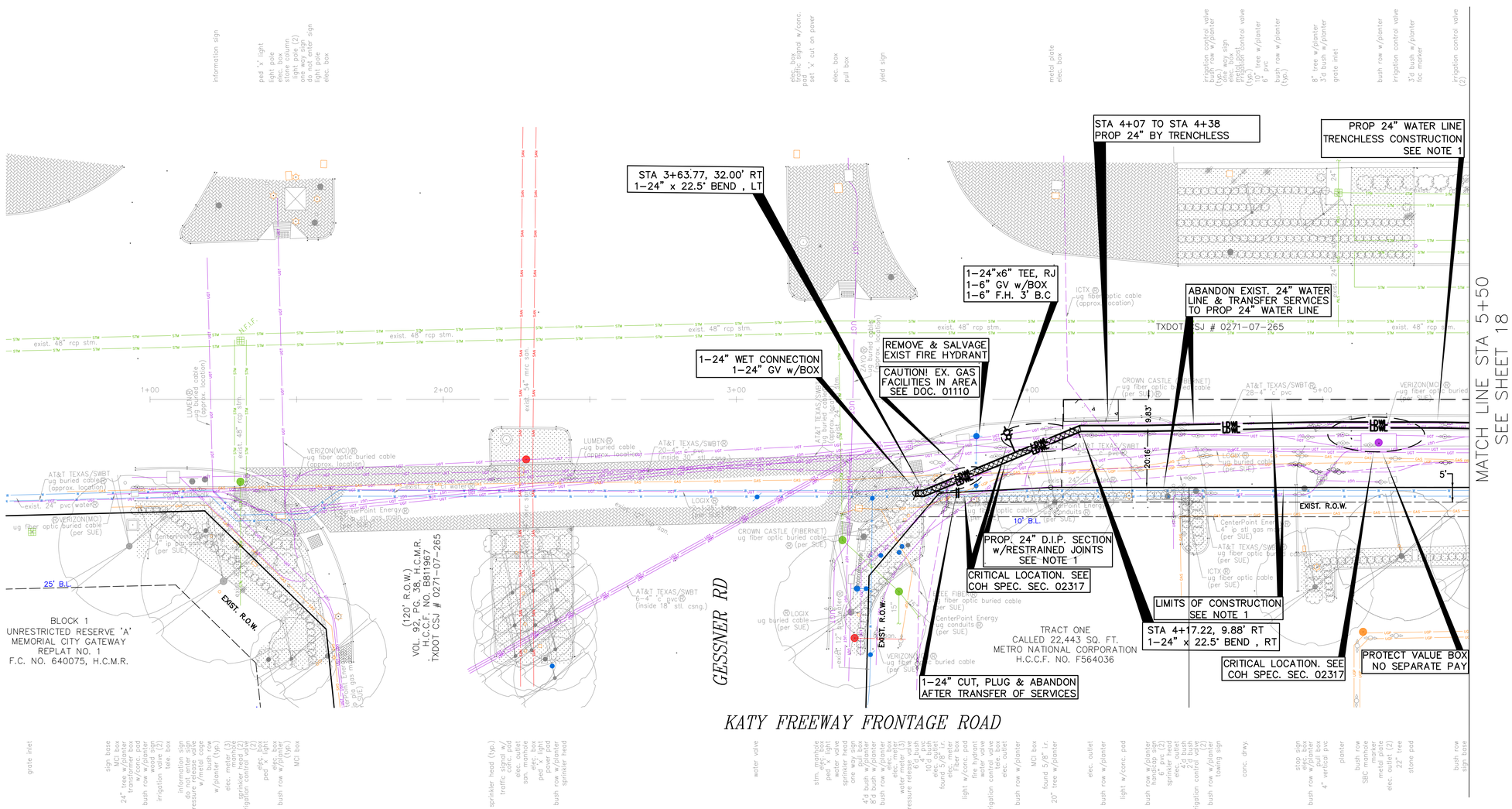
SURVEY CONTROL MAP (SHEET 4 OF 4)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–3	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 15 OF 153	

FILE PATH: S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\SCM\Site 2\24057–Swingties–Site 2.dwg

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 17 FOR PROFILE

N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-11
SET 'X' CUT ON PAVER
ELEV.=81.470
D. STA. 3+78.63 OFFSET: 38.37L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX–XXX–XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

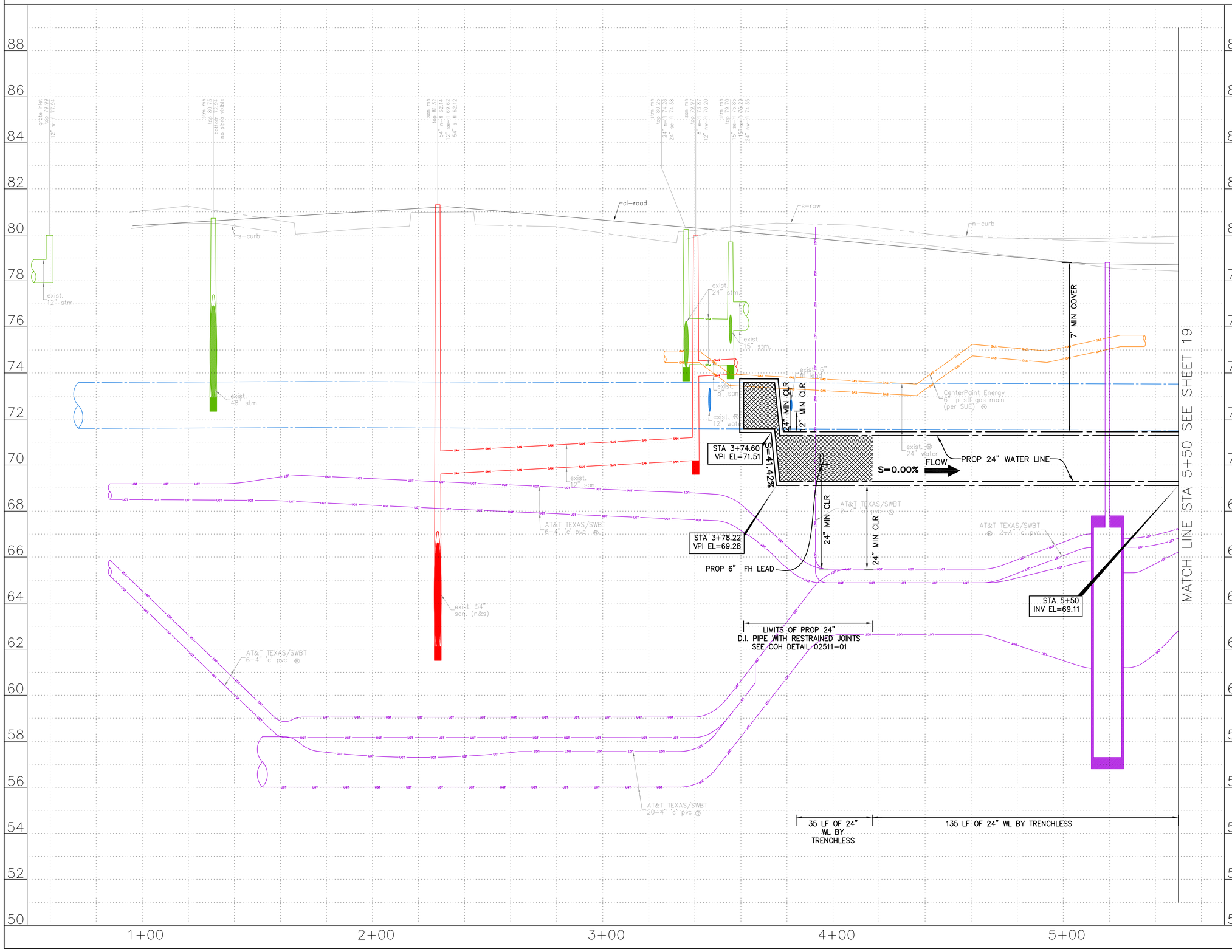
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE–1

PLAN
BEGIN TO STA 5+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 16 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Katy freeway.dwg plotted on Sep 22, 2025 – 11:36am

SEE SHEET 16 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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

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Signature valid for six months.

Date

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

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

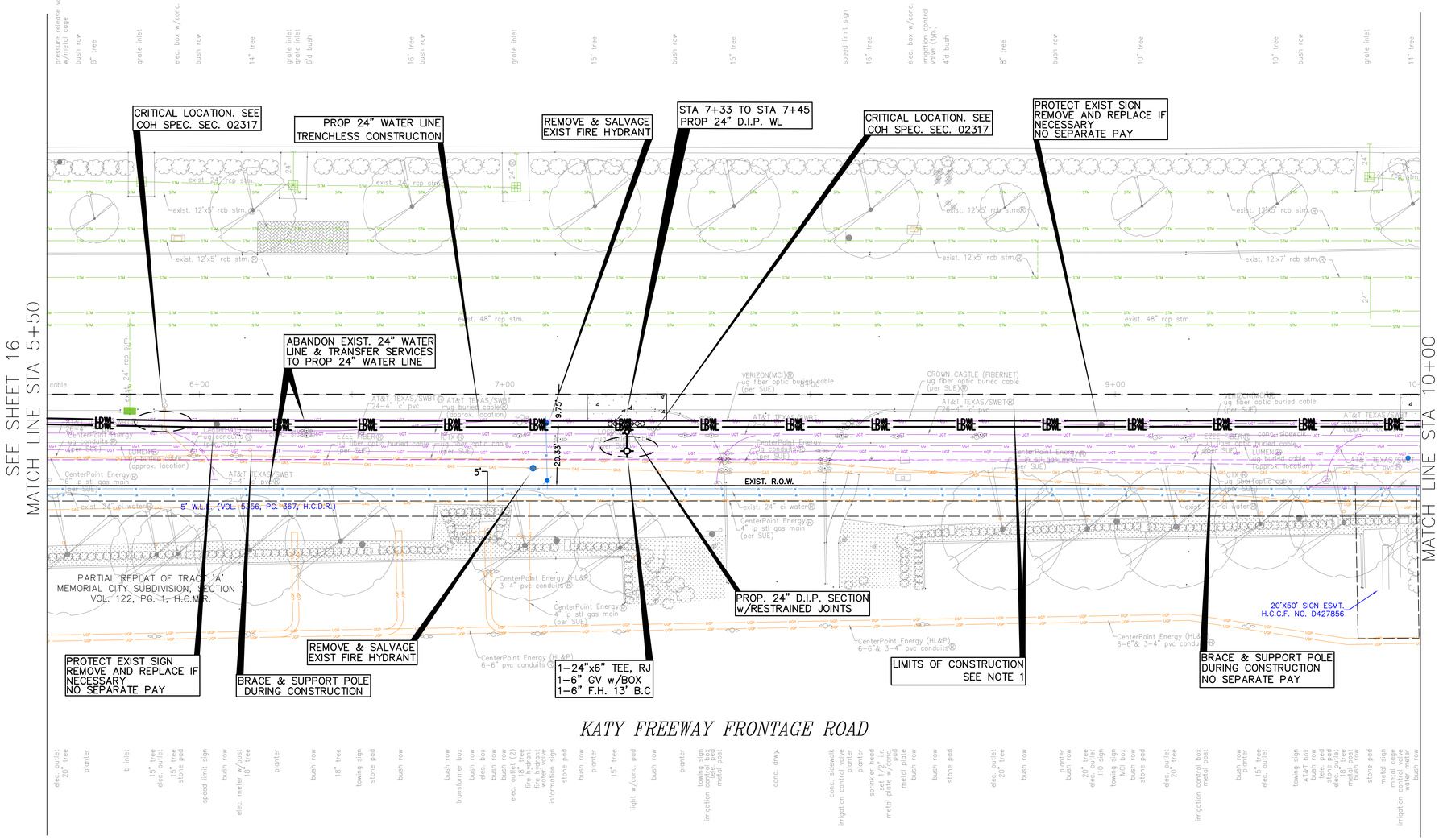
PROFILE
BEGIN TO STA 5+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 17 OF 153	

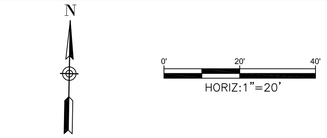
S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 - 12:41pm

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 19 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-12
SET 1/2" I.R. W/CAP
ELEV.=79.910
D. BL STA. 8+70.16 OFFSET: 34.99R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UCTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

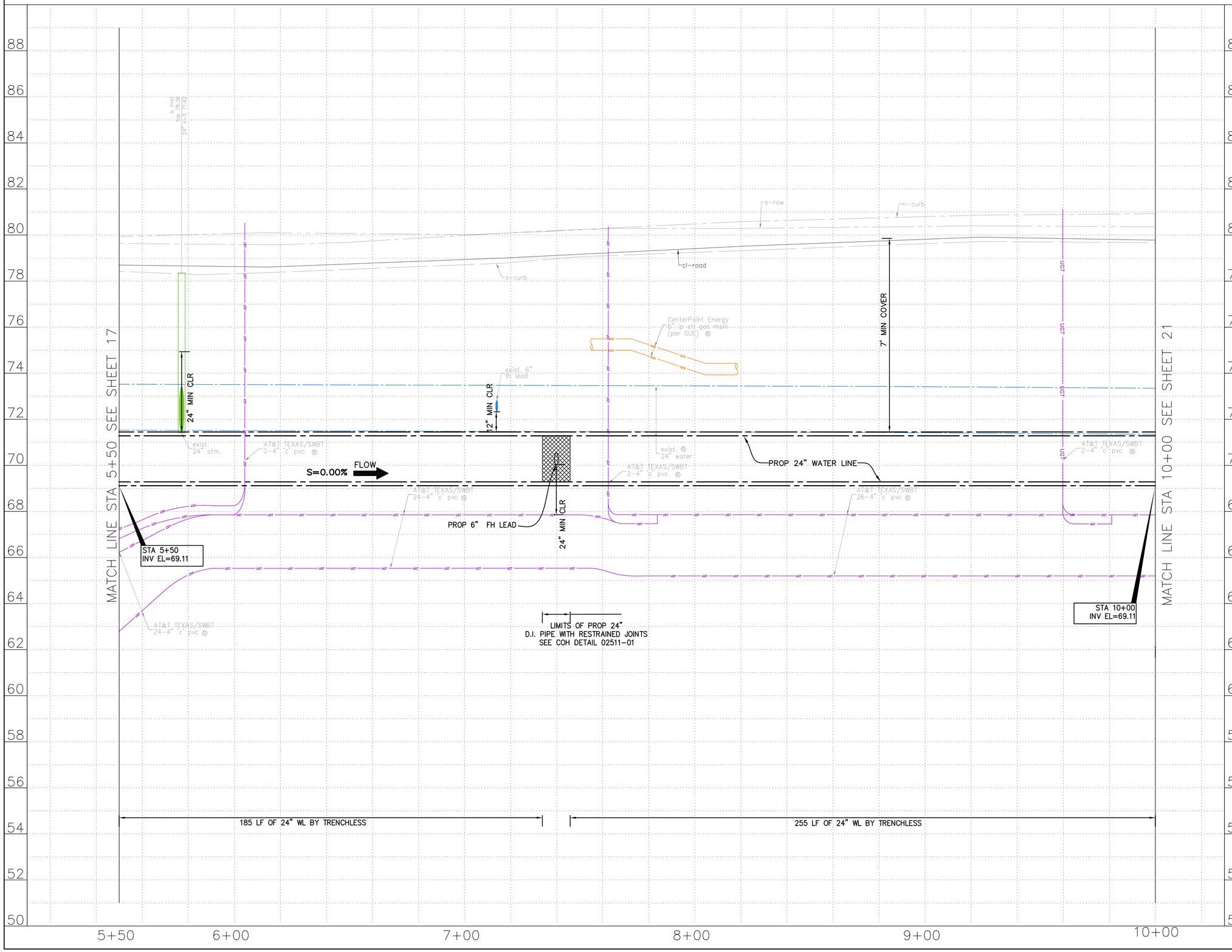
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PLAN
5+50 TO STA 10+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 18 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 - 11:37am

SEE SHEET 18 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

KATY FREEWAY SITE-1
PROFILE

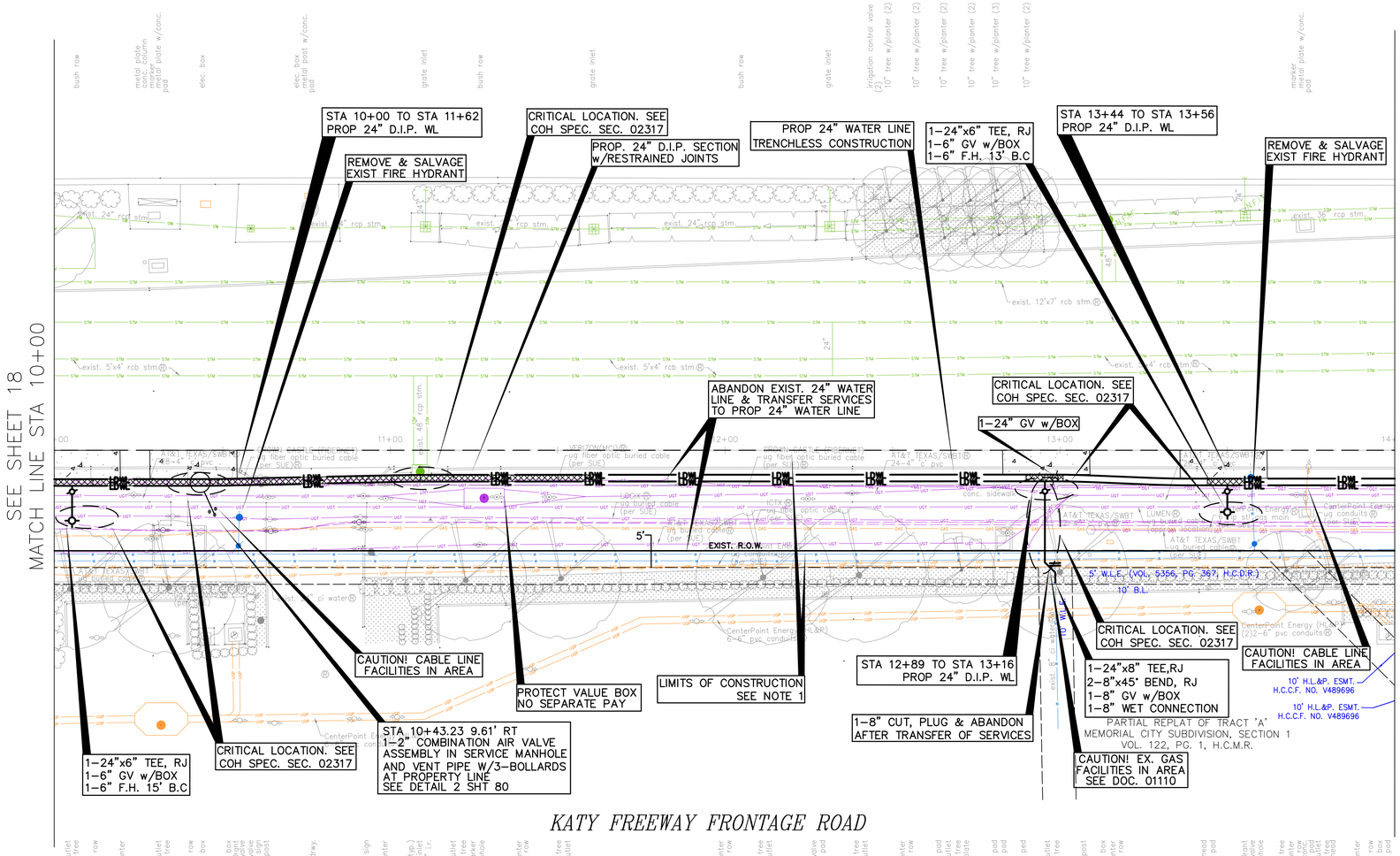
STA 5+50 TO STA 10+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 19 OF 153	

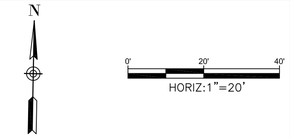
S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 - 12:41pm

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 21 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-13
SET 1/2" I.R. W/CAP
ELEV.=80.015
D. BL STA. 11+62.03 OFFSET: 34.58R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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 be used for conflict verification.

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

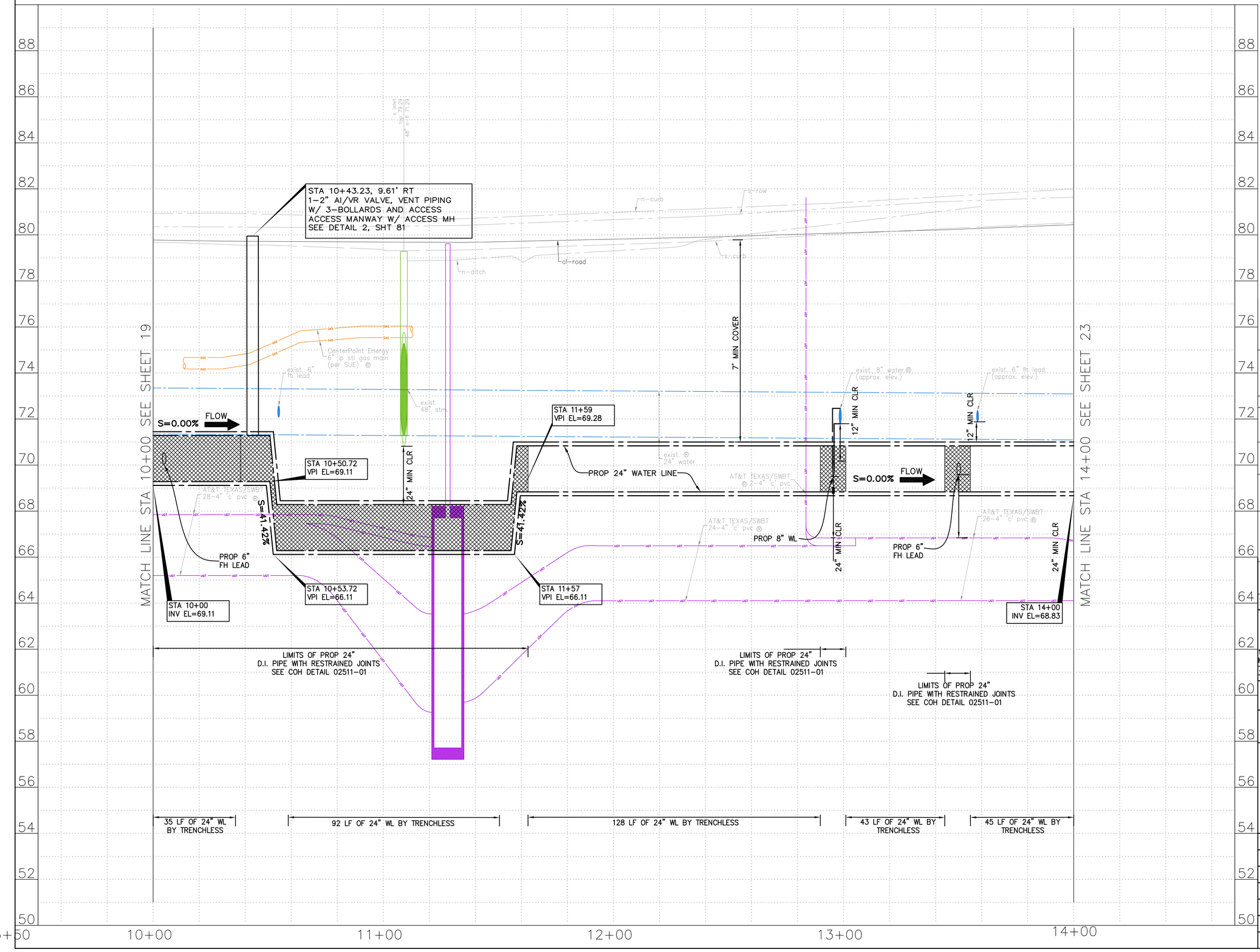
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PLAN
10+00 TO STA 14+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 20 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 - 11:38am

SEE SHEET 20 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

KATY FREEWAY SITE-1

PROFILE
STA 10+00 TO STA 14+00

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S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 21 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 - 12:42pm

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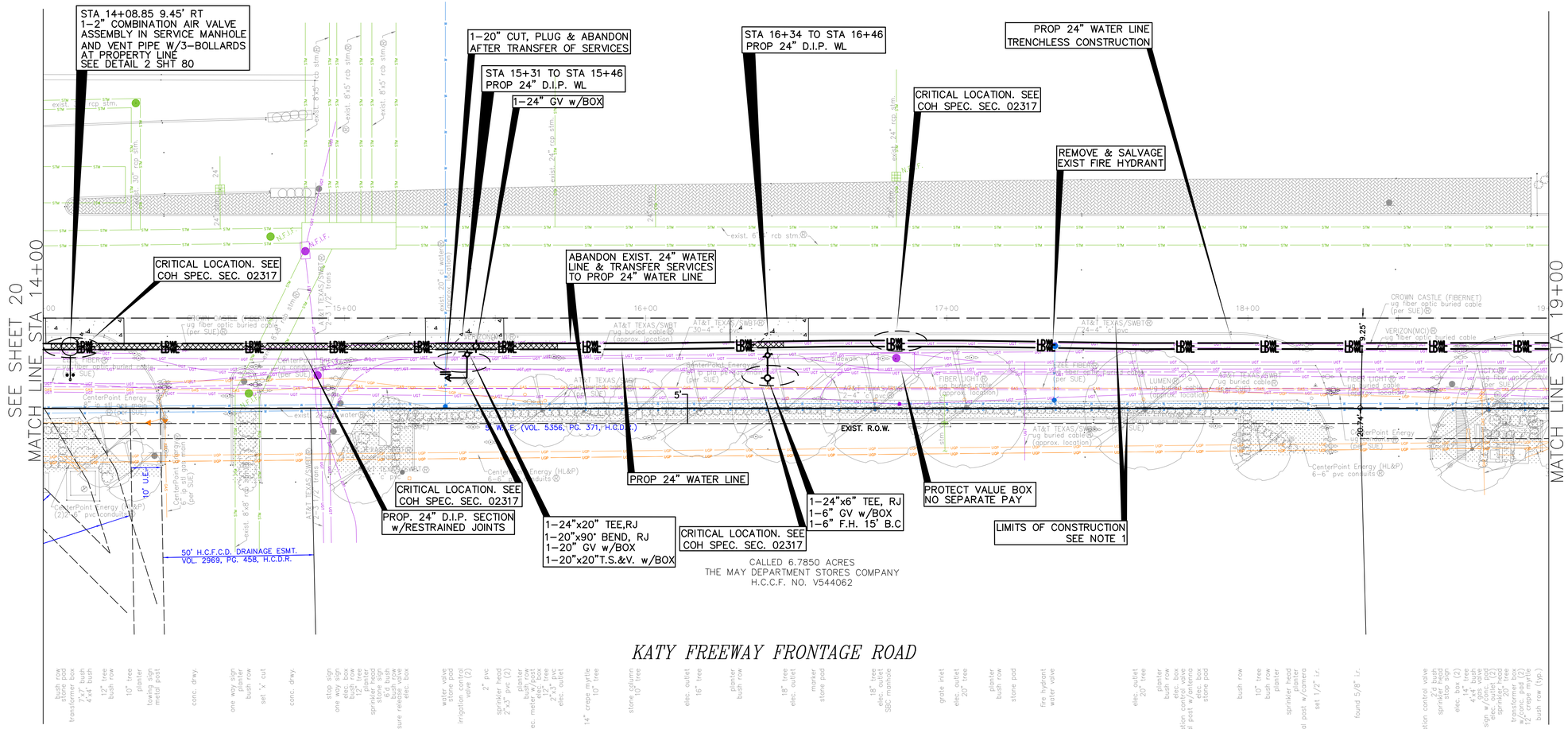

SEE SHEET 23 FOR PROFILE

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-15
SET 1/2" I.R. W/CAP
ELEV.=79.196
D. BL STA. 18+72.47 OFFSET: 36.27R

NOTES:

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PLAN
14+00 TO STA 19+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 22 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 – 11:40am

SEE SHEET 23 FOR PLAN

MATCH LINE STA 14+00 SEE SHEET 21

MATCH LINE STA 19+00 SEE SHEET 25

STA 14+08.85, 9.45' RT
1-2" AI/VR VALVE, VENT PIPING
W/ 3-BOLLARDS AND ACCESS
ACCESS MANWAY W/ ACCESS MH
SEE DETAIL 2, SHT 80

n-curb

s-curb

s-row

cl-road

CenterPoint Energy
6" ip stl gas main
(per SUE) Ⓔ

exist. 8x8 stm. (n&s) Ⓔ

exist. 12" stm. (n&s)

exist. Ⓔ 10" water

AT&T TEXAS/SWBT
Ⓔ 2-4" C pvc

exist. Ⓔ 24" water

exist. 6" fh lead

7' MIN COVER

24" MIN CLR

12" MIN CLR

STA 14+16.35
VPI EL=68.83

STA 14+20.10
VPI EL=65.08

STA 14+00
INV EL=68.83

S=41.42%

S=0.00%

FLOW

PROP 20" WL

AT&T TEXAS/SWBT
4-4" bore-gbrd Ⓔ

AT&T TEXAS/SWBT
30-4" C pvc Ⓔ

PROP 6"
FH LEAD

STA 15+61.02
VPI EL=67.75

STA 15+58.35
VPI EL=65.08

PROP 24" WATER LINE

STA 19+00
INV EL=67.25

LIMITS OF PROP 24"
D.I. PIPE WITH RESTRAINED JOINTS
SEE COH DETAIL 02511-01

125 LF OF 24" WL BY TRENCHLESS

64 LF OF 24" WL BY TRENCHLESS

255 LF OF 24" WL BY TRENCHLESS

14+00 15+00 16+00 17+00 18+00 19+00

88 86 84 82 80 78 76 74 72 70 68 66 64 62 60 58 56 54 52 50

N

0' 20' 40'
HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

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SURVEYED BY:
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

KATY FREEWAY SITE-1

PROFILE
STA 14+00 TO STA 19+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 23 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 - 12:42pm

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N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-16
SET 1/2" I.R. W/CAP
ELEV.=78.940
D. BL STA. 22+02.87 OFFSET: 29.10R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION LIGTS. NO SEPARATE PAY.
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KUO & ASSOCIATES
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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
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FB NO. 000000

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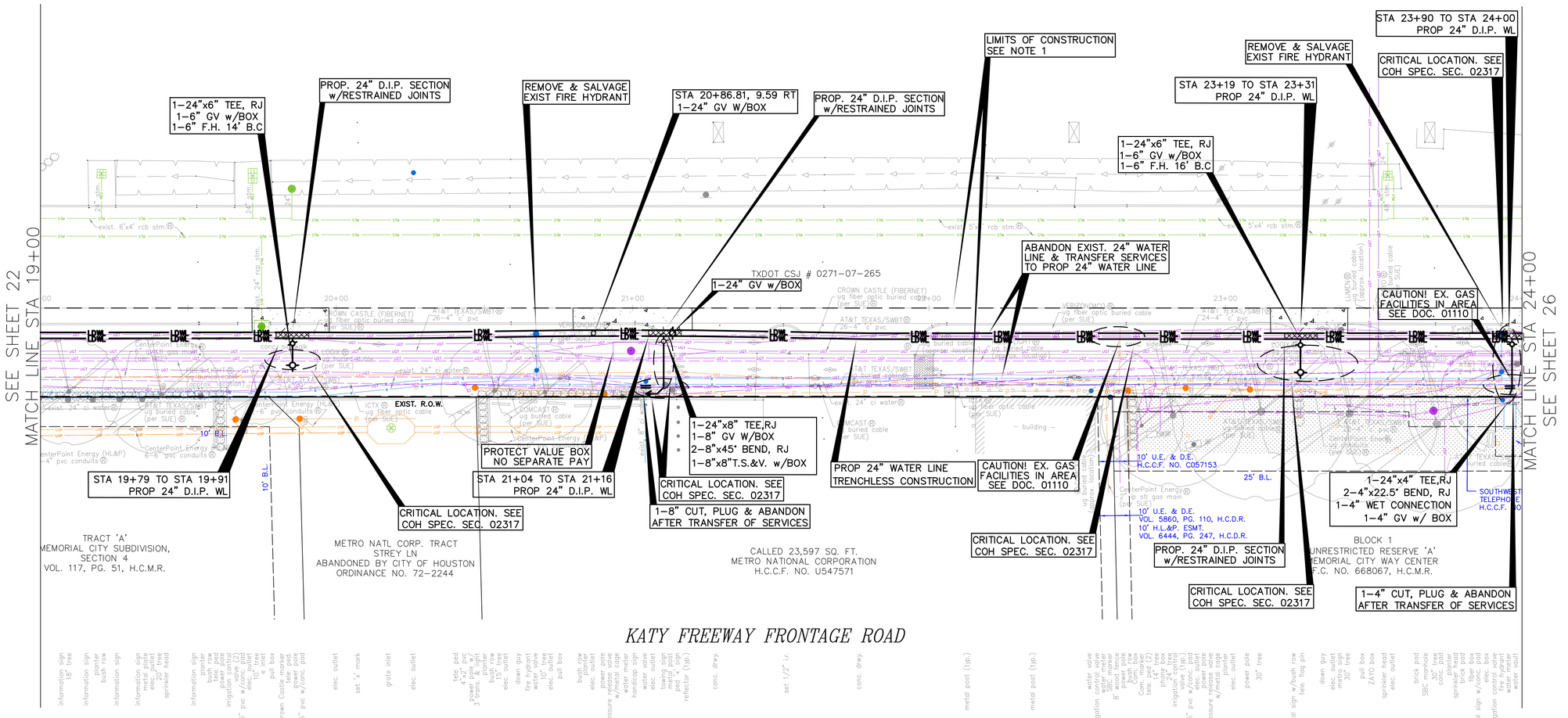
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE–1

PLAN
19+00 TO STA 24+00

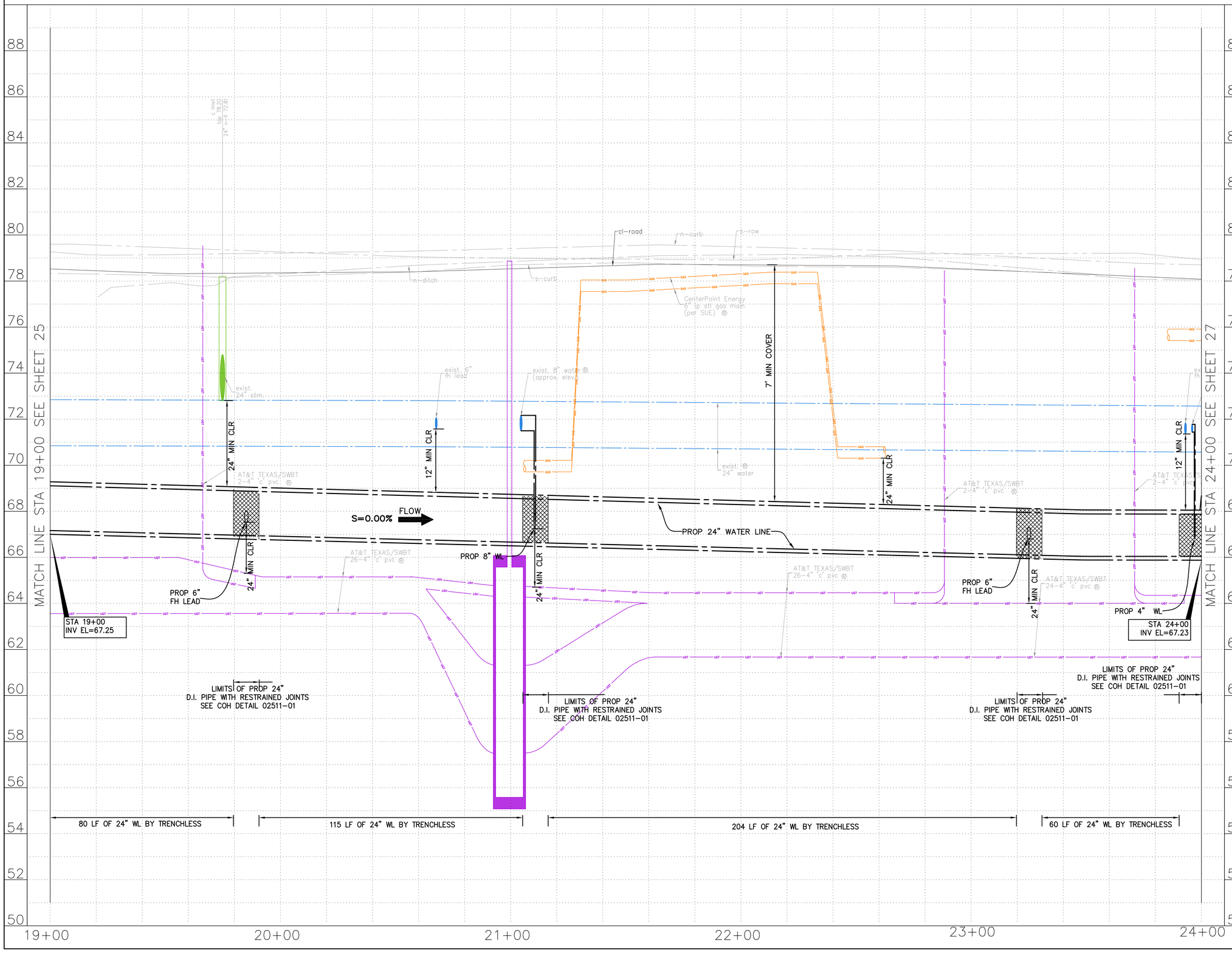
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 24 OF 153	



SEE SHEET 25 FOR PROFILE

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 – 11:42am

SEE SHEET 24 FOR PLAN



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HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

KATY FREEWAY SITE-1

PROFILE
STA 19+00 TO STA 24+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 25 OF 153	

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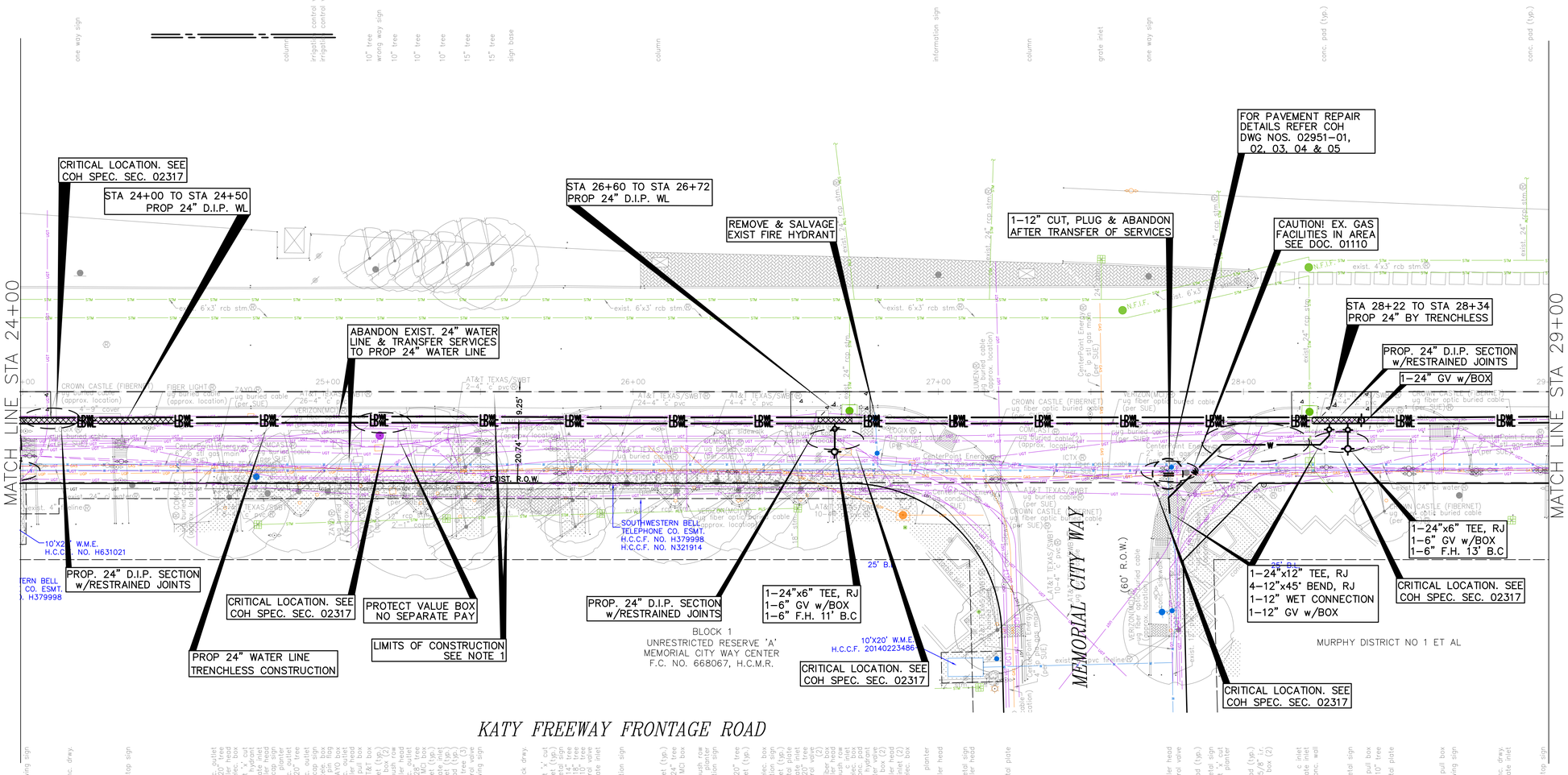
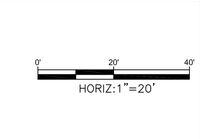


SEE SHEET 27 FOR PROFILE



NO.	DATE	REVISION	APP.

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ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-18
SET 'X' CUT ON CONC.
ELEV.=77.708
D. BL STA. 28+42.13 OFFSET: 33.30R

NOTES:

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TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

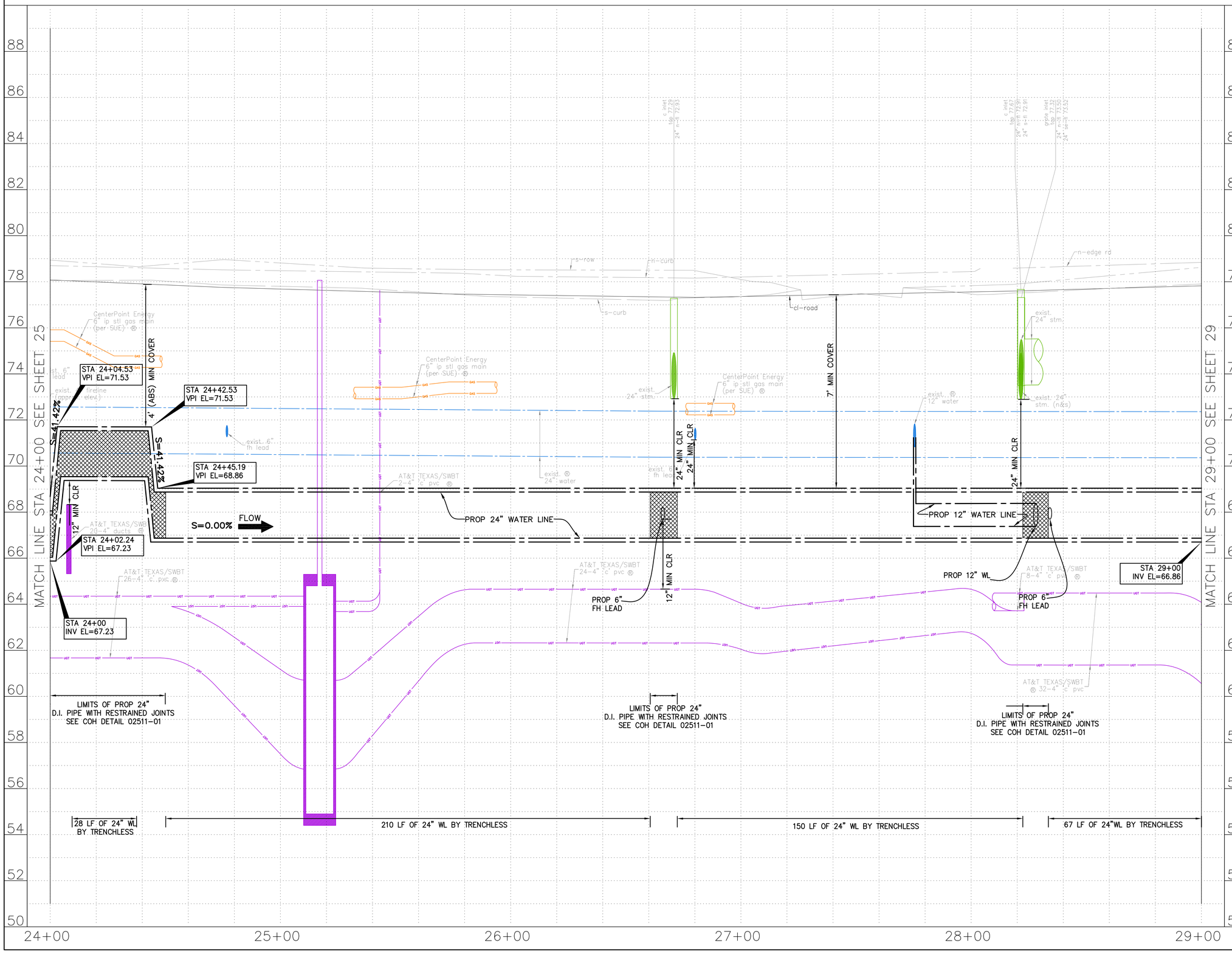
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PLAN
STA 24+00 TO STA 29+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 26 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 - 11:43am

SEE SHEET 26 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

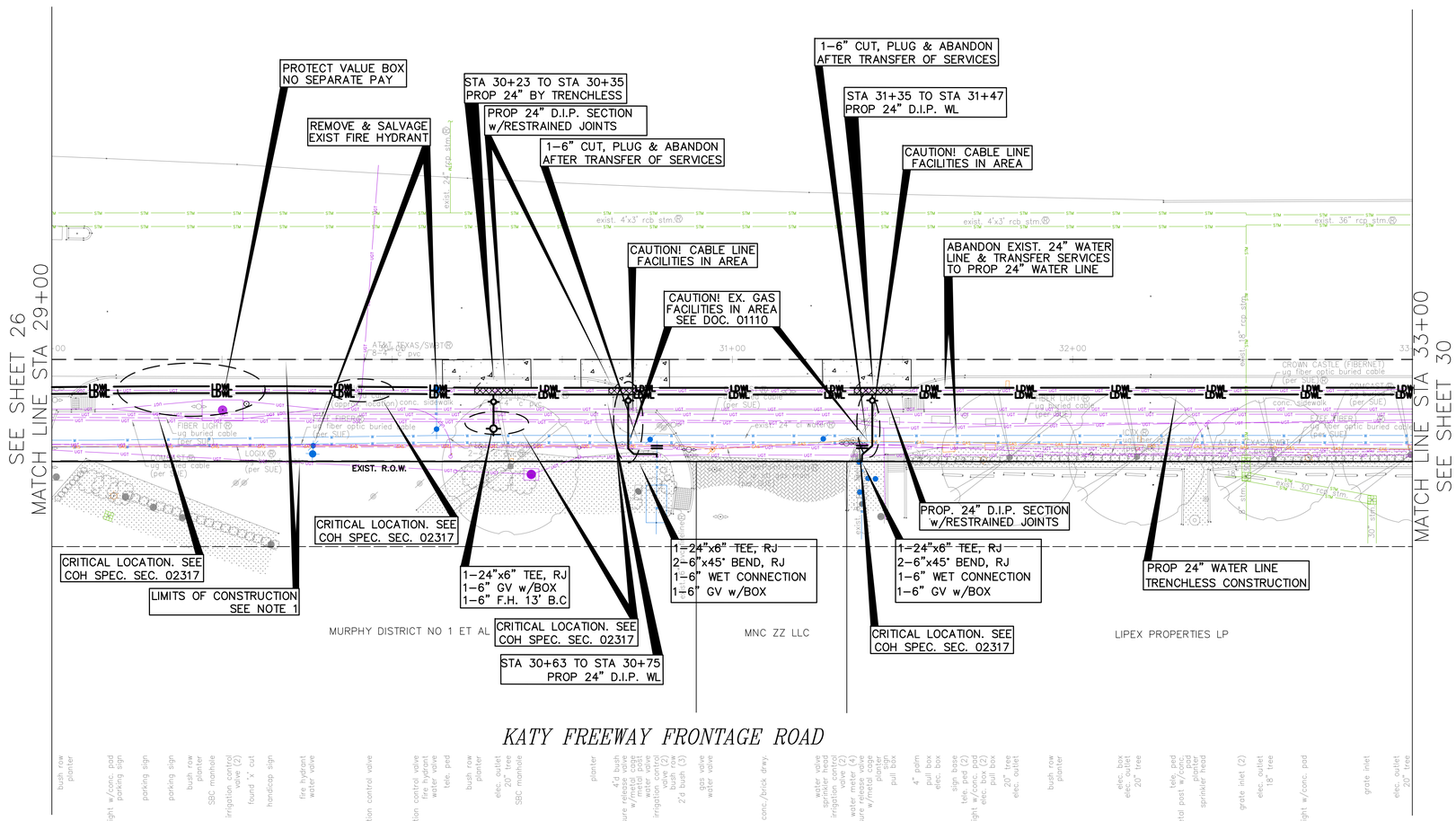
PROFILE
STA 24+00 TO STA 29+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 27 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 - 12:43pm

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 29 FOR PROFILE

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:

T.B.M. B-19
SET 1/2" I.R. W/CAP
ELEV.=78.697
D. BL STA. 31+94.33 OFFSET: 34.02R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

NOTICE:
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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Signature valid for six months.

Date

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

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

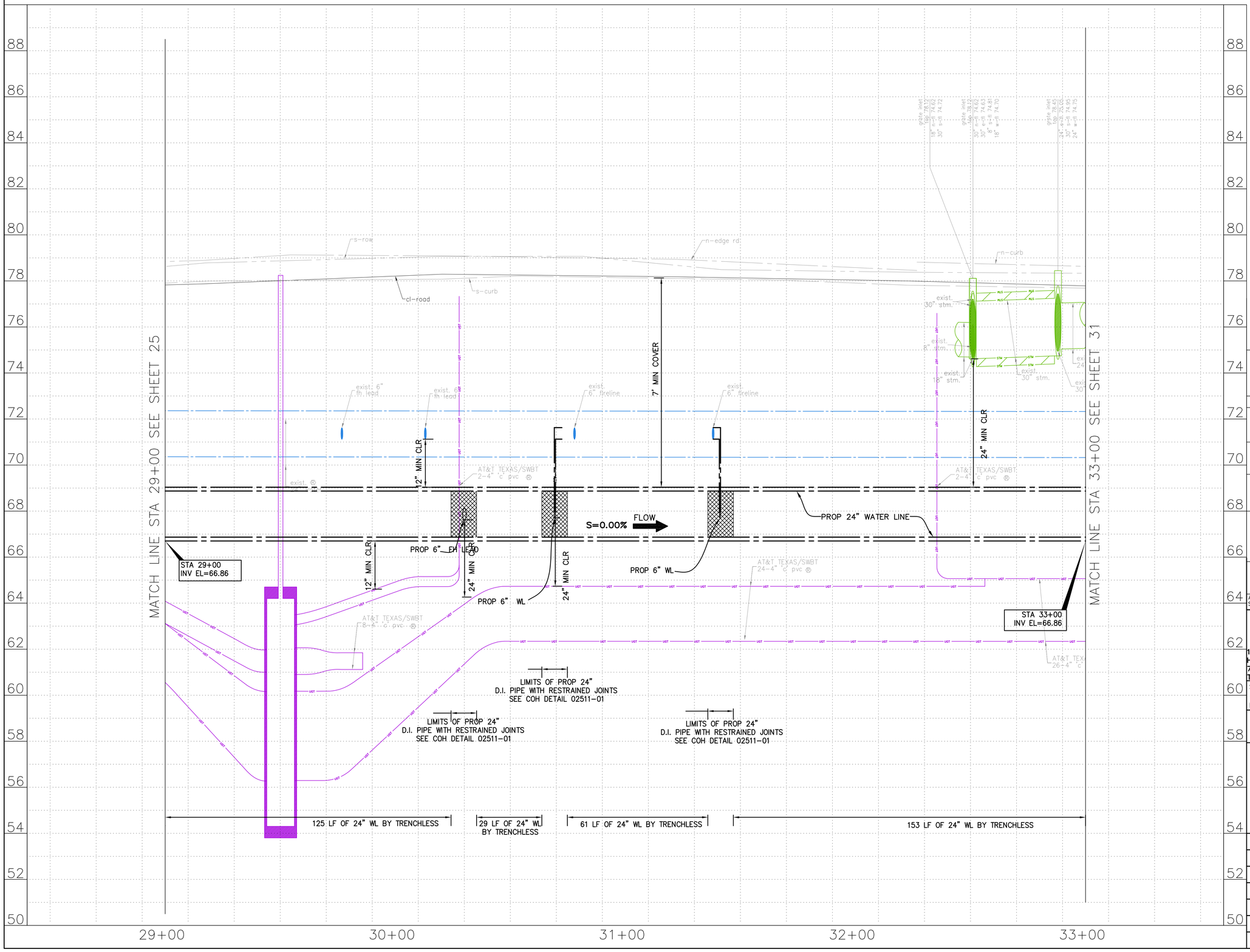
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PLAN
STA 29+00 TO STA 33+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 28 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 - 11:43am

SEE SHEET 28 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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TX FIRM NO.: F-4578

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

KATY FREEWAY SITE-1

PROFILE
STA 29+00 TO STA 33+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 29 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 – 12:43pm

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

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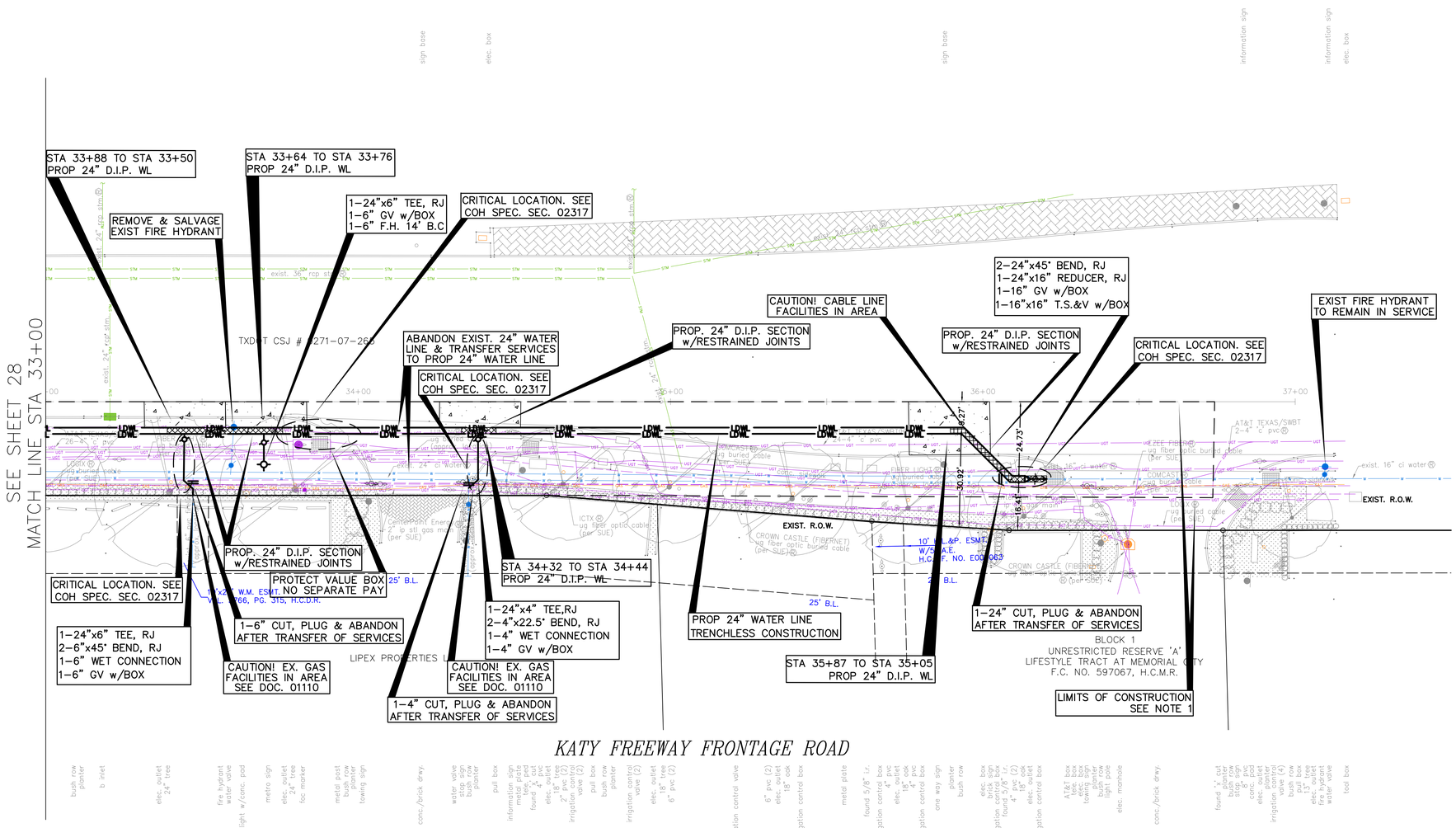

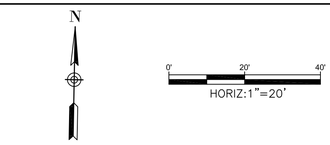

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:

T.B.M. B-10
SET 1/2" I.R. W/CAP
ELEV.=78.374
D. BL STA. 34+94.06 OFFSET: 36.73R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UOTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Date

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

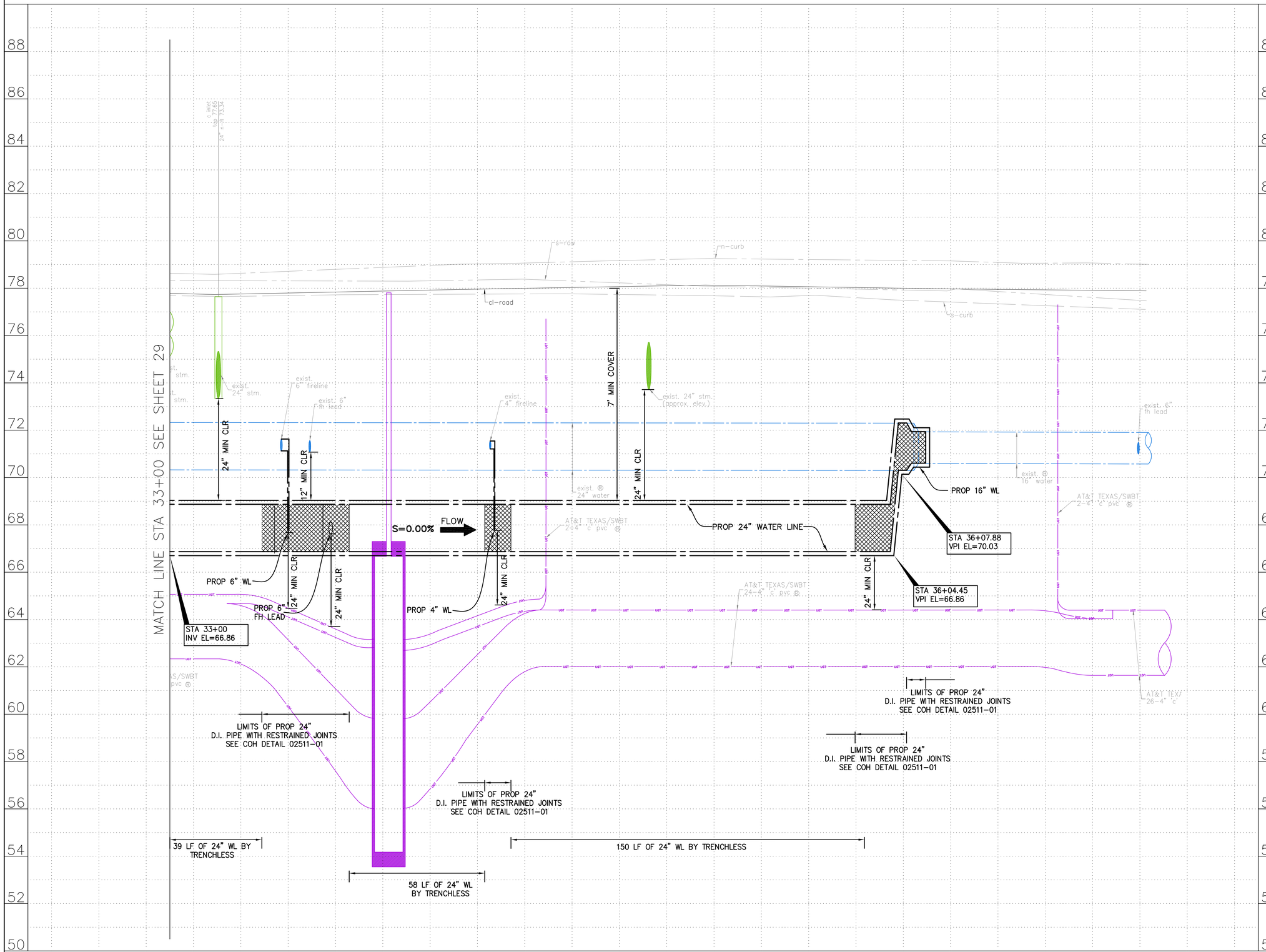
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PLAN
STA 33+00 TO END

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 30 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 22, 2025 - 11:45am

SEE SHEET 30 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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FB NO. 000000

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

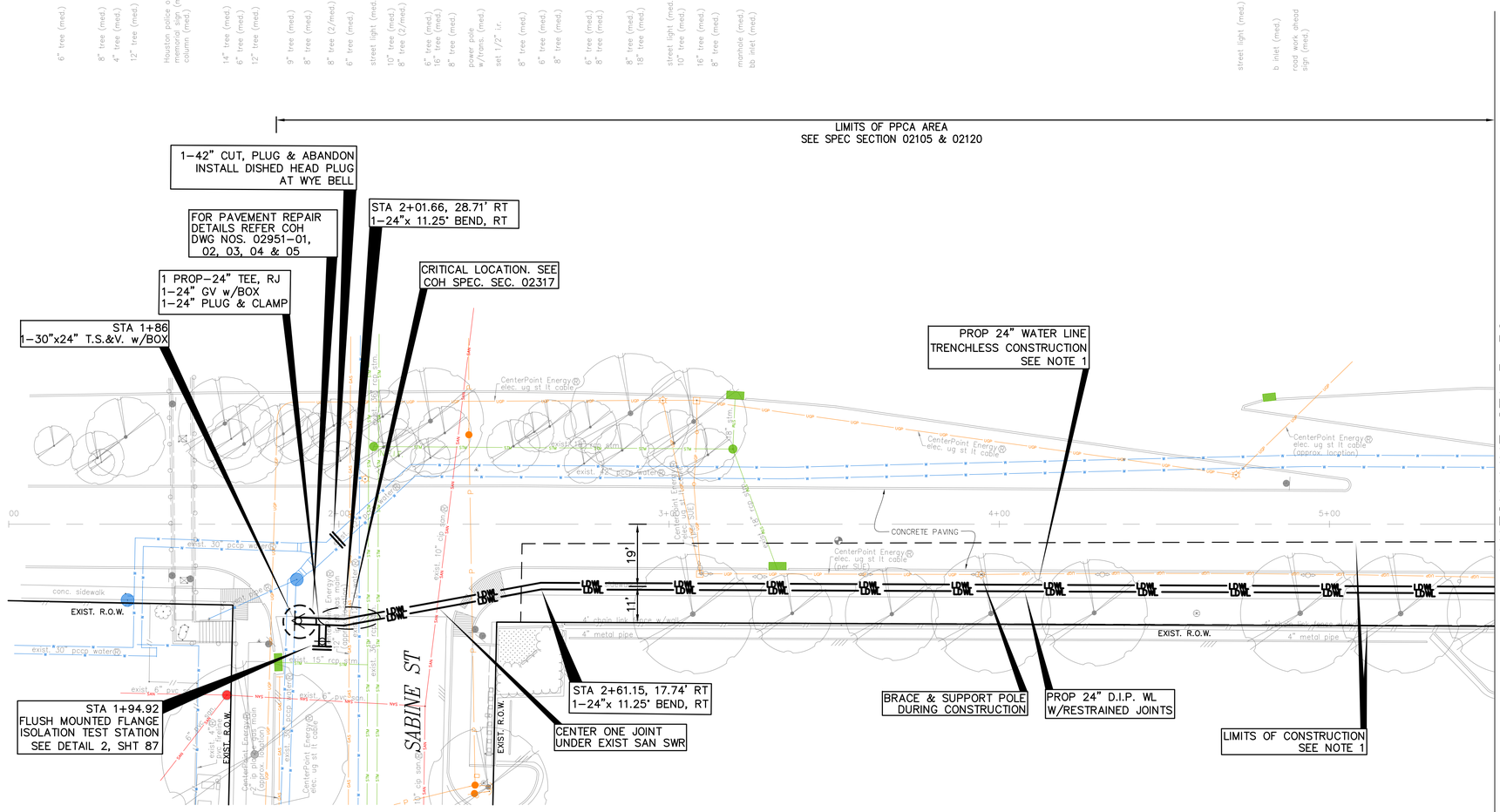
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
KATY FREEWAY SITE-1

PROFILE
STA 33+00 TO END

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 31 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Katy freeway.dwg plotted on Sep 21, 2025 - 12:44pm

4. TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.
5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 33 FOR PROFILE

N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-20
SET 'X' CUT ON CONC.
ELEV.=38.58
D. STA. 1+75.82 OFFSET: 35.49R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Date

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
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SURVEYED BY:
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FB NO. 000000

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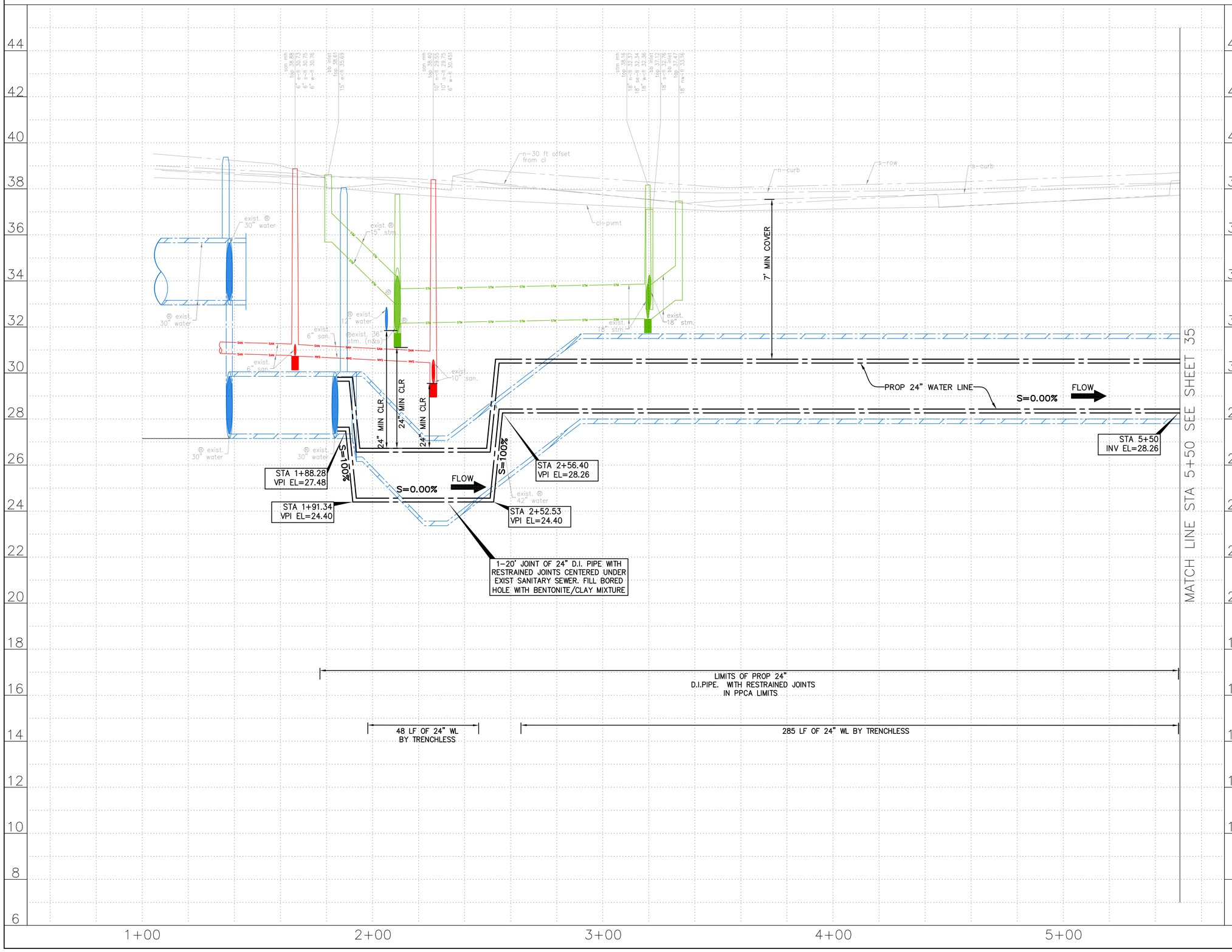
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
MEMORIAL WAY
SITE 4&5
PLAN
BEGIN TO STA 5+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 32 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 21, 2025 - 2:37pm

SEE SHEET 32 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

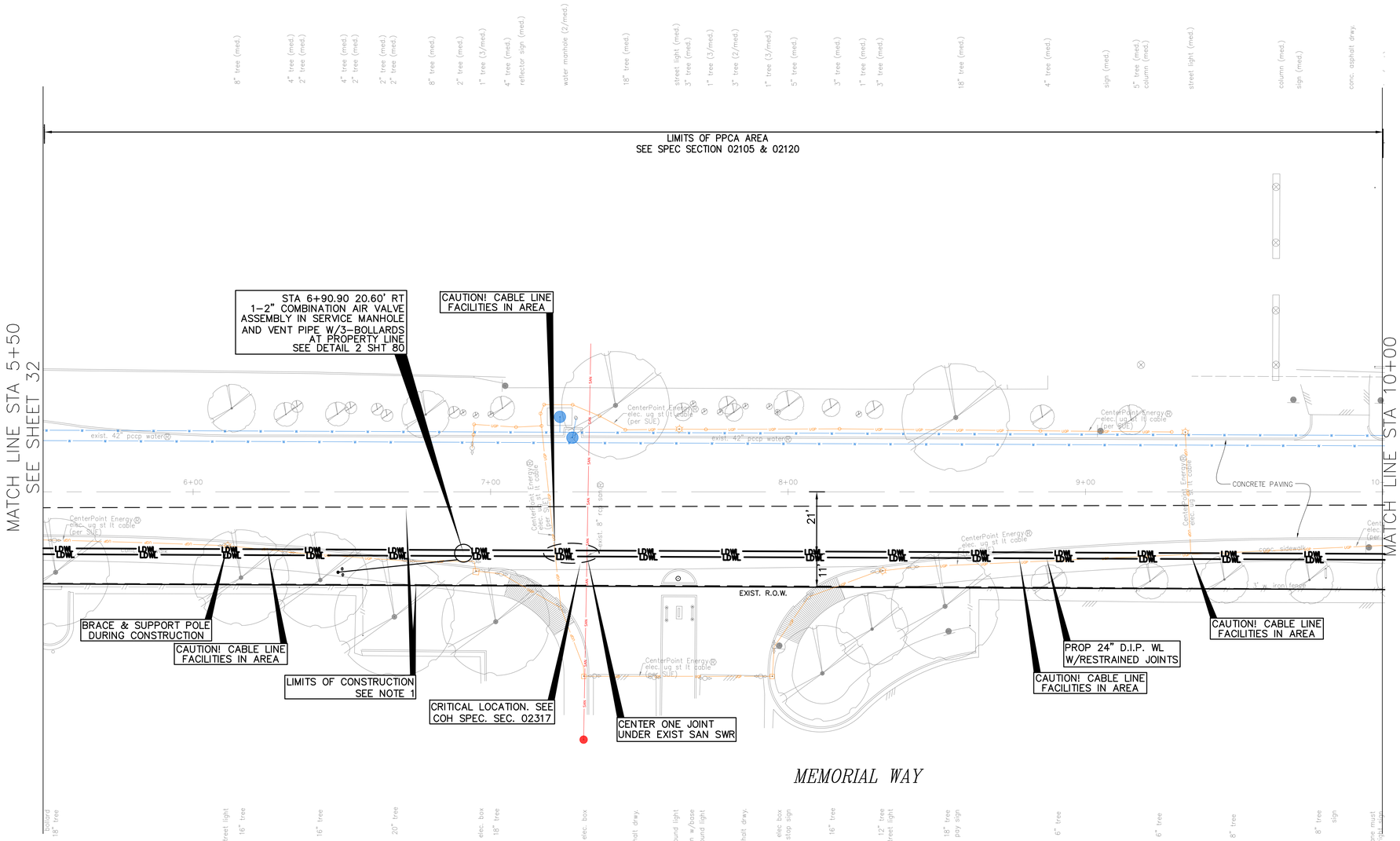
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

MEMORIAL WAY
SITE 4&5
PROFILE
BEGIN TO STA 5+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 33 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 21, 2025 - 2:28pm

4. TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.
5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 35 FOR PROFILE

N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-22
FND 5/8" I.R.
ELEV.=39.30
D. STA. 7+63.05 OFFSET: 29.13R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
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Date

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

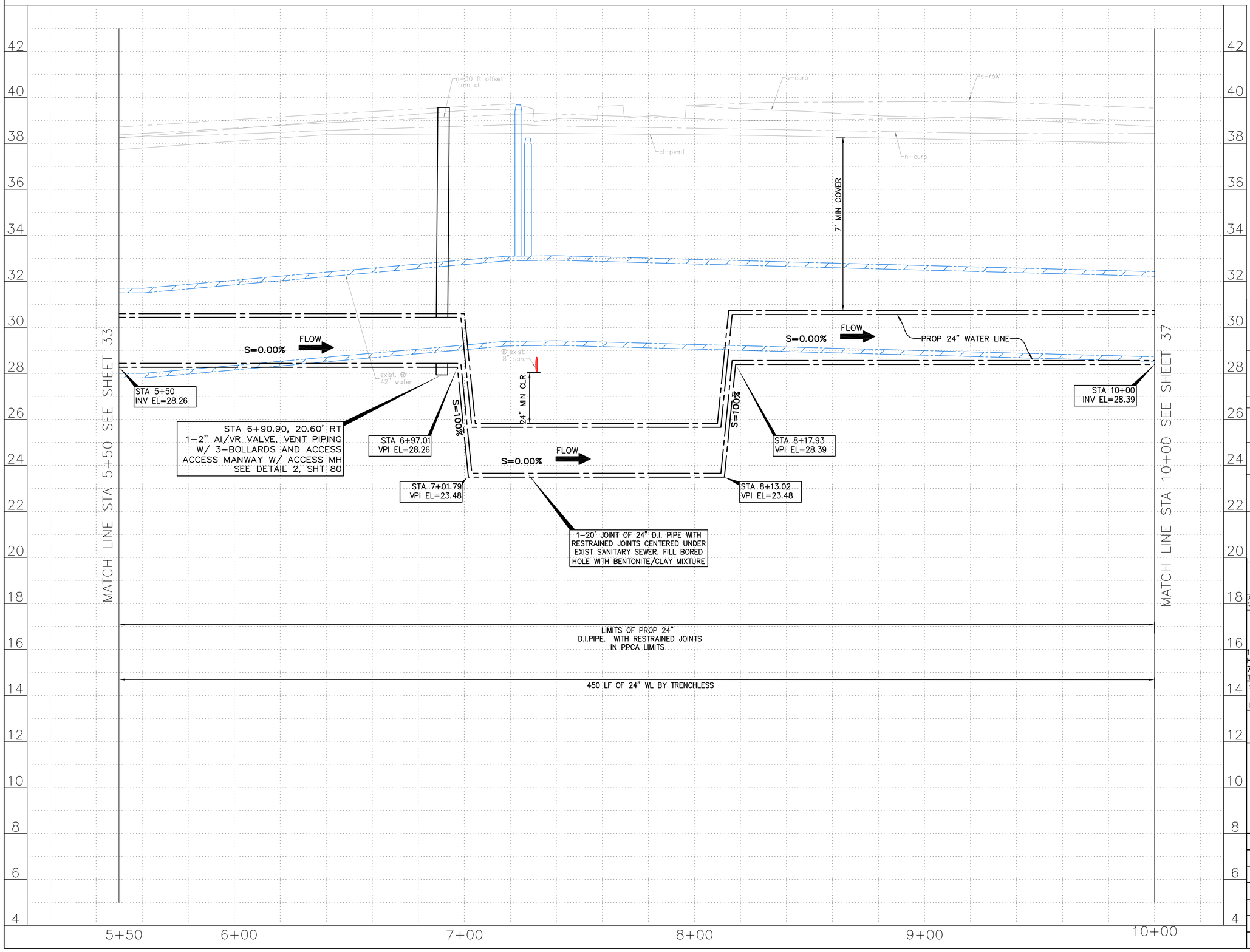
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
MEMORIAL WAY
SITE 4&5
PLAN
STA 5+50 TO STA 10+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 34 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 21, 2025 - 2:38pm

SEE SHEET 34 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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

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CITY OF HOUSTON

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MEMORIAL WAY
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STA 5+50 TO STA 10+00

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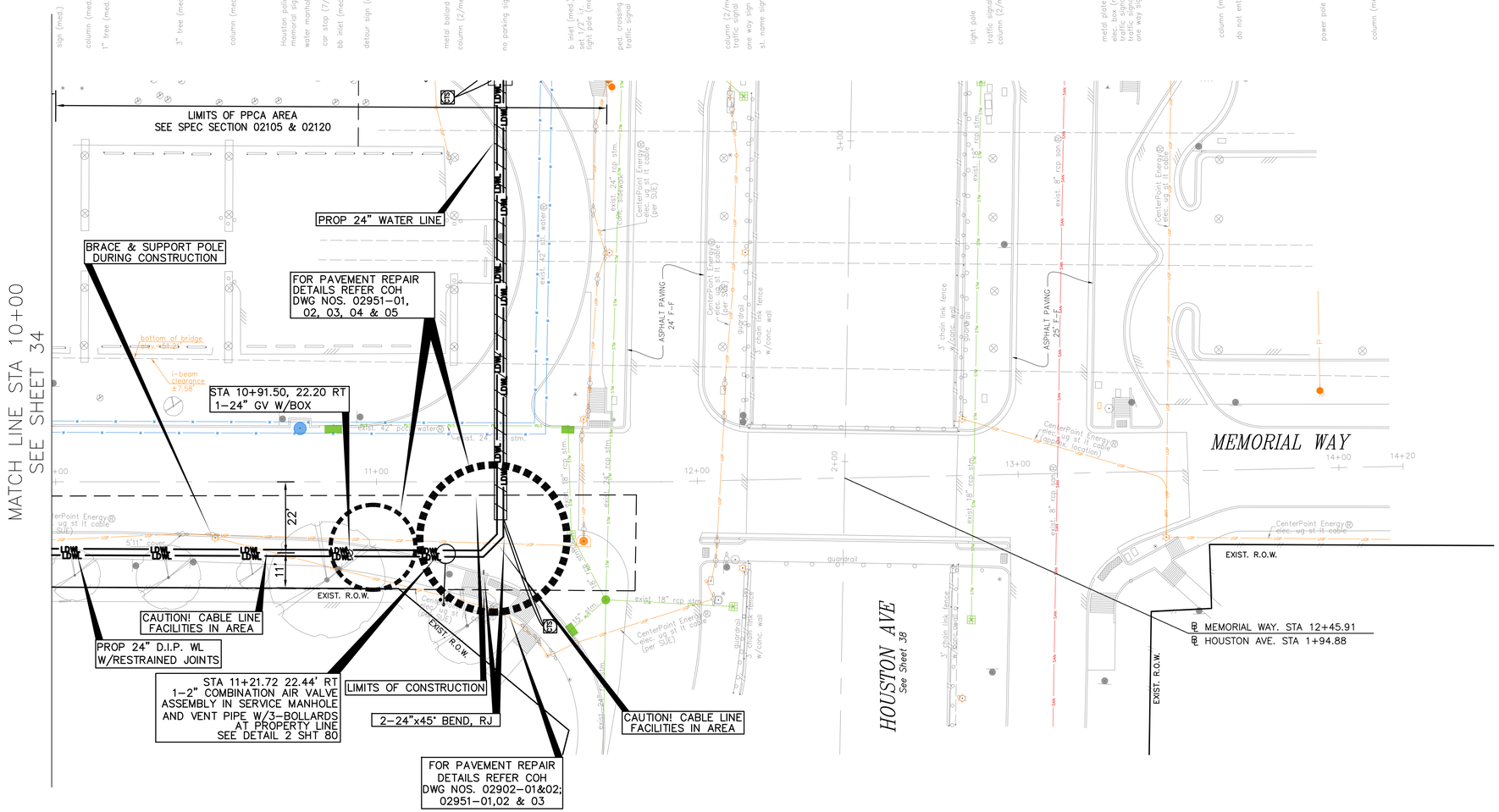
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 35 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 21, 2025 - 2:30pm

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.



SEE SHEET 37 FOR PROFILE

N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-23
SET 1/2" I.R. W/CAP
ELEV.=38.01
D. STA. 11+61.93 OFFSET: 27.24L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

NOTICE:
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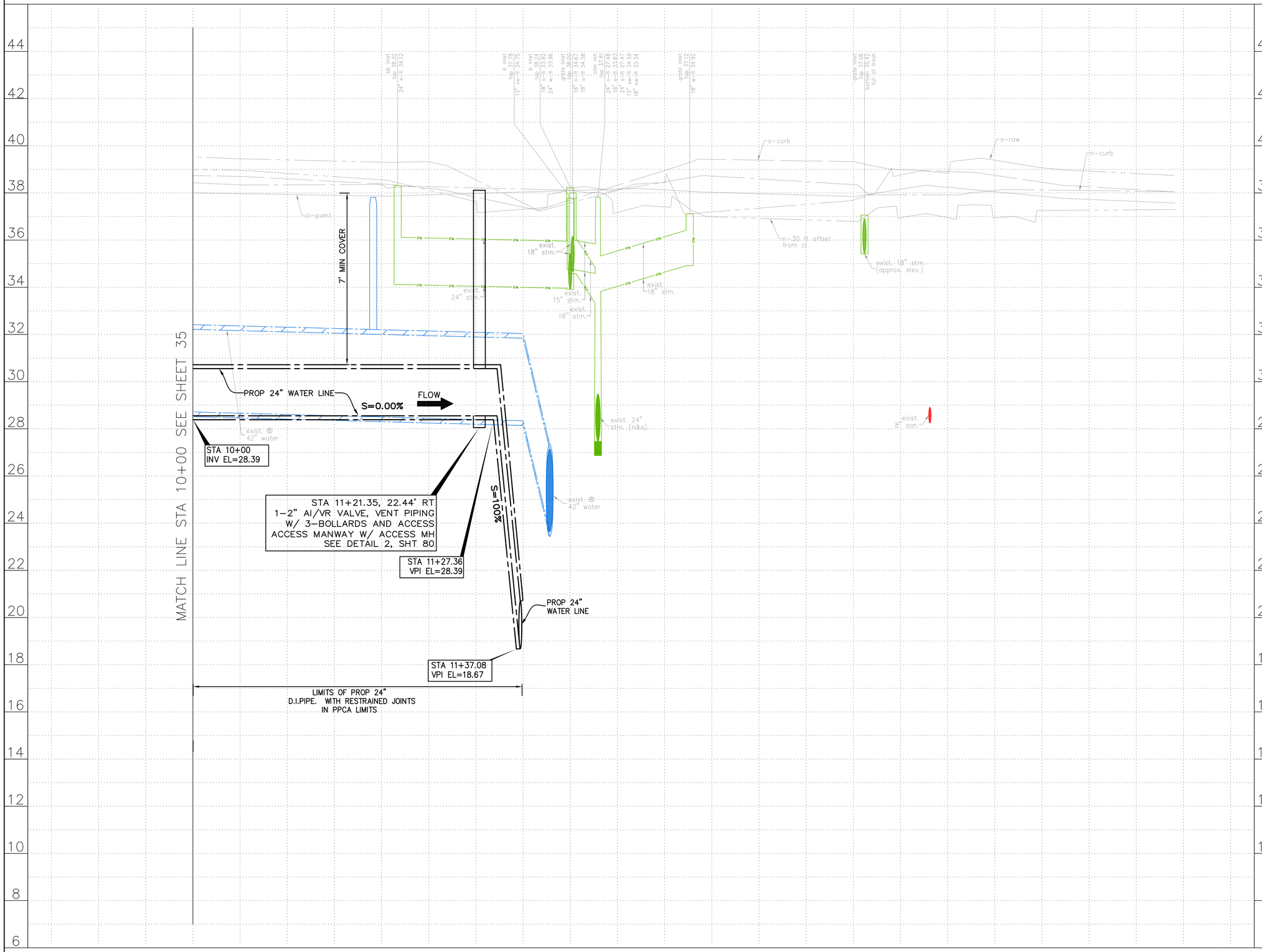
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
MEMORIAL WAY
SITE 4&5
PLAN
STA 10+00 TO STA 14+20

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 36 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 22, 2025 - 10:31am

SEE SHEET 36 FOR PLAN



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0' 20' 40'

HORIZ:1"=20'
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NO.	DATE	REVISION	APP.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
MEMORIAL WAY
SITE 4&5
PROFILE
STA 10+00 TO STA 14+20

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CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 37 OF 153	

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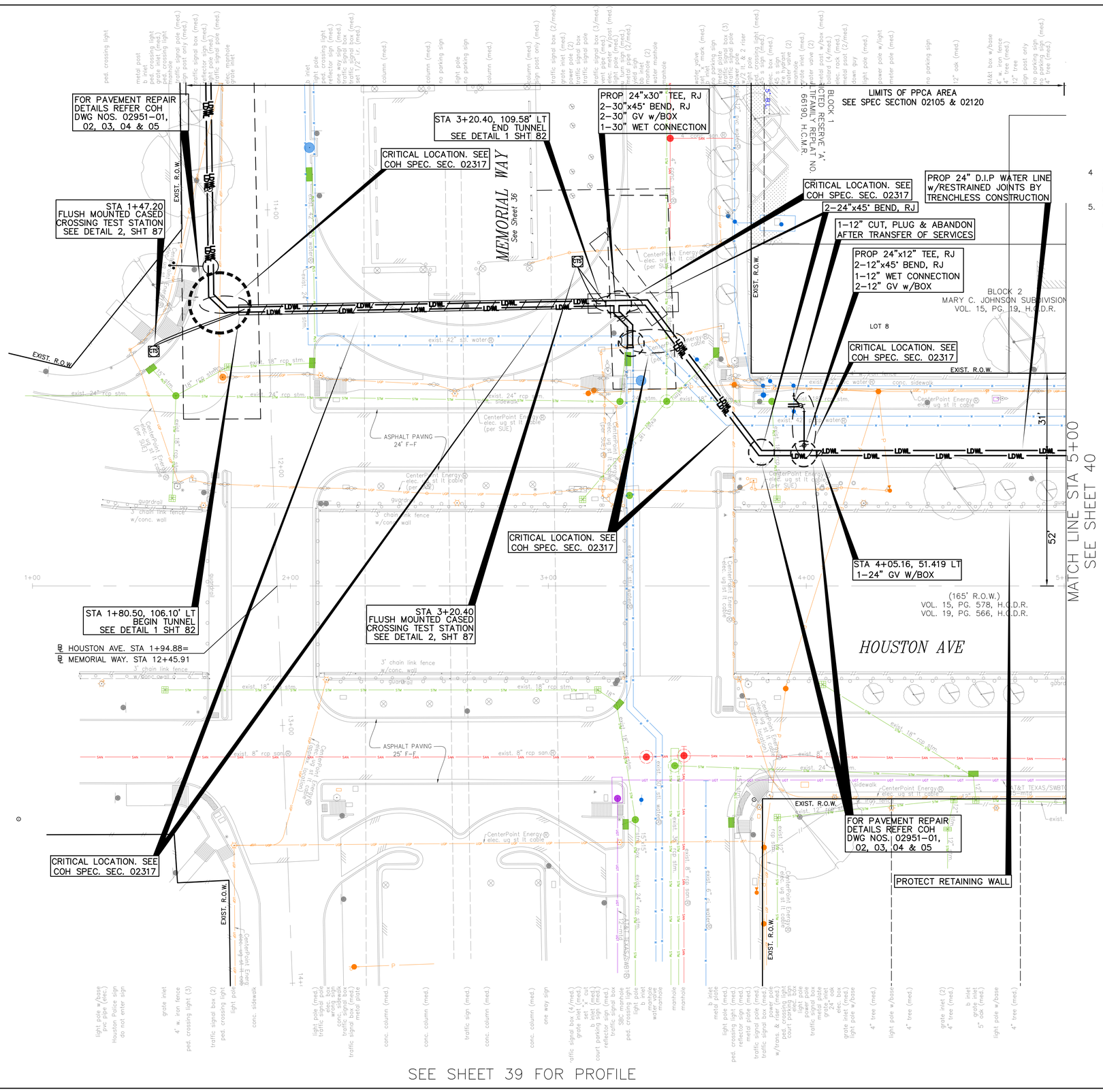

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ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-25
SET 'X' CUT ON CONC.
ELEV.=34.28
D. STA. 3+18.02 OFFSET: 79.83R

NOTES:

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713-975-8769
TX FIRM NO.: F-4578
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
HOUSTON AVE
SITE 4&5
PLAN
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 38 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 22, 2025 - 10:30am

SEE SHEET 38 FOR PLAN

LINE STA 5+00 SEE SHEET 41 MATCH LINE

e-curb
w-curb
w-row
e-row
cl-road

exist. 24" stm.
exist. 15" stm. approx. elev.
exist. 18" stm.
exist. 8" san.
exist. 12" water
exist. 30" water
exist. 42" water
exist. 12-mtd AT&T
exist. 8" san. approx. elev.

7' MIN COVER
24" MIN CLR

FLOW
S=0.00%
S=1.00%

PROP 24" WATER LINE
PROP 12" WATER LINE
PROP 30" WATER LINE

STA 1+74.58
VPI EL=18.51

STA 1+80.
END CASING

STA 3+20.39
BEG CASING

STA 3+82.19
VPI EL=18.51

STA 3+88.98
VPI EL=23.05

STA 5+50
INV EL=23.05

PROP 140' LF OF 24"
WATER LINE BY TUNNEL
(SEE DETAIL SHT. 82)

LIMITS OF PROP 24"
D.I.PIPE. WITH RESTRAINED JOINTS
IN PPCA LIMITS

1+00 2+00 3+00 4+00 5+00

HORIZ:1"=20'
VERT:1"=2'

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HOUSTON AVE
SITE 4&5
PROFILE
STA 1+00 TO STA 5+00

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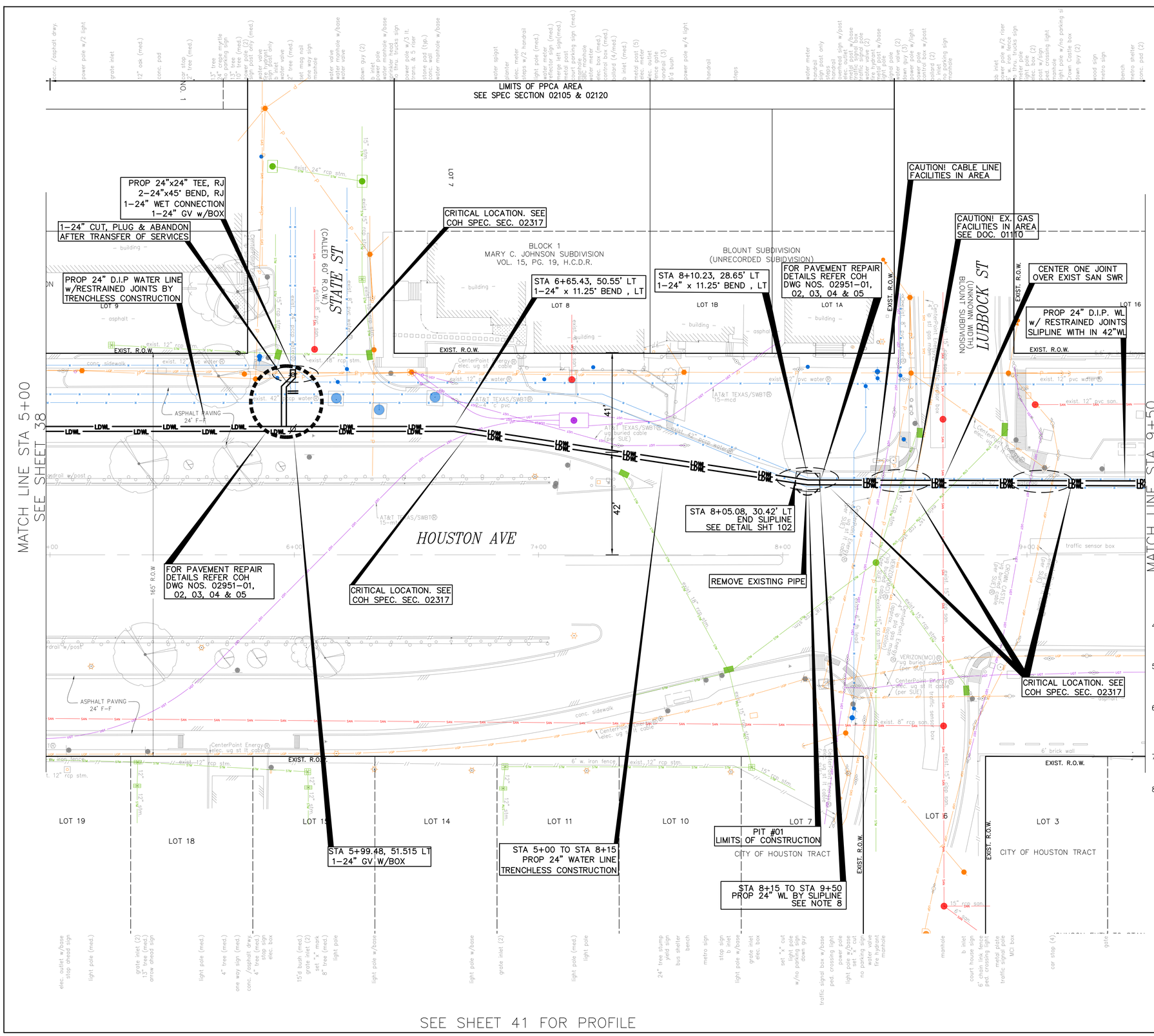
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 39 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Woy and Houston Ave.dwg plotted on Sep 22, 2025 - 11:52am



N

0' 20' 40'

HORIZ:1"=20'

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ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

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T.B.M.:
T.B.M. B-26
SET 'X' CUT ON CONC.
ELEV.=40.12
D. STA. 8+29.91 OFFSET: 69.18R

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5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
6. CONTRACTOR TO LOCATE EXISTING 24-INCH PCCP JOINT AND MAKE CONNECTION TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER INCLUDE A FLANGE ISOLATION KIT BETWEEN PCCP AND D.I.PIPES.
7. CONTRACTOR TO LOCATE EXISTING 42-INCH PCCP JOINT AND MARK CUT AND PLUG TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER.
8. LOCATION OF PROPOSED WATER LINE IN SLIPLINE WITHIN EXISTING 42-INCH WATER LINE IS SHOWN BASED ON APPROXIMATE LOCATION OF THE EXISTING 42-INCH LINE. THEREFORE STATIONS AND INVERTS OF PROPOSED WATER LINE ARE ESTIMATES ONLY. CONTRACTOR TO FIELD VERIFY LOCATION OF 42-INCH WATER LINE PROPER TO BEGINNINGS SLIPLING AND ADJUST LOCATIONS. SLIPLING PIT/LIMIT, PROPOSED BENDS, INVERTS ETC., RELATED TO SLPLING ACCORDINGLY WITH APPROVAL OF THE PROJECT MANAGER.

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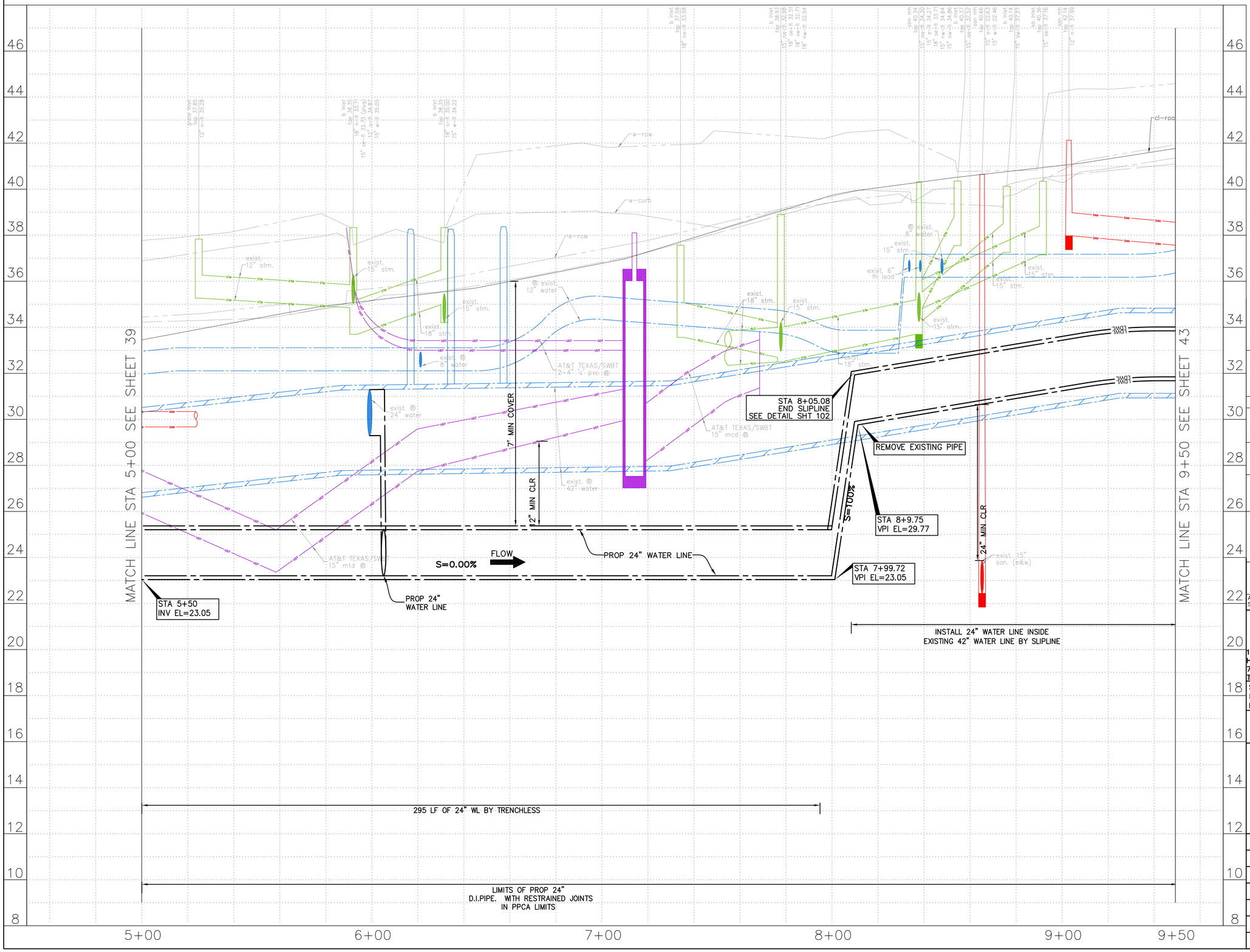
SEE SHEET 40 FOR PLAN



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SITE 4&5
PROFILE
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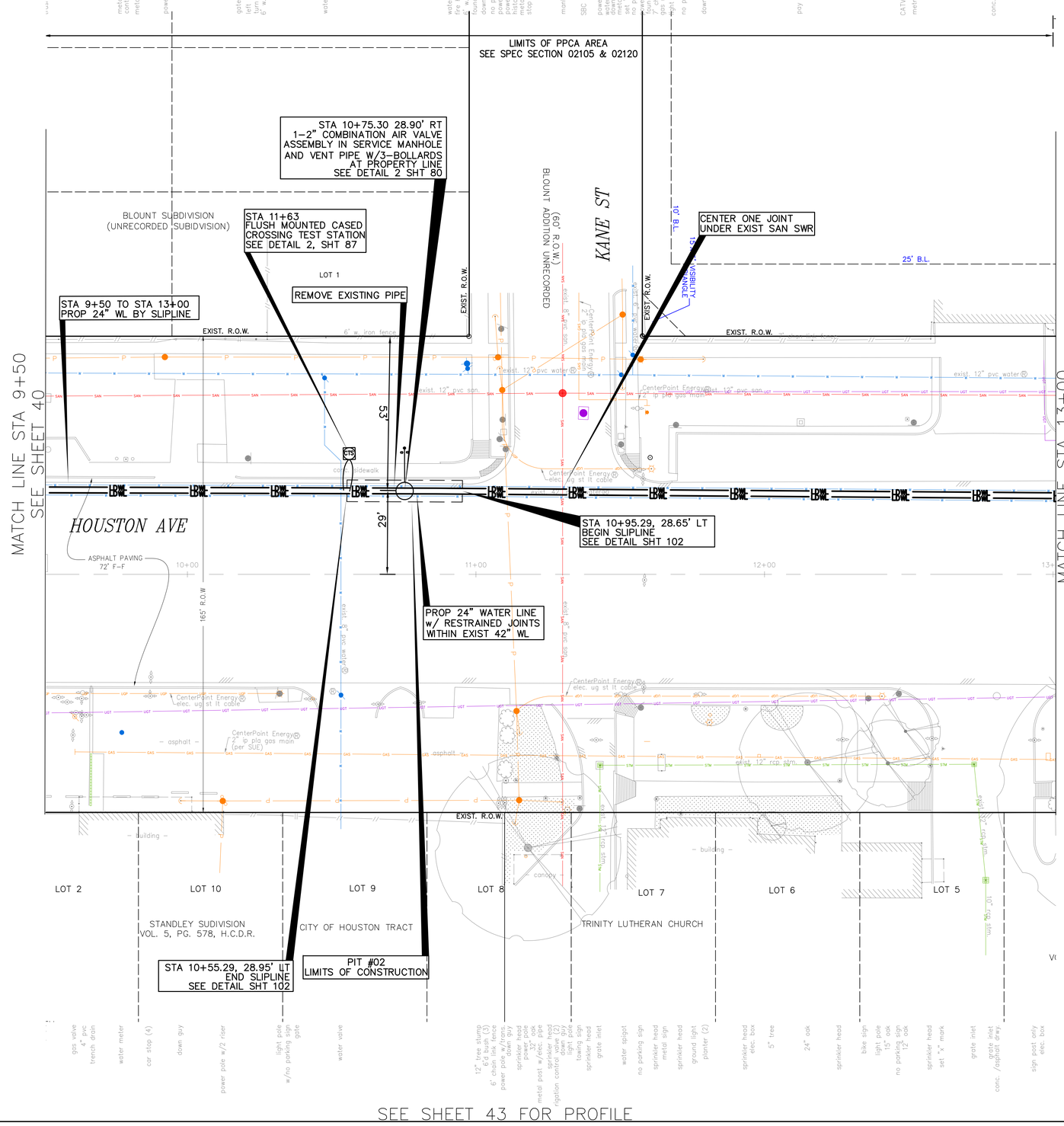


HORIZ:1"=20'

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-26
SET 'X' CUT ON CONC.
ELEV.=40.12
D. STA. 8+29.91 OFFSET: 69.18R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL
4. TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.
5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
6. CONTRACTOR TO LOCATE EXISTING 24-INCH PCCP JOINT AND MAKE CONNECTION TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER INCLUDE A FLANGE ISOLATION KIT BETWEEN PCCP AND D.I.PIPES.
7. CONTRACTOR TO LOCATE EXISTING 42-INCH PCCP JOINT AND MARK CUT AND PLUG TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER.
8. LOCATION OF PROPOSED WATER LINE IN SLIPLINE WITHIN EXISTING 42-INCH WATER LINE IS SHOWN BASED ON APPROXIMATE LOCATION OF THE EXISTING 42-INCH LINE. THEREFORE STATIONS AND INVERTS OF PROPOSED WATER LINE ARE ESTIMATES ONLY. CONTRACTOR TO FIELD VERIFY LOCATION OF 42-INCH WATER LINE PROPER TO BEGINNINGS SLIPLING AND ADJUST LOCATIONS. SLIPLING PIT/LIMIT, PROPOSED BENDS, INVERTS ETC., RELATED TO SLPLING ACCORDINGLY WITH APPROVAL OF THE PROJECT MANAGER.

NO.	DATE	REVISION	APP.

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

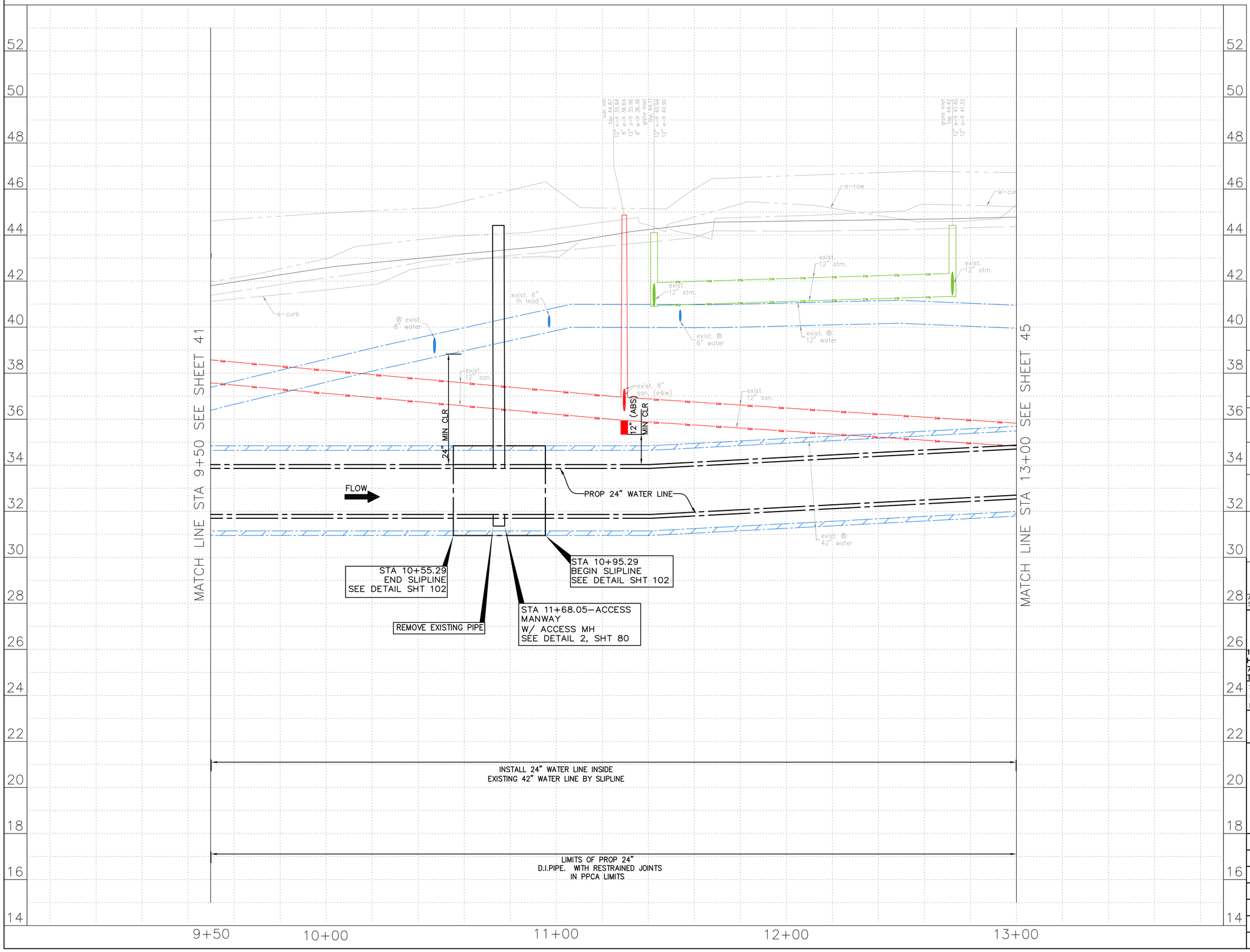
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
HOUSTON AVE
SITE 4&5
PLAN
STA 9+50 TO STA 13+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 42 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 21, 2025 - 2:49pm

SEE SHEET 42 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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ON 09/22/2025
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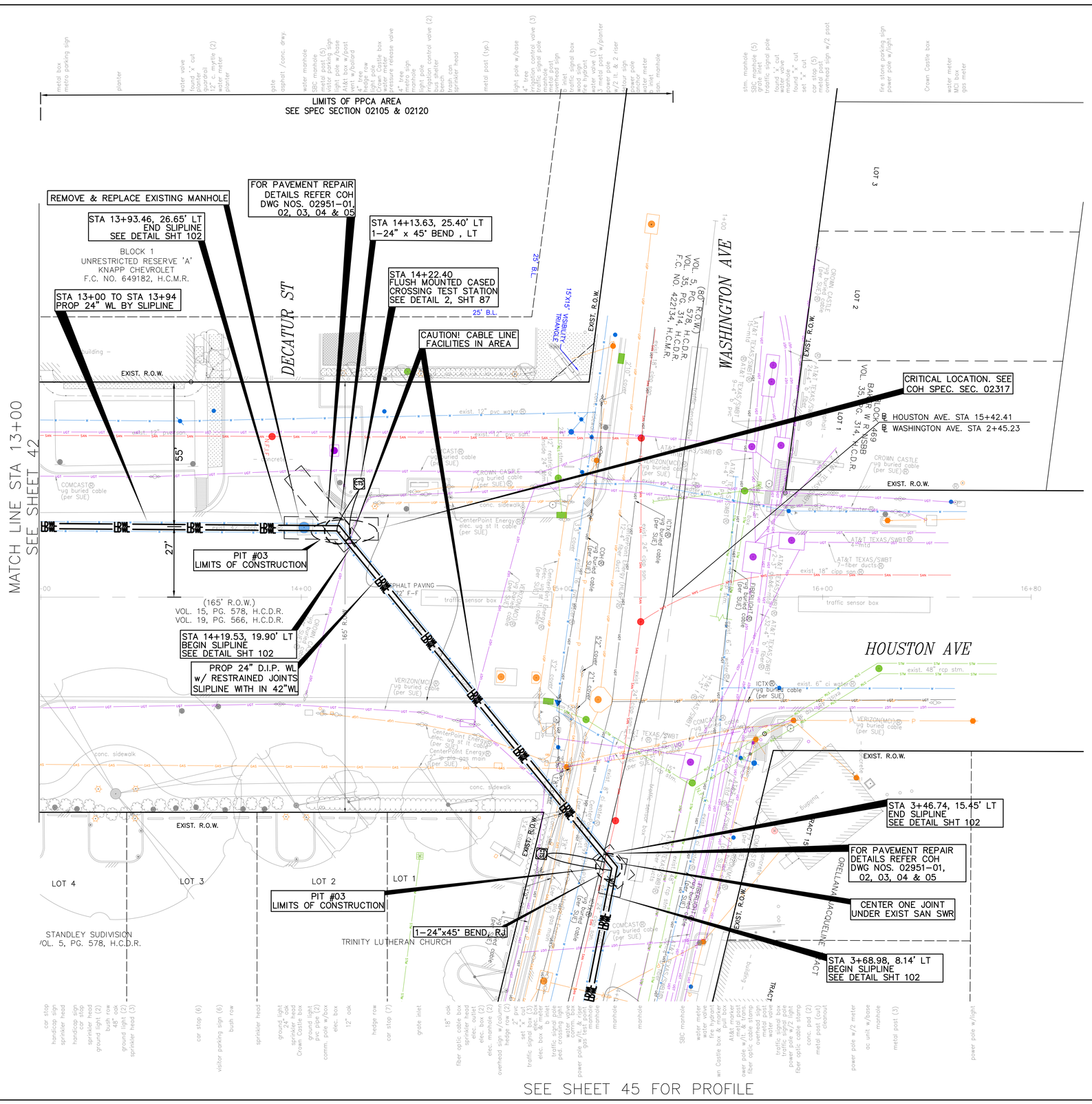
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
HOUSTON AVE
SITE 4&5
PROFILE
STA 9+50 TO STA 13+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 43 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 21, 2025 - 2:50pm



HORIZ:1"=20'

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-28
SET 'X' CUT ON CONC.
ELEV.=44.13
D. STA. 2+07.74 OFFSET: 43.27L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL
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NO.	DATE	REVISION	APP.

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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Signature valid for six months.

Date

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

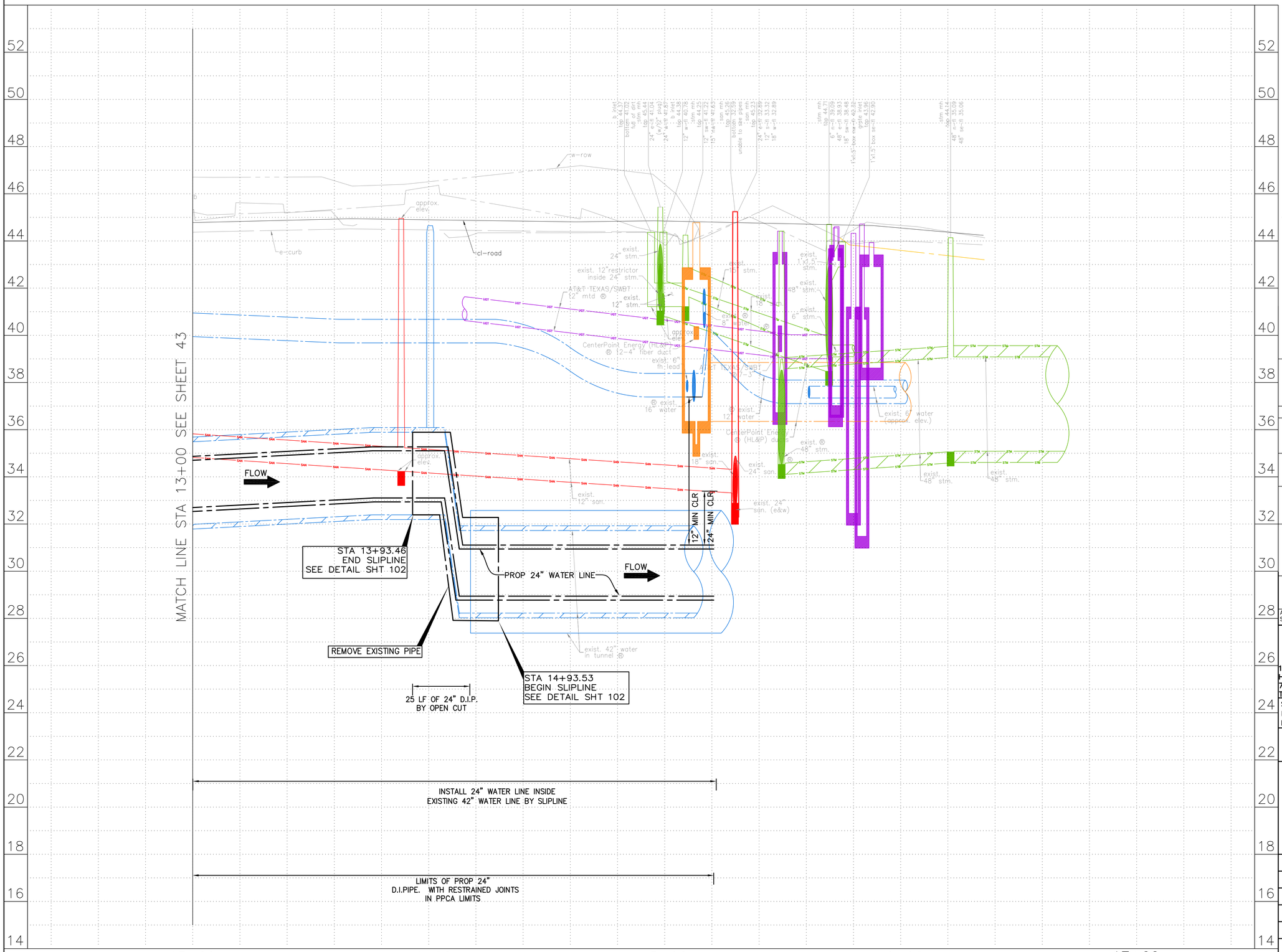
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
HOUSTON AVE
SITE 4&5
PLAN
STA 13+00 TO STA 16+80

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 44 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 22, 2025 - 10:30am

SEE SHEET 44 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

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TX FIRM NO.: F-4578

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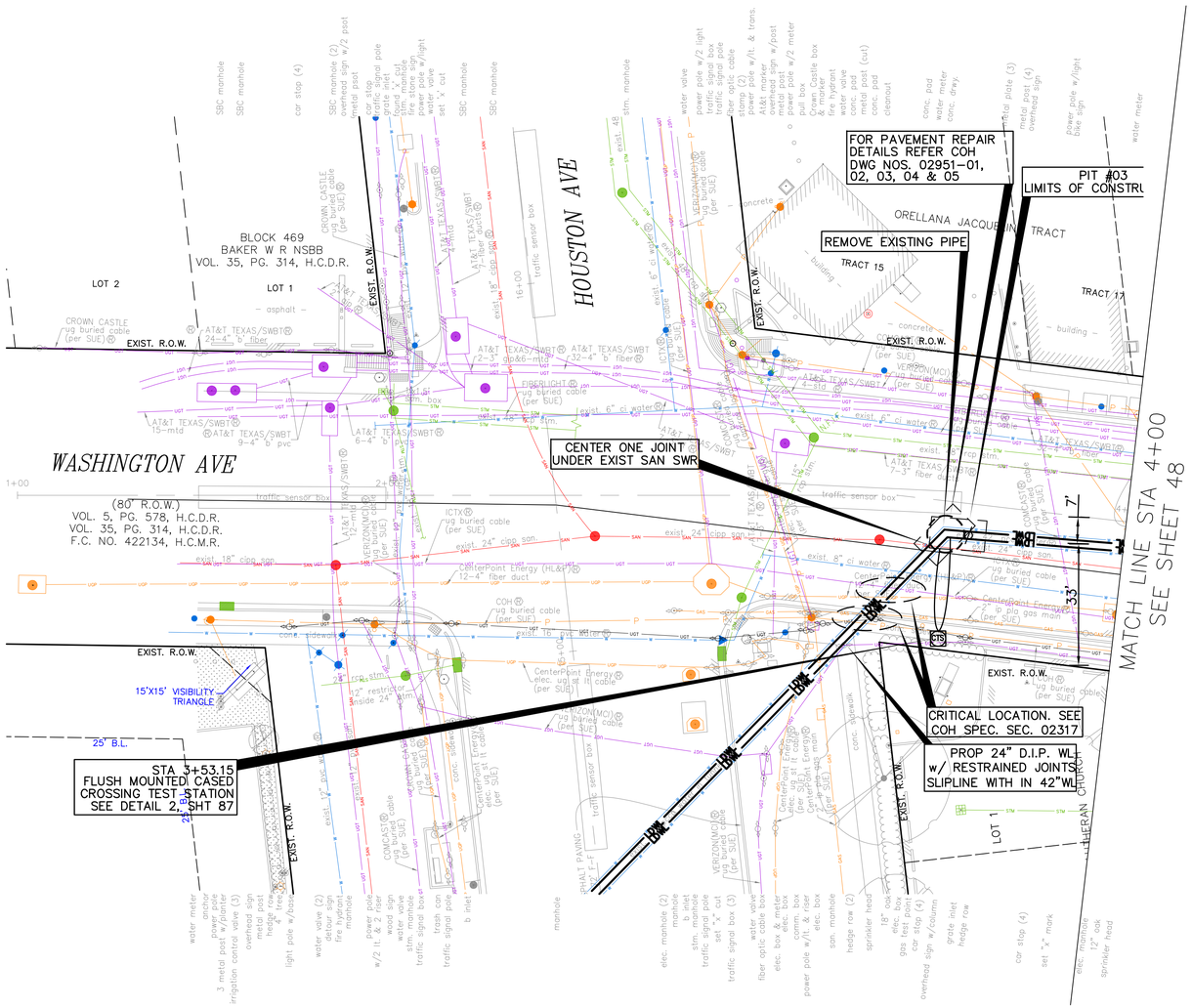
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

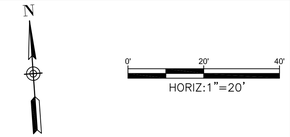
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

HOUSTON AVE
SITE 4&5
PROFILE
STA 13+00 TO STA 16+80

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 45 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Memorial Way and Houston Ave.dwg plotted on Sep 22, 2025 – 11:51am





NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-28
SET 'X' CUT ON CONC.
ELEV.=44.13
D. STA. 2+07.74 OFFSET: 43.27L

NOTES:

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5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
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Date

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Signature valid for six months.

Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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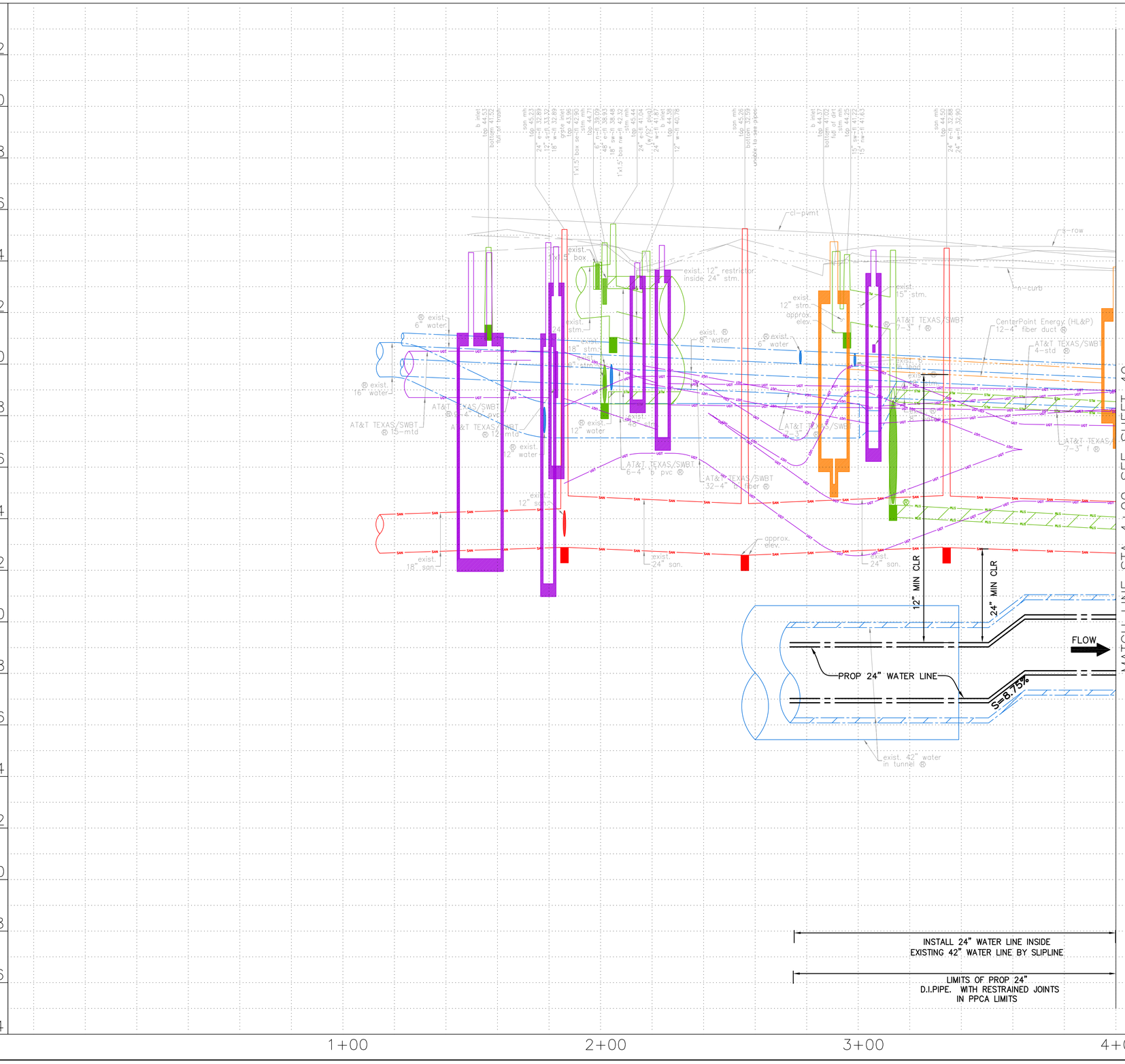
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
WASHINGTON AVE
SITE 4&5
PLAN
BEGIN TO STA 4+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 46 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 22, 2025 - 11:54am

SEE SHEET 46 FOR PLAN



52 50 48 46 44 42 40 38 36 34 32 30 28 26 24 22 20 18 16 14

1+00 2+00 3+00 4+00

N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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ON 09/22/2025
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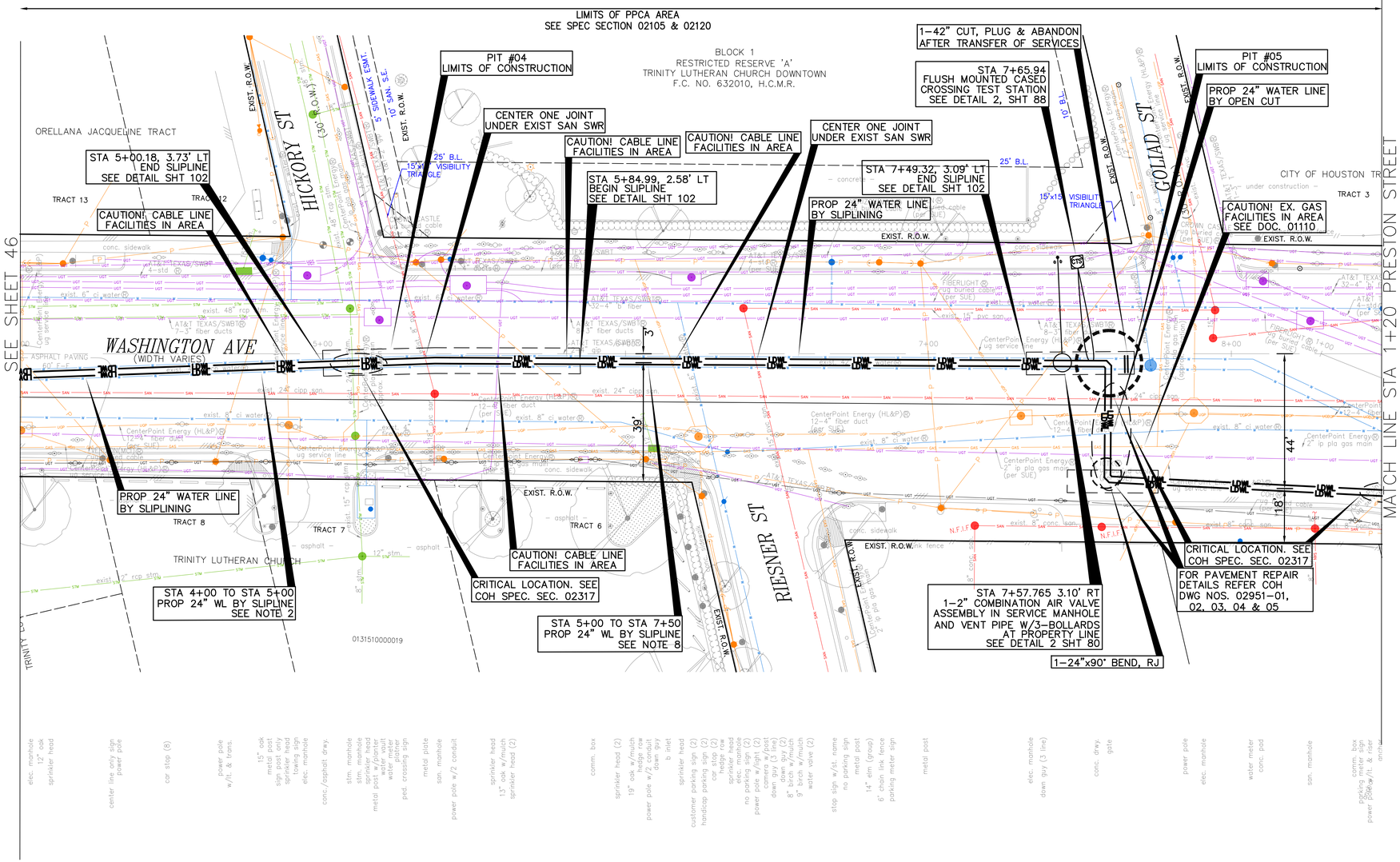
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
WASHINGTON AVE
SITE 4&5
PROFILE
BEGIN TO STA 4+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 47 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 21, 2025 - 3:12pm



SEE SHEET 49 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
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N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-32
SET 1/2" I.R. W/CAP
ELEV.=42.02
D. BL STA. 8+14.92 OFFSET: 53.16R

NOTES:

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Date

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Signature valid for one year.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

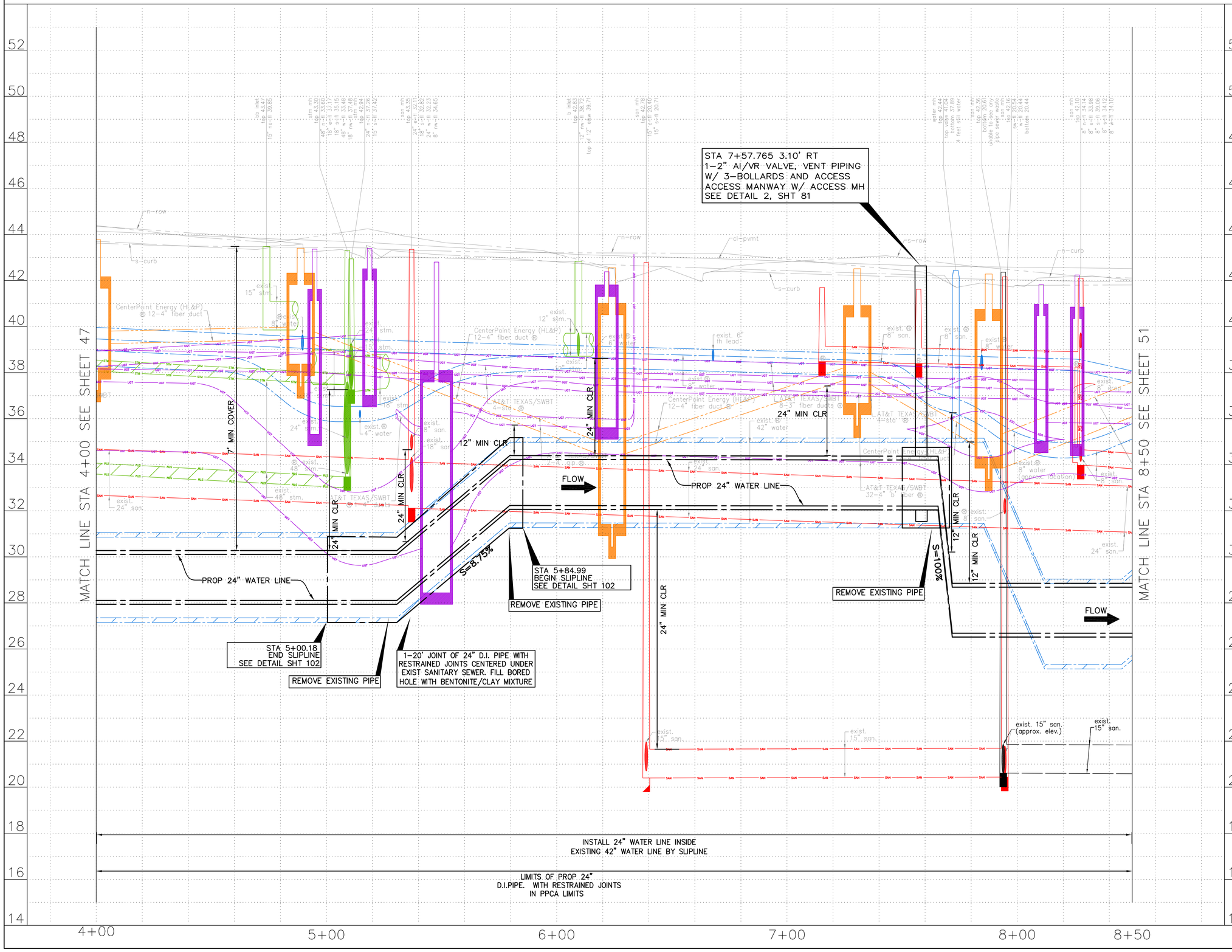
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
WASHINGTON AVE
SITE 4&5
PLAN
STA 4+00 TO STA 8+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 48 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 22, 2025 - 12:01pm

SEE SHEET 48 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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

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

Signature valid for six months.

Date

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

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CITY OF HOUSTON

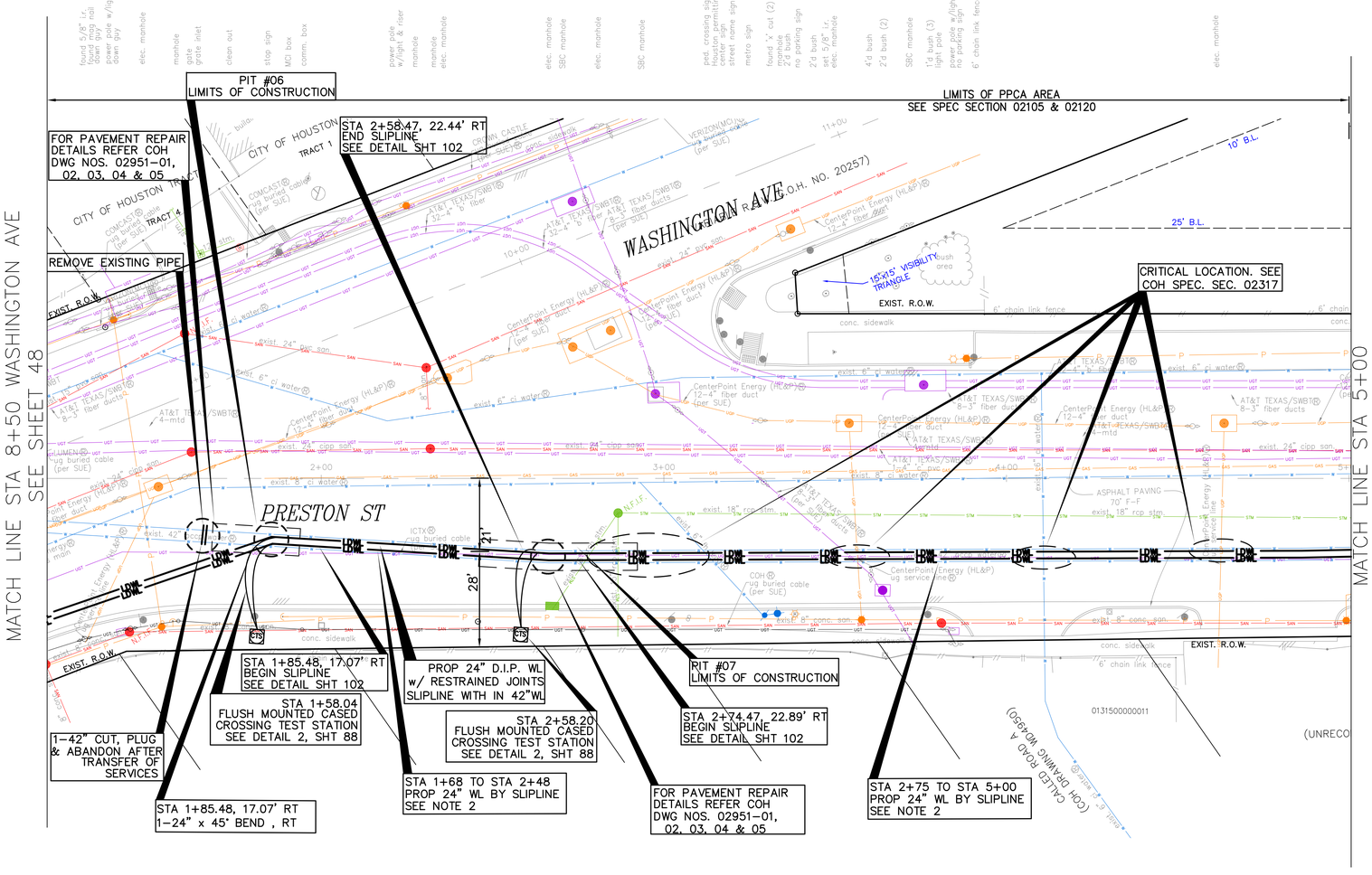
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

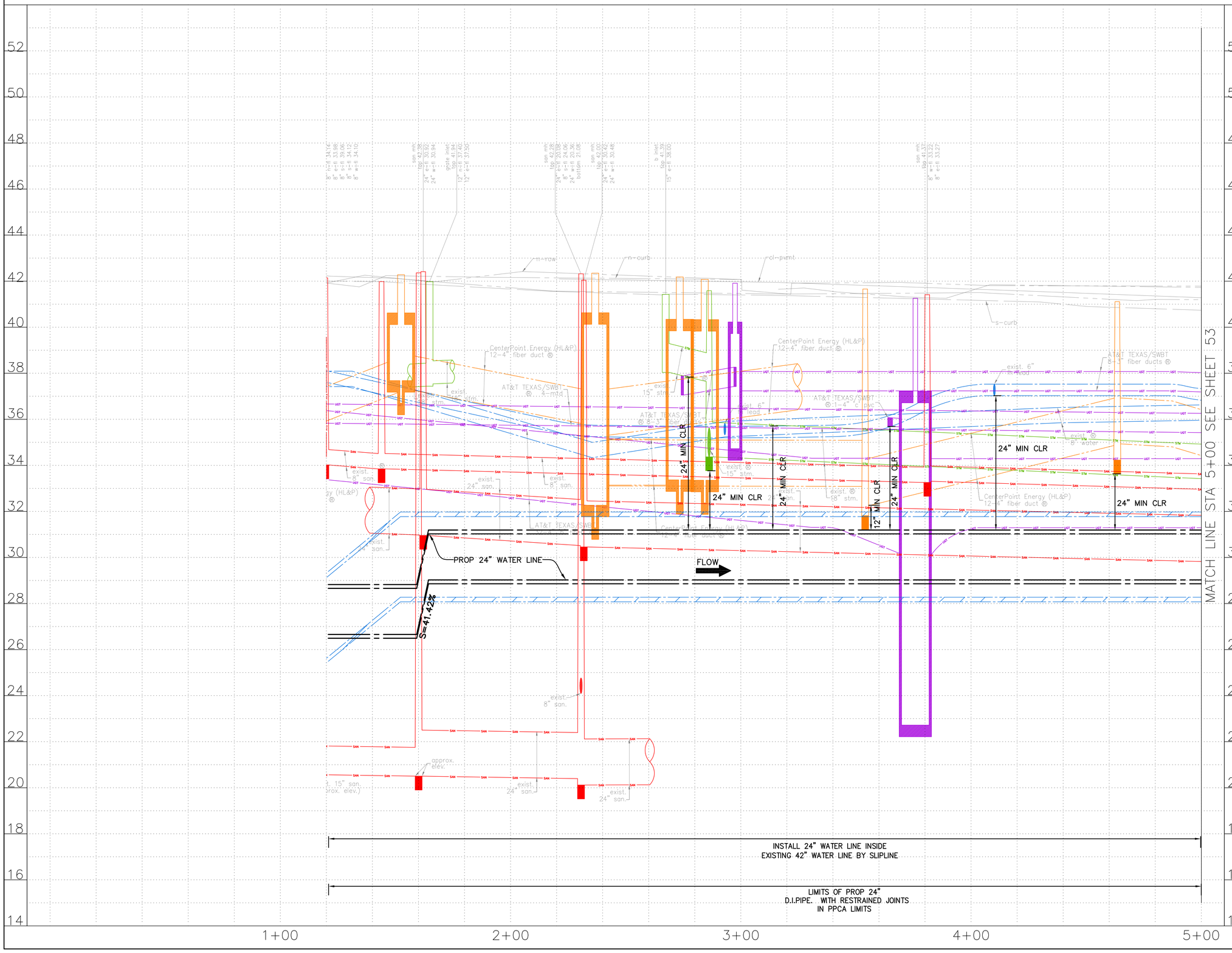
WASHINGTON AVE
SITE 4&5
PROFILE
STA 4+00 TO STA 8+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 49 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 21, 2025 - 3:15pm


MATCH LINE STA 8+50 WASHINGTON AVE
SEE SHEET 48
MATCH LINE STA 5+00
SEE SHEET 52
WASHINGTON AVE
(H.C.R.O.H. NO. 20257)
PRESTON ST
PIT #06
LIMITS OF CONSTRUCTION
LIMITS OF PPCA AREA
SEE SPEC SECTION 02105 & 02120
FOR PAVEMENT REPAIR
DETAILS REFER COH
DWG NOS. 02951-01,
02, 03, 04 & 05
STA 2+58.47, 22.44' RT
END SLIPLINE
SEE DETAIL SHT 102
REMOVE EXISTING PIPE
EXIST. R.O.W.
CRITICAL LOCATION. SEE
COH SPEC. SEC. 02317
15'x15' VISIBILITY TRIANGLE
10' B.L.
25' B.L.
21'
28'
STA 1+85.48, 17.07' RT
BEGIN SLIPLINE
SEE DETAIL SHT 102
STA 1+58.04
FLUSH MOUNTED CASED
CROSSING TEST STATION
SEE DETAIL 2, SHT 88
PROP 24" D.I.P. WL
w/ RESTRAINED JOINTS
SLIPLINE WITH IN 42"WL
STA 2+58.20
FLUSH MOUNTED CASED
CROSSING TEST STATION
SEE DETAIL 2, SHT 88
RIT #07
LIMITS OF CONSTRUCTION
STA 2+74.47, 22.89' RT
BEGIN SLIPLINE
SEE DETAIL SHT 102
1-42" CUT, PLUG
& ABANDON AFTER
TRANSFER OF
SERVICES
STA 1+85.48, 17.07' RT
1-24" x 45° BEND , RT
STA 1+68 TO STA 2+48
PROP 24" WL BY SLIPLINE
SEE NOTE 2
FOR PAVEMENT REPAIR
DETAILS REFER COH
DWG NOS. 02951-01,
02, 03, 04 & 05
STA 2+75 TO STA 5+00
PROP 24" WL BY SLIPLINE
SEE NOTE 2
(COH DRAWING W-4950-3)
0131500000011
(UNRECO
CITY OF HOUSTON
TRACT 1
TRACT 4
CHAIN CASTLE
conc. sidewalk
6' chain link fence
ASPHALT PAVING
70' F-F
exist. 18" rcp strm
exist. 24" cipp san
exist. 8" conc. san
exist. 6" ci water
exist. 8" ci water
exist. 42" cipp san
exist. 24" rcp san
exist. 6" wv
exist. 8" wv
exist. 12" wv
AT&T TEXAS/SWBT
8-3" fiber ducts
4-mtd
CenterPoint Energy (HL&P)
12-4" fiber duct
(per SUE)
CenterPoint Energy (HL&P)
ug service line
COH
ug buried cable
(per SUE)
ICTX
ug buried cable
(per SUE)
LUMEN
ug buried cable
(per SUE)
VERIZON/MCI/Va
ug buried cable
(per SUE)
COMCAST
ug buried cable
(per SUE)
CenterPoint Energy (HL&P)
12-4" fiber duct
(per SUE)
AT&T TEXAS/SWBT
12-4" 5" fiber duct
(per SUE)
AT&T TEXAS/SWBT
8-3" fiber ducts
(per SUE)
AT&T TEXAS/SWBT
8-3" fiber ducts
CenterPoint Energy (HL&P)
12-4" fiber duct
AT&T TEXAS/SWBT
8-3" fiber ducts
AT&T TEXAS/SWBT
4-mtd
AT&T TEXAS/SWBT
4-2" PVC
AT&T TEXAS/SWBT
8-3" fiber ducts
CenterPoint Energy (HL&P)
12-4" fiber duct
AT&T TEXAS/SWBT
4-mtd
AT&T TEXAS/SWBT
8-3" fiber ducts
CenterPoint Energy (HL&P)
ug service line
CenterPoint Energy (HL&P)
12-4" fiber duct
AT&T TEXAS/SWBT
8-3" fiber ducts
CenterPoint Energy (HL&P)
ug service line
CenterPoint Energy (HL&P)
ug service line
CenterPoint Energy (HL&P)
ug service line

SEE SHEET 50 FOR PLAN



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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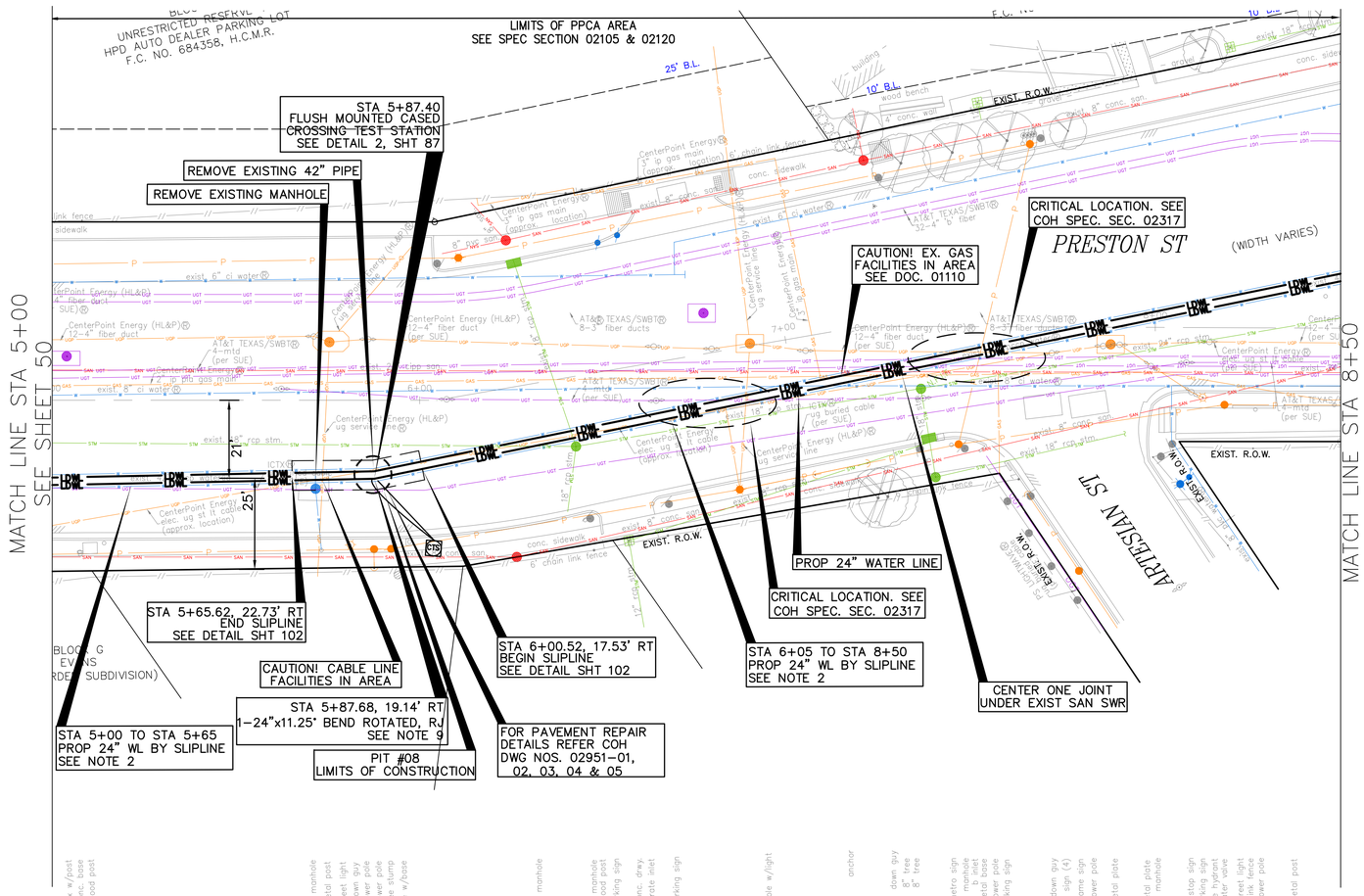
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

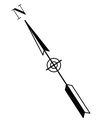
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PROFILE
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 51 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 21, 2025 - 3:19pm



SEE SHEET 53 FOR PROFILE



0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:

T.B.M. B-34
SET MAGNAIL W/SHINER
ELEV.=39.69
D. BL STA. 7+24.10 OFFSET: 32.32L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICAION UOTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX-XXX-XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL
4. TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.
5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
6. CONTRACTOR TO LOCATE EXISTING 24-INCH PCCP JOINT AND MAKE CONNECTION TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER INCLUDE A FLANGE ISOLATION KIT BETWEEN PCCP AND D.I.PIPES.
7. CONTRACTOR TO LOCATE EXISTING 42-INCH PCCP JOINT AND MARK CUT AND PLUG TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER.
8. LOCATION OF PROPOSED WATER LINE IN SLIPLINE WITHIN EXISTING 42-INCH WATER LINE IS SHOWN BASED ON APPROXIMATE LOCATION OF THE EXISTING 42-INCH LINE. THEREFORE STATIONS AND INVERTS OF PROPOSED WATER LINE ARE ESTIMATES ONLY. CONTRACTOR TO FIELD VERIFY LOCATION OF 42-INCH WATER LINE PROPER TO BEGINNINGS SLIPLING AND ADJUST LOCATIONS. SLIPLING PIT/LIMIT, PROPOSED BENDS, INVERTS ETC., RELATED TO SLPLING ACCORDINGLY WITH APPROVAL OF THE PROJECT MANAGER.
9. ANGLE OF ROTATED BEND REPRESENTS FABRICATED ANGLE.

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Date

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Date

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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
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TX FIRM NO.: F-4578
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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

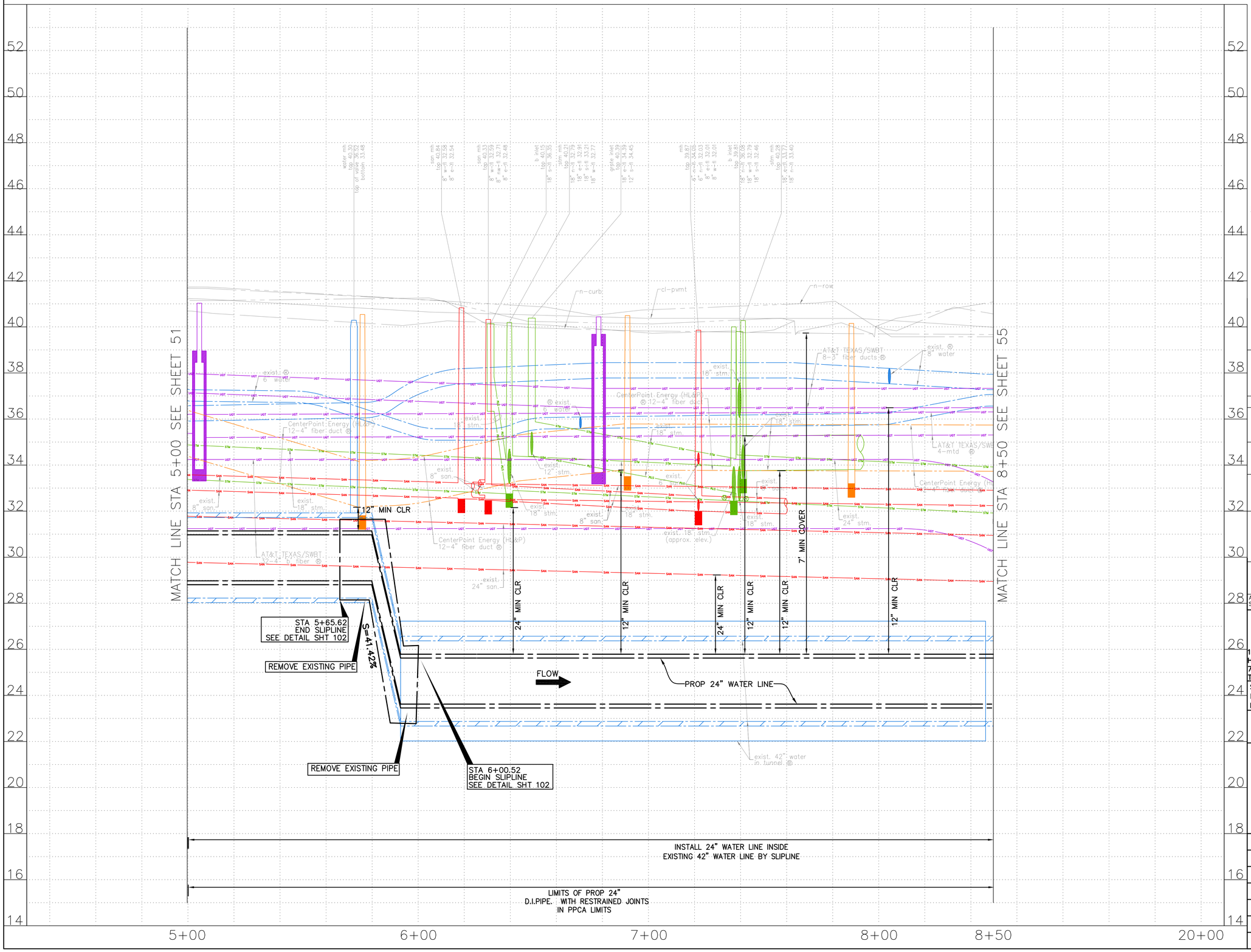
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

PRESTON STREET
SITE 4&5
PLAN
STA 5+00 TO STA 8+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 52 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 22, 2025 - 1:09pm

SEE SHEET 52 FOR PLAN



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HORIZ:1"=20'
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NO.	DATE	REVISION	APP.

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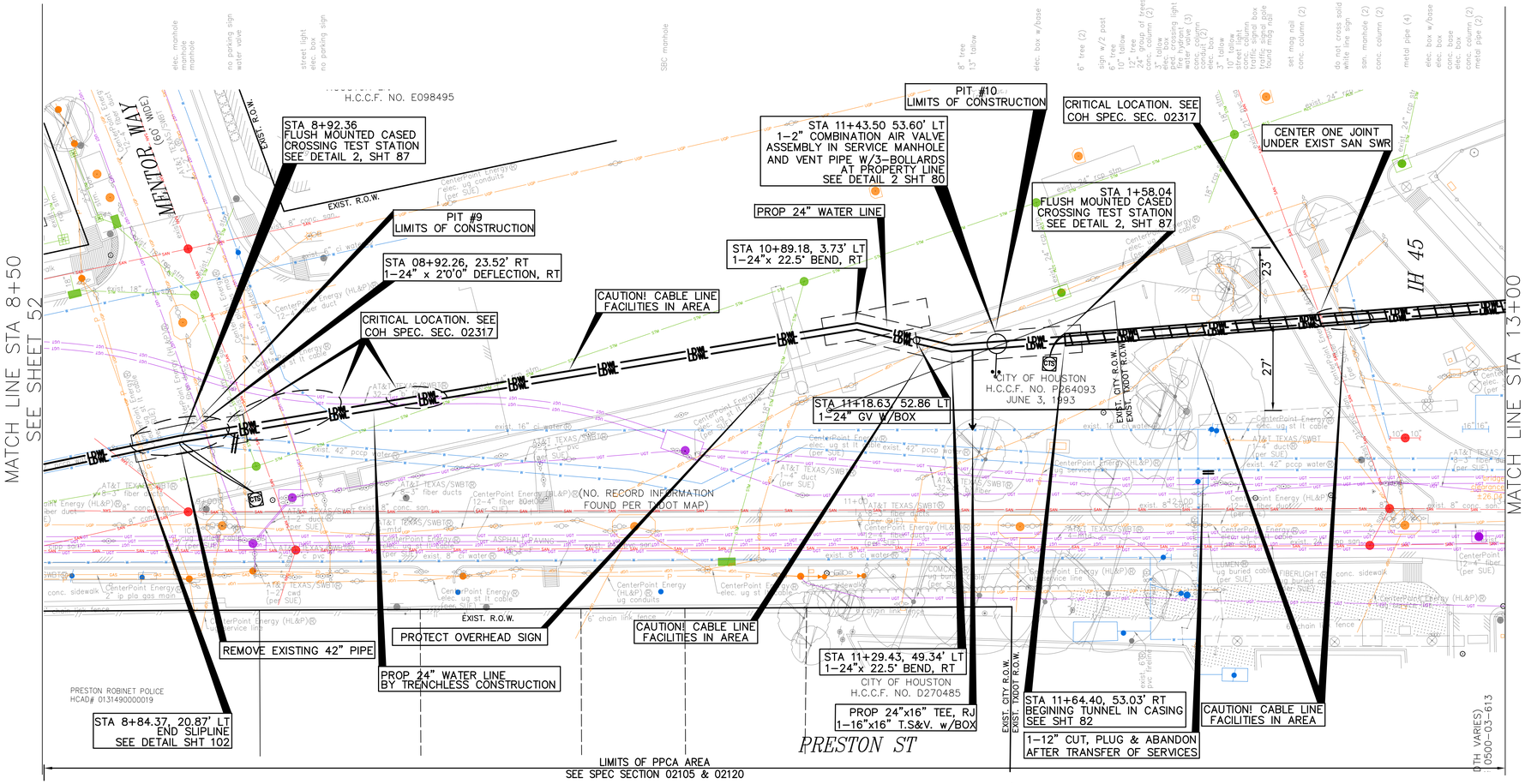
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

PRESTON STREET
SITE 4&5
PROFILE
STA 5+00 TO STA 8+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 53 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 22, 2025 - 1:10pm



SEE SHEET 55 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
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HORIZ:1"=20'

NO.	DATE	REVISION	APP.

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ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-35
FIND 'X' CUT ON CONC.
ELEV.=40.60
D. BL STA. 9+20.39 OFFSET: 3.64L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UOTS. NO SEPARATE PAY.
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HOUSTON PUBLIC WORKS

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SITE 4&5
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STA 8+50 TO STA 13+00

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MARTIN MATHEW, ENV SP	
SHEET NO. 54 OF 153	

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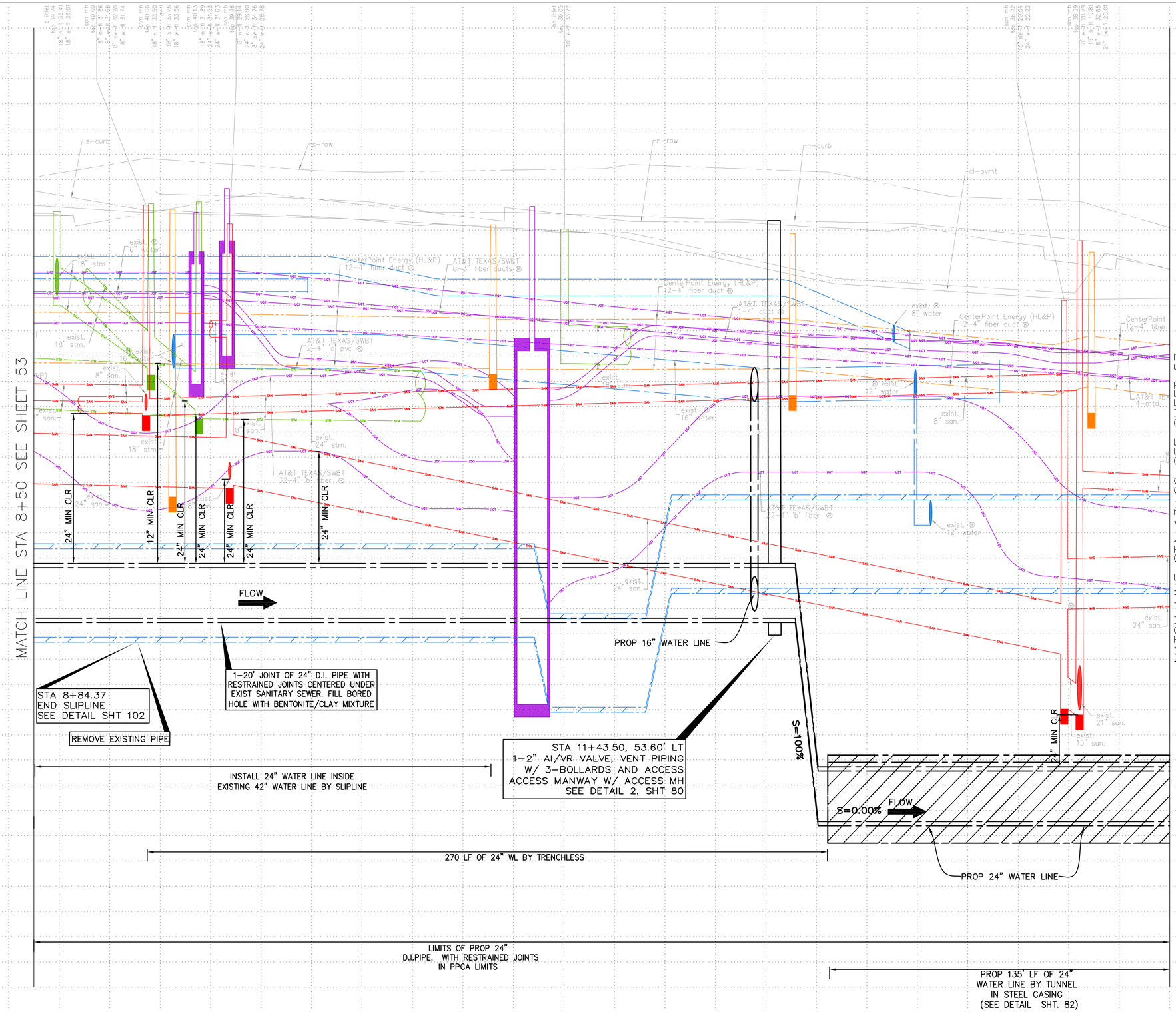
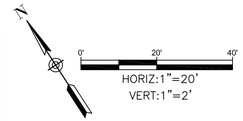
SEE SHEET 54 FOR PLAN

MATCH LINE STA 8+50 SEE SHEET 53

MATCH LINE STA 13+00 SEE SHEET 57





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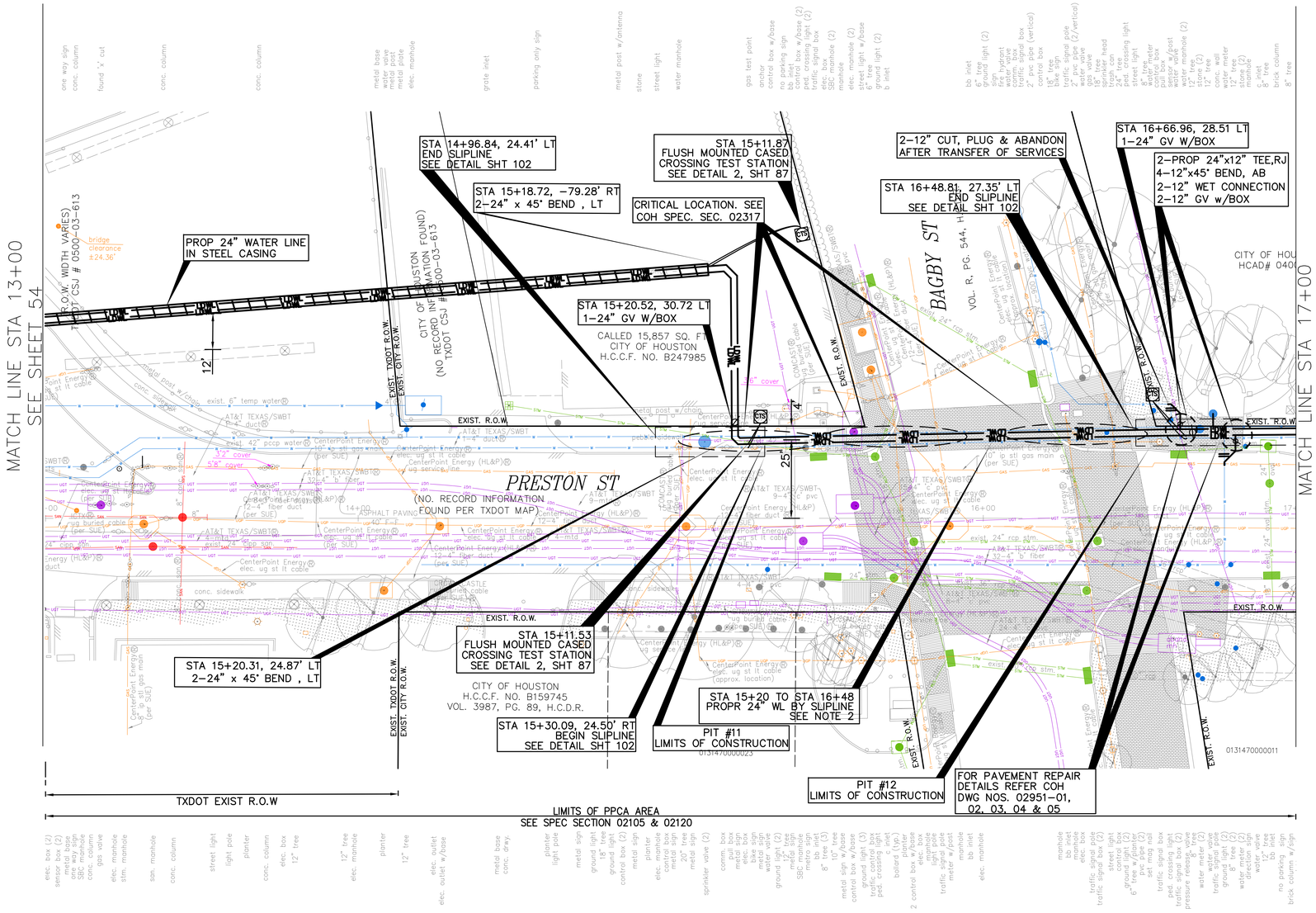
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PROFILE
STA 8+50 TO STA 13+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 55 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 22, 2025 - 1:13pm



SEE SHEET 57 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
6. CONTRACTOR TO LOCATE EXISTING 24–INCH PCCP JOINT AND MAKE CONNECTION TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER INCLUDE A FLANGE ISOLATION KIT BETWEEN PCCP AND D.I.PIPES.
7. CONTRACTOR TO LOCATE EXISTING 42–INCH PCCP JOINT AND MARK CUT AND PLUG TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER.
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HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-37
SET 'X' CUT ON PAVERS.
ELEV.=30.93
D. BL STA. 16+46.90 OFFSET: 27.98R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UOTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX–XXX–XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PLAN
STA 13+00 TO STA 17+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 56 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Washington Ave and Preston street.dwg plotted on Sep 22, 2025 – 1:14pm

SEE SHEET 56 FOR PLAN

MATCH LINE STA 13+00 SEE SHEET 55

MATCH LINE STA 17+00 SEE SHEET 59

s-row

s-curb

n-row

n-curb

Energy (HL&P) duct

CenterPoint Energy (HL&P) 12-4" fiber duct

AT&T TEXAS/SWBT 8-3" fiber ducts

AT&T TEXAS/SWBT 32-4" b. fiber

AT&T TEXAS/SWBT 3-4" c. pvc

exist. 20" water

CenterPoint Energy 10" ip stl gas main (per SUE)

exist. 8" san.

exist. 4" water

exist. 42" water

exist. 24" san.

exist. 24" stm.

exist. 18" stm.

exist. 42" water in tunnel

exist. 36" rcp

7' MIN COVER

12" MIN CLR

12" MIN CLR

24" MIN CLR

S=0.00% FLOW

S=0.00% FLOW

S=1.00%

PROP 24" WATER LINE

PROP 198' LF OF 24" WATER LINE BY TUNNEL

REMOVE EXISTING PIPE

STA 15+28.37
BEGIN SLIPLINE
SEE DETAIL SHT 102

INSTALL 24" WATER LINE INSIDE EXISTING 42" WATER LINE BY SLIPLINE

13+00 14+00 15+00 16+00 17+00

HORIZ:1"=20'
VERT:1"=2'

NOTES:

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Date

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KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PROFILE
STA 13+00 TO STA 17+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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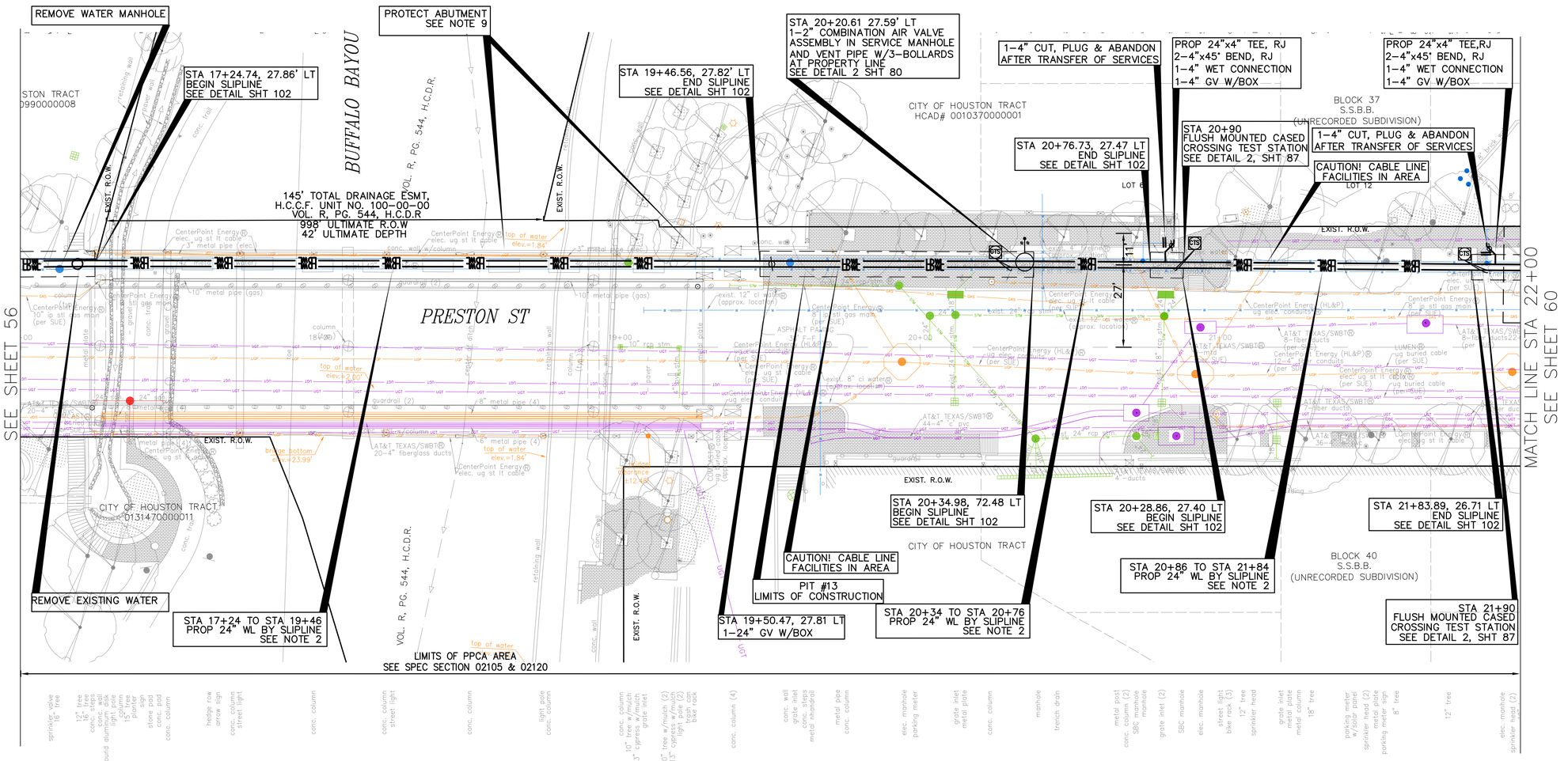
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 57 OF 153	

NO.	DATE	REVISION	APP.

S:\Proj-2024\24057-7(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Washington Ave and Preston street.dwg plotted on Sep 22, 2025 - 1:16pm



SEE SHEET 59 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

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9. EXCAVATION ADJOINING THE PRESTON BRIDGE TO BE PERFORMED WITH DUE CASE AND CONSIDERATIONS INCLUDING BUT NOT LIMITED TO HAND EXCAVATION FOR EXISTENCE OF RETAINING WALL SYSTEM IS COMPOSED OF MECHANICALLY STABILIZED EARTH(MSC) WALLS AS PER TXDOT RECORD DRAWING FOR THE PRESTON BRIDGE. CONTRACTOR TO INSPECT THE MSE WALLS BEFORE EXCAVATION TO ASSESS ITS CURRENT CONDITION. THE EXCAVATION IS EXPECTED TO ENCROACH THE EXISTING CEMENT STABILIZED BACKFILL AND REINFORCEMENT MESH OR STRAPS BASED ON THE TXDOT MSE WALL STANDARDS PROVIDED IN THE RECORD DRAWINGS. THE CONTRACTOR MUST BE PREPARED TO DISCOVER DIFFERENT MATERIALS DURING EXCAVATION. THE CONTRACTOR SHALL EXERCISE DUE CARE TO PROTECT THE STRUCTURAL INTEGRITY OF THE MSE WALL AND ITS COUNTERPARTS DURING ALL CONSTRUCTION ACTIVITIES PERTAINING TO EXCAVATION AND FILLING. THE CONTRACTOR MUST DOCUMENT THE TYPE OF MATERIAL USED FOR BACKFILLING AND REINFORCEMENT DURING EXCAVATION TO ENSURE THAT THE SAME MATERIAL WILL BE REPLACED WHEN RECONSTRUCTING. NEED TO CUT REINFORCING MESH OR STRAPS TO REPLACE THE PIPE BENDS AND VALUES IS ALSO ANTICIPATED. RECOMMEND INSTALLING EXTERNAL BRACING AND SHORING TO SUPPORT THE WALL. ADDITIONALLY A THIRD–PARTY GEOTECHNICAL ENGINEER SHOULD BE ON–SITE DURING EXCAVATION UNTIL THE MATERIALS HAVE BEEN ADEQUATELY REPLACED. DUE TO THE DEPTH AND NATURE OF THE EXCAVATION, SHORING MAY BE REQUIRED TO MEET AND SATISFY LOCAL REQUIREMENTS TO ENSURE SAFETY.

HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-38
SET 'X' CUT ON PAVERS.
ELEV.=32.98
D. BL STA. 19+64.23 OFFSET: 25.88L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX–XXX–XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Signature valid for six months.

Date

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Date

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KUO & ASSOCIATES
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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
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FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PLAN
STA 17+00 TO STA 22+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 58 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Preston Street.dwg plotted on Sep 22, 2025 – 2:19pm

SEE SHEET 58 FOR PLAN

MATCH LINE STA 17+00 SEE SHEET 57

MATCH LINE STA 10+00 SEE SHEET 61

REMOVE WATER MANHOLE

PROP 24" WATER LINE

REMOVE EXISTING 42" WATER

INSTALL 24" WATER LINE INSIDE
EXISTING 42" WATER LINE BY SLIPLINE

145' TOTAL DRAINAGE ESMT.
H.C.C.F. UNIT NO. 100-00-00
VOL. R, PG. 544, H.C.D.R
998' ULTIMATE R.O.W
42' ULTIMATE DEPTH

STA 20+35.05, 27.59' RT
1-2" AI/VR VALVE, VENT PIPING
W/ 3-BOLLARDS AND ACCESS
ACCESS MANWAY W/ ACCESS MH
SEE DETAIL 2, SHT 39

LIMITS OF PROP 24"
D.I.PIPE. WITH RESTRAINED JOINTS
IN PPCA LIMITS

INSTALL 24" WATER LINE INSIDE
EXISTING 42" WATER LINE BY SLIPLINE

24" MIN CLR

12" MIN CLR

12" MIN CLR

7' MIN COVER

PROP 24" WATER LINE

PROP 4"
WATER LINE

PROP 4"
WATER LINE

INSTALL 24" WATER LINE INSIDE
EXISTING 42" WATER LINE BY SLIPLINE

HORIZ:1"=20'
VERT:1"=2'

NOTES:

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HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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ON 09/22/2025
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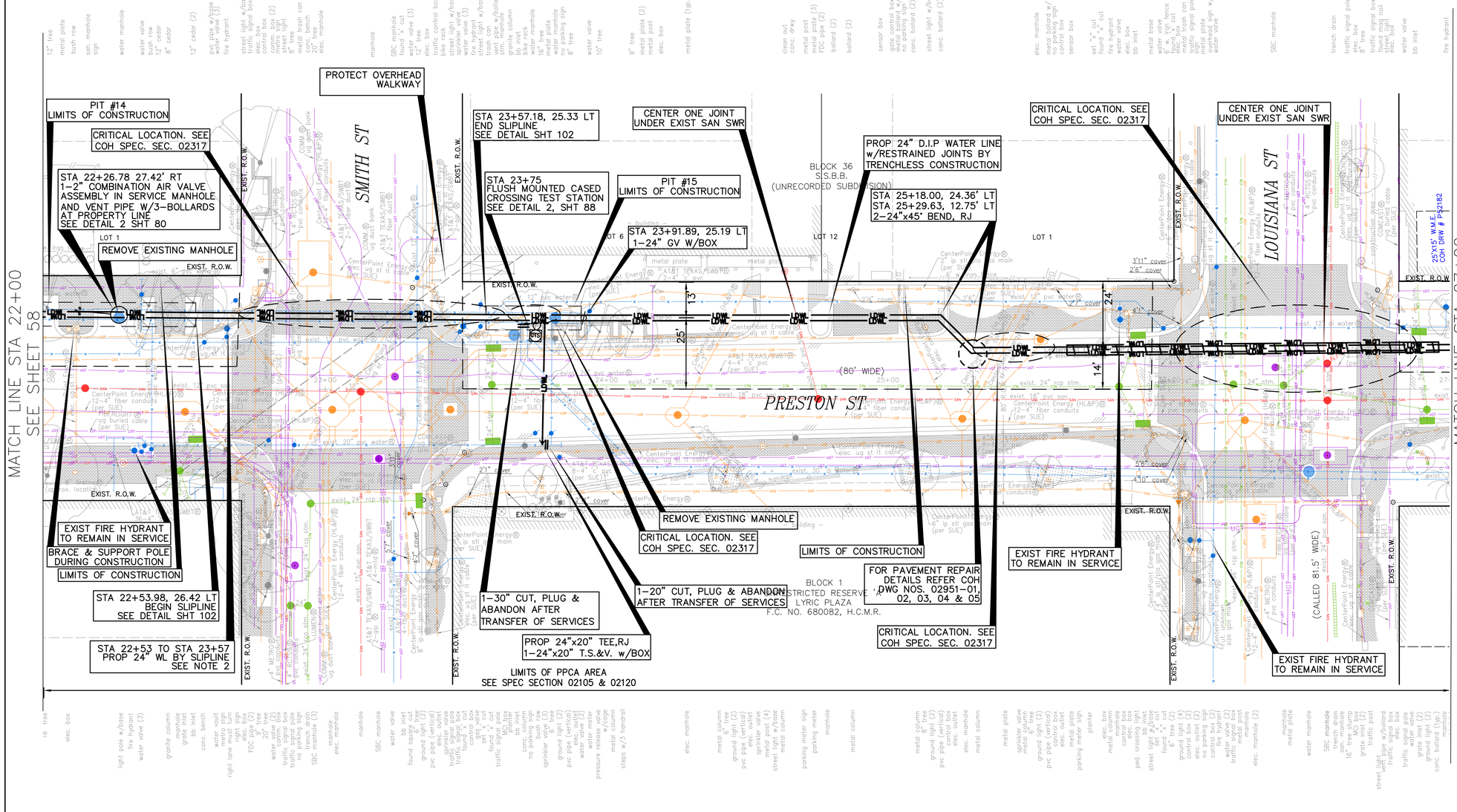
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PROFILE
STA 17+00 TO STA 22+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 59 OF 153	

NO.	DATE	REVISION	APP.

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 22, 2025 - 2:20pm



SEE SHEET 61 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
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HORIZ:1"=20'

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-39
SET 'X' CUT ON CONC.
ELEV.=36.44
D. BL STA. 23+44.86 OFFSET: 27.19R

NOTES:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON ST
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PLAN
STA 22+00 TO STA 27+00

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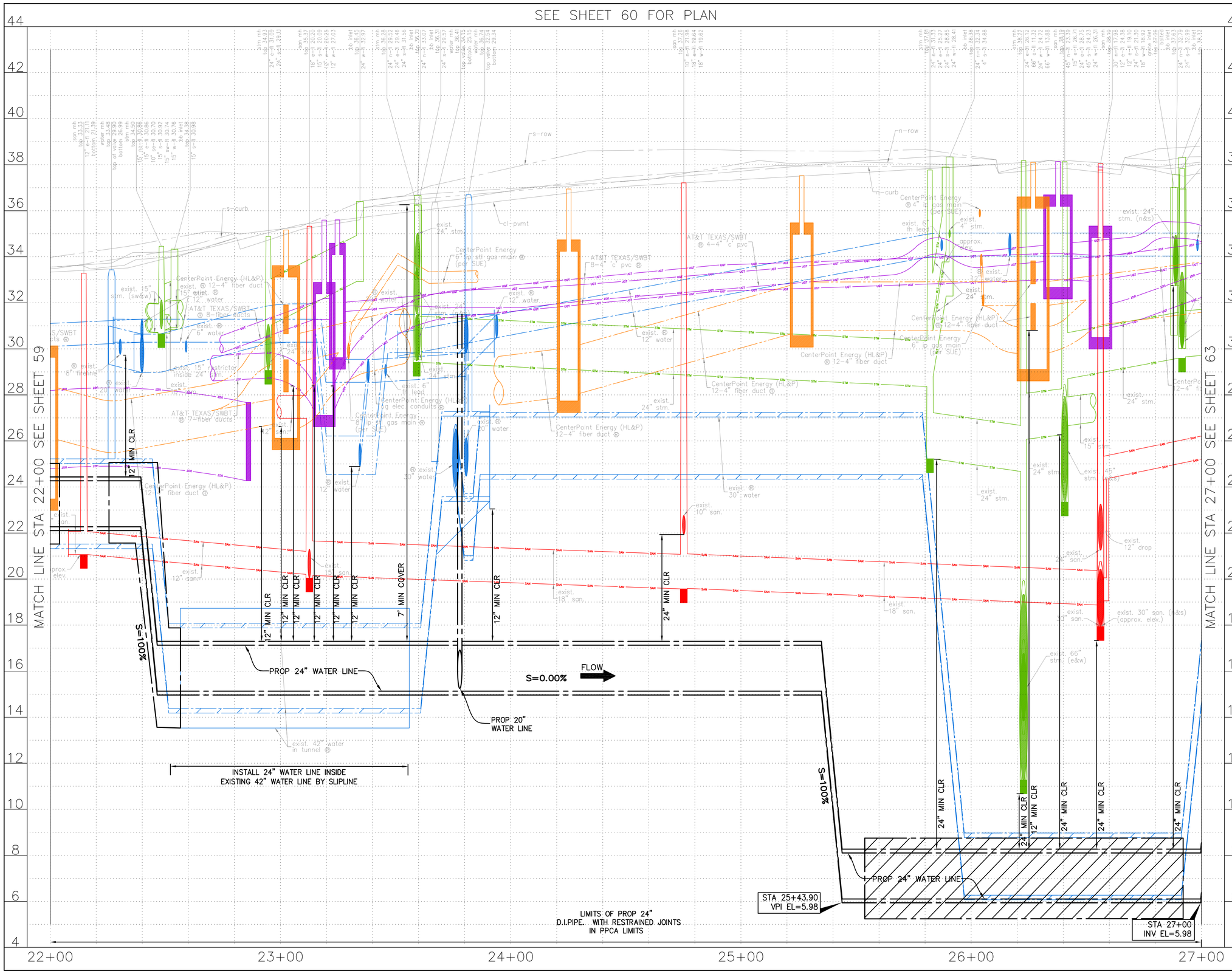
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 60 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Preston Street.dwg plotted on Sep 22, 2025 – 3:40pm



N

0' 20' 40'

HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

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HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
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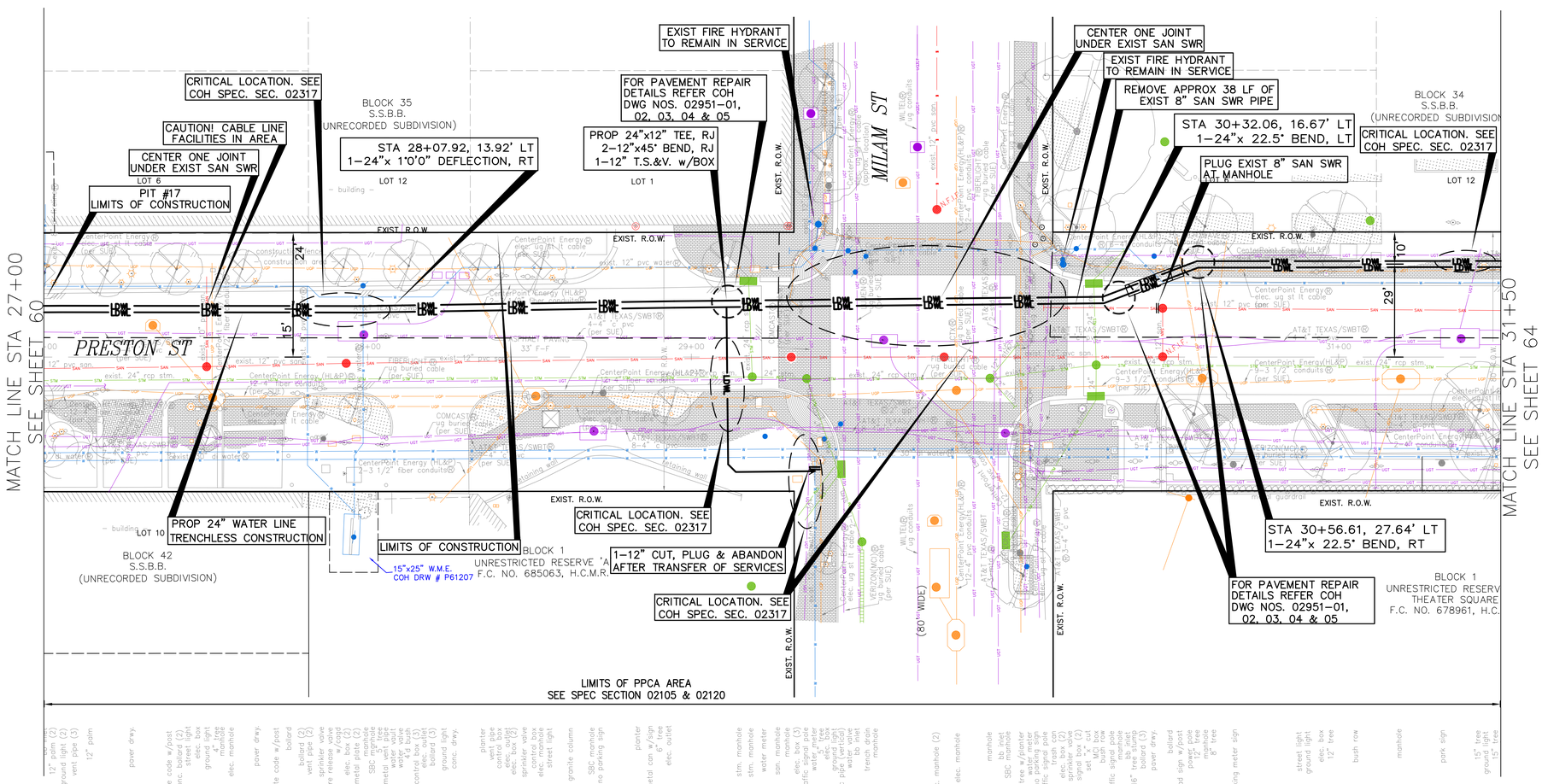
WBS NUMBER	S-000701-0043-4
DRAWING SCALE	H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM	MARTIN MATHEW, ENV SP
SHEET NO. 61 OF 153	

FOR CITY OF HOUSTON USE ONLY

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 22, 2025 - 2:26pm



SEE SHEET 63 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
6. CONTRACTOR TO LOCATE EXISTING 24–INCH PCCP JOINT AND MAKE CONNECTION TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER INCLUDE A FLANGE ISOLATION KIT BETWEEN PCCP AND D.I.PIPES.
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8. LOCATION OF PROPOSED WATER LINE IN SLIPLINE WITHIN EXISTING 42–INCH WATER LINE IS SHOWN BASED ON APPROXIMATE LOCATION OF THE EXISTING 42–INCH LINE. THEREFORE STATIONS AND INVERTS OF PROPOSED WATER LINE ARE ESTIMATES ONLY. CONTRACTOR TO FIELD VERIFY LOCATION OF 42–INCH WATER LINE PROPER TO BEGINNINGS SLIPLING AND ADJUST LOCATIONS. SLIPLING PIT/LIMIT, PROPOSED BENDS, INVERTS ETC., RELATED TO SLPLING ACCORDINGLY WITH APPROVAL OF THE PROJECT MANAGER.

HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-41
SET 'X' CUT ON CONC.
ELEV.=43.51
D. BL STA. 30+10.07 OFFSET: 18.64R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX–XXX–XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

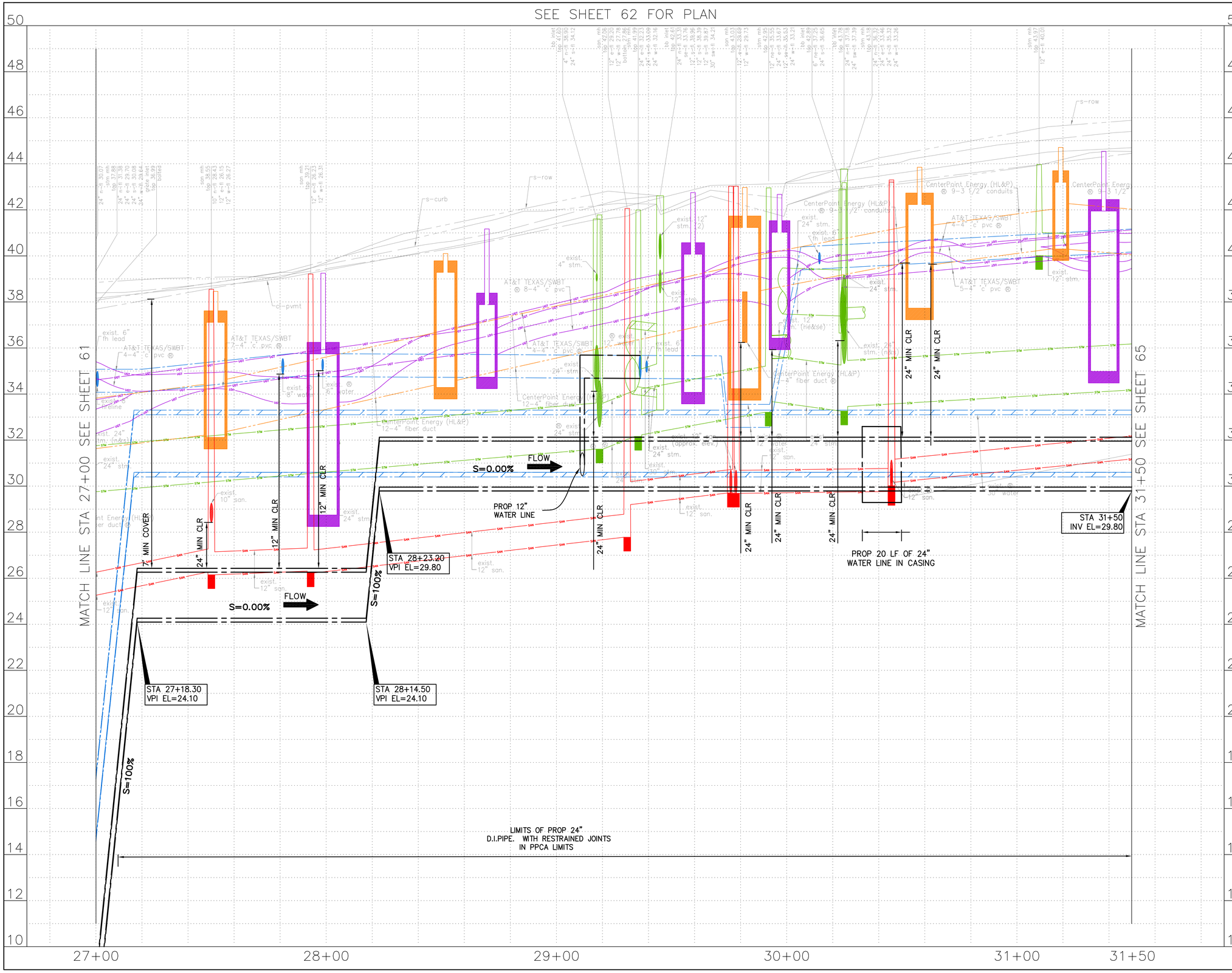
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

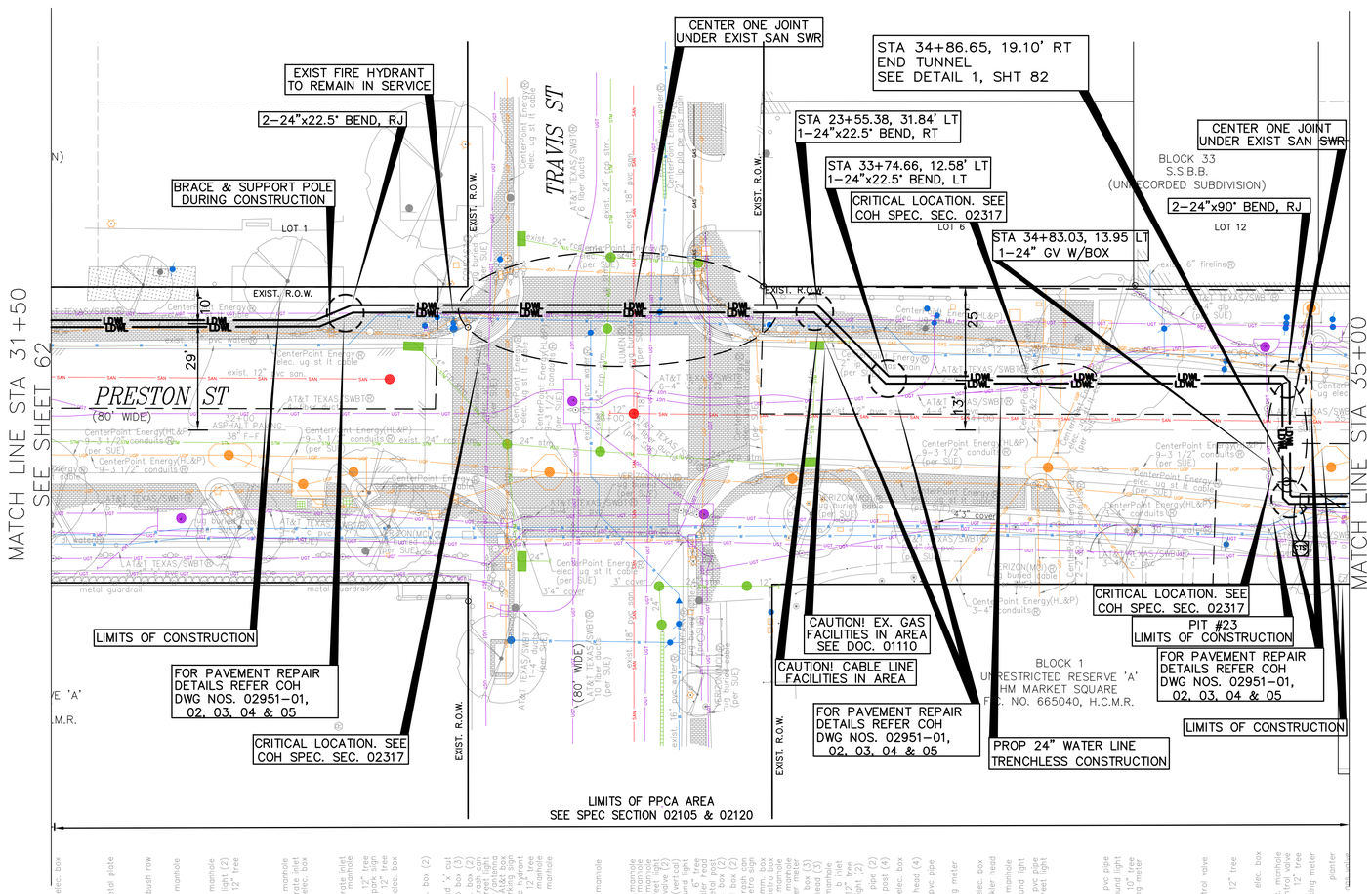
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PLAN
STA 27+00 TO STA 31+50

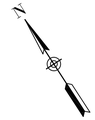
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 62 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Preston Street.dwg plotted on Sep 22, 2025 – 3:41pm


SEE SHEET 62 FOR PLAN
MATCH LINE STA 27+00 SEE SHEET 61
MATCH LINE STA 31+50 SEE SHEET 65
STA 27+18.30
VPI EL=24.10
STA 28+14.50
VPI EL=24.10
STA 28+23.20
VPI EL=29.80
STA 31+50
INV EL=29.80
S=0.00%
S=100%
FLOW
PROP 12"
WATER LINE
PROP 20 LF OF 24"
WATER LINE IN CASING
LIMITS OF PROP 24"
D.I.PIPE. WITH RESTRAINED JOINTS
IN PPCA LIMITS
7' MIN COVER
24" MIN CLR
12" MIN CLR
s-row
s-curb
cl-pvmt
AT&T TEXAS/SWBT
CenterPoint Energy (HL&P)
exist. 24" stm.
exist. 12" stm.
exist. 10" san.
exist. 12" san.
exist. 8" water
exist. 6" water
exist. 6" fh lead
exist. 4" stm.
exist. 24" stm. (nexa)
exist. 12" stm. (nexa)
exist. 10" water (approx. elev.)
exist. 12" water
exist. 24" san.
exist. 12" san.
exist. pipeline
exist. 24" stm (nexa)
exist. 24" stm (nexa)
exist. 24" stm (nexa)



SEE SHEET 65 FOR PROFILE



0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____-_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-42
FND 'X' CUT ON CONC.
ELEV.=44.90
D. BL STA. 32+61.76 OFFSET: 27.81L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UOTS. NO SEPARATE PAY.
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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 be used for conflict verification.

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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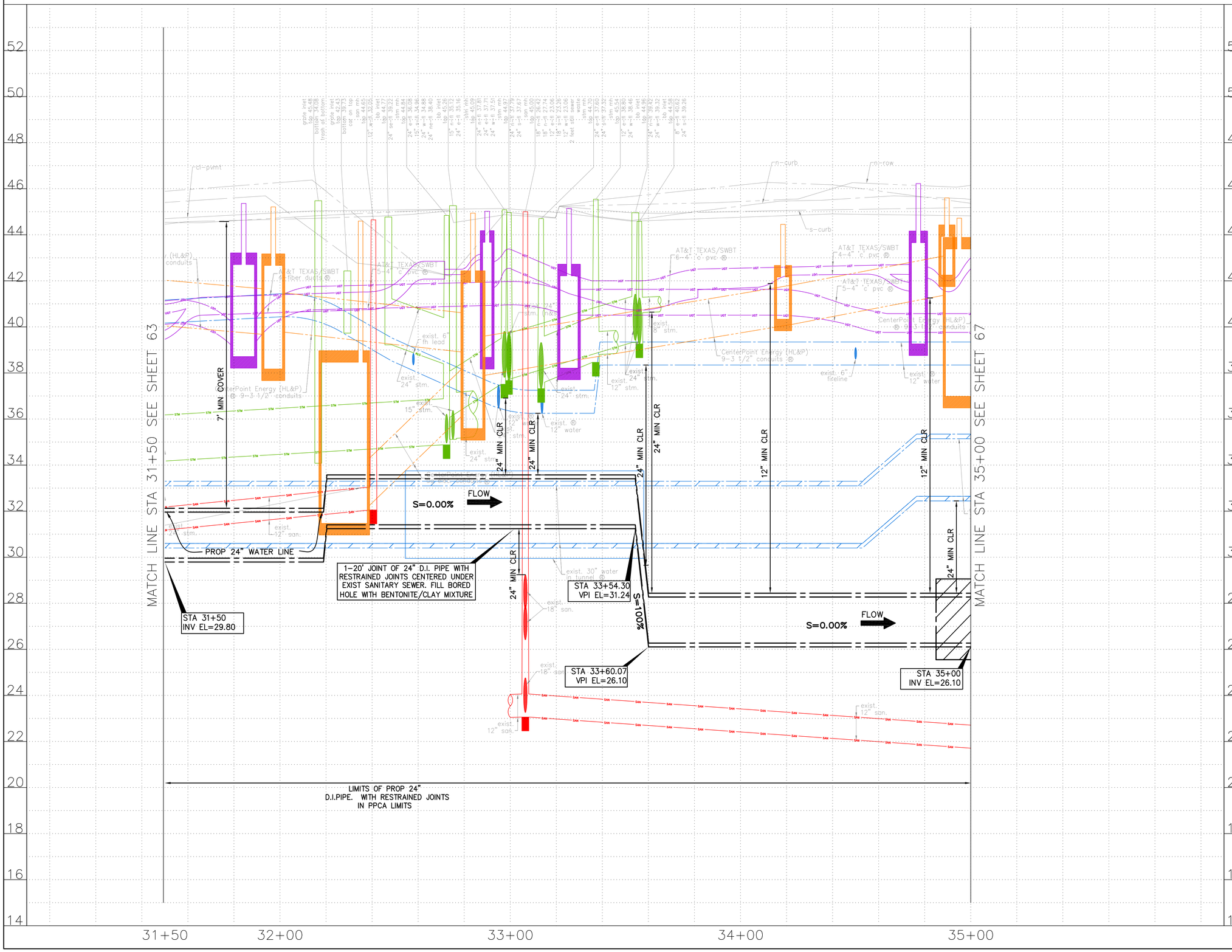
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4
PRESTON STREET
SITE 4&5
PLAN
STA 31+50 TO STA 35+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 64 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 22, 2025 - 3:42pm

SEE SHEET 64 FOR PLAN



NO.	DATE	REVISION	APP.

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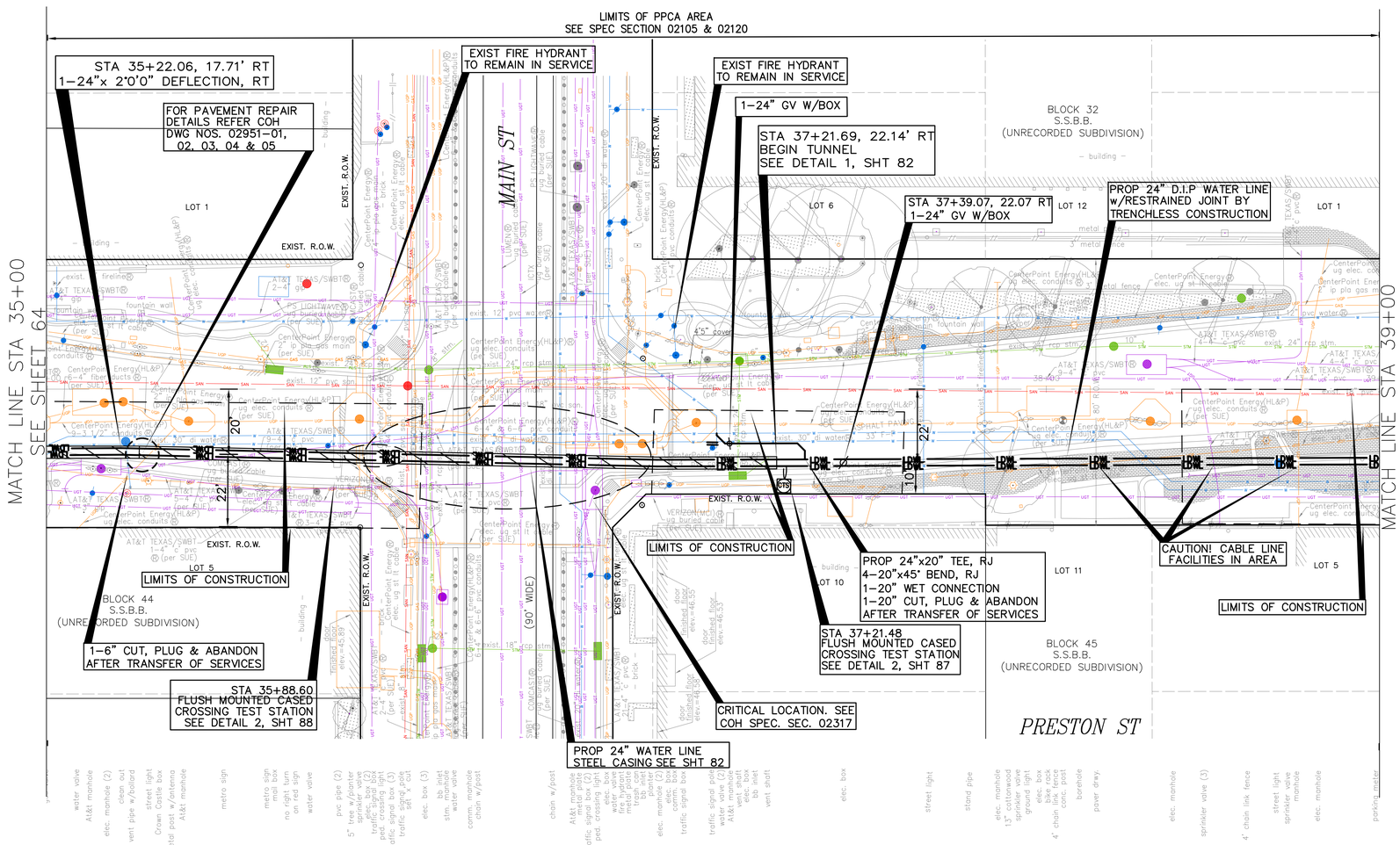
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PROFILE
STA 31+50 TO STA 35+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 65 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 21, 2025 - 4:16pm



SEE SHEET 67 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

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N

0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
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ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-43
FND 'X' CUT ON CONC.
ELEV.=45.66
D. BL STA. 36+78.83 OFFSET: 9.22L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
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Date

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Signature valid for six months.

Date

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Signature valid for six months.

Date

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

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
PRESTON STREET
SITE 4&5
PLAN
STA 35+00 TO STA 39+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 66 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Preston Street.dwg plotted on Sep 22, 2025 – 3:42pm

SEE SHEET 66 FOR PLAN

MATCH LINE STA 35+00 SEE SHEET 65

MATCH LINE STA 39+00 SEE SHEET 69

n-row

exist. 4" san.

cl-pvmt

s-edge rd

n-edge rd

s-row

CenterPoint Energy (HL&P) @ ug elec. conduits

AT&T TEXAS/SWBT @ 1-4" c pvc

AT&T TEXAS/SWBT @ 5-4" c pvc @

AT&T TEXAS/SWBT @ 3-4" c pvc

AT&T TEXAS/SWBT @ 2-4" c pvc

AT&T TEXAS/SWBT @ 6-4" c pvc @

AT&T TEXAS/SWBT @ 9-4" c pvc @

AT&T TEXAS/SWBT @ 4-4" c pvc @

exist. 8" stm.

exist. 6" stm.

exist. 24" stm.

exist. 10" stm.

exist. 6" fh lead

exist. 6" fireline

exist. 20" water (approx. elev.)

exist. 30" water

exist. 12" san. (n&s)

exist. 18" san.

7' MIN COVER

24" MIN CLR

12" MIN CLR

PROP 24" WATER LINE

PROP 6" WATER LINE

PROP 20" WATER LINE

S=0.00%

S=100%

FLOW

STA 35+00
INV EL=26.10

STA 38+78.10
VPI EL=26.10

STA 38+84.10
VPI EL=32.00

STA 39+00
INV EL=32.00

PROP 220 LF OF 24" WATER LINE BY TUNNEL IN STEEL CASING (SEE DETAIL 1, SHT 82)

LIMITS OF PROP 24" D.I.PIPE. WITH RESTRAINED JOINTS IN PPCA LIMITS

35+00 36+00 37+00 38+00 39+00

0' 20' 40'
HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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10300 WESTOFFICE DR. SUITE 800
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

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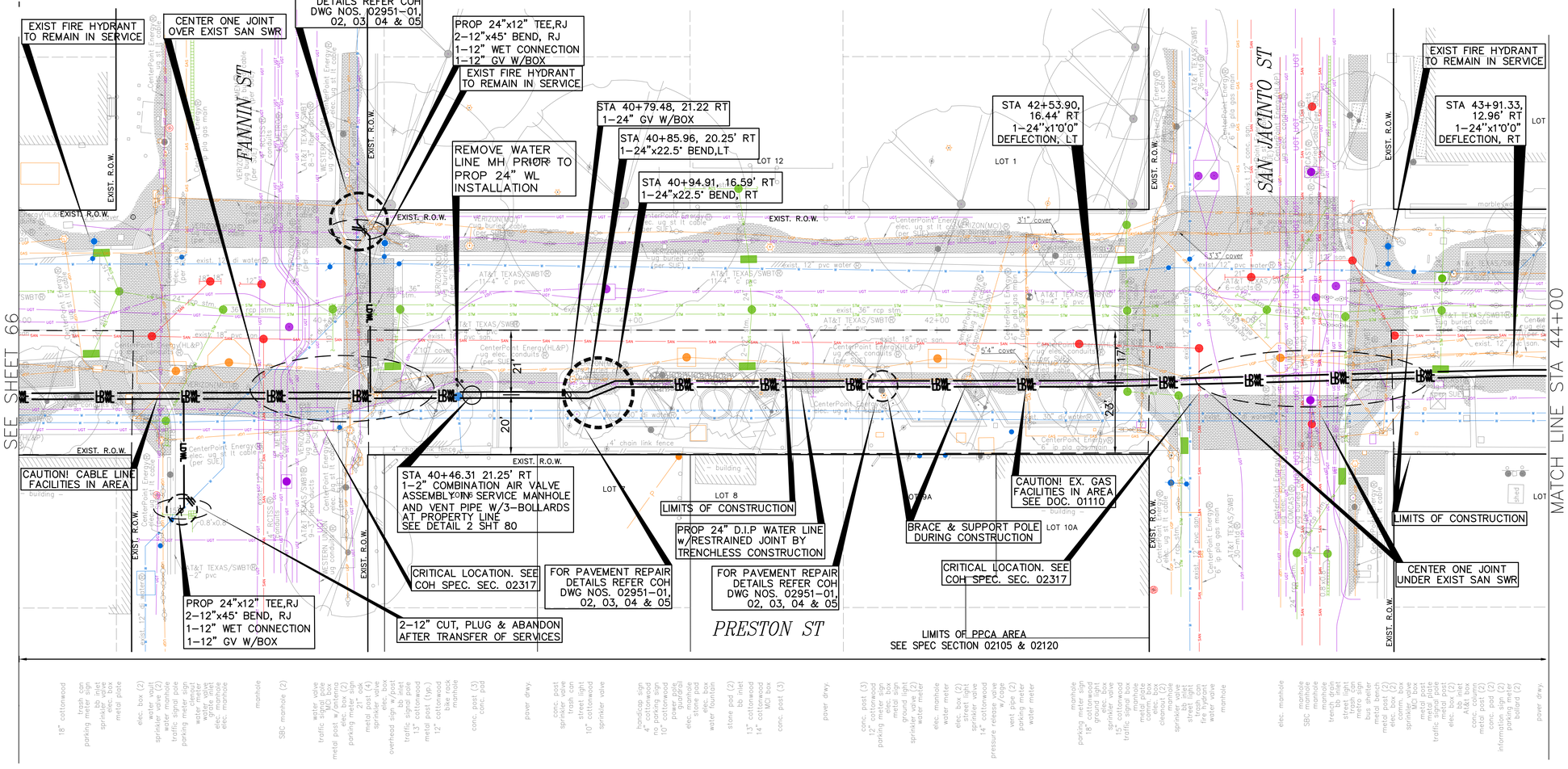
PRESTON STREET
SITE 4&5
PROFILE
STA 35+00 TO STA 39+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 67 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 21, 2025 - 4:17pm



SEE SHEET 69 FOR PROFILE

4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

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0' 20' 40'
HORIZ:1"=20'

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-44
SET 'X' CUT ON CONC.
ELEV.=43.73
D. BL STA. 39+43.92 OFFSET: 28.07L

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX–XXX–XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
3. THIS PROJECT SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION EXCEPT AS NOTED ON THE DRAWINGS. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FILED SUBJECT TO THE CITY ENGINEER'S APPROVAL

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

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

Signature valid for six months.

Date

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

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

KUO & ASSOCIATES
ENGINEERING * SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

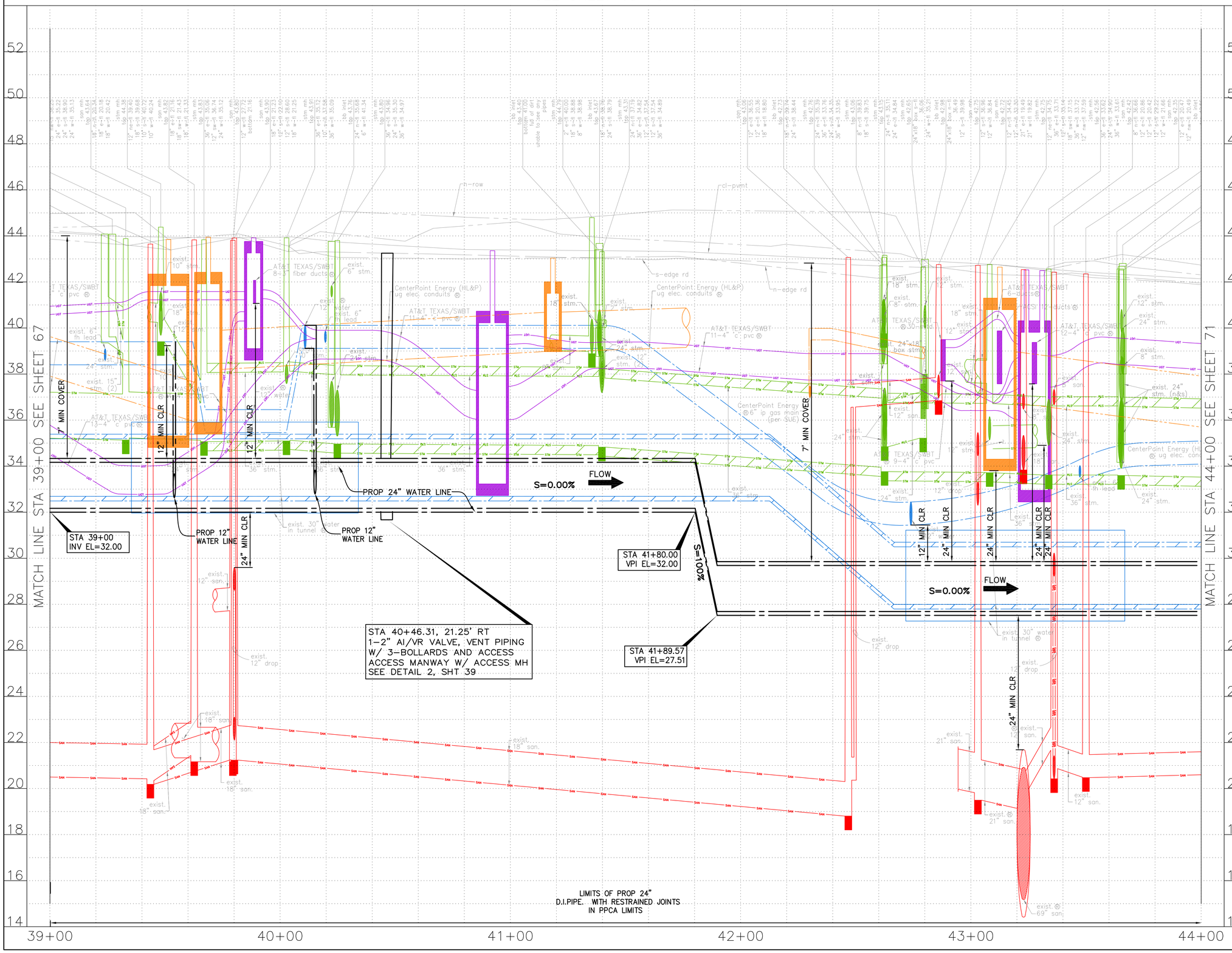
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

PRESTON STREET
SITE 4&5
PLAN
STA 39+00 TO STA 44+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 68 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Preston Street.dwg plotted on Sep 22, 2025 – 3:43pm

SEE SHEET 69 FOR PLAN



HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

NOTES:

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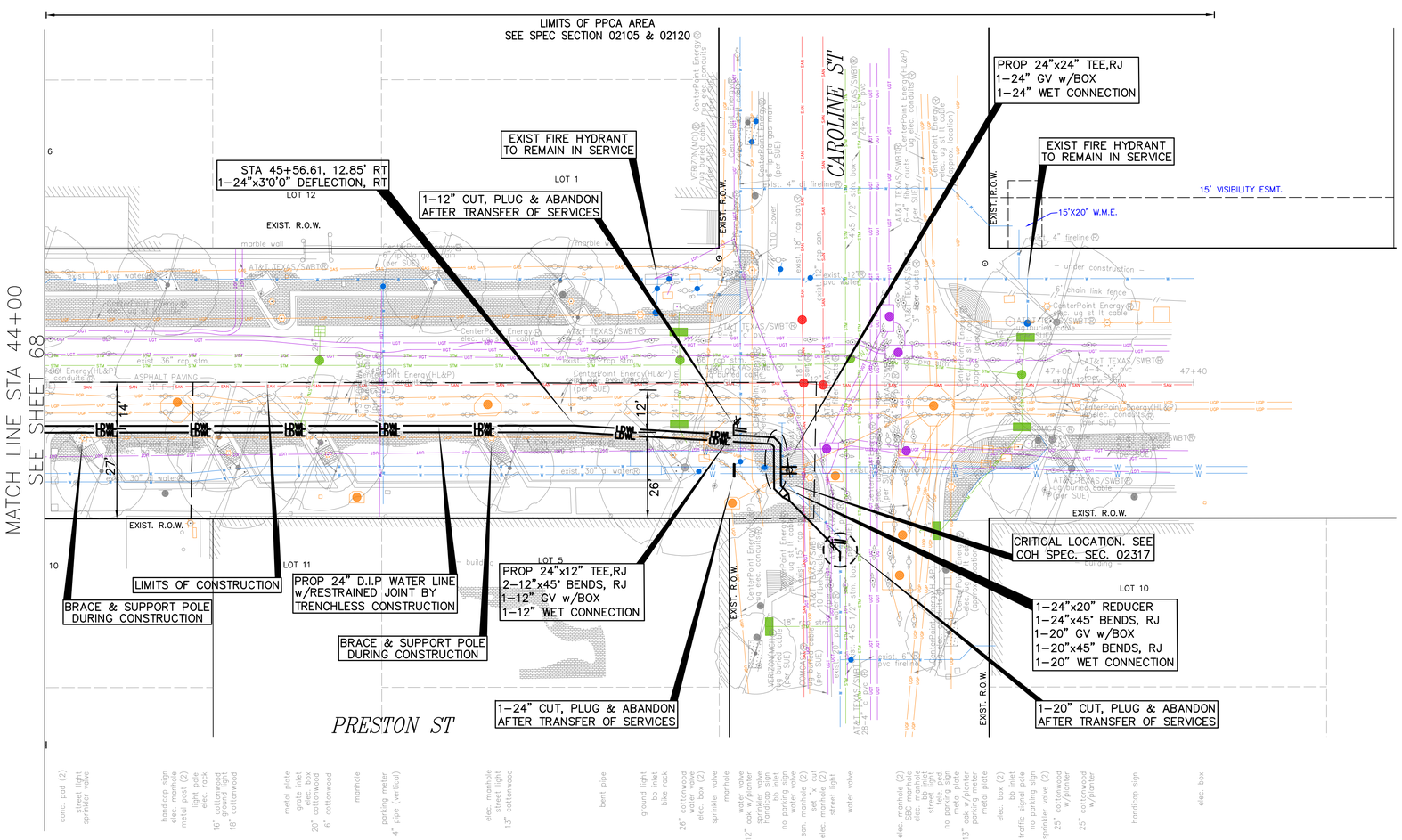
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

PRESTON STREET
SITE 4&5
PROFILE
STA 39+00 TO STA 44+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 69 OF 153	

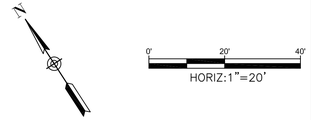
S:\Proj-2024\24057-(MSC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 21, 2025 - 4:24pm



4 TRESS ARE LOCATIONS IN THE VICINITY OF PROPOSED ALIGNMENT OF WATER LINE AND ITS APPURTENANCES. REFER TO THE TREE PROTECTION PLANS FOR APPROPRIATE PROTECTION MEASURES.

5. WATER LINE FIREHYDRANT LEAD WITHIN LIMITS IF PPCA TO BE RESTRAINED JOINT DUCTILE IRON PIPE WITH VITON (FKM) GASKETS AS PER SPECIFICATION SECTION 02105.
6. CONTRACTOR TO LOCATE EXISTING 24–INCH PCCP JOINT AND MAKE CONNECTION TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER INCLUDE A FLANGE ISOLATION KIT BETWEEN PCCP AND D.I.PIPES.
7. CONTRACTOR TO LOCATE EXISTING 42–INCH PCCP JOINT AND MARK CUT AND PLUG TO INTACT BELL OR SPIGOT WITH APPROPRIATE ADAPTER.
8. LOCATION OF PROPOSED WATER LINE IN SLIPLINE WITHIN EXISTING 42–INCH WATER LINE IS SHOWN BASED ON APPROXIMATE LOCATION OF THE EXISTING 42–INCH LINE. THEREFORE STATIONS AND INVERTS OF PROPOSED WATER LINE ARE ESTIMATES ONLY. CONTRACTOR TO FIELD VERIFY LOCATION OF 42–INCH WATER LINE PROPER TO BEGINNINGS SLIPLING AND ADJUST LOCATIONS. SLIPLING PIT/LIMIT, PROPOSED BENDS, INVERTS ETC., RELATED TO SLPLING ACCORDINGLY WITH APPROVAL OF THE PROJECT MANAGER.

SEE SHEET 71 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT _____–_____, AN ALUMINUM DISK IN CONCRETE, LOCATED AT SOUTH SIDE OF IH 10 EASTBOUND FRONTAGE ROAD APPROXIMATELY 1,475 FEET EAST FROM THE INTERSECTION OF GESSNER ROAD

ELEV.79.32 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED OCTOBER 19, 2024.

T.B.M.:
T.B.M. B-46
SET 'X' CUT ON CONC.
ELEV.=40.58
D. BL STA. 46+19.94 OFFSET: 24.45R

NOTES:

1. EXISTING PRIVATE UTILITIES FACILITIES ARE ENCOUNTERED THROUGHOUT THE ENTIRE PROJECT LIMITS. EXERCISE CAUTION AND CRITICAL LOCATE AS DEEMED NECESSARY CRITICAL LOCATION INCLUDES BUT NOT LIMITED TO WATER LINE CONNECTIONS, PRIVATE AND PUBLIC UTILITIES SUCH AS WATER LINE, GAS LINE CONDUITS, COMMUNICATION UGTS. NO SEPARATE PAY.
2. RELOCATE CONDUIT/CABLE BY OTHERS. CONTACT XXXX CONSTRUCTION MANAGER, XXX AT XXX–XXX–XXXX 4 TO 6 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
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NOTICE:
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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Date

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HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
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FB NO. 000000

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

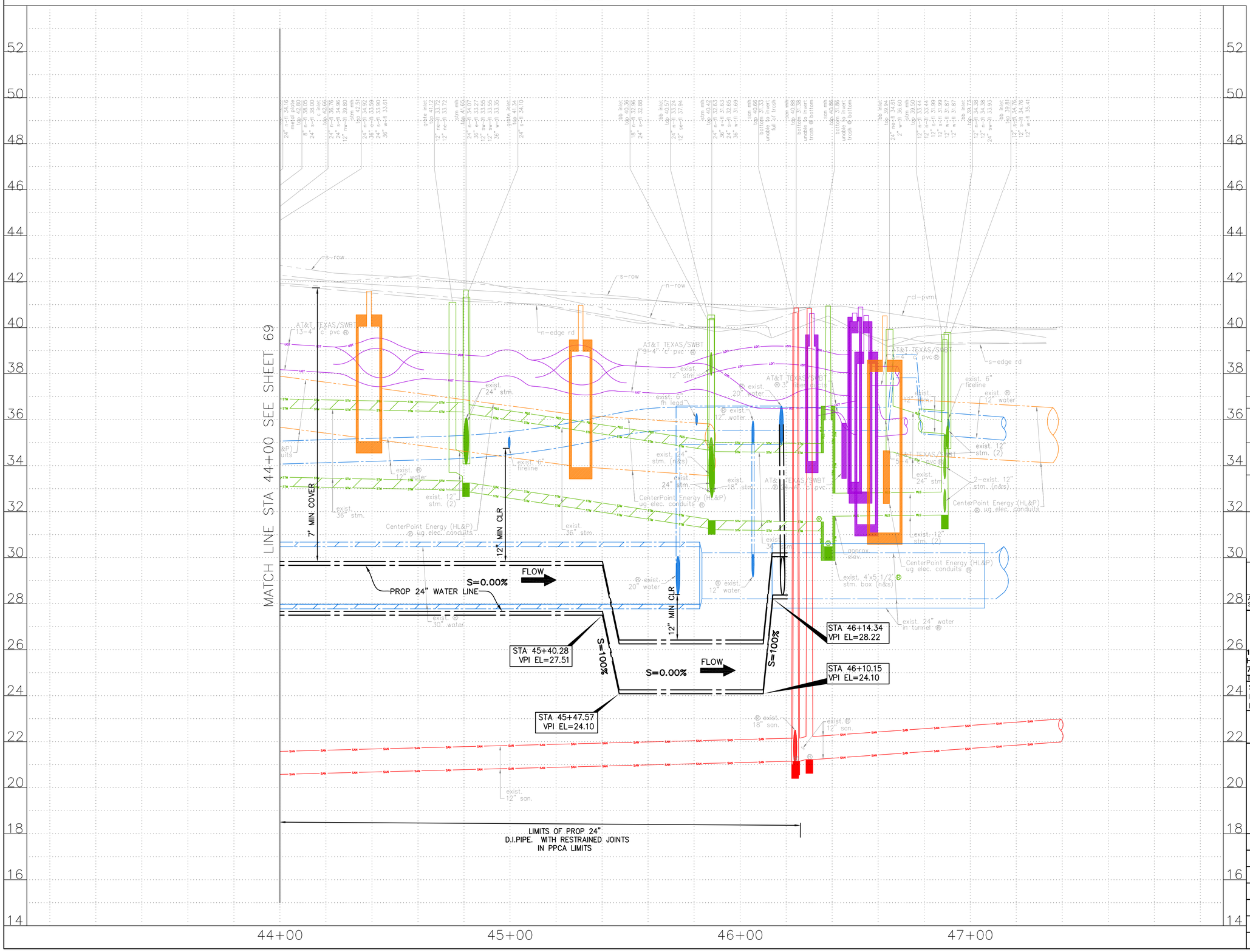
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

PRESTON STREET
SITE 4&5
PLAN
STA 44+00 TO STA 47+40

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 70 OF 153	

S:\Proj–2024\24057–(MISC LDWL IMPROVEMENTS–PKG 4)\Dwgs\Design\Sheets\P&P Sheet–Preston Street.dwg plotted on Sep 22, 2025 – 3:43pm

SEE SHEET 70 FOR PLAN



0' 20' 40'
HORIZ:1"=20'
VERT:1"=2'

NO.	DATE	REVISION	APP.

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PRESTON STREET
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CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 71 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\P&P Sheet-Preston Street.dwg plotted on Sep 21, 2025 – 4:21pm

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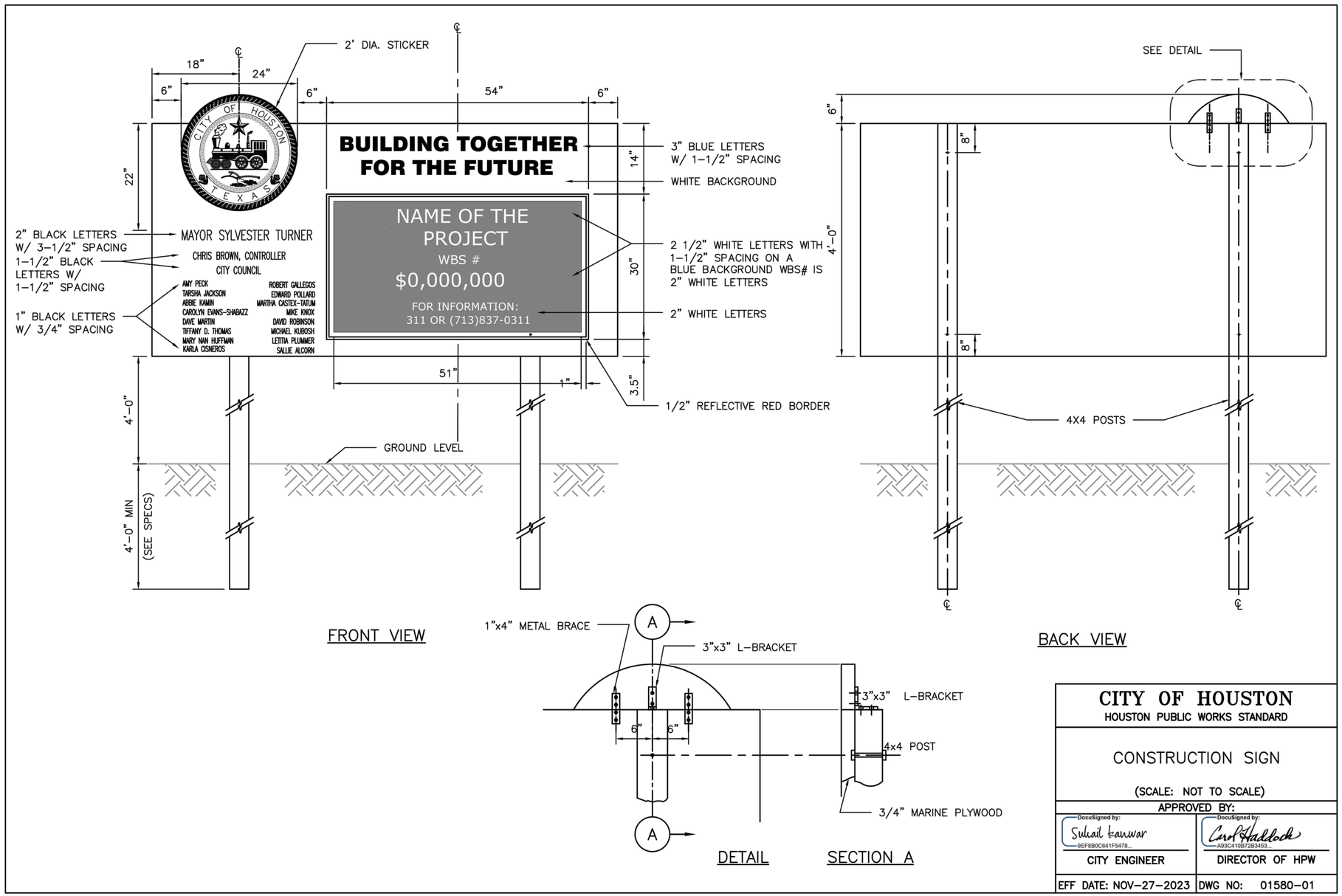

DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR USE, ACCEPTS RESPONSIBILITY FOR THEIR APPLICABILITY, ADEQUACY AND SAFETY. NO WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONSTRUCTION SIGN

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail Kanwar 9EF8B0C841F5478... CITY ENGINEER	DocuSigned by: Carl Haddock A93C410B72B3453... DIRECTOR OF HPW
EFF DATE: NOV–27–2023	DWG NO: 01580–01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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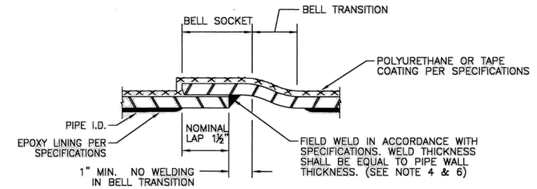
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

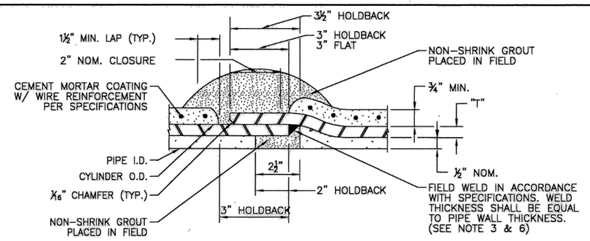
CONSTRUCTION SIGN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 72 OF 153	

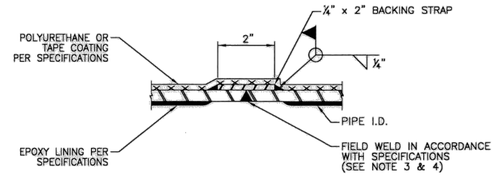
S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\Standard Details.dwg plotted on Sep 21, 2025 – 1:46pm



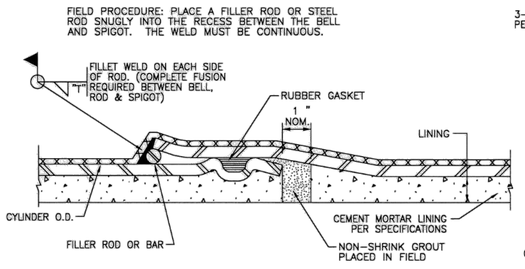
1 LAP–WELD FIELD JOINT – STEEL PIPE JOINT
FLEXIBLE COATING AND LINING



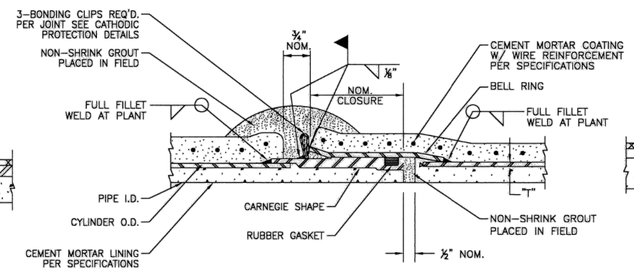
2 LAP–WELD FIELD JOINT – STEEL PIPE JOINT
CEMENT MORTAR LINED & CEMENT MORTAR COATED



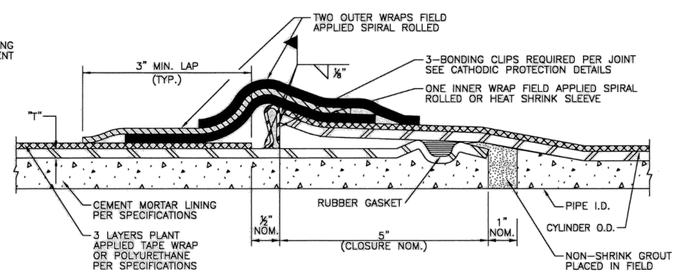
3 BUTT WELD FIELD JOINT – STEEL PIPE JOINT
FLEXIBLE COATING AND LINING



4 FIELD WELDED O–RING – STEEL PIPE JOINT
FLEXIBLE COATING AND CEMENT MORTOR LINING
(FOR ADJUSTMENTS ONLY AS APPROVED BY ENGINEER AND PIPE MANUFACTURER.)



5 CARNEGIE JOINT – STEEL PIPE JOINT
CEMENT MORTAR LINED & CEMENT MORTAR COATED



6 O–RING – STEEL PIPE JOINT
CEMENT MORTAR LINED & FLEXIBLE COATING

NOTES:

1. T = STEEL CYLINDER THICKNESS AND SIZE OF FILLET ATTACHMENT WELD.
2. ALL REFERENCES TO PIPE DIAMETER FOR THIS PROJECT SHALL SIGNIFY SIZE MEASURED TO INSIDE DIAMETER OF THE LINED PIPE.
3. DETAILS 1 AND 3 SHOW EPOXY LINING. CEMENT MORTAR LINING TO BE SIMILAR TO DETAILS ON THIS SHEET SHOWING CEMENT MORTAR LINED PIPE, AS APPROVED BY PROGRAM MANAGER.
4. SEE SPECIFICATIONS FOR REPAIR OF EPOXY LINING.
5. WHEN CEMENT MORTAR COATING IS USED FOR STEEL PIPE, FLEXIBLE MASTIC SEALER SHALL BE APPLIED TO THE EXTERIOR OF THE JOINT PRIOR TO JOINT ENGAGEMENT WHEN PIPE IS INSTALLED IN A TUNNEL OR ENCASEMENT PIPE.
6. OUTSIDE WELD MAY BE SUBSTITUTED FOR INSIDE WELD. INTERIOR WELDING IS NOT RECOMMENDED FOR 30" DIAMETER PIPE AND SMALLER.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
STEEL PIPE DETAILS
(SHEET 1 OF 2)

(NOT TO SCALE)

APPROVED BY: ACTING CITY ENGINEER

APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: MAR-20-2018

DWG NO: 02518-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL
STEEL PIPE DETAILS
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 73 OF 153	

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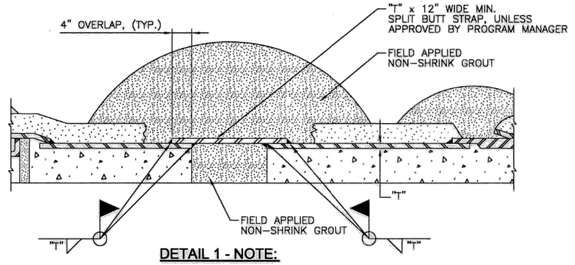
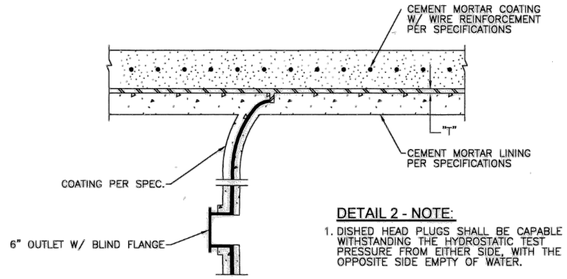


DETAIL 1 - NOTE:

1. WELD SIZE SHALL MATCH THICKNESS OF BUTT STRAP AND CARRIER PIPE, AS RECOMMENDED BY THE PIPE MANUFACTURER.
2. INTERNAL WELD NOT RECOMMENDED FOR 30" DIAMETER PIPE AND SMALLER.
3. NO ANGULAR DEFLECTION ALLOWED.

1 CLOSURE PIECE

FOR STEEL PIPE WITH CEMENT MORTAR LINED AND CEMENT MORTAR COATED (SIMILAR FOR FLEXIBLE COATING AND LINING)

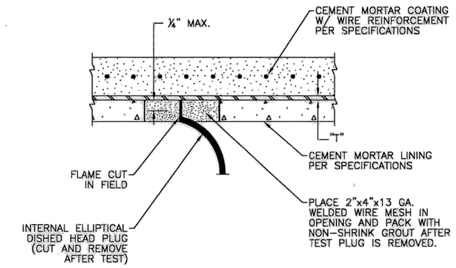


DETAIL 2 - NOTE:

1. DISHED HEAD PLUGS SHALL BE CAPABLE OF WITHSTANDING THE HYDROSTATIC TEST PRESSURE FROM EITHER SIDE, WITH THE OPPOSITE SIDE EMPTY OF WATER.

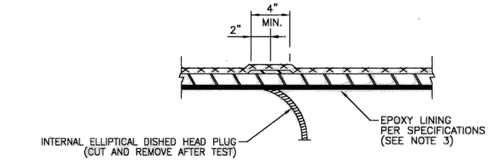
2 INTERNAL ELLIPTICAL DISHED HEAD PLUG

CEMENT MORTAR LINING AND CEMENT MORTAR COATED STEEL PIPE SPECIAL



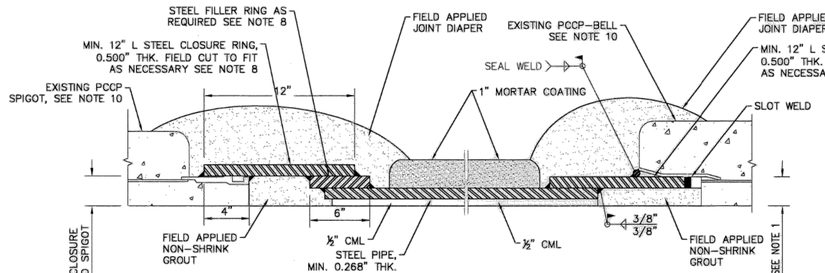
3 INTERNAL ELLIPTICAL DISHED HEAD PLUG REMOVAL

CEMENT MORTAR LINING AND CEMENT MORTAR COATED STEEL PIPE SPECIAL



4 INTERNAL ELLIPTICAL DISHED HEAD PLUG REMOVAL

FOR STEEL PIPE WITH FLEXIBLE COATING AND LINING

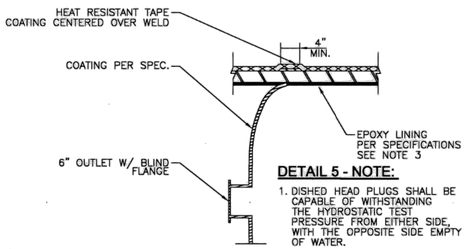


6 CONNECTION PIECE DETAIL STEEL-TO-PCCP BELL/SPIGOT

(OPTION 1: IF EXISTING PIPE JOINT IS NOT WELDED)

NOTES:

1. T = STEEL CYLINDER THICKNESS AND SIZE OF FILLET ATTACHMENT WELD.
2. ALL REFERENCES TO PIPE DIAMETER FOR THIS PROJECT SHALL SIGNIFY SIZE MEASURED TO INSIDE DIAMETER OF THE LINED PIPE.
3. DETAILS 4 AND 5 SHOW EPOXY LINING. CEMENT MORTAR LINING TO BE SIMILAR TO DETAILS ON THIS SHEET SHOWING CEMENT MORTAR LINED PIPE, AS APPROVED BY PROGRAM MANAGER.
4. SEE SPECIFICATIONS FOR REPAIR OF EPOXY LINING.
5. WHEN CEMENT MORTAR COATING IS USED FOR STEEL PIPE, FLEXIBLE MASTIC SEALER SHALL BE APPLIED TO THE EXTERIOR OF THE JOINT PRIOR TO JOINT ENGAGEMENT WHEN PIPE IS INSTALLED IN A TUNNEL OR ENCASEMENT PIPE.
6. OUTSIDE WELD MAY BE SUBSTITUTED FOR INSIDE WELD. INTERIOR WELDING IS NOT RECOMMENDED FOR 30" DIAMETER PIPE AND SMALLER.
7. FIELD VERIFY INSIDE DIAMETER OF JOINT RING.
8. RING THICKNESS TO BE DETERMINED BASED ON FIELD VERIFIED JOINT DIMENSIONS.
9. COATINGS ON PROPOSED PIPE TO BE SIMILAR TO EXISTING PIPE.
10. PROTECT EXISTING PIPE SECTIONS TO REMAIN IN PLACE. NOTIFY ENGINEER IF ANY SUSPECTED DAMAGE OCCURS.

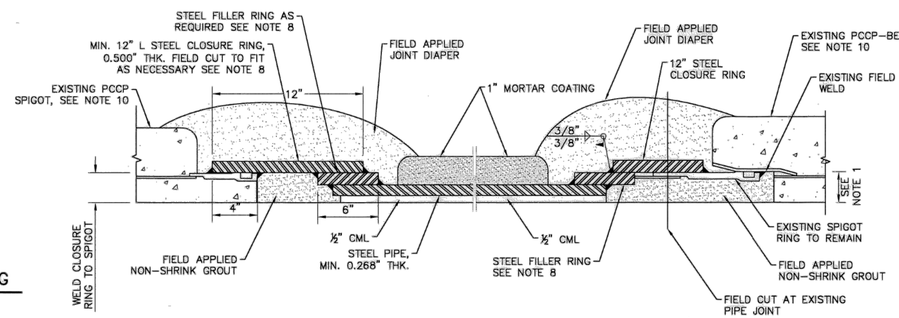


DETAIL 5 - NOTE:

1. DISHED HEAD PLUGS SHALL BE CAPABLE OF WITHSTANDING THE HYDROSTATIC TEST PRESSURE FROM EITHER SIDE, WITH THE OPPOSITE SIDE EMPTY OF WATER.

5 INTERNAL ELLIPTICAL DISHED HEAD PLUG

FOR STEEL PIPE WITH FLEXIBLE COATING AND LINING



7 CONNECTION PIECE DETAIL STEEL-TO-PCCP BELL/SPIGOT

(OPTION 2: IF EXISTING PIPE JOINT IS WELDED)

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
STEEL PIPE DETAILS
(SHEET 2 OF 2)

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
ACTING CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR-20-2018	DWG NO: 02518-02

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

STANDARD LDWL
STEEL PIPE DETAILS
SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 74 OF 153	

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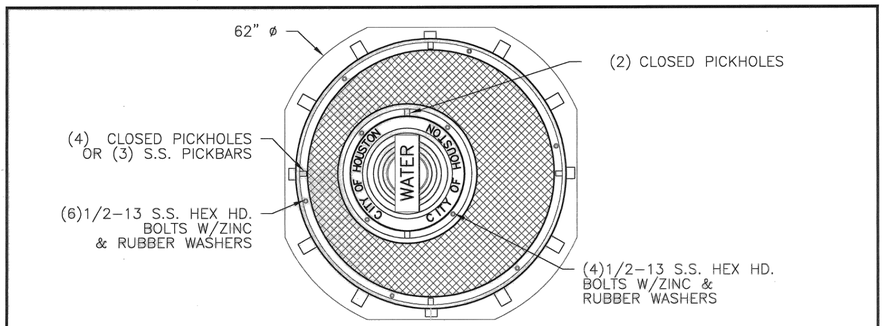
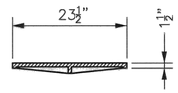
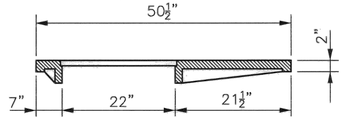


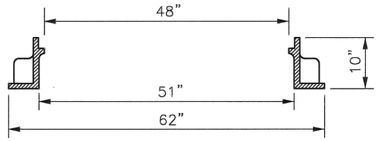
PLAN



INNER COVER



OUTER COVER



SECTION FRAME

NOTES:

1. MATERIAL – GRAY IRON ASTM A48 CL35B / DUCTILE IRON ASTM A536 70–50–05
2. CASTING TO MEET M306 PROOF LOAD SPECIFICATION
3. EJIW MODEL V–7048–2 OR APPROVED EQUAL.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
48" DIA HEAVY DUTY MANHOLE
FRAME AND COVER DETAIL
(NOT TO SCALE)

APPROVED BY: ACTING CITY ENGINEER

APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: MAR-20-2018

DWG NO: 02090-12

NO.	DATE	REVISION	APP.

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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
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FB NO. 000000

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ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL HEAVY DUTY MANHOLE FRAME AND COVER DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 75 OF 153	

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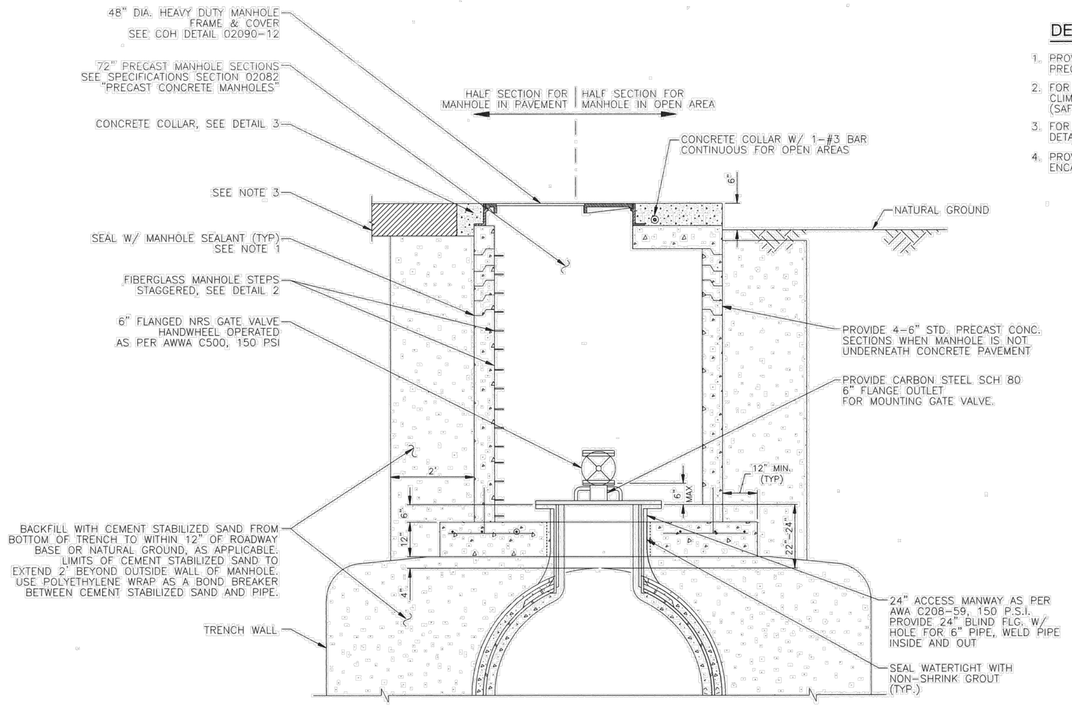
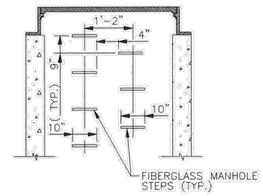


1 ACCESS MANWAY IN ACCESS MANHOLE
(FOR WATER LINES 36-INCH TO 96-INCH DIAMETER)

DETAIL 1 - NOTES:

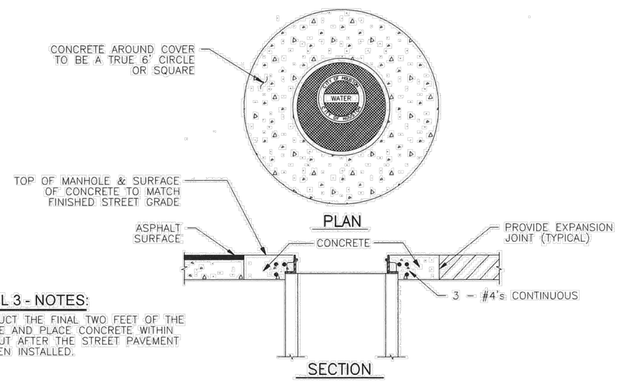
1. PROVIDE RAM-NEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
2. FOR MANHOLES DEEPER THAN 20 FEET, SAFETY CLIMBING RAIL MUST BE PROVIDED. (SAF-T-CLIMB OR APPROVED EQUAL).
3. FOR PAVEMENT REPAIR, SEE COH STANDARD DETAILS 02902-01 & 02902-02.
4. PROVIDE AN APPROVED PETROLATUM BASED TAPE ENCAPSULATING ALL BOLTS IN ACCESS MANHOLE.



DETAIL 2 - NOTES:

1. PROVIDE MODEL PS1-PF STEPS AS MANUFACTURED BY M.A. INDUSTRIES INC., OR APPROVED EQUAL.
2. BOTTOM MANHOLE STEP SHALL BE NO HIGHER THAN 12" ABOVE MANHOLE INVERT.

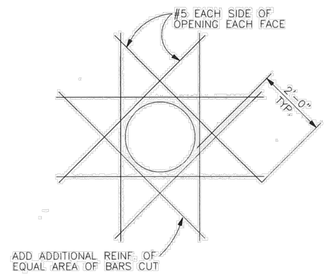
2 MANHOLE STEP DETAIL



DETAIL 3 - NOTES:

1. CONSTRUCT THE FINAL TWO FEET OF THE MANHOLE AND PLACE CONCRETE WITHIN BLOCKOUT AFTER THE STREET PAVEMENT HAS BEEN INSTALLED.

3 MANHOLE CONCRETE COLLAR DETAIL



4 SERVICE MANHOLE REINFORCEMENT DETAIL

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL ACCESS MANHOLE DETAILS

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
Suhail Kanwar, CITY ENGINEER	Carol Haddock, DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JULY - 01 - 2021	DWG NO: 02082-10

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
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713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL ACCESS MANHOLE DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 76 OF 153	

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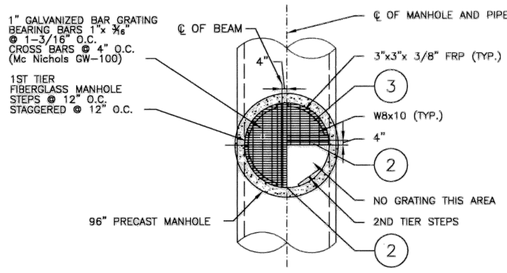
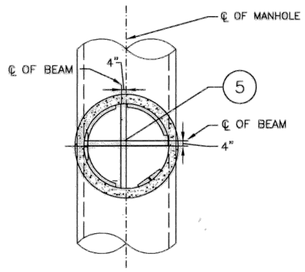
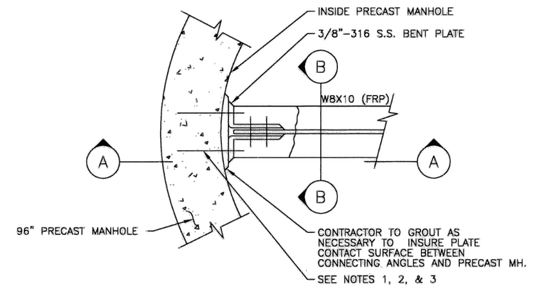


PLAN VIEW OF LANDING
(W/GRATING SHOWN)



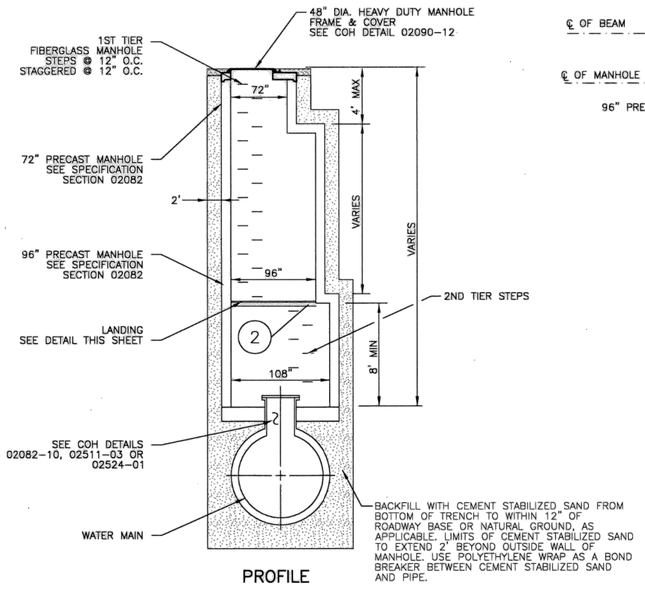
PLAN VIEW OF LANDING
(W/O GRATING SHOWN)



2 BEAM CONNECTION DETAIL
NO SCALE

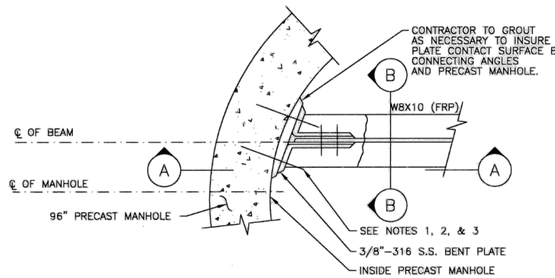
NOTES:

1. CONTRACTOR TO DRILL 1¼" DIAMETER HOLES 4" DEEP, INTO PRECAST MANHOLE FOR ¾" DIAMETER ANCHOR BOLTS.
2. GROUT IN ¾" DIAMETER ANCHOR BOLTS WITH GRUTEM 435 AS MANUFACTURED BY I.W. INDUSTRIES, OR APPROVED EQUAL. MANUFACTURERS INSTRUCTIONS IN THE USE OF ALL MATERIALS SPECIFIED SHALL BE FOLLOWED IN STRICT ACCORDANCE.
3. ANCHOR BOLTS SHALL BE ¾" DIAMETER x 6" LONG 316 S.S. ALL THREAD BOLTS WITH 2" PROJECTION.
4. ALL STEEL TO BE GRADE 40.
5. ALL CONCRETE TO BE CLASS "A".
6. COORDINATE THE LOCATION AND TYPE JOINTS BETWEEN OFFSET BOX AND PRECAST SECTIONS.
7. PROVIDE RAMNEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.

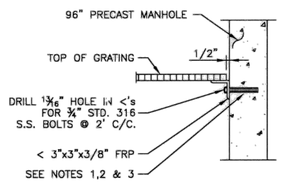


PROFILE

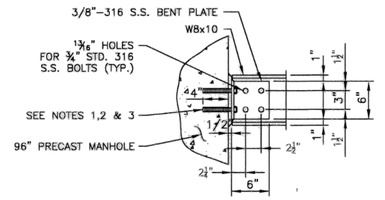
1 EXTRA DEPTH – ACCESS MANHOLE
(SEE PLANS FOR LOCATION)
NO SCALE



3 BEAM CONNECTION DETAIL
NO SCALE



4 ANGLE CONNECTION DETAIL
NO SCALE



A SECTION
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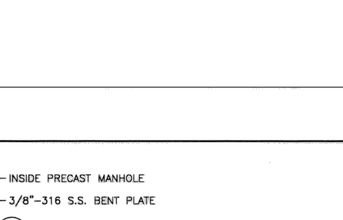

B SECTION B
NO SCALE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
SAF-T-CLIMB DETAILS FOR
EXTRA DEPTH MANHOLE

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
ACTING CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR-20-2018	DWG NO: 02082-11

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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10300 WESTOFFICE DR. SUITE 800
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713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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TEXAS REG. NO.: 116965
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER
WATER LINE IMPROVEMENTS –
PACKAGE 4

STANDARD LDWL DETAILS
EXTRA DEPTH MANHOLE

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 77 OF 153	

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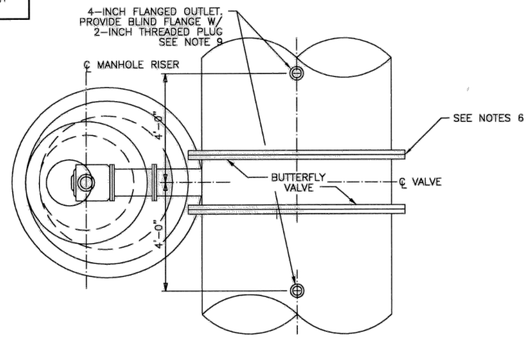
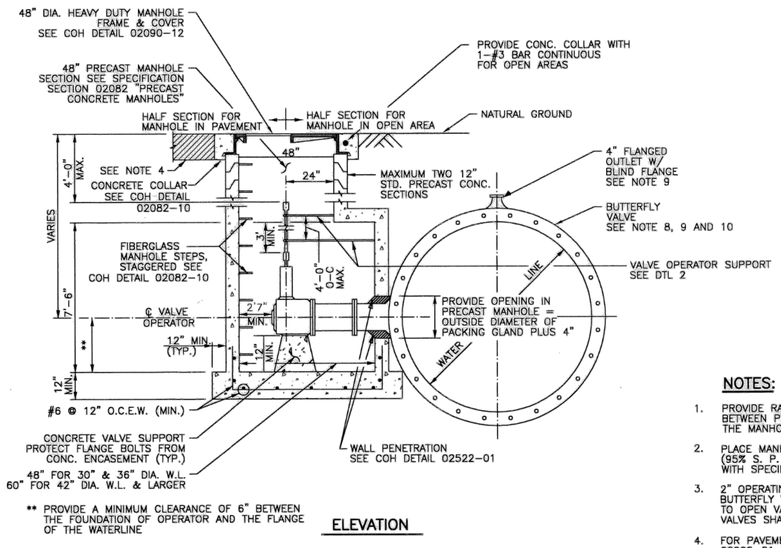
NOTE:

SHOULD CONTRACTOR DESIRE TO USE VALVES IN A THROTTLED POSITION FOR FILLING OF LINE SEGMENTS, CONTRACTOR IS CAUTIONED TO OBSERVE RECOMMENDATIONS OF VALVE MANUFACTURER IN ORDER TO PRECLUDE DAMAGE ASSOCIATED WITH THIS MODE OF OPERATION.



PLAN

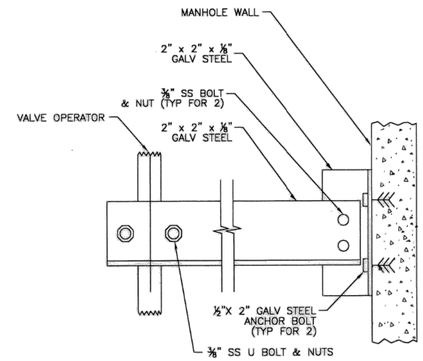


** PROVIDE A MINIMUM CLEARANCE OF 6" BETWEEN THE FOUNDATION OF OPERATOR AND THE FLANGE OF THE WATERLINE

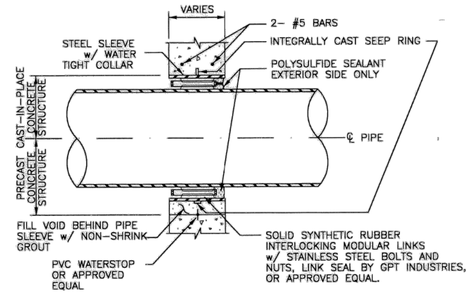
ELEVATION

1 BUTTERFLY VALVE AND OPERATOR MANHOLE DETAIL

(FOR WATER LINES 30–INCHES TO 96–INCH IN DIAMETER)



2 VALVE OPERATOR SUPPORT



3 TYPICAL WALL PENETRATION DETAIL

NOTES:

1. PROVIDE RAMNEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
2. PLACE MANHOLE ON NEW COMPACTED (95% S. P. D.) BOTTOM IN ACCORDANCE WITH SPECIFICATION 02316.
3. 2" OPERATING NUT ON LARGE DIAMETER BUTTERFLY VALVES SHALL TURN CLOCKWISE TO OPEN VALVE. ABOVE–GROUND AND PLANT VALVES SHALL OPEN COUNTERCLOCKWISE.
4. FOR PAVEMENT REPAIR, SEE COH DETAILS 02902–01 & 02902–02.
5. FOR MANHOLES DEEPER THAN 20 FEET, PROVIDE SAFETY CLIMBING RAIL (SAF–T–CLIMB OR EQUAL)
6. FOR JOINT BONDING DETAILS AT BUTTERFLY VALVES SEE COH DETAIL 15640–02.
7. ADJUST MANHOLE AND MANHOLE OPENING TO ALIGN WITH VALVE OPERATOR NUT FOR EASE OF OPERATION
8. FOR VALVES GREATER THAN OR EQUAL TO 24–INCH DIAMETER, BACKFILL USING CONTROLLED LOW STRENGTH MATERIAL (CLSM, 100 P.S.I. MIN.) EXTENDING FROM THE VALVE CENTERLINE TO 7–FEET UPSTREAM AND DOWNSTREAM OF THE VALVE CENTERLINE FROM THE BOTTOM OF THE TRENCH TO 12–INCH MIN. ABOVE THE TOP OF PIPE. PROVIDE BUOYANCY CONTROL.
9. ADJUST FLANGED OUTLET LOCATION TO 9–FEET FROM VALVE CENTER LINE FOR VALVES GREATER THAN OR EQUAL TO 54–INCH DIAMETER.
10. USE ENCAPSULATED BOLTS AND POLYETHYLENE WRAP AS A BOND BREAKER BETWEEN PIPE, VALVE AND CLSM. ENSURE CLSM IS PROPERLY FILLED IN PIPE HAUNCHES. FOUR CLSM IN LIFTS.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
BUTTERFLY VALVE AND
OPERATOR MANHOLE DETAILS

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
ACTING CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR-20-2018	DWG NO: 02522-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING • SURVEYING
10300 WESTOFFICE DR. SUITE 800
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713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
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ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL
BUTTERFLY VALVE AND
OPERATOR MANHOLE DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 78 OF 153	

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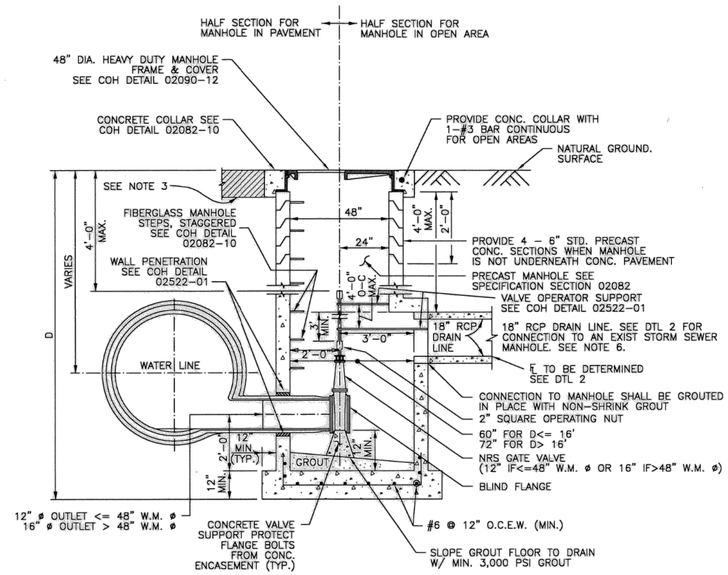
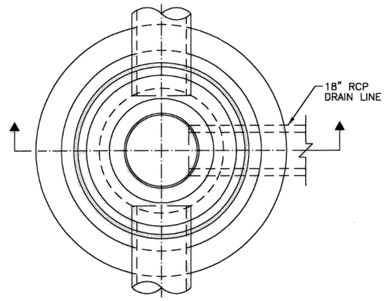
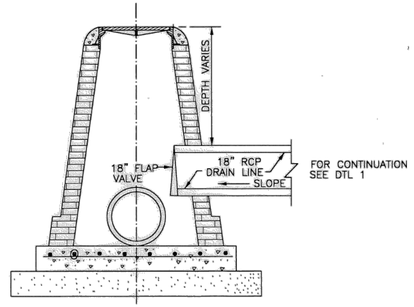


1 SERVICE MANHOLE FOR DRAINLINE VALVE CONNECTION



PLAN
(COVER NOT SHOWN)



SECTION

2 DRAIN LINE CONNECTION TO EXISTING STORM SEWER MANHOLE

NOTES:

1. PROVIDE RAMNEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
2. PLACE MANHOLE ON NEW COMPACTED (95% S. P. D.) BOTTOM IN ACCORDANCE WITH SPECIFICATION 02316.
3. FOR PAVEMENT REPAIR, SEE COH DETAILS 02902-01 & 02902-02.
4. FOR MANHOLES DEEPER THAN 20 FEET, PROVIDE SAFETY CLIMBING RAIL (SAF-T-CLIMB OR EQUAL). SEE COH DETAIL 02082-11.
5. ADJUST MANHOLE AND MANHOLE OPENING TO ALIGN WITH VALVE OPERATOR NUT FOR EASE OF OPERATION.
6. IF PROPOSED STORM SEWER MANHOLE IS CALLED OUT IN PLANS, SEE COH DETAILS 02081-01 OR 02081-02.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
DRAIN LINE VALVE DETAILS

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
ACTING CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR-20-2018	DWG NO: 02511-03

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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10300 WESTOFFICE DR. SUITE 800
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713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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TEXAS REG. NO.: 116965
ON 09/22/2025
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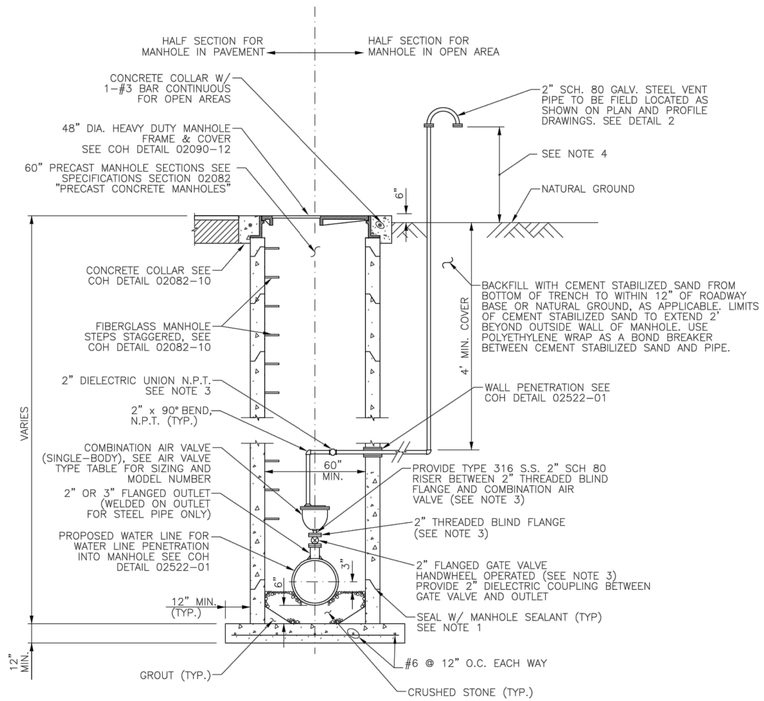
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

STANDARD LDWL
DRAIN LINE VALVE DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 79 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\Standard Details.dwg plotted on Sep 21, 2025 - 1:47pm



1 COMBINATION AIR VALVE ASSEMBLY IN SERVICE MANHOLE

(FOR WATER LINES SMALLER THAN 36-INCHES DIAMETER)

		VACUUM (AI/VR)	
WATER MAIN DIAMETER	MANUFACTURER (1)	SERIES	ORIFICE SIZE
<=36"	APCO	140C	
	CLAVAL	36	
	PRATT	WCV 01	

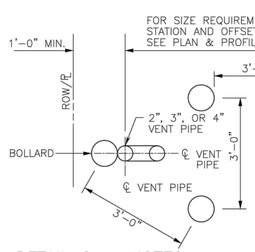
COMBINATION AIR VALVE & TYPE TABLE

(FOR WATER LINES SMALLER THAN 36" DIAMETER)

(1) OR APPROVED EQUAL.

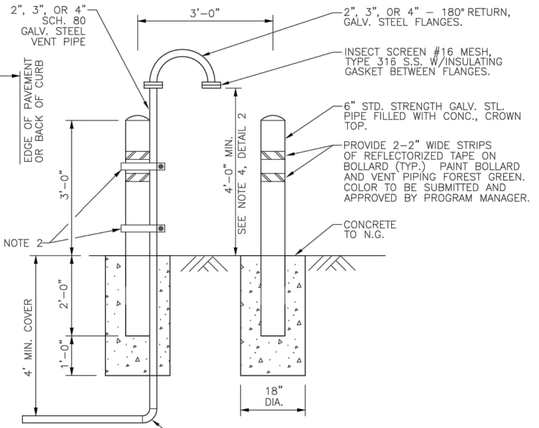
DETAIL 1 - NOTES:

1. PROVIDE RAM-NEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
2. FOR MANHOLES DEEPER THAN 20 FEET, SAFETY CLIMBING RAIL MUST BE PROVIDED (SAF-T-CLIMB OR APPROVED EQUAL). SEE COH DETAIL 02082-11.
3. PIPING AND APPURTENANCES OF THE SAME DIAMETER AND CONSTRUCTED OF THE SAME MATERIAL AND CLASS.
4. VERIFY THAT LOCATION OF VENT PIPE SCREEN IS 1 FOOT ABOVE 100-YEAR FLOOD PLAIN ELEVATION OR 4 FEET ABOVE NATURAL GROUND WHICHEVER IS HIGHER.
5. REFER TO PLAN AND PROFILE SHEETS FOR LOCATIONS OF AIR VALVES.
6. FOR PAVEMENT REPAIR, SEE COH DETAILS 02902-01 & 02902-02.
7. PROVIDE AN APPROVED PETROLATUM BASED TAPE ENCAPSULATING ALL BOLTS IN ACCESS MANHOLE.

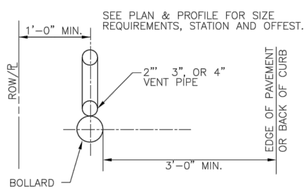


DETAIL 2 - NOTES:

1. 3 BOLLARDS SHOULD BE PROVIDED IN TRIANGULAR PATTERN AROUND VENT PIPE OR ANODE PIPE.
2. 2 - 1½" WIDE x 3/16" THICK GALVANIZED STEEL STRAPS SECURED W/ ⅝" DIA. S.S. BOLTS.
3. CLASS B CONCRETE WILL BE USED IN AND AROUND BOLLARDS.
4. SEE DETAIL 4A FOR LOCATION OF ONE BOLLARD AROUND VENT PIPE.



2 VENT PIPE WITH 3 BOLLARDS DETAIL



2A VENT PIPE WITH 1 BOLLARD DETAIL

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LDWL
COMBINATION AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAILS

(NOT TO SCALE)

REVISED ON: _____

REVISED BY: _____

EFF DATE: MAR-20-2018 | DWG NO: **02524-02**

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

STANDARD LDWL COMBINATION AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 80 OF 153	

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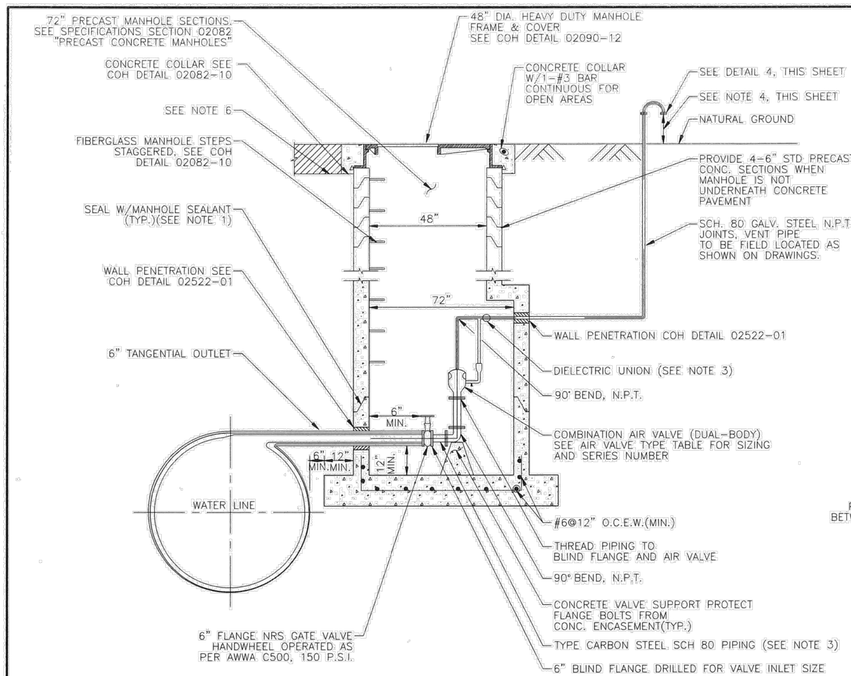
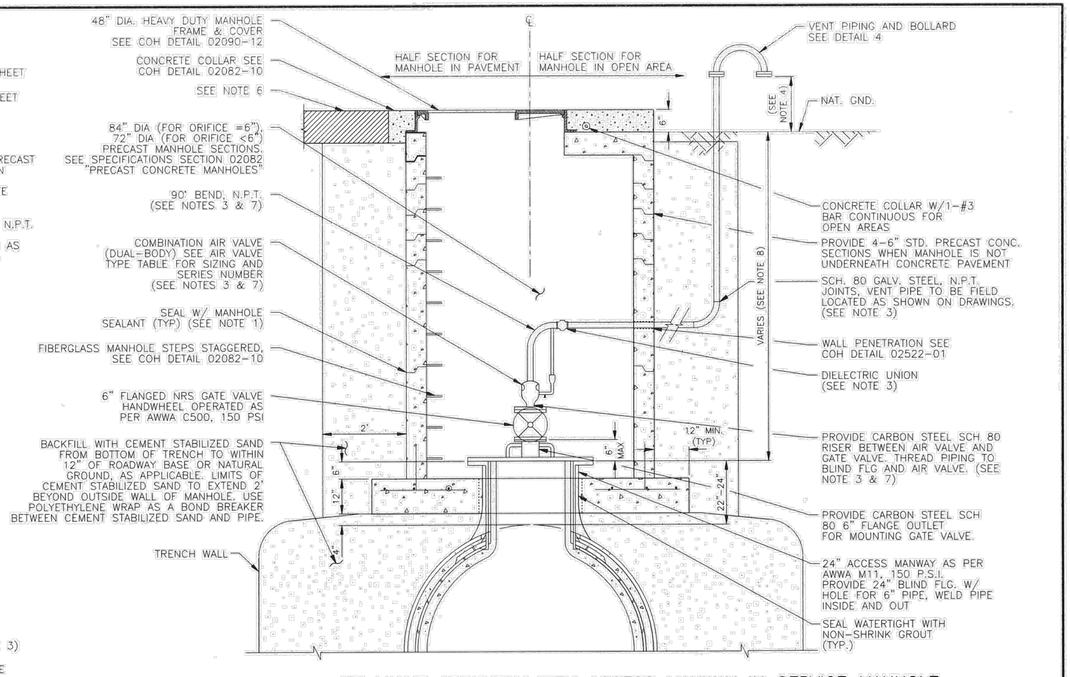


1 LOW PROFILE AIR VALVE ASSEMBLY

(FOR WATER LINES 36-INCH TO 96-INCH DIAMETER, ONLY IF SPECIFIED IN PLAN AND PROFILE SHEETS)



2 AIR VALVE ASSEMBLY WITH ACCESS MANWAY IN SERVICE MANHOLE

(FOR WATER LINES 36-INCH TO 96-INCH DIAMETER)

WATER MAIN DIAMETER	MANUFACTURER (1)	VACUUM (AI/VR) SERIES	VACUUM (AI/VR) ORIFICE SIZE	AIR RELEASE SERIES	AIR RELEASE INLET SIZE (NPT)	AIR RELEASE ORIFICE SIZE (2)
>=36" <=96"	APCO	1500C		200A	1"	
	CLAVAL	38VB		34AR-C	1"	
	PRATT	WAVVB		WAR 02	1"	

3 AIR VALVE & TYPE TABLE

(FOR WATER LINES 36" TO 96" DIAMETER)

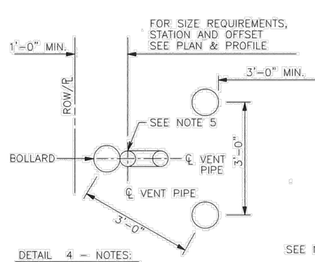
DETAILS 3 - NOTES:

(1) OR APPROVED EQUAL.

(2) MINIMUM ORIFICE SIZE REQUIRED. TO BE UPDATED FOR EACH PROJECT BASED ON TRANSIENT ANALYSIS.

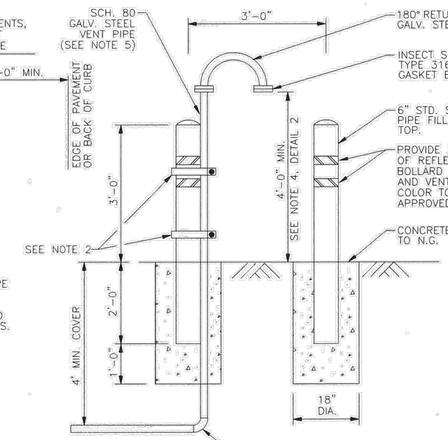
DETAILS 1 & 2 - NOTES:

1. PROVIDE RAM-NEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
2. FOR MANHOLES DEEPER THAN 20 FEET, SAFETY CLIMBING RAIL MUST BE PROVIDED (SAF-T-CLIMB OR APPROVED EQUAL). SEE COH DETAIL 02082-11.
3. PIPING AND APPURTENANCES OF THE SAME DIAMETER AND CONSTRUCTED OF THE SAME MATERIAL AND CLASS.
4. VERIFY THAT LOCATION OF VENT PIPE SCREEN IS 1 FOOT ABOVE 100-YEAR FLOOD PLAIN ELEVATION OR 4 FEET ABOVE NATURAL GROUND WHICHEVER IS HIGHER.
5. REFER TO PLAN AND PROFILE SHEETS FOR LOCATIONS OF AIR VALVES.
6. FOR PAVEMENT REPAIR, SEE COH DETAILS 02902-01 & 02902-02.
7. PROVIDE AN APPROVED PETROLATUM BASED TAPE ENCAPSULATING ALL BOLTS IN ACCESS MANHOLE.
8. USE "LOW PROFILE AIR VALVE ASSEMBLY DETAIL" ONLY IF SPECIFIED IN PLAN AND PROFILE SHEETS.
9. NATIONAL PIPE THREAD IS ABBREVIATED AS N.P.T. ON THIS DRAWING

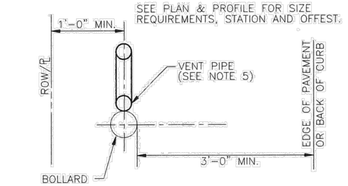


DETAIL 4 - NOTES:

1. 3 BOLLARDS SHOULD BE PROVIDED IN TRIANGULAR PATTERN AROUND VENT PIPE OR ANODE PIPE.
2. 2 - 1½" WIDE x 3/16" THICK GALVANIZED STEEL STRAPS SECURED W/ 3/8" DIA. S.S. BOLTS.
3. CLASS B CONCRETE WILL BE USED IN AND AROUND BOLLARDS.
4. SEE DETAIL 4A FOR LOCATION OF ONE BOLLARD AROUND VENT PIPE.
5. MATCH VENT PIPE SIZE TO AIR VALVE ORIFICE SIZE.



4 VENT PIPE WITH 3 BOLLARDS DETAIL



4A VENT PIPE WITH 1 BOLLARD DETAIL

KUO & ASSOCIATES
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713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LDWL
AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAIL
(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
Suhail Kanwar, CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 02524-03

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

STANDARD LDWL AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 81 OF 153	

NO.	DATE	REVISION	APP.

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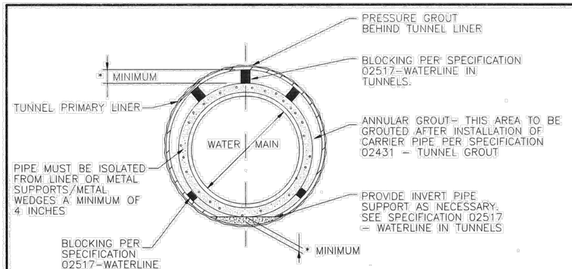
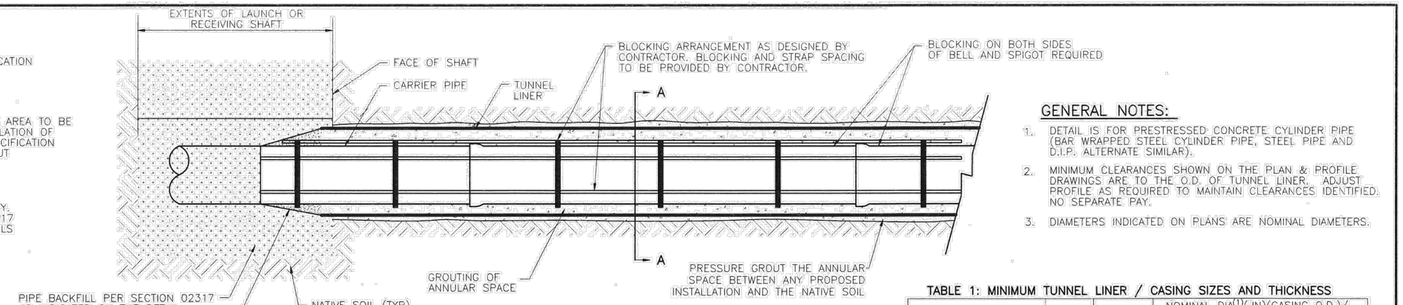


SECTION A–A

1 WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING BLOCKING



WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING BLOCKING

GENERAL NOTES:

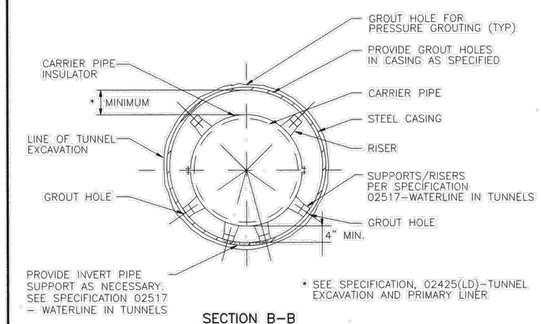
1. DETAIL IS FOR PRESTRESSED CONCRETE CYLINDER PIPE (BAR WRAPPED STEEL CYLINDER PIPE, STEEL PIPE AND D.I.P. ALTERNATE SIMILAR).
2. MINIMUM CLEARANCES SHOWN ON THE PLAN & PROFILE DRAWINGS ARE TO THE O.D. OF TUNNEL LINER. ADJUST PROFILE AS REQUIRED TO MAINTAIN CLEARANCES IDENTIFIED. NO SEPARATE PAY.
3. DIAMETERS INDICATED ON PLANS ARE NOMINAL DIAMETERS.

TABLE 1: MINIMUM TUNNEL LINER / CASING SIZES AND THICKNESS

LOCATION	WATER MAIN DIA.	PIPE MATERIAL	NOMINAL DIA[1](IN)(CASING O.D.)/ WALL THICKNESS (IN.)		
			2–FLANGE[2] LINER PLATE	4–FLANGE LINER PLATE	STEEL CASING
STA 1+80–STA 3+20	24"	STEEL	48"/0.1046"	48"/0.1046"	37"/0.3125"
STA 11+64–STA 14+98	24"	STEEL	48"/0.1046"	48"/0.1046"	37"/0.3125"
STA 35+87–STA 37+19	24"	STEEL	48"/0.1345"	48"/0.1345"	37"/0.3125"

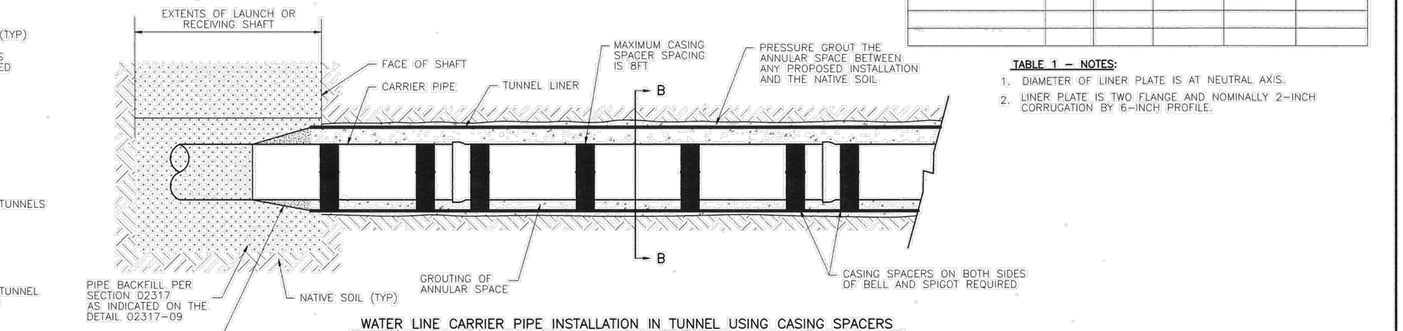
TABLE 1 – NOTES:

1. DIAMETER OF LINER PLATE IS AT NEUTRAL AXIS.
2. LINER PLATE IS TWO FLANGE AND NOMINALLY 2–INCH CORRUGATION BY 6–INCH PROFILE.

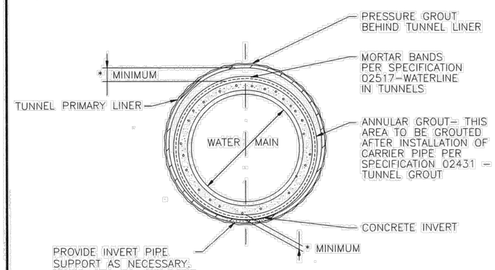


SECTION B–B

2 WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING CASING SPACERS

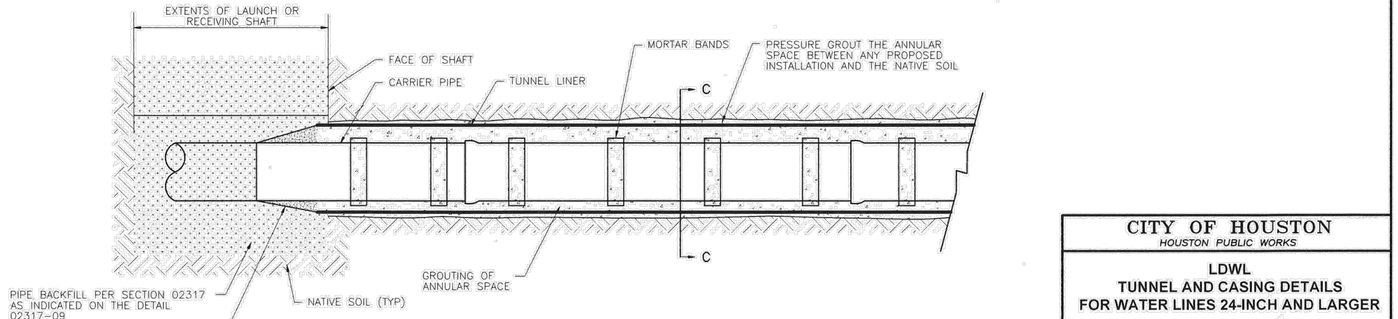


WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING CASING SPACERS



SECTION C–C

3 WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING MORTAR BANDS



WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING MORTAR BANDS

(ONLY APPLICABLE FOR MORTAR COATED CARRIER PIPES)

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LDWL
TUNNEL AND CASING DETAILS
FOR WATER LINES 24-INCH AND LARGER

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
Susan Kamoo CITY ENGINEER	Carol Haddock DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 02517-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL
TUNNEL AND CASING DETAILS

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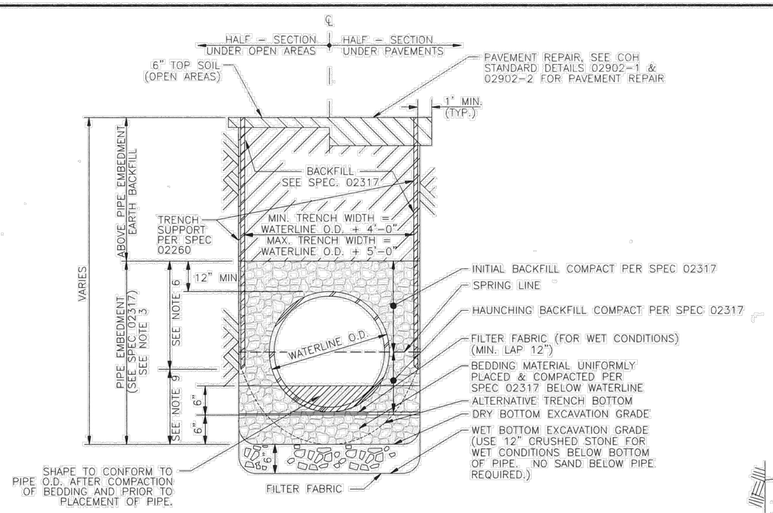
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 82 OF 153	



1 EXCAVATION & BACKFILL DETAIL

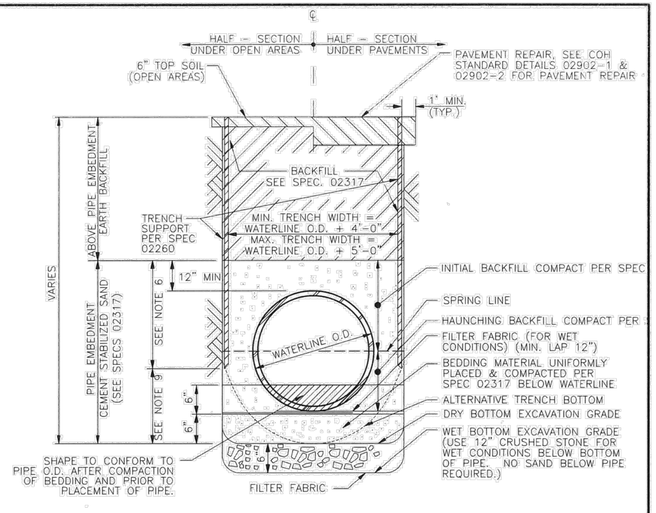
NO SCALE

DETAIL APPLICABLE IN FOLLOWING LIMITS:

– WATER MAIN WITH DEPTH OF COVER LESS THAN 16 FT

DETAILS 1 & 2 – NOTES:

1. SEE TRENCH SAFETY SYSTEM SPECIFICATIONS.
2. FOR WET BOTTOM EXCAVATION LIMITS OF CRUSHED STONE, EXTEND AS SHOWN.
3. PLACEMENT OF TRENCH DAM WITH A MINIMUM OF 12 INCHES INTO TRENCH BOTTOM AND WALLS.
4. TRENCH DAM MAY BE FORMED OR UNFORMED. ACTUAL SHAPE OF TRENCH DAM CROSS SECTION MAY BE DETERMINED BY CONTRACTOR IN FIELD, MEETING 12-INCH MINIMUM THICKNESS AND 12-INCH KEY DEPTH REQUIREMENTS.
5. TRENCH DAM SHALL BE PLACED AT LEAST 5 FT. AWAY FROM ANY PIPELINE STRUCTURE (EACH SIDE). SEE SECTION 02317 FOR OTHER REQUIREMENTS.
6. THIS PORTION OF PIPE EMBEDMENT ZONE MUST BE RECOMPACTED TO PROPER DENSITIES AFTER MOVING SUPPORT SYSTEM FORWARD.
7. USE FILTER FABRIC AS A BOND BREAKER IN PPCA LIMITS AND USE POLYETHYLENE WRAP AS A BOND BREAKER AT OTHER LOCATIONS BETWEEN CEMENT STABILIZED SAND AND PIPE.
8. REFER TO SPEC 02317 FOR GEOTEXTILE REQUIREMENTS AROUND EMBEDMENT.
9. ADJUST HEIGHT OF UNSUPPORTED TRENCH AS NEEDED FOR SAFE CONDITIONS.



2 EXCAVATION & BACKFILL DETAIL

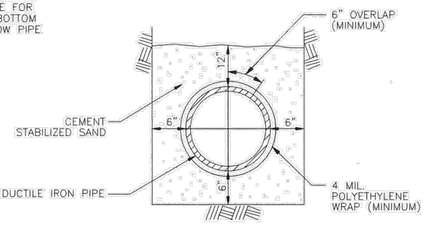
NO SCALE

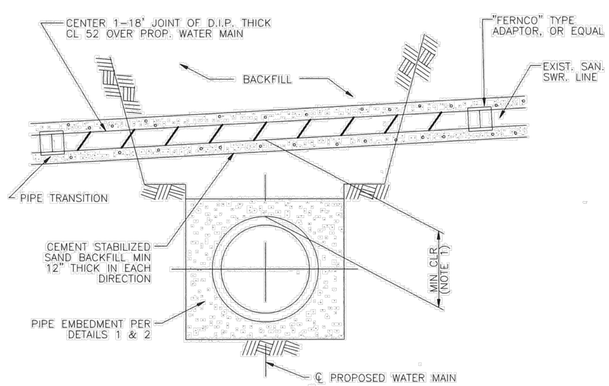
DETAIL APPLICABLE IN FOLLOWING LIMITS:

– WATER MAIN WITH DEPTH OF COVER GREATER THAN 16 FT

– TUNNEL SHAFT LIMITS

– PPCA LIMITS





3 EXISTING SANITARY CROSSING OVER/UNDER PROPOSED WATER LINE

NO SCALE

DETAIL 3 – NOTES:

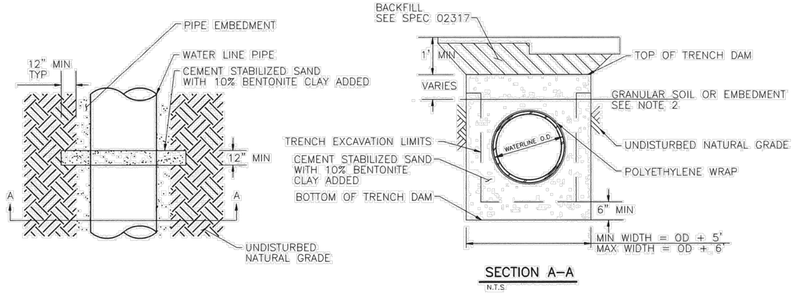
1. REFER TO MINIMUM CLEARANCE REQUIRED IN DRAWINGS.

4 EMBEDMENT AND CORROSION PROTECTION FOR SANITARY SEWER DUCTILE IRON PIPE

NO SCALE

DETAIL 4 – NOTES:

1. FOLLOWING EXCAVATION OF TRENCH, PLACE A 6" LAYER OF CEMENT STAB. SAND AT BOTTOM OF TRENCH, LAY POLYETHYLENE WRAP IN TRENCH, AND LAY PIPE ON TOP OF WRAP. FOLD WRAP AROUND PIPE WITH A 6" OVERLAP (MIN.) AND TIE AROUND PIPE WITH HEAVY BINDER TWINE, OR EQUAL, ON 6' CENTERS. PROVIDE A 12" OVERLAP (MIN.) AND TIE WITH HEAVY BINDER TWINE END LAPS. PLACE ADDITIONAL CEMENT SAND UP TO 12" ABOVE.
2. ALL DUCTILE IRON PIPE SHALL HAVE A POLYETHYLENE "WRAP" OF 4 MIL. THICKNESS (MINIMUM) EXCEPT AS NOTED BELOW.
3. WHERE PIPE IS PLACED IN AN AUGER OR TUNNEL OR IN A CASING, PIPE IS TO HAVE A DOUBLE WRAP OF 4 MIL POLYETHYLENE AND SHALL BE BONDED ON 12" CENTERS WITH ½" STAINLESS STEEL BANDS. END LAPS TO BE AS SPECIFIED FOR TRENCH SECTIONS.
4. REFER TO SPECIFICATION SECTION 02528 – POLYETHYLENE ENCASEMENT/WRAP.



5 TRENCH DAM DETAIL

NO SCALE

SECTION A–A
N.T.S.

DETAIL 5 – NOTES:

1. REFER TO SPEC 02317 FOR INSTALLATION REQUIREMENTS.
2. EXTEND TRENCH DAM 5 FEET MIN ABOVE TOP OF SURROUNDING GRANULAR SOIL LAYERS OR TOP OF GRANULAR EMBEDMENT MATERIAL, WHICHEVER IS HIGHEST.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL EXCAVATION AND BACKFILL DETAIL

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
Sarhail Kanwar, CITY ENGINEER	Carol Haddock, DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 02317-09

NO.	DATE	REVISION	APP.

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10300 WESTOFFICE DR. SUITE 800
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713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL EXCAVATION AND BACKFILL DETAILS

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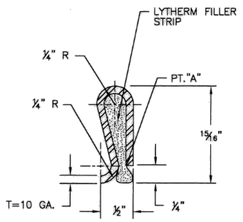
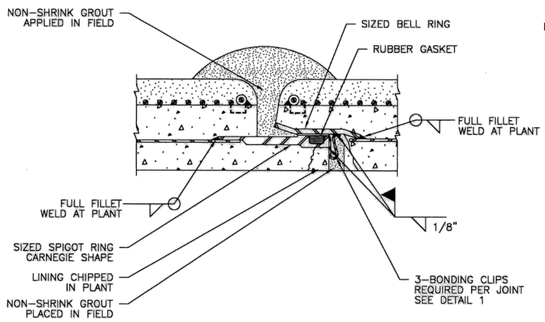


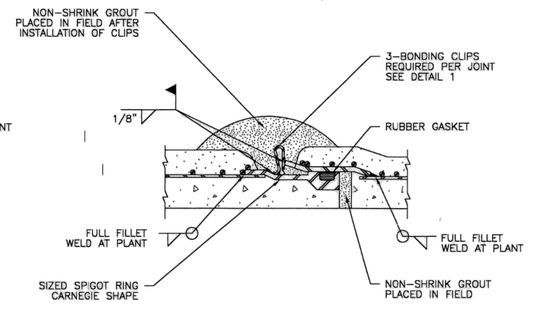
DETAIL 1 – NOTES:

1. STEEL BONDING CLIP:
   MATERIAL SPECIFICATION --- ASTM A366 (COMMERCIAL QUALITY)
   CUT LENGTH ---------- 2½" ± 1/16"
   WIDTH---------- 1¼" ± 1/16"
2. LYTHERM FILLER STRIP TO BE 1" x 1½" WIDE TO OVERLAP SIDES OF CLIP.
3. CRIMP JUMPER OVER FILLER AT "A" TO COMPRESS FILLER CLOSE AT PT. "A" AS MUCH AS POSSIBLE WITHOUT CUTTING FILLER PAD.
4. THREE BONDING CLIPS ARE REQUIRED PER GASKETED JOINT (TYPICAL).
5. BONDING NOT REQUIRED FOR WELDED JOINTS.

1 STEEL BONDING CLIP DETAIL

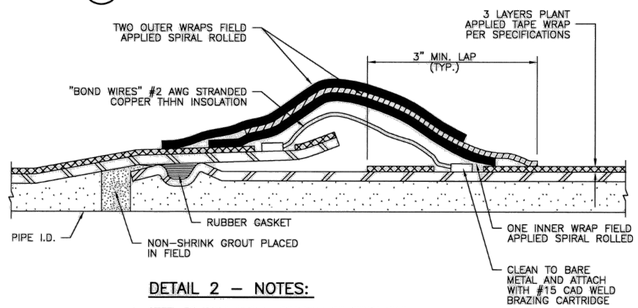


2 BONDED JOINT – EMBEDDED CYLINDER PIPE



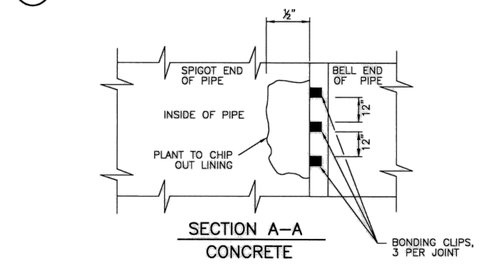
3 BONDED JOINT – BAR WRAPPED CYLINDER PIPE

(SIMILAR FOR LINED CYLINDER PIPE)

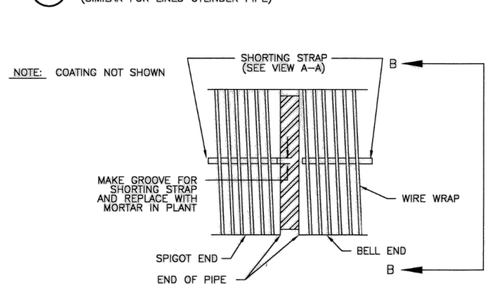


DETAIL 2 – NOTES:

1. STEEL BONDING CLIP IS OPTIONAL TO BOND WIRE.
2. A MINIMUM OF TWO BOND WIRES OR THREE BONDING CLIPS ARE REQUIRED FOR RUBBER GASKETED STEEL PIPE. CLIPS ARE TO BE PROVIDED IN ACCORDANCE WITH DETAILS.
3. BONDING NOT REQUIRED FOR WELDED JOINTS.



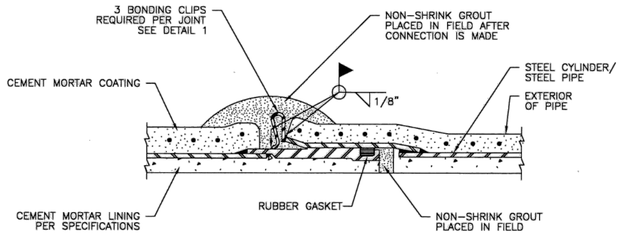
SECTION A–A
CONCRETE



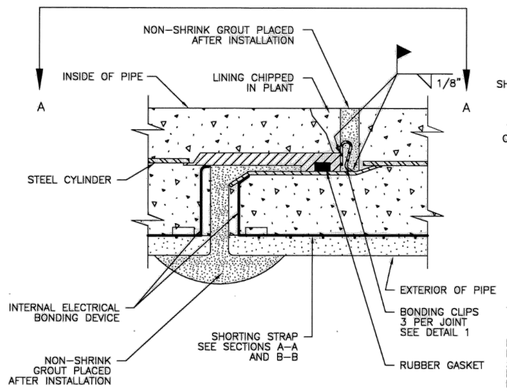
SECTION A–A
REINFORCEMENT

4 O–RING STEEL PIPE JOINT DETAIL

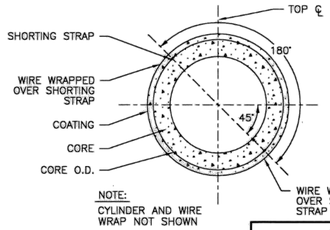
(CEMENT MORTAR LINED & TAPE WRAPPED SHOWN. FLEXIBLE LINING SIMILAR)



5 BONDED JOINT – MORTAR COATED STEEL PIPE



6 ELECTRICAL CONTINUITY BONDING OF EMBEDDED CYLINDER PIPE



NOTE:
CYLINDER AND WIRE WRAP NOT SHOWN

SECTION B–B

DETAIL 6 – NOTES:

PLACE BONDING CLIPS IN INTERIOR JOINT RECESS AS SHOWN. WELD CLIPS TO BELL AND SPIGOT USING ⅛" FILLET WELD. REMOVE SLAG FROM WELD AND FILL RECESS WITH CEMENT MORTAR, COVERING ALL EXPOSED STEEL.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR JOINT BONDING
(SHEET 1 OF 2)

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
ACTING CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR-20-2018	DWG NO: 15640-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR JOINT BONDING
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 84 OF 153	

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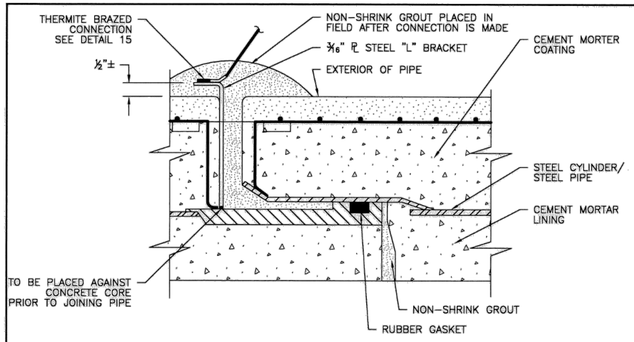
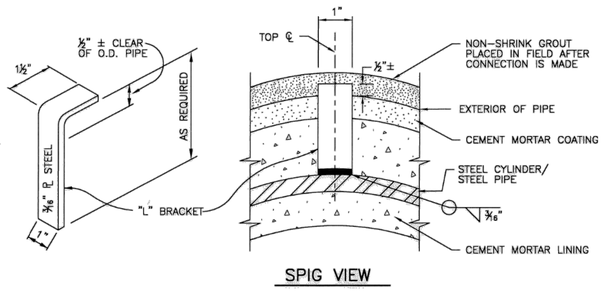
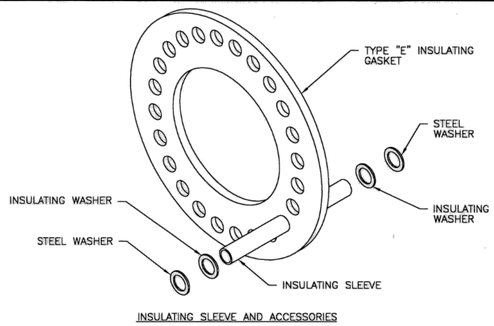


7 TEST LEAD CONNECTION DETAIL



SPIG VIEW

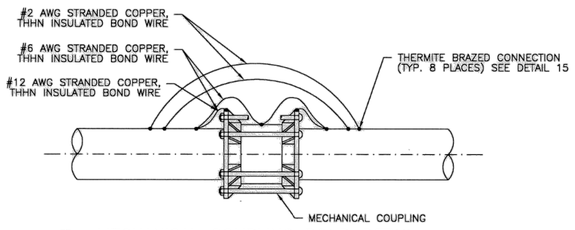
8 "L" BRACKET DETAIL



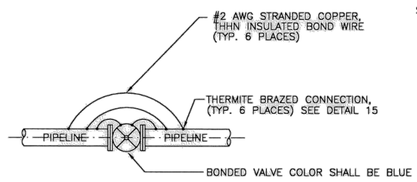
INSULATING SLEEVE AND ACCESSORIES

9 ISOLATION FLANGE ASSEMBLY

SEE AWWA M11 FOR FLANGE BOLT TIGHTENING SEQUENCE

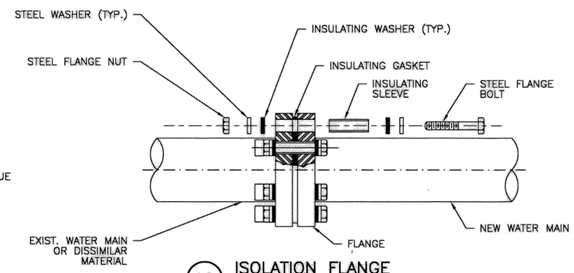


10 MECHANICAL COUPLING BOND DETAIL



11 VALVE BONDING ARRANGEMENT

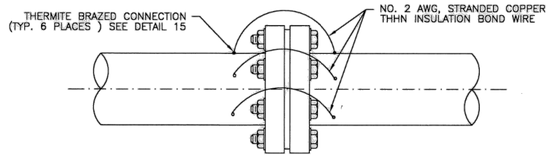
MAINLINE WITH CATHODIC PROTECTION



12 ISOLATION FLANGE

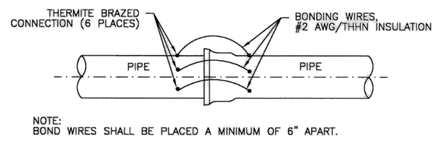
DETAIL 12 – NOTES:

1. DETAILS SHOW BONDING ARRANGEMENTS ONLY. SEE JOINT DETAIL FOR PIPE JOINT REQUIREMENTS.



13 ELECTRICAL BONDING ACROSS FLANGE

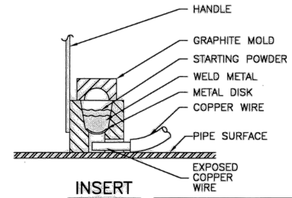
NOTE: BOND WIRES SHALL BE PLACED A MINIMUM OF 6" APART.



NOTE:
BOND WIRES SHALL BE PLACED A MINIMUM OF 6" APART.

14 BELL & SPIGOT BONDING ARRANGEMENT

DUCTILE IRON PIPE



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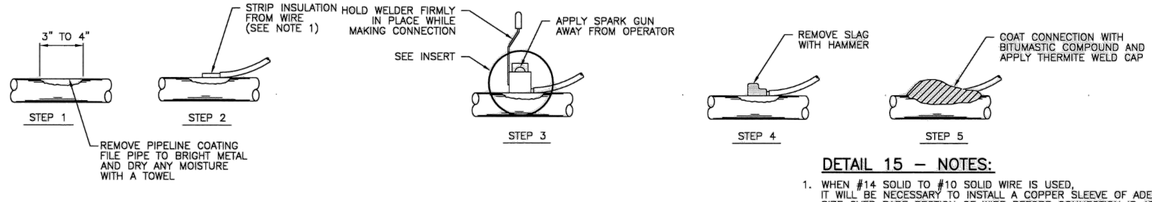

15 THERMITE BRAZED CONNECTION DETAIL

DETAIL 15 – NOTES:

1. WHEN #14 SOLID TO #10 SOLID WIRE IS USED, IT WILL BE NECESSARY TO INSTALL A COPPER SLEEVE OF ADEQUATE SIZE OVER BARE SECTION OF WIRE BEFORE CONNECTION IS ATTEMPTED.
2. THERMITE WELD PROCEDURES SIMILAR FOR "L" BRACKETS.
3. REPAIR ALL DAMAGE TO COATING AND LINING IN ACCORDANCE WITH MFG. RECOMMENDATIONS.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR JOINT BONDING
(SHEET 2 OF 2)
(NOT TO SCALE)

APPROVED BY: ACTING CITY ENGINEER
APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR-20-2018
DWG NO: 15640-02

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR JOINT BONDING
SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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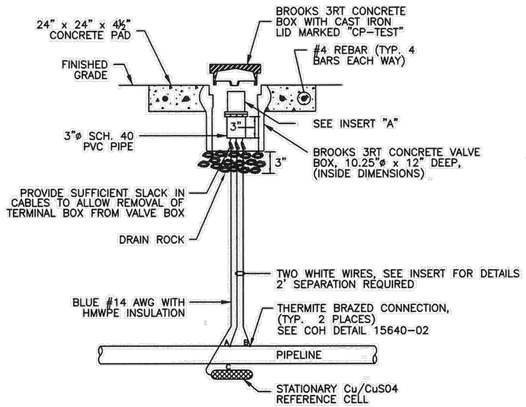
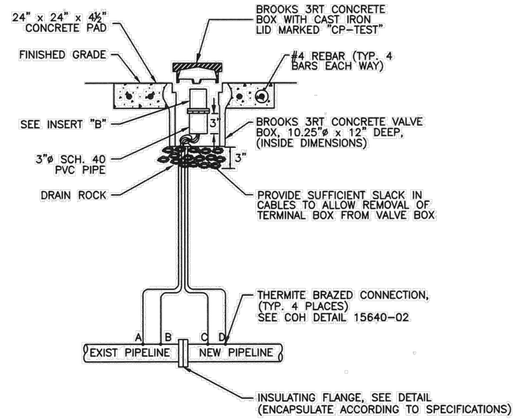


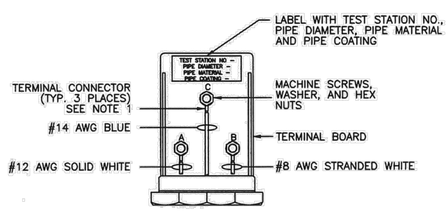
1 FLUSH MOUNTED POTENTIAL TEST STATION

WIRE CODING:
* WIRES A & B ARE WHITE, WIRE C IS BLUE
* WIRE A IS #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRE B IS #8 AWG TW STRANDED SINGLE CONDUCTOR
* WIRES C IS #14 AWG WITH HMWPE INSULATION



2 FLUSH MOUNTED FLANGE ISOLATION TEST STATION

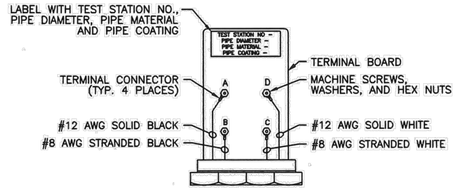
WIRE CODING:
* WIRES A & B ARE BLACK, WIRES C & D ARE WHITE
* WIRES A & D ARE #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRES B & C ARE #8 AWG TW STRANDED SINGLE CONDUCTOR
* BLACK WIRES ATTACHED TO UNPROTECTED OR EXISTING PIPE
* WHITE WIRES ATTACHED TO PROTECTED OR NEW PIPE



INSERT A – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ¼" STUD SIZE

INSERT "A"



INSERT B – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ¼" STUD SIZE

INSERT "B"

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS (SHEET 1 OF 3) (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 15641-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
SHEET 1 OF 3

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DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 86 OF 153	

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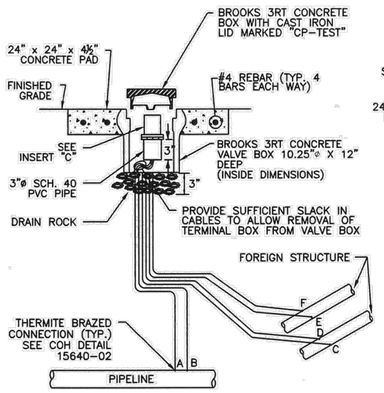
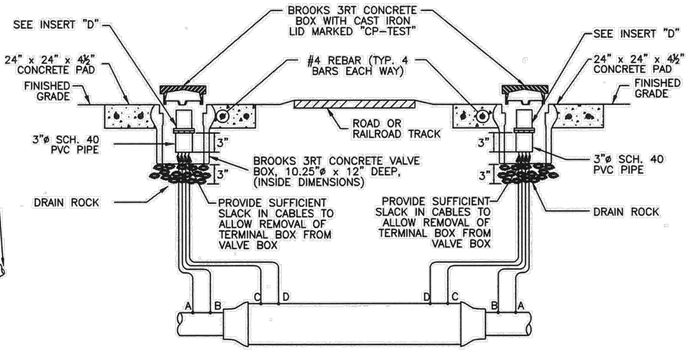


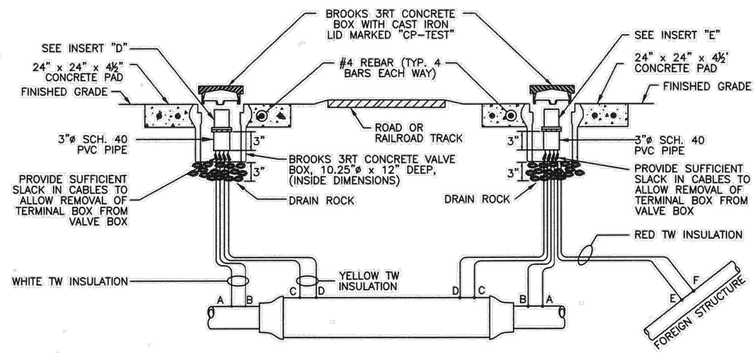
DETAIL 3 – NOTES:

1. TEST STATION SHALL BE MOUNTED DIRECTLY ABOVE THE NEW WATER LINE.
2. FOR MORE THAN TWO (2) FOREIGN LINES, INSTALL A COTTBOX TYPE TEST STATION. (UP TO 20 TERMINALS)



DETAIL 4 – NOTES:

1. FOR PARALLEL CASED CROSSINGS, INSTALL A COTTBOX TYPE TEST STATION. (UP TO 20 TERMINALS)

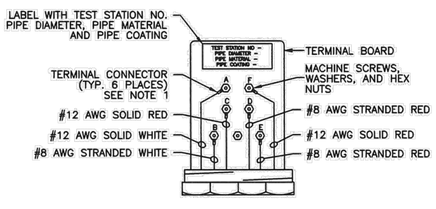


DETAIL 5 – NOTES:

1. TEST STATION SHALL BE MOUNTED DIRECTLY ABOVE THE NEW WATER LINE.
2. FOR MORE THAN ONE (1) FOREIGN LINE, INSTALL A COTTBOX TYPE TEST STATION. (UP TO 20 TERMINALS)

3 FLUSH MOUNTED FOREIGN LINE TEST STATION

WIRING CODE:
* WIRES A & B ARE WHITE
* WIRES C, D, E & F ARE RED
* WIRES A, C, F ARE #12 AWG TW SOLID COPPER WIRE
* WIRES B, D, E ARE #8 AWG TW STRANDED COPPER WIRE
* RED WIRES ATTACHED TO FOREIGN OWNED PIPE
* WHITE WIRES ATTACHED TO NEW PIPE



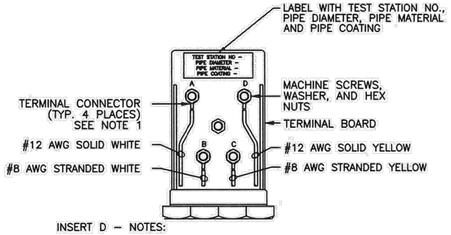
INSERT C – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ¼" STUD SIZE.

INSERT "C"

4 FLUSH MOUNTED CASED CROSSING TEST STATION

WIRE CODING:
* WIRES A & B ARE WHITE, WIRES C & D ARE YELLOW
* WIRES A & D ARE #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRES B & C ARE #8 AWG TW STRANDED SINGLE CONDUCTOR
* YELLOW WIRES ATTACHED TO CASING
* WHITE WIRES ATTACHED TO PROTECTED OR NEW PIPE



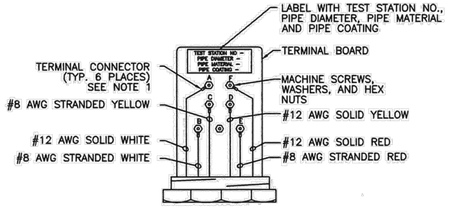
INSERT D – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ¼" STUD SIZE.

INSERT "D"

5 FLUSH MOUNTED CASED CROSSING AND FOREIGN LINE TEST STATION

WIRE CODING:
* WIRES A & B ARE WHITE, WIRES C & D ARE YELLOW
* WIRES E & F ARE RED
* WIRES A, D & F ARE #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRES B, C & E ARE #8 AWG TW STRANDED SINGLE CONDUCTOR
* WHITE WIRES ATTACHED TO PROTECTED OR NEW PIPE
* YELLOW WIRES ATTACHED TO CASING
* RED WIRES ATTACHED TO FOREIGN OWNED PIPE



INSERT E – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ¼" STUD SIZE.

INSERT "E"

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
(SHEET 2 OF 3)
(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 15641-02

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HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
SHEET 2 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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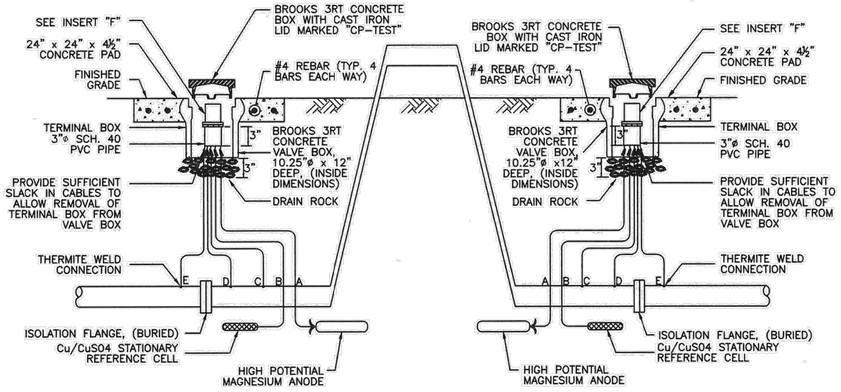
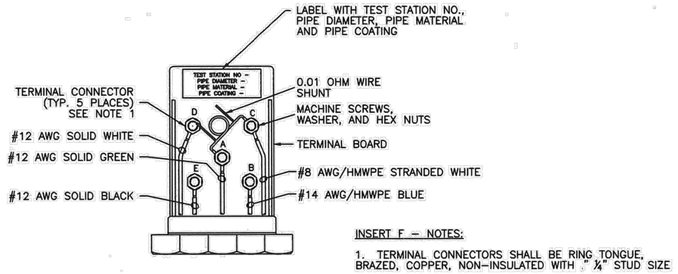


6 ABOVE GROUND CROSSING FLUSH MOUNTED FLANGE ISOLATION AND ANODE INSTALLATION TEST STATION

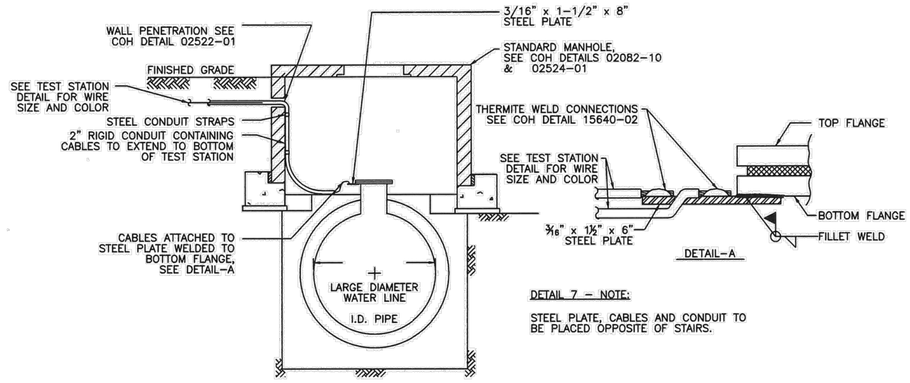
WIRE CODING:
* WIRES C & D ARE WHITE, WIRE E IS BLACK
* WIRES D & E ARE #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRE C IS #8 AWG/HMWPE STRANDED SINGLE CONDUCTOR WIRE
* WIRE A IS GREEN #12 AWG ANODE LEAD WIRE TO 48 LB. MAGNESIUM
* WIRE B IS BLUE #14 AWG/HMWPE LEAD WIRE TO REFERENCE CELL



INSERT "F"

INSERT F – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ," ¼" STUD SIZE



DETAIL 7 – NOTE:

STEEL PLATE, CABLES AND CONDUIT TO BE PLACED OPPOSITE OF STAIRS.

7 TEST STATION INSTALLATION IN MANHOLE

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS (SHEET 3 OF 3) (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 15641-03

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
SHEET 3 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 88 OF 153	

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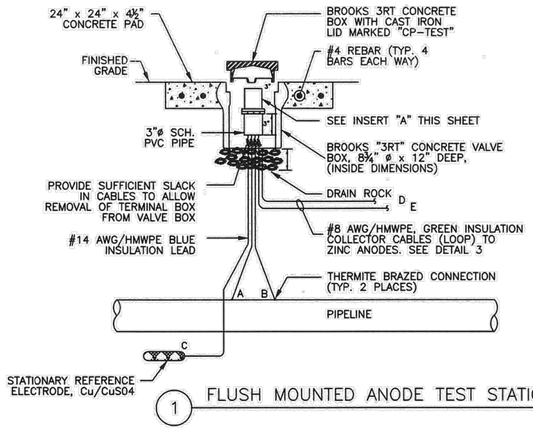
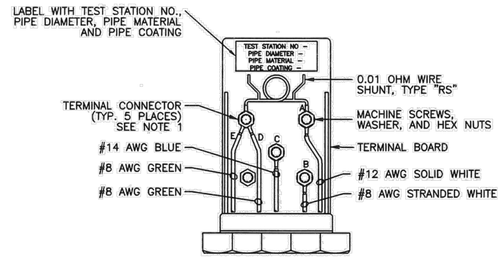


1 FLUSH MOUNTED ANODE TEST STATION

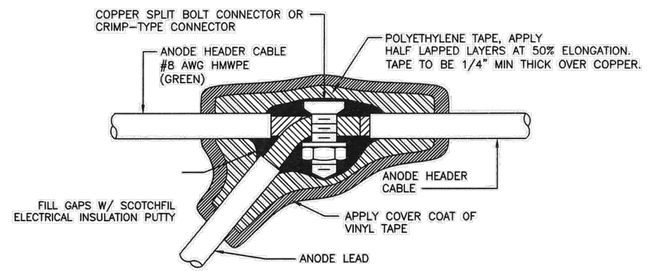
WIRE CODING:
* WIRES A & B ARE WHITE
* WIRE A IS #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRE B IS #8 AWG TW STRANDED SINGLE CONDUCTOR WIRE
* WIRE C IS BLUE #14 AWG/HMWPE LEAD WIRE TO REFERENCE ELECTRODE
* WIRES D & E ARE GREEN #8 AWG ANODE LEAD WIRE TO ANODE GROUND BED



INSERT A – NOTES:

1. TERMINAL CONNECTORS SHALL BE RING TONGUE, BRAZED, COPPER, NON-INSULATED WITH ¼" STUD SIZE

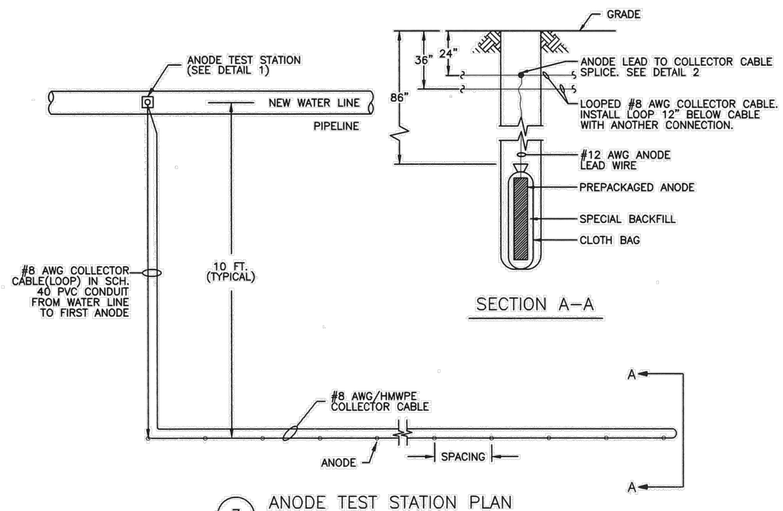
INSERT "A"



DETAIL 2 – NOTES:

1. MAKE SPLICE WATERPROOF
   A. SMOOTH ALL IRREGULAR SURFACES WITH ELECTRICAL INSULATION PUTTY.
   B. APPLY 2 LAYERS OF HALF LAPPED RUBBER SPLICING TAPE.
   C. APPLY 2 LAYERS OF HALF LAPPED VINYL ELECTRICAL TAPE.
2. NUMBER OF WIRES MAY VARY PER SPLICE

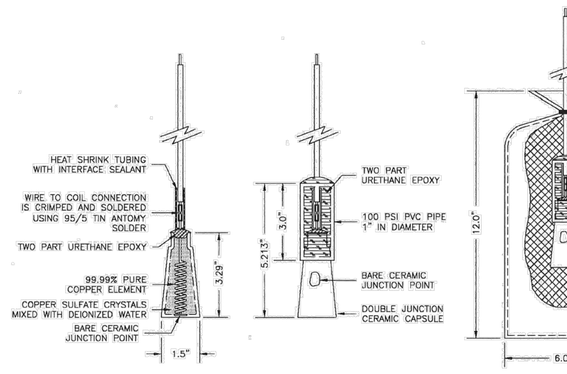
2 SPLICE DETAIL



SECTION A–A

3 ANODE TEST STATION PLAN

ANODE SIZE AND SPACING REQUIREMENT PER DESIGN DRAWINGS



4 Cu/CuSO4 PERMACELL PLUS STATIONARY REFERENCE CELL

CITY OF HOUSTON *HOUSTON PUBLIC WORKS*	
STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS & ANODES (NOT TO SCALE)	
APPROVED BY: Ishail Kanwar CITY ENGINEER	APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 16640-01

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS AND ANODES

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 89 OF 153	

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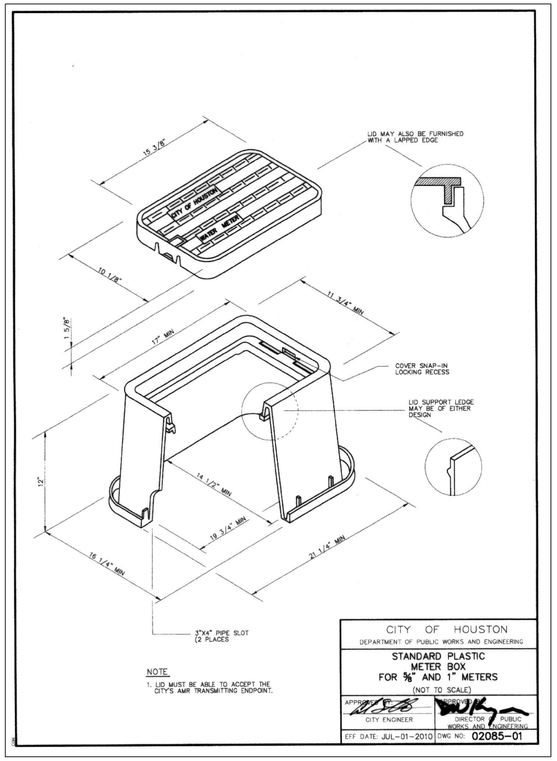


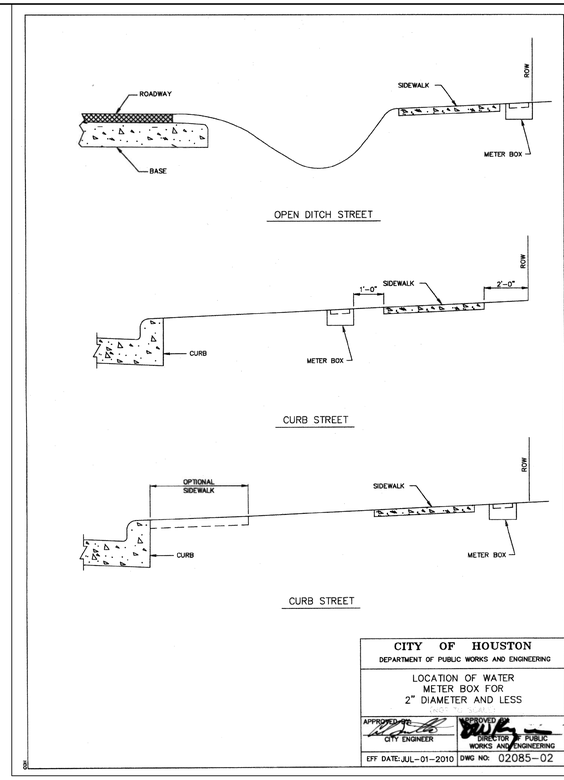
NOTE.

1. LID MUST BE ABLE TO ACCEPT THE CITY'S AMR TRANSMITTING ENDPOINT.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STANDARD PLASTIC METER BOX FOR ⅝" AND 1" METERS
(NOT TO SCALE)

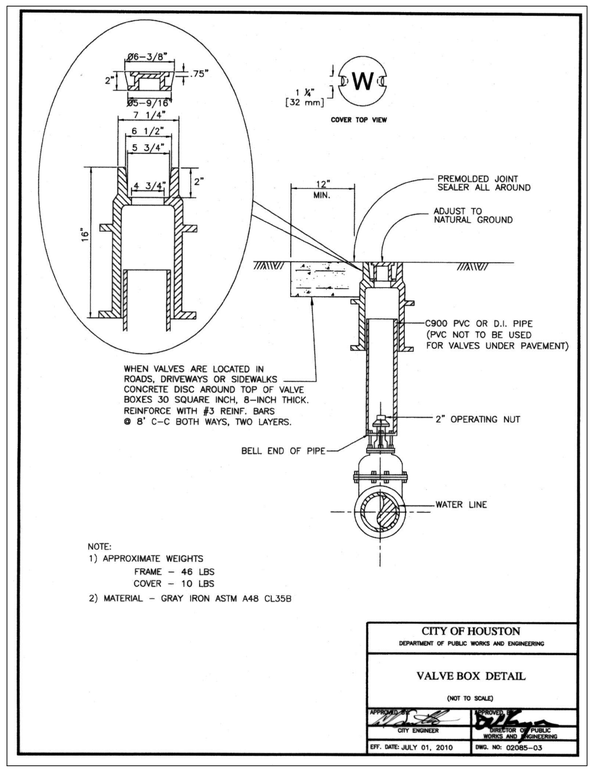
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: JUL-01-2010 | DWG NO: 02085-01



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

LOCATION OF WATER METER BOX FOR 2" DIAMETER AND LESS

APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 | DWG NO: 02085-02

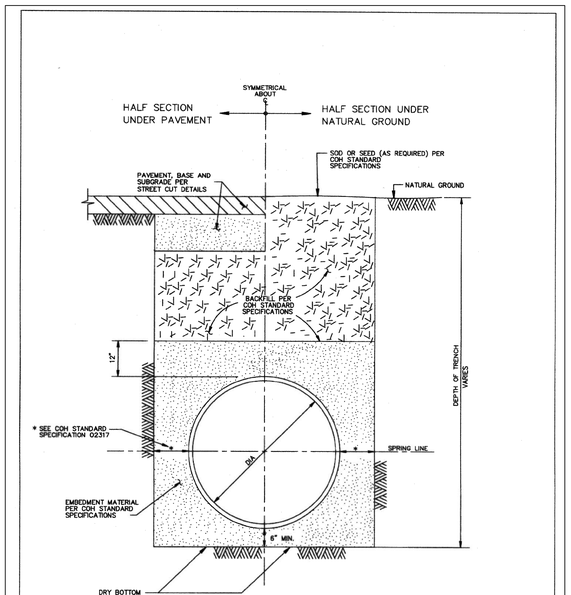


NOTE:
1) APPROXIMATE WEIGHTS
FRAME – 46 LBS
COVER – 10 LBS
2) MATERIAL – GRAY IRON ASTM A48 CL35B

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

VALVE BOX DETAIL
(NOT TO SCALE)

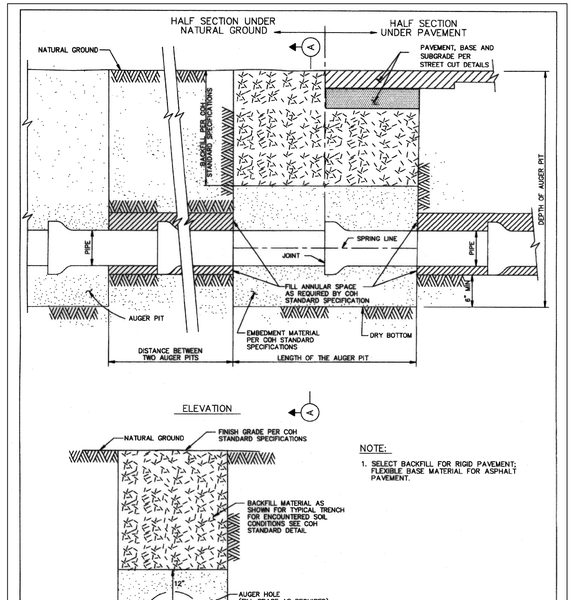
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: JULY 01, 2010 | DWG. NO: 02085-03



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER DISTRIBUTION MAIN BEDDING AND BACKFILL FOR OPEN CUT TRENCHES
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 | DWG NO: 02317-04



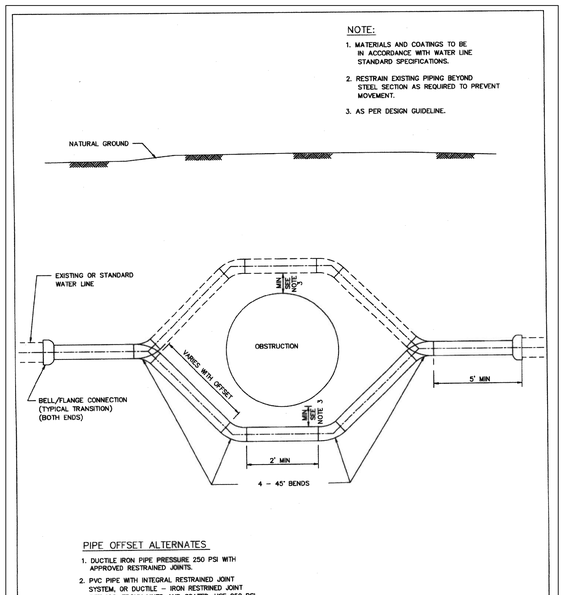
NOTE:

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

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 | DWG NO: 02447-01



PIPE OFFSET ALTERNATES

1. DUCTILE IRON PIPE PRESSURE 250 PSI WITH APPROVED RESTRAINED JOINTS.
2. PVC PIPE WITH INTEGRAL RESTRAINED JOINT SYSTEM, OR DUCTILE – IRON RESTRINED JOINT FITTINGS, EPOXY LINED AND COATED. USE 250 PSI AWWA C900 DR 14 FOR PVC RESTRAINED JOINTS.
3. PVC NOT ALLOWED FOR GREATER THAN 20 FT OF COVER OR FOR DIAMETER LARGER THAN 20 IN.
4. USE ONLY DUCTILE IRON AND PVC PRODUCTS LISTED ON OCE DIVISION APPROVED PRODUCTS LIST AND IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TYPICAL STEEL PIPE OFFSET SECTION FOR WATER LINES
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 | DWG NO: 02511-01

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD SDWL DETAILS
SHEET 1 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 90 OF 153	

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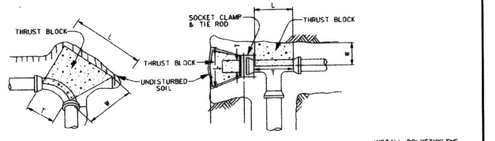
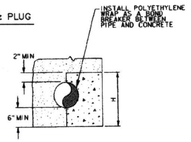


90° BEND

(45° BENDS SIMILAR)



PIPE
CROSS SECTION

MINIMUM BLOCKING DIMENSION IN INCHES												
PIPE SIZE	90° BEND				45° BEND				TEE/PLUG			
	W	H	L	T	W	H	L	T	W	H	L	T
4"	6	12	14	10	6	8	11	8	6	10	21	12
6"	8	14	26	12	8	14	14	12	8	14	19	19
8"	10	16	40	16	10	18	20	16	10	18	26	26
10"	12	24	42	18	12	22	25	18	12	24	30	30
12"	14	36	40	30	14	26	30	22	14	26	40	40

CORRECTION FACTORS		
SOIL TYPE	SOIL BEARING STRENGTH S_b (lb/ft²)	MULTIPLY "L" AND "H" BY
SOFT CLAY	1000	1.73
SILT	1500	1.41
SANDY SILT	3000	1.00
SAND	4000	0.87
SANDY CLAY	6000	0.71
HARD CLAY	9000	0.58

NOTES:

1. DEPTH "W" MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE.
2. BLOCKING MUST BE PLACED AGAINST UNDISTURBED EARTH. WHERE THIS IS NOT POSSIBLE, THE FILL BETWEEN THE BEARING SURFACE AND UNDISTURBED SOIL MUST BE COMPACTED TO AT LEAST 90% STANDARD PROCTOR DENSITY.
3. PROVIDE CONCRETE IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 03315 – CONCRETE FOR UTILITY CONSTRUCTION.
4. BLOCKING DIMENSIONS SHOWN ARE BASED ON 3000 PSI SOIL BEARING STRENGTH AND 125 PSI INTERNAL WATER PRESSURE. FOR OTHER SOIL CONDITIONS, MULTIPLY DIMENSIONS "L" AND "H" BY THE APPROPRIATE CORRECTION FACTOR.

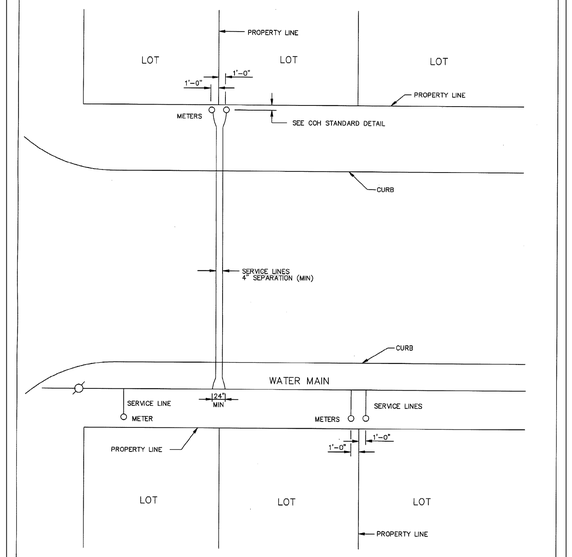
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

THRUST BLOCK DETAIL FOR WATER LINES (4-INCH TO 12 INCH)

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 02511-02



GENERAL NOTES:

1. TWO SERVICE LINES MAY BE INSTALLED IN SAME TRENCH PROVIDING 4" CLEARANCE IS MAINTAINED.
2. ONE METER PER SERVICE LINE

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TYPICAL 3/4" THROUGH 2" SERVICE ARRANGEMENTS

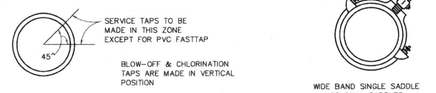
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JUL-01-2016 DWG NO: 02512-01

PIPE TAPPING SCHEDULE				
WATER MAIN TYPE AND DIAMETER	SERVICE SIZE			
	3/4"	1"	1 1/2"	2"
4" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
4" ASBESTOS (EXISTING) CEMENT	WBSS	WBSS	DSS, WBSS	DSS, WBSS
4" PVC (AWWA C900)	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" ASBESTOS (EXISTING) CEMENT	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" PVC (AWWA C900)	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
12" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
12" ASBESTOS (EXISTING) CEMENT	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
12" PVC (AWWA C900)	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
16" AND UP CAST IRON OR DUCTILE IRON	DWBSS	DWBSS	DWBSS	DWBSS
16" AND UP ASBESTOS (EXISTING) CEMENT	DWBSS	DWBSS	DWBSS	DWBSS
16" AND UP PVC (AWWA C900)	DWBSS	DWBSS	DWBSS	DWBSS

DSS – DUAL STRAP SADDLES
WBSS – WIDE BAND STRAP SADDLES
DWBSS – DUAL WIDE BAND STRAP SADDLES



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SERVICE TAPS

(NOT TO SCALE)

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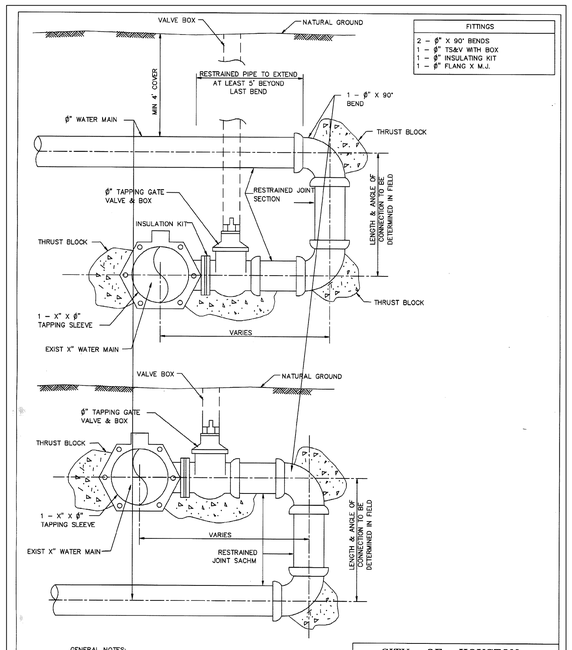


FITTINGS
2 – 6" X 90° BENDS
1 – 6" TS&V WITH BOX
1 – 6" INSULATING KIT
1 – 6" FLANG X M.J.

GENERAL NOTES:

1. X" AND 6" DENOTE RUN AND BRANCH LINE SIZES RESPECTIVELY.
2. 90° BENDS ARE TO BE ROLLED TO PROVIDE CLEARANCE FOR VALVE BOX.
3. WATER MAIN ASSEMBLY FOR BACK TAP SAME FOR PROPOSED WATER MAIN UNDER EXISTING MAIN.
4. PROVIDE RESTRAINED JOINT PIPE AS SHOWN.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

BACK TAP ON EXISTING LINE

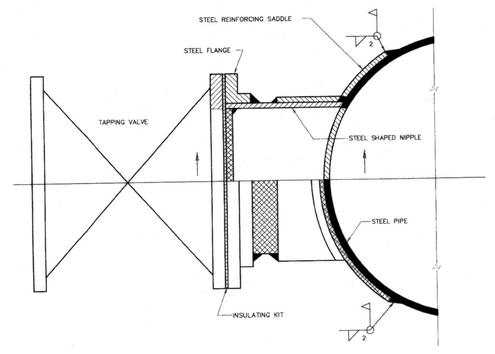
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JUL-01-2016 DWG NO: 02512-03

GENERAL NOTES:

1. PROVIDE STEEL TAPPING SLEEVE AS PER WATER MAIN SPECIFICATIONS.
2. WELDING SHALL BE AS NOTED IN WELD SYMBOLS.
3. INSULATING KIT IN ACCORDANCE WITH WATER MAIN SPECIFICATIONS.
4. REPAIR COATING AS PER WATER MAIN STANDARD SPECIFICATIONS.



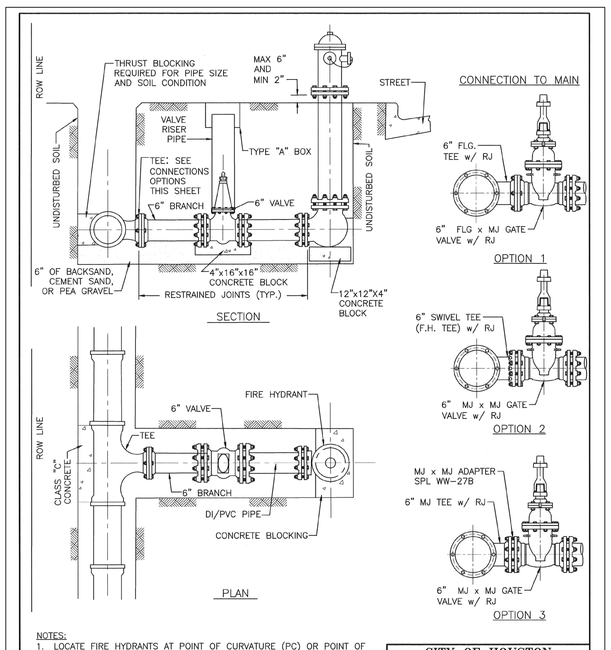
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STANDARD TAP TO EXISTING STEEL MAIN

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 02512-04



NOTES:

1. LOCATE FIRE HYDRANTS AT POINT OF CURVATURE (PC) OR POINT OF TANGENCY (PT) OF THE INTERSECTION CURB RADIUS, 3 FEET BEHIND CURB OR PROJECTED FUTURE CURB.
2. ON OPEN-DITCH ROADWAYS, SET THE FIRE HYDRANTS WITH IN 5 FEET OF RIGHT-OF-WAY LINES.
3. FIRE HYDRANT STEAMER NOZZLE SHALL FACE THE STREET.
4. LOCATE HYDRANT VALVE IMMEDIATELY ADJACENT TO WATER LINE.
5. ALL PIPING TO BE RESTRAINED JOINTS.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD FIRE HYDRANT DETAIL

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: JUL-01-2021 DWG NO: 02520-01

NO.	DATE	REVISION	APP.

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ON 09/22/2025

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD SDWL DETAILS SHEET 2 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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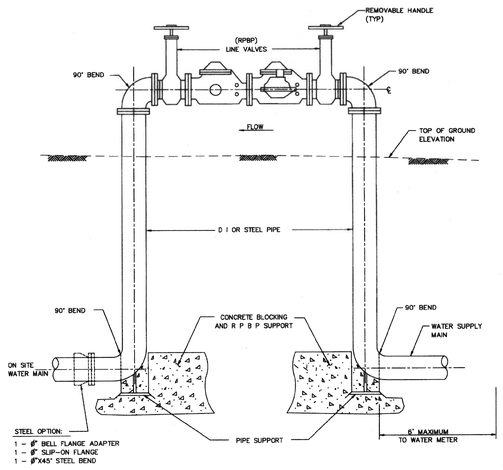
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 91 OF 153	

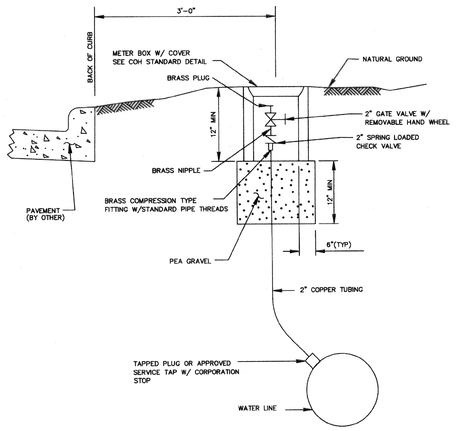
S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\Standard Details.dwg plotted on Sep 21, 2025 – 1:49pm

GENERAL NOTES:

1. INSULATE REDUCED PRESSURE BACKFLOW PREVENTER TO AVOID FREEZING.
2. REDUCED PRESSURE BACKFLOW PREVENTER'S DISCHARGE OPENING IS TO BE A MINIMUM OF 12 INCHES ABOVE GROUND ELEVATION OR 100 YEAR FLOOD ELEVATION WHICHEVER IS GREATER.



CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
REDUCED PRESSURE BACKFLOW – PREVENTER (R P B P) (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02523-01



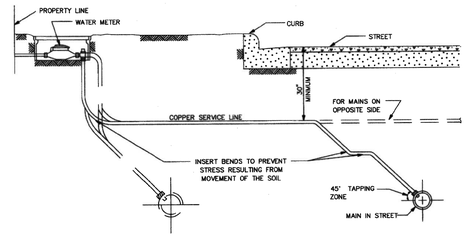
GENERAL NOTES:

1. PLACE GATE VALVE VERTICAL TO GROUND WITH END OF BRASS PLUG 3 INCHES FROM SURFACE
2. PLACE METER BOX CENTER AROUND GATE VALVE BOX WITH LONG SIDE PARALLEL TO VALVE.

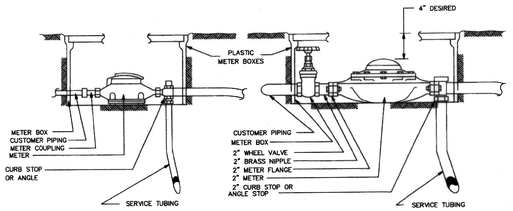
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
PERMANENT BLOW-OFF-DETAIL (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02524-01

NOTES:

1 1/2" METER SET IS SAME AS 2" EXCEPT WHEEL VALVE IS NOT REQUIRED.



TYPICAL SECTION SERVICE LINE



5/8", 3/4" AND 1" METER SET

2" METER SET

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
TYPICAL METER SETTINGS (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02526-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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TX FIRM NO.: F-4578
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ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD SDWL DETAILS
SHEET 3 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 92 OF 153	

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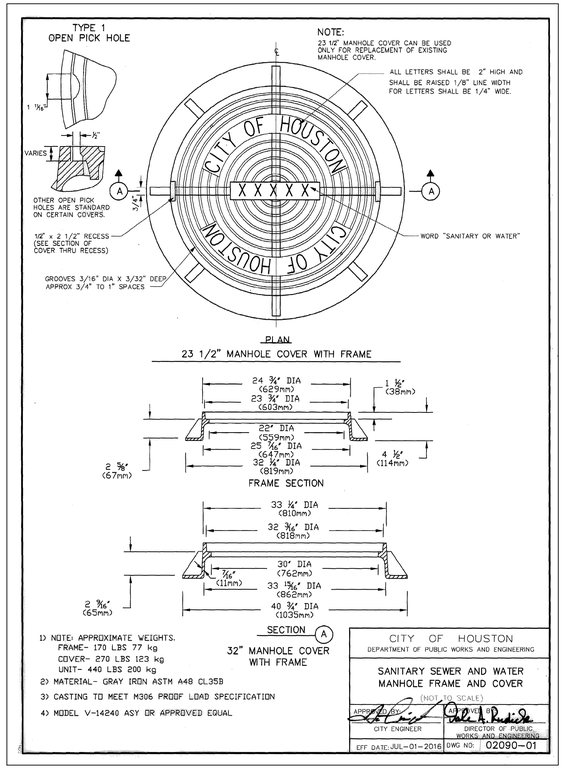
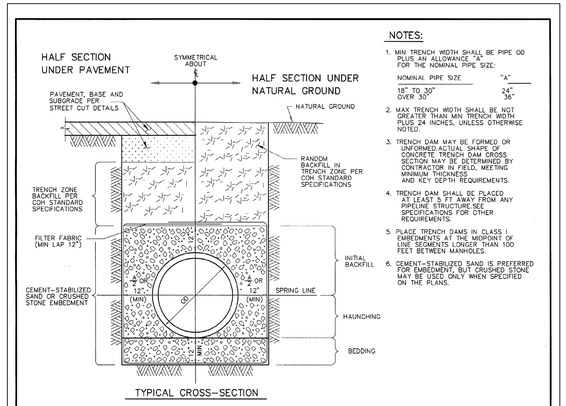


1) NOTE: APPROXIMATE WEIGHTS.
FRAME- 170 LBS 77 kg
COVER- 270 LBS 123 kg
UNIT- 440 LBS 200 kg
2) MATERIAL- GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-14240 ASY OR APPROVED EQUAL

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER AND WATER MANHOLE FRAME AND COVER
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2016 | DWG NO: 02090-01



NOTES:

1. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "A" FOR THE NOMINAL PIPE SIZE:

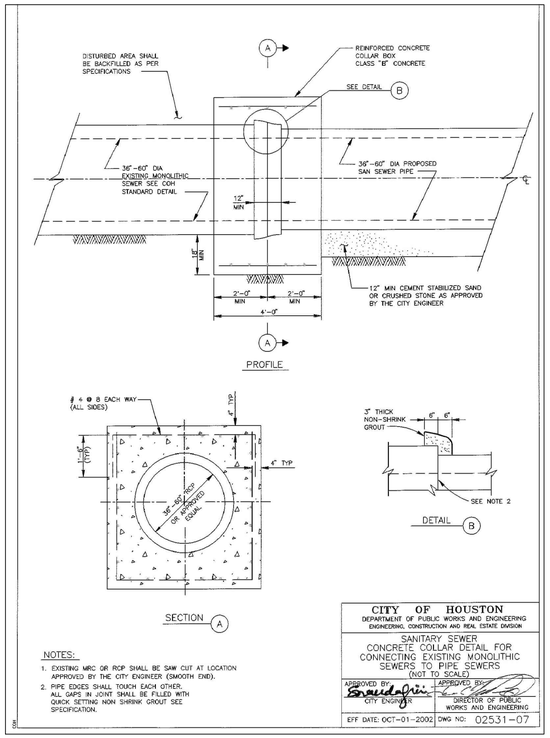
NOMINAL PIPE SIZE	"A"
18" TO 30"	24"
OVER 30"	¾"

2. MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
3. TRENCH DAM MAY BE FORMED OR UNFORMED.ACTUAL SHAPE OF CONCRETE TRENCH DAM CROSS SECTION MAY BE DETERMINED BY CONTRACTOR IN FIELD, MEETING MINIMUM THICKNESS AND KEY DEPTH REQUIREMENTS.
4. TRENCH DAM SHALL BE PLACED AT LEAST 5 FT AWAY FROM ANY PIPELINE STRUCTURE.SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
5. PLACE TRENCH DAMS IN CLASS I EMBEDMENTS AT THE MIDPOINT OF LINE SEGMENTS LONGER THAN 100 FEET BETWEEN MANHOLES.
6. CEMENT-STABILIZED SAND IS PREFERRED FOR EMBEDMENT, BUT CRUSHED STONE MAY BE USED ONLY WHEN SPECIFIED ON THE PLANS.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER EMBEDMENT AND TRENCH ZONE BACKFILL FOR DRY OR WET STABLE TRENCH
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2016 | DWG NO: 02317-01



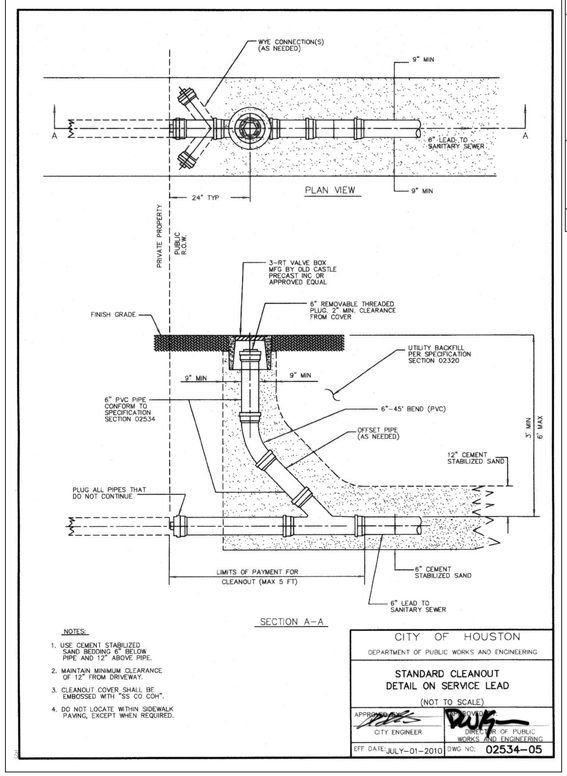
NOTES:

1. EXISTING WRC OR RCP SHALL BE SAW CUT AT LOCATION APPROVED BY THE CITY ENGINEER (SMOOTH END).
2. PIPE EDGES SHALL TOUCH EACH OTHER. ALL GAPS IN JOINT SHALL BE FILLED WITH QUICK SETTING NON SHRINK GROUT SEE SPECIFICATION.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY SEWER CONCRETE COLLAR DETAIL FOR CONNECTING EXISTING MONOLITHIC SEWERS TO PIPE SEWERS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 | DWG NO: 02531-07



NOTES:

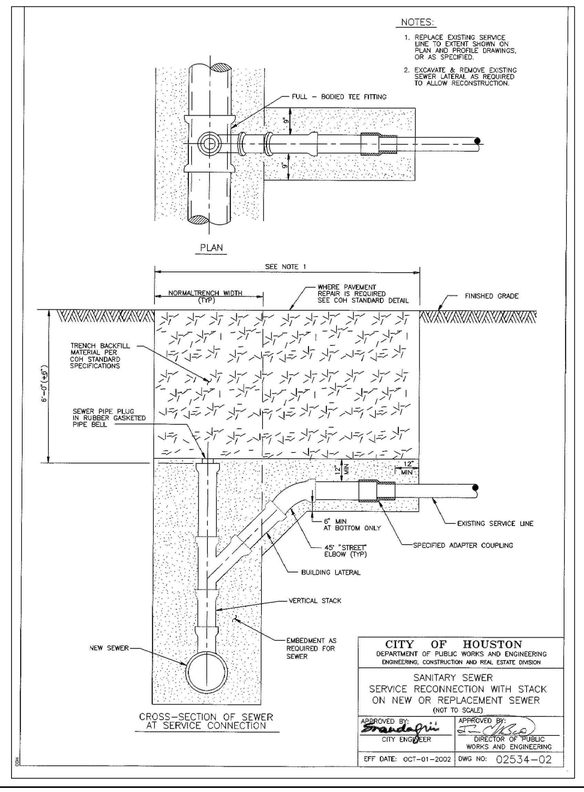
1. USE CEMENT STABILIZED SAND BEDDING 6" BELOW PIPE AND 12" ABOVE PIPE.
2. MAINTAIN MINIMUM CLEARANCE OF 12" FROM DRIVEWAY.
3. CLEANOUT COVER SHALL BE EMBOSSED WITH "SS CO COH".
4. DO NOT LOCATE WITHIN SIDEWALK PAVING, EXCEPT WHEN REQUIRED.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STANDARD CLEANOUT DETAIL ON SERVICE LEAD
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 | DWG NO: 02534-05

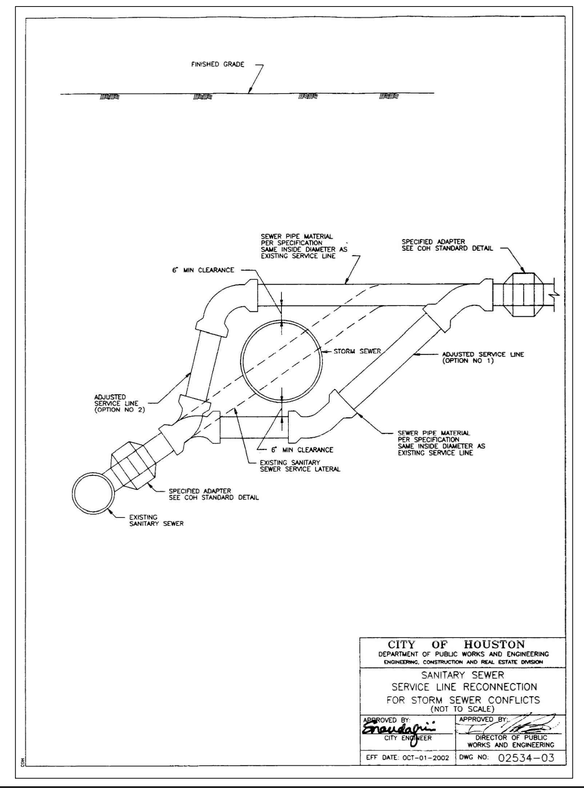
NO.	DATE	REVISION	APP.



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY SEWER SERVICE RECONNECTION WITH STACK ON NEW OR REPLACEMENT SEWER
(NOT TO SCALE)

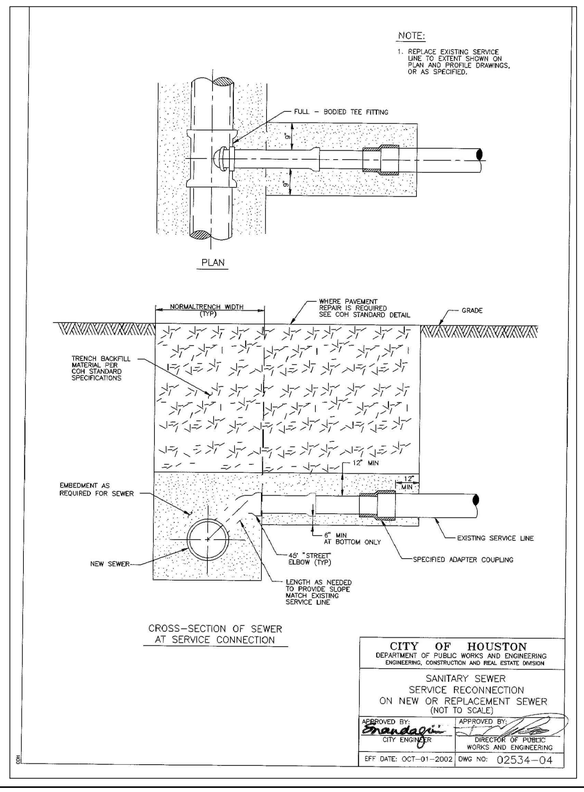
APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 | DWG NO: 02534-02



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY SEWER SERVICE LINE RECONNECTION FOR STORM SEWER CONFLICTS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 | DWG NO: 02534-03



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY SEWER SERVICE RECONNECTION ON NEW OR REPLACEMENT SEWER
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 | DWG NO: 02534-04

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD SANITARY SEWER DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 93 OF 153	

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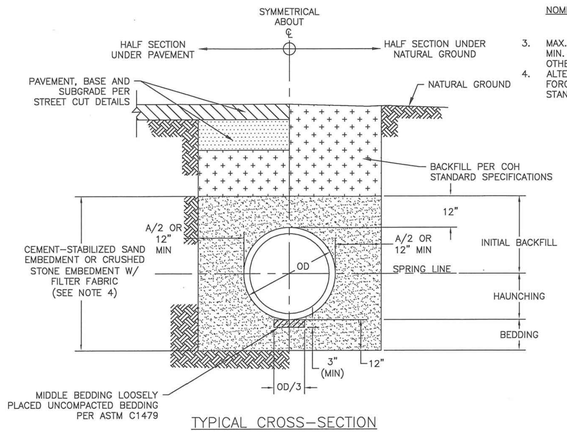
02317-03

NOTES:

1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS PER COH STANDARD. SEE COH STANDARD SPECIFICATION FOR REQUIREMENTS IN OTHER CONDITIONS.
2. MIN. TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "A" FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	"A"
18" TO 30"	24"
OVER 30"	36"

3. MAX. TRENCH WIDTH SHALL BE NOT GREATER THAN MIN. TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
4. ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR FORCE MAINS MAY BE ALLOWED. SEE COH STANDARD SPECIFICATIONS.



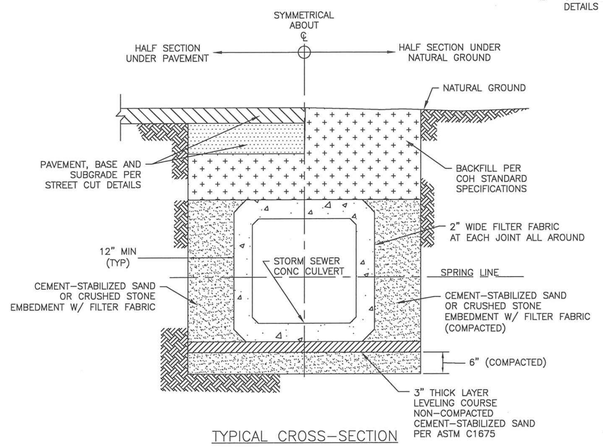
TYPICAL CROSS-SECTION

SANITARY OR STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH
NTS

02317-05

NOTES:

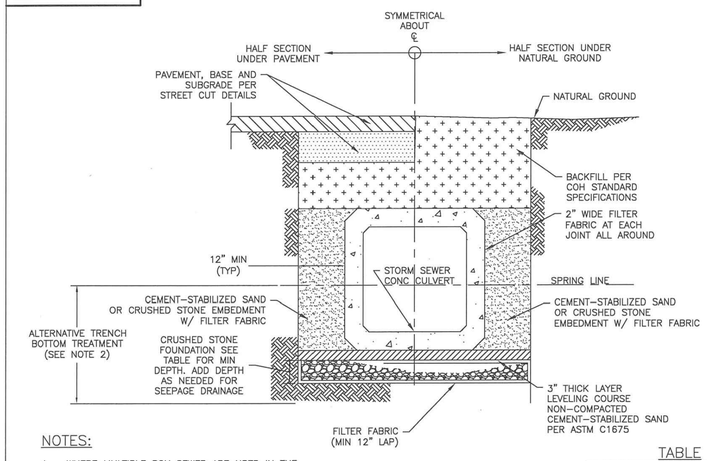
1. WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
2. SUBGRADE AND PAVEMENT FOR STREET CUT DETAILS – 02951.



TYPICAL CROSS-SECTION

PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH
NTS

02317-06



NOTES:

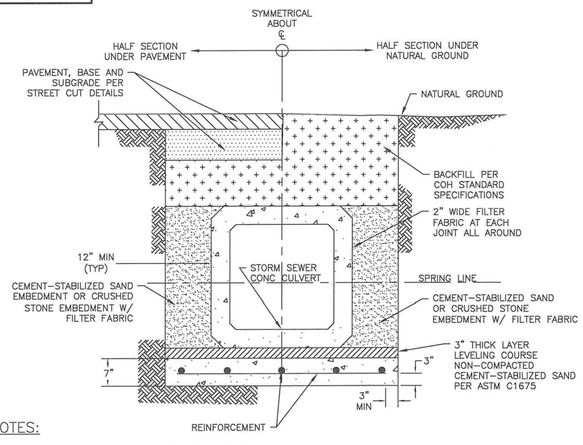
1. WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
2. ALTERNATIVE TRENCH BOTTOM TREATMENT MAY BE USED AS APPROVED BY THE CITY OF ENGINEERS AND AS PAID FOR IN THE PROPOSAL.

TABLE

CULVERT SIZE (FT)	FOUNDATION DEPTH(INCHES)
3' X 2' TO 6' X 6'	12
6' X 6' AND LARGER	18

PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR WET STABLE TRENCH
NTS

02317-07



NOTES:

1. WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
2. REINFORCED CONCRETE SLAB PIPE BEDDING TO BE PLACED IN DRY TRENCH ONLY.
3. CONCRETE IN SLAB TO REACH MIN COMPRESSIVE STRENGTH OF 1000 PSI BASED ON MAX DESIGN BEFORE PIPE IS LAID.
4. PRECAST SEAL SLAB MAYBE USED AS APPROVED BY CITY ENGINEER.

PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL WITH SEAL SLAB
NTS

NO.	DATE	REVISION	APP.

FIRM INFORMATION | ENGINEER'S SEAL

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STORM SEWER
02317-03 THROUGH 07

APPROVED BY: _____ CITY ENGINEER
APPROVED BY: _____ DEPUTY DIRECTOR
APPROVED BY: Carol Haddock DIRECTOR
EFFECTIVE DATE: JUL-01-2019
FOR CITY OF HOUSTON USE ONLY

SHEET NO.

KUO & ASSOCIATES
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD SANITARY SEWER AND STORM SEWER BEDDING & BACKFILL DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 94 OF 153	

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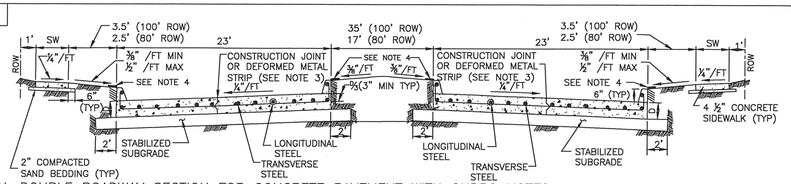
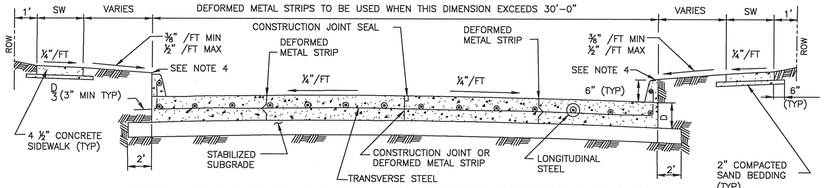
02751-01



TYPICAL DOUBLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS NOTES:

1. THE MAXIMUM WIDTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'-0".
2. ALL EARTHEN AREAS ARE TO BE HYDROMULCHED UNLESS SHOWN OTHERWISE ON DRAWINGS.
3. CONTRACTOR MAY SAW CUT IN LIEU OF DEFORMED METAL STRIP.
4. USE STRIP OF SOD GRASS TO PREVENT EROSION UNTIL STAND OF GRASS IS ESTABLISHED.
5. AN EQUAL OR LARGER AREA OF WELDED REINFORCEMENT BAR CONFORMING TO ASTM A497, MAY BE SUBSTITUTED FOR REBARS LISTED IN TABLE 1.
6. IF AVAILABLE ROW IS NOT SUFFICIENT TO ACCOMMODATE SIDEWALK WIDTH (SW) ACCORDING TO IDM REQUIREMENTS, ENGINEER SHALL OBTAIN A VARIANCE FROM THE CITY ENGINEER.



TYPICAL SINGLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS

TABLE 1

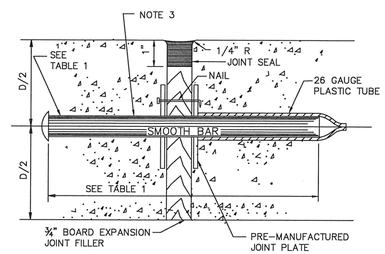
REINFORCING STEEL BAR SIZES AND SPACINGS FOR VARIOUS PAVEMENT THICKNESSES (D) WITH:
MAXIMUM TRANSVERSE CONTROL JOINT SPACING = 20'-0"
MAXIMUM EXPANSION JOINT SPACING = 80'-0"
fc' = 4,000 PSI/28 DAYS AND FY = 60,000 PSI

PAVEMENT THICKNESS D (IN)	PAVEMENT WIDTH (FT)	LONGITUDINAL STEEL # 4 BARS NUMBER OF BARS	# 4 BARS SPACING (IN)	# 4 BARS END BAR SPACING (IN)	# 5 BARS NUMBER OF BARS	# 5 BARS SPACING (IN)	# 5 BARS END BAR SPACING (IN)	# 6 BARS NUMBER OF BARS	# 6 BARS SPACING (IN)	# 6 BARS END BAR SPACING (IN)	TRANSVERSE STEEL # 4 BARS SPACING (IN)	# 5 BARS SPACING (IN)	# 6 BARS SPACING (IN)
6	28	17	20.50	4	–	–	–	–	–	–	36	–	–
7	25	17	18.25	4	–	–	–	–	–	–	36	–	–
7	35	24	18.00	3	–	–	–	–	–	–	36	–	–
7	36	25	17.75	3	–	–	–	–	–	–	36	–	–
7	37	25	18.25	3	–	–	–	–	–	–	36	–	–
7	41	28	18.00	3	–	–	–	–	–	–	36	–	–
7	45	31	17.75	3.75	–	–	–	–	–	–	36	–	–
8	25	20	15.50	2.75	13	24.50	3	–	–	–	36	36	–
8	34	27	15.50	2.50	17	25.00	4	–	–	–	36	36	–
8	35	27	16.00	2	18	24.25	4	–	–	–	36	36	–
8	36	28	15.75	3.25	18	25.00	3	–	–	–	30	36	–
8	44	24	15.75	4	22	24.75	4	–	–	–	30	36	–
8	45	35	15.75	2.25	23	24.25	3	–	–	–	30	36	–
9	25	22	14.00	3	14	22.50	4	–	–	–	36	36	–
9	34	31	13.50	2	19	22.25	3.50	–	–	–	30	36	–
9	35	31	13.75	3.75	20	21.75	3.50	–	–	–	30	36	–
9	36	32	13.75	3	21	21.25	3.50	–	–	–	30	36	–
9	44	39	13.75	2.75	25	21.75	3	–	–	–	24	36	–
9	45	39	14.00	4	26	21.25	4.50	–	–	–	24	36	–
10	25	24	12.75	3.5	17	18.25	4	–	–	–	36	36	36
10	34	33	12.50	4	21	20.00	4	–	–	–	30	36	36
10	35	34	12.50	3.75	23	18.75	4	–	–	–	30	36	36
10	36	35	12.50	3.5	24	18.50	3	–	–	–	30	36	36
10	44	44	12.00	4	29	18.50	4.50	–	–	–	24	36	36
10	45	44	12.50	3	29	19.00	3	–	–	–	24	36	36
11	25	27	11.25	3	17	18.25	4	12	26.75	3	36	36	36
11	34	36	11.50	2.75	24	17.50	2.5	17	25.00	4	24	36	36
11	35	37	11.50	3	24	18.00	3	17	25.75	4	24	36	36
11	36	40	11.00	2	25	17.75	3	17	26.50	4	24	36	36
11	44	48	11.125	2.5	30	18.00	3	21	26.00	4	24	36	36
11	45	49	11.125	3	31	17.75	4	22	25.50	3	24	36	36
12	25	–	–	–	19	16.25	4	13	24.50	3	36	36	36
12	34	–	–	–	26	16.00	4	18	23.50	4	24	36	36
12	35	–	–	–	26	16.50	4	19	23.00	3	24	36	36
12	36	–	–	–	27	16.25	4.5	20	22.25	4.5	24	36	36
12	44	–	–	–	33	16.25	4	24	22.50	5	24	30	36
12	45	–	–	–	35	15.75	3	25	22.25	3	24	30	36

MINIMUM LAP LENGTH (L):
A. # 4 BARS ; L = 22 INCHES
B. # 5 BARS ; L = 27 INCHES
C. # 6 BARS ; L = 32 INCHES

CONCRETE PAVEMENT DETAILS
NTS

02752-01



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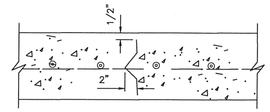
DOWEL TYPE EXPANSION JOINT
N.T.S.



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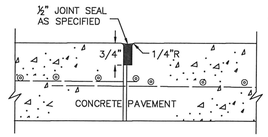
N.T.S.



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CONSTRUCTION JOINT SEAL
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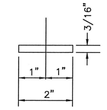
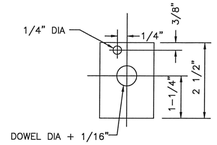


PLAN – JOINT PLATE



ELEVATION – JOINT PLATE
N.T.S.

NOTES:

1. STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS. UNITS TO BE SPACED ON 12" CENTRS.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS.
3. CENTER DOWEL HORIZONTALLY ON JOINT.
4. CENTER DOWEL VERTICALLY IN CONCRETE BASE. EXTEND THICKENED CONCRETE AS NEEDED TO MAINTAIN 3" MIN COVER.
5. CITY OF HOUSTON APPROVED PRODUCTS MAY BE USED AS JOINT PLATE ALTERNATIVE.

TABLE 1

PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12

PAVEMENT EXPANSION AND CONSTRUCTION JOINT DETAILS
NTS

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STREET PAVING AND SIDEWALK
02751-01 THROUGH 02752-01

APPROVED BY: _____ CITY ENGINEER
APPROVED BY: 9/17/2025 DEPUTY DIRECTOR
APPROVED BY: Carol Haddock DIRECTOR OF HOUSTON PUBLIC WORKS
EFFECTIVE DATE: JUL-01-2020
FOR CITY OF HOUSTON USE ONLY

SHEET NO.

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING • SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD STREET PAVING AND SIDEWALK DETAILS
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 95 OF 153	

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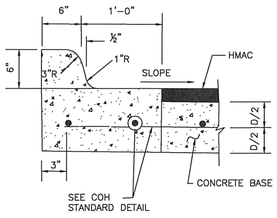
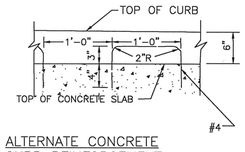
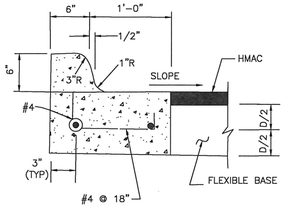
02771-01



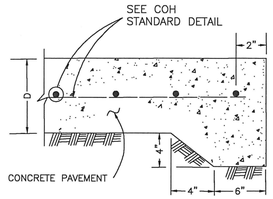
ESPLANADE CURB CONNECTED TO CONCRETE BASE



ALTERNATE CONCRETE CURB REINFORCEMENT



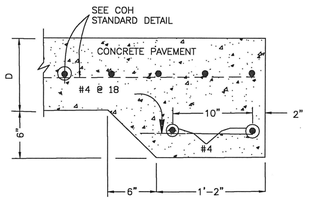
ESPLANADE CURB CONNECTED TO FLEXIBLE BASE



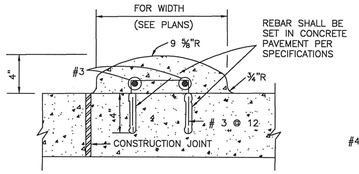
STANDARD CONCRETE PAVING HEADER

CONCRETE CURB

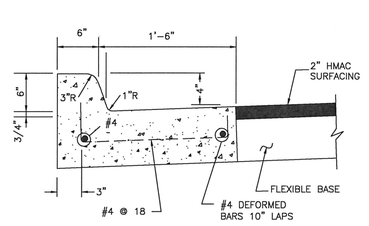
WHEN CONCRETE CURB IS TO BE PLACED EXISTING CONCRETE USE BASE #4 @ 18x10" LONG, DOWELED AND SET IN EPOXY GROUT, SET #4 DOWELS, 25" LONG AT 12" C-C WHEN PAVEMENT SECTION POURED.



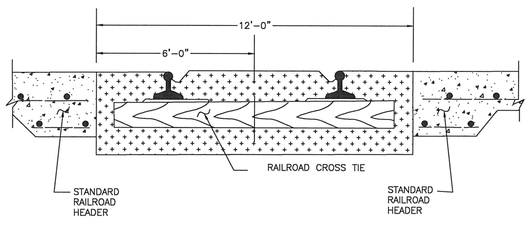
STANDARD RAILROAD HEADER



MOUNTABLE CURB



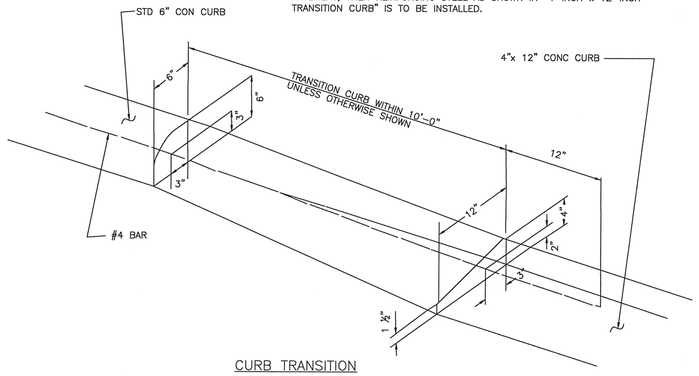
MONOLITHIC CURB AND GUTTER



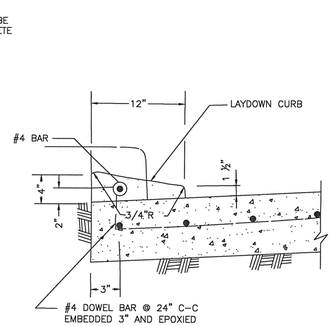
STANDARD RAILROAD CROSSING – SINGLE TRACK

4"x12" MONOLITHIC AND TRANSITION CURB NOTES:

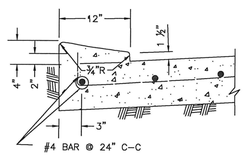
1. 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS NON-RESIDENTIAL STREETS, AND RESIDENTIAL STREETS.
2. TRANSITIONS FROM 6- INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10-FOOT TRANSITION CURB IS NOT POURED MONOLITHICALLY WITH THE PAVEMENT, THEN REINFORCING STEEL AS SHOWN IN "4-INCH x 12-INCH TRANSITION CURB" IS TO BE INSTALLED.



CURB TRANSITION



4-INCH x 12-INCH TRANSITION CURB



4-INCH x 12-INCH MONOLITHIC CURB

CURB, CURB AND GUTTER AND HEADER DETAILS
NTS

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STREET PAVING AND SIDEWALK
02771-01

APPROVED BY: _____ CITY ENGINEER
APPROVED BY: _____ DEPUTY DIRECTOR
APPROVED BY: _____ DIRECTOR OF HOUSTON PUBLIC WORKS
EFFECTIVE DATE: JUL-01-2020
FOR CITY OF HOUSTON USE ONLY

SHEET NO.

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

STANDARD STREET PAVING AND SIDEWALK DETAILS
SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 96 OF 153	

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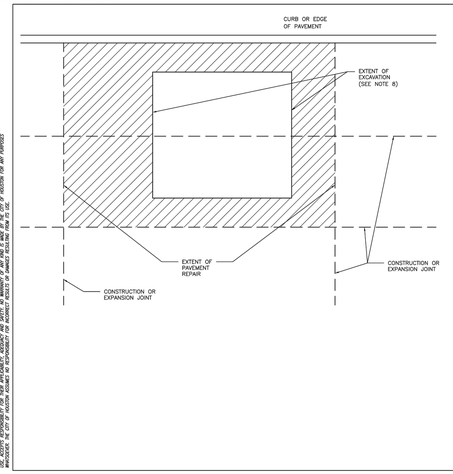

NOTES:

1. EXTENT OF PAVEMENT REPAIR SHALL BE PERPENDICULAR AND PARALLEL TO TRAVEL WAY.
2. REPLACE ENTIRE PANEL WIDTH AND LENGTH TO NEAREST CONSTRUCTION OR EXPANSION JOINT BEYOND EDGE OF EXCAVATION.
3. SAW CUT AND EXPOSE 15" OF REINFORCING STEEL WITHIN EXISTING PAVEMENT. PROVIDE HORIZONTAL DOWELS (PER SPECIFICATION SECTION 02951-PAVEMENT REPAIR AND RESTORATION) IF EXISTING REINFORCING IS BROKEN OFF.
4. REPLACE CURB WHEN ADJACENT LANE IS REPLACED.
5. MAINTAIN EXPANSION JOINTS AT EXISTING LOCATIONS UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
6. SPECIALTY PAVEMENTS (IE: BRICK PAVERS) TO BE REPLACED WITH MATCHING PAVEMENT IN ALL CASES.
7. REPLACE PAVEMENT MARKINGS IN ACCORDANCE WITH CITY OF HOUSTON STANDARD SPECIFICATIONS 02764-RAISED PAVEMENT MARKERS AND 02767-THERMOPLASTIC PAVEMENT MARKINGS.
8. EXTENT OF EXCAVATION INCLUDES 18" OVERCUT AS SHOWN ON STANDARD DETAIL 02951-04 PAVEMENT REPAIR DETAIL FOR STREET CUTS (FLEX-BASE PAVEMENT & CONCRETE PAVEMENT).

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET CUT FOR CONCRETE PAVEMENT REPLACEMENT/RESTORATION AGE OF PAVEMENT ≤ 5YRS
(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 DWG NO: 02951-01

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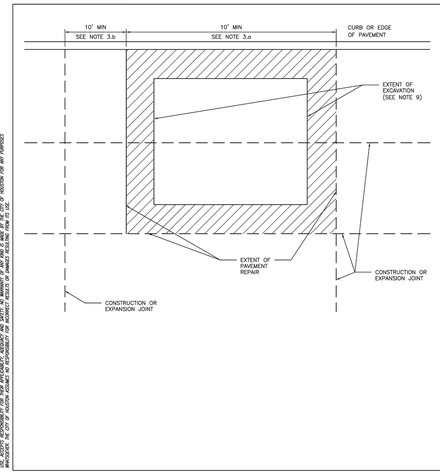

NOTES:

1. EXTENT OF PAVEMENT REPAIR SHALL BE PERPENDICULAR AND PARALLEL TO TRAVEL WAY.
2. WIDTH:
   REPLACE PANEL WIDTH TO NEAREST CONSTRUCTION OR EXPANSION JOINT BEYOND EDGE OF EXCAVATION.
3. LENGTH:
   a. MINIMUM LENGTH OF PAVEMENT REPAIR ALONG TRAVEL WAY IS 10' FROM THE NEAREST JOINT.
   b. IF EXTENT OF PAVEMENT REPAIR IS LESS THAN 10' FROM EXISTING CONSTRUCTION OR EXPANSION JOINT, EXTEND PAVEMENT REPAIR TO EXISTING JOINT.
4. SAW CUT AND EXPOSE 15" OF REINFORCING STEEL AROUND EDGE OF PANEL REPLACEMENT. PROVIDE HORIZONTAL DOWELS (PER SPECIFICATION SECTION 02951-PAVEMENT REPAIR AND RESTORATION) IF REINFORCING IS BROKEN OFF OR DOES NOT EXIST.
5. REPLACE CURB WHEN ADJACENT LANE IS REPLACED.
6. MAINTAIN EXPANSION JOINTS AT EXISTING LOCATIONS UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
7. SPECIALTY PAVEMENTS (IE: BRICK PAVERS) TO BE REPLACED WITH MATCHING PAVEMENT IN ALL CASES.
8. REPLACE PAVEMENT MARKINGS IN ACCORDANCE WITH CITY OF HOUSTON STANDARD SPECIFICATIONS 02764-RAISED PAVEMENT MARKERS AND 02767-THERMOPLASTIC PAVEMENT MARKINGS.
9. EXTENT OF EXCAVATION INCLUDES 18" OVERCUT AS SHOWN ON STANDARD DETAIL 02951-04 PAVEMENT REPAIR DETAIL FOR STREET CUTS (FLEX-BASE PAVEMENT & CONCRETE PAVEMENT).

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET CUT FOR CONCRETE PAVEMENT REPLACEMENT/RESTORATION AGE OF PAVEMENT > 5YRS
(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 DWG NO: 02951-02

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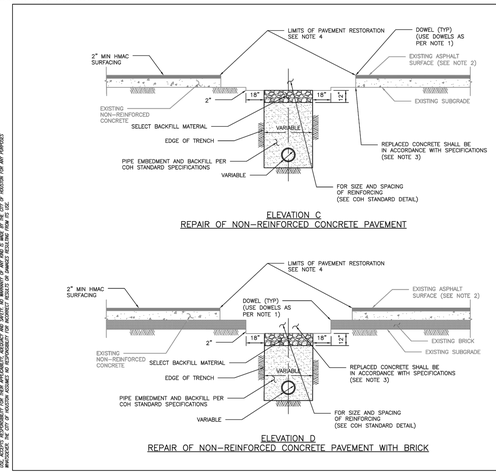

ELEVATION C
REPAIR OF NON-REINFORCED CONCRETE PAVEMENT

ELEVATION D
REPAIR OF NON-REINFORCED CONCRETE PAVEMENT WITH BRICK

NOTES:

1. EXPOSE 15" OF REINFORCING STEEL AT PROPOSED SAWED JOINT. IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE #6 BAR, 24" LONG, 24" C-C, DRILLED AND EMBEDDED 8" INTO THE CENTER OF THE EXISTING SLAB. WITH "PO ROC" OR EQUAL.
2. IF REINFORCED CONCRETE IS OVERLAYED REPLACE WITH SAME THICKNESS OF HMAC SURFACING.
3. REFER TO STANDARD DETAIL 02751-01 FOR REINFORCING STEEL REQUIREMENT.
4. REFER TO STANDARD DETAILS 02951-01 THROUGH 03 FOR PAVEMENT RESTORATION LIMITS.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PAVEMENT REPAIR DETAIL
FOR STREET CUTS
(NON-REINFORCED CONCRETE & BRICK PAVEMENT)
(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 DWG NO: 02951-05

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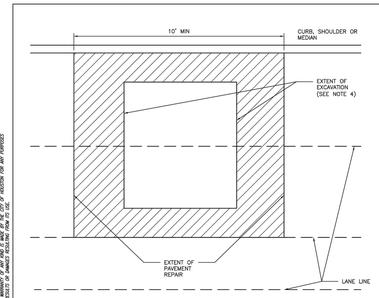

NOTES:

1. EXTENT OF PAVEMENT REPAIR SHALL BE PERPENDICULAR AND PARALLEL TO TRAVEL WAY.
2. FLEXIBLE BASE: REPLACE BASE TO SAME THICKNESS PLUS TWO INCHES (2") FOR EXTENT OF EXCAVATION. USE APPROVED BASE MATERIAL TYPE.*
3. SURFACE COURSE:
   3.1. WIDTH:
   SURFACE MILL AND OVERLAY FULL WIDTH OF LANE(S) TO NEAREST LANE DIVIDER BEYOND EDGE OF EXCAVATION.
   3.2. LENGTH:
   MINIMUM LENGTH OF SURFACE MILL ALONG TRAVEL WAY IS 10'.
   3.3. REPLACE PAVEMENT MARKINGS IN ACCORDANCE WITH CITY OF HOUSTON STANDARD SPECIFICATIONS 02764-RAISED PAVEMENT MARKERS AND 02767-THERMOPLASTIC PAVEMENT MARKINGS.
4. EXTENT OF EXCAVATION INCLUDES 18" OVER CUT AS SHOWN ON STANDARD DETAIL 02951-04 PAVEMENT REPAIR DETAIL FOR STREET CUTS (FLEX-BASE PAVEMENT AND CONCRETE PAVEMENT).
5. ADDITIONAL REQUIREMENTS FOR ASPHALT OVERLAY ON CONCRETE PAVEMENT:
   5.1. REPLACE CONCRETE FOR EXTENT OF EXCAVATION. REPLACE TO SAME THICKNESS PLUS TWO INCHES (2").
   5.2. WIDTH:
   5.2.1. IF EXCAVATION EXTENDS MORE THAN HALF OF A LANE, REPLACE ENTIRE LANE OF CONCRETE. OTHERWISE USE STANDARD DETAIL 02951-04 THROUGH 05.
   5.3. SAW CUT AND EXPOSE 15" OF REINFORCING STEEL AROUND EDGE OF CONCRETE REPLACEMENT. IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS PER CITY OF HOUSTON STANDARD SPECIFICATION SECTION 02951-PAVEMENT REPAIR AND RESTORATION.
   5.4. REPLACE CURB WHEN ADJACENT LANE IS REPLACED.
   5.5. MAINTAIN CONCRETE EXPANSION JOINTS AT EXISTING LOCATIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET CUT FOR ASPHALT PAVEMENT REPLACEMENT/RESTORATION FOR PAVEMENT OF ALL AGES
(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 DWG NO: 02951-03

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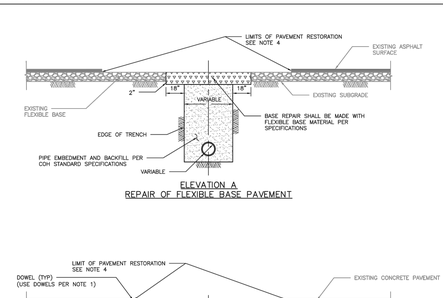
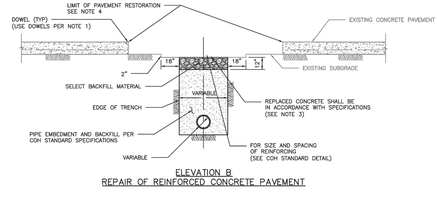


ELEVATION A
REPAIR OF FLEXIBLE BASE PAVEMENT



ELEVATION B
REPAIR OF REINFORCED CONCRETE PAVEMENT

NOTES:

1. EXPOSE 15" OF REINFORCING STEEL AT PROPOSED SAWED JOINT. IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE #6 BAR, 24" LONG, 24" C-C, DRILLED AND EMBEDDED 8" INTO THE CENTER OF THE EXISTING SLAB. WITH "PO ROC" OR EQUAL.
2. IF REINFORCED CONCRETE IS OVERLAYED WITH ASPHALT, REPLACE WITH 2" MIN HMAC SURFACING.
3. REFER TO STANDARD DETAIL 02751-01 FOR REINFORCING STEEL REQUIREMENTS.
4. REFER TO STANDARD DETAIL 02951-01 THROUGH 03 FOR PAVEMENT RESTORATION LIMITS.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PAVEMENT REPAIR DETAIL
FOR STREET CUTS
(FLEX-BASE PAVEMENT & CONCRETE PAVEMENT)
(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 DWG NO: 02951-04

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NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

COH STANDARD STREET CUT PAVEMENT REPLACEMENT DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 97 OF 153	

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DESCRIPTION AND APPLICATION OF PAVEMENT MARKING LINES				
LINE SERIES	COLOR	DESCRIPTION	WIDTH (INCHES)	TYPICAL APPLICATIONS
WB	WHITE	BROKEN (10' STRIPE W/30' GAP)	4"	LANE LINES BETWEEN TRAVEL LANES IN THE SAME DIRECTION WHERE CHANGING OF LANES IS PERMITTED.
WS	WHITE	SOLID	4"	EDGE LINES TO DELINEATE THE RIGHT EDGE OF THE ROADWAY.
			6"	LEFT EDGE OF BICYCLE LANE AND LANE LINES BETWEEN TRAVEL LANES IN THE SAME DIRECTION WHERE CHANGING OF LANES IS DISCOURAGED.
			12"	PERPENDICULAR CROSSWALK LINES.
			24"	STOP BARS AT INTERSECTIONS (SIGNALIZED AND UNSIGNALIZED).
				HATCHING AT HIGH VISIBILITY CROSSWALKS.
			12", 24"	DIAGONAL HATCHING USED IN GORES BETWEEN SAME DIRECTION OF TRAVEL LANES.
WG	WHITE	GUIDE (2' STRIPE W/6' GAP)	6"	GUIDE LINES THROUGH INTERSECTIONS.
				TAPER LINES FOR TURN LANES.
				GUIDE LINES FOR BICYCLE LANES.
YS	YELLOW	SOLID	4"	EDGE LINES TO DELINEATE THE LEFT EDGE OF A DIVIDED ROADWAY, A ONE-WAY ROAD, OR RAMP.
			6"	BIDIRECTIONAL BICYCLE LANE PAVEMENT MARKING.
			12", 24"	DIAGONAL HATCHING USED IN GORES BETWEEN OPPOSING DIRECTION OF TRAVEL LANES.
YDS	YELLOW	DOUBLE SOLID	4" – (4") – 4" (GAP)	CENTERLINE THAT SEPARATES OPPOSING TRAVEL LANES AND DELINEATION OF MEDIAN ISLANDS.
YDB	YELLOW	DOUBLE BROKEN	4" – (4") – 4" (GAP)	DEFINES THE EDGES OF CENTER REVERSIBLE LANES THAT ARE USED AS TWLTLS DURING INTERMITTENT PERIODS.
YB	YELLOW	BROKEN (10' STRIPE W/30' GAP)	4"	SEPARATES TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS OF TRAVEL.
YB (BIKE)	YELLOW	BROKEN (3' STRIPE W/9' GAP)	4"	SEPARATES BICYCLE TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS OF TRAVEL.
YSB	YELLOW	SOLID & BROKEN BROKEN (10' STRIPE W/30' GAP)	4" – (4") – 4" (GAP)	SEPARATES TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN ONE DIRECTION AND PROHIBITED IN THE OPPOSITE DIRECTION.
				USED FOR EDGE OF TWO-WAY LEFT TURN LANES (TWLTL).
BICYCLE GREEN	GREEN	SOLID COLORED PAVEMENT	VARIES	PED/BIKE CROSSING
				VEHICLE / BIKE / CONFLICT AREA
YIELD LINE	WHITE	TRIANGLE	16" x 24"	MID-BLOCK CROSSING.

DESCRIPTION AND APPLICATION OF REFLECTIVE RAISED PAVEMENT MARKERS (RPM)			
RRPM TYPES	COLOR	COH SPEC. REF. 32764 EQUIVALENT	DESCRIPTION
C	CLEAR	TYPE II-C	APPROACH FACE THAT REFLECTS WHITE LIGHT, AND THE OTHER SIDE DOES NOT REFLECT.
R	CLEAR & RED	TYPE II-C-R	APPROACH FACE THAT REFLECTS WHITE LIGHT, AND THE OTHER SIDE REFLECTS RED LIGHT.
A	AMBER & AMBER	TYPE II-A-A	APPROACH FACE AND THE OTHER SIDE BOTH REFLECT AMBER LIGHT.

LINE STYLE DESIGNATION : YSB4 – A40/A40

- COLOR
- PATTERN
- WIDTH OF STRIPE
- RPM SPACING
- RPM TYPE
- RPM SPACING
- RPM TYPE

GENERAL PAVEMENT MARKING NOTES:

1. PRIOR TO START OF CONSTRUCTION, ALL EXISTING PAVEMENT MARKINGS WITHIN THE AREA OF CONSTRUCTION SHALL BE INVENTORIED AND DOCUMENTED BY THE CITY TRAFFIC ENGINEER AND THE CONTRACTOR. THIS DOCUMENT WILL BE JOINTLY SIGNED BY BOTH PARTIES REFLECTING ALL EXISTING PAVEMENT MARKINGS AND LANE CONFIGURATIONS WILL BE DUPLICATED AGAIN. THIS REVIEW CAN BE DONE IN CONJUNCTION WITH SIGN INVENTORY. THE CONTRACTOR IS HELD ACCOUNTABLE FOR EXISTING AND TEMPORARY CONSTRUCTION PAVEMENT MARKINGS THROUGHOUT THE PROJECT AND AT THE PROJECT'S COMPLETION.
2. ALL PAVEMENT MARKINGS SHALL CONFORM TO CITY OF HOUSTON STANDARDS AND SPECIFICATIONS AND GENERAL GUIDELINES OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
3. THE PERMANENT PAVEMENT MARKINGS MAY BE MODIFIED AS DIRECTED BY THE CITY TRAFFIC ENGINEER.
4. THE DESIGN SPEED FOR THE ROAD IS: _____ THE POSTED SPEED LIMIT IS: _____
5. ALL LANE DIMENSIONS ARE FROM CENTER OF LANE LINE, CENTER OF DOUBLE LANE LINE, FACE OF CURB, OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
6. THE PAVEMENT MARKING DRAWINGS ARE SCHEMATIC ONLY. THE CONTRACTOR SHALL FOLLOW ALL DIMENSIONS, DETAILS, AND STANDARDS WHEN INSTALLING PAVEMENT MARKINGS AND SYMBOLS.
7. THE FINAL LONGITUDINAL STRIPINGS SHALL BE 60 MIL (0.060") THICK HOT-SPRAYED THERMOPLASTIC PLACED OVER THE TEMPORARY STRIPING WITHIN 14 TO 30 CALENDAR DAYS AFTER COMPLETION OF THE FINAL PAVEMENT SURFACE, OR AS DIRECTED BY THE CITY TRAFFIC ENGINEER. WHERE THE FINAL SURFACE COURSE IS PLACED IN MORE THAN ONE LIFT, AT THE SAME TIME, TEMPORARY STRIPING SHALL BE WATER BASED PAINT.
8. ALL FINAL TRANSVERSE MARKINGS SHALL BE 90 MIL (0.090") HOT-SPRAYED THERMOPLASTIC. ALL PAVEMENT ARROWS AND LEGENDS SHALL ALSO BE 90 MIL (0.090") HOT-SPRAYED THERMOPLASTIC. PREFORMED THERMOPLASTIC APPLICATIONS MAY BE USED IF ONLY APPROVED BY THE CITY TRAFFIC ENGINEER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LAYOUT AND INSTALLATION OF PAVEMENT MARKINGS OF FINAL SURFACE COURSE FOLLOWING CONTROL POINTS THAT HAVE BEEN SET NO MORE THAN 50 FEET APART ALONG THE LINES TO BE IMPLEMENTED. IN TANGENT SECTIONS OF A ROAD WHERE THE PAVEMENT MARKING PATTERN DOES NOT CHANGE, CONTROL POINTS MAY BE SET AT GREATER SPACING. THE LAYOUT AND INSPECTION OF ALL PAVEMENT MARKINGS SHALL BE APPROVED BY CITY OF HOUSTON REPRESENTATIVE PRIOR TO THE APPLICATION OF MATERIALS.
10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE FINAL SURFACE COURSE IS PLACED SO THAT THE STRIPING IS OFFSET NO MORE THAN ONE FOOT CLEAR OF THE CONSTRUCTION JOINT, UNLESS OTHERWISE DIRECTED BY THE CITY TRAFFIC ENGINEER.
11. ALL RAISED PAVEMENT MARKERS (RPM) SHALL BE INSTALLED SO THAT THE REFLECTIVE FACE OF EACH MARKER IS FACING THE DIRECTION OF TRAFFIC AND IS PERPENDICULAR TO THE DIRECTION OF TRAFFIC FLOW. TYPE C PAVEMENT MARKERS SHALL BE INSTALLED SO THAT THE CLEAR FACE OF EACH MARKER IS FACING THE APPROACHING TRAFFIC FLOW AND PERPENDICULAR TO THE DIRECTION OF TRAFFIC FLOW.
12. ALL REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED IN ACCORDANCE TO CITY OF HOUSTON STANDARD SPECIFICATION 02782 - APPLYING OVER EXISTING PAVEMENT MARKINGS DOES NOT CONSTITUTE AS APPROVED OBLITERATION METHOD.
13. THE ENGINEER OF RECORD SHALL BE REQUIRED TO PRODUCE AS-BUILT OF PAVEMENT MARKING PLANS WITHIN 30 DAYS AFTER COMPLETION OF PAVEMENT MARKING INSTALLATION.
14. RPM'S (RPM) MAY BE PLACED ADJACENT TO FIRE HYDRANTS WITH THE APPROVAL OF THE CITY TRAFFIC ENGINEER.
15. FOR ALL CONSTRUCTION, ALL PAVEMENT MARKINGS AND SIGNING SHALL BE INSTALLED AND SHALL BE PAID BY THE PROJECT OWNER/DEVELOPER.
16. FINAL INSPECTION AND ACCEPTANCE OF PAVEMENT MARKINGS SHALL BE PERFORMED BY TRANSPORTATION & DRAINAGE OPERATION REPRESENTATIVE (713-803-3054).

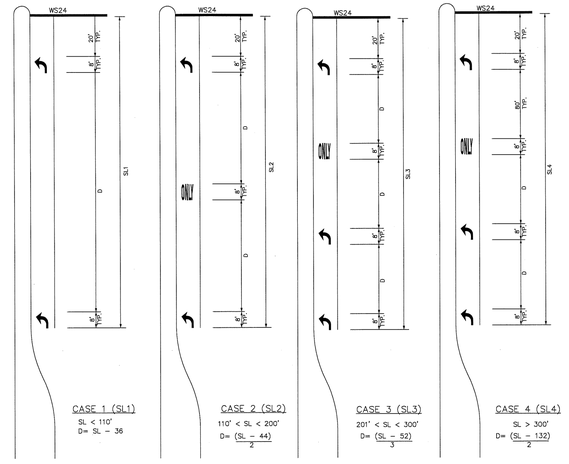
APPROVED BY:	APPROVED BY:
Suhail Faruqui	Hadi Hashemi
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY:	
Carol Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO. 02760-01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PAVEMENT MARKINGS GENERAL NOTES AND LEGENDS

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE



CASE 1 (SL1)
SL < 110'
D= SL – 36

CASE 2 (SL2)
110' < SL < 200'
D= (SL – 44) / 2

CASE 3 (SL3)
201' < SL < 300'
D= (SL – 52) / 3

CASE 4 (SL4)
SL > 300'
D= (SL – 132) / 2

KEY (FOR TURN LANES ONLY):

SL – STORAGE LENGTH (FEET)

D – DISTANCE BETWEEN ARROWS AND/OR WORDS (FEET)

GENERAL NOTES:

1. ALL CASES AND DETAILS ALSO APPLY TO RIGHT-TURN LANES.
2. FOR DUAL-TURN LANES, DIMENSIONS SHALL BE THE SAME FOR EACH LANE.
3. SL DIMENSION IS FROM BACK OF STOP LINE TO END OF TURN LANE. NOTE: DO NOT INCLUDE TAPER LENGTH.
4. PAVEMENT ARROWS AND "ONLY" LEGEND MARKINGS ARE TYPICALLY USED AT ALL SIGNALIZED INTERSECTIONS AND AT ALL UNSIGNALIZED INTERSECTIONS THAT HAVE TURN LANES.
5. MINIMUM SL= 100'. SL MAY BE LESS THAN 100 FEET ONLY BY APPROVAL OF THE CITY TRAFFIC ENGINEER.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LEFT/RIGHT-TURN "ONLY" AND ARROW SPACING

(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-02

APP.	REVISION	NO.	DATE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD PAVEMENT MARKING – (WORDS)

(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-03

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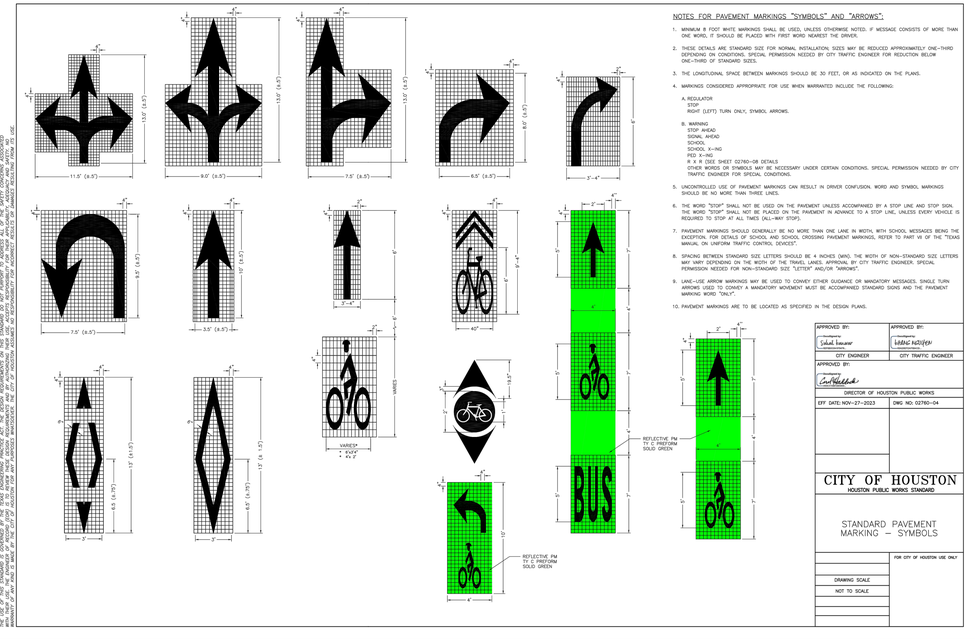

NOTES FOR PAVEMENT MARKINGS "SYMBOLS" AND "ARROWS":

1. MINIMUM 8 FOOT WHITE MARKINGS SHALL BE USED, UNLESS OTHERWISE NOTED. IF MESSAGE CONSISTS OF MORE THAN ONE WORD, IT SHOULD BE PLACED WITH FIRST WORD NEAREST THE DRIVER.
2. THESE DETAILS ARE STANDARD SIZE FOR NORMAL INSTALLATION. SIZES MAY BE REDUCED APPROXIMATELY ONE-THIRD DEPENDING ON CONDITIONS. SPECIAL PERMISSION NEEDED BY CITY TRAFFIC ENGINEER FOR REDUCTION BELOW ONE-THIRD OF STANDARD SIZES.
3. THE LONGITUDINAL SPACE BETWEEN MARKINGS SHOULD BE 30 FEET, OR AS INDICATED ON THE PLANS.
4. MARKINGS CONSIDERED APPROPRIATE FOR USE WHEN WARRANTED INCLUDE THE FOLLOWING:

   A. REGULATOR
   STOP
   RIGHT (LEFT) TURN ONLY, SYMBOL ARROWS.

   B. WARNING
   STOP AHEAD
   SIGNAL AHEAD
   SCHOOL
   SCHOOL X-ING
   PED X-ING
   X X R (SEE SHEET S3780-09 DETAILS
   OTHER LEGENDS OR SYMBOLS MAY BE NECESSARY UNDER CERTAIN CONDITIONS. SPECIAL PERMISSION NEEDED BY CITY TRAFFIC ENGINEER FOR SPECIAL CONDITIONS.
5. UNCONTROLLED USE OF PAVEMENT MARKINGS CAN RESULT IN DRIVER CONFUSION. WORD AND SYMBOL MARKINGS SHOULD BE NO MORE THAN THREE LINES.
6. THE WORD "STOP" SHALL NOT BE USED ON THE PAVEMENT UNLESS ACCOMPANIED BY A STOP LINE AND STOP SIGN. THE WORD "STOP" SHALL NOT BE PLACED ON THE PAVEMENT IN ADVANCE TO A STOP LINE, UNLESS EVERY VEHICLE IS REQUIRED TO STOP AT ALL TIMES (ALL-WAY STOP).
7. PAVEMENT MARKINGS SHOULD GENERALLY BE NO MORE THAN ONE LANE IN WIDTH, WITH SCHOOL MESSAGES BEING THE EXCEPTION. FOR DETAILS OF SCHOOL AND SCHOOL CROSSING PAVEMENT MARKINGS, REFER TO PART VII OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
8. SPACING BETWEEN STANDARD SIZE LETTERS SHOULD BE 4 INCHES (MIN). THE WIDTH OF NON-STANDARD SIZE LETTERS MAY VARY DEPENDING ON THE WIDTH OF THE TRAVEL LANES. APPROVAL BY CITY TRAFFIC ENGINEER. SPECIAL PERMISSION NEEDED FOR NON-STANDARD SIZE "LETTER" AND/OR "ARROWS".
9. LANE-USE ARROW MARKINGS MAY BE USED TO CONVEY EITHER GUIDANCE OR MANDATORY MESSAGES. SINGLE TURN ARROWS USED TO CONVEY A MANDATORY MOVEMENT MUST BE ACCOMPANIED STANDARD SIGNS AND THE PAVEMENT MARKING WORD "ONLY".
10. PAVEMENT MARKINGS ARE TO BE LOCATED AS SPECIFIED IN THE DESIGN PLANS.

APPROVED BY:	APPROVED BY:
Suhail Faruqui	Hadi Hashemi
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY:	
Carol Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO. 02760-04

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STANDARD PAVEMENT MARKING – SYMBOLS

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ENGINEERING + SURVEYING
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713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
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ON 09/22/2025
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

COH STANDARD PAVEMENT MARKING DETAILS SHEET 1 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 98 OF 153	

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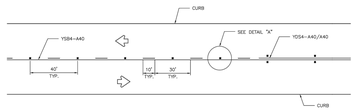
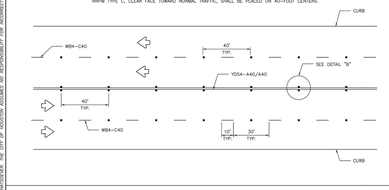
CENTERLINE & FOR ALL TWO LANE STREETS WITH PASSING ZONE



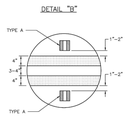
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY STREETS

RRPM TYPE C, CLEAR FACE TOWARD NORMAL TRAFFIC, SHALL BE PLACED ON 40-FOOT CENTERS.

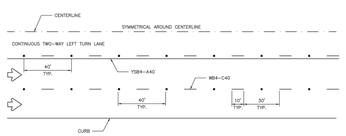


DETAIL "A"

DETAIL "B"

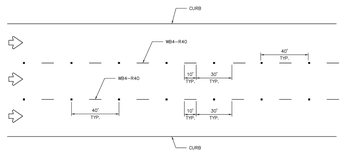


CENTERLINE & LANE LINES FOR TWO-WAY LEFT TURN LANE

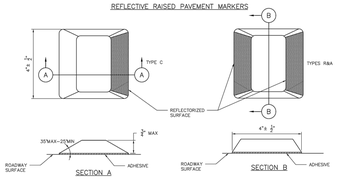


LANE LINES FOR ONE-WAY MULTILANE STREET

RRPM TYPE R SHALL HAVE CLEAR FACE TOWARD NORMAL TRAFFIC AND RED FACE TOWARD WRONG-WAY TRAFFIC.



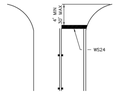
REFLECTIVE RAISED PAVEMENT MARKERS



GENERAL NOTES:

1. EDGELINE ADJACENT TO CURB AND GUTTER IS NOT REQUIRED IN ALL CASES, HOWEVER SHALL BE PLACED AS DIRECTED BY CITY TRAFFIC ENGINEER.
2. THE TRAVELED WAY INCLUDES ONLY THAT PORTION OF THE ROADWAY USED FOR VEHICULAR TRAVEL AND NOT THE PARKING LANES, SIDEWALKS, BERMS AND SHOULDERS. THE TRAVELED WAY SHALL BE MEASURED FROM THE INSIDE OF EDGELINE TO INSIDE OF EDGELINE OF A TWO LANE ROADWAY.
3. ALL RAISED PAVEMENT MARKERS PLACED IN BROKEN LANE LINES SHALL BE PLACED IN LINE WITH AND MIDWAY BETWEEN THE STRIPES.
4. ON CONCRETE PAVEMENTS THE RAISED PAVEMENT MARKERS SHOULD BE PLACED TO ONE SIDE OF THE LONGITUDINAL JOINTS.
5. ALL PAVEMENT MARKING MATERIAL SHALL MEET THE REQUIRED MATERIAL SPECIFICATIONS AS SPECIFIED BY CITY OF HOUSTON STANDARD SPECIFICATIONS.

GUIDE FOR PLACEMENT OF STOP LINES & CENTERLINE



APPROVED BY:	APPROVED BY:
CITY ENGINEER	CITY TRAFFIC ENGINEER

APPROVED BY:
DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: NOV-27-2023 | DWG NO: 02760-05

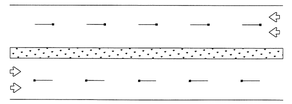
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE

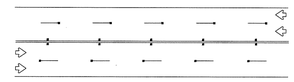
FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

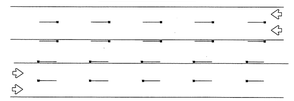
LANE LINES FOR DIVIDED STREET



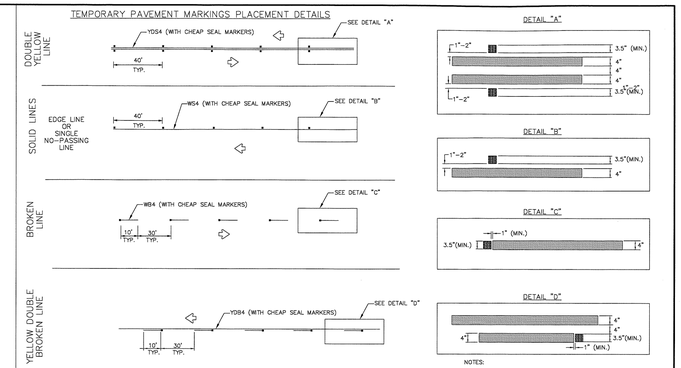
LANE & CENTER LINES FOR MULTILANE UNDIVIDED STREETS



TWO-WAY LEFT TURN LANE



TEMPORARY PAVEMENT MARKINGS PLACEMENT DETAILS



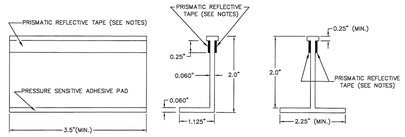
DETAIL "A"

DETAIL "B"

DETAIL "C"

DETAIL "D"

TEMPORARY CHIP SEAL MARKER DETAIL



NOTES:

1. YELLOW MARKERS SHALL HAVE YELLOW BODIES AND YELLOW REFLECTIVE TAPE.
2. WHITE MARKERS SHALL HAVE WHITE BODIES AND WHITE REFLECTIVE TAPE.
3. ONE-WAY OR TWO-WAY REFLECTIVE SHALL BE USED AS NECESSARY FOR APPLICATION.
4. THE CLEAR PLASTIC COVER MAY VARY FROM ONE MANUFACTURER TO ANOTHER IF DEEMED NECESSARY BY SPECIFIC PROJECT.
5. ALL TEMPORARY PAVEMENT MARKERS SHALL BE PLACED WITH REFLECTIVE SIDE FACING ON COMING TRAFFIC.
6. ALL TEMPORARY STRIPING SHALL BE WATER BASED PAINT.

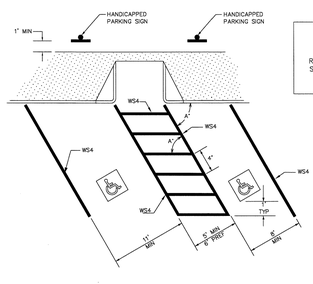
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

REFLECTIVE CHIP SEAL MARKER USE FOR TEMPORARY MARKINGS
(NOT TO SCALE)

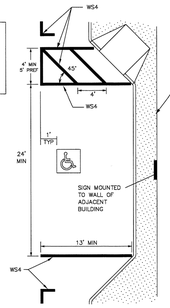
CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-06

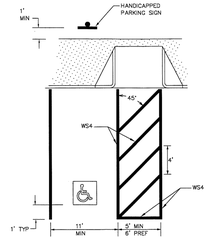
NO.	DATE	REVISION	APP.

TYPICAL ACCESSIBLE PARKING SPACE DIMENSIONS



RAMP DETAILS ARE AS SHOWN ELSEWHERE IN THE PLANS.
REFER TO CITY OF HOUSTON STANDARDS ON WHEELCHAIR RAMP CRITERIA.

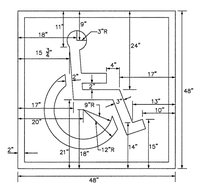




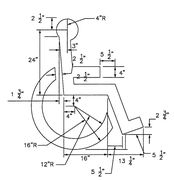
NOTES:

1. ALL PARKING SPACE LIMIT LINES SHALL BE 4", WS4.
2. AISLE MARKINGS SHOWN ARE EXAMPLES ONLY. OTHER METHODS TO INDICATE A NO PARKING AREA ARE ACCEPTABLE. AISLE MARKINGS SHALL BE WHITE.
3. DIMENSIONS OF LIMIT LINES, AISLE MARKINGS, AND SYMBOL (WITH OR WITHOUT BACKGROUND) MAY VARY ± 10%.
4. PAVEMENT MARKING SYMBOLS (WITH BACKGROUND):
   A) ARE REQUIRED UNLESS STATED ELSEWHERE IN THE PLANS,
   B) SHOULD BE PLACED TOWARD THE FAR END OF THE PARKING SPACES SO AS TO BE VISIBLE TO MOTORISTS IN THE TRAVEL LANE,
   C) MAY BE PAINTED OR PREFABRICATED MATERIAL, AND
   D) SHALL BE 30"x 30" MINIMUM.
5. WITH APPROVAL OF THE CITY TRAFFIC ENGINEER, PREFABRICATED PAVEMENT MARKING SYMBOLS WITH BACKGROUND OF OTHER DIMENSIONS EXCEEDING THE 30"x 30" MINIMUM MAY BE USED. ALTERNATIVE DESIGNS SHALL INCLUDE A PROPORTION SIZED SYMBOL OF ACCESSIBILITY, AND SHALL CONFORM TO THE ILLUSTRATED COLORS FOR BACKGROUND, SYMBOL AND BORDER.
6. ALL SLOPE IN AND AROUND EXPECTED WHEELCHAIR PATH SHALL NOT EXCEED ADA REQUIREMENTS FOR WHEELCHAIR RAMPS.
7. REFER TO CITY OF HOUSTON TRAFFIC SIGN STANDARDS FOR HANDICAPPED PARKING SIGN DETAILS.
8. NOTE THAT ANGLED PARKING ON PUBLIC ROADWAYS REQUIRE CITY COUNCIL APPROVAL BEFORE IMPLEMENTATION.

HANDICAPPED PAVEMENT MARKING SYMBOLS



WITH BACKGROUND
SYMBOL & BORDER: WHITE
BACKGROUND: BLUE



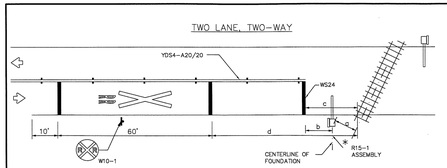
SYMBOL ONLY
SYMBOL: BLUE OR WHITE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

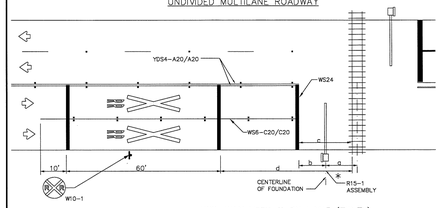
PAVEMENT MARKINGS FOR ACCESSIBLE PARKING
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-07

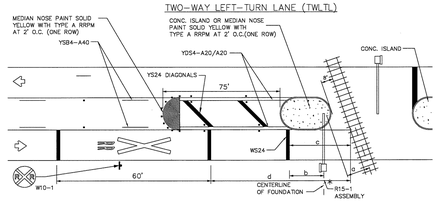
TWO LANE, TWO-WAY



UNDIVIDED MULTILANE ROADWAY



TWO-WAY LEFT-TURN LANE (TWLTL)



a = 12 FEET MINIMUM, 15 FEET USUAL, IF ACTIVE WARNING DEVICES ARE PRESENT, DISTANCE "a" SHOULD BE MEASURED FROM THE CENTERLINE OF * R15-1 ASSEMBLY TO THE CENTER-LINE OF NEAREST TRACK.

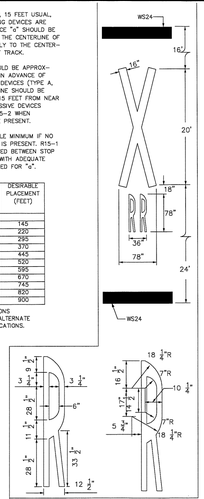
b = STOP LINES SHOULD BE APPROX-IMATELY 8 FEET IN ADVANCE OF ACTIVE WARNING DEVICES (TYPE A, E OR F). STOP LINE SHOULD BE APPROXIMATELY 15 FEET FROM NEAR RAIL IF ONLY PASSIVE DEVICES (R15-1, PLUS R15-2 WHEN APPLICABLE) ARE PRESENT.

c = 15 FEET DESIRABLE MINIMUM IF NO GATE OR SIGNAL IS PRESENT. R15-1 SHOULD BE PLACED BETWEEN STOP LINE AND RAILS WITH ADEQUATE DISTANCE PROVIDED FOR "a".

* d =

APPROACH SPEED (MPH)	DESIRABLE PLACEMENT (FEET)
20	145
25	220
30	295
35	370
40	445
45	520
50	595
55	670
60	745
65	820
70	900

* LOCAL CONDITIONS MAY REQUIRE ALTERNATE PLACEMENT LOCATIONS.



NOTES:

1. THE PAVEMENT MARKINGS ON AN APPROACH TO A RAILROAD GRADE CROSSING SHALL CONSISTS OF:
   A) THE RR X-ING SYMBOL,
   B) THREE TRANSVERSE 24" LINES, AND
   C) LANE LINES. A SOLID NO PASSING LINE FOR TWO-WAY TRAFFIC APPROACHES, OR SOLID LAND LINES FOR MULTILANE APPROACHES.
2. FOR BIDDING PURPOSES, THE RR X-ING SYMBOL WILL BE MEASURED AND PAID FOR AS FOR EACH (EA) LANE IN PLACE. THE TRANSVERSE MARKINGS AND LANE LINES WILL BE MEASURED AND PAID FOR BY THE LINEAR FOOT (LF).
3. APPROACH LANES LESS THAN 8 FOOT WIDTH SHALL NOT HAVE MARKINGS.
4. MARKINGS SHOULD NOT BE PLACED WHERE LESS THAN 110 FEET OF APPROACH ROADWAY IS AVAILABLE FOR PLACEMENT UNLESS DIRECTED BY CITY TRAFFIC ENGINEER.
5. RR X-ING SYMBOLS SHOULD BE PLACED APPROXIMATELY IN THE CENTER OF THE APPROACH LANE.
6. ALL TRANSVERSE MARKINGS, INCLUDING STOP LINES, SHALL BE PLACED AT RIGHT ANGLES TO THE CENTERLINE AND ACROSS ALL APPROACH LANES.
7. EXISTING NON-STANDARD MARKINGS SHALL BE REMOVED TO THE FULLEST EXTENT POSSIBLE SO AS NOT TO LEAVE A DISCERNABLE MARKING, BY ANY METHOD APPROVED BY THE CITY TRAFFIC ENGINEER. OVERPAINTING WILL NOT BE ALLOWED.
8. ADDITIONAL MARKINGS AND PLACEMENT DETAILS MAY BE FOUND IN THE TMUTCD, APPENDIX H.
9. THE CITY TRAFFIC ENGINEER MAY REQUIRE ADDITIONAL LONGITUDINAL MARKINGS IF THE DISTANCE BETWEEN THE STOP LINES IS GREATER THAN 80 FEET. MARKINGS ARE NOT REQUIRED ACROSS OR BETWEEN THE RAILS UNLESS SPECIFIED ELSEWHERE IN THE PLANS.

SIGN W10-1 TO BE PLACED AS SHOWN IN TYPICAL DETAILS WHEN PAVEMENT MARKINGS ARE INSTALLED.

* R15-1 ASSEMBLY
MAY CONSIST OF ONE OR MORE OF THE FOLLOWING:

R15-1	CROSSBUCK SIGN
R15-2	MULTIPLE TRACK SIGN
TYPE A	MAST FLASHERS
TYPE E	CANTILEVERS
TYPE F	GATES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

RAILROAD CROSSING PAVEMENT MARKINGS DETAILS
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-08

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

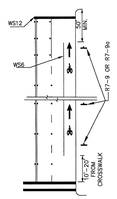
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

COH STANDARD PAVEMENT MARKING DETAILS SHEET 2 OF 4

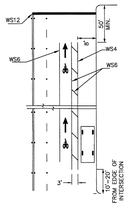
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 99 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\Standard Details.dwg plotted on Sep 21, 2025 - 1:51pm

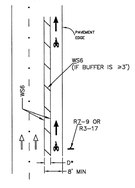
NO.	DATE	REVISION	APP.



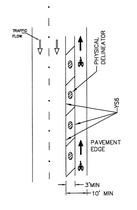
STANDARD BIKE LANES
NO ON-STREET PARKING
ALONG BICYCLE LANE



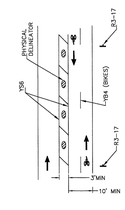
STANDARD BIKE LANES
ON-STREET PARKING
ALONG BICYCLE LANE



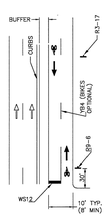
BUFFERED BIKE LANES
*DELINEATOR REQUIRED IF D<2'



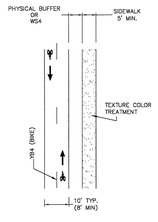
SEPARATED BIKE LANES
ONE-WAY (CONTRA-FLOW)



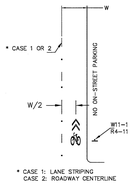
SEPARATED BIKE LANES
TWO-WAY



TWO-WAY SIDE PATH

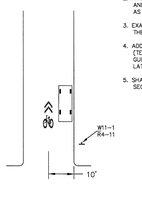


SIDEPATH WITH DEDICATED SIDEWALK



ROADWAY WITH SHARED LANE

- NEIGHBORHOOD BIKEWAY
- COLLECTOR / THROUGHFARE
- NO ON-STREET PARKING



ROADWAY WITH SHARED LANE

- NEIGHBORHOOD STREET
- NO CENTER LINE OR LANE MARKING
- ON STREET PARKING

NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE WHITE EXCEPT WHEN NOTED OTHERWISE ON PLANS.
2. PAVEMENT MARKINGS SHALL BE OF THE MATERIALS SPECIFIED AND SHALL BE IN CONFORMANCE WITH MATERIAL SPECIFICATIONS AS SPECIFIED BY CITY OF HOUSTON STANDARD SPECIFICATIONS.
3. EXACT SIGN PLACEMENT AND DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.
4. ADDITIONAL REFERENCES: TMUTCD (TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL) GUIDE FOR THE DEVELOPMENT OF BICYCLES FACILITIES, AASHTO, LATEST EDITION.
5. SHARED LANE MARKING SHALL BE IMPLEMENTED ONLY ON ROADWAY SEGMENT BUT NOT WITHIN THE FUNCTIONAL LIMITS OF AN INTERSECTION.

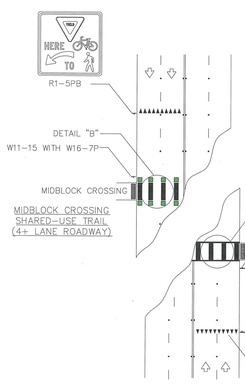
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

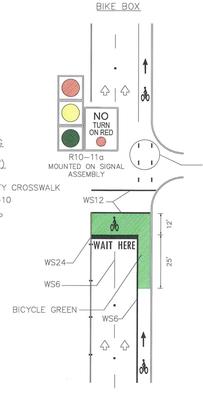
BICYCLE LANE
PAVEMENT MARKINGS

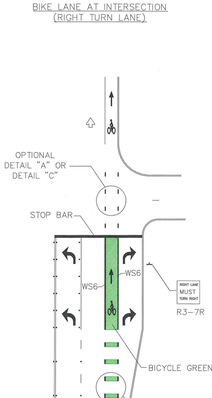
(NOT TO SCALE)

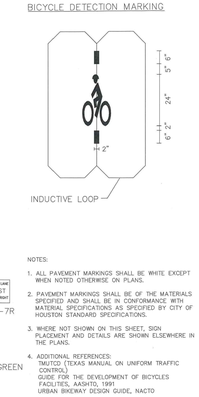
CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-09

USE OF TREATMENTS ON THIS SHEET MUST BE PRE-APPROVED BY THE CITY TRAFFIC ENGINEER





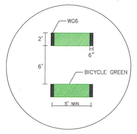




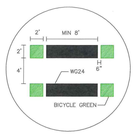
NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE WHITE EXCEPT WHEN NOTED OTHERWISE ON PLANS.
2. PAVEMENT MARKINGS SHALL BE OF THE MATERIALS SPECIFIED AND SHALL BE IN CONFORMANCE WITH MATERIAL SPECIFICATIONS AS SPECIFIED BY CITY OF HOUSTON STANDARD SPECIFICATIONS.
3. WHERE NOT SHOWN ON THIS SHEET, SIGN PLACEMENT AND DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.
4. ADDITIONAL REFERENCES: TMUTCD (TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL) GUIDE FOR THE DEVELOPMENT OF BICYCLES FACILITIES, AASHTO, 1991 URBAN BIKEWAY DESIGN GUIDE, NACTO
5. FOR PLACEMENT OF PAVEMENT ARROWS AND WORDS SEE TURN LANE LEFT/RIGHT) SPACING WORKSHEET.

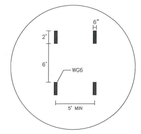
DETAIL "A"



DETAIL "B"



DETAIL "C"

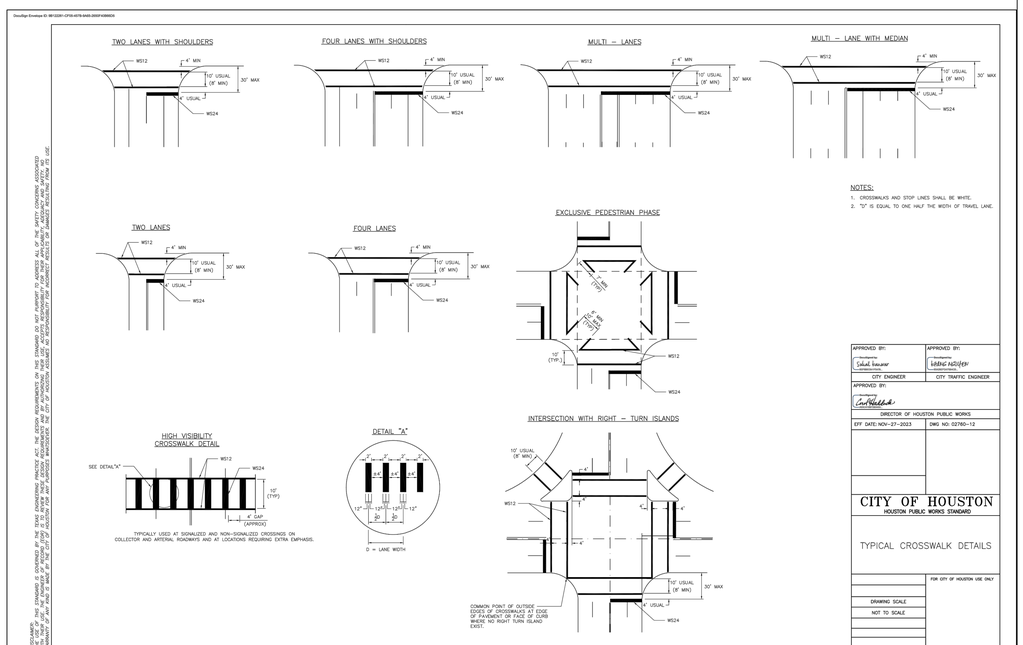


CITY OF HOUSTON
HOUSTON PUBLIC WORKS

BICYCLE INTERSECTION TREATMENTS

(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-09A



NOTES:

1. CROSSWALKS AND STOP LINES SHALL BE WHITE.
2. "D" IS EQUAL TO ONE HALF THE WIDTH OF TRAVEL LANE.

TYPICALLY USED AT SIGNALIZED AND NON-SIGNALIZED CROSSINGS ON COLLECTOR AND ARTERIAL ROADWAYS AND AT LOCATIONS REQUIRING EXTRA EMPHASIS.

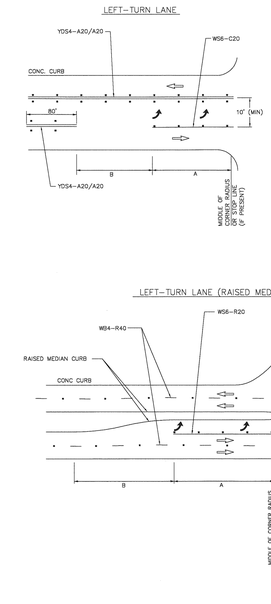
APPROVED BY: CITY ENGINEER	APPROVED BY: CITY TRAFFIC ENGINEER
APPROVED BY: DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02760-12

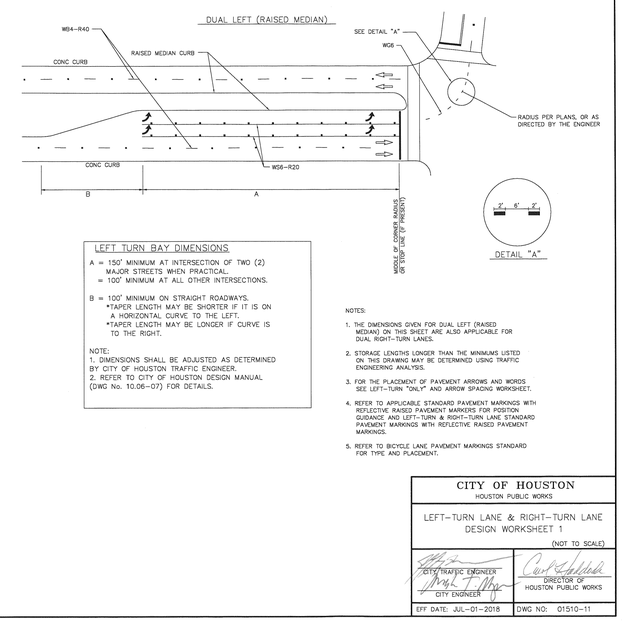
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL CROSSWALK DETAILS

FOR CITY OF HOUSTON USE ONLY	
DRAWING SCALE	
NOT TO SCALE	

DISCLAIMER:
USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ADOPT APPROPRIATE SAFETY CRITERIA FOR EACH SITE. THE USE OF THIS STANDARD IN THE DESIGN OF STREETS, ROADWAYS OR ALLEYS WITHIN THE CITY OF HOUSTON, AND ANY DAMAGES RESULTING THEREFROM, ARE THE RESPONSIBILITY OF THE DESIGN ENGINEER. THE CITY OF HOUSTON, AND/OR ITS OFFICIALS, EMPLOYEES AND AGENTS ASSUME NO RESPONSIBILITY FOR ANY DESIGN USING THIS STANDARD AND WILL NOT BE LIABLE IN ANY WAY FOR ANY CLAIMS OR DAMAGES RESULTING FROM THE USE OF THIS STANDARD BY ANY PERSON, FIRM OR CORPORATION.





LEFT TURN BAY DIMENSIONS

A = 150' MINIMUM AT INTERSECTION OF TWO (2) MAJOR STREETS WHEN PRACTICAL.
= 100' MINIMUM AT ALL OTHER INTERSECTIONS.

B = 100' MINIMUM ON STRAIGHT ROADWAYS.
*TAPER LENGTH MAY BE SHORTER IF IT IS ON A HORIZONTAL CURVE TO THE LEFT.
*TAPER LENGTH MAY BE LONGER IF CURVE IS TO THE RIGHT.

NOTE:
1. DIMENSIONS SHALL BE ADJUSTED AS DETERMINED BY CITY OF HOUSTON TRAFFIC ENGINEER.
2. REFER TO CITY OF HOUSTON DESIGN MANUAL (DWG No. 10.06-07) FOR DETAILS.

NOTES:

1. THE DIMENSIONS GIVEN FOR DUAL LEFT (RAISED MEDIAN) ON THIS SHEET ARE ALSO APPLICABLE FOR DUAL RIGHT-TURN LANES.
2. STORAGE LENGTHS LONGER THAN THE MINIMUMS LISTED ON THIS DRAWING MAY BE DETERMINED USING TRAFFIC ENGINEERING ANALYSIS.
3. FOR THE PLACEMENT OF PAVEMENT ARROWS AND WORDS SEE LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET.
4. REFER TO APPLICABLE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT-TURN & RIGHT-TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKINGS.
5. REFER TO BICYCLE LANE PAVEMENT MARKINGS STANDARD FOR TYPE AND PLACEMENT.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LEFT-TURN LANE & RIGHT-TURN LANE
DESIGN WORKSHEET 1

(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-11

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

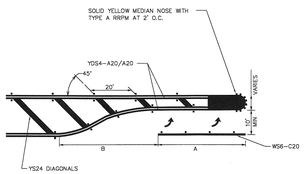
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

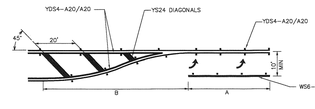
COH STANDARD PAVEMENT MARKING DETAILS SHEET 3 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 100 OF 153	

S:\Proj-2024\24057-(MISC LDWL IMPROVEMENTS-PKG 4)\Dwgs\Design\Sheets\Standard Details.dwg plotted on Sep 21, 2025 - 1:51pm

PAINTED MEDIAN LEFT TURN BAY DETAILS





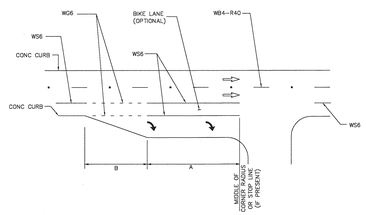
LEFT TURN BAY DIMENSIONS

A = 150' MINIMUM AT INTERSECTION OF TWO (2) MAJOR STREETS WHEN PRACTICAL.
= 100' MINIMUM AT ALL OTHER INTERSECTIONS.

B = 100' MINIMUM ON STRAIGHT ROADWAYS.
*TAPER LENGTH MAY BE SHORTER IF IT IS ON A HORIZONTAL CURVE TO THE LEFT.
*TAPER LENGTH MAY BE LONGER IF CURVE IS TO THE RIGHT.

NOTE:
1. DIMENSIONS SHALL BE ADJUSTED AS DETERMINED BY CITY OF HOUSTON TRAFFIC ENGINEER.
2. REFER TO CITY OF HOUSTON DESIGN MANUAL (DWG No. 10.06-07) FOR DETAILS.

UNSIGNALIZED RIGHT-TURN LANE



NOTES:

1. STORAGE LENGTHS LONGER THAN THE MINIMUMS LISTED ON THIS DRAWING MAY BE DETERMINED USING TRAFFIC ENGINEERING ANALYSIS OR APPROXIMATE CALCULATIONS.
2. FOR THE PLACEMENT OF PAVEMENT ARROWS AND WORDS SEE LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET.
3. REFER TO APPLICABLE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT-TURN & RIGHT-TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKINGS.
4. REFER TO BICYCLE LANE PAVEMENT MARKINGS STANDARD FOR TYPE AND PLACEMENT.

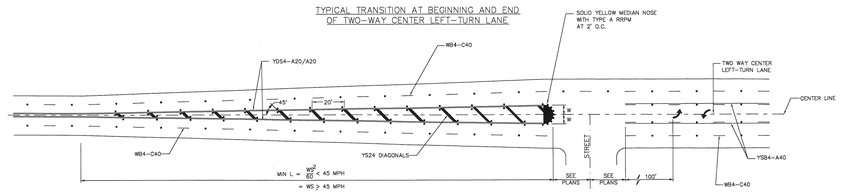
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LEFT-TURN LANE & RIGHT-TURN LANE DESIGN WORKSHEET 2

(NOT TO SCALE)

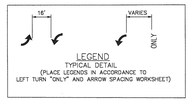
CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-12

TYPICAL TRANSITION AT BEGINNING AND END OF TWO-WAY CENTER LEFT-TURN LANE



MIN L = $\frac{WS^2}{60}$ < 45 MPH
= WS > 45 MPH

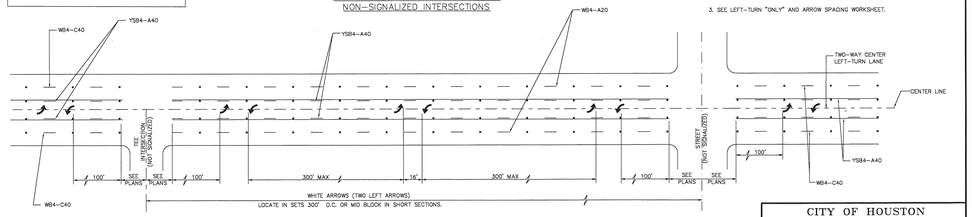
W = WIDTH OF OFFSET (FT)
S = POSTED SPEED (MPH)
L = LENGTH OF CROSSHATCHING (FT)



NOTE:

1. REFLECTIVE RAISED PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT-TURN & RIGHT-TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS.
2. SEE LEFT-TURN & RIGHT-TURN LANE DESIGN WORKSHEET FOR APPLICABLE INFORMATION.
3. SEE LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET.

TWO-WAY LEFT-TURN LANE DETAILS NON-SIGNALIZED INTERSECTIONS



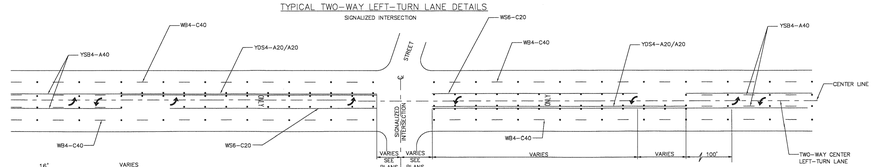
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TWO-WAY LEFT-TURN LANE DETAIL 1

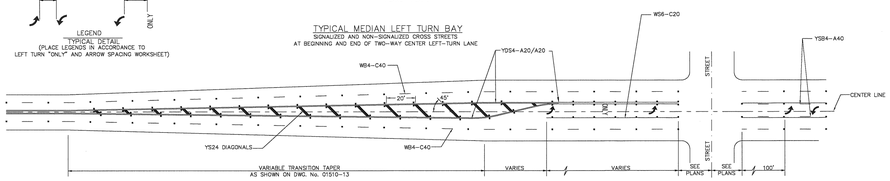
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-13

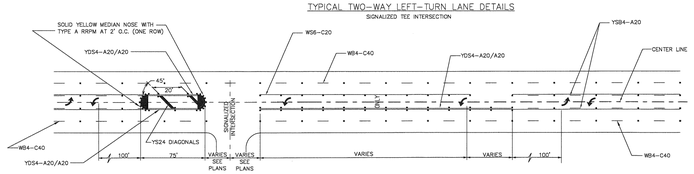
TYPICAL TWO-WAY LEFT-TURN LANE DETAILS
SIGNALIZED INTERSECTION



TYPICAL MEDIAN LEFT TURN BAY
SIGNALIZED AND NON-SIGNALIZED CROSS STREETS AT BEGINNING AND END OF TWO-WAY CENTER LEFT-TURN LANE



TYPICAL TWO-WAY LEFT-TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



NOTE:

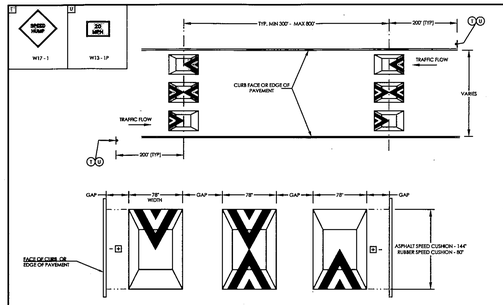
1. REFLECTIVE RAISED PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT-TURN & RIGHT-TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS.
2. SEE LEFT-TURN & RIGHT-TURN LANE DESIGN WORKSHEET FOR APPLICABLE INFORMATION.
3. SEE LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

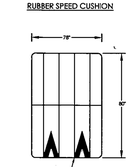
TWO-WAY LEFT-TURN LANE DETAIL 2

(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-14



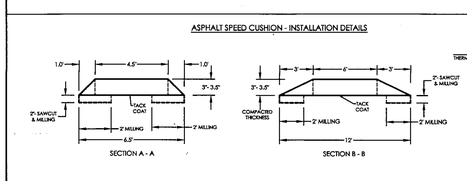
RUBBER SPEED CUSHION



SEE SECTION 10800 FOR MATERIAL AND PRODUCT SPECIFICATIONS

INSTALL PER MANUFACTURERS SPECIFICATIONS

ASPHALT SPEED CUSHION - INSTALLATION DETAILS

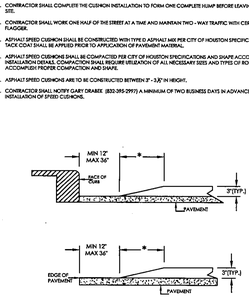


TYPICAL SPEED CUSHIONS ARRANGEMENT FOR A GIVEN PAVEMENT WIDTH

PAVEMENT WIDTH (FT)	No OF CUSHIONS	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)
16	2	12	78	12	78	12						
18	2	20	78	20	78	20						
20	2	30	78	24	78	30						
22	2	36	78	36	78	36						
24	3	15	78	12	78	12	78	15				
26	3	26	78	19	78	19	78	20				
28	3	27	78	24	78	24	78	27				
30	3	31	78	32	78	32	78	31				
32	4	18	78	12	78	12	78	12	78	18		
34	4	21	78	18	78	18	78	18	78	21		
36	4	24	78	24	78	24	78	24	78	24		
38	4	30	78	28	78	28	78	28	78	30		
40	4	33	78	34	78	24	78	34	78	33		
42	5	19	78	19	78	19	78	19	78	19	78	19
44	5	23	78	23	78	23	78	23	78	23	78	23

GENERAL NOTES

1. SPEED CUSHIONS AND ASSOCIATED SIGNS AND PAVEMENT MARKINGS WILL BE CONSTRUCTED AT LOCATIONS DESIGNED BY TRAFFIC OPERATIONS DIVISION (TOD) OR PER PLANS APPROVED BY TOD.
2. CONTRACTOR SHALL CONTACT THE CONSTRUCTION COORDINATOR BEFORE ANY STREET IS TEMPORARILY CLOSED FOR CONSTRUCTION.
3. THE TYPE OF SPEED CUSHION AND DISTANCE BETWEEN EACH CUSHION WILL BE DETERMINED BY TOD.
4. NO PART OF A SPEED CUSHION SHALL BE LOCATED IN FRONT OF DRIVEWAY APPROACHS. RATHER THESE SHOULD BE A MINIMUM OF 4 FEET FROM THE EDGE OF A DRIVEWAY, WHERE PRACTICAL.
5. SPEED CUSHIONS SHOULD BE PLACED AS CLOSE AS POSSIBLE TO THE PROPERTY LINES INSTEAD OF MID - LOT LOCATION, WHERE PRACTICAL.
6. SPEED CUSHIONS SHOULD BE INSTALLED AT A RIGHT ANGLE TO THE CENTERLINE TANGENT OF THE ROADWAY.
7. TRAFFIC CONTROL CONSISTING OF SIGNS SHALL BE PROVIDED TO ADVISE ROADWAY USER OF SPEED CUSHIONS PRESENT. TRAFFIC SIGNS, AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
8. ALL SIGNS AND PAVEMENT MARKINGS WILL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
9. CONTRACTOR SHALL NOT OPEN SPEED CUSHIONS TO TRAFFIC UNTIL ALL REQUIRED WARNING SIGNS AND PAVEMENT MARKINGS ARE COMPLETED.
10. CONTRACTOR WILL MAINTAIN TEMPORARY MARKINGS UNTIL PERMANENT MARKINGS ARE INSTALLED.
11. CONTRACTOR SHALL COMPLETE THE CUSHION INSTALLATION TO FORM ONE COMPLETE HUMP BEFORE LEAVING THE JOB SITE.
12. CONTRACTOR SHALL WORK ONE HALF OF THE STREET AT A TIME AND MAINTAIN TWO - WAY TRAFFIC WITH CERTIFIED FLAGGER.
13. ASPHALT SPEED CUSHION SHALL BE CONSTRUCTED WITH TYPE D ASPHALT MIX PER CITY OF HOUSTON SPECIFICATIONS. A TACK COAT SHALL BE APPLIED PRIOR TO APPLICATION OF PAVEMENT MATERIAL.
14. ASPHALT SPEED CUSHIONS SHALL BE COMPACTED PER CITY OF HOUSTON SPECIFICATIONS AND SHAPE ACCORDING TO INSTALLATION DETAILS. COMPACTION SHALL REQUIRE UTILIZATION OF ALL NECESSARY SIZES AND TYPES OF ROLLERS TO ACCOMPLISH PROPER COMPACTION AND SHAPE.
15. ASPHALT SPEED CUSHIONS ARE TO BE CONSTRUCTED BETWEEN 3" - 3.5" IN HEIGHT.
16. CONTRACTOR SHALL NOTIFY EMS DRAKE (832-393-2997) A MINIMUM OF TWO BUSINESS DAYS IN ADVANCE OF THE INSTALLATION OF SPEED CUSHIONS.



* RUBBER CUSHION - 12" TAPER. ASPHALT CUSHION - 12" TAPER.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SPEED CUSHIONS ARRANGEMENT AND INSTALLATION

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-2016	DWG NO: 13501-01

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713-975-8769
TX FIRM NO.: F-4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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KIRAN V. PUNYAMANTHULA, P.E.
TEXAS REG. NO.: 116965
ON 09/22/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

COH STANDARD PAVEMENT MARKING DETAILS SHEET 4 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 101 OF 153	

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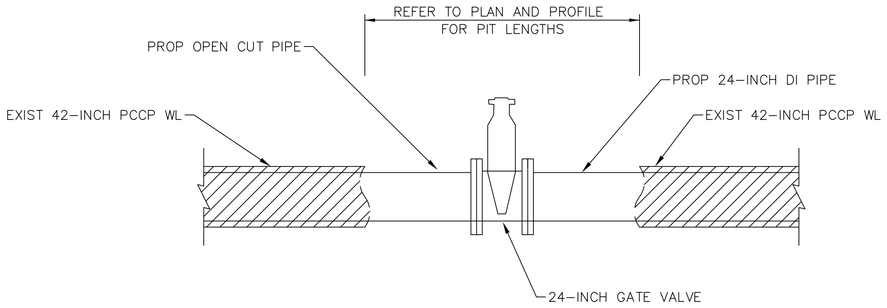
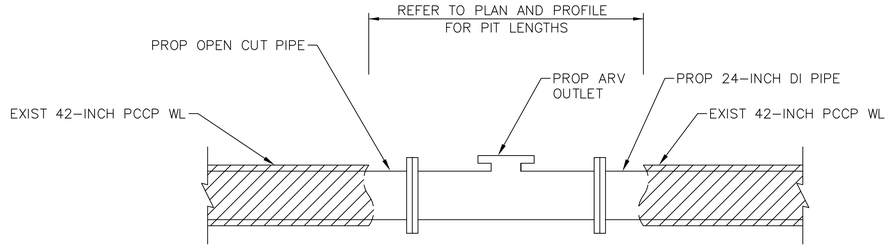
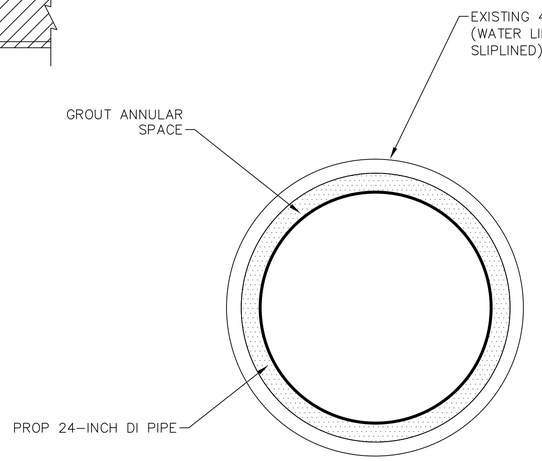


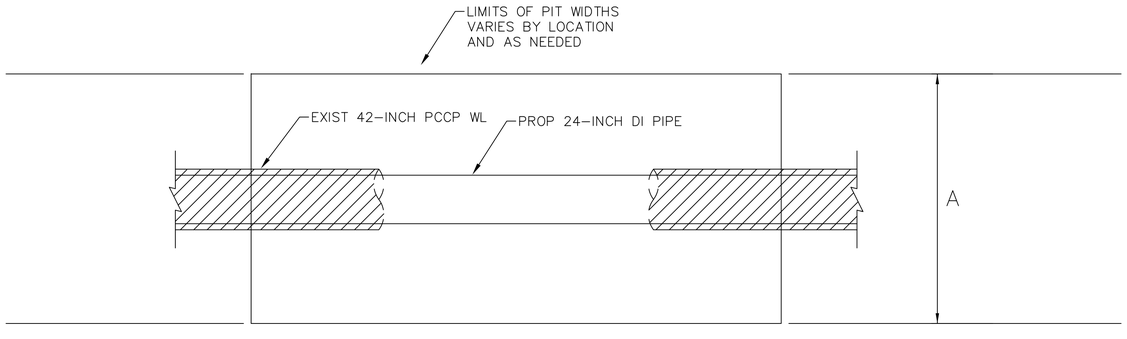
1 XX GATE VALVE INSTALLATION
NTS



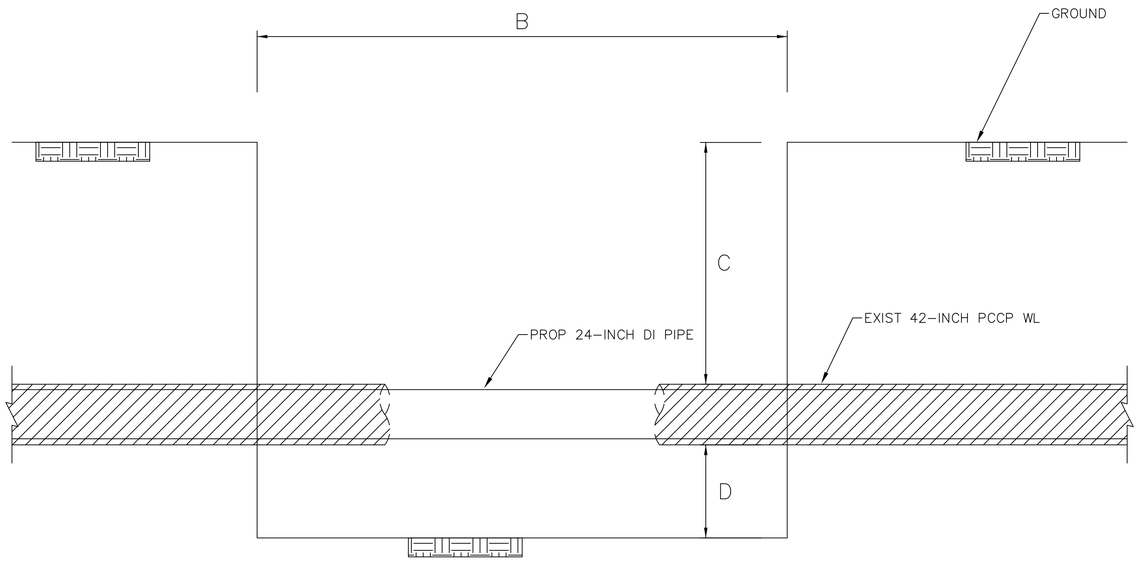
2 XX AIR VALVE INSTALLATION
NTS



4 XX 42" PCCP SLIPLINING
USING DI PIPE



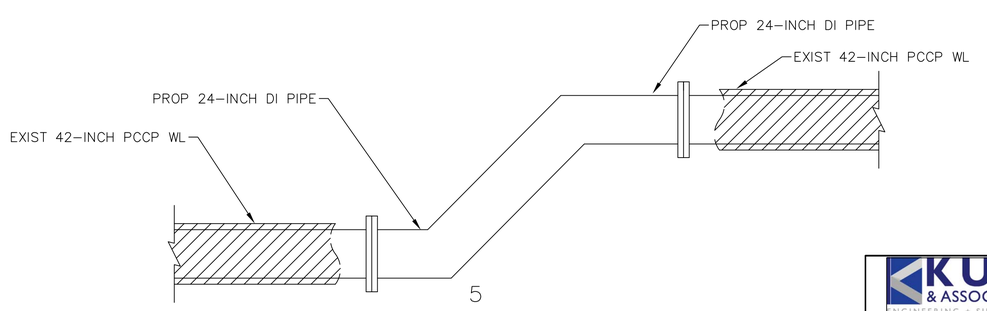
PLAN VIEW



PROFILE VIEW

3 XX SLIPLINING PITS
NTS

A	+/– 8 FT MAXIMUM WIDTH
B	VARIES AS NEEDED FOR INSTALLATION
C	INVERT DEPTH
D	+/– 3 FT



XX TYPICAL BEND INSTALLATION
NTS

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SLIPLINNING DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 102 OF 153	

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GENERAL NOTES

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) LATEST EDITION WITH REVISIONS DURING THE ENTIRE CONSTRUCTION PERIOD.
2. ALL SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM THE LATEST VERSION OF THE TMUTCD.
3. NO LANES SHALL BE CLOSED DURING THE HOURS OF 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM MONDAY THRU FRIDAY WITHOUT APPROVAL OF THE CITY TRAFFIC ENGINEER.
4. NO WORK SHALL BE PERFORMED IN RESIDENTIAL AREAS FROM 7:00 PM TO 7:00 AM.
5. CONTRACTOR SHALL MAINTAIN APPROVED NUMBER OF THROUGH LANES OF TRAFFIC IN EACH DIRECTION DURING CONSTRUCTION WORKING HOURS. TRAFFIC CONTROL PLANS SHALL INCLUDE ONE–WAY AND/OR DETOUR PLANS. CONTRACTOR SHALL MAINTAIN ADA COMPLIANT PEDESTRIAN ACCESS TO BUS STOPS AND ADEQUATE BUS ACCESS TO ALL THE BUS STOPS.
6. CONTRACTOR SHALL MAINTAIN TRAFFIC LANES AND DETOURS ACCORDING TO TRAFFIC CONTROL PLANS DURING WORKING HOURS.
7. CONTRACTOR SHALL COVER OPEN PAVEMENT EXCAVATIONS FOR MINOR UTILITY WORK WITH ANCHORED STEEL PLATES DURING NON–WORKING HOURS, AND OPEN LANES FOR NORMAL TRAFFIC FLOW WHEN FEASIBLE.
8. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE TO PREPARE AND SUBMIT AN ALTERNATE SET OF TRAFFIC CONTROL PLANS TO THE CITY OF HOUSTON PROJECT MANAGER FOR APPROVAL TEN WORKING DAYS PRIOR TO IMPLEMENTATION. THESE PLANS SHALL BE DRAWN TO SCALE ON REPRODUCIBLE MYLARS AND SHALL BE SEALED BY A LICENSED ENGINEER IN THE STATE OF TEXAS, OFFICE OF CITY ENGINEER, MOBILITY PERMITS SECTION REPRESENTATIVE APPROVAL IS REQUIRED TO ACCEPT THE PROPOSED CHANGES.
9. CONTRACTOR SHALL SECURE LANE/SIDEWALK/BICYCLE FACILITY CLOSURE PERMITS FROM OFFICE OF CITY ENGINEER (MOBILITY PERMIT SECTION AT https://geohub.houstontx.gov) BEFORE IMPLEMENTING THE TRAFFIC CONTROL PLAN. THE APPLICATION MUST BE SUBMITTED AT LEAST TEN DAYS PRIOR TO THE IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN AND/OR BEGINNING CONSTRUCTION WORK. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLANS, CONSTRUCTION SEQUENCING, AND CONSTRUCTION SCHEDULE WITH THE APPLICATION.
10. CONTRACTOR SHALL HAVE APPROVED TRAFFIC CONTROL PLAN AND PERMIT AT THE JOB SITE FOR INSPECTION AT ALL TIMES.
11. DURING PAVEMENT SURFACE RESTORATION PROJECTS; THE CONTRACTOR SHALL NOT OPEN CLOSED LANES UNTIL THE PAVEMENT SURFACE HAS CURED ENOUGH TO ALLOW VEHICULAR TRAFFIC ACCORDING TO CITY OF HOUSTON STANDARD SPECIFICATIONS.
12. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING AND COORDINATING ALL CONSTRUCTION ACTIVITIES WITH STAKE HOLDERS IN THE VICINITY INCLUDING EMERGENCY RESPONSE AGENCIES SUCH AS HOUSTON POLICE DEPARTMENT, HOUSTON FIRE DEPARTMENT, AND METROPOLITAN TRANSIT AUTHORITY.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ISSUING ALL WORK DIRECTIVES TO ALL SUB–CONTRACTORS, UTILITY COMPANIES, AND ALL OTHER ENTITIES PERFORMING CONSTRUCTION WORK ASSOCIATED WITH THE PROJECT.
14. NOTHING IN THESE NOTES OR PLANS SHALL RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT; INCLUDING SAFETY OF ALL MODES OF TRANSPORTATION, PERSONS, AND PROPERTY, AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO WORKING HOURS.
15. THE OFFICE OF CITY ENGINEER (MOBILITY PERMITS GROUP) PER THE DIRECTION OF THE CITY TRAFFIC ENGINEER HAVE THE RIGHT TO DEMAND THE INSTALLATION OF ADDITIONAL TRAFFIC CONTROL DEVICES OR MODIFICATIONS OF THESE PLANS AND NOTES, AS DEEMED NECESSARY TO PROMOTE THE SAFE AND ORDERLY FLOW OF TRAFFIC, INCLUDING PEDESTRIANS AND BICYCLES, THROUGH THE CONSTRUCTION WORK ZONE. THE CONTRACTOR SHALL COMPLY WITH THESE ADDITIONAL REQUESTS OR MODIFICATIONS WITH DUE DILIGENCE.
16. ALL EXISTING TRAFFIC CONTROL SIGNS AND PAVEMENT MARKINGS SHALL BE MAINTAINED IN VISIBLE LOCATIONS DURING CONSTRUCTION UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM CITY OF HOUSTON PROJECT MANAGER. THE CONTRACTOR SHALL RESTORE OR REPLACE (AT THE DISCRETION OF THE CITY TRAFFIC ENGINEER) ANY PAVEMENT MARKING OR SIGNING DAMAGE DURING CONSTRUCTION OPERATIONS, INCLUDING RAISED PAVEMENT MARKERS (RPMS).
17. WHEN ENTERING OR LEAVING ROADWAYS CARRYING PUBLIC TRAFFIC, THE CONTRACTOR'S EQUIPMENT, WHETHER EMPTY OR LOADED SHALL IN ALL CASES YIELD TO PUBLIC TRAFFIC WITH THE ASSISTANCE OF CONTRACTOR PROVIDED CERTIFIED FLAGGER/PEACE OFFICER.
18. ACCESS TO DRIVEWAYS ADJACENT TO THE CONSTRUCTION WORK ZONE SHALL BE MAINTAINED AT ALL TIMES AS MUCH AS POSSIBLE. ADDITIONAL CONES AND/OR DELINEATORS MAY BE REQUIRED TO DELINEATE THE DRIVEWAY ACCESS ROUTE THROUGH THE CONSTRUCTION WORK ZONE. A MINIMUM OF ONE TRAVEL LANE SHALL BE MAINTAINED ACROSS THE DRIVEWAYS, UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM CITY OF HOUSTON PROJECT MANAGER.
19. SPILLAGE RESULTING FROM HAULING OPERATIONS ALONG OR ACROSS ANY PUBLIC TRAVELED WAY SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
20. THE CONTRACTOR SHALL SUBMIT AN APPLICATION FOR TEMPORARY PARKING RESTRICTIONS IF THERE ARE PARKING METERS LOCATED AT THE PROPOSED LANE CLOSURES FROM PARKING MANAGEMENT DIVISION (832–393–8690) AT LEAST TEN BUSINESS DAYS BEFORE IMPLEMENTATION OF LANE CLOSURES. IN ADDITION, TEMPORARY NO PARKING SIGNS SHALL BE POSTED 24 HOURS PRIOR TO COMMENCEMENT OF WORK.
21. ADDITIONAL OFF DUTY OFFICERS/FLAGGERS MAY BE REQUESTED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED AT THE DISCRETION OF THE CITY PROJECT MANAGER EVEN IF THEY ARE NOT SPECIFICALLY IDENTIFIED ON THE PROJECT PLANS.
22. THE CONTRACTOR SHALL REPLACE WITHIN 72 HOURS, ALL TRAFFIC SIGNAL LOOP DETECTORS DAMAGED DURING CONSTRUCTION.
23. IN GENERAL, A SOLAR POWERED FLASHING ARROW BOARD SHALL BE REQUIRED ON ALL MAJOR THOROUGHFARE LANES CLOSURES. EXCEPTIONS TO FLASHING ARROW BOARDS AND/OR IMPLEMENTATION ON RESIDENTIAL LANE CLOSURES SHALL BE APPROVED BY CITY TRAFFIC ENGINEER.
24. APPROVED TRAFFIC CONTROL PLAN SHALL BE IN PLACE BEFORE STARTING ANY EXCAVATION.
25. WATER FILLED BARRIERS CAN BE USED AS INSTRUCTED BY THE ENGINEER AND APPROVED BY THE CITY FOR PROJECTS WHERE SPACE IS LIMITED AND HEAVY EQUIPMENT TO PLACE CONCRETE BARRIERS IS NOT FEASIBLE. WATER FILLED BARRIERS SHALL NOT BE USED ON ROADWAYS WITH A POSTED SPEED LIMIT MORE THAN 45 MPH.
26. WATER FILLED BARRIERS MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S REQUIREMENTS AND ROUTINELY INSPECTED FOR DEFECTS.
27. IF WATER FILLED BARRIER IS PROVIDED, USE ENVIRONMENTALLY SAFE ANTI–FREEZING AGENT IN THE WATER WHEN IT IS APPLICABLE PER MANUFACTURER SPECIFICATIONS AND RECOVER AGENT WHEN THE BARRIER IS DRAINED.
28. DISPOSE OF WATER AND AGENT PROPERLY. DO NOT DRAIN WATER FILLED BARRIER INTO OR ACROSS AN EXISTING TRAVEL LANE.
29. PROVIDE BARRIER UNITS THAT ARE CAPABLE OF BEING LIFTED AND MOVED WHEN FILLED IF DRAINING IS NOT POSSIBLE.
30. PROVIDE WATER FILLED BARRIER THAT ACTS AS ITS OWN FREE STANDING, NON–REDIRECTIVE END TREATMENT.
31. WHEN WATER FILLED BARRIERS ARE USED TO CHANNELIZE PEDESTRIANS, THEY MUST HAVE A CONTINUOUS DETECTABLE BOTTOM FOR USERS OF LONG CANES AND THE TOP OF THE UNIT SHALL NOT BE LESS THAN 32 INCHES IN HEIGHT.
32. ANY CLOSURE OF A PEDESTRIAN OR BICYCLE FACILITY SHALL REQUIRE THE SHORTEST DETOUR THAT MAINTAINS THE SAFETY OF PEDESTRIAN AND/OR BICYCLISTS.

SPACING FOR CHANNELIZING DEVICES

A. PLASTIC DRUMS ON MERGING TAPER @ 30' C – C WITH CHEVRON SIGN @ 60' C – C AND WARNING LIGHTS FOR OVERNIGHT CLOSURE.

B. PLASTIC DRUMS ON DOWNSTREAM TAPER @ 30' C – C (RETURN TAPER AND BARRICADE ARE OPTIONAL AND DIVIDED ROADWAY SECTION)

C. PLASTIC DRUMS ON RADII @ 35' C –C.

D. PLASTIC DRUMS ON TANGENT @ 35' C – C WITH VERTICAL PANEL AT 70' C – C AND APPROVED WARNING LIGHT @ 70' C – C (FOR OVERNIGHT CLOSURE).

E. PLASTIC DRUMS IN FRONT OF CONSTRUCTION ZONE @ 20' C – C WITH VERTICAL PANEL AT 40' C – C AND APPROVED WARNING LIGHT @ 40' C – C (FOR OVERNIGHT CLOSURE).

F. CONCRETE TRAFFIC BARRIER (CTB) OR LOW PROFILE CONCRETE TRAFFIC BARRIER (LPCTB) WITH APPROVED REFLECTORS @ 10' C – C IF PAVEMENT DROP IS GREATER THAN 1 FOOT.

G. PLASTIC DRUMS W/GUARD RAIL MOUNTED.

H. SELF– RIGHTING VERTICAL PANEL SPACING.
– 4 LANES TO 2 LANES UNDIVIDED ROADWAY SECTION @ 20' C – C.
– 4 LANES DIVIDED ROADWAY TO ONE SIDE TWO WAY ROADWAY @ 20' C – C.
– LEFT LANE AND RIGHT LANE STORAGE BAYS @ 15' C – C.

I. SPACING SHOWN ON TRAFFIC CONTROL SHALL SUPERSEDE THE ABOVE SPACING.

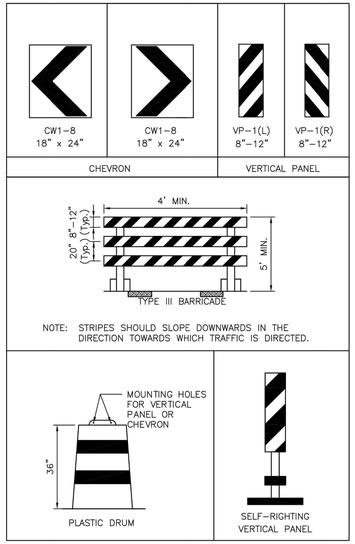
J. SPACING MAY BE ADJUSTED TO PROVIDE DRIVEWAYS, INTERSECTIONS AND /OR MEDIAN OPENINGS.

TABLE C3 – TYPICAL SIGN SPACING, TAPER LENGTHS, AND SUGGESTED SPACING OF CHANNELIZATION DEVICES

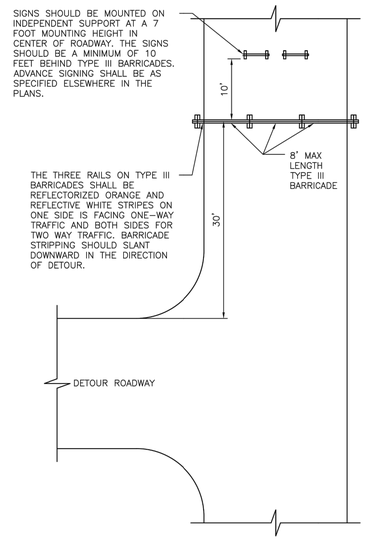
POSTED SPEED (MPH)	SIGN SPACING "X" (FEET)	MIN. DESIRABLE TAPER LENGTH "L"			SUGGESTED MAXIMUM SPACING OF DEVICE	
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER	ON A TANGENT
30	120'	150'	165'	180'	30'	60'–75'
35	160'	205'	225'	245'	35'	70'–90'
40	240'	265'	295'	320'	40'	80'–100'
45	320'	450'	495'	540'	45'	90'–110'
50	400'	500'	550'	600'	50'	100'–125'
55	500'	550'	605'	660'	55'	110'–140'

TABLE C4 – STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

POSTED SPEED (MPH)	DISTANCE "D" (FEET)
30	200
35	250
40	305
45	360
50	425
55	495



CHANNELIZATION AND BARRICADES



PLAN VIEW
TYPE III BARRICADE (POST AND SKID)
TYPICAL APPLICATION

LEGEND:

- SIGN
- FLAGGER
- APPROVED CHANNELIZATION DEVICE
- BARRICADE
- FLASHING ARROW PANEL
- AREA UNDER CONSTRUCTION
- EXISTING TRAVEL WAY
- TRAFFIC CONTROL PLAN DETOUR TRAVEL WAY

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar –9EF8B0C461F5478...	DocuSigned by: LEANG NGUYEN –95A28EFDA7B94CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock –A60C410B72B2466...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 01555–01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP NOTES CHANNELIZING DEVICES AND BARRICADES

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TCP NOTES CHANNELIZING DEVICES AND BARRICADES

TCP SHEET: 1 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 103 OF 153	

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THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR USE, ACCEPTS RESPONSIBILITY FOR THEIR APPLICABILITY, ADEQUACY AND SAFETY. NO WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

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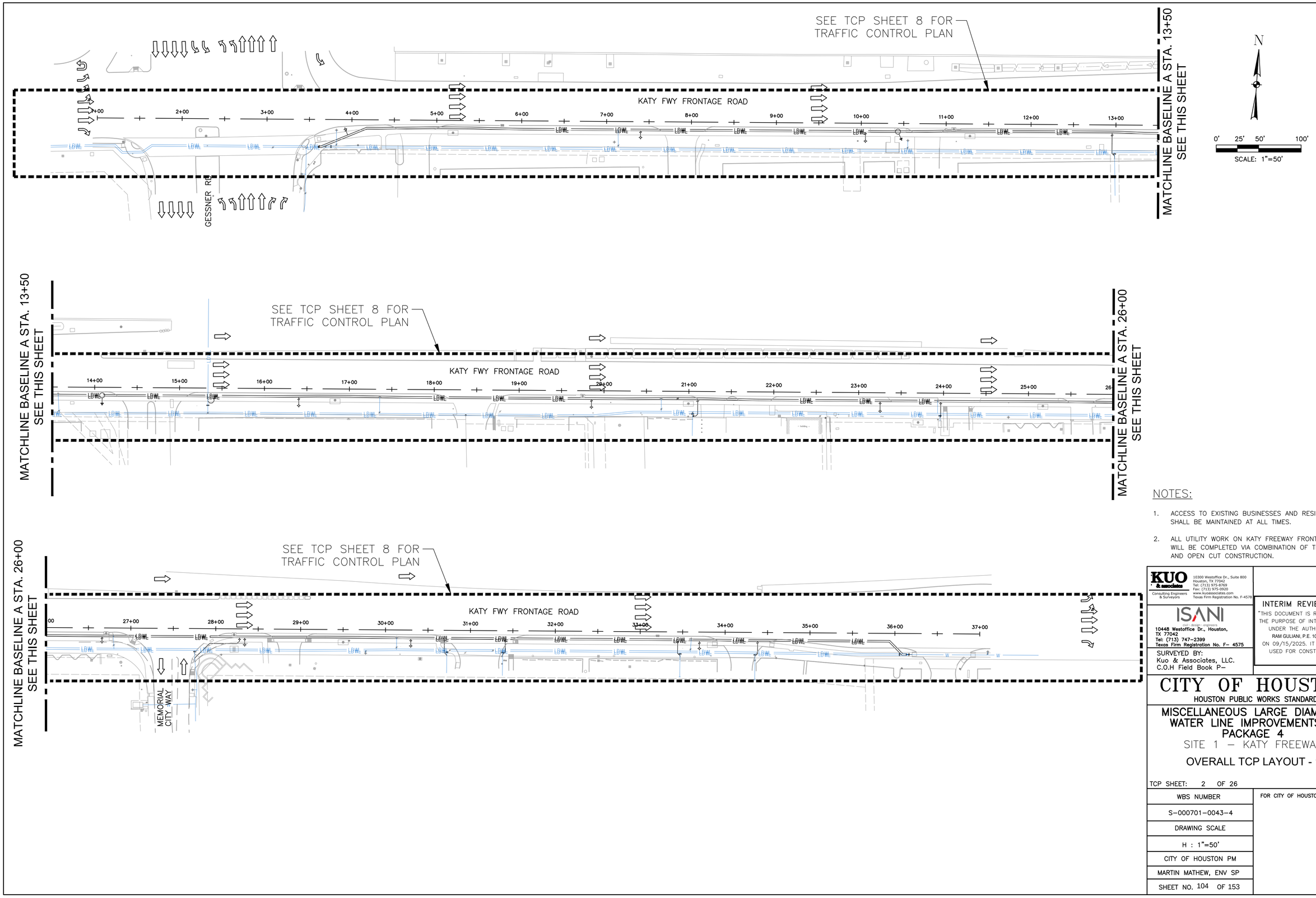

NOTES:

1. ACCESS TO EXISTING BUSINESSES AND RESIDENCIES SHALL BE MAINTAINED AT ALL TIMES.
2. ALL UTILITY WORK ON KATY FREEWAY FRONTAGE ROAD WILL BE COMPLETED VIA COMBINATION OF TRENCHLESS AND OPEN CUT CONSTRUCTION.

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 1 – KATY FREEWAY

OVERALL TCP LAYOUT - 1

TCP SHEET: 2 OF 26

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CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 104 OF 153	

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MATCHLINE BASELINE B STA. 4+00
SEE THIS SHEET

0' 50' 100' 200'
SCALE: 1"=100'

N MEMORIAL WAY

SEE TCP SHEETS 9 & 10
FOR TRAFFIC CONTROL PLAN

BASELINE A

BEGINNING OF CONSTRUCTION

MEMORIAL DR

PROPOSED
24-INCH
WATERLINE

BASELINE B

HOUSTON AVE.

SABINE ST.

SEE TCP SHEETS 11 & 12 FOR
TRAFFIC CONTROL PLAN

STATE ST.

LUBBOCK ST.

KANE ST.

DECATUR ST.

BASELINE C

SEE TCP SHEETS 13, 14 & 15
FOR TRAFFIC CONTROL PLAN

WASHINGTON AVE

MATCHLINE BASELINE B STA. 4+00
SEE THIS SHEET

BASELINE B

HOUSTON AVE.

LUBBOCK ST.

MATCHLINE BASELINE C STA. 4+00
SEE THIS SHEET

GOLIAD ST.

BASELINE C

HICKORY ST

WASHINGTON AVE

PRESTON ST.

PROPOSED
24-INCH
WATERLINE

MENTOR WAY

BASELINE D

MATCHLINE BASELINE D STA. 9+00
SEE TCP SHEET 4

RIESNER ST.

ARTESIAN RD.

SEE TCP SHEETS 13, 14 & 15
FOR TRAFFIC CONTROL PLAN

SEE TCP SHEET 16 FOR
TRAFFIC CONTROL PLAN

NOTES:

1. ACCESS TO EXISTING BUSINESSES AND RESIDENCIES SHALL BE MAINTAINED AT ALL TIMES.

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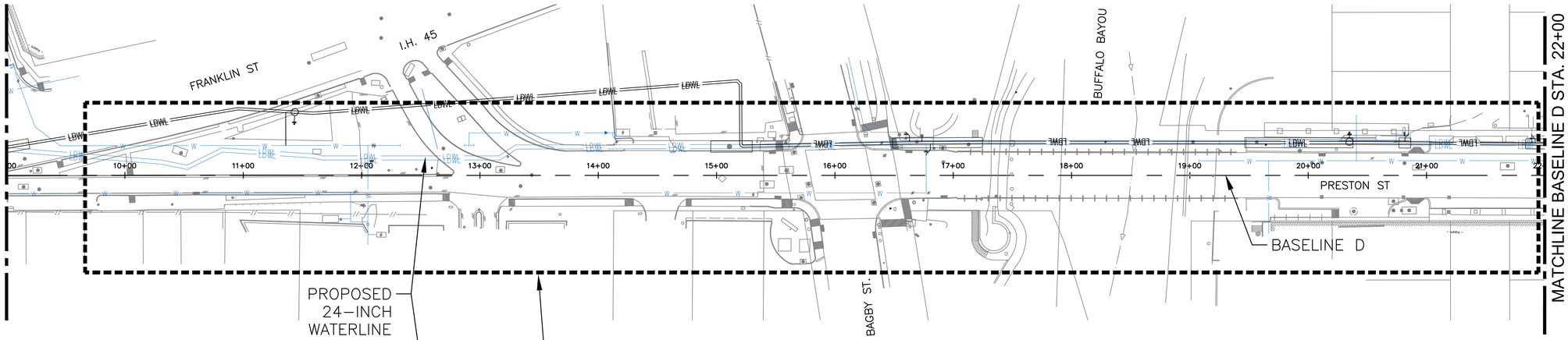
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

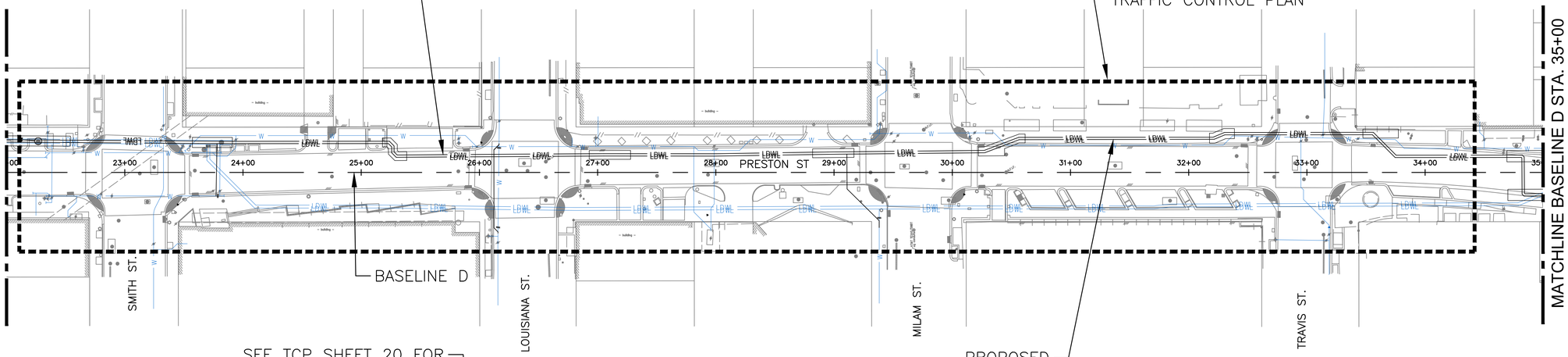
SITE 4 & 5

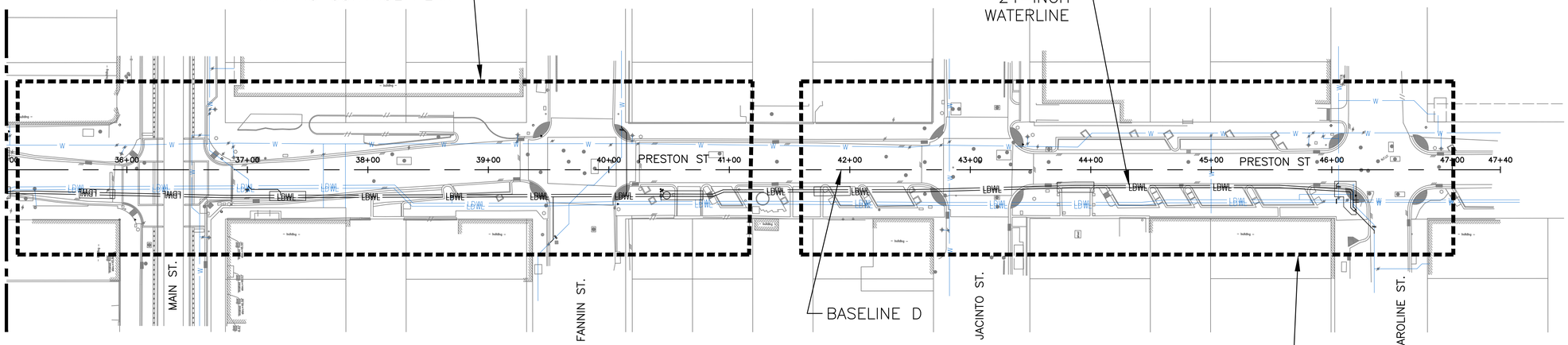
OVERALL TCP LAYOUT - 2

TCP SHEET: 3 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=100'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 105 OF 153	







N

0' 50' 100' 200'

SCALE: 1"=100'

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

OVERALL TCP LAYOUT - 3

TCP SHEET: 4 OF 26

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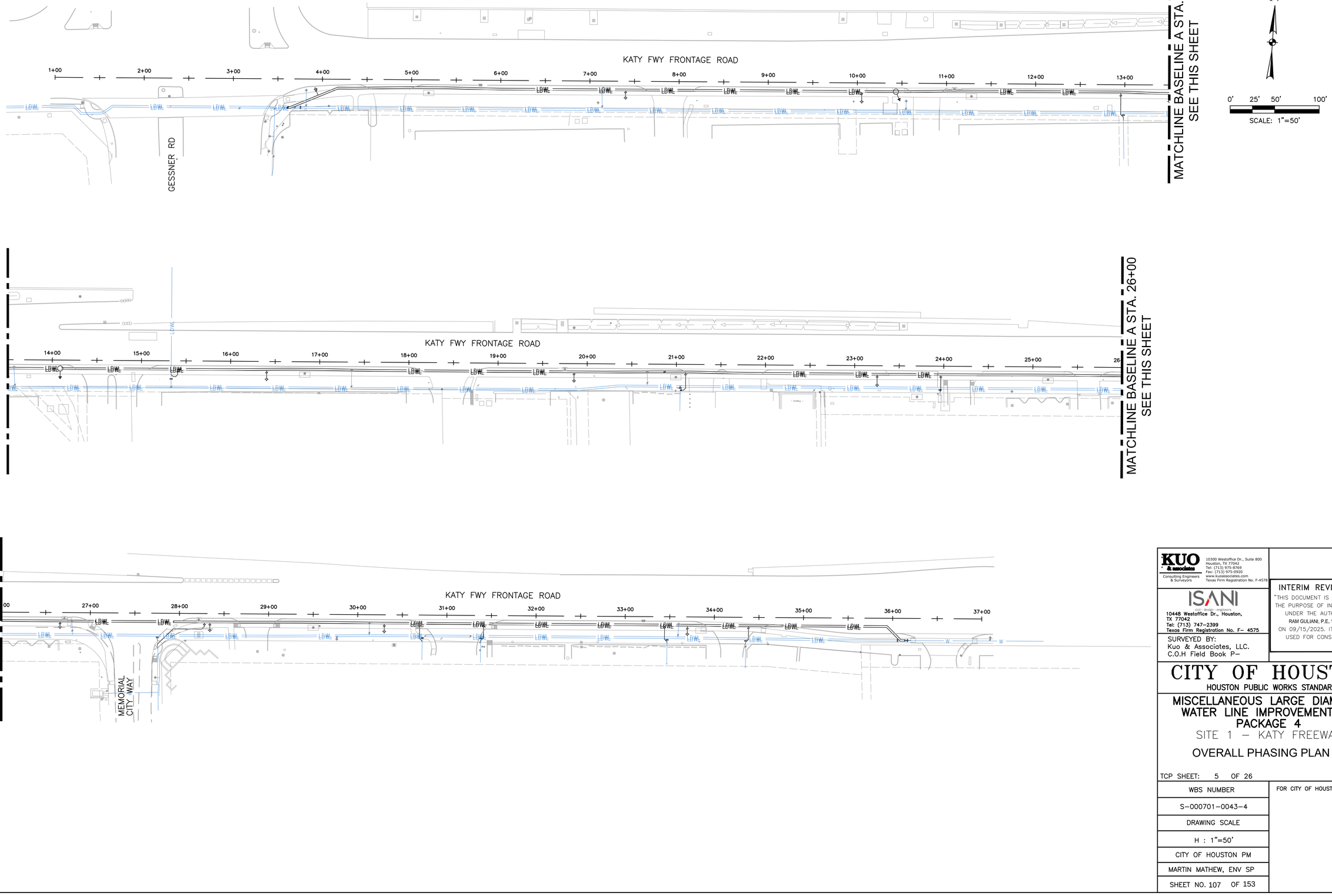

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HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 1 – KATY FREEWAY

OVERALL PHASING PLAN - 1

TCP SHEET: 5 OF 26

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LEGEND:

- PHASE 1 – STEP 1A
- PHASE 1 – STEP 1B
- PHASE 1 – STEP 2
- PHASE 1 – STEP 3
- PHASE 1 – STEP 4
- PHASE 1 – STEP 5
- PHASE 2 – STEP 1
- PHASE 2 – STEP 2
- PHASE 2 – STEP 3
- PHASE 2 – STEP 4
- PHASE 3 – STEP 1
- PHASE 3 – STEP 2
- PHASE 3 – STEP 3
- PHASE 4 – STEP 1
- PHASE 4 – STEP 2
- PHASE 4 – STEP 3

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HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

OVERALL PHASING PLAN- 2

TCP SHEET: 6 OF 26

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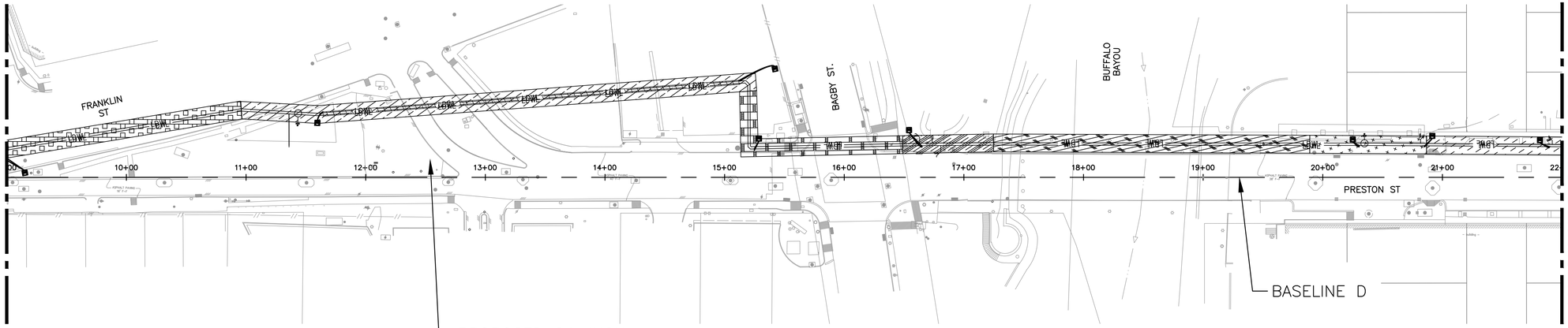

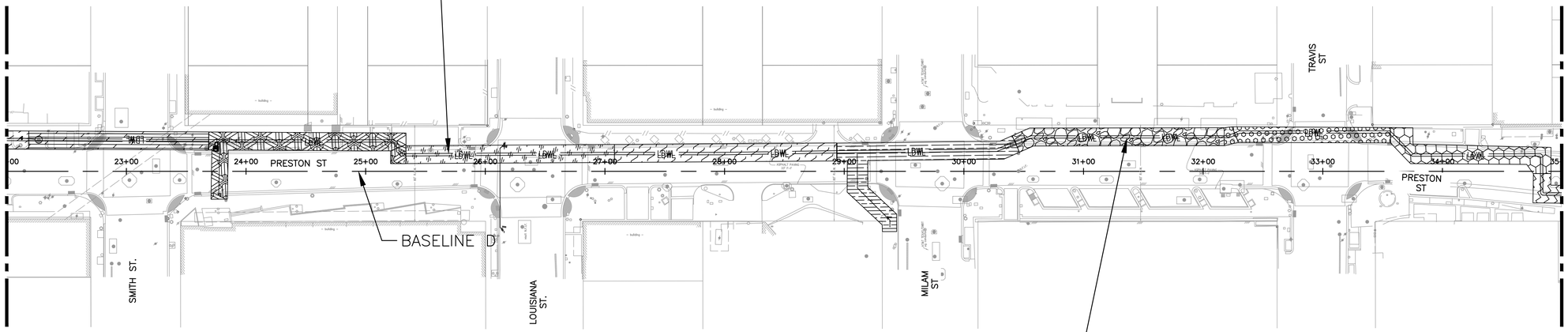

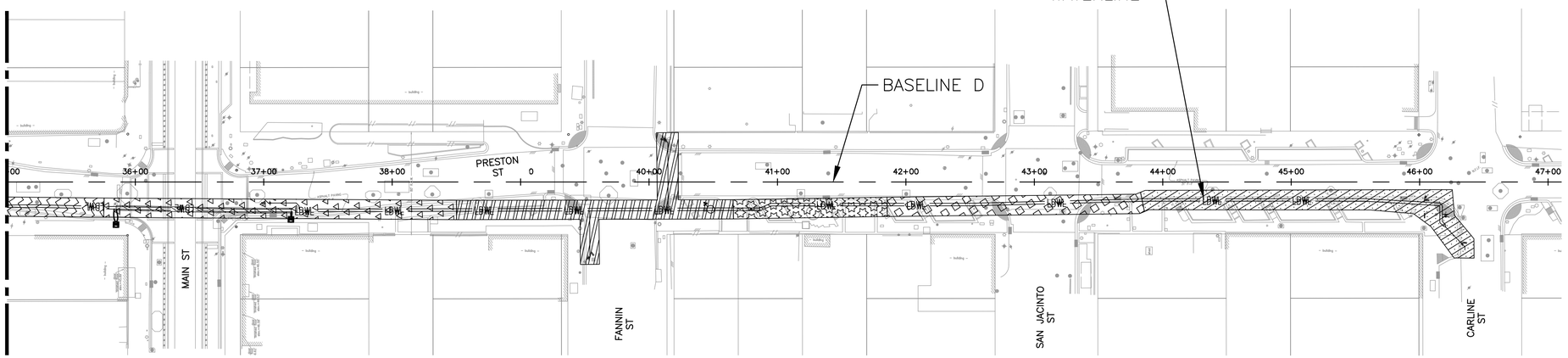

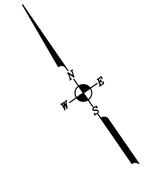

LEGEND:

- PHASE 4 – STEP 4
- PHASE 5 – STEP 1
- PHASE 5 – STEP 2
- PHASE 5 – STEP 3
- PHASE 5 – STEP 4
- PHASE 5 – STEP 5
- PHASE 6 – STEP 1
- PHASE 6 – STEP 2
- PHASE 6 – STEP 3
- PHASE 6 – STEP 4
- PHASE 6 – STEP 5
- PHASE 6 – STEP 7
- PHASE 6 – STEP 8
- PHASE 6 – STEP 9
- PHASE 6 – STEP 10
- PHASE 7 – STEP 1

LEGEND:

- PHASE 7 – STEP 2
- PHASE 7 – STEP 3
- PHASE 8 – STEP 1
- PHASE 8 – STEP 2
- PHASE 8 – STEP 3

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SURVEYED BY:
Kuo & Associates, LLC.
C.O.H Field Book P–

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

OVERALL PHASING PLAN- 3

TCP SHEET: 7 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=50'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 109 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:30 AM
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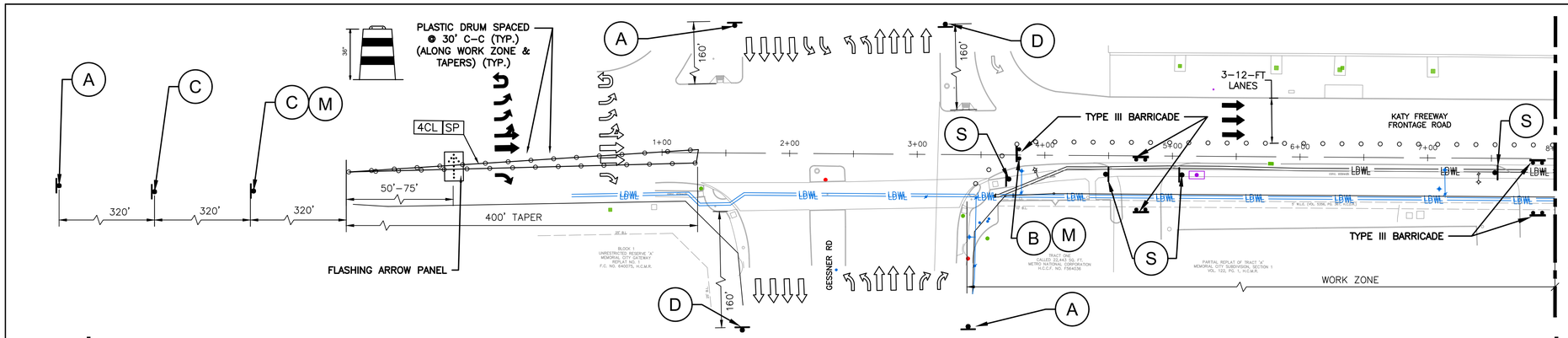
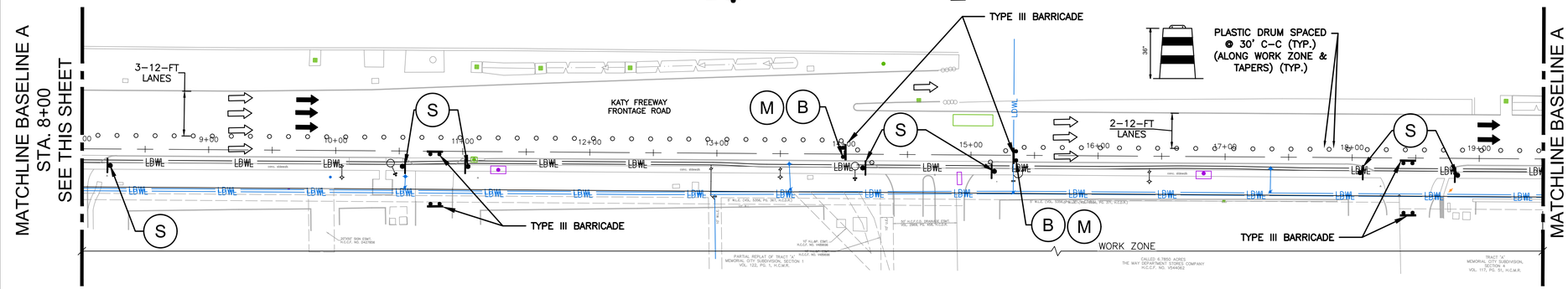
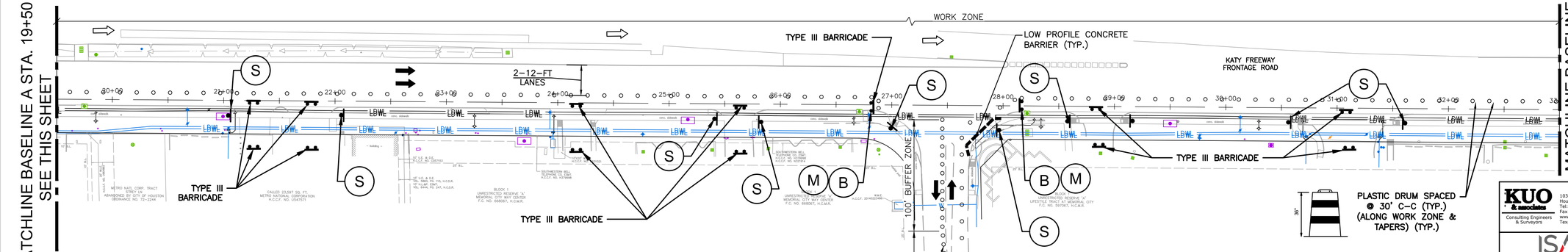
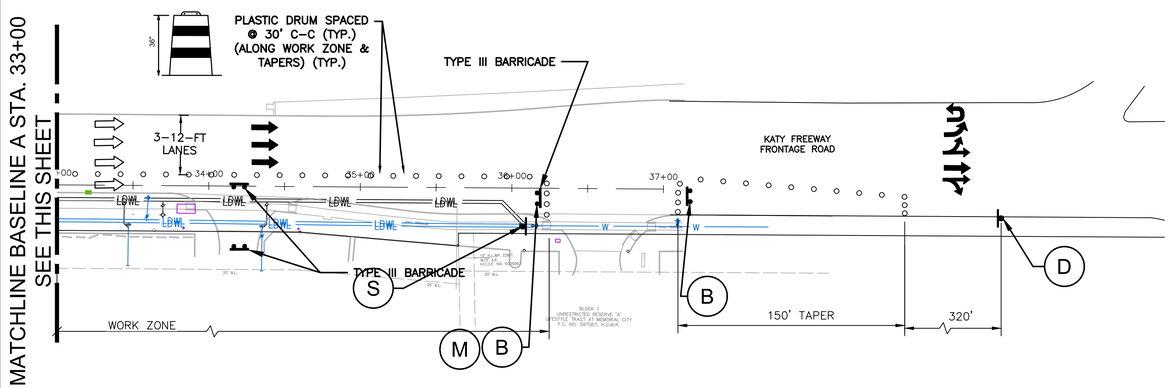
FILE PATH: P:\ACTIVE\25WL57\WORKING\DRAWINGS\SITE 1 - KATY FREEWAY\25WL57 - TCP - PLANS.dwg
PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:30 AM









LEGEND:

- 3PD — PLASTIC DRUM (DRUM) (SEE LEGEND SP FOR SPACING)
- 4CL — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (LEFT) (SEE LEGEND SP FOR SPACING)
- 4CR — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
- CW6-4 — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
- SP — SPACED @ 45' C-C (45 MPH) SPACED @ 30'C-C (30 & 35 MPH) (ALONG WORK ZONE & TAPERS) SPACED @ 5' C-C (AT INTERSECTIONS & ON RADII)
- PROPOSED SIGN POST
- APPROVED CHANNELIZATION DEVICE PLASTIC DRUM (SEE LEGEND FOR SPACING)
- TYPE III BARRICADE
- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

KATY FREEWAY FRONTAGE RD. : 45 M.P.H.
MEMORIAL CITY WAY : 30 M.P.H.
GESSNER RD. : 35 M.P.H.

N

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

NOTES:
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3. THE CONTRACTOR HAS TO COORDINATE WITH METRO FOR TEMPORARY BUS STOP RELOCATION AND DETOURS.
4. CONTRACTOR TO INSTALL CONSTRUCTION FENCE AS NEEDED TO DELINEATE THE WORK ZONE ALONG THE SIDEWALK.
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10. CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON OR TXDOT TRAFFIC OPERATIONS FOR ANY SIGNAL TIMING MODIFICATIONS AT LEAST 72 HOURS PRIOR TO IMPLEMENTING THE TCP STAGES. THIS NOTE APPLES TO ALL CONSTRUCTION PHASES AND STAGES.

A	B	C	D	M	S			
UTILITY WORK AHEAD	ROAD CLOSED	RIGHT LANE CLOSED AHEAD	END UTILITY WORK	ONLY	SIDEWALK CLOSED	CHEVRON	8"-12"	MOUNTING HOLES FOR VERTICAL PANEL OR CHEVRON
CW21-7D 36" X 36"	R11-2 36" X 18"	CW20-5R 36 X 36 PLAQUE 30 X 12	G20-2 36" X 18"	R3-5R 30" X 36"	G20-2a 36" X 18"	CW1-8 18 X 24	VP-1	36" PLASTIC DRUM

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

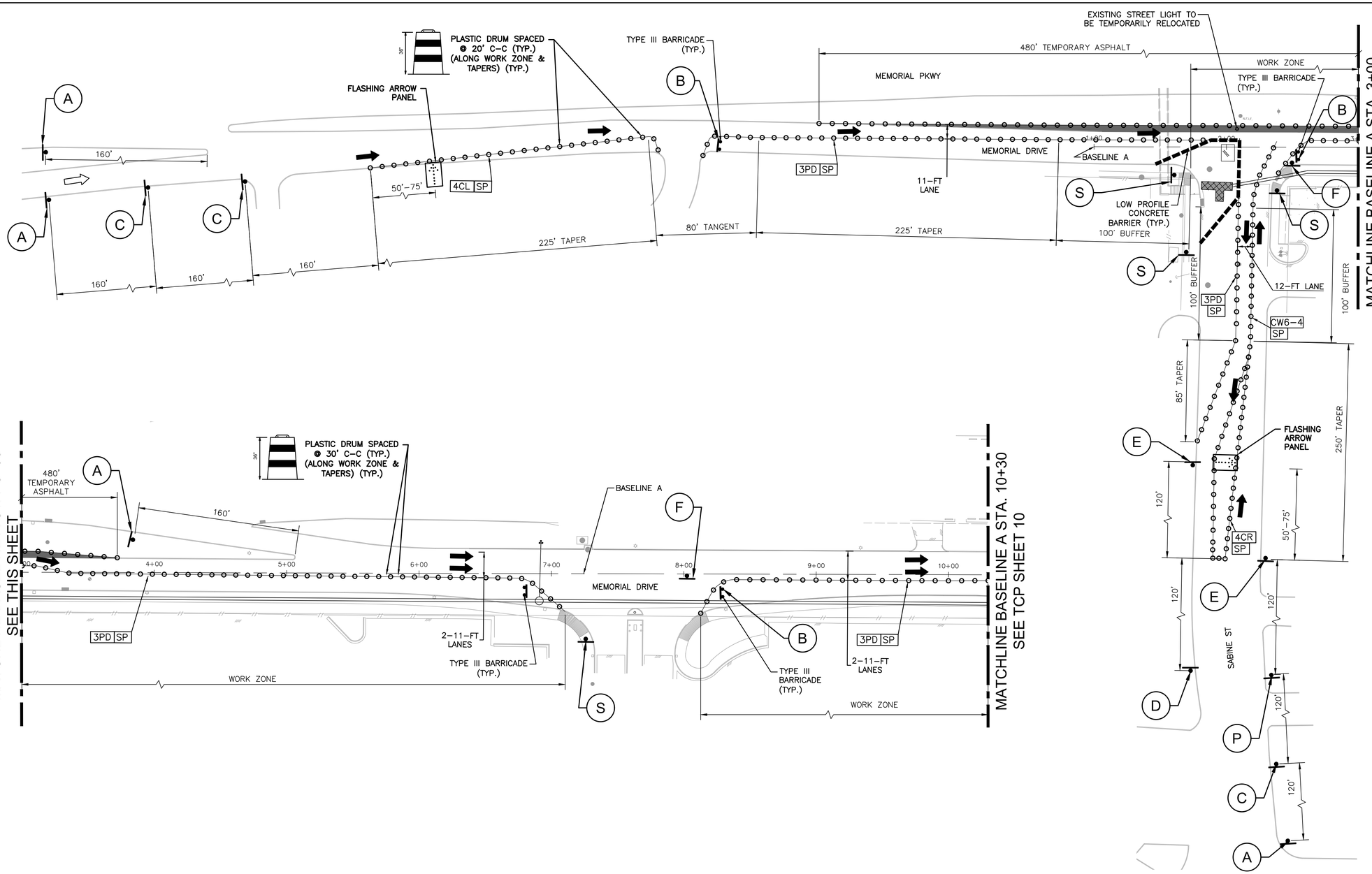
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 1 – KATY FREEWAY

TRAFFIC CONTROL PLAN
STA 1+00 TO END

TCP SHEET: 8 OF 26

WBS NUMBER	S-000701-0043-4
DRAWING SCALE	H : 1"=40'
CITY OF HOUSTON PM	MARTIN MATHEW, ENV SP
SHEET NO. 110 OF 153	

FOR CITY OF HOUSTON USE ONLY



A	B	C	D	E	F	S	U	MOUNTING HOLES	FOR VERTICAL	PANEL OR CHEVRON	P
UTILITY WORK AHEAD	ROAD CLOSED	RIGHT LANE CLOSED AHEAD	END UTILITY WORK	NO PARKING	STOP	SIDEWALK CLOSED		CHEVRON	8"-12"	36" PLASTIC DRUM	ROAD NARROWS
CW21-7D 36" X 36"	R11-2 36" X 18"	CW20-5R 36" X 36" PLAQUE 30" X 12"	G20-2 36" X 18"	R8-3 24" X 30"	R1-1 30" X 30"	G20-2a 36" X 18"	R3-4 24 X 24"	CW1-8 18" X 24"	VP-1		W5-1 36" X 36"

NOTES:
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SCALE: 1"=40'

LEGEND:

- 3PD — PLASTIC DRUM (DRUM) (SEE LEGEND SP FOR SPACING)
- 4CL — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (LEFT) (SEE LEGEND SP FOR SPACING)
- 4CR — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
- CW6-4 — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
- SP — SPACED @ 30' C-C (ALONG WORK ZONE & TAPERS) SPACED @ 5' C-C (AT INTERSECTIONS & ON RADII)
- PROPOSED SIGN POST
- APPROVED CHANNELIZATION DEVICE PLASTIC DRUM (SEE LEGEND FOR SPACING)
- TYPE III BARRICADE
- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

HOUSTON AVE. : 35 M.P.H.
MEMORIAL DR. : 35 M.P.H.
SABINE ST. : 30 M.P.H.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 1
SHEET 1 OF 2

TCP SHEET: 9 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 111 OF 153	

PLOTTED: 9/16/2025 11:31 AM
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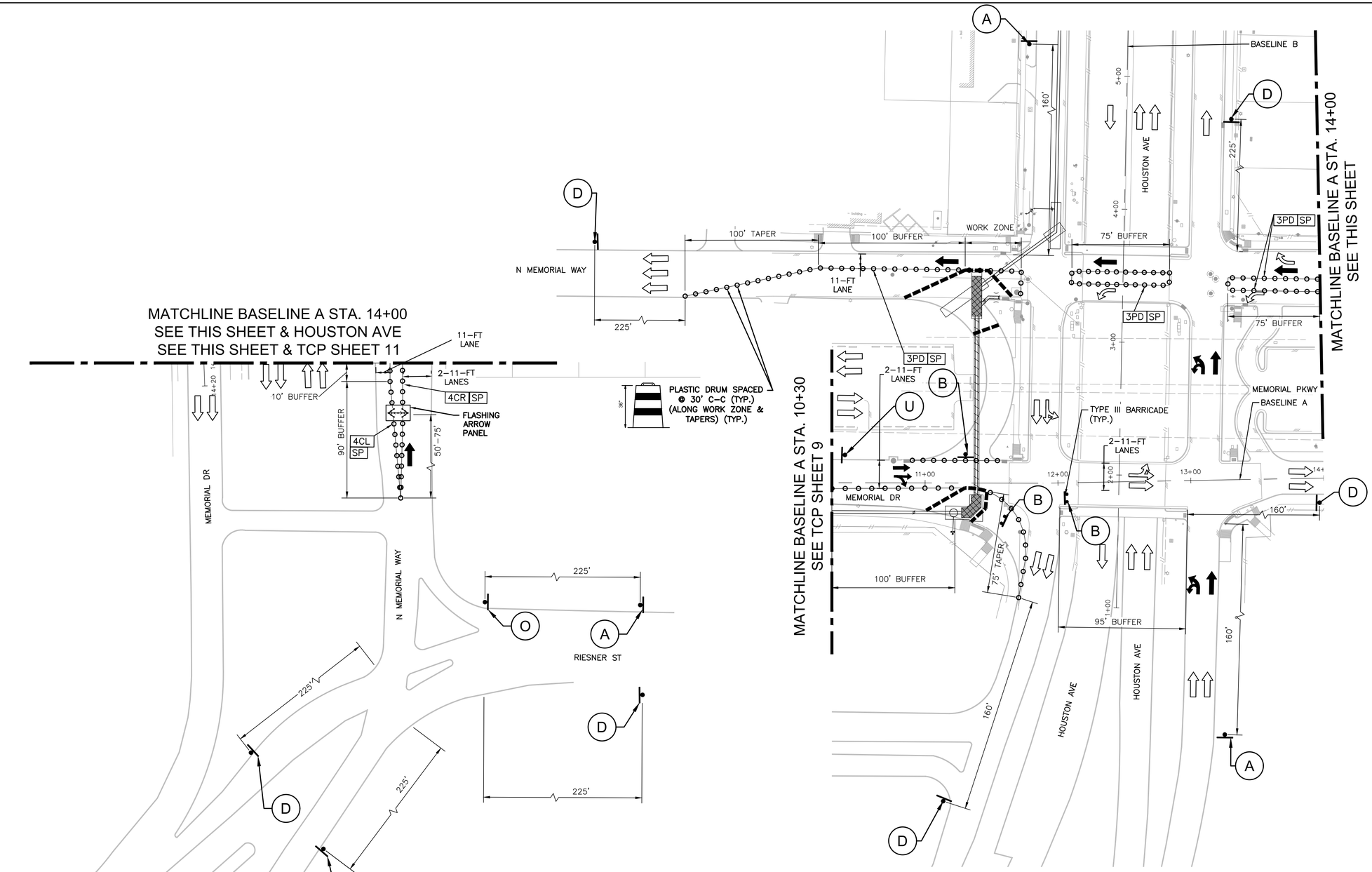

A	B	C	D	E	F	S	U	MOUNTING HOLES	FOR VERTICAL	PANEL OR CHEVRON	O
UTILITY WORK AHEAD CW21–7D 36" X 36"	ROAD CLOSED R11–2 36" X 18"	RIGHT LANE CLOSED AHEAD CW20–5R 36" X 36" PLAQUE 30" X 12"	END UTILITY WORK G20–2 36" X 18"	NO PARKING R8–3 24" X 30"	STOP R1–1 30" X 30"	SIDEWALK CLOSED G20–2a 36" X 18"	 R3–4 24 X 24"	CHEVRON CW1–8 18" x 24"	8"–12" VP–1	36" PLASTIC DRUM	CENTER LANE CLOSED AHEAD CW20–5C 48" X 48" PLAQUE 30" X 12"

N
W E
S

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

LEGEND:

- 3PD — PLASTIC DRUM (DRUM) (SEE LEGEND SP FOR SPACING)
- 4CL — DRUM WITH CHEVRON (CW1–8) ON EVERY OTHER DRUM (LEFT) (SEE LEGEND SP FOR SPACING)
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- CW6–4 — DRUM WITH CHEVRON (CW1–8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
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- PROPOSED SIGN POST
- APPROVED CHANNELIZATION DEVICE PLASTIC DRUM (SEE LEGEND FOR SPACING)
- TYPE III BARRICADE
- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

HOUSTON AVE. : 35 M.P.H.
MEMORIAL DR. : 35 M.P.H.

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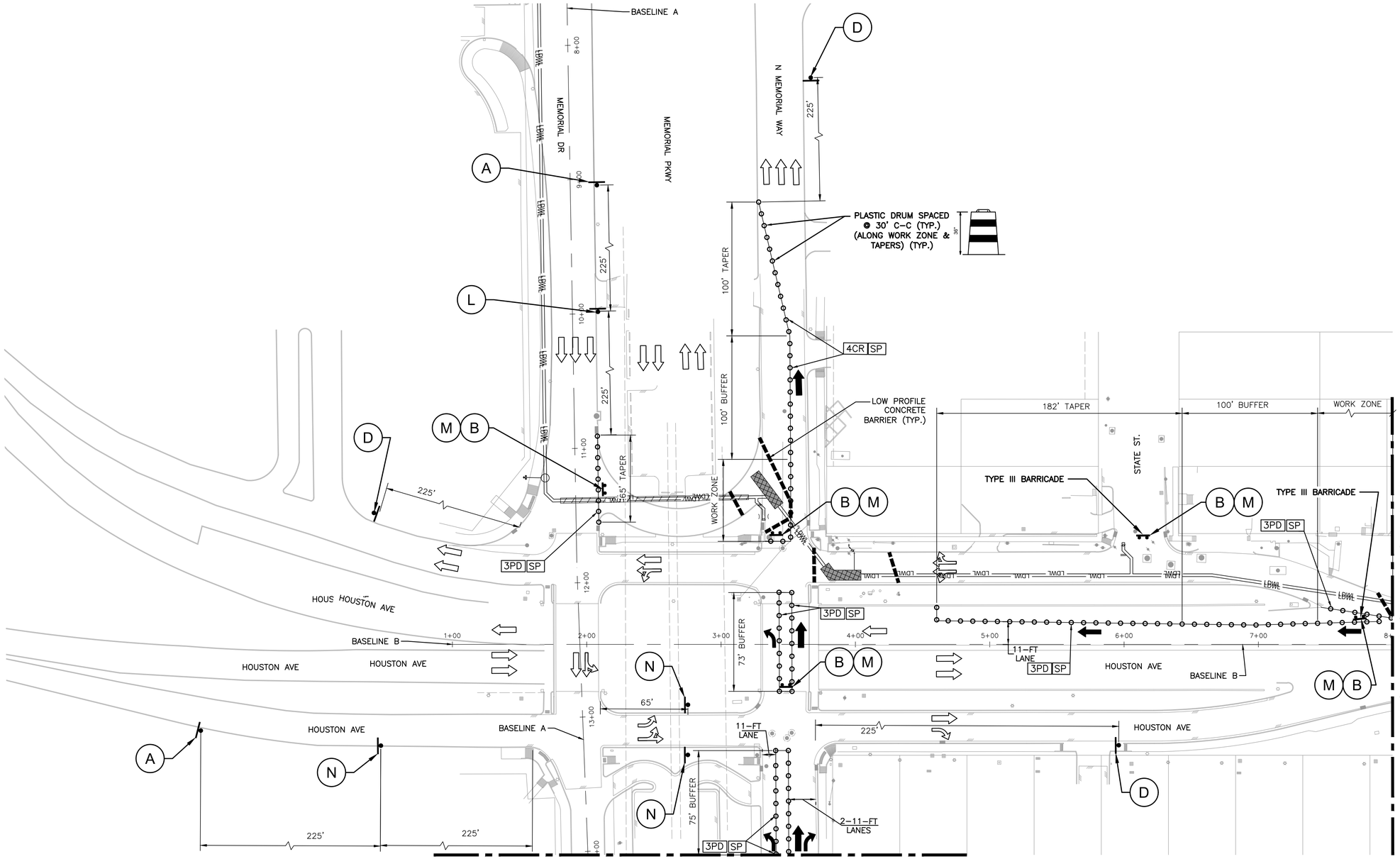
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 1
SHEET 2 OF 2

TCP SHEET: 10 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 112 OF 153	



MATCHLINE BASELINE A STA. 14+00
SEE TCP SHEET 10

MATCHLINE BASELINE B STA. 8+00
SEE TCP SHEET 12

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

LEGEND:

- 3PD — PLASTIC DRUM (DRUM) (SEE LEGEND SP FOR SPACING)
- 4CL — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (LEFT) (SEE LEGEND SP FOR SPACING)
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- APPROVED CHANNELIZATION DEVICE PLASTIC DRUM (SEE LEGEND FOR SPACING)
- TYPE III BARRICADE
- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

N MEMORIAL WAY : 35 M.P.H.

HOUSTON AVE. : 35 M.P.H.

A	B	C	N	D	E	F	G	H	I
UTILITY WORK AHEAD CW21-7D 36" X 36"	ROAD CLOSED R11-2 36" X 18"	RIGHT LANE CLOSED AHEAD CW20-5R 36" X 36" PLAQUE 30" X 12"	LEFT LANE CLOSED AHEAD CW20-5L 36" X 36" PLAQUE 30" X 12"	END UTILITY WORK G20-2 36" X 18"	 R3-2 36" X 36"	STOP R1-1 30" X 30"	ONLY R3-5R 30" X 36"	RIGHT TWO LANES CLOSED CW20-5aR 36" X 36" CW1-6R 60" X 30"	LEFT TWO LANES CLOSED CW20-5aL 36" X 36" CW1-6L 60" X 30"
J	K	L	M	N	O	S			
RIGHT LANE CLOSED CW20-5R 36" X 36" CW1-6R 60" X 30"	ONLY R3-8 Varies X 30"	 R3-4 24 X 24"	DO NOT ENTER R5-1 30" X 30"	ONLY R3-8 Varies X 30"	CENTER LANE CLOSED AHEAD CW20-5C 48" X 48" PLAQUE 30" X 12"	SIDEWALK CLOSED G20-2a 36" X 18"	MOUNTING HOLES CHEVRON CW1-8 18" x 24"	FOR VERTICAL 8"-12" VP-1	PANEL OR CHEVRON 36" PLASTIC DRUM

NOTES:
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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

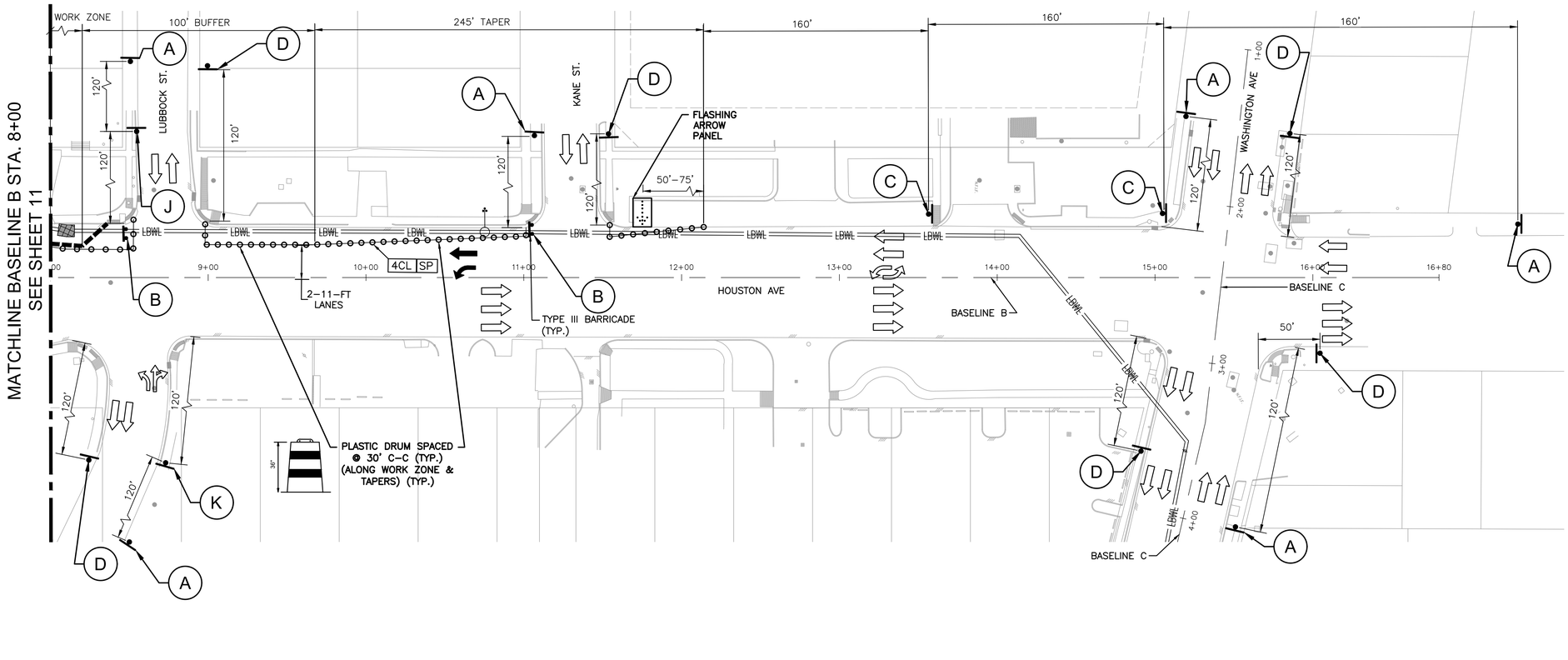
TRAFFIC CONTROL PLAN - PHASE 2
SHEET 1 OF 2

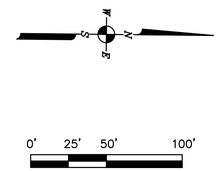
TCP SHEET: 11 OF 26

WBS NUMBER	S-000701-0043-4
DRAWING SCALE	H : 1"=40'
CITY OF HOUSTON PM	MARTIN MATHEW, ENV SP
SHEET NO. 113 OF 153	

FOR CITY OF HOUSTON USE ONLY

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:32 AM
FILE PATH: P:\ACTIVE\25WL57\WORKING\DRAWINGS\SITE 4 & 5\25WL57 – TCP-HOUSTON AVE.dwg



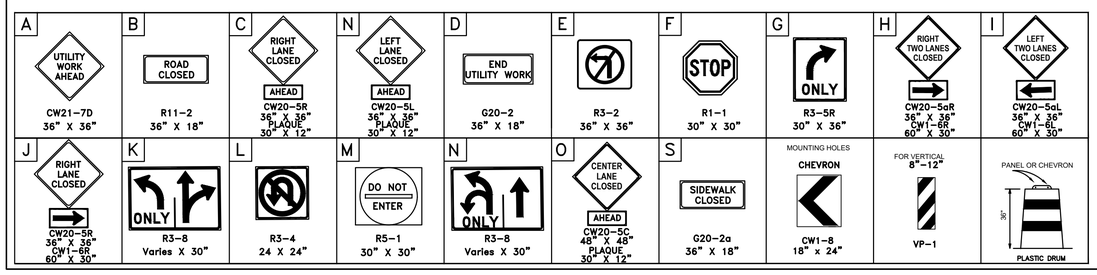


LEGEND:

- 3PD — PLASTIC DRUM (DRUM) (SEE LEGEND SP FOR SPACING)
- 4CL — DRUM WITH CHEVRON (CW1–8) ON EVERY OTHER DRUM (LEFT) (SEE LEGEND SP FOR SPACING)
- 4CR — DRUM WITH CHEVRON (CW1–8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
- CW6–4 — DRUM WITH CHEVRON (CW1–8) ON EVERY OTHER DRUM (RIGHT) (SEE LEGEND SP FOR SPACING)
- SP — SPACED @ 30' C–C (ALONG WORK ZONE & TAPERS) SPACED @ 5' C–C (AT INTERSECTIONS & ON RADII)
- PROPOSED SIGN POST
- APPROVED CHANNELIZATION DEVICE PLASTIC DRUM (SEE LEGEND FOR SPACING)
- TYPE III BARRICADE
- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

HOUSTON AVE. : 35 M.P.H.

WASHINGTON AVE. : 30 M.P.H.



NOTES:

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2. CHANNELING DEVICES, BARRICADES, TRAFFIC SIGNS AND TEMPORARY PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
3. THE CONTRACTOR HAS TO COORDINATE WITH METRO FOR TEMPORARY BUS STOP RELOCATION AND DETOURS.
4. CONTRACTOR TO INSTALL CONSTRUCTION FENCE AS NEEDED TO DELINEATE THE WORK ZONE ALONG THE SIDEWALK.
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SURVEYED BY:
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C.O.H Field Book P–

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 2

SHEET 2 OF 2

TCP SHEET: 12 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 114 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:32 AM
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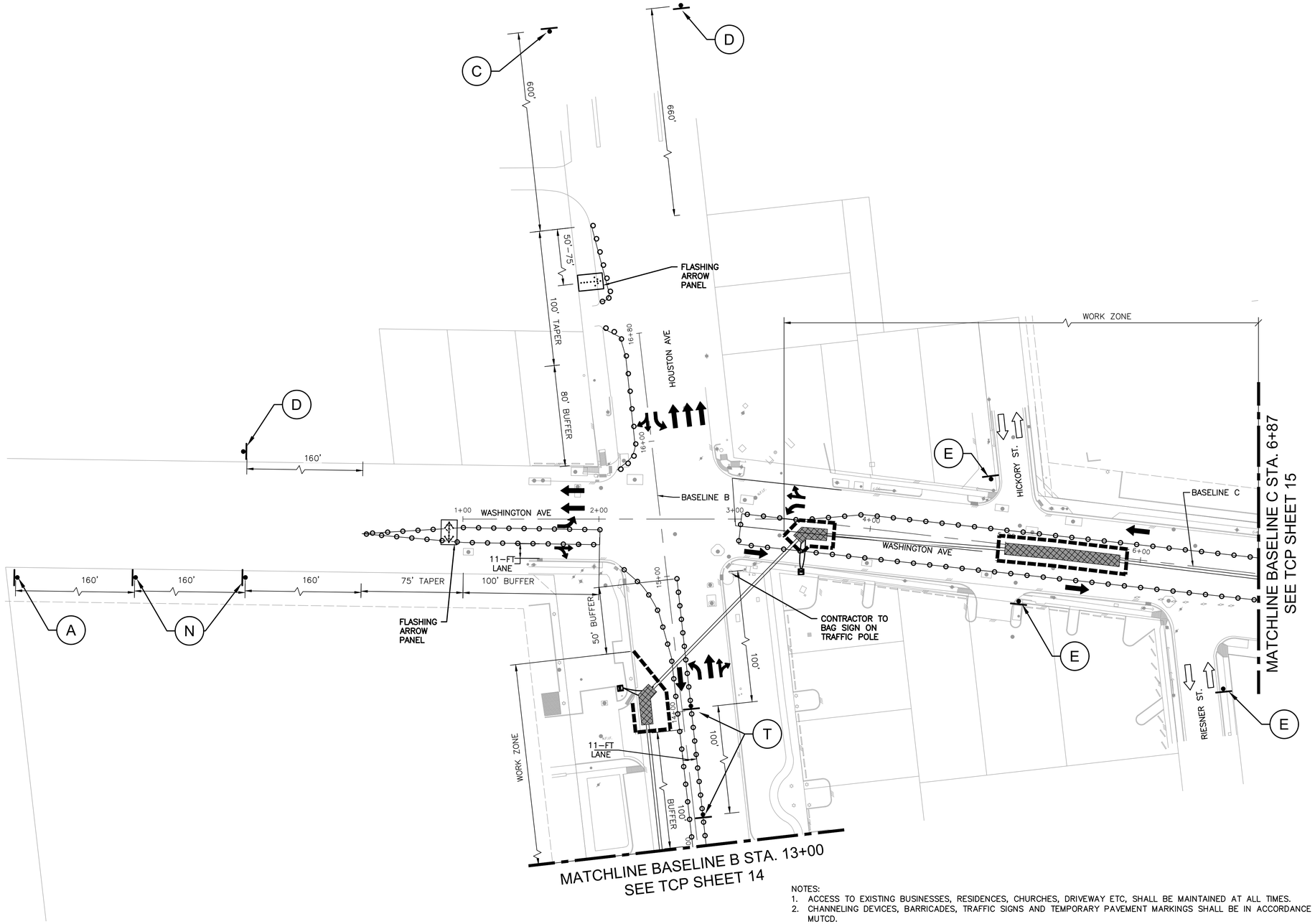

A	B	C	D	E	M	N	S	T	CHEVRON	8"–12"	MOUNTING HOLES FOR VERTICAL PANEL OR CHEVRON
UTILITY WORK AHEAD	ROAD CLOSED	RIGHT LANE CLOSED AHEAD	END UTILITY WORK		DO NOT ENTER	LEFT LANE CLOSED AHEAD	SIDEWALK CLOSED	LEFT LANE MUST TURN LEFT			36" PLASTIC DRUM
CW21–7D 36" X 36"	R11–2 36" X 18"	CW20–5R 36 X 36 PLAQUE 30 X 12	G20–2 36" X 18"	R3–2 36" X 36"	R5–1 30" X 30"	CW20–5L 36 X 36 PLAQUE 30 X 12	G20–2a 36" X 18"	R3–7L 30" X 30"	CW1–8 18" x 24"	VP–1	

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N
W E
S

0' 20' 40' 80'
SCALE: 1"=40'

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- WORK AREA
- EXISTING TRAVEL FLOW
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HOUSTON AVE. : 35 M.P.H.
WASHINGTON AVE. : 30 M.P.H.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

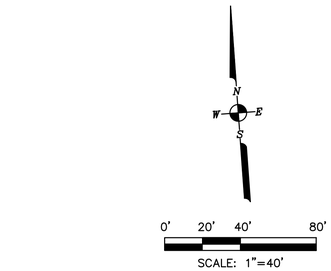
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 3
SHEET 1 OF 3

TCP SHEET: 13 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 115 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:32 AM
FILE PATH: P:\ACTIVE\25WL57\WORKING\DRAWINGS\SITE 4 & 5\25WL57 – TCP–WASHINGTON AVE.dwg



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HOUSTON AVE. : 35 M.P.H.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 3
SHEET 2 OF 3

TCP SHEET: 14 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 116 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:33 AM
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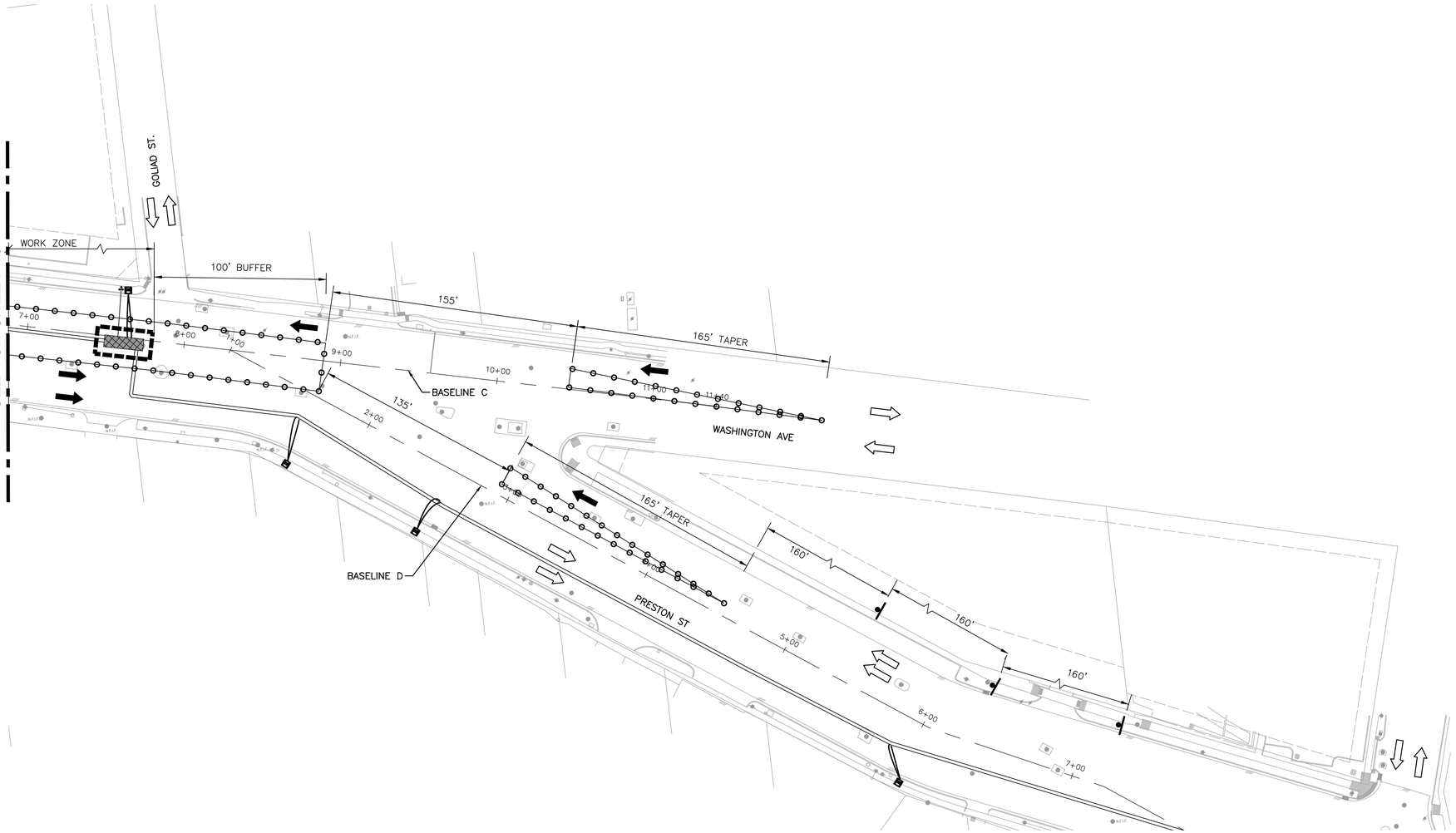
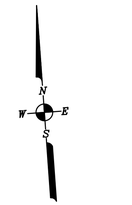
MATCHLINE BASELINE C STA. 6+87
SEE TCP SHEET 13





0' 20' 40' 80'

SCALE: 1"=40'

LEGEND:

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- WORK AREA
- EXISTING TRAVEL FLOW
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- LOW PROFILE CONCRETE BARRIER

PRESTON ST : 30 M.P.H.

WASHINGTON AVE : 30 M.P.H.

A	B	C	D	E	M	N	S	T			
UTILITY WORK AHEAD	ROAD CLOSED	RIGHT LANE CLOSED / AHEAD	END UTILITY WORK		DO NOT ENTER	LEFT LANE CLOSED / AHEAD	SIDEWALK CLOSED	LEFT LANE MUST TURN LEFT	CHEVRON	8"-12"	MOUNTING HOLES FOR VERTICAL PANEL OR CHEVRON
CW21-7D 36" X 36"	R11-2 36" X 18"	CW20-5R 36 X 36 PLAQUE 30 X 12	G20-2 36" X 18"	R3-2 36" X 36"	R5-1 30" X 30"	CW20-5L 36 X 36 PLAQUE 30 X 12	G20-2a 36" X 18"	R3-7L 30" x 30"	CW1-8 18" x 24"	VP-1	36" PLASTIC DRUM

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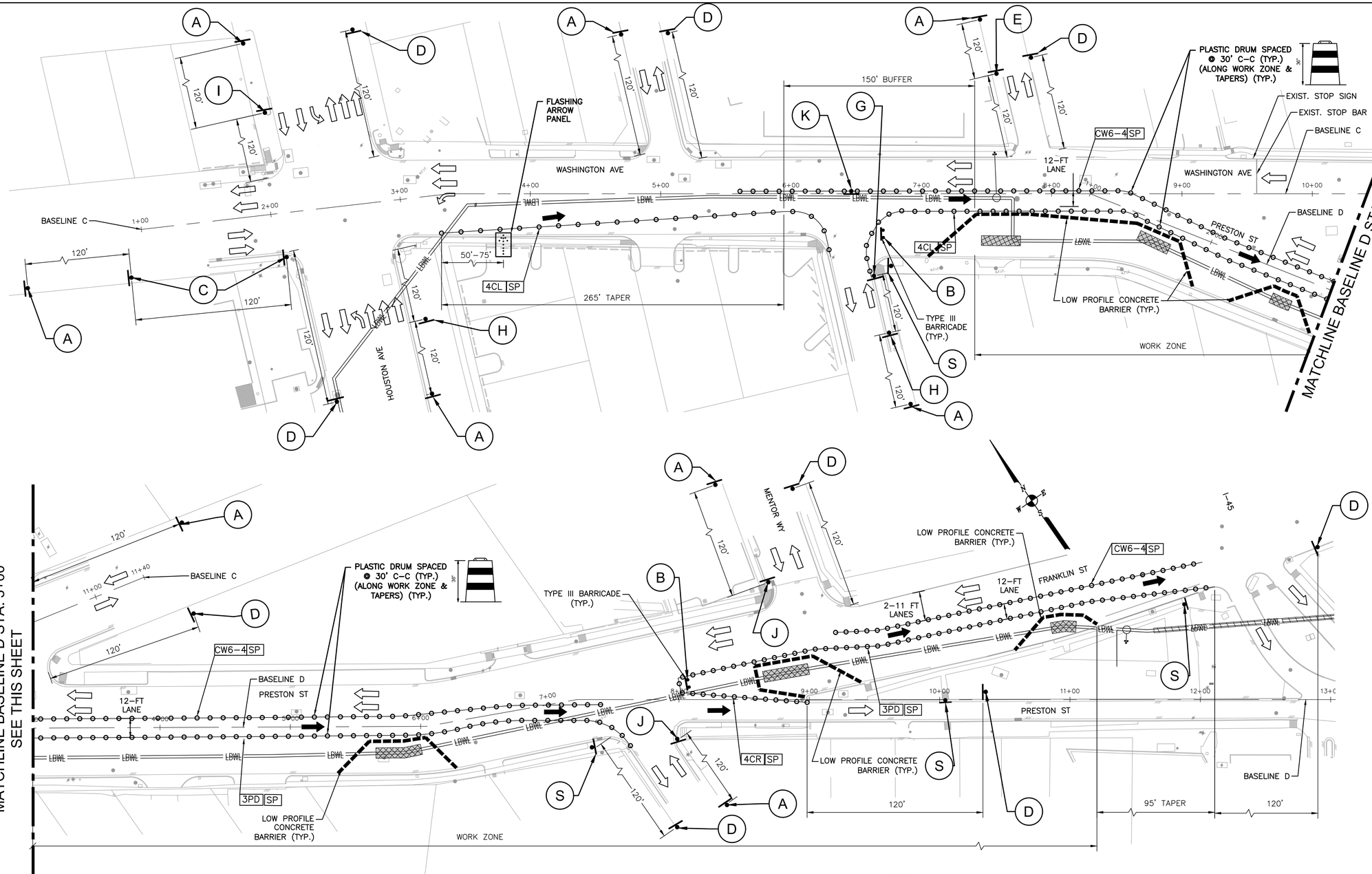
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 3
SHEET 3 OF 3

TCP SHEET: 15 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 117 OF 153	



SCALE: 1"=40'

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- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

WASHINGTON AVE.	30 M.P.H.
PRESTON RD.	30 M.P.H.
FRANKLIN ST.	30 M.P.H.

A	B	C	D	E	F	G	H	I	S	J
UTILITY WORK AHEAD CW21-7D 36" X 36"	ROAD CLOSED R11-2 36" X 18"	RIGHT LANE CLOSED AHEAD CW20-5R 36" X 36" PLAQUE 30" X 12"	END UTILITY WORK G20-2 36" X 18"	 R3-2 36" X 36"	STOP AHEAD R1-1 30" X 30" PLAQUE 30" X 12"	ONLY R3-5R 30" X 36"	RIGHT TWO LANES CLOSED CW20-5aR 36" X 36" CW1-6R 60" X 30"	RIGHT TWO LANES CLOSED CW20-5aL 36" X 36" CW1-6L 60" X 30"	SIDEWALK CLOSED G20-2a 36" X 18"	STOP R1-1 30" X 30"

K			
ONE WAY R6-2R 12" X 16"	CHEVRON CW1-8 18" X 24"	MOUNTING HOLES 8"-12" VP-1	FOR VERTICAL PANEL OR CHEVRON 36" PLASTIC DRUM

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11. DURING CONSTRUCTION, TRUCKS ARE PROHIBITED FROM TURNING LEFT ONTO ELDER ST FROM FRANKLIN ST AND FROM TURNING RIGHT ONTO ELDER ST FROM WASHINGTON AVE.

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Tel: (713) 747-2399
Texas Firm Registration No. F- 4575

SURVEYED BY:
Kuo & Associates, LLC.
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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 4

TCP SHEET: 16 OF 26

WBS NUMBER	S-000701-0043-4
DRAWING SCALE	H : 1"=40'
CITY OF HOUSTON PM	MARTIN MATHEW, ENV SP
SHEET NO. 118	OF 153

FOR CITY OF HOUSTON USE ONLY

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:33 AM
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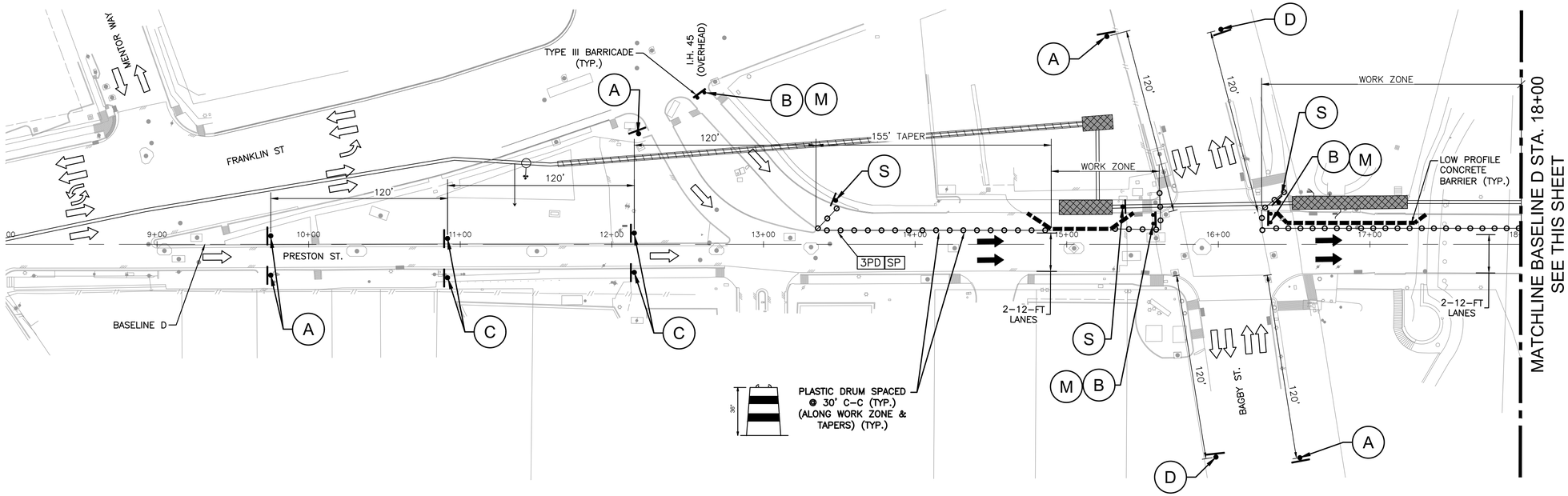

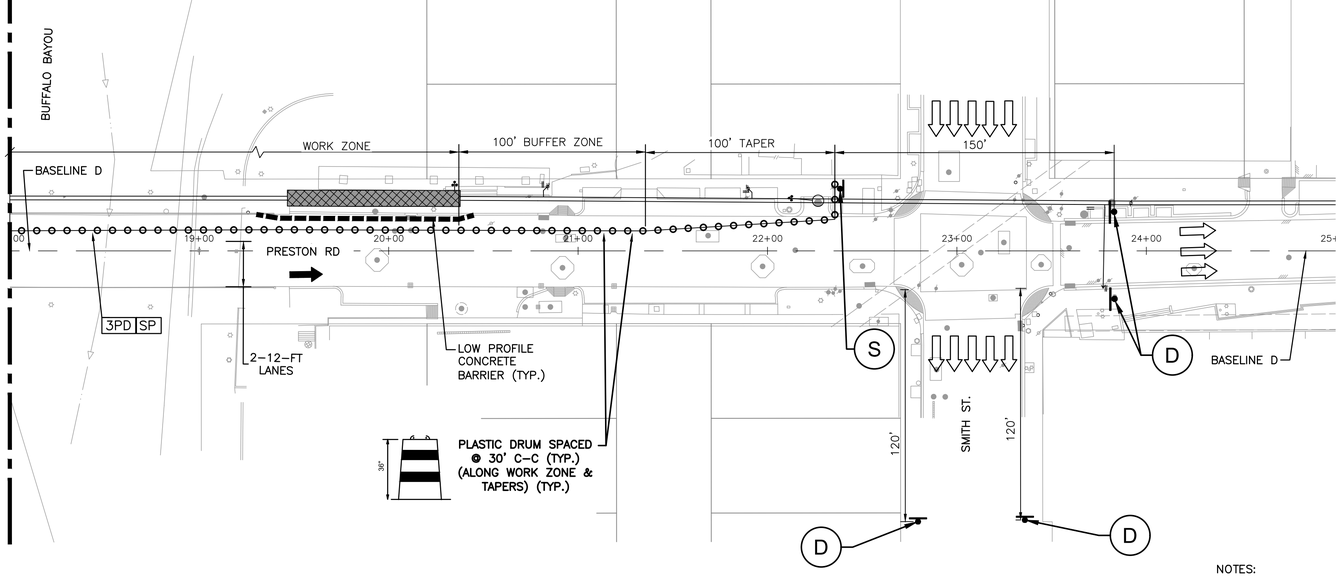

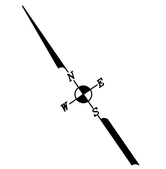

LEGEND:

- 3PD — PLASTIC DRUM (DRUM) (SEE LEGEND SP FOR SPACING)
- 4CL — DRUM WITH CHEVRON (CW1-8) ON EVERY OTHER DRUM (LEFT) (SEE LEGEND SP FOR SPACING)
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- PROPOSED SIGN POST
- APPROVED CHANNELIZATION DEVICE PLASTIC DRUM (SEE LEGEND FOR SPACING)
- TYPE III BARRICADE
- FLASHING ARROW PANEL (SEE LEGEND)
- WORK AREA
- EXISTING TRAVEL FLOW
- PROPOSED TRAFFIC FLOW
- LOW PROFILE CONCRETE BARRIER

PRESTON RD. : 30 M.P.H.

A	B	C	D	M	S	CHEVRON	8"-12"
UTILITY WORK AHEAD	ROAD CLOSED	LEFT LANE CLOSED AHEAD	END UTILITY WORK	DO NOT ENTER	SIDEWALK CLOSED		
CW21-7D 36" X 36"	R11-2 36" X 18"	CW20-5L 36 X 36 PLAQUE 30 X 12	G20-2 36" X 18"	R5-1 30" X 30"	G20-2a 36" X 18"	CW1-8 18 x 24	VP-1

NOTES:

1. ACCESS TO EXISTING BUSINESSES, RESIDENCES, CHURCHES, DRIVEWAY ETC, SHALL BE MAINTAINED AT ALL TIMES.
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7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING, RESTORING, REPLACING ALL INFRASTRUCTURES AND EXISTING DETECTION CURRENTLY IN PLACE FOR ALL APPROACHES IF DAMAGED DURING CONSTRUCTION.
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10. CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON OR TXDOT TRAFFIC OPERATIONS FOR ANY SIGNAL TIMING MODIFICATIONS AT LEAST 72 HOURS PRIOR TO IMPLEMENTING THE TCP STAGES. THIS NOTE APPLES TO ALL CONSTRUCTION PHASES AND STAGES.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 5

TCP SHEET: 17 OF 26

WBS NUMBER
S-000701-0043-4
DRAWING SCALE
H : 1"=40'
CITY OF HOUSTON PM
MARTIN MATHEW, ENV SP
SHEET NO. 119 OF 153

FOR CITY OF HOUSTON USE ONLY

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:34 AM
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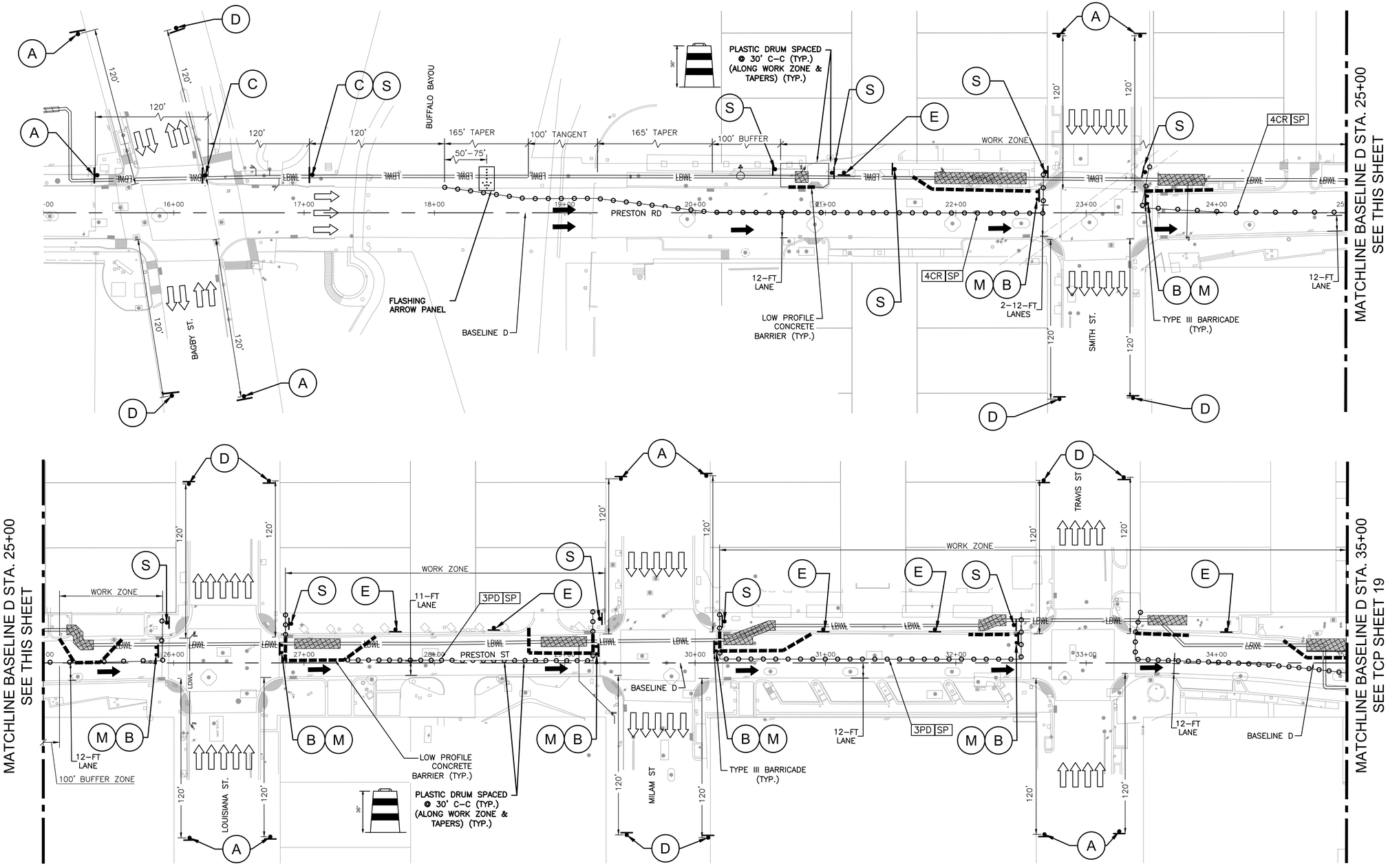

A	B	C	D	E	M	S			
UTILITY WORK AHEAD CW21-7D 36" X 36"	ROAD CLOSED R11-2 36" X 18"	LEFT LANE CLOSED AHEAD CW20-5L 36 X 36 PLAQUE 30 X 12	END UTILITY WORK G20-2 36" X 18"	NO PARKING R8-3 24" X 30"	DO NOT ENTER R5-1 30" X 30"	SIDEWALK CLOSED G20-2a 36" X 18"	CHEVRON CW1-8 18 x 24	8"-12" VP-1	MOUNTING HOLES FOR VERTICAL PANEL OR CHEVRON 36" PLASTIC DRUM

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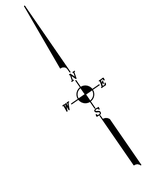

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- WORK AREA
- EXISTING TRAVEL FLOW
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PRESTON RD. : 30 M.P.H.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 6
SHEET 1 OF 2

TCP SHEET: 18 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 120 OF 153	

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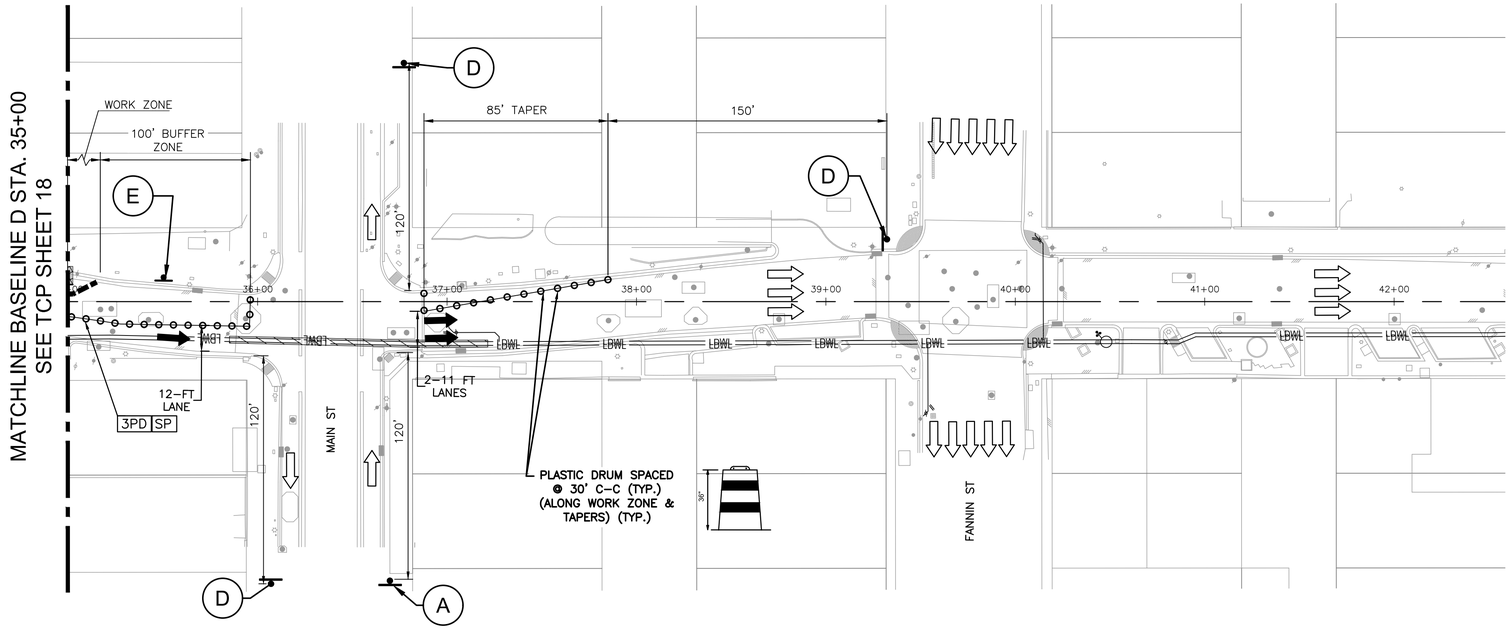

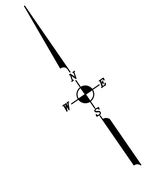

0' 20' 40' 80'

SCALE: 1"=40'

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- LOW PROFILE CONCRETE BARRIER

PRESTON RD. : 30 M.P.H.

A	B	C	D	E	M	S
UTILITY WORK AHEAD	ROAD CLOSED	LEFT LANE CLOSED AHEAD	END UTILITY WORK	NO PARKING	DO NOT ENTER	SIDEWALK CLOSED
CW21-7D 36" X 36"	R11-2 36" X 18"	CW20-5L 36 X 36 PLAQUE 30 X 12	G20-2 36" X 18"	R8-3 24" X 30"	R5-1 30" X 30"	G20-2a 36" X 18"

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 6

SHEET 2 OF 2

TCP SHEET: 19 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO.121 OF 153	

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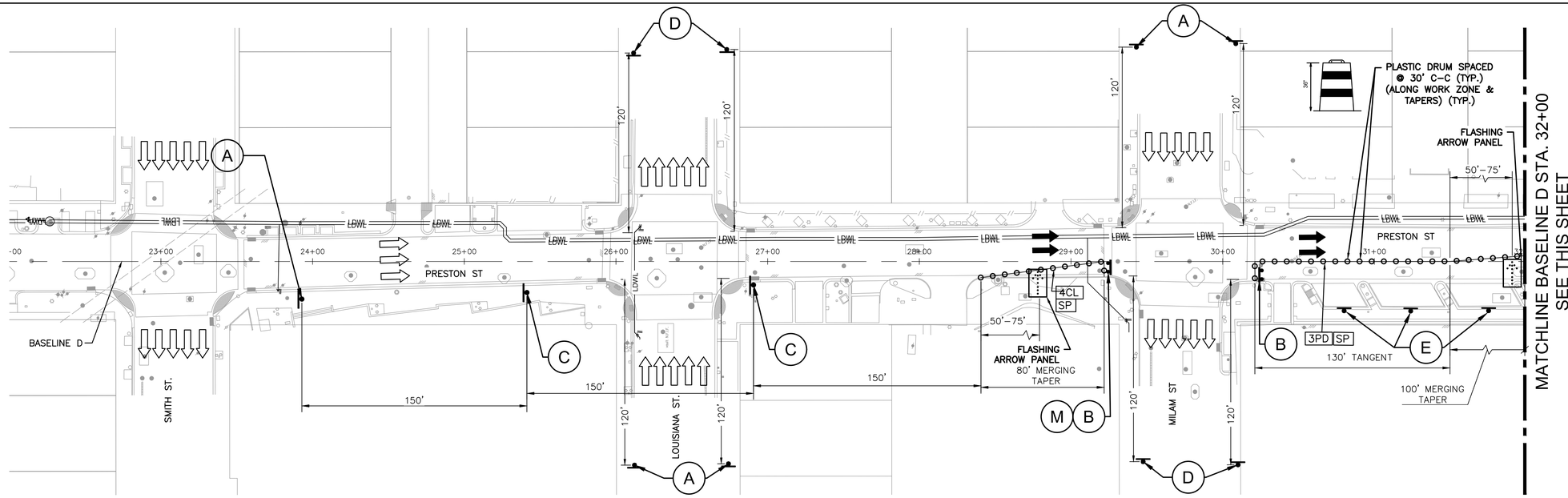

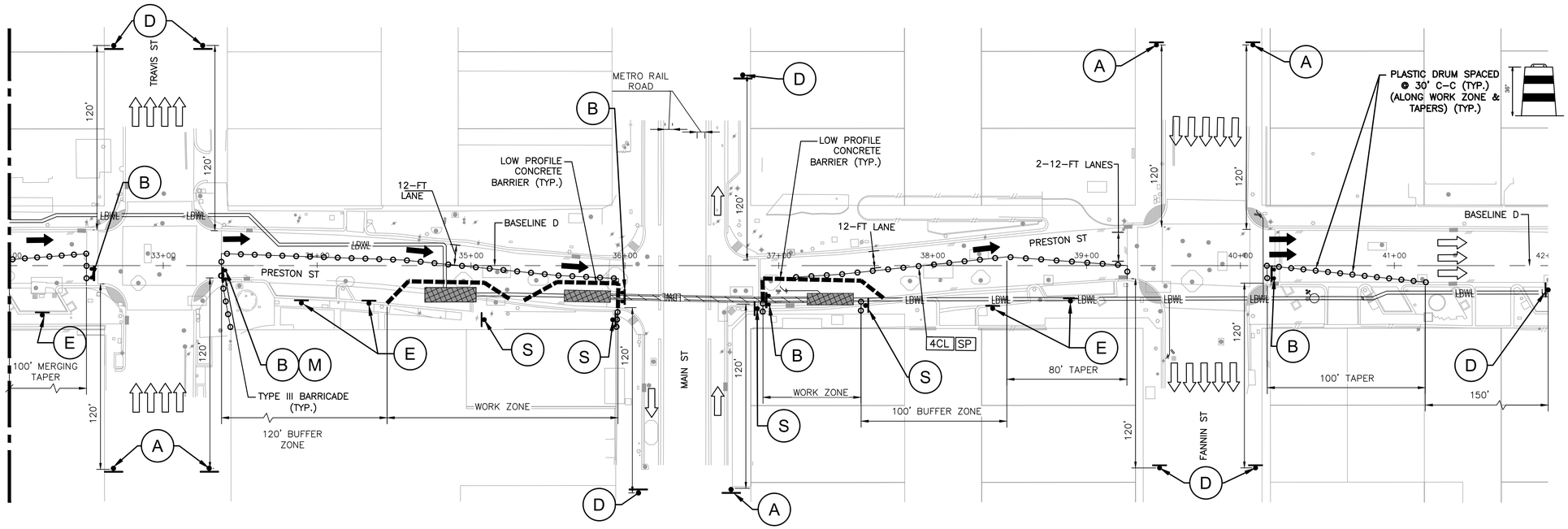

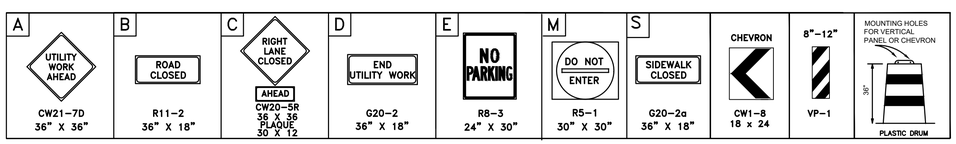

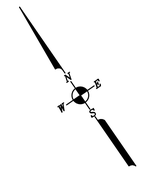

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PRESTON RD. : 30 M.P.H.

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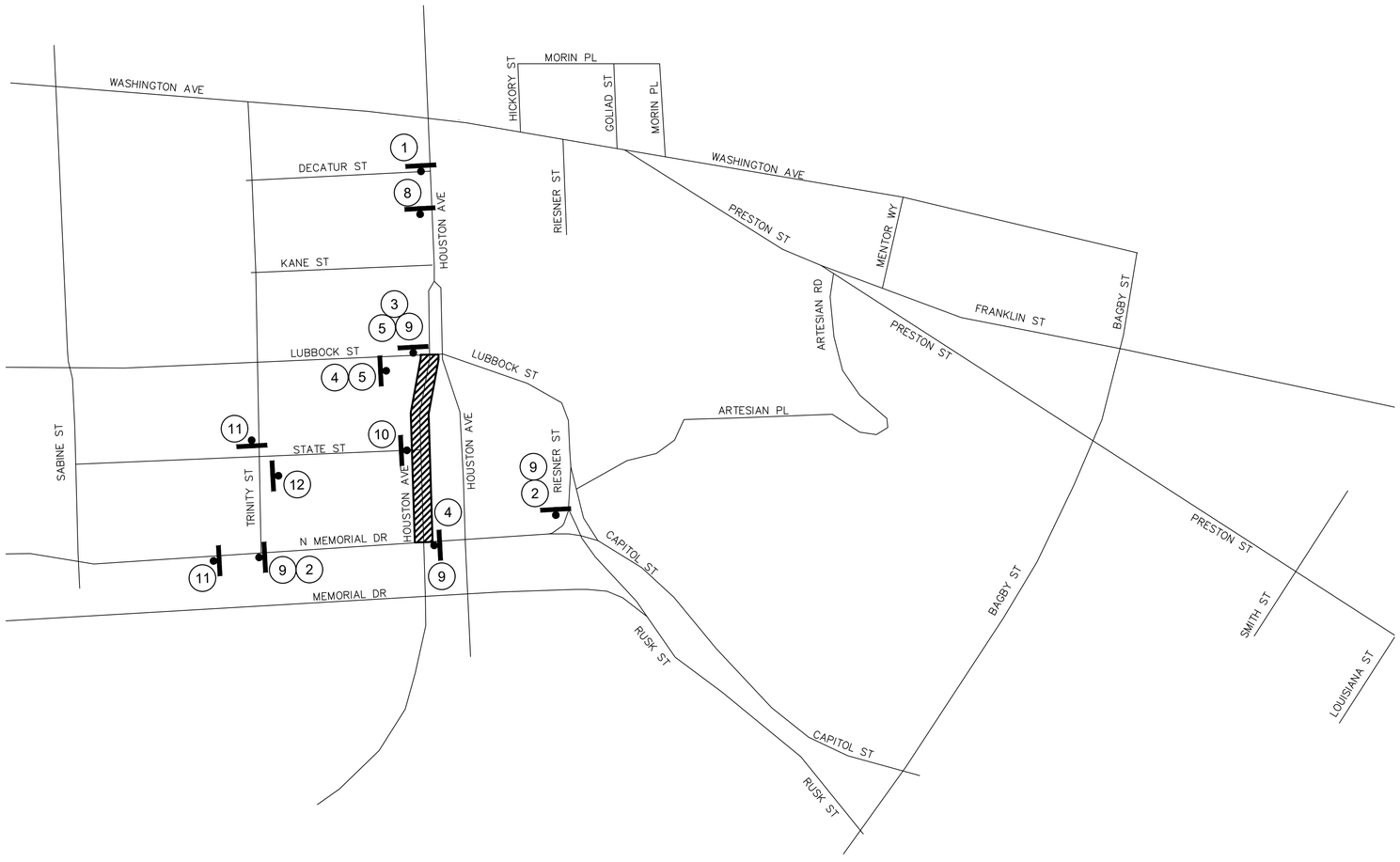
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

TRAFFIC CONTROL PLAN - PHASE 7

TCP SHEET: 20 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 122 OF 153	



0' 100' 200' 400'

SCALE: 1"=200'

N

LEGEND:

WORK ZONE

PROPOSED SIGN POST

1 — DETOUR AHEAD — CW20-2D 36 X 36

2 — DETOUR — M4-9R 30 X 24

3 — DETOUR — M4-9L 30 X 24

4 — DETOUR — M4-9S 30 X 24

5 — N MEMORIAL DR — M4-9N 30 X 12

6 — END DETOUR — M4-8T 24 X 18

8 — ROAD CLOSED AHEAD — CW20-3 36 X 36

9 — STATE ST — M4-9N 30 X 12

10 — ROAD CLOSED — R11-2 48 X 30

11 — END DETOUR — M4-8a 30 X 12

12 — ROAD CLOSED TO THRU TRAFFIC — R11-4 12 X 24

DETOUR PLAN FOR ROAD CLOSURE ON HOUSTON AVE

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

DETOUR PLAN

PHASE 2 - STEP 2

TCP SHEET: 21 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=200'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 123 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:35 AM

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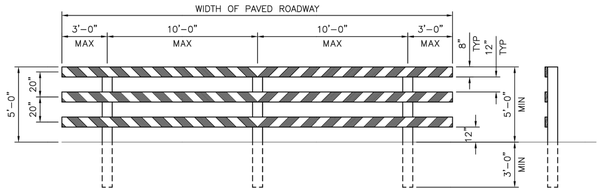
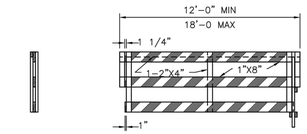
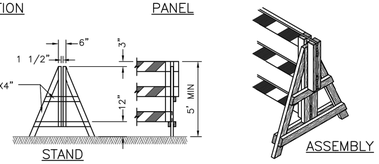


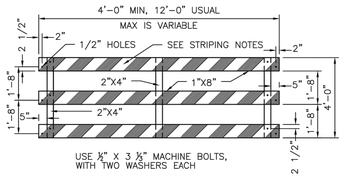
TYPE III BARRICADE FOR END OF ROAD

FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND RELFLECTIVE WHITE STRIPES ON SIDE FACING TRAFFIC

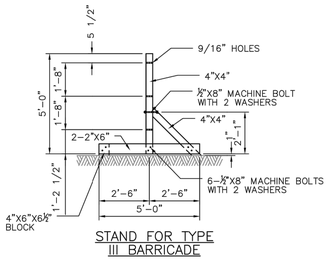




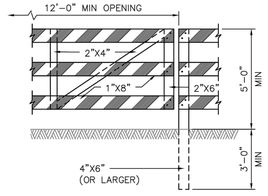
DEMOUNTABLE TYPE III BARRICADE



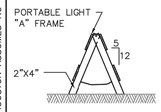
PANEL FOR TYPE III BARRICADE



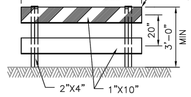
STAND FOR TYPE III BARRICADE



GATE FOR TYPE III BARRICADE



"A" FRAME



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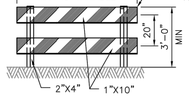

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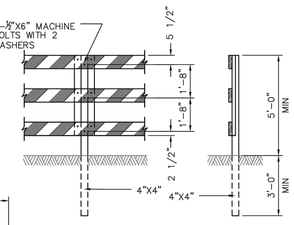
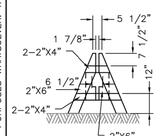
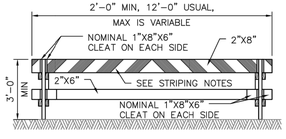


POST FOR TYPE III BARRICADE



DEMOUNTABLE



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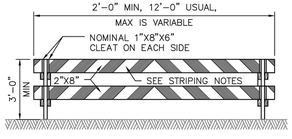
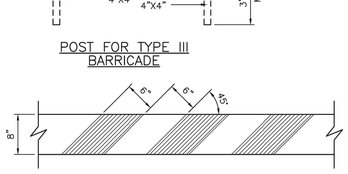


TYPE II

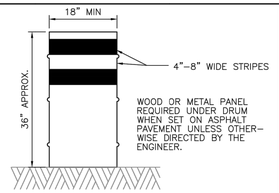
BARRICADE NOTES:

1. THE MOST RECENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND IT'S REVISIONS, SHALL GOVERN THE CONSTRUCTION AND USE OF ALL ITEMS HEREIN DESCRIBED.
2. CHANNELIZATION DEVICES OTHER THAN BARRICADES SHOULD NORMALLY BE USED FOR CHANNELIZATION PURPOSES.
3. BARRICADES SHOULD NORMALLY BE PLACED PERPENDICULAR TO THE TRAFFIC FLOW. OTHER CHANNELIZING DEVICES, SUCH AS DRUMS, VERTICAL PANELS OR PORTABLE BARRIERS, SHOULD BE USED WHERE NEEDED TO SEPARATE TRAFFIC FROM THE WORK AREA. IN ALL CASES, THE BARRICADES SHOULD BE SO LOCATED AS TO MOST ADVANTAGEOUSLY WARN AND DIRECT TRAFFIC.
4. BARRICADES MAY BE DESIGNED AND CONSTRUCTED FROM WOOD OR ANY OTHER SUITABLE MATERIAL APPROVED BY THE TMUTCD. THE CONSTRUCTION DETAILS SHOWN HEREON ARE TYPICAL AND ARE SUGGESTED DETAILS FOR WOOD SUPPORT SYSTEMS FOR BARRICADES. THE DETAILS OF RAIL WIDTH AND STRIPING, NUMBER AND SPACING OF RAILS, MINIMUM LENGTH AND HEIGHT (ABOVE PAVEMENT) OF RAILS MUST BE ADHERED TO WHEN ALTERNATE DESIGNS ARE USED.
5. BARRICADES ARE TO BE CONSTRUCTED OF CLEAN SOUND MATERIAL. ALL SURFACES ABOVE GROUND, WHICH ARE NOT STRIPED, SHALL BE WHITE EXCEPT THE UNPAINTED GALVANIZED METAL OR ALUMINUM COMPONENTS MAY BE USED. COMPONENTS MADE OF LUMBER SHALL BE PAINTED WITH A MINIMUM OF TWO COATS OF AN APPROVED BRAND OF WHITE PAINT TO SECURE THOROUGH COVERAGE AND A UNIFORM WHITE COLOR.
6. THE REFLECTORIZED WHITE AND REFLECTORIZED ORANGE (REFLECTORIZED RED) STRIPES FOR BARRICADES, DRUMS AND VERTICAL PANELS SHALL BE CONSTRUCTED OF HIGH INTESITY SHEETING AND SHALL BE MAINTAINED TO MEET THE APPEARANCE, COLOR AND REFLECTIVITY REQUIREMENTS SET BY DOTT.
7. THE CONTRACTOR SHALL MAINTAIN EACH BARRICADE IN A CLEAN AND GOOD CONDITION.
8. BARRICADES SHALL BE REMOVED UPON COMPLETION OF THE WORK AND/OR THE ELIMINATION OF THE HAZARD ON ANY SECTION.



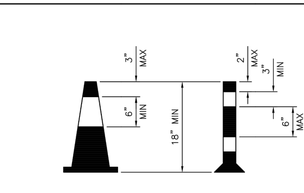
STRIPING FOR BARRICADE

1. FOR ALL TYPES OF BARRICADES WITH RAILS LESS THAN 3'-0" LONG, STRIPES 4" WIDE SHALL BE USED. IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON BACK SIDE OF BARRICADE RAILS.
2. STRIPING SHOULD COVER THE FULL WIDTH OF THE RAIL. STRIPING OF RAILS, PANELS, ETC, SHOULD SLOPE DOWNWARD AT AN ANGLE OF 45° DEGREES IN DIRECTIONS TRAFFIC IS TO PASS.
3. WHERE A BARRICADE EXTENDS ENTIRELY ACROSS A ROADWAY, IT IS DESIRABLE THAT THE STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING. WHEN BOTH RIGHT AND LEFT TURNS ARE PROVIDED FOR, THE CHEVRON STRIPING MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE.



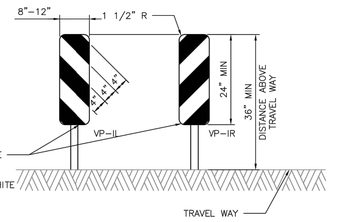
DRUMS

1. DRUMS, SET ON END, AND USED FOR TRAFFIC WARNING OR CHANNELIZATION SHALL BE APPROX 36" IN HEIGHT AND A MIN OF 18" IN DIAMETER. THE CONTRACTOR, AT HIS OPTION, MAY USE DRUMS MADE FROM STEEL BARRELS OR BLACK POLYETHYLENE PLASTIC DRUM LINERS WEIGHING APPROX EIGHT POUNDS EACH. THE MARKINGS ON DRUMS SHALL BE HORIZONTAL, CIRCUMFERENTIAL, REFLECTORIZED ORANGE AND REFLECTORIZED WHITE STRIPES, 4 TO 8 INCHES WIDE. THE FIRST REFLECTORIZED STRIPE SHOULD START WITHIN TWO (2) INCHES OF THE TOP OF THE DRUM. THERE SHALL BE AT LEAST TWO ORANGE AND TWO WHITE STRIPES ON EACH DRUM. IF THERE ARE NON-REFLECTORIZED SPACES BETWEEN THE HORIZONTAL ORANGE AND WHITE STRIPES, THEY SHALL BE NO MORE THAN 2 INCHES WIDE. METAL DRUMS SHALL BE PAINTED BLACK OR ORANGE BEFORE REFLECTORIZED STRIPES ARE ADDED. ALL DRUMS ON PROJECT WILL BE THE SAME COLOR. WHEN DRUMS ARE PLACED IN THE ROADWAY, APPROPIATE WARNING SIGNS SHOULD BE USED. DURING HOURS OF DARKNESS, A FLASHING WARNING LIGHT SHOULD BE PLACED ON DRUMS USED SINGLY AS A WARNING DEVICE. STEADY BURN ELECTRIC LIGHTS OR DELINEATORS SHOULD BE PLACED ON DRUMS USED IN SERIES FOR TRAFFIC CHANNELIZATION. DRUMS SHALL BE WEIGHTED WITH SAND TO THE EXTENT INDICATED IN THE PLANS.
2. CWI-8 CHEVRON SIGNS, CWI-6A ARROW SIGNS OR VP-I VERTICAL PANELS MOUNTED ABOVE DRUMS MAY BE USED AS SUPPLEMENTS TO DRUM DELINEATION.



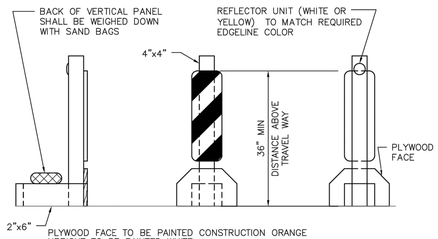
CONES

1. TRAFFIC CONES AND TUBULAR MARKERS SHALL BE A MIN OF 18" INCHES IN HEIGHT WITH A BROADENED BASE AND MAY BE MADE OF VARIOUS MATERIALS TO WITHSTAND IMPACT WITHOUT DAMAGE TO THEMSELVES OR TO VEHICLES. LARGER SIZES SHOULD BE USED ON FREEWAYS AND OTHER ROADWAYS WHERE SPEED ARE RELATIVELY HIGH OR WHERE EVER MORE CONSPICUOUS GUIDANCE IS NEEDED. ORANGE SHALL BE THE PREDOMINANT COLOR ON CONES AND TUBULAR MARKERS. THEY SHOULD BE KEPT CLEAN AND BRIGHT FOR MAX TARGET VALUE. FOR NIGHT TIME USE THEY SHALL BE REFLECTORIZED OR EQUIPPED WITH LIGHTING DEVICES FOR MAX VISIBILITY. REFLECTORIZED MATERIAL SHALL HAVE A SMOOTH, SEALED OUTER SURFACE WHICH WILL DISPLAY THE SAME APPROX COLOR DAY AND NIGHT.
2. REFLECTORIZATION OF TUBULAR MARKERS SHALL BE A MIN OF TWO THREE-INCH BANDS PLACED A MAX OF 2" FROM THE TOP WITH A MAX OF 6" BETWEEN THE BANDS. REFLECTORIZATION OF CONES SHALL BE PROVIDED BY A MIN 6" BAND PLACED A MAX OF 3" FROM THE TOP.
3. CONES OR TUBULAR MARKERS ARE GENERALLY ONLY SUITABLE FOR TEMPORARY USAGE (UP TO 8 HOURS) WITH OTHER CHANNELIZATION DEVICES SUCH AS VERTICAL PANELS OR BARRICADES PREFERRED FOR LONGER TERM USAGE. CARE SHOULD BE TAKEN TO INSURE THAT THEY REMAIN IN THEIR PROPER LOCATION AND IN AN UPRIGHT POSITION.



VERTICAL PANELS (VP)

VERTICAL PANELS ARE NORMALLY USED AS CHANNELIZING DEVICES TO INDICATE TANGENT OR NEARLY TANGENT ROADWAY ALIGNMENT WHERE GOOD TARGET VALUE OF A DEVICE IS NEEDED IN DAYTIME AS WELL AS THE NIGHTTIME. IN ADDITION, VERTICAL PANELS SHOULD BE USED AT THE EDGE OF SHOULDER DROP-OFFS AND OTHER SUCH AREAS AS LANE TRANSITIONS WHERE POSITIVE DAY AND NIGHT DELINEATION MAY BE REQUIRED. VERTICAL PANELS SHOULD BE MOUNTED BACK TO BACK IF USED AT THE EDGE OF CUTS ADJACENT TO TWO-WAY TWO LANE ROADWAYS. STRIPES SHOULD ALWAYS SLOPE DOWNWARD TOWARD THE TRAVELED WAY.



TYPICAL PORTABLE VERTICAL PANEL OR DELINEATOR

OTHER SIMILAR SUPPORTS MAY BE USED WHEN APPROVED BY TMUTCD AND DIRECTED BY THE CITY OF HOUSTON.

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CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock A80C61057260464...	
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BARRICADE AND CHANNELIZING DEVICES

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

BARRICADE AND CHANNELIZING DEVICES

TCP SHEET: 22 OF 26

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SHEET NO. 124 OF 153	

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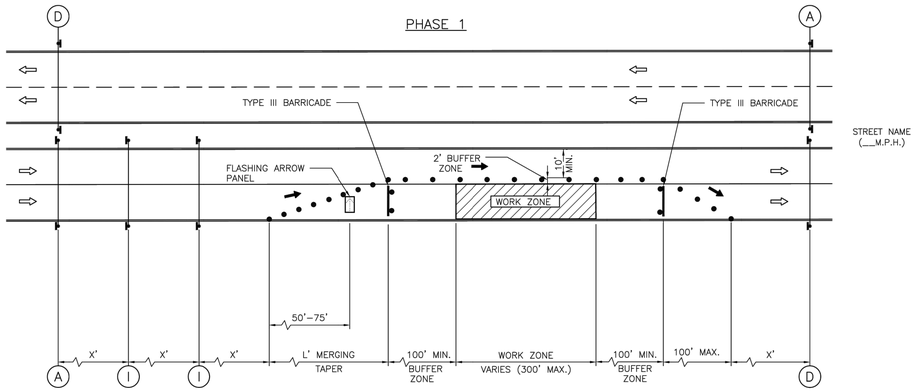
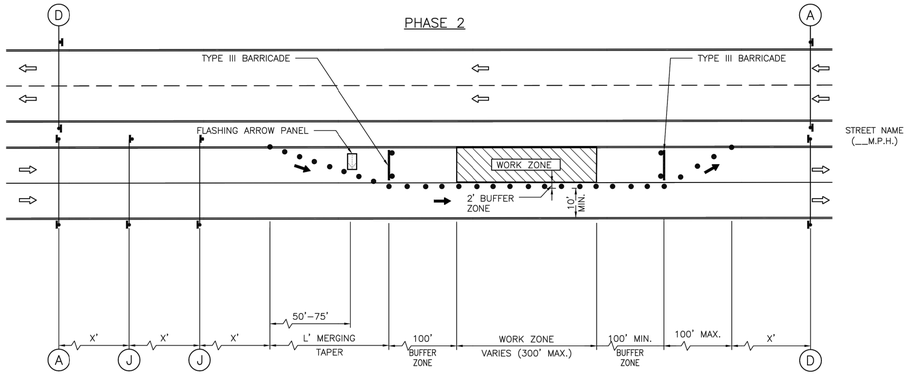
A	D	I	J
ROAD WORK AHEAD CW20-1	END ROAD WORK G20-2	RIGHT LANE CLOSED AHEAD CW20-5(2) CW16-3	LEFT LANE CLOSED AHEAD CW20-5(1) CW16-3

PHASE 1



PHASE 2



LEGEND:

- SIGN
- FLAGGER
- APPROVED CHANNELIZATION DEVICE
- BARRICADE
- FLASHING ARROW PANEL
- AREA UNDER CONSTRUCTION
- EXISTING TRAVEL WAY
- TRAFFIC CONTROL PLAN DETOUR TRAVEL WAY

NOTES:

1. RETURN TAPERS AND DOWNSTREAM BARRICADES ARE OPTIONAL ON A DIVIDED ROADWAY SECTION.
2. DOUBLE SIGNS SHALL BE USED ONLY ON ROADWAYS WITH MEDIANS.
3. FOR DIMENSIONS REFER TO SHEET 01555-01.
4. INSTALL FLASHERS ON DRUMS WHERE REQUIRED AND APPROVED BY CITY TRAFFIC ENGINEER.

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CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock	
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TCP ONE LANE CLOSURE
PHASE 1 & 2

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

ONE LANE CLOSURE
PHASE 1 & 2

TCP SHEET: 23 OF 26

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SHEET NO. 125 OF 153	

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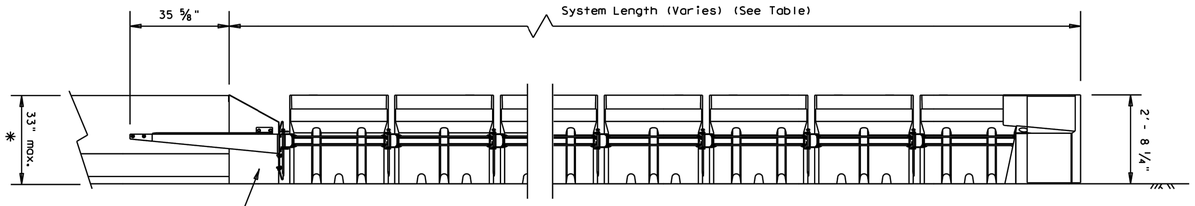
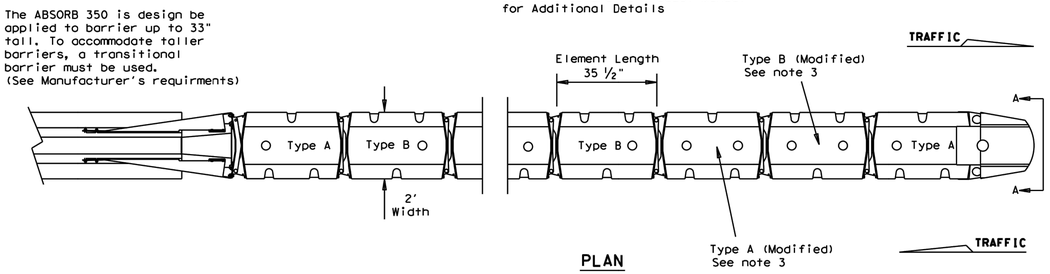


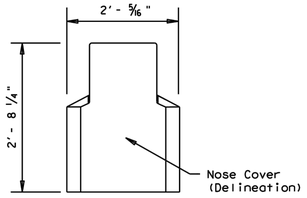
ELEVATION

See Manufacturer's Product Manual for Additional Details

✳ The ABSORB 350 is design be applied to barrier up to 33" tall. To accommodate taller barriers, a transitional barrier must be used. (See Manufacturer's requirments)



PLAN



SECTION A-A

Nose Piece delineation orientation, is shown elsewhere on the plans.

TEST LEVEL	NUMBER OF ELEMENTS	SYSTEM LENGTH (approx.)
TL-2	5	20' - 0"
TL-3	10	35' - 0"

The ABSORB 350 is only to be used in temporary (Work Zone) locations.

BACKUP SUPPORT
Steel Backup (Attach to Concrete Barriers, Precast or Cast-in-Place)

TRANSITION OPTIONS
Steel Backup to Vertical Wall
Steel Backup to Concrete Traffic Barriers

Backup and Transition types are shown elsewhere on the plans (i.e. Attenuator location details or in the general notes).

GENERAL NOTES

1. Refer to Installation manual and configuration chart for specific system assembly and element orientation. For additional information. Contact Interstate Steel Inc. at (432)263-3725.
2. The ABSORB 350 system is approved for use in temporary (Work Zone) locations. The ABSORB 350 is a water filled non-redirective, gating crash cushion that does not need to be attached to a foundation and can be installed on top of concrete, asphalt, or any surface capable of bearing the weight of the system.
3. Modified Type A and Type B elements require drilling of an additional 3" Dia. hole (as shown). See Manufacturers installation manual for details.
4. Maximum permissible cross-slope is 8%.
5. The installation area should be free from curbs, elevated objects, or depressions.
6. The ABSORB 350 should be approximately parallel with the barrier or ℄ of merging barrier.

BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
B010825	1	Replacement Nose Assembly
B010830	1	Nose Piece Cover
B000303	TBD	Type A Element Assembly
B000708	TBD	Type B Element Assembly
B000706	TBD	Replacement Element Type A
B000708	TBD	Replacement Element Type B
B000520	1	Replacement Transition to PCB
A010420	TBD	Pin Link Hinge Locking
B000520	1	Transition Adapter Assembly
B000209	TBD	Strap Left Adapter
B000207	TBD	Strap Right Adapter
B000611	TBD	Adapter Hinge Plate
A000521	TBD	Anchor Bolt (U-Bolt)
B000518	1	Tapered Adapter
B020421	TBD	I Beam Adapter Female
B020420	TBD	I Beam Adapter Male
C021212	1	Transition to Link

(TBD) = To Be Determined, depending on System Length. (See manufacturer's product manual)

Required Information
The use of the ABSORB 350 is restricted to a maximum barrier height of 33 inches.

Texas Department of Transportation — Design Division Standard

BARRIER SYSTEMS ABSORB 350 CRASH CUSHION (TEMPORARY, WORK ZONE)

ABSORB-13

FILE: absorb13.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

BARRIER SYSTEM ABSORB 350

TCP SHEET: 24 OF 26

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 126 OF153	

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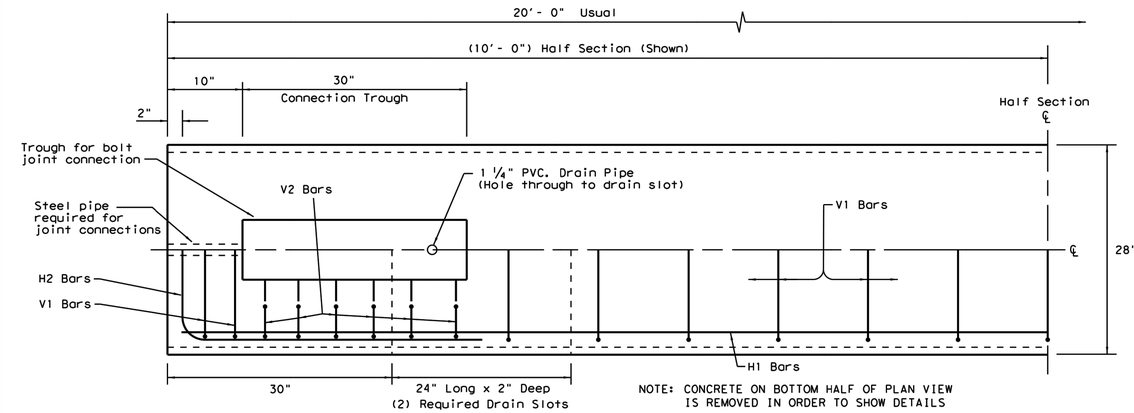
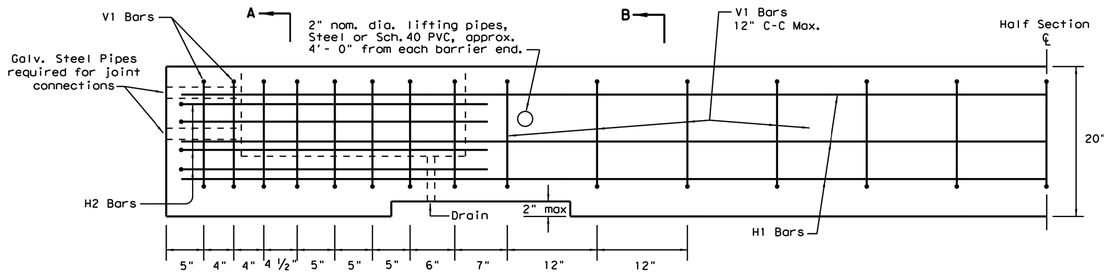
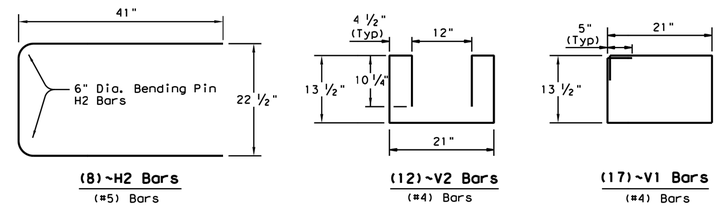


PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

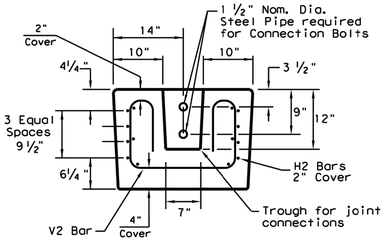


ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

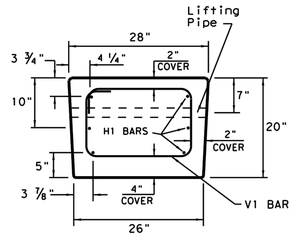


REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



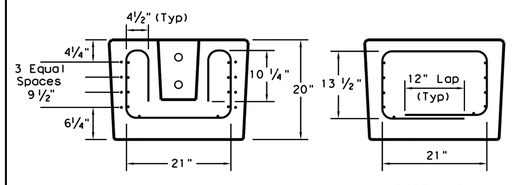
SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445,"Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



SECTION A-A SECTION B-B

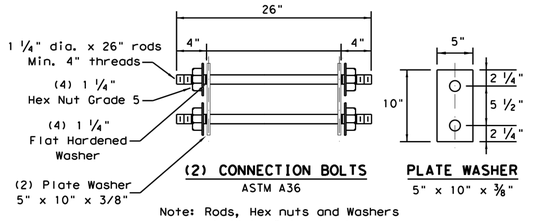
(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

LOW PROFILE CONCRETE BARRIER

TCP SHEET: 25 OF 26

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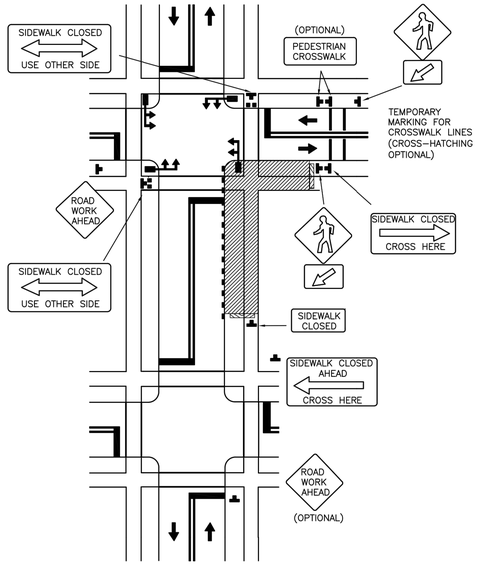

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CROSSWALK CLOSURES AND PEDESTRIAN DETOURS

(SCALE: NOT TO SCALE)

EFF DATE: NOV-27-2023 | DWG NO: 01555-16

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HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

CROSSWALK CLOSURES AND PEDESTRIAN DETOURS

TCP SHEET: 26 OF 26

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HYPER–CHLORINATED WATER NOTES

1. HYPER–CHLORINATED WATER SHALL NOT BE DISCHARGED TO THE STORM SEWER DRAINAGE SYSTEM UNLESS THE CHLORINE CONCENTRATION IS REDUCED TO 4PPM OR LESS BY CHEMICALLY TREATING WITH DECHLORINATE OR BY ON–SITE RETENTION UNTIL NATURAL ATTENUATION OCCUR.
2. DISCHARGE OF HIGH FLOW RATE AND VELOCITIES SHALL BE DIRECTED TO VELOCITY DISSIPATION DEVICES.
3. CHLORINE CAN BURN VEGETATION, SO IT SHOULD NOT BE USED TO WATER VEGETATION THAT IS BEING USED FOR STABILIZATION. VEGETATED FILTERS OR BUFFERS, OR OTHER VEGETATION TO BE PRESERVED.
4. HYPER–CHLORINATED WATER MAY BE DISCHARGED TO AN ON–SITE RETENTION AREA UNTIL DECHLORINATION OCCURS NATURALLY. THE AREA MAY CONSIST OF A DRY RETENTION BASIN, RETENTION POND, TEMPORARY PIT, OR A BERMED/STAGED AREA GRADED ON–SITE.
5. NATURAL ATTENUATION OF CHLORINE MAY BE AIDED BY AERATION. AIR CAN BE ADDED TO THE WATER BY DIRECTING THE DISCHARGE OVER A ROUGH SURFACE BEFORE IT ENTERS THE TEMPORARY RETENTION AREA OR AN AERATION DEVICE CAN BE PLACED IN THE RETENTION AREA.
6. ON–SITE DISCHARGE MAY BE REQUIRED FOR SEVERAL HOURS TO A FEW DAYS BEFORE THE WATER IS SAFE TO RELEASE. THE RATE AT WHICH CHLORINE ATTENUATES DEPENDS ON SOIL AND WEATHER CONDITIONS, WITH ATTENUATION OCCURRING MOST RAPIDLY DURING WARM, SUNNY, AND DRY PERIODS

SPILL AND LEAK RESPONSE NOTES

1. RECORDS OF ANY RELEASES OF OIL OR HAZARDOUS SUBSTANCES THAT EXCEEDS THE REPORTABLE QUANTITY (RQ) SHALL BE MAINTAINED IN ACCORDANCE WITH APPLICABLE FEDERAL AND STATE REGULATIONS.
2. EMERGENCY CONTACT INFORMATION AND SPILL RESPONSE PROCEDURES SHALL BE POSTED IN A READILY AVAILABLE AREA FOR ACCESS BY ALL EMPLOYEES AND SUBCONTRACTORS.
3. SPILL CONTAINMENT KIT SHOULD BE MAINTAINED FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS THAT ARE REGULARLY ONSITE, MATERIALS IN KITS SHOULD BE BASED ON CONTAINMENT GUIDELINES IN THE MATERIALS SAFETY AND DATA SHEETS (MSDS) FOR THE SUBSTANCE MOST FREQUENTLY ONSITE.
4. SPILL KITS ARE INTENDED FOR RESPONSE TO SMALL SPILLS, TYPICALLY LESS THAN 5 GALLONS, OR SUBSTANCES THAT ARE NOT EXTREMELY HAZARDOUS.
5. SIGNIFICANT SPILLS OR OTHER RELEASES WARRANT IMMEDIATE RESPONSE BY TRAINED PROFESSIONALS.
6. SUSPECTED JOB SITE CONTAMINATION SHOULD BE IMMEDIATELY REPORTED TO REGULATORY AUTHORITIES AND PROTECTIVE ACTIONS TAKEN.
7. THE CONTRACTOR SHOULD BE REQUIRED TO DESIGNATE A SITE SUPERINTENDENT, FOREMAN, SAFETY OFFICER, OR OTHER SENIOR PERSON WHO IS ONSITE DAILY TO BE THE SPILL AND LEAK RESPONSE COORDINATOR (SLRC) AND MUST HAVE KNOWLEDGE OF AND BE TRAINED IN CORRECT SPILL AND LEAK RESPONSE PROCEDURES.

SANITARY WASTE NOTES

1. THE CONTRACTOR SHALL PROVIDE AN APPROPRIATE NUMBER OF PORTABLE TOILETS BASED ON THE NUMBER OF EMPLOYEES USING THE TOILETS AND THE HOURS THEY WILL WORK.
2. SANITARY FACILITIES SHALL BE PLACED A MINIMUM OF 50 FEET AWAY FROM STORM DRAIN INLETS, CONVEYANCE CHANNELS OR SURFACE WATERS. IF UNABLE TO MEET THE 50 FEET REQUIREMENT DUE TO SITE CONFIGURATION, PORTABLE TOILETS SHALL BE A MINIMUM OF 20 FEET AWAY FROM STORM DRAIN INLETS, CONVEYANCE CHANNELS OR SURFACE WATER AND SECONDARY CONTAINMENT SHALL BE PROVIDED IN CASE OF SPILLS.
3. THE LOCATION OF THE PORTABLE TOILET SHALL BE ACCESSIBLE TO MAINTENANCE TRUCKS WITHOUT DAMAGING EROSION AND SEDIMENT CONTROLS OR CAUSING EROSIONS OR TRACKING PROBLEMS.
4. SANITARY FACILITIES SHALL BE FULLY ENCLOSED AND DESIGNED IN A MANNER THAT MINIMIZES THE EXPOSURE OF SANITARY WASTE TO PRECIPITATION AND STORMWATER RUNOFF.
5. WHEN HIGH WINDS ARE EXPECTED, PORTABLE TOILET SHALL BE ANCHORED OR OTHERWISE SECURED TO PREVENT THEM FROM BEING BLOWN OVER.
6. THE COMPANY THAT SUPPLIES AND MAINTAINS THE PORTABLE TOILETS SHALL BE NOTIFIED IMMEDIATELY IF A TOILET IS TIPPED OVER OR DAMAGED IN A WAY THAT RESULTS IN A DISCHARGE. DISCHARGED SOLID MATTER SHALL BE VACUUMED INTO A SEPTIC TRUCK BY THE COMPANY THAT MAINTAINS THE TOILETS.
7. SANITARY FACILITIES SHALL NOT BE PERMITTED ON PUBLIC SIDEWALKS, STREETS OR INLETS.

SUBGRADE STABILIZATION NOTES

1. MINIMIZE THE DISCHARGE OF THE CHEMICAL STABILIZERS BY THE CONTRACTOR BY LIMITING THE AMOUNT OF STABILIZING AGENT ONSITE TO THAT WHICH CAN BE THOROUGHLY MIXED AND COMPACTED BY THE END OF EACH WORKDAY.
2. STABILIZERS SHALL BE APPLIED AT RATES THAT RESULT IN NO RUN OFF.
3. STABILIZATION SHALL NOT OCCUR IMMEDIATELY BEFORE AND DURING RAINFALL EVENTS.
4. NO TRAFFIC OTHER THAN WATER TRUCKS, AND MIXING EQUIPMENT SHALL BE ALLOWED TO PASS OVER THE AREA BEING STABILIZED UNTIL AFTER COMPLETION OF MIXING THE CHEMICALS.
5. AREA ADJACENT AND DOWNSTREAM OF STABILIZED AREA SHALL BE ROUGHENED TO INTERCEPT CHEMICAL RUNOFF AND REDUCE RUNOFF VELOCITY.
6. GEOTEXTILE FABRICS SUCH AS THOSE USED FOR SILT FENCE SHOULD NOT BE USED TO TREAT CHEMICAL RUNOFF, BECAUSE THE CHEMICALS ARE DISSOLVED IN THE WATER AND WON'T BE AFFECTED BY A BARRIER AND THE SUSPENDED SOLIDS ARE SIGNIFICANTLY SMALLER THAN THE APPARENT OPENING SIZE OF THE FABRIC.
7. IF SOIL STABILIZERS ARE STORED ONSITE, THEY SHALL BE CONSIDERED HAZARDOUS MATERIAL AND SHALL BE MANAGED ACCORDING TO THE CRITERIA OF CHEMICAL MANAGEMENT TO CAPTURE ANY ACCIDENTAL LIME OR ANY CHEMICAL OVERFLOW.
8. THE CONTRACTOR SHALL INSTALL BMP'S TO ALL INLETS AND OPENINGS CONNECTED TO THE STORM SEWER SYSTEMS TO PREVENT LIME FROM ENTERING THE MS4 SYSTEM.

DEBRIS AND TRASH NOTES

1. ALL WASTE SOURCES AND STORAGE AREAS SHALL BE LOCATED A MINIMUM OF 50 FEET AWAY FROM INLETS, SWALES, DRAINAGE WAYS, CHANNELS, AND OTHER WATERS, IF THE SITE CONFIGURATION PROVIDE SUFFICIENT SPACE TO DO SO. IN NO CASE SHALL MATERIAL AND WASTE SOURCES BE CLOSURE THAN 20 FROM INLETS, SWALES, DRAINAGE WAYS, CHANNELS, AND OTHER WATERS.
2. CONSTRUCTION WASTE AND TRASH SHALL BE STORED IN A MANNER THAT MINIMIZES IT'S EXPOSURE TO PRECIPITATION AND STORM WATER RUN OFF.
3. WHENEVER POSSIBLE MINIMIZE PRODUCTION OF DEBRIS AND TRASH.
4. INSTRUCT CONSTRUCTION WORKERS IN PROPER DEBRIS AND TRASH STORAGE AND HANDLING PROCEDURES.
5. SEGREGATE POTENTIAL HAZARDOUS WASTE FROM NON–HAZARDOUS CONSTRUCTION SITE DEBRIS.
6. PROHIBIT LITTERING BY WORKERS AND VISITORS.
7. POLICE SITE DAILY FOR LITTER AND DEBRIS.
8. ENFORCE SOLID WASTE HANDLING AND STORAGE PROCEDURES.
9. IF FEASIBLE, RECYCLE CONSTRUCTION AND DEMOLITION DEBRIS SUCH AS WOOD, METAL, AND CONCRETE.
10. TRASH AND DEBRIS SHALL BE REMOVED FROM THE SITE AT REGULAR INTERVALS THAT ARE SCHEDULED TO EMPTY CONTAINERS WHEN THEY ARE 90 PERCENT FULL OR MORE FREQUENTLY.
11. GENERAL CONSTRUCTION DEBRIS MAY BE HAULED TO A LICENSED CONSTRUCTION DEBRIS LANDFILL.
12. USE WASTE AND RECYCLING HAULERS/ FACILITIES APPROVED BY THE LOCAL MUNICIPALITY.
13. CHIPPING OF TREES AND BRUSH FOR USE SUCH AS MULCH IS PREFERRED ALTERNATIVE TO OFFSITE DISPOSAL
14. NO WASTE, TRASH OR DEBRIS SHALL BE BURIED, BURNED OR OTHERWISE DISPOSED OF ONSITE.
15. CLEARLY MARK ON ALL DEBRIS AND TRASH CONTAINERS WHICH MATERIALS ARE ACCEPTABLE. FOREMAN AND/OR CONSTRUCTION SUPERVISOR SHALL MONITOR ONSITE SOLID WASTE STORAGE AND DISPOSAL PROCEDURE DAILY.

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SWPPP
GENERAL NOTES

SWPPP SHEET: 1 OF 14

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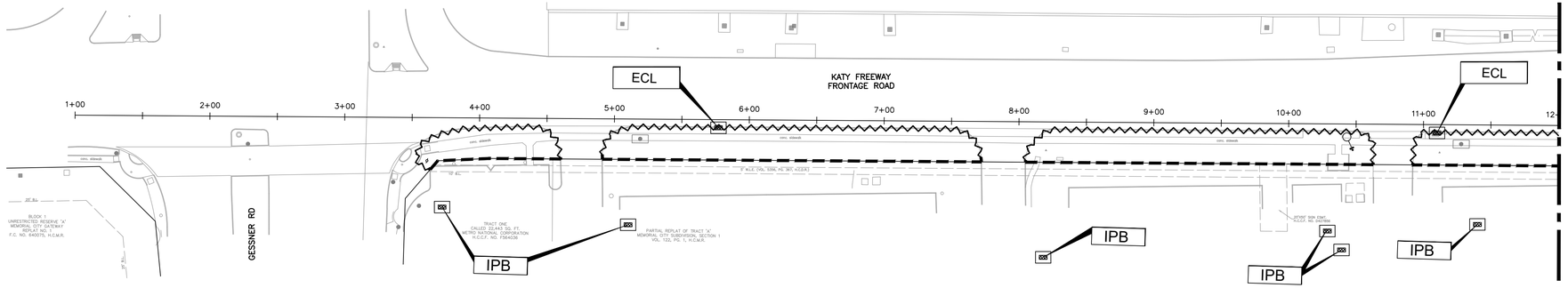

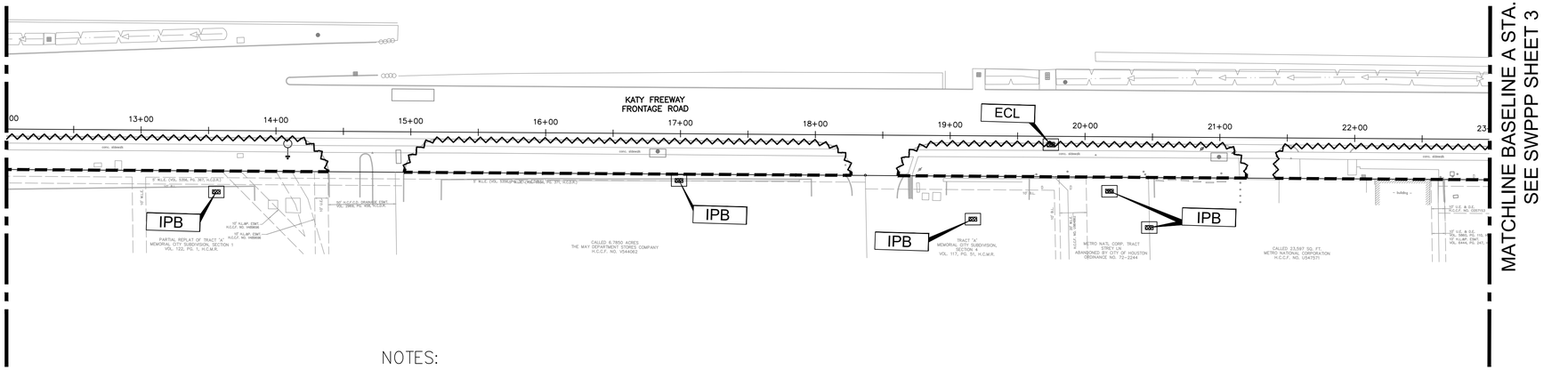

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0' 25' 50' 100'

SCALE: 1"=50'

LEGEND:

- EROSION CONTROL LOG AT BACK OF CURB
- EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- IPB — INLET PROTECTION BASKET
- ECL — EROSION CONTROL LOG AT REFER NOTE 8

NOTES:

1. CONTRACTOR SHALL PROVIDE STABILIZED CONSTRUCTION ACCESS IF NEEDED ALL THE TIME DURING CONSTRUCTION INCLUDING TRUCK WASHING AREA, VERIFIED IN THE FIELD AND AUTHORIZED BY ENGINEER. EXACT LOCATION TO BE DETERMINED BY THE CONTRACTOR.
2. PROTECT ALL EXISTING STORM INLETS AND CULVERTS
3. WATERLINES SHALL BE CONSTRUCTED USING A COMBINATION OF OPEN-CUT, TRENCHLESS, AND SLIP-LINING METHODS, AS SHOWN IN THE DRAWING.
4. CONTRACTOR SHALL PROVIDE STABILIZED STAGING/PARKING AREA.
5. ADDITIONAL SWPPP MEASURES MAY BE APPLIED ADJACENT TO THE PROJECT AREA IF APPROPRIATE (EG. DAILY STREET SWEEPING).
6. REFER TO STORM WATER POLLUTION DETAILS FOR NOTES AND DETAIL
7. THE WATER LINE SHALL BE INSTALLED BY THE OPEN-CUT METHOD AT ALL DRIVEWAYS WHERE THE PROPOSED WATER LINE IS ADJACENT TO THE ROW. DRIVEWAYS SHALL BE CLOSED ONE AT A TIME TO MINIMIZE DISRUPTION AND REOPENED AS SOON AS POSSIBLE
8. CONTRACTOR SHALL MAINTAIN EROSION CONTROL LOGS FOR INLET AND BACK OF CURB AT ALL TIMES DURING CONSTRUCTION. FOR EROSION CONTROL LOG (ECL) DETAILS, REFER TO SHEET 11. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING AND INSTALLING THE APPROPRIATE ECL MEASURES BASED ON SITE CONDITIONS. IF NECESSARY, INLET PROTECTION BASKETS CAN BE APPLIED FOR INLETS WHICH ARE NOT ON THE TXDOT ROADWAYS (E.G PARKING LOTS).

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 1 – KATY FREEWAY

STORM WATER POLLUTION PREVENTION PLAN -1

SWPPP SHEET: 2 OF 14

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H : 1"=40'	
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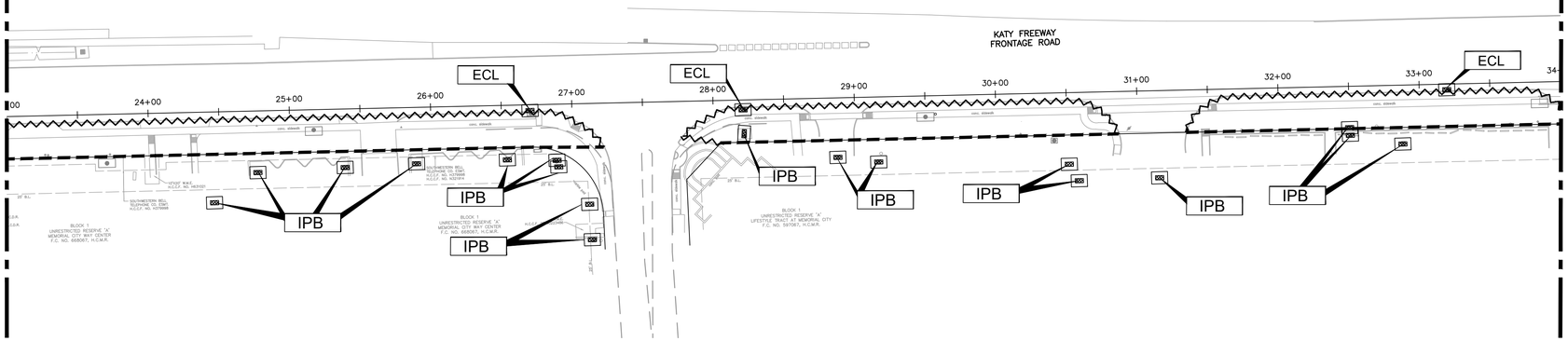

MATCHLINE BASELINE A STA. 34+00
SEE THIS SHEET

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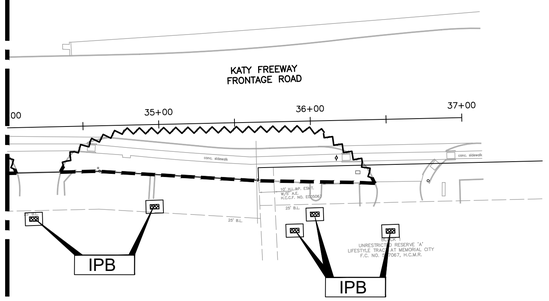
SEE THIS SHEET



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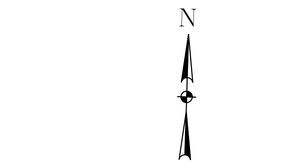

LEGEND:

- EROSION CONTROL LOG AT BACK OF CURB
- EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- IPB — INLET PROTECTION BASKET
- ECL — EROSION CONTROL LOG AT REFER NOTE 8

NOTES:

1. CONTRACTOR SHALL PROVIDE STABILIZED CONSTRUCTION ACCESS IF NEEDED ALL THE TIME DURING CONSTRUCTION INCLUDING TRUCK WASHING AREA, VERIFIED IN THE FIELD AND AUTHORIZED BY ENGINEER. EXACT LOCATION TO BE DETERMINED BY THE CONTRACTOR.
2. PROTECT ALL EXISTING STORM INLETS AND CULVERTS
3. WATERLINES SHALL BE CONSTRUCTED USING A COMBINATION OF OPEN-CUT, TRENCHLESS, AND SLIP-LINING METHODS, AS SHOWN IN THE DRAWING.
4. CONTRACTOR SHALL PROVIDE STABILIZED STAGING/PARKING AREA.
5. ADDITIONAL SWPPP MEASURES MAY BE APPLIED ADJACENT TO THE PROJECT AREA IF APPROPRIATE (EG. DAILY STREET SWEEPING).
6. REFER TO STORM WATER POLLUTION DETAILS FOR NOTES AND DETAIL
7. THE WATER LINE SHALL BE INSTALLED BY THE OPEN-CUT METHOD AT ALL DRIVEWAYS WHERE THE PROPOSED WATER LINE IS ADJACENT TO THE ROW. DRIVEWAYS SHALL BE CLOSED ONE AT A TIME TO MINIMIZE DISRUPTION AND REOPENED AS SOON AS POSSIBLE
8. CONTRACTOR SHALL MAINTAIN EROSION CONTROL LOGS FOR INLET AND BACK OF CURB AT ALL TIMES DURING CONSTRUCTION. FOR EROSION CONTROL LOG (ECL) DETAILS, REFER TO SHEET 10. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING AND INSTALLING THE APPROPRIATE ECL MEASURES BASED ON SITE CONDITIONS. IF NECESSARY, INLET PROTECTION BASKETS CAN BE APPLIED FOR INLETS WHICH ARE NOT ON THE TXDOT ROADWAYS.

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SURVEYED BY:
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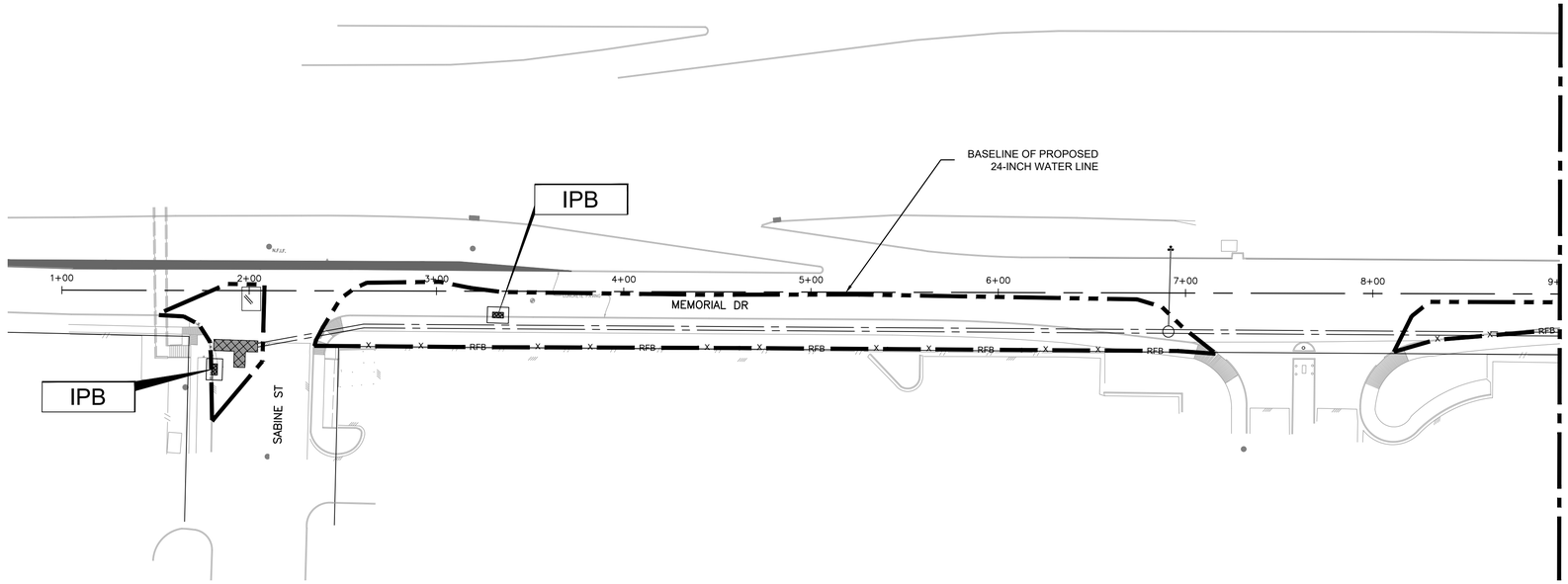
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

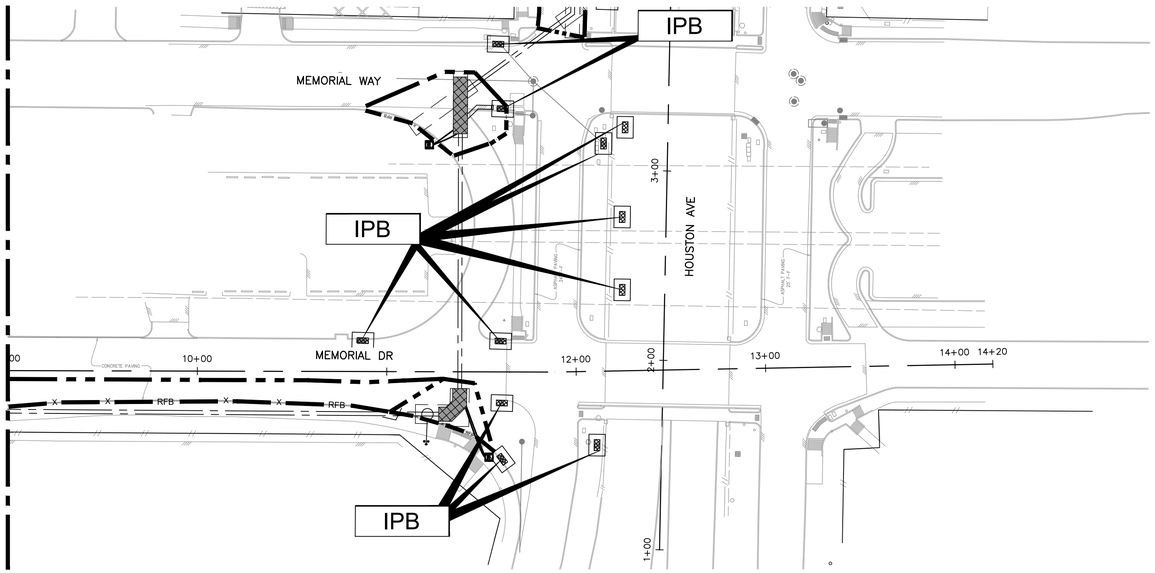
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 1 – KATY FREEWAY

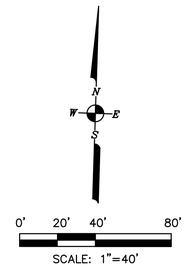
STORM WATER POLLUTION PREVENTION PLAN -2

SWPPP SHEET: 3 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 131 OF153	







LEGEND:

- HAY/SAND FILLED TUBULAR SOCKS (TS)
- X—RFB—X — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- IPB — INLET PROTECTION BASKET
- TD — TRENCH DRAIN INLET PROTECTION BASKET

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9. FOR INLET PROTECTION BASKET (IBP) DETAILS, REFER TO SHEET 10.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

STORM WATER POLLUTION PREVENTION PLAN - 3

SWPPP SHEET: 4 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 132 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:38 AM
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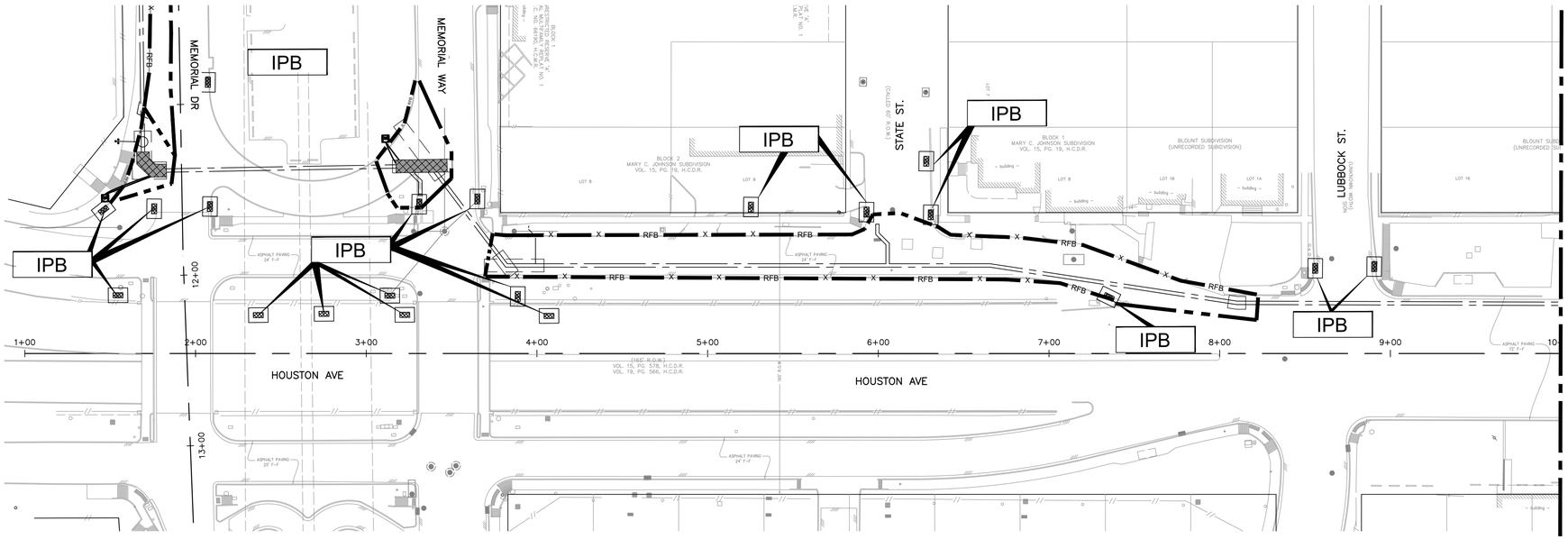

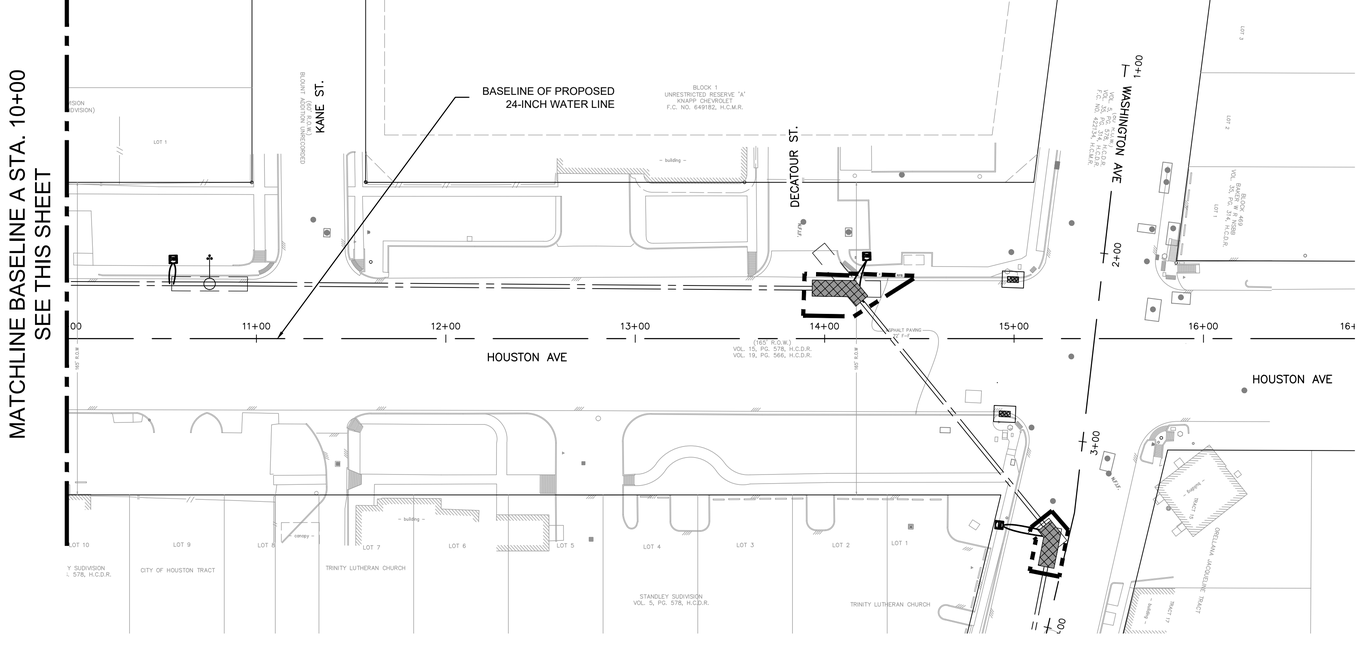

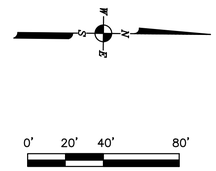

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LEGEND:

— — —	HAY/SAND FILLED TUBULAR SOCKS (TS)
-X—RFB—X-	EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
IPB	INLET PROTECTION BASKET
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

STORM WATER POLLUTION PREVENTION PLAN - 4

SWPPP SHEET: 5 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 133 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:38 AM
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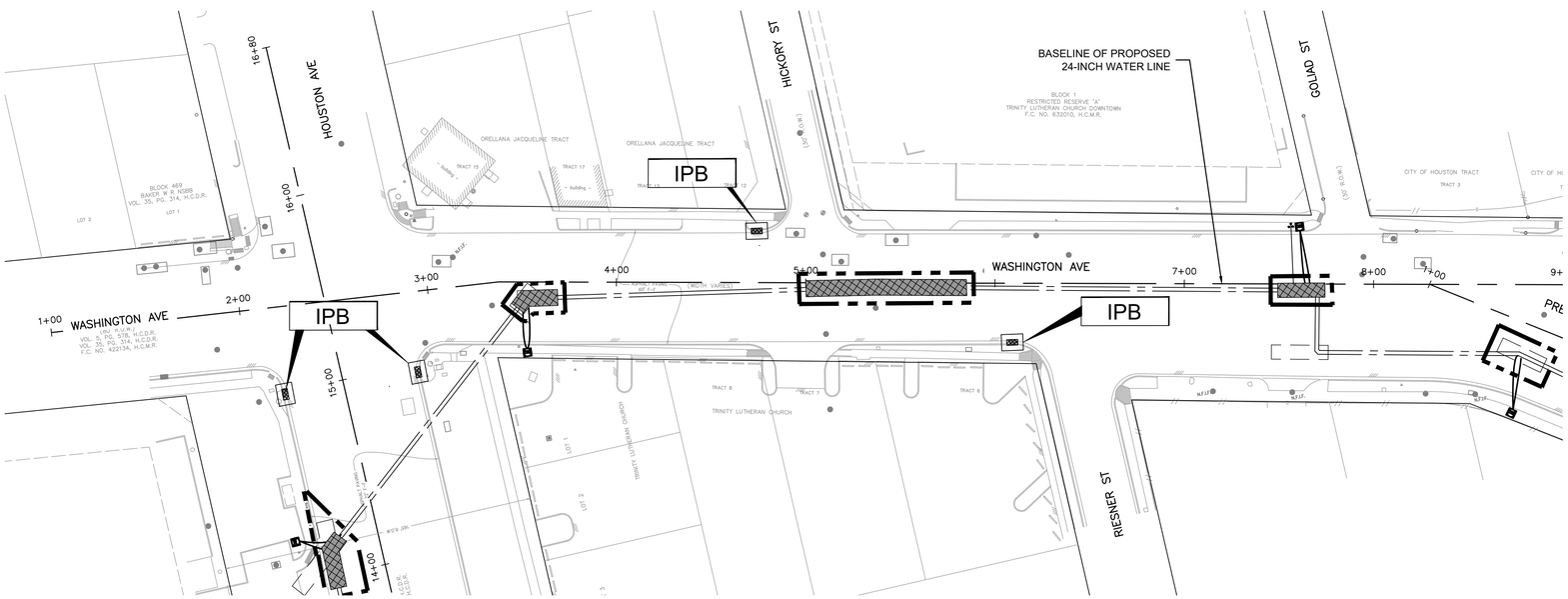

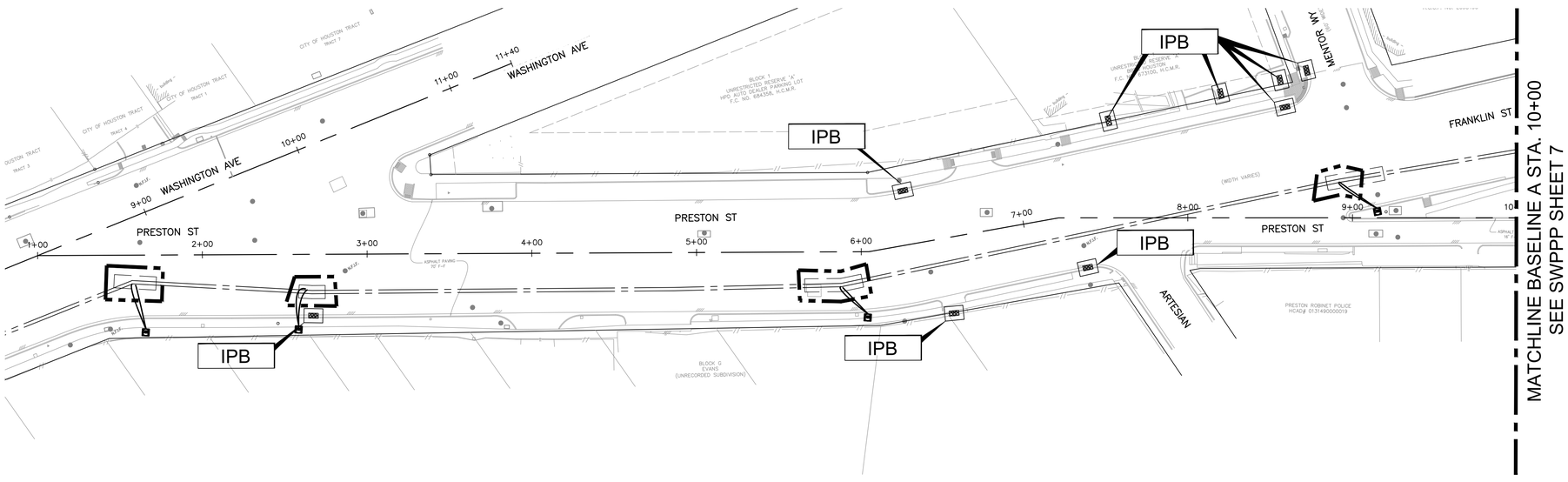

MATCHLINE BASELINE A STA. 10+00
SEE SWPPP SHEET 7

0' 20' 40' 80'
SCALE: 1"=40'

LEGEND:

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HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

STORM WATER POLLUTION PREVENTION PLAN - 5

SWPPP SHEET: 6 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 134 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:38 AM

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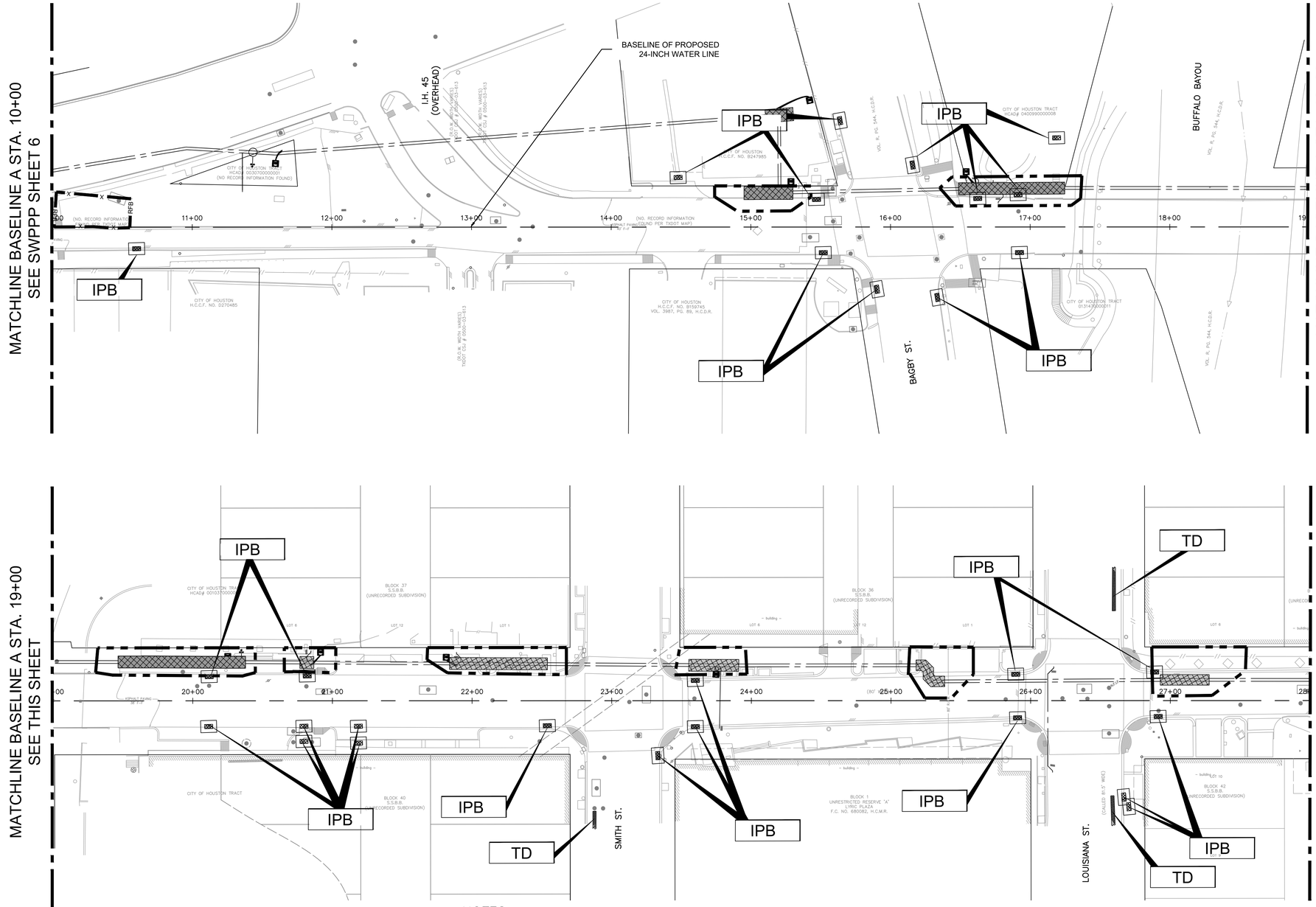

LEGEND:

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SITE 4 & 5

STORM WATER POLLUTION PREVENTION PLAN - 6

SWPPP SHEET: 7 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 135 OF 153	

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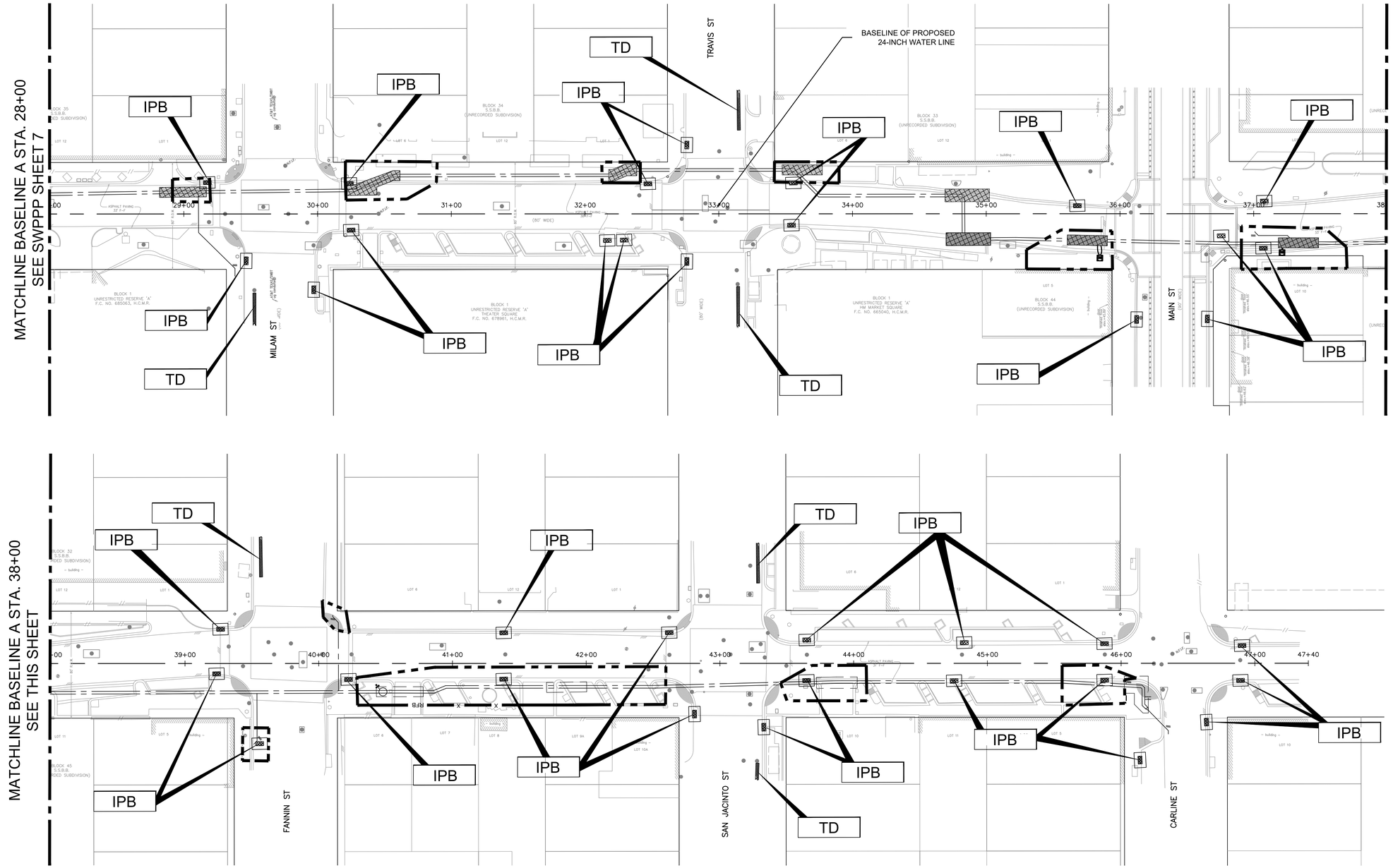

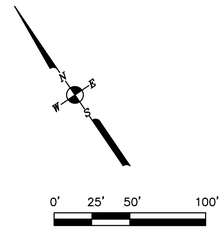

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MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4
SITE 4 & 5

STORM WATER POLLUTION PREVENTION PLAN - 7
SWPPP SHEET: 8 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
H : 1"=40'	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 136 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:39 AM
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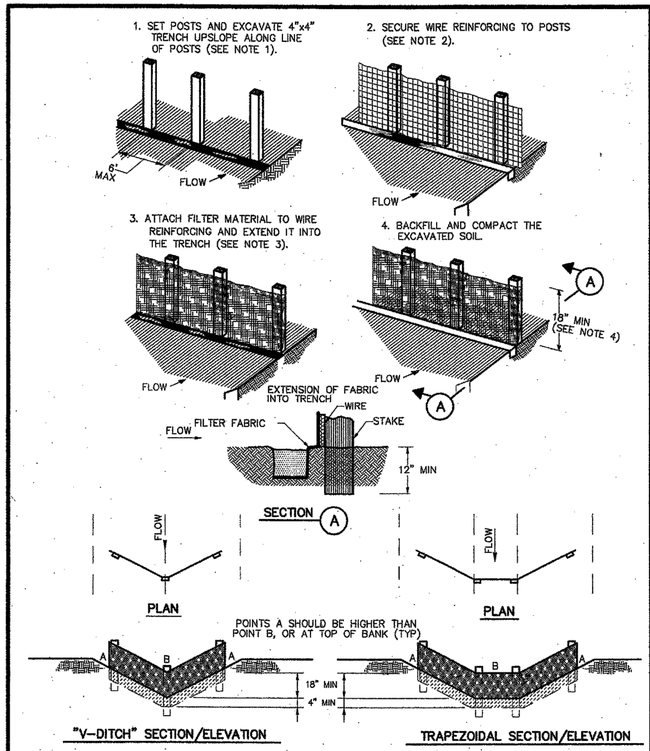
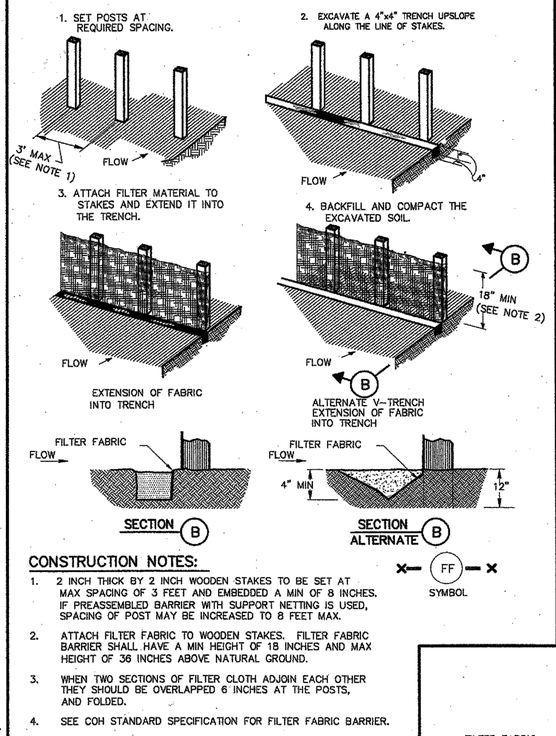


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE REINFORCING TO BE FASTENED SECURELY TO BARRIER POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE REINFORCING, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM 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 COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

SYMBOL

REINFORCED FILTER FABRIC BARRIER

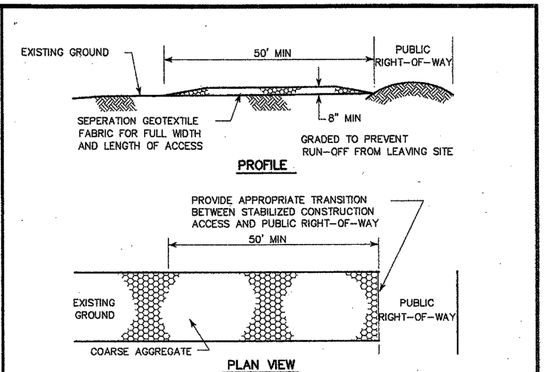


CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED BARRIER WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC BARRIER 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 COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

SYMBOL

FILTER FABRIC BARRIER

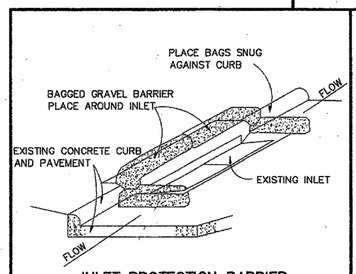


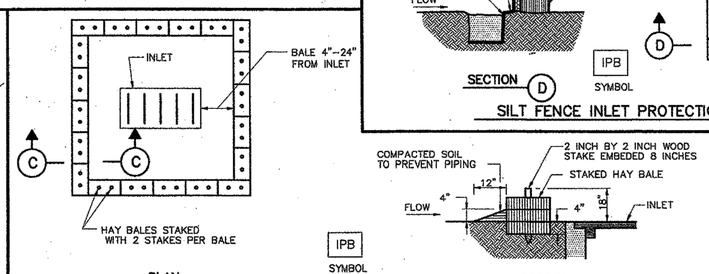
CONSTRUCTION NOTES:

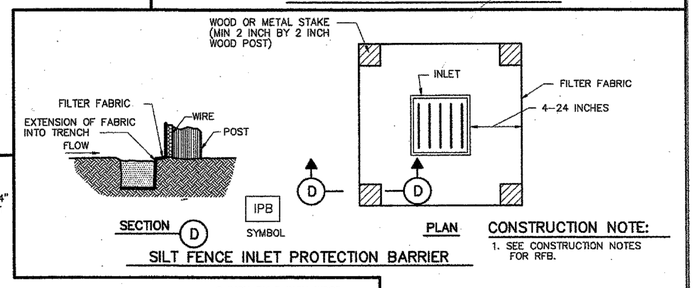
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE WASHING AREA.
6. COH STANDARD SPECIFICATION FOR STABILIZED CONSTRUCTION ACCESS.
7. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

SC
SYMBOL

STABILIZED CONSTRUCTION ACCESS







CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS
(NOT TO SCALE)

APPROVED: CITY ENGINEER
APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010
DWG NO: 01571-01

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

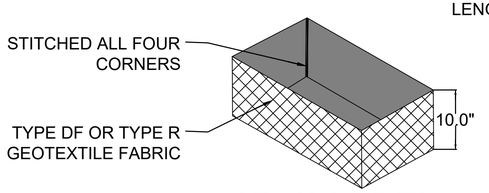
MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

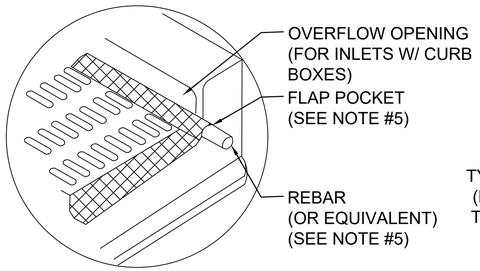
SWPPP
DETAIL - 1

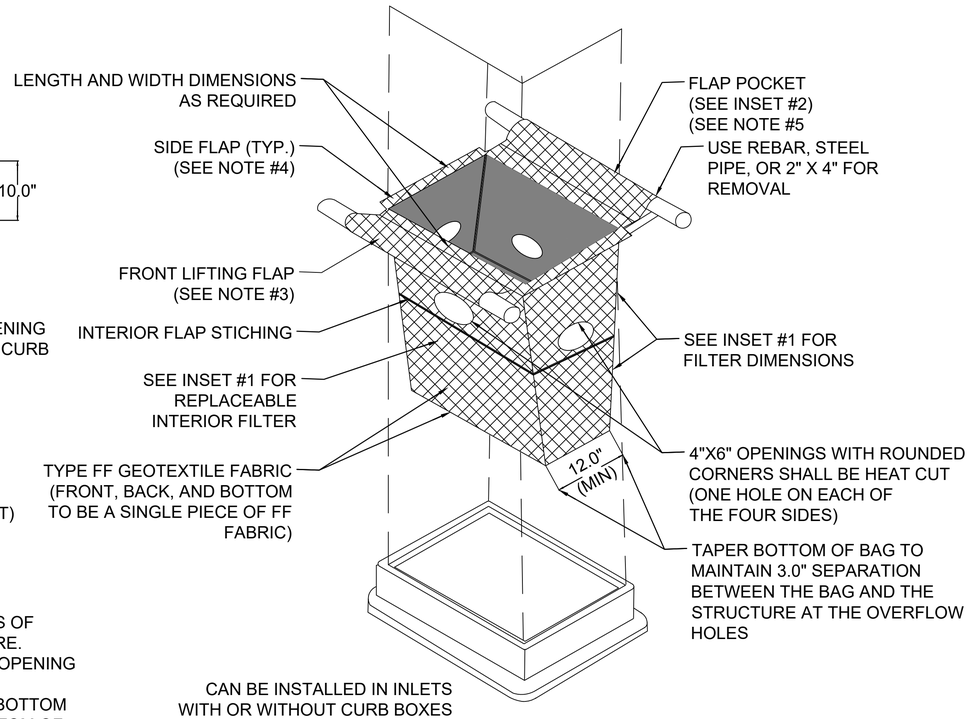
SWPPP SHEET: 9 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 137 OF 153	

FILE PATH: P:\ACTIVE\25WL57\WORKING\DRAWINGS\GENERAL SHEETS\25WL57 – SWPPP-DETAILS.dwg







NOTES:

1. TAPER BOTTOM OF BAG TO MAINTAIN THREE INCHES OF CLEARENCE BETWEEN THE BAG AND THE STRUCTURE. MEASURED FROM THE BOTTOM OF THE OVERFLOW OPENING TO THE STRUCTURE WALL.
2. GEOTEXTILE FABRIC TYPE FF FOR FLAPS, TOP AND BOTTOM OF OUTSIDE OF FILTER BAG, FRONT, BACK AND BOTTOM OF FILTER BEING ONE PIECE.
3. FRONT LIFTING FLAP IS TO BE USED WHEN REMOVING AND MAINTAINING FILTER BAG.
4. SIDE FLAPS SHALL BE A MAXIMUM OF TWO INCHES LONG. FOLD THE FABRIC OVER AND REINFORCE WITH MULTIPLE STITCHES.
5. FLAP POCKETS SHALL BE LARGER ENOUGH TO ACCEPT WOOD 2"X4". THE REBAR, STEEL PIPE, OR WOOD SHALL BE INSTALLED IN THE REAR FLAP AND SHALL NOT BLOCK THE TOP HALF OF THE CURB FACE OPENING.

MAINTENANCE NOTES:

1. WHEN REMOVING OR MANTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED IN THE FABRIC DOES NOT FALL INTO THE STRUCTURE. MATERIAL THAT HAS FALLEN INTO THE INLET SHALL BE IMMEDIATELY REMOVED.

1 INLET PROTECTION BASKET DETAILS
SCALE: NTS

STORM WATER POLLUTION PREVENTION NOTES:

1. CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG PROJECT LIMITS AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION (SWPP) PLANS TO KEEP SILT AND OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS AND ENVIRONMENTAL CLEAN OUTS EVENTUALLY POLLUTING THE RECEIVING STORM. CONTRACTOR TO MAKE SURE APPROPRIATE STORM QUALITY MEASURES ARE TAKEN.

2. DURING THE EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATION MATERIAL CAN BE QUICKLY HAULED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT. ANY LOOSE EXCAVATED MATERIAL WHICH FALLS ON APRON PAVEMENTS SHALL BE SWEPT BACK INTO THE EXCAVATED AREA.

3. CONTRACTOR SHALL CLEAN UP THE EXISTING PAVEMENT, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT OR ROCK TRACKED FROM THE EXCAVATED AREA.

4. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.

5. CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.

   - DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
   - AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
   - STRUCTURAL CONTROL MEASURES.
   - LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.

6. CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING BOX CULVERTS FOR UNOBSTRUCTED DRAINAGE AT ALL TIMES.

7. EROSION CONTROL MEASURES NEED TO BE COORDINATED WITH PHASING. ADDITIONAL EROSION CONTROL MEASURES BEYOND WHAT IS SHOWN ON THE PLANS WILL BE REQUIRED ON THE CONTRACTORS OPERATIONAL NEEDS AND BASED ON WORK AREA.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SWPPP
DETAIL - 2

SWPPP SHEET: 10 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 138 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:39 AM
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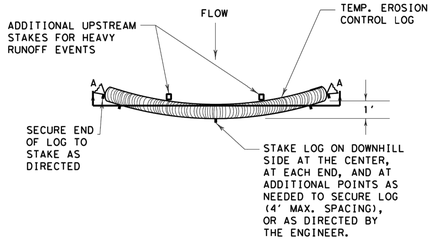
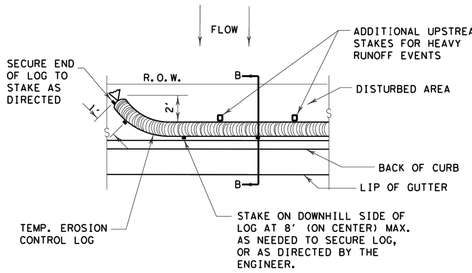
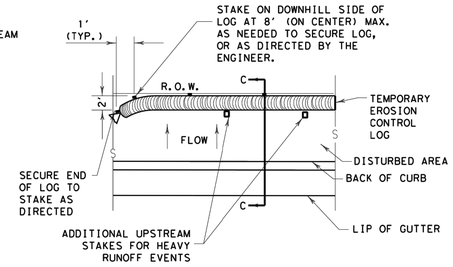


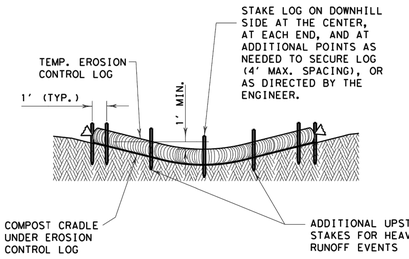
PLAN VIEW



PLAN VIEW



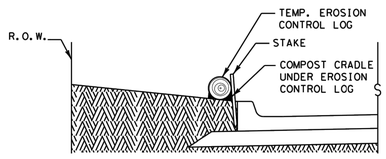
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

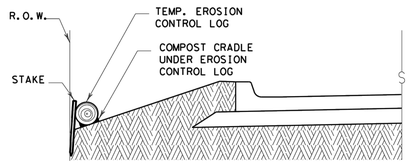
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

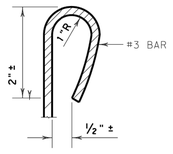
CL-ROW

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS			
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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SWPPP
DETAIL - 3

SWPPP SHEET: 11 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 139 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:39 AM
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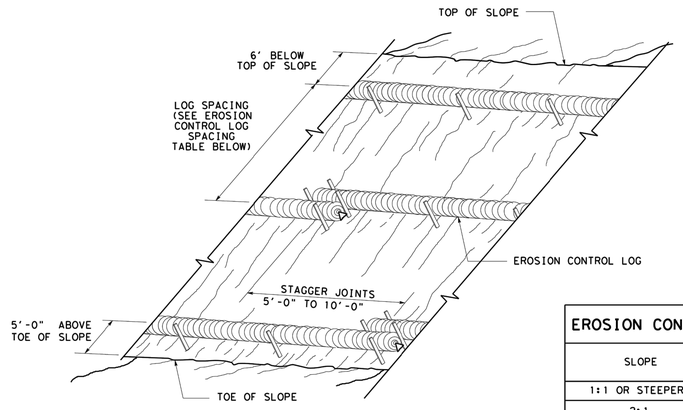
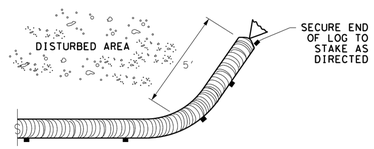


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

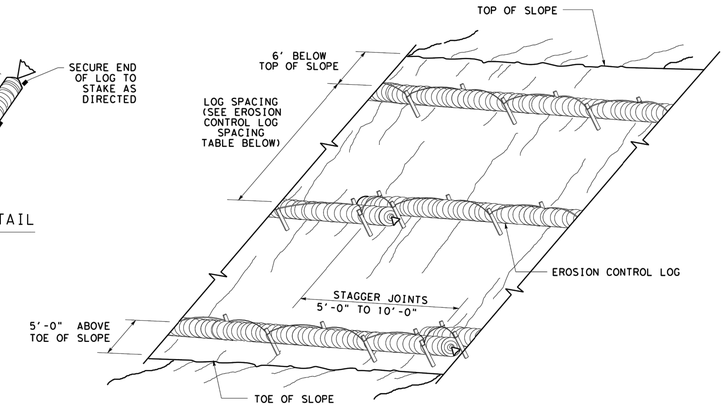
CL-SST



END SECTION RAP DETAIL

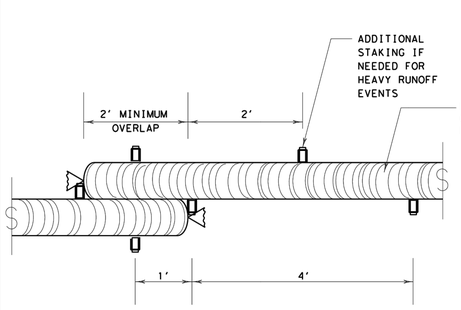
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



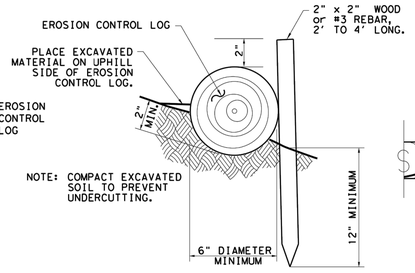
EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

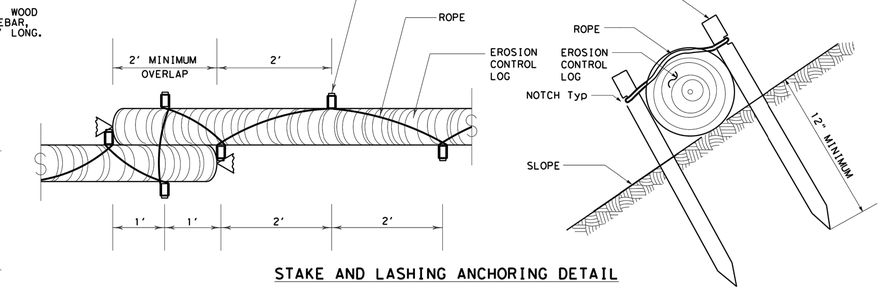
CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

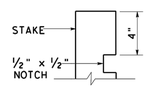




STAKE AND LASHING ANCHORING DETAIL

CL-SSL

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



STAKE NOTCH DETAIL

DATE:
FILE:

SHEET 2 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
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	DIST	COUNTY		SHEET NO.

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HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SWPPP
DETAIL - 4

SWPPP SHEET: 12 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 140 OF153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:40 AM
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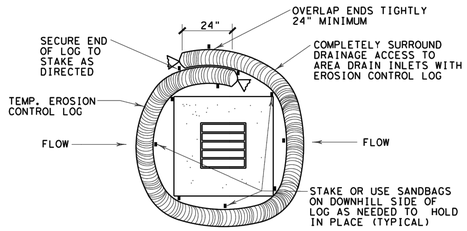
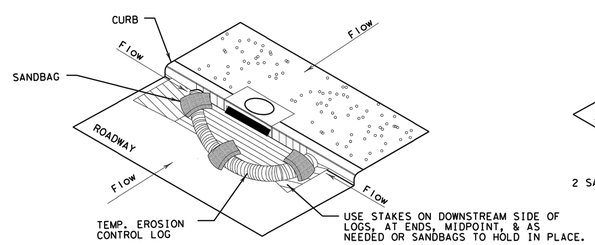
DATE:
FILE:



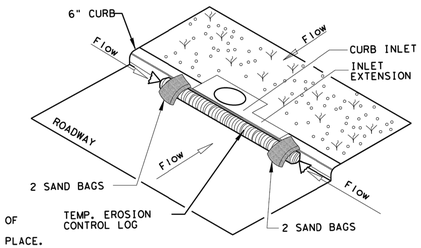
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

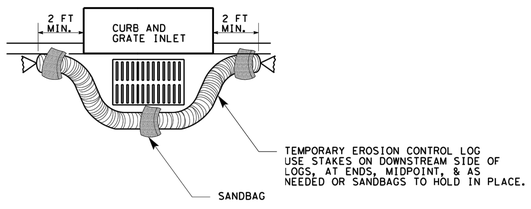
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

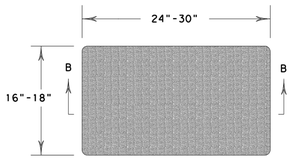
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
	DIST	COUNTY		SHEET NO.	

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10448 Westoffice Dr., Houston, TX 77042
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Texas Firm Registration No. F- 4575

SURVEYED BY:
Kuo & Associates, LLC.
C.O.H Field Book P-

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

SWPPP
DETAIL - 5

SWPPP SHEET: 13 OF 14

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 141 OF 153	

PLOT STYLE: Coh_ctb_230809.ctb PLOTTED: 9/16/2025 11:40 AM
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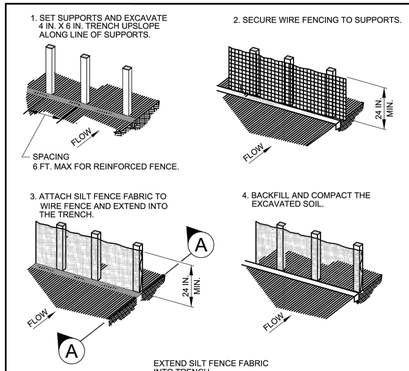
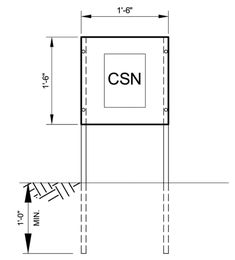


NOTE:

1. SEE SPECIFICATION SECTION NO. 02361-SILT FENCES.

SYMBOL — RSF — REINFORCED SILT FENCE

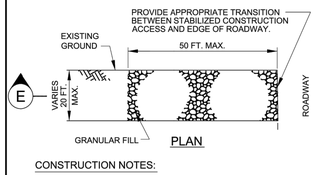
REINFORCED SILT FENCE



NOTE:
CONSTRUCT IN ACCORDANCE WITH HCFCD SPECIFICATION SECTION 01580 - PROJECT SIGNS.

CSN HOLDER

SWPPP / BMP SIGN AND CONSTRUCTION SITE NOTICE HOLDER DETAILS

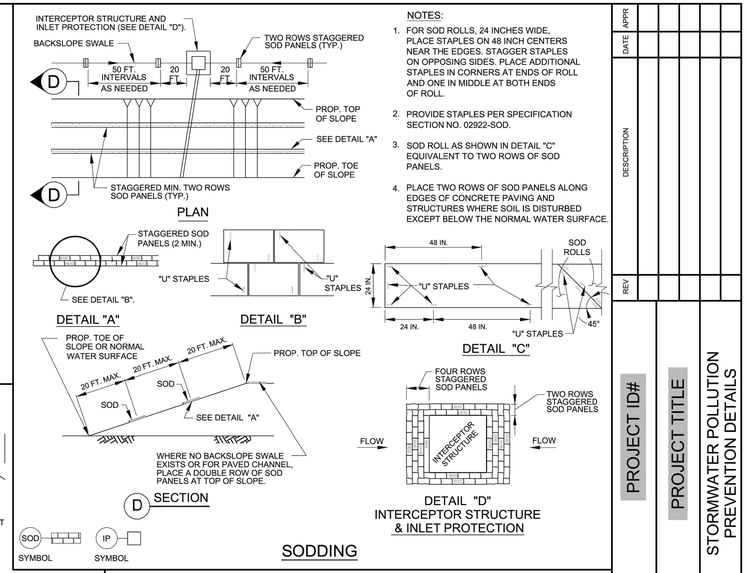


CONSTRUCTION NOTES:

1. SEE SPECIFICATION SECTION NO. 02365-STABILIZED CONSTRUCTION ACCESS.

STABILIZED CONSTRUCTION ACCESS

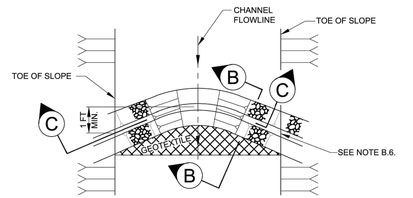
SCA — SYMBOL



NOTES:

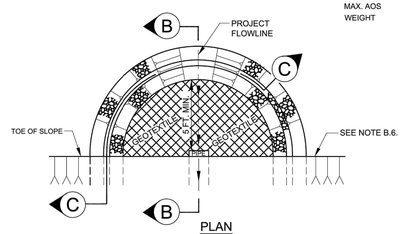
1. FOR SOD ROLLS, 24 INCHES WIDE, PLACE STAPLES ON 48 INCH CENTERS NEAR THE EDGES. STAGGER STAPLES ON OPPOSING SIDES. PLACE ADDITIONAL STAPLES IN CORNERS AT ENDS OF ROLL AND ONE IN MIDDLE AT BOTH ENDS OF ROLL.
2. PROVIDE STAPLES PER SPECIFICATION SECTION NO. 02922-SOD.
3. SOD ROLL AS SHOWN IN DETAIL "C" EQUIVALENT TO TWO ROWS OF SOD PANELS.
4. PLACE TWO ROWS OF SOD PANELS ALONG EDGES OF CONCRETE PAVING AND STRUCTURES WHERE SOIL IS DISTURBED EXCEPT BELOW THE NORMAL WATER SURFACE.

SODDING

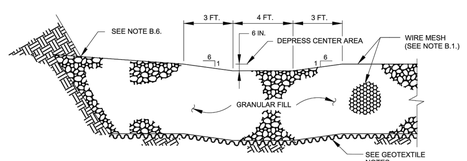


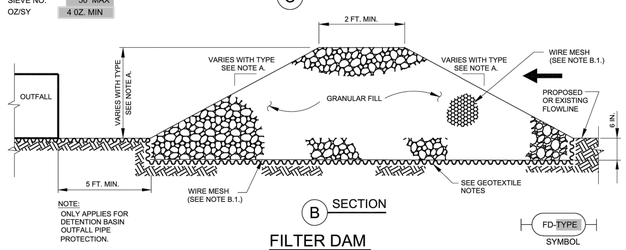
GEOTEXTILE NOTES:

MIN. AOS	SIEVE NO.	120 MIN
MAX. AOS	SIEVE NO.	50 MAX
WEIGHT	OZ/SY	4 OZ. MIN



FILTER DAM AT DETENTION BASIN OUTFALL PIPE





NOTE:
ONLY APPLIES FOR DETENTION BASIN OUTFALL PIPE PROTECTION.

FILTER DAM

FILTER DAM NOTES:

A. TYPES OF FILTER DAMS
   1. TYPE 1 - NOT USED BY HCFCD
   2. TYPE 2 (REINFORCED)
      a. HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
      b. TOP WIDTH - 2 FEET (MINIMUM).
      c. SLOPES - 2:1 (MAXIMUM).
   3. TYPE 3 - NOT USED BY HCFCD
   4. TYPE 4 (GABION)
      a. HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
      b. TOP WIDTH - 2 FEET (MINIMUM).
   5. TYPE 5. AS SHOWN ON THE PLANS.

B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.
   1. TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
   2. GRANULAR FILL:
      a. PLACE ON MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
      b. 3-5 INCHES FOR ROCK FILTER DAM TYPES 2, AND 4.
      REFER TO GRANULAR FILL IN SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
   3. WIRE MESH: FOLD AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURE TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.
   4. IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
   5. SEE SPECIFICATION SECTION NO. 02364-FILTER DAMS.
   6. EMBED ONE FOOT MINIMUM INTO SLOPE AND AT SLOPE RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA.

THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON HCFCD PROJECTS OR PROJECTS TO BE MAINTAINED BY THE HCFCD WHEN COMPLETED BY OTHERS. AN ENGINEER WHO INCORPORATES THE DETAILS ON THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (b) AND (c) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.

P.E. SEAL AND SIGNATURE

ENGINEER - CONFIRM, CHANGE, OR FILL IN.

REV	DESCRIPTION	DATE	APPR

PROJECT ID#

PROJECT TITLE

STORMWATER POLLUTION PREVENTION DETAILS

PREPARED:

CHECKED:

APPROVED:

COMPANY INFORMATION AND LOGO GOES HERE

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HARRIS COUNTY FLOOD CONTROL DISTRICT
9900 Northwest Freeway
Houston, Texas 77092

DATE: 10-23-2018
SCALE: NTS

SHEET NUMBER
OF

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

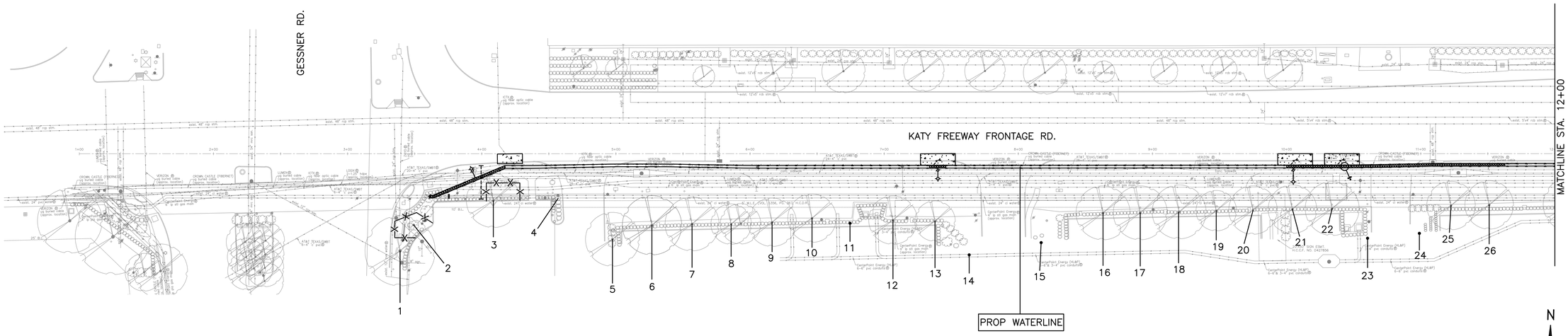
SWPPP
DETAIL - 6

SWPPP SHEET: 14 OF 14

WBS NUMBER
S-000701-0043-4
DRAWING SCALE
N/A
CITY OF HOUSTON PM
MARTIN MATHEW, ENV SP
SHEET NO. 142 OF 153

FOR CITY OF HOUSTON USE ONLY

FILE PATH: P:\ACTIVE\25WL57\WORKING\DRAWINGS\GENERAL SHEETS\25WL57 – SWPPP–DETAILS.dwg
X:\Operations\PROJECTS\2020 Standard Detail Sheets\STORMWATER POLLUTION PREVENTION DETAILS\Stormwater Pollution Prevention Details.dwg



Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Katy Freeway Frontage Road					
1	984 Gessner	16" Bald Cypress	Protected	Not impacted	
2	984 Gessner	6" Holly	Protected		Fence
3	984 Gessner	14" Bald Cypress	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline
4	984 Gessner	5" Holly	Not protected	Private tree, Not impacted	
5	984 Gessner	15" Crepe Myrtle	Not protected	Private tree, Not impacted	
6	984 Gessner	14" Holly	Not protected	Hedged, Private, Not impacted	
7	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
8	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
9	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
10	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
11	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
12	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
13	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
14	984 Gessner	19" Magnolia	Not protected	Private tree, Not impacted	
15	984 Gessner	16" Magnolia	Not protected	Private tree, Not impacted	
16	984 Gessner	13" Holly	Not protected	Hedged, Trunk scars, Private, Not impacted	
17	984 Gessner	14" Holly	Not protected	Hedged, Private, Not impacted	
18	984 Gessner	15" Holly	Not protected	Hedged, Private, Not impacted	
19	984 Gessner	13" Holly	Not protected	Hedged, Private, Not impacted	
20	984 Gessner	12" Holly	Not protected	Hedged, Private, Not impacted	
21	984 Gessner	14" Holly	Not protected	Hedged, Private, Not impacted	
22	984 Gessner	14" Holly	Not protected	Hedged, Private, Not impacted	
23	984 Gessner	11" Crepe Myrtle	Not protected	Private tree, Not impacted	
24	984 Gessner	9" Crepe Myrtle	Not protected	Private tree, Not impacted	
25	984 Gessner	19" Holly	Not protected	Hedged, Private, Not impacted	
26	984 Gessner	15" Holly	Not protected	Hedged, Private, Not impacted	

NOTE:

1. THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED AUGUST 2025. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915.
2. CN KOEHL URBAN FORESTRY, INC. HAS NOT BEEN CONTRACTED TO COMPLETE ANY TREE RISK ASSESSMENTS ON THIS PROJECT–THIS TPP INCLUDES PROTECTION MEASURES FOR SPECIES OF TREES PROTECTED BY APPLICABLE ORDINANCE ONLY. CN KOEHL URBAN FORESTRY, INC. DOES NOT GUARANTEE CONDITION OR STRUCTURAL INTEGRITY OF ANY TREE LOCATED ON OR ADJACENT TO THIS PROJECT.
3. IN AREAS WHERE INDIVIDUAL TREES HAVE NOT BEEN TIED IN BY SURVEY, APPROXIMATE LOCATION IS INDICATED ON TPP WITH A DOT AND TREE NUMBER. ACCURACY OF REPRESENTED LOCATION IS NOT GUARANTEED BY CN KOEHL URBAN FORESTRY, INC.
4. THE CONTRACTOR'S ARBORIST WILL MARK LOCATIONS OF TREES TO BE PLANTED AND OBTAIN APPROVAL BY CITY ENGINEER AND CITY FORESTER BEFORE PURCHASING OR EXCAVATING PLANTING HOLE OF EACH TREE.

TREE PRESERVATION PLAN LEGEND

1	TREE NUMBER/LOCATION
(1)	TREE TO BE REMOVED
–X–X–	TREE PROTECTION FENCE
⊢------⊣	ROOT PRUNING TRENCH

N

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
210 Stone Bush Ct. ◦ Katy, Texas 77493
281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

KUO & ASSOCIATES
ENGINEERING + SURVEYING
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HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 1 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 143 OF 153	

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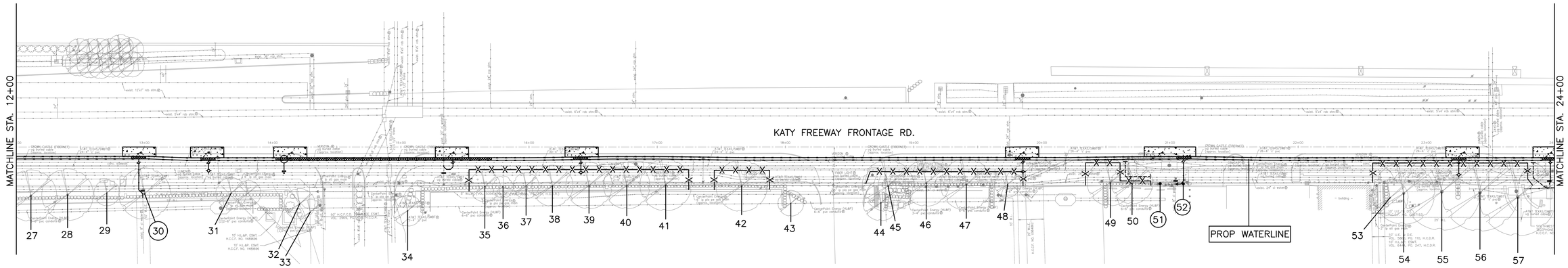

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Katy Freeway Frontage Road					
27	984 Gessner	15" Holly	Not protected	Hedged, Private, Not impacted	
28	984 Gessner	15" Holly	Not protected	Hedged, Private, Not impacted	
29	984 Gessner	15" Holly	Not protected	Hedged, Private, Not impacted	
30	984 Gessner	15" Holly	Not protected	Remove for wet connection	Remove no replacement required
31	984 Gessner	7" Crepe Myrtle	Not protected	Private tree, Not impacted	
32	984 Gessner	8" Crepe Myrtle	Not protected	Private tree, Not impacted	
33	984 Gessner	6" Crepe Myrtle	Not protected	Private tree, Not impacted	
34	900 Memorial City Mall	7" Crepe Myrtle	Not protected	Private tree, Not impacted	
35	900 Memorial City Mall	8" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
36	900 Memorial City Mall	6" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
37	900 Memorial City Mall	8" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
38	900 Memorial City Mall	13" Holly	Not protected	Private tree	Fence, Bore waterline
39	900 Memorial City Mall	15" Holly	Not protected	Private tree	Fence, Bore waterline
40	900 Memorial City Mall	13" Holly	Not protected	Private tree	Fence, Bore waterline
41	900 Memorial City Mall	15" Holly	Not protected	Private tree	Fence, Bore waterline
42	900 Memorial City Mall	16" Holly	Not protected	TXDOT ROW	Fence, Bore waterline
43	900 Memorial City Mall	6" Crepe Myrtle	Not protected	Private tree, Not impacted	
44	900 Memorial City Mall	9" Crepe Myrtle	Not protected	Private tree, Not impacted	
45	900 Memorial City Mall	13" Holly	Not protected	TXDOT ROW	Fence, Bore waterline
46	900 Memorial City Mall	13" Holly	Not protected	TXDOT ROW	Fence, Bore waterline
47	900 Memorial City Mall	15" Holly	Not protected	TXDOT ROW	Fence, Bore waterline
48	900 Memorial City Mall	7" Holly	Not protected	TXDOT ROW	Fence, Bore waterline
49	9829 Katy Fwy	11" Holly	Not protected	TXDOT ROW	Fence, Bore waterline
50	9829 Katy Fwy	10" Holly	Not protected	TXDOT ROW	Root prune for fire hydrant, Clearance prune, Fence
51	9829 Katy Fwy	7" Holly	Not protected	TXDOT ROW, Remove for ts&v	Remove no replacement required
52	9829 Katy Fwy	7" Holly	Not protected	TXDOT ROW, Remove for ts&v	Remove no replacement required
53	9821 Katy Fwy	11" Holly	Not protected	Private tree	Fence, Bore waterline
54	9821 Katy Fwy	21" Live Oak	Not protected	Private tree	Fence, Bore waterline
55	9821 Katy Fwy	20" Live Oak	Not protected	Private tree	Fence, Bore waterline
56	9821 Katy Fwy	22" Live Oak	Not protected	Private tree	Fence, Bore waterline
57	9821 Katy Fwy	27" Live Oak	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline, Clearance prune

NOTE:

1. THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED AUGUST 2025. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915.
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TREE PRESERVATION PLAN LEGEND

1	TREE NUMBER/LOCATION
(1)	TREE TO BE REMOVED
–X–X–	TREE PROTECTION FENCE
⊢------⊣	ROOT PRUNING TRENCH

N

40 0 40 80

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
210 Stone Bush Ct. ◦ Katy, Texas 77493
281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

KUO & ASSOCIATES ENGINEERING + SURVEYING
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HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 2 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 144 OF 153	

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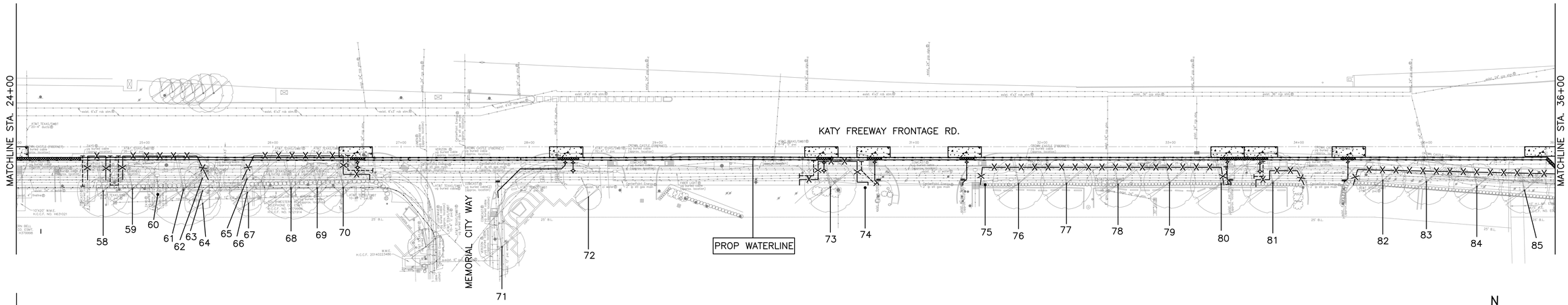

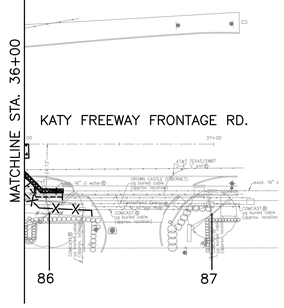

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Katy Freeway Frontage Road					
58	9811 Katy Fwy	21" Live Oak	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline, Clearance prune
59	9811 Katy Fwy	18" Live Oak	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline
60	9811 Katy Fwy	17" Live Oak	Not protected	Private tree	Fence, Bore waterline
61	9811 Katy Fwy	21" Live Oak	Not protected	Private tree	Fence, Bore waterline
62	9811 Katy Fwy	11" Crepe Myrtle	Not protected	TXDOT ROW	Fence, Bore waterline
63	9811 Katy Fwy	11" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
64	9811 Katy Fwy	11" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
65	9811 Katy Fwy	11" Crepe Myrtle	Not protected	TXDOT ROW	Fence, Bore waterline
66	9811 Katy Fwy	11" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
67	9811 Katy Fwy	11" Crepe Myrtle	Not protected	Private tree	Fence, Bore waterline
68	9811 Katy Fwy	23" Live oak	Not protected	Private tree	Fence, Bore waterline
69	9811 Katy Fwy	18" Live Oak	Not protected	Private tree	Fence, Bore waterline
70	9811 Katy Fwy	16" Live Oak	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline
71	9805 Katy Fwy	13" Live Oak	Protected	Not impacted	
72	9805 Katy Fwy	13" Live Oak	Not protected	Private tree, Not impacted	
73	9805 Katy Fwy	16" Live Oak	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline, Clearance prune
74	9805 Katy Fwy	15" Live Oak	Not protected	Private tree	Root prune for fire hydrant, Fence, Bore waterline, Clearance prune
75	9799 Katy Fwy	8' Palm	Not protected	TXDOT ROW	Fence, Bore waterline
76	9799 Katy Fwy	18" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
77	9799 Katy Fwy	16" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
78	9799 Katy Fwy	15" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
79	9799 Katy Fwy	15" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
80	9799 Katy Fwy	18" Live Oak	Not protected	TXDOT ROW	Root prune for fire hydrant, Fence, Bore waterline, Clearance prune
81	9799 Katy Fwy	17" Live Oak	Not protected	TXDOT ROW	Root prune for fire hydrant, Fence, Bore waterline, Clearance prune
82	9799 Katy Fwy	12" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
83	9799 Katy Fwy	11" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
84	9799 Katy Fwy	11" Live Oak	Not protected	TXDOT ROW	Fence, Bore waterline
85	9799 Katy Fwy	11" Live Oak	Not protected	Private tree	Fence, Bore waterline
86	9799 Katy Fwy	10" Live Oak	Not protected	Private tree	Root prune, Fence, Clearance prune
87	9753 Katy Fwy	10" Live Oak	Not protected	Private tree, Not impacted	

NOTE:

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4. THE CONTRACTOR'S ARBORIST WILL MARK LOCATIONS OF TREES TO BE PLANTED AND OBTAIN APPROVAL BY CITY ENGINEER AND CITY FORESTER BEFORE PURCHASING OR EXCAVATING PLANTING HOLE OF EACH TREE.

TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ⊢-----⊣ — ROOT PRUNING TRENCH

N

40 0 40 80

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
210 Stone Bush Ct. ◦ Katy, Texas 77493
281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 3 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 145 OF 153	

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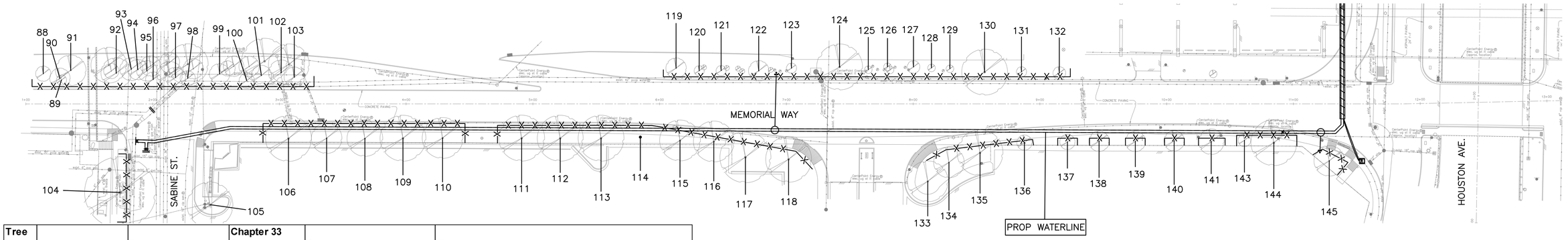

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Memorial Way					
88	Median	6" Sweetgum	Protected	60% dieback	Fence
89	Median	6" Sweetgum	Protected		Fence
90	Median	11" Sweetgum	Protected		Fence
91	Median	12" Sweetgum	Protected		Fence
92	Median	10" Bald Cypress	Protected		Fence
93	Median	8" Bald Cypress	Protected		Fence
94	Median	8" Bald Cypress	Protected		Fence
95	Median	6" Sweetgum	Protected		Fence
96	Median	10" Pine	Protected		Fence
97	Median	8" Pine	Protected		Fence
98	Median	7' Pine	Protected		Fence
99	Median	9" Pine	Protected		Fence
100	Median	5" Sweetgum	Protected		Fence
101	Median	9" Bald Cypress	Protected		Fence
102	Median	6" Bald Cypress	Protected		Fence
103	Median	7" Sweetgum	Protected		Fence
104	105 Sabine	28" Live Oak	Protected		Fence, Clearance prune
105	110 Sabine	10" Vitex	Not protected		
106	110 Sabine	18" Sweetgum	Protected	15% dieback	Fence, Bore waterline
107	110 Sabine	13" Sweetgum	Protected	30% dieback	Fence, Bore waterline
108	110 Sabine	17" Sweetgum	Protected	40% dieback	Fence, Bore waterline
109	110 Sabine	20" Sweetgum	Protected		Fence, Bore waterline
110	110 Sabine	14" Sweetgum	Protected	40% dieback	Fence, Bore waterline
111	110 Sabine	18" Sweetgum	Protected	60% dieback	Fence, Bore waterline
112	110 Sabine	17" Sweetgum	Protected	50% dieback	Fence, Bore waterline
113	110 Sabine	18" Sweetgum	Protected	30% dieback	Fence, Bore waterline
114	110 Sabine	14" Sweetgum	Protected	20% dieback	Fence, Bore waterline
115	110 Sabine	14" Sweetgum	Protected	20% dieback	Fence, Bore waterline
116	110 Sabine	15" Sweetgum	Protected	30% dieback	Fence, Bore waterline
117	110 Sabine	24" Sweetgum	Protected		Fence, Bore waterline
118	110 Sabine	22" Sweetgum	Protected	50% dieback	Fence, Bore waterline
119	Median	9" Sweetgum	Protected		Fence
120	Median	6" Sweetgum	Protected		Fence
121	Median	6" Sweetgum	Protected		Fence
122	Median	10" Bald Cypress	Protected		Fence
123	Median	6" Sweetgum	Protected		Fence
124	Median	12" Bald Cypress	Protected		Fence
125	Median	5" Sweetgum	Protected		Fence
126	Median	5" Sweetgum	Protected		Fence
127	Median	5" Sweetgum	Protected		Fence
128	Median	5" Sweetgum	Protected		Fence
129	Median	5" Sweetgum	Protected		Fence
130	Median	13" Bald Cypress	Protected		Fence
131	Median	6" Sweetgum	Protected		Fence
132	Median	6" Sweetgum	Protected		Fence
133	110 Sabine	15" Sweetgum	Protected	40% dieback	Fence, Bore waterline
134	110 Sabine	14" Sweetgum	Protected	40% dieback	Fence, Bore waterline
135	110 Sabine	21" Sweetgum	Protected		Fence, Bore waterline
136	110 Sabine	6" Bur Oak	Protected		Fence, Bore waterline
137	110 Sabine	7" Bur Oak	Protected		Fence, Bore waterline
138	110 Sabine	12" Bald Cypress	Protected		Fence, Bore waterline
139	110 Sabine	11" Bald Cypress	Protected		Fence, Bore waterline
140	110 Sabine	9" Bald Cypress	Protected		Fence, Bore waterline
141	110 Sabine	10" Bur Oak	Protected		Fence, Bore waterline
142	Not used				
143	110 Sabine	8" Bur Oak	Protected		Fence, Bore waterline
144	110 Sabine	17" Bald Cypress	Protected		Fence, Bore waterline
145	110 Sabine	12" Cald Cypress	Protected		Fence, Bore waterline

NOTE:

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TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ------ — ROOT PRUNING TRENCH

N

40 0 40 80

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
210 Stone Bush Ct. ◦ Katy, Texas 77493
281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

KUO & ASSOCIATES ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 4 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 146 OF 153	

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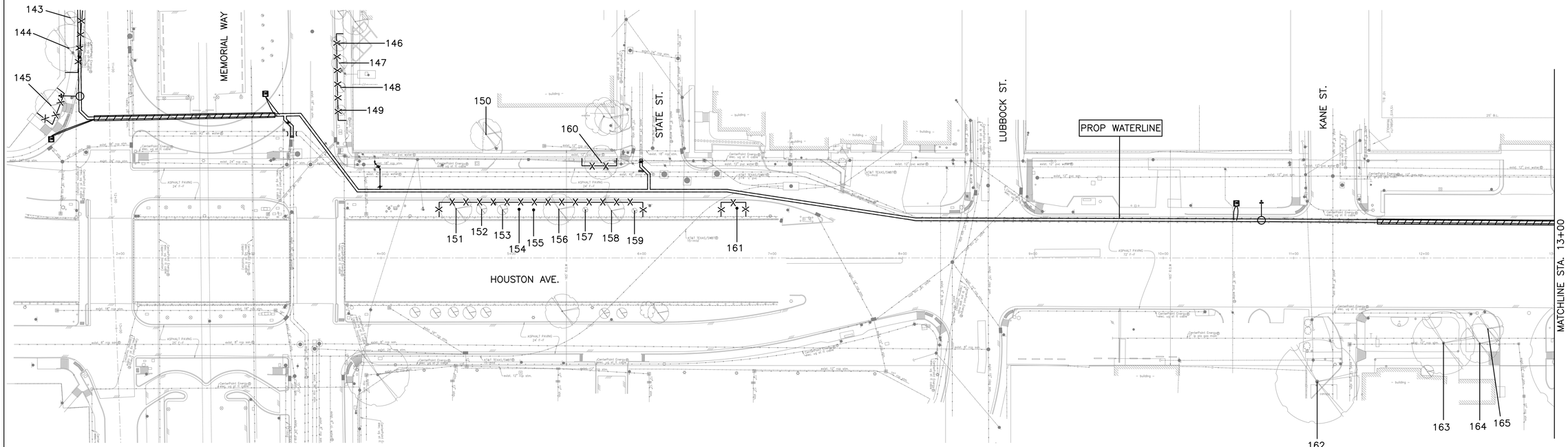

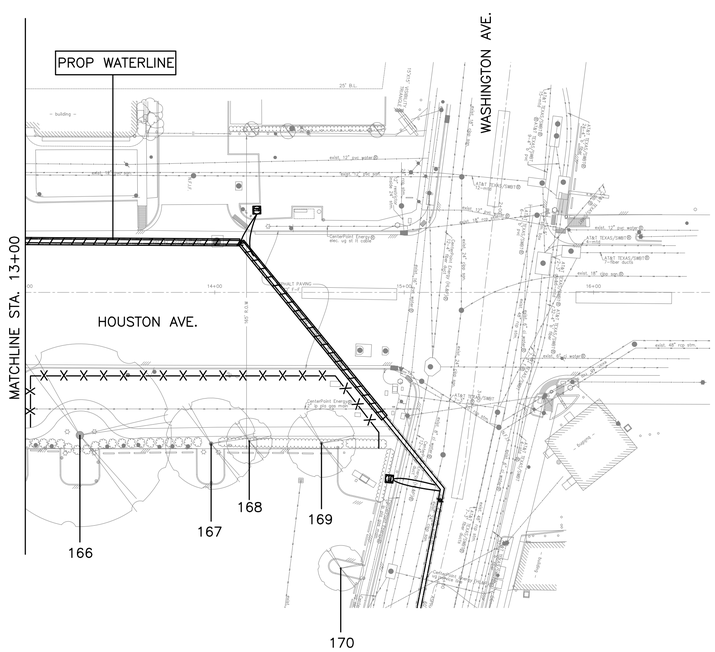

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Houston Avenue					
146	1550 N Memorial Way	6" Live Oak	Protected		Fence
147	1550 N Memorial Way	7" Live Oak	Protected		Fence
148	1550 N Memorial Way	5" Live Oak	Protected		Fence
149	1550 N Memorial Way	5" Live Oak	Protected		Fence
150	1550 N Memorial Way	27" Pecan	Corridor Tree		Clearance prune
151	Median	13" Sweetgum	Protected		Fence
152	Median	5" Cedar Elm	Protected		Fence
153	Median	5" Pine	Protected	Dead, Not impacted	
154	Median	3" Bald Cypress	Protected		Fence
155	Median	2" American Elm	Protected		Fence
156	Median	12" Sweetgum	Protected	30% dieback	Fence
157	Median	2" Live Oak	Protected	Stump Sprouts	Fence
158	Median	13" Sweetgum	Protected	70% dieback	Fence
159	Median	3" Bald Cypress	Protected		Fence
160	515 Houston	13" Sycamore	Protected	Topped by CPE	Clearance prune, Fence
161	Median	2" American Elm	Protected		Fence
162	800 Houston	32" Live Oak	Protected	Corridor tree, not impacted	
163	800 Houston	25" Live Oak	Protected	Not impacted	
164	800 Houston	18" Live Oak	Protected	Not impacted	
165	800 Houston	11" Live Oak	Protected	Not impacted	
166	800 Houston	54" Live Oak	Protected		Fence
167	800 Houston	28" Live Oak	Protected		Fence
168	800 Houston	16" Live Oak	Protected		Fence
169	800 Houston	20" Live Oak	Protected		Fence

N

40 0 40 80

SCALE: 1"=40'

NOTE:

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TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ⊢------⊣ — ROOT PRUNING TRENCH

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
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281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

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713–975–8769
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 5 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 147 OF 153	

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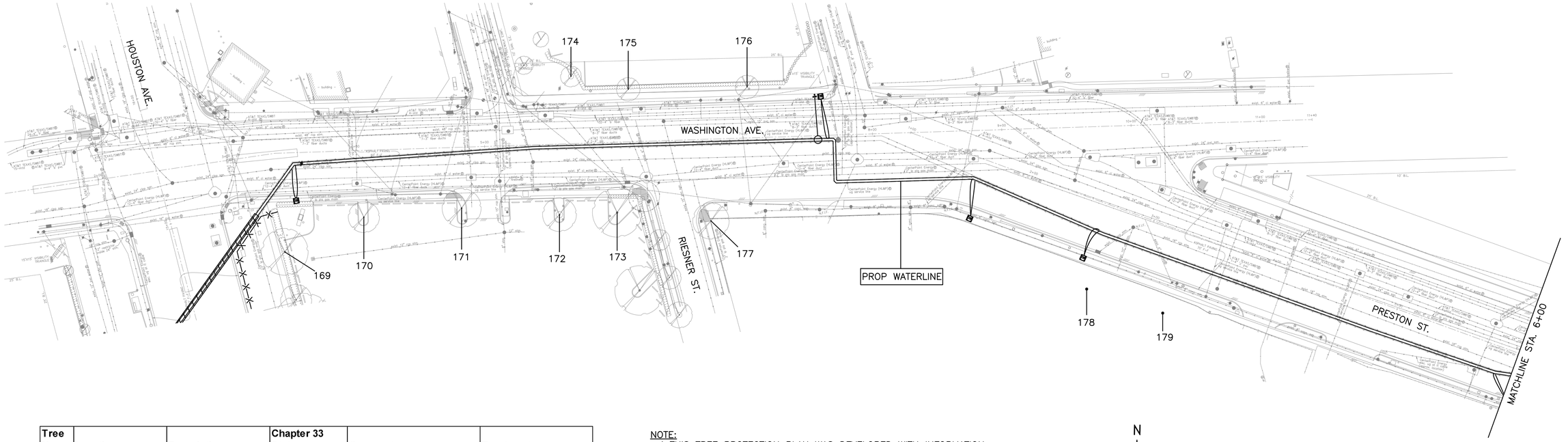

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Washington Avenue					
170	800 Houston	11" Live Oak	Not protected	Private tree, Not impacted	
171	800 Houston	19" Live Oak	Not protected	Private tree, Not impacted	
172	800 Houston	15" Live Oak	Not protected	Private tree, Not impacted	
173	800 Houston	22" Live Oak	Not protected	Private tree, Not impacted	
174	1302 Washington	7" Lacebark Elm	Not protected	Private tree, Not impacted	
175	1302 Washington	10" Lacebark Elm	Not protected	Private tree, Not impacted	
176	1302 Washington	9" Lacebark Elm	Not protected	Private tree, Not impacted	
177	61 Riesner	7" American Elm	Not protected	Private tree, Not impacted	
Trees on Preston Street					
178	61 Riesner	22" Sycamore	Protected	Corridor tree, 30% dieback, Pruned by CPE, Not impacted	
179	61 Riesner	21" Sycamore	Protected	Corridor tree, 30% dieback, Pruned by CPE, Not impacted	

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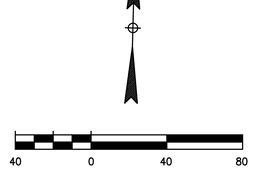
TREE PRESERVATION PLAN LEGEND

1	TREE NUMBER/LOCATION
(1)	TREE TO BE REMOVED
—X—X—	TREE PROTECTION FENCE
⊢------⊣	ROOT PRUNING TRENCH



SCALE: 1"=40'

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 6 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 148 OF 153	

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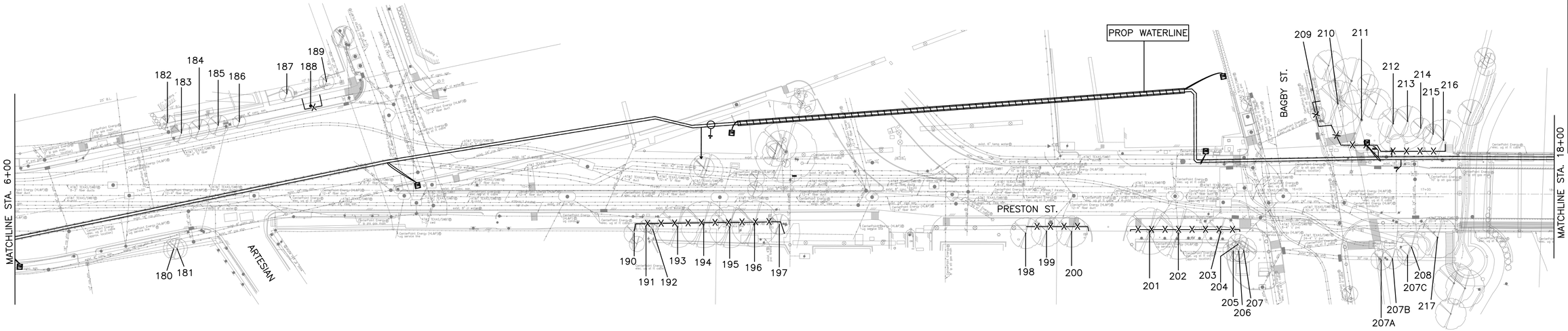

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Preston Street					
180	1000 Preston	9" Mulberry	Not protected	Private tree, Not impacted	
181	1000 Preston	8" Mulberry	Not protected	Private tree, Not impacted	
182	1002 Washington	7" Nuttal oak	Protected	Not impacted	
183	1002 Washington	5" Vitex	Not protected		
184	1002 Washington	5" Vitex	Not protected		
185	1002 Washington	5" Vitex	Not protected		
186	1002 Washington	5" Vitex	Not protected		
187	1002 Washington	8" Nuttal Oak	Protected	Not impacted	
188	1002 Washington	7" Nuttal oak	Protected		Fence
189	1002 Washington	8" Nuttal Oak	Protected	Not impacted	
190	208 Preston	10" Holly	Not protected	Private tree	
191	208 Preston	7" Pecan	Protected		Fence
192	208 Preston	6" Pecan	Protected		Fence
193	208 Preston	15" Live Oak	Protected		Clearance prune, Fence
194	208 Preston	17" Live Oak	Protected		Clearance prune, Fence
195	208 Preston	19" Live Oak	Protected		Clearance prune, Fence
196	208 Preston	18" Live Oak	Protected		Clearance prune, Fence
197	208 Preston	11" Holly	Protected		Fence
198	410 Bagby	12" Holly	Protected		Fence
199	410 Bagby	18" Live Oak	Protected		Clearance prune, Fence
200	410 Bagby	16" Live Oak	Protected		Clearance prune, Fence
201	410 Bagby	16" Live Oak	Protected		Clearance prune, Fence
202	410 Bagby	18" Live Oak	Not protected	Private tree	Clearance prune, Fence
203	410 Bagby	15" Live Oak	Not protected	Private tree	Clearance prune, Fence
204	410 Bagby	12" Japanese Blueberry	Not protected	Private tree, Not impacted	
205	410 Bagby	12" Japanese Blueberry	Not protected	Private tree, Not impacted	
206	410 Bagby	12" Japanese Blueberry	Not protected	Private tree, Not impacted	
207	410 Bagby	12" Japanese Blueberry	Not protected	Private tree, Not impacted	
207A	409 Bagby	10" Crepe Myrtle	Not protected		
207B	409 Bagby	10" Crepe Myrtle	Not protected		
207C	409 Bagby	10" Crepe Myrtle	Not protected		
208	409 Bagby	11" Crepe Myrtle	Not protected		
209	505 Bagby	9" Baldcypress	Protected		Fence
210	505 Bagby	16" Montezuma Cypress	Protected		Fence
211	505 Bagby	25" Montezuma Cypress	Protected		Fence
212	505 Bagby	9" Crepe Myrtle	Not protected		
213	505 Bagby	9" Crepe Myrtle	Not protected		
214	505 Bagby	9" Crepe Myrtle	Not protected		
215	505 Bagby	10" Crepe Myrtle	Not protected		
216	505 Bagby	14" Crepe Myrtle	Not protected		
217	409 Preston	15" Crepe Myrtle	Not protected		

NOTE:

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TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ----- — ROOT PRUNING TRENCH

N

40 0 40 80

SCALE: 1"=40'

C.N. Koehl
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281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

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TX FIRM NO.: F–4578

SURVEYED BY:
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FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 7 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 149 OF 153	

NO.	DATE	REVISION	APP.

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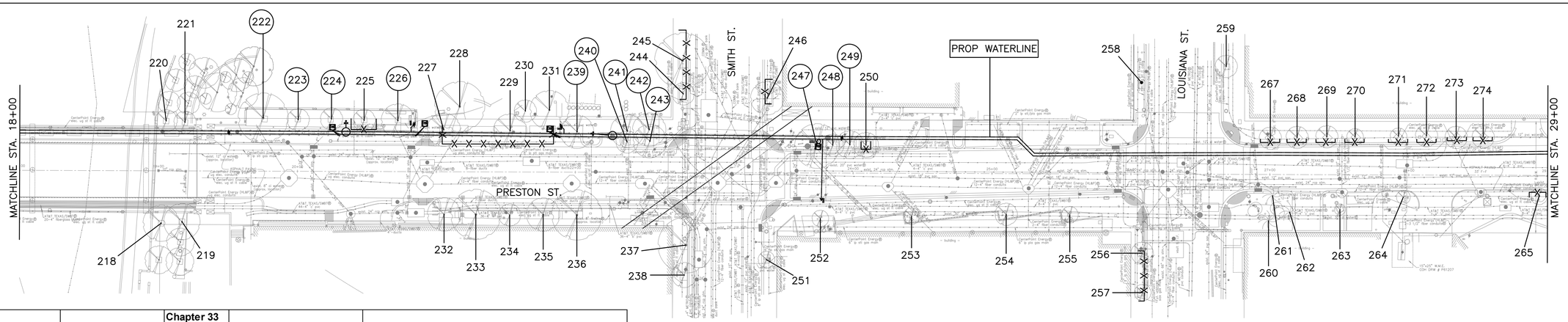

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Preston Street					
218	510 Preston	10" Baldcypress	Protected	Not impacted	
219	510 Preston	10" Baldcypress	Protected	Not impacted	
220	515 Preston	7" Baldcypress	Protected	Not impacted	
221	515 Preston	7" Baldcypress	Protected	Not impacted	
222	515 Preston	14" Sweetgum	Protected	Remove for open cut	Remove tree, Provide 14" in mitigation
223	515 Preston	Stump			
224	515 Preston	10" Sweetgum	Protected	Remove for open cut	Remove tree, Provide 10" in mitigation
225	515 Preston	11" Sweetgum	Protected	60% dieback	Fence, Bore waterline
226	515 Preston	13" Sweetgum	Protected	Remove for open cut	Remove tree, Provide 13" in mitigation
227	515 Preston	12" Shumard Oak	Protected		Fence, Bore waterline
228	515 Preston	22" Mexican Sycamore	Protected		Fence, Bore waterline
229	515 Preston	12" Shumard Oak	Protected		Fence, Bore waterline
230	515 Preston	10" Sweetgum	Protected		Fence, Bore waterline
231	515 Preston	15" Sweetgum	Protected		Fence, Bore waterline
232	510 Preston	10" Shumard Oak	Protected		Clearance prune
233	510 Preston	17" Shumard Oak	Protected	30% dieback	Clearance prune
234	510 Preston	9" Shumard Oak	Protected	50% dieback	Clearance prune
235	510 Preston	12" Shumard Oak	Protected	30% dieback	Clearance prune
236	510 Preston	16" Shumard Oak	Protected	30% dieback	Clearance prune
237	510 Preston	18" Live Oak	Protected	Not impacted	
238	510 Preston	12" Live Oak	Protected	Not impacted	
239	515 Preston	13" Shumard Oak	Protected	Remove for open cut	Remove tree, Provide 13" in mitigation
240	515 Preston	10" Baldcypress	Protected	Remove for open cut	Remove tree, Provide 10" in mitigation
241	515 Preston	13" Baldcypress	Protected	Remove for open cut	Remove tree, Provide 13" in mitigation
242	515 Preston	12" Baldcypress	Protected	Remove for open cut	Remove tree, Provide 12" in mitigation
243	515 Preston	12" Baldcypress	Protected	Remove for open cut	Remove tree, Provide 12" in mitigation
244	515 Preston	10" Live Oak	Protected		Fence
245	515 Preston	21" Live Oak	Protected		Fence
246	601 Preston	14" Live Oak	Protected	60% dieback	Fence
247	601 Preston	14" Live Oak	Protected	Remove for open cut	Remove tree, Provide 14" in mitigation
248	601 Preston	11" Live Oak	Protected	Remove for open cut	Remove tree, Provide 11" in mitigation
249	601 Preston	12" Live Oak	Protected	Remove for open cut	Remove tree, Provide 12" in mitigation
250	601 Preston	11" Live Oak	Protected		Fence, Bore waterline
251	411 Smith	6" Baldcypress	Protected	Not impacted	
252	411 Smith	8" Baldcypress	Protected	Not impacted	
253	411 Smith	6" Baldcypress	Protected	Not impacted	
254	411 Smith	9" Baldcypress	Protected	Not impacted	
255	411 Smith	8" Baldcypress	Protected	Not impacted	
256	411 Smith	8" Baldcypress	Protected		Fence
257	411 Smith	7" Baldcypress	Protected		Fence
258	601 Preston	15" Baldcypress	Protected	Not impacted	
259	777 Preston	11" Baldcypress	Protected	Not impacted	
260	401 Louisiana	15' Palm	Not protected		
261	401 Louisiana	15' Palm	Not protected		
262	401 Louisiana	15' Palm	Not protected		
263	401 Louisiana	6" Mexican Sycamore	Protected	Not impacted	
264	401 Louisiana	5" Shumard Oak	Protected	Not impacted	
265	401 Louisiana	10" Shumard Oak	Protected		Fence
267	777 Preston	9" Baldcypress	Protected		Fence
268	777 Preston	10" Baldcypress	Protected		Fence
269	777 Preston	9" Baldcypress	Protected		Fence
270	777 Preston	8" Baldcypress	Protected		Fence
271	777 Preston	9" Baldcypress	Protected		Fence
272	777 Preston	11" Baldcypress	Protected		Fence
273	777 Preston	10" Baldcypress	Protected		Fence
274	777 Preston	9" Baldcypress	Protected		Fence

NOTE:

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TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ROOT PRUNING TRENCH

N

40 0 40 80

SCALE: 1"=40'

C.N. Koehl
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APPROVED:

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SURVEYED BY:
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FB NO. 000000

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 8 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 150 OF 153	

NO.	DATE	REVISION	APP.

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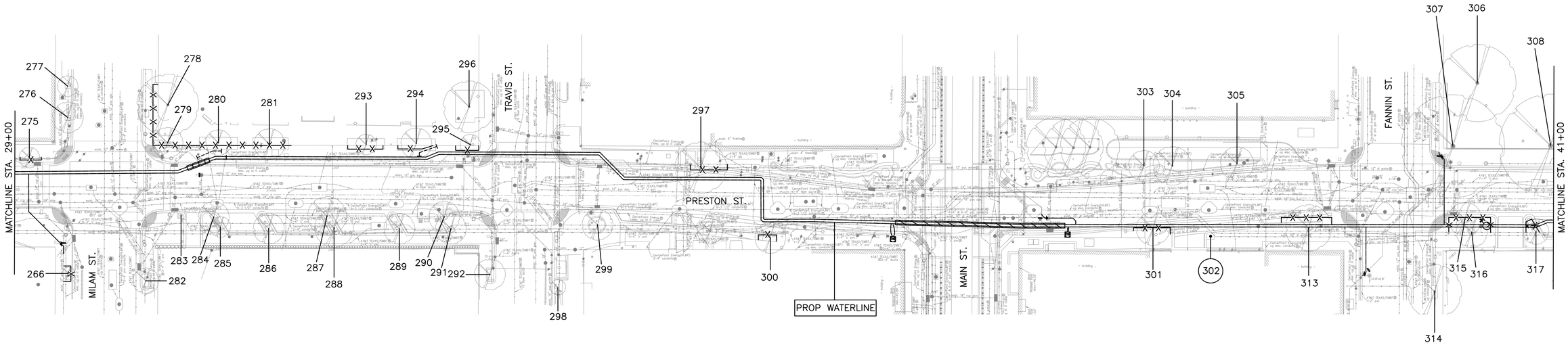

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Preston Street					
266	401 Louisiana	7" Shumard Oak	Protected		Fence
275	777 Preston	7" Baldcypress	Protected		Fence
276	777 Preston	13" Baldcypress	Protected		Fence
277	777 Preston	8" Baldcypress	Protected		Fence
278	301 Milam	28" Live Oak	Protected		Fence
279	301 Milam	11" Live Oak	Protected	40% dieback	Fence
280	301 Milam	10" Live Oak	Protected	30% dieback	Root prune, Fence, Clearance prune
281	301 Milam	14" Live Oak	Protected		Clearance prune, Fence
282	415 Milam	10" Shumard Oak	Protected	Not impacted	
283	415 Milam	3" Sycamore	Protected	Not impacted	
284	415 Milam	12" Sycamore	Protected		Clearance prune
285	415 Milam	9" Sycamore	Protected	Not impacted	
286	415 Milam	12" Sycamore	Protected	Not impacted	
287	415 Milam	14" Sycamore	Protected	Not impacted	
288	415 Milam	13" Sycamore	Protected	Not impacted	
289	420 Travis	12" Sycamore	Protected	Not impacted	
290	420 Travis	16" Sycamore	Protected	Not impacted	
291	420 Travis	15" Sycamore	Protected	Not impacted	
292	420 Travis	14" Shumard Oak	Protected	Not impacted	
293	301 Milam	12" Live Oak	Protected		Fence, Bore waterline
294	301 Milam	14" Live Oak	Protected		Root prune, Fence, Clearance prune
295	301 Milam	10" Live Oak	Protected		Fence, Bore waterline
296	301 Milam	25" Live Oak	Protected	Not impacted	
297	911 Preston	17" Sycamore	Protected		Fence, Bore waterline
298	409 Travis	8" Shumard Oak	Protected	Not impacted	
299	409 Travis	10" Shumard Oak	Protected	Leaning, Not impacted	
300	409 Travis	14" Sycamore	Protected		Clearance prune, Fence
301	407 Main	11" Mexican Sycamore	Protected	30% dieback	Fence, Bore waterline
302	407 Main	29" Mexican Sycamore	Protected	Remove for open cut	Remove tree, provide 29" in mitigation
303	1001 Preston	13" Mexican Sycamore	Protected	Not impacted	
304	1001 Preston	13" Mexican Sycamore	Protected	Not impacted	
305	1001 Preston	12" Mexican Sycamore	Protected	Not impacted	
306	301 Fannin	27" Magnolia	Protected	Corridor Tree, 50% dieback, Not impacted	
307	301 Fannin	34" Live Oak	Protected	Corridor Tree, 20% dieback, Not impacted	
308	301 Fannin	35" Live Oak	Protected	Corridor Tree	Clearance prune
313	1018 Preston	16" Mexican Sycamore	Protected		Fence, Bore waterline
314	1110 Preston	19" Live Oak	Protected	Not impacted	
315	1110 Preston	15" Sycamore	Protected		Fence, Bore waterline
316	1110 Preston	11" Sycamore	Protected		Fence, Bore waterline
317	1110 Preston	11" Mexican Sycamore	Protected		Fence, Bore waterline

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TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ----- — ROOT PRUNING TRENCH

N

40 0 40 80

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
210 Stone Bush Ct. ◦ Katy, Texas 77493
281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

KUO & ASSOCIATES ENGINEERING + SURVEYING
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HOUSTON, TX 77042
713–975–8769
TX FIRM NO.: F–4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 9 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0043–4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 151 OF 153	

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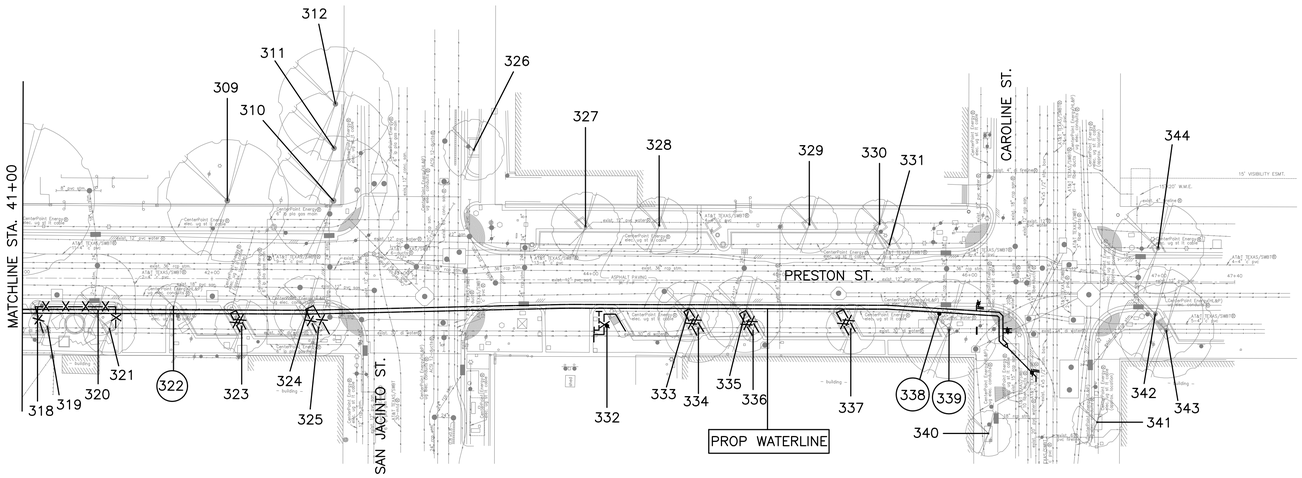

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Preston Street					
309	301 Fannin	27" Live Oak	Protected	Corridor Tree	
310	301 Fannin	37" Live Oak	Protected	Corridor Tree, 50% dieback, Not impacted	
311	301 Fannin	28" Live Oak	Protected	Corridor tree, not impacted	
312	301 Fannin	24" Live Oak	Protected	Corridor tree, not impacted	
318	1110 Preston	5" Mexican Sycamore	Protected		Fence, Bore waterline
319	1110 Preston	10" Mexican Sycamore	Protected		Fence, Bore waterline
320	1110 Preston	12" Mexican Sycamore	Protected		Fence, Bore waterline
321	1110 Preston	14" Mexican Sycamore	Protected		Fence, Bore waterline
322	400 San Jacinto	14" Mexican Sycamore	Protected	Remove for open cut	Remove tree, Provide 14" in mitigation
323	400 San Jacinto	11" Mexican Sycamore	Protected		Fence, Bore waterline
324	400 San Jacinto	15" Mexican Sycamore	Protected		Fence, Bore waterline
325	400 San Jacinto	11" Mexican Sycamore	Protected		Fence, Bore waterline
326	301 San Jacinto	14" Mexican Sycamore	Protected	Trunk wounds, Not impacted	
327	301 San Jacinto	15" Mexican Sycamore	Protected	15% dieback, Not impacted	
328	301 San Jacinto	14" Mexican Sycamore	Protected	Not impacted	
329	1200 Congress	15" Mexican Sycamore	Protected	Not impacted	
330	1200 Congress	13" Mexican Sycamore	Protected	Not impacted	
331	1200 Congress	11" Mexican Sycamore	Protected	Not impacted	
332	1106 Preston	14" Mexican Sycamore	Protected		Root prune for open cut, Fence, Clearance prune, Bore waterline
333	1106 Preston	15" Mexican Sycamore	Protected		Fence, Bore waterline
334	1106 Preston	18" Mexican Sycamore	Protected		Fence, Bore waterline
335	1106 Preston	16" Mexican Sycamore	Protected		Fence, Bore waterline
336	1106 Preston	6" Mexican Sycamore	Protected		Fence, Bore waterline
337	1106 Preston	12" Mexican Sycamore	Protected		Fence, Bore waterline
338	1106 Preston	12" Mexican Sycamore	Protected	Remove for open cut	Remove tree, Provide 12" in mitigation
339	1106 Preston	21" Mexican Sycamore	Protected	Remove for open cut	Remove tree, Provide 21" in mitigation
340	1106 Preston	12" Shumard oak	Protected	Not impacted	
341	1302 Preston	12" Shumard oak	Protected	Not impacted	
342	1302 Preston	18" Mexican Sycamore	Protected	Not impacted	
343	1302 Preston	18" Mexican Sycamore	Protected	Not impacted	
344	305 Caroline	17" Mexican Sycamore	Protected	Not impacted	

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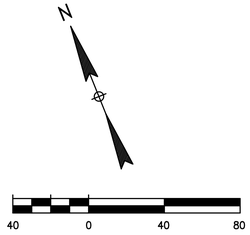
TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- –X–X– — TREE PROTECTION FENCE
- ⊢-----⊣ — ROOT PRUNING TRENCH



SCALE: 1"=40'

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS – PACKAGE 4

TREE PROTECTION PLAN

SHEET 10 OF 11

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 152 OF 153	

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Tree Removal List

Tree No.	Location	Description	Replacement requirement
30	984 Gessner	15" Holly	0
51	9829 Katy Fwy	7" Holly	0
52	9829 Katy Fwy	7" Holly	0
222	515 Preston	14" Sweetgum	14
224	515 Preston	10" Sweetgum	10
226	515 Preston	13" Sweetgum	13
239	515 Preston	13" Shumard Oak	13
240	515 Preston	10" Baldcypress	10
241	515 Preston	13" Baldcypress	13
242	515 Preston	12" Baldcypress	12
243	515 Preston	12" Baldcypress	12
247	601 Preston	14" Live Oak	14
248	601 Preston	11" Live Oak	11
249	601 Preston	12" Live Oak	12
302	407 Main	29" Mexican Sycamore	29
322	400 San Jacinto	14" Mexican Sycamore	14
338	1106 Preston	12" Mexican Sycamore	12
339	1106 Preston	21" Mexican Sycamore	21
		TOTAL REPLACEMENT INCHES REQUIRED	**210**

Tree Replacement List

Quantity	Caliper Size	Species	Container/Tree Spade size
		TOTAL REPLACEMENT INCHES INCLUDED IN PLAN	**0**

NOTE: Tree replacement locations are not shown on plans. Contractor must coordinate with City of Houston Urban Forestry and Houston Public Works prior to PURCHASING trees. This project may not have adequate room for all required replacement trees without creating regulatory sign or traffic/pedestrian visibility issues. Number of trees and planting locations will be determined by City of Houston Urban Forestry in construction phase. Trees that are planted are to be maintained and watered for 2 years following planting per standard spec 02915. Timing of planting may be delayed in periods of drought with mandatory water restrictions in place-timing to be coordinated with City of Houston Urban Forestry. Trees in esplanade groupings to be planted in common bed with 4" of hardwood mulch between trees.

Trees are to be maintained and watered for 2 years following planting per standard spec 02915. Timing of planting may be delayed in periods of drought with mandatory water restrictions in place-timing to be coordinated with City of Houston Forestry.

Tree replacement locations shall comply with Houston Public Works spec sections 02811, 02911, 02912, 02915, 02921 & 02922. In general trees along sides of street right of ways shall be no closer than 3' to back of curb or 20' from another tree. Trees in medians shall be no closer than 6' back of curb, 75' from an intersection, 50' to a median cut, or 20' from another tree. Contractor to coordinate locations with City Forestry and HPW prior to PURCHASING trees. All replacement trees called out on plans may not be planted on project relative to coordination with listed parties.

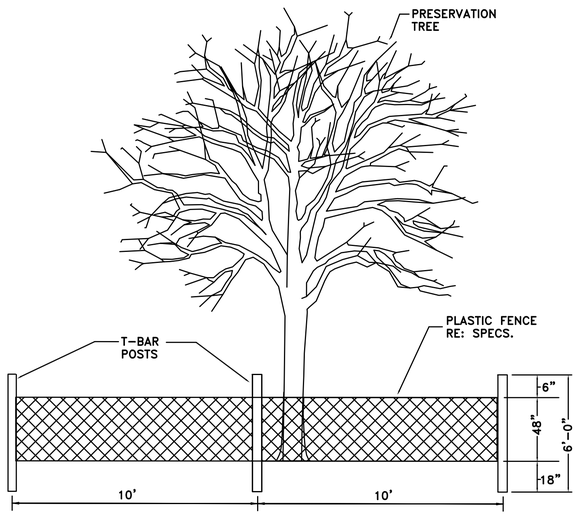
Cash Allowance Due Parks from HPW for Balance of Mitigation Not Planted on Project

	Required Mitigation total	Mitigation rate/inch	
0-5.99"		$ 297.98	$ -
6-11.99"	31	496.64	$ 15,395.84
12" +	179	662.19	$ 118,532.01
		TOTAL REQUIRED MITIGATION FEE	**$ 133,927.85**

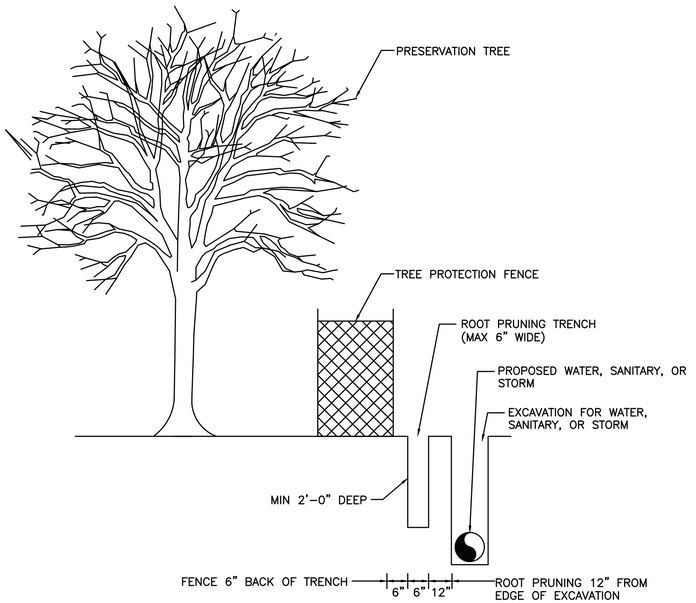
Arboriculturally Significant Tree List

Tree No.	Location	Description
57	9821 Katy Fwy	27" Live Oak
104	105 Sabine	28" Live Oak
117	110 Sabine	24" Sweetgum
150	1550 N Memorial Way	27" Pecan
162	800 Houston	32" Live Oak
163	800 Houston	25" Live Oak
166	800 Houston	54" Live Oak
167	800 Houston	28" Live Oak
211	505 Bagby	25" Montezuma Cypress
278	301 Milam	28" Live Oak
296	301 Milam	25" Live Oak
302	407 Main	29" Mexican Sycamore
306	301 Fannin	27" Magnolia
307	301 Fannin	34" Live Oak
308	301 Fannin	35" Live Oak
309	301 Fannin	27" Live Oak
310	301 Fannin	37" Live Oak
311	301 Fannin	28" Live Oak
312	301 Fannin	24" Live Oak

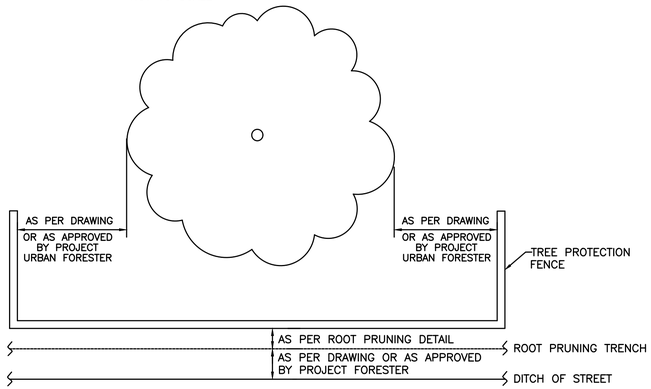
Trees Identified by City of Houston Forestry/Parks & Recreation Department as Arboriculturally Significant are identified here and/or in treatment schedule included on TPP sheets. Arboriculturally Significant trees are to be pruned under direct supervision of City of Houston Forestry. Minimal pruning will be allowed for construction equipment access, and in some cases no pruning will be allowed. Contractor must review conditions around and/or under the canopy of Arboriculturally Significant trees and consider restrictions when preparing cost estimate and planning construction equipment that will be necessary to accomplish design installation with minimal to no tree pruning.



TREE PROTECTION FENCING DETAIL A
NOT TO SCALE



ROOT PRUNE FOR WATER, SANITARY, OR STORM LINE
NOT TO SCALE



TREE PROTECTION FENCING DETAIL B
NOT TO SCALE

NO.	DATE	REVISION	APP.

C.N. Koehl
Urban Forestry, Inc.
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APPROVED:

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713-975-8769
TX FIRM NO.: F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. 000000

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

MISCELLANEOUS LARGE DIAMETER WATER LINE IMPROVEMENTS - PACKAGE 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0043-4	
DRAWING SCALE	
CITY OF HOUSTON PM	
MARTIN MATHEW, ENV SP	
SHEET NO. 153 OF 153	

C:\Users\Ned\Desktop\Work For Craig\KUO LDWL PACKAGE 4\KOU LDWL PKG 4 TP-11.dwg plotted on Sep 17, 2025 - 10:56am