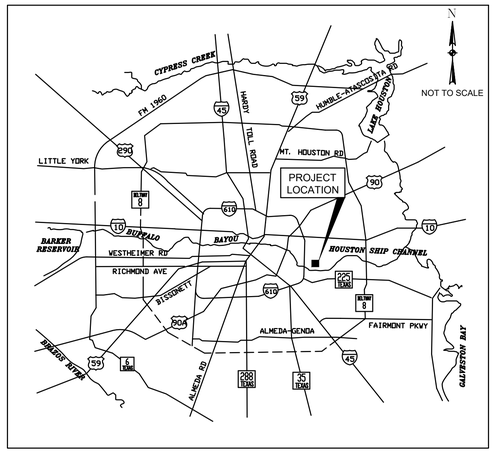
CITY OF HOUSTON

HOUSTON PUBLIC WORKS

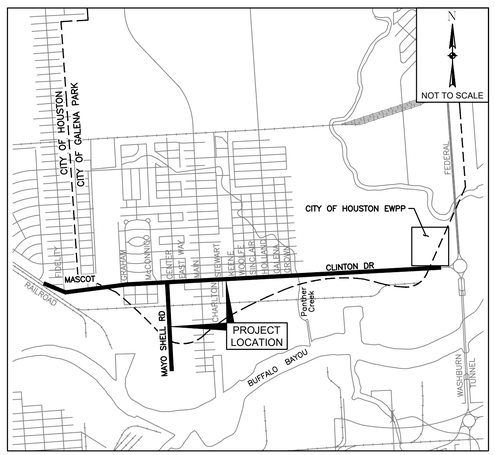
CAPITAL PROJECTS

LARGE DIAMETER WATER LINE AND VALVE REPLACEMENT - PACKAGE 3

WBS NO. S-000701-0038-3



LOCATION MAP
COUNCIL DISTRICTS 'E' & 'I'



VICINITY MAP
KEY MAP NO 495Z, 496 W, X, & Y, 536 A
GIMS MAP NO 5656 B, 5756 A, B, & C

TDLR EABPR _____

MAYOR
JOHN WHITMIRE

CONTROLLER
CHRIS HOLLINS

DISTRICT
COUNCIL MEMBERS

AMY PECK — DISTRICT A
TARSHA JACKSON — DISTRICT B
ABBIE KAMIN — DISTRICT C
CAROLYN 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
LETITIA PLUMMER — POSITION 4
SALLIE ALCORN — POSITION 5

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10300 WESTOFFICE DR. SUITE 800
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PHONE: 713–975–8769
TX ENGR. FIRM NO.: F–4578
TX SURVEY FIRM NO.: 10075600

SURVEYED BY: KUO & ASSOCIATES, LLC
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_____
PARKS–FORESTRY DEPT.

_____
METRO

_____
HOUSTON WATER

_____
TRANSPORTATION & DRAINAGE OPERATIONS

_____ _____
CAPITAL PROJECTS SURVEY

FOR CITY OF HOUSTON USE ONLY

_____
CITY ENGINEER DATE

_____
DIRECTOR OF DATE
HOUSTON PUBLIC WORKS

SHEET NO 1 OF 204 SHEETS

SHEET NO.	SHEET TITLE
GENERAL	
1	COVER SHEET
2	SHEET INDEX
3	HARRIS COUNTY EXPRESS REVIEW SHEET
4	HARRIS COUNTY FLOOD CONTROL EXPRESS REVIEW SHEET
5	ABBREVIATIONS
6	SYMBOLS
7	GENERAL CONSTRUCTION NOTES (SHEET 1 OF 3)
8	GENERAL CONSTRUCTION NOTES (SHEET 2 OF3)
9	GENERAL CONSTRUCTION NOTES (SHEET 3 OF 3)
SHEET LAYOUT	
10	OVERALL LAYOUT PLAN SHEET 1 OF 6
11	OVERALL LAYOUT PLAN SHEET 2 OF 6
12	OVERALL LAYOUT PLAN SHEET 3 OF 6
13	OVERALL LAYOUT PLAN SHEET 4 OF 6
14	OVERALL LAYOUT PLAN SHEET 5 OF 6
15	OVERALL LAYOUT PLAN SHEET 6 OF 6
FLOODPLAIN MITIGATION	
16	FLOODPLAIN MITIGATION PLAN
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17	SURVEY CONTROL MAP SHEET 1 OF 6
18	SURVEY CONTROL MAP SHEET 2 OF 6
19	SURVEY CONTROL MAP SHEET 3 OF 6
20	SURVEY CONTROL MAP SHEET 4 OF 6
21	SURVEY CONTROL MAP SHEET 5 OF 6
22	SURVEY CONTROL MAP SHEET 6 OF 6
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23	CLINTON DRIVE PLAN BEGIN TO STA 5+50
24	CLINTON DRIVE PROFILE BEGIN TO STA 5+50
25	CLINTON DRIVE PLAN STA 5+50 TO STA 10+00
26	CLINTON DRIVE PROFILE STA 5+50 TO STA 10+00
27	CLINTON DRIVE PLAN STA 10+00 TO STA 15+00
28	CLINTON DRIVE PROFILE STA 10+00 TO STA 15+00
29	CLINTON DRIVE PLAN STA 15+00 TO STA 20+00
30	CLINTON DRIVE PROFILE STA 15+00 TO STA 20+00
31	CLINTON DRIVE PLAN STA 20+00 TO STA 25+00
32	CLINTON DRIVE PROFILE STA 20+00 TO STA 25+00
33	CLINTON DRIVE PLAN STA 25+00 TO STA 30+00
34	CLINTON DRIVE PROFILE STA 25+00 TO STA 30+00
35	CLINTON DRIVE PLAN STA 30+00 TO STA 35+00
36	CLINTON DRIVE PROFILE STA 30+00 TO STA 35+00
37	CLINTON DRIVE PLAN STA 35+00 TO STA 40+00
38	CLINTON DRIVE PROFILE STA 35+00 TO STA 40+00
39	CLINTON DRIVE PLAN STA 40+00 TO STA 44+00
40	CLINTON DRIVE PROFILE STA 40+00 TO STA 44+00
41	CLINTON DRIVE PLAN STA 44+00 TO STA 49+00
42	CLINTON DRIVE PROFILE STA 44+00 TO STA 49+00
43	CLINTON DRIVE PLAN STA 49+00 TO STA 54+00
44	CLINTON DRIVE PROFILE STA 49+00 TO STA 54+00
45	CLINTON DRIVE PLAN STA 54+00 TO STA 59+00
46	CLINTON DRIVE PROFILE STA 54+00 TO STA 59+00
47	CLINTON DRIVE PLAN STA 59+00 TO STA 63+00
48	CLINTON DRIVE PROFILE STA 59+00 TO STA 63+00
49	CLINTON DRIVE PLAN STA 63+00 TO STA 67+00
50	CLINTON DRIVE PROFILE STA 63+00 TO STA 67+00
51	CLINTON DRIVE PLAN STA 67+00 TO STA 71+00
52	CLINTON DRIVE PROFILE STA 67+00 TO STA 71+00
53	CLINTON DRIVE PLAN STA 71+00 TO STA 75+00
54	CLINTON DRIVE PROFILE STA 71+00 TO STA 75+00
55	CLINTON DRIVE PLAN STA 75+00 TO STA 79+00
56	CLINTON DRIVE PROFILE STA 75+00 TO STA 79+00
57	CLINTON DRIVE PLAN STA 79+00 TO STA 83+00
58	CLINTON DRIVE PROFILE STA 79+00 TO STA 83+00
59	CLINTON DRIVE PLAN STA 83+00 TO STA 87+00
60	CLINTON DRIVE PROFILE STA 83+00 TO STA 87+00
61	CLINTON DRIVE PLAN STA 87+00 TO STA 92+00
62	CLINTON DRIVE PROFILE STA 87+00 TO STA 92+00 (SHEET 1 OF 2)
63	CLINTON DRIVE PROFILE STA 87+00 TO STA 92+00 (SHEET 2 OF 2)
64	CLINTON DRIVE PLAN STA 92+00 TO STA 97+00
65	CLINTON DRIVE PROFILE STA 92+00 TO STA 97+00 (SHEET 1 OF 2)
66	CLINTON DRIVE PROFILE STA 92+00 TO STA 97+00 (SHEET 2 OF 2)
67	CLINTON DRIVE PLAN STA 97+00 TO STA 102+00
68	CLINTON DRIVE PROFILE STA 97+00 TO STA 102+00
69	CLINTON DRIVE PLAN STA 102+00 TO STA 107+00
70	CLINTON DRIVE PROFILE STA102+00 TO STA 107+00
71	CLINTON DRIVE PLAN STA 107+00 TO STA 111+00
72	CLINTON DRIVE PROFILE STA 107+00 TO STA 111+00
73	CLINTON DRIVE PLAN STA 111+00 TO STA 116+00
74	CLINTON DRIVE PROFILE STA 111+00 TO STA 116+00
75	CLINTON DRIVE PLAN STA 116+00 TO STA 121+00
76	CLINTON DRIVE PROFILE STA 116+00 TO STA 121+00
77	CLINTON DRIVE PLAN STA 121+00 TO STA 126+00
78	CLINTON DRIVE PROFILE STA 121+00 TO STA 126+00
79	CLINTON DRIVE PLAN STA 126+00 TO STA 131+00
80	CLINTON DRIVE PROFILE STA 126+00 TO STA 131+00
81	CLINTON DRIVE PLAN STA 131+00 TO STA 136+00
82	CLINTON DRIVE PROFILE STA 131+00 TO STA 136+00
83	CLINTON DRIVE PLAN STA 136+00 TO END
84	CLINTON DRIVE PROFILE STA 136+00 TO END
85	MAYO SHELL ROAD PLAN & PROFILE BEGIN TO STA 5+00
86	MAYO SHELL ROAD PLAN & PROFILE STA 5+00 TO STA 9+00
87	MAYO SHELL ROAD PLAN & PROFILE STA 9+00 TO STA 14+00
88	MAYO SHELL ROAD PLAN & PROFILE STA 14+00 TO STA 19+00
89	MAYO SHELL ROAD PLAN & PROFILE STA 19+00 TO STA 24+00
90	MAYO SHELL ROAD PLAN & PROFILE STA 24+00 TO STA 29+00
91	MAYO SHELL ROAD PLAN & PROFILE STA 29+00 TO STA 33+00
92	MAYO SHELL ROAD PLAN & PROFILE STA 33+00 TO END
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96	WATER LINE LATERALS – CLINTON DRIVE PLAN & PROFILE STA 8+75
97	WATER LINE LATERALS – CLINTON DRIVE PLAN & PROFILE STA 13+50
98	WATER LINE LATERALS – CLINTON DRIVE PLAN & PROFILE STA 25+00
99	WATER LINE LATERALS – CLINTON DRIVE PLAN & PROFILE STA 45+55
100	WATER LINE LATERALS – CLINTON DRIVE PLAN & PROFILE STA 67+45
101	WATER LINE LATERALS – CLINTON DRIVE PLAN & PROFILE STA 83+85
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103	CLINTON DRIVE – 72–INCH VALVE SHEET
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105	CLINTON DRIVE – REPAIR OF DAMAGED PIPE (SHEET 2 OF 2)
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106	PAVEMENT RESTORATION SHEET 1 OF 6
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109	PAVEMENT RESTORATION SHEET 4 OF 6
110	PAVEMENT RESTORATION SHEET 5 OF 6
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116	STANDARD LDWL ACCESS MANHOLE DETAILS
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118	STANDARD LDWL BUTTERFLY VALVE AND OPERATOR MANHOLE DETAILS
119	STANDARD LDWL DRAIN LINE VALVE DETAILS
120	STANDARD LDWL COMBINATION AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAILS
121	STANDARD LDWL AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAILS
122	STANDARD LDWL TUNNEL AND CASING DETAILS
123	STANDARD LDWL EXCAVATION AND BACKFILL DETAILS
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126	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS SHEET 1 OF 3
127	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS SHEET 2 OF 3
128	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS SHEET 3 OF 3
129	STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS & ANODES
130	STANDARD SDWL DETAILS (SHEET 1 OF 3)
131	STANDARD SDWL DETAILS (SHEET 2 OF 3)
132	STANDARD SDWL DETAILS (SHEET 3 OF 3)
133	STANDARD SANITARY SEWER DETAILS
134	SANDARD SANITARY SEWER AND STORM SEWER BEDDING & BACKFILL DETAILS
135	STANDARD STREET PAVING AND SIDEWALK DETAILS (SHEET 1 OF 2)
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137	COH STANDARD STREET CUT PAVEMENT REPLACMENT DETAILS
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184	STORM WATER POLLUTION PREVENTION PLAN SHEET 2 OF 11
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186	STORM WATER POLLUTION PREVENTION PLAN SHEET 4 OF 11
187	STORM WATER POLLUTION PREVENTION PLAN SHEET 5 OF 11
188	STORM WATER POLLUTION PREVENTION PLAN SHEET 6 OF 11
189	STORM WATER POLLUTION PREVENTION PLAN SHEET 7 OF 11
190	STORM WATER POLLUTION PREVENTION PLAN SHEET 8 OF 11
191	STORM WATER POLLUTION PREVENTION PLAN SHEET 9 OF 11
192	STORM WATER POLLUTION PREVENTION PLAN SHEET 10 OF 10
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196	TREE PROTECTION PLAN SHEET 2 OF 10

SHEET NO.	SHEET TITLE
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198	TREE PROTECTION PLAN SHEET 4 OF 10
199	TREE PROTECTION PLAN SHEET 5 OF 10
200	TREE PROTECTION PLAN SHEET 6 OF 10
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202	TREE PROTECTION PLAN SHEET 8 OF 10
203	TREE PROTECTION PLAN SHEET 9 OF 10
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NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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HOUSTON, TX 77042
PHONE: 713–975–8769
TX ENGR. FIRM NO.: F–4578
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FB NO.

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

SHEET INDEX

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **2** OF 204	

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\2 – Sheet Index.dwg plotted on Aug 15, 2025 – 10:07pm

1. PAVING

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

	DESIGN THICKNESS OF PAVING	STABILIZED SUBGRADE DEPTH	DESIGN STRENGTH OF CONCRETE	STEEL SPACING		REINFORCE STEEL SIZE
				LONG.	TRANS.	
CONCRETE	(IN.)	(IN.)	(PSI)	(IN.)	(IN.)	(#4 MIN.)
	N/A					

	DESIGN SURFACE COURSE THICKNESS	DESIGN SURFACE COURSE TYPE	DESIGN BASE COURSE THICKNESS	DESIGN BASE COURSE TYPE	STABILIZED SUBGRADE THICKNESS	STABILIZED SUBGRADE TYPE
ASPHALT	(IN.)	(MATERIAL)	(IN.)	(MATERIAL)	(IN.)	(MATERIAL)
	☒					

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 XX

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: CLINTON DR FROM MASCOT ST TO CITY OF HOUSTON EWPP

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.

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): _____

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_____ * _____ = _____ ACRE FEET
DETENTION REQUIRED
* ☐ .65 (CHANNEL)
* ☐ .75 (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 ENTRES 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

7. FLOOD PLAIN STATUS

I. GENERAL INFORMATION
FIRM PANEL(S) FOR PROPERTY: 48201C0885N & 48201C0905N
FIRM PANEL(S) DATE: MAY 02, 2019
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.)* FLOODPLAIN REFERENCE MARK NUMBER 070475, IS A BRASS DISK STAMPED PAN CR 5 1968, LOCATED ON THE NORTHWEST CORNER OF THE BRIDGE ON CLINTON RD OVER PANTHER CREEK, APPROXIMATELY 950 FEET EAST FROM THE INTERSECTION OF HOLLAND AVE, IN KEYMAP 496X, IN THE SAN JACINTO RIVER WATERSHED ELEV. 11.58 FEET NAVD 1998 2001 ADJUSTMENT

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 ☐CLOMR 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

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.

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 GOVERNEMENT CODE CH. 245.

ENGINEER'S CERTIFICATION

I, SUDHEER SANGAM , 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 06/03/25 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. | HCFCD PROJECT NO. | SHEET NUMBER ___ OF ___

HARRIS COUNTY ENGINEERING DEPARTMENT REVIEW SHEET

VERSION 20.0 MAY 27, 2020

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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

HARRIS COUNTY EXPRESS REVIEW SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 3 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\3 - Harris County Express Review Sheet.dwg plotted on Aug 15, 2025 - 10:07pm

1. PROPERTY DESCRIPTION

I. LOCATION INFORMATION

A. HARRIS COUNTY COMMISSIONER'S PRECINCT:
☒ 1 ☐ 2 ☒ 3 ☐ 4

B. KEY MAP: 495 Z, 496 W, X, & Y

C. ADDRESS: _____

II. LEGAL DESCRIPTION

A. ACREAGE: _____

B. ☐ SUBDIVISION: _____

☐ SURVEY & ABSTRACT: _____

C. ADJACENT ROADS: ALONG CLINTON DRIVE FROM MASCOT ST TO FEDERAL RD

III. PLATTING

A. SUBDIVISION PLAT
☐ PROPOSED PLAT / REPLAT
☐ RECORDED PLAT / REPLAT

PLAT NAME: _____

B. STREETS PROPOSED
☐ PUBLIC
☐ PRIVATE
☐ PUBLIC & PRIVATE
☒ NONE

IV. JURISDICTIONS

☐ CITY OF HOUSTON
☒ ETJ, CITY OF HOUSTON
☐ ETJ, CITY OF _____
☐ NO ETJ
☐ UTILITY DISTRICT (NAME)_____

V. HCAD ACCOUNT NOS. (ALL)

_____

2. SITE DETENTION DRAINAGE

I. PROPOSED DRAINAGE AREA

☐ NEW DEVELOPMENT AREA: _____
☐ RE-DEVELOPMENT AREA (AMOUNT INCREASED IMPERVIOUS AREA): _____
☐ LOW IMPACT DEVELOPMENT (LID)
METHOD/DESCRIPTION _____

II. METHODOLOGY

HCFCD PCPM DETENTION METHOD USED:
☐ METHOD 1 (LESS THAN 20 ACRES)
☐ METHOD 2 (20 ACRES TO 640 ACRES)
☐ METHOD 3 (GREATER THAN 640 ACRES)
☐ OTHER _____

III. DETENTION VOLUME & OUTFALL

OUTFALL TO:
☐ .65, H.C.F.C.D. CHANNEL, (H.C.F.C.D. UNIT NO.) _____
☐ .75, EXISTING STORM SEWER (OWNER & OPERATOR) _____
☐ 1.00, ROADSIDE DITCH, (OWNER & ROAD NAME) _____
☐ OTHER (OWNER & OPERATOR)_____

IV. STORMWATER DETENTION BASIN INFORMATION

A. HCFCD PCPM SUMMARY TABLE SEE SHEET _____ OF THESE PLANS.

DETENTION BASIN SERVICE AREA	acres		
STORM EVENT	50% EXCEEDANCE (2-YEAR)	10% EXCEEDANCE (10-YEAR)	1% EXCEEDANCE (100-YEAR)
MAXIMUM ALLOWABLE OUTFLOW (PRE-DEVELOPMENT PEAK FLOW)			
MAXIMUM OUTFLOW PROVIDED (PEAK FLOW FROM BASIN)			
LOWEST NATURAL/FINISHED GROUND OR FINISHED FLOOR ELEVATION ESTIMATE			
DESIGN WATER SURFACE ELEVATION			
MINIMUM STORAGE REQUIRED (ac-ft)			
DETENTION STORAGE PROVIDED (ac-ft)			
STORAGE RATE PROVIDED (ac-ft/ac)			
OUTFLOW VELOCITY INTO CHANNEL (ft/sec)			
DRAIN TIME – 1% ONLY (hours)			
EMERGENCY OVERFLOW (TYPE, SIZE, ELEVATION, ETC.)			

B. DETENTION BASIN TO BE MAINTAINED BY _____

C. DETENTION SERVICE AREA MAP ON SHEET _____

D. ADDITIONAL CRITERIA FOR PUMPED DETENTION BASINS
VOLUME OF PUMPED 1% EXCEEDANCE STORAGE VOLUME = _____ ACFT _____ % OF TOTAL VOLUME
MAXIMUM DESIGN OUTFLOW VELOCITY INTO HCFCD CHANNEL = _____ FT/SEC
DRAIN TIME FOR BASIN = _____ HOURS BASED ON _____HEAD CONDITIONS

V. DETENTION PROVIDED IN OTHER PLANS:

HCFCD PROJECT No. _____ DATE SIGNED BY HCFCD: _____
PLAN TITLE _____
DETENTION POND SERVICE AREA MAP IS PROVIDED ON SHEET _____
ENGINEERING FIRM _____
DETENTION BASIN MAINTAINED BY: _____

VI. FLOW RESTRICTOR SIZE

OUTFALL PIPE SIZE: _____
RESTRICTOR PIPE SIZE: _____
RESTRICTOR PLATE DIMENSION: _____

VII. DETENTION PROVIDED BY

☐ REGIONAL DETENTION BASIN SYSTEM (APPROVED H.C. PRJ NO.): _____

FOR PROJECTS LOCATED IN ANY FLOODPLAIN
Development constructed or placed in accordance with these plans will comply with all provisions of the designated Floodplain Administrator.
No net fill is allowed in the flood plain and no fill is allowed in the floodway.

OFFSITE SHEET FLOW: (100 YEAR)

OFFSITE SHEET FLOW MAPPING, TOTAL DISCHARGE CALCULATIONS, AND DESIGN ACCOMODATIONS ARE SHOWN ON SHEET N/A 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. SWQ DISCHARGE INTO FCD FACILITY

I. SWPPP: CONSTRUCTION MEASURES. (Must complete)

☐ DISTURBS >1AC. SITE PLAN & DETAILS ON SHEET(S) _____
☐ DISTURBS <1AC. N/A

*II. APPLICABILITY FOR PERMANENT FEATURES. (Must complete)

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:
☐ 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 CALCULATIONSAPPEAR ON SHEET(S)_____
☐ HYDRODYNAMIC TYPE SEPARATOR MODEL: _____
☐ OTHER(S): _____

4. 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_____) (0.2% BASE FLOOD LEVEL_____)
☐ 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 *(ONVI ADJ.)* FLOODPLAIN REFERENCE MARK NUMBER 070475, IS A BRASS DISK STAMPED PAN CR 5 1968, LOCATED ON THE NORTHWEST CORNER OF THE BRIDGE ON CLINTON RD OVER PANTHER CREEK, APPROXIMATELY 950 FEET EAST FROM THE INTERSECTION OF HOLLAND AVE, IN KEYMAP 496X, IN THE SAN JACINTO RIVER WATERSHED ELEV. 11.58 FEET NAVD 1988 2001 ADJUSTMENT

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 FEMA REGULATORY FLOODPLAIN).

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.) ____ CUBIC YARDS 0

B. TOTAL VOLUME OF MATERIAL PROPOSED TO BE REMOVED FROM THE FIRM DELINEATED FLOODPLAIN: BELOW 0.2% BASE FLOOD ELEVATION (2001 ADJ.) ____ CUBIC YARDS 0 INCLUDING CALCULATIONS)

C. FILL AREA & VOLUME CALCULATIONS ARE SHOWN ON SHEET N/A

5. WORK IN HCFCD RIGHT-OF-WAY

I. TYPE OF WORK TO BE PERFORMED IN HCFCD HCFCD ROW

A. BOND/NOTIFICATION INFORMATION
☐ HCFCD WATERSHED _____
☐ HCFCD UNIT No. _____
☐ NUMBER OF OUTFALLS _____
☒ UTILITY CROSSING
☐ ROADWAY BRIDGE/CULVERT CROSSING
☐ FILL ACTIVITY
☐ REHABILITATION OF CHANNEL
☐ MAINTENANCE
☐ TEMPORARY CROSSING
☐ TRAIL (LENGTH) _____
☐ OTHER _____
COST OF WORK IN HCFCD ROW _____

II. USACE ENVIRONMENTAL PERMIT

☐ US ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT NUMBER(S) _____
☐ US ARMY CORPS OF ENGINEERS INDIVIDUAL PERMITS
☐ OTHER
☐ NO PERMITS REQUIRED
EXPLAIN: _____

III. REFERENCE / BASIS OF DETERMINATION

☐ ENVIRONMENTAL CONSULTANT REPORT
BY _____
REPORT TITLE _____
REPORT DATE _____
☐ OTHER _____

NOTES:
i. – III. REQUIRED ON PROJECTS WITH WORK IN A HCFCD CHANNEL. PLEASE REFERENCE SECTION 17 OF THE FLOOD CONTROL DISTRICT POLICY, CRITERIA, AND PROCEDURE MANUAL FOR MORE INFORMATION.

IV. HCFCD STANDARD NOTES: SEE SHEET X OF THESE PLANS.

V. HCFCD STANDARD DETAILS: SEE SHEET _____ OF THESE PLANS.

VI. HCFCD ACCESS PLAN: SEE SHEET _____ OF THESE PLANS.

VII. REFER TO THE FOLLOWING PLAN SHEETS: _____
FOR EXISTING AND PROPOSED RIGHT(S) OF WAY INCLUDING DELINEATION AND RECORDING INFORMATION PER HCFCD POLICY, CRITERIA, & PROCEDURE MANUAL (i.e., DRAINAGE EASEMENT, FEE STRIP, ETC.) AND GRANTEE (e.g. COH, HCFCD, PUBLIC, TXDOT, ETC.)

6. REPORTS/AGREEMENTS

I. HCFCD ACCEPTED REPORTS (ALL)

STORMWATER DRAINAGE DESIGN REPORT
REPORT TITLE _____
HCFCD PROJECT #_____
ENGINEERING FIRM _____
REPORT ACCEPTANCE DATE _____

GEOTECHNICAL INVESTIGATION REPORT
REPORT TITLE _____
HCFCD PROJECT #_____
ENGINEERING FIRM _____
REPORT ACCEPTANCE DATE _____

HCFCD APPROVED VARIANCE
DESCRIPTION OF VARIANCE _____
DOCUMENT ID #_____
VARIANCE ACCEPTANCE DATE _____

II. AGREEMENT TYPE & No.:

☐ INTERLOCAL (ILA): _____
☑ HCFCD MAINTENANCE _____
☐ TURF ESTABLISHMENT _____
☐ OTHER _____

HCFCD SIGNATURE BLOCK

PROJECT NAME: LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

ADDRESS: _____

WAS ACCEPTED BY HARRIS COUNTY FLOOD CONTROL DISTRICT FOR THE PURPOSES LISTED BELOW:

HARRIS COUNTY FLOOD CONTROL DISTRICT

INTERPOSE NO OBJECTION

BY_____
FOR ITEMS LOCATED OUTSIDE OF HCFCD RIGHT-OF-WAY

APPROVED:

BY_____
FOR ITEMS LOCATED WITHIN EXISTING HCFCD RIGHT-OF-WAY

APPROVED:

BY_____
FOR ITEMS LOCATED WITHIN PROPOSED HCFCD RIGHT-OF-WAY

NO REVIEW REQUIRED:

BY_____
FINAL PERMITTING BY OTHERS

ADDITIONAL COMMENTS:

_____

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, SUDHEER GOUD SANGAM, 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.

ANY VIOLATIONS WILL BE FORWARDED TO THE HARRIS COUNTY DISTRICT ATTORNEY'S OFFICE FOR PROSECUTION.

THE COMPLETED PROJECT CONSISTS OF DRAWING SHEETS 1 THRU XXX

SIGNATURE _____ XX/XX/2025 DATE

SEAL

REVISIONS

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

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

HARRIS COUNTY FLOOD CONTROL PROJECT NO.

SHEET NUMBER ____ OF ____

HARRIS COUNTY FLOOD CONTROL DISTRICT REVIEW SHEET

VERSION 1.0 OCTOBER 2019

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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

HARRIS COUNTY FLOOD CONTROL EXPRESS REVIEW SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 4 OF 204	

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ABBREVIATIONS:

&	AND
@	AT
AB	ALL BELL
AC	ACRE / ASBESTOS CEMENT
AI/VR	AIR INLET / VACUUM RELIEF
APPROX	APPROXIMATELY
ASPH	ASPHALT
AVE	AVENUE
℄	BASELINE
B/B	BACK TO BACK
BC	BACK OF CURB
BFV	BUTTERFLY VALVE
BL	BUILDING LINE
BLDG	BUILDING
BLVD	BOULEVARD
℄	CENTER LINE
C/C	CENTER TO CENTER
CGMP	CORRUGATED GALVANIZED METAL PIPE
CMP	CORRUGATED METAL PIPE
CIP	CAST IRON PIPE
CLR	CLEARANCE
CO	CLEAN OUT
COH	CITY OF HOUSTON
CONC	CONCRETE
CONSTR	CONSTRUCTION
CPEE	CENTERPOINT ENERGY ELECTRIC
CPEG	CENTERPOINT ENERGY GAS
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DR	DRIVE
DWG	DRAWING
DWY	DRIVEWAY
E	EAST
EL	ELEVATION
EP	EDGE OF PAVEMENT
E/R	END OF RADIUS
ESMT	EASEMENT
EXST	EXISTING
FC	FACE OF CURB
F/F	FACE TO FACE
FH	FIRE HYDRANT
℄	FLOW LINE
FM	FORCE MAIN
FT	FEET
GPS	GLOBAL POSITIONING SYSTEM
GV	GATE VALVE
GV&B	GATE VALVE AND BOX
HCFCD	HARRIS COUNTY FLOOD CONTROL DISTRICT
HDPE	HIGH-DENSITY POLYETHYLENE
HGL	HYDRAULIC GRADE LINE
HP	HIGH PRESSURE
INV EL	INVERT ELEVATION
IP	INTERMEDIATE PRESSURE
IR	IRON ROD

ABBREVIATIONS:

J-BOX	JUNCTION BOX
JT	JOINT
JUNCT	JUNCTION
LF	LINEAR FEET
LN	LANE
LPT	LOW POINT
LT	LEFT
LS	LIFT STATION
MAX	MAXIMUM
METRO	METROPOLITAN TRANSIT AUTHORITY
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
N	NORTH
NA	NOT APPLICABLE
NAVD	NORTH AMERICAN VERTICAL DATUM
NG	NATURAL GROUND
NO	NUMBER
NTS	NOT TO SCALE
OCC	ZERO CURB CUT
OS	OFFSET
OH	OVERHEAD
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVATURE
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PERM	PERMANENT
PGL	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PNT	POINT
PPCA	POTENTIALLY PETROLEUM CONTAMINATED AREA
PRC	POINT OF REVERSE
PROP	PROPOSED
PSI	POUND PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE PIPE / POINT OF VERTICAL CURVATURE
PVMT	PAVEMENT
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY

ABBREVIATIONS:

Ⓡ	RECORD DRAWING
R	RADIUS
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REINF	REINFORCED
REM	REMOVABLE
RJ	RESTRAINED JOINT
ROW	RIGHT OF WAY
RR	RAILROAD
RRPM	REFLECTIVE REMOVABLE PAVEMENT MARKERS
RT	RIGHT
S	SOUTH
SAN	SANITARY
SCHED	SCHEDULE
SF	SQUARE FEET
SHT	SHEET
SSE	SANITARY SEWER EASEMENT
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STM	STORM
SWBT	SOUTHWESTERN BELL TELEPHONE
SWR	SEWER
SY	SQUARE YARD
TAN	TANGENT
TBM	TEMPORARY BENCHMARK
TEMP	TEMPORARY
TOB	TOP OF BANK
TOC	TOP OF CURB
TOP	TOP OF PAVEMENT
TOS	TOP OF STACK
TS&V	TAPPING SLEEVE AND VALVE
TXDOT	TEXAS DEPARTMENT OF TRANSPORTATION
TYP	TYPICAL
UE	UTILITY EASEMENT
UGND	UNDERGROUND
VC	VERTICAL CURVE
VPI	VERTICAL POINT OF INTERSECTION
W	WEST
W/	WITH
WL	WATER LINE
WLE	WATER LINE EASEMENT
WM	WATER METER
WP	WOOD POLE
WSEL	WATER SURFACE ELEVATION
WV	WATER VALVE
WWTP	WASTE WATER TREATMENT PLANT

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

ABBREVIATIONS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
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SHAN HANG LEI, P.E.	
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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
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- 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 TELCOMM 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
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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
- 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

MISC STANDARD ELEMENTS

- COH NORTH ARROW
- COH BAR SCALE
- REVISION CLOUD/DELTA
- DETAIL/SECTION TITLE
- SECTION CALLOUT
- DETAIL CALLOUT

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

SYMBOLS

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S–000701–0038–3	
DRAWING SCALE	
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CITY OF HOUSTON PM	
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SHEET NO. 6 OF 204	

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PRIVATE UTILITY NOTES:

AT&T TEXAS/ SWBT FACILITIES:

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY 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 ROOSEVELT LEE JR. AT (713) 567-4552 OR EMAIL HIM AT RL7259@ATT.COM, IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

CENTERPOINT ENERGY NOTES:

CAUTION: UNDERGROUND GAS FACILITIES

1. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.
   - -WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL 713-945-8036 OR 713-945-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
   - -WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
   - -WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
   - -FOR EMERGENCIES REGARDING GAS LINES CALL 713-659-3552 OR 713-207-4200
2. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRICAL LINES:

1. 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 & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:
   - -ANY ACTIVITY WHERE PERSONS 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.
2. 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

1. NO APPROVAL TO USE, CROSS, OR OCCUPY NO 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 UTILITIES:

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.

1. 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.
2. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES WHEN AND WHERE THEY FALL IN THE PATH OF CONSTRUCTION.
3. THE CONTRACTOR IS ALSO RESPONSIBLE FOR CONTRACTING 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.
4. 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.
5. ALL PROPOSED FACILITIES SHALL MAINTAIN 12" CLEAR FROM ALL EXISTING UTILITIES.

FLOOD PLAIN NOTE:

ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S PRELIMINARY FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 48201C0905N AND 48201C0885N, REVISED MAY 2, 2019. THE PROJECT LIMITS ALONG CLINTON DR FROM MASCOT ST TO HOLLAND AVE, FROM APPROX. 600' TO 1,200' EAST OF CROWN AVE, AND ALONG MAYO SHELL RD, LIES WITHIN THE UNSHADED ZONE 'X', WHICH IS DETERMINED TO BE OUTSIDE THE 500-YR FLOOD ZONE. THE PROJECT LIMITS ALONG CLINTON DR FROM HOLLAND AVE UP TO APPROX. 50' EAST OF GALENA AVE, FROM 500' TO APPROX. 700' EAST OF CROWN AVE, AND FROM 1,270' TO 4,200' EAST OF CROWN AVE, LIES WITHIN THE SHADED ZONE 'X', WHICH IS DETERMINED TO BE WITHIN THE 500-YR FLOOD OR AREAS WITHIN THE 100-YR FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE. THE PROJECT LIMITS ALONG CLINTON DR FROM APPROX. 160' TO 230' EAST OF CROWN AVE, LIES WITHIN THE REGULATORY FLOODWAY. THE PROJECT LIMITS ALONG CLINTON DR FROM GALENA AVE TO APPROX. 150' EAST OF CROWN AVE, FROM APPROX. 230' TO 510' EAST OF CROWN AVE, AND FROM APPROX. 4,200' TO 5,300' EAST OF CROWN AVE, LIES WITHIN THE ZONE 'AE', WHICH IS DETERMINED TO BE INSIDE THE 100-YR FLOOD, WHOSE BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED.

GENERAL NOTES – METRO:

1. CONTRACTOR SHALL NOTIFY METRO AT 713-615-6195 TWO WEEKS PRIOR TO DISTURBING EXISTING BUS STOPS.
1. CONTRACTOR SHALL COORDINATE WITH METRO TO REMOVE EXISTING AMENITIES.
2. BUS STOPS SHALL CONSTRUCTED PER CITY OF HOUSTON INFRASTRUCTURE DESIGN MANUAL AND MEET CURRENT ADA REQUIREMENTS

STREET AND BRIDGE NOTES:

1. FILL AREAS ON PLANS SHALL BE FILLED IN LAYERS NOT EXCEEDING 8" 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.
2. UTILITY CONTRACTOR SHALL PROVIDE TEMPORARY SILT BARRIER FENCE ON ALL NON-CURBED INLETS WHICH WILL REMAIN IN PLACE AFTER UNDERGROUND CONTRACT IS COMPLETE.
3. CONTRACTOR SHALL PROVIDE SILT BARRIER FENCE ON ALL STAGE 1 CURB INLETS.
4. 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.
5. 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.
6. 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.
7. WHEELCHAIR 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.
8. 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.
9. 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.

GENERAL NOTES-INSIDE CITY LIMITS:

1. UNLESS OTHERWISE NOTED AND APPROVED ON DRAWINGS, CONSTRUCT CIVIL INFRASTRUCTURE IN ACCORDANCE WITH THE EFFECTIVE EDITION OF THE HOUSTON PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS, STANDARD CONSTRUCTION DETAILS, AND SUPPLEMENTS, ADDENDA AND AMENDMENTS THERETO. THE LATEST EDITION OF THE ABOVE PUBLICATIONS CAN BE FOUND AT: HTTP://WWW.HOUSTONPERMITTINGCENTER.ORG/OFFICE-CITY-ENGINEER/DESIGN-AND-CONSTRUCTION-STANDARDS.
2. THE DESIGN MUST BE CONSISTENT WITH THE EFFECTIVE EDITION OF HOUSTON PUBLIC WORKS INFRASTRUCTURE DESIGN MANUAL AND TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY) REQUIREMENTS.
3. 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 [GEOTECHNICAL ENGINEERING FIRM] REPORT NO. [NO. OF REPORT], DATED [DATE OF REPORT].
4. 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.
5. 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 EFFECTIVE EDITION OF HOUSTON PUBLIC WORKS, STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, STREET PAVING, AND TRAFFIC AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, STREET PAVING, AND TRAFFIC, REFERENCED ABOVE AND SUPPLEMENTS, ADDENDA AND AMENDMENTS THERETO, AT NO ADDITIONAL COST TO THE CITY OF HOUSTON.
6. 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.
7. 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 AND TO THE SATISFACTION OF THE OWNING AUTHORITY.
8. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
9. CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
10. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD AS-BUILT CONDITIONS DURING CONSTRUCTION. THESE AS-BUILT 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.

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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

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

GENERAL CONSTRUCTION NOTES (SHEET 1 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
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SHEET NO. 7 OF 204	

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STANDARD NOTES FOR CONSTRUCTION DRAWINGS (HCFCD):

1. OBTAIN AND COMPLY WITH ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL PERMITS AND APPROVALS, WITH ASSISTANCE FROM ENGINEER, IF NECESSARY. OBTAIN PERMIT (CERTIFICATION) FROM HARRIS COUNTY ENGINEER TO ENTER HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT–OF–WAY.

2. NOTIFY THE HARRIS COUNTY FLOOD CONTROL DISTRICT'S PROPERTY MANAGEMENT DEPARTMENT IN WRITING AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. SUBMIT THE HCFCD 48 HOUR PRE–CONSTRUCTION NOTIFICATION FORM, A COPY OF THE APPROVED CONSTRUCTION DRAWINGS, AND A COPY OF THE CORPS OF ENGINEERS INDIVIDUAL SECTION 404 PERMIT, IF APPLICABLE, TO HCFCD, 9900 NORTHWEST FREEWAY, HOUSTON, TEXAS 77092, ATTN: PROPERTY MANAGEMENT DEPT. BY HAND DELIVERY, OR FAX TO 713–684–4129 (FAX NUMBER).

3. ENGINEER SHALL SUBMIT CERTIFICATION LETTER AND RECORD DRAWINGS TO THE HARRIS COUNTY FLOOD CONTROL DISTRICT'S PROPERTY MANAGEMENT DEPARTMENT REQUESTING INSPECTION OF ITEMS CONSTRUCTED IN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT–OF–WAY. PRIOR TO REQUESTING INSPECTION, THE DRAINAGE RIGHT–OF–WAY AND/OR EASEMENTS SHALL BE STAKED AND FLAGGED.

4. PROTECT, MAINTAIN, AND RESTORE EXISTING BACKSLOPE DRAINAGE SYSTEMS.

5. BACKSLOPE SWALE AND INTERCEPTOR STRUCTURE ELEVATIONS AND LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. FINAL ELEVATIONS AND LOCATIONS SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.

6. ESTABLISH TURF GRASS ON ALL DISTURBED AREAS WITHIN THE CHANNEL OR DETENTION RIGHT–OF–WAY, EXCEPT THE CHANNEL BOTTOM AND WHERE STRUCTURAL EROSION MEASURES ARE USED. MINIMUM ACCEPTANCE CRITERIA ARE 75% COVERAGE OF LIVE BERMUDA GRASS AND NO EROSION OR RILLS DEEPER THAN 4".

7. BACKFILL IN ACCORDANCE WITH THE HARRIS COUNTY FLOOD CONTROL DISTRICT STANDARD SPECIFICATION, SECTION 02315 – EXCAVATING AND BACKFILLING, OR EQUIVALENT.

8. EXCAVATE CHANNEL FLOWLINE TO DESIGN ELEVATION AS SHOWN ON PLANS AND DOWNSTREAM, AS NECESSARY, TO ENSURE NO WATER REMAINS IN THE FACILITY (STORM SEWER, LATERAL CHANNEL, OR DRY BOTTOM DETENTION BASIN) DURING NORMAL WATER SURFACE CONDITIONS IN THE CHANNEL, SO THE FACILITY WILL FUNCTION AS INTENDED. FOR WET BOTTOM DETENTION BASINS, ENSURE NO WATER IS ABOVE THE DESIGN LEVEL IN THE WET BOTTOM DURING NORMAL WATER SURFACE CONDITIONS IN THE CHANNEL.

9. MAINTAIN FLOW IN CHANNEL DURING CONSTRUCTION AND RESTORE CHANNEL TO ORIGINAL CONDITION.

10. REMOVE ALL EXCAVATED MATERIAL FROM THE HARRIS COUNTY FLOOD CONTROL DISTRICT OR DRAINAGE RIGHT–OF–WAY. NO FILL IS TO BE PLACED WITHIN A DESIGNATED FLOOD PLAIN AREA WITHOUT FIRST OBTAINING A FILL PERMIT FROM THE APPROPRIATE JURISDICTIONAL AUTHORITY.

GENERAL NOTES – HARRIS COUNTY:

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.

2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.

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

5. PRIOR TO CONSTRUCTION, THE CONTRACTOR, ALONG WITH CONCURRENCE FROM THE FIELD ENGINEER, SHALL DETERMINE HIS/HER LAY–DOWN AND/OR STAGING AREA LOCATIONS.

6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.

7. TRAFFIC INGRESS AND EGRESS FOR DRIVEWAYS AND PEDESTRIAN ACCESS FACILITIES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

8. THE CONTRACTOR SHALL REMOVE ANY FENCES, POSTS, MAILBOXES, PLANTERS, PERMANENT TRASH CONTAINERS, CULVERTS, ETC. OR SECTIONS THEREOF, THAT ENCROACH WITHIN THE COUNTY'S RIGHT–OF–WAY. NOTE: PRIOR TO CONSTRUCTION, THE PROPERTY OWNER WAS PAID TO RELOCATE OR REPLACE THESE ITEMS OUTSIDE OF THE COUNTY'S RIGHT–OF–WAY. IF THE OWNER HAS FAILED TO DO SO, THE CONTRACTOR WILL REPLACE THEM WITH THE MINIMUM LEVEL OF QUALITY NEEDED TO SECURE THE PROPERTY AND/OR MAINTAIN MAIL DELIVERY. IN THAT CASE, PAYMENT FOR THESE INSTALLATIONS WILL BE INCLUDED AS EXTRA WORK ITEMS OR AS OVERRUNS TO EXISTING PAY ITEMS.

   ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS LOCATED OUTSIDE OF THE COUNTY'S RIGHT–OF–WAY, SHALL BE REPLACED WITH LIKE–KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   ALSO, IF THESE ITEMS ARE LOCATED WITHIN THE PROJECT RIGHT–OF–WAY AND ARE DESIGNATED TO REMAIN, ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS, SHALL BE REPLACED WITH LIKE–KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   TREES, BUSHES, SHRUBBERY AND OTHER DAMAGED PLANTINGS DESIGNATED TO REMAIN SHALL BE REPLACED WITHIN 72 HOURS OF REMOVAL AND ARE TO BE THOROUGHLY WATERED–IN. NO SEPARATE PAY.

9. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY TRACKED EQUIPMENT.

10. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PROFESSIONAL LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.

11. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR. TWO COPIES OF STAKING NOTES TO BE PROVIDED TO THE ENGINEER PRIOR TO CONSTRUCTION.

12. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.

13. THE CONTRACTOR SHALL MAINTAIN UPDATED RED–LINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.

14. MOWING, MAINTENANCE, AND CLEAN–UP OF THE PROJECT SHALL MEET THE REQUIREMENT OF STANDARD SPECIFICATION ITEM 560 (NO SEPARATE PAY). MOWING, MAINTENANCE, AND CLEAN–UP IS REQUIRED FOR THE PROJECT LIMITS AND DURATION, REGARDLESS OF THE CONTRACTOR'S SCOPE OF ACTIVITIES WITHIN THE PROJECT LIMITS.

15. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.

16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON–SITE OR AT A SECURED OFF–SITE LOCATION AT NO ADDITIONAL EXPENSE TO HARRIS COUNTY. ANY SUITABLE EXCAVATED MATERIAL ON THE PROJECT WHICH IS AVAILABLE AT THE TIME OF NEED; WHETHER FROM STORM SEWER, ROADWAY, AND/OR CHANNEL EXCAVATION, SHALL BE USED BEFORE BORROW IS BROUGHT ON–SITE.

17. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRECAST OR CAST–IN–PLACE.

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PHONE: 713–975–8769
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TX SURVEY FIRM NO.: 10075600

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

GENERAL CONSTRUCTION NOTES (SHEET 2 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
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SHEET NO. 8 OF 204	

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PIPELINE COORDINATION NOTES:

UNLESS OTHERWISE NOTED, CONTRACTOR TO CONTACT AUTHORIZED PIPELINE REPRESENTATIVES WITHIN 72 HOURS OF CONSTRUCTION ACTIVITIES WITHIN 50 FEET OF PIPELINE CROSSING.

EXXON MOBIL NOTES:

GENERAL RESTRICTIONS & REQUIREMENTS

1. IN ACCORDANCE WITH LAW, CONSTRUCTORS MUST CONTACT THE APPROPRIATE ONE CALL SYSTEM(S) PRIOR TO WORK AND COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS
2. NO WORK MAY COMMENCE IN OR AROUND EMPCO'S RIGHT OF WAY UNTIL AN EMPCO REPRESENTATIVE HAS AUTHORIZED IT TO BEGIN. NOTICE OF DESIRED WORK START DATE SHOULD BE GIVEN TO EMPCO A MINIMUM OF 72 HOURS IN ADVANCE.
3. A THIRD PARTY EXCAVATION SAFE WORK CHECKLIST SHOULD BE SIGNED EACH DAY PRIOR TO BEGINNING WORK ON EMPCO'S RIGHT OF WAY.
4. EMPCO'S RIGHT OF WAY SHOULD NOT BE USED AS TEMPORARY WORKSPACE (WHICH INCLUDES ITS USE FOR THE STAGING, STORAGE OR LAYDOWN OF EQUIPMENT, MATERIALS OR SPOIL) WITHOUT PRIOR WRITTEN APPROVAL FROM EMPCO.
5. ANY CROSSINGS OF EMPCO'S PIPELINES WITH VEHICLES OR HEAVY EQUIPMENT MUST BE PRE-APPROVED BY EMPCO AND MAY REQUIRE RAMPING, MATTING OR AIR BRIDGING AT REQUESTOR'S EXPENSE. AN EMPCO INSPECTOR SHOULD BE PRESENT WHEN TEMPORARY MATERIALS ARE INSTALLED AND REMOVED ON EMPCO RIGHT OF WAY.
6. THE CONSTRUCTOR SHALL ASSUME FULL LIABILITY FOR ANY DAMAGES TO EMPCO FACILITIES DUE TO CONSTRUCTION/EXCAVATION ACTIVITIES. BE ADVISED THAT EMPCO PIPELINES ARE CATHODICALLY PROTECTED AND MAY HAVE AN EFFECT ON UTILITY LINES THAT ARE MADE OF ELECTRICALLY CONDUCTIVE MATERIAL.

PIPELINE & UTILITY CROSSINGS

7. PERMANENT ABOVE GROUND MARKERS IDENTIFYING THE CROSSING PIPELINE OR UTILITY SHALL BE INSTALLED AND MAINTAINED AT THE LIMITS OF EMPCO'S RIGHT OF WAY AND/OR AT THE CROSSING.
8. IF IT IS IMPRACTICAL TO INSTALL AND MAINTAIN ABOVEGROUND MARKERS DUE TO THE CROSSING LOCATION, PLASTIC MARKER TAPE SHALL BE INSTALLED BELOW CULTIVATION LEVEL AND OVER EMPCO'S PIPELINE, EXTENDING THE WIDTH OF THE RIGHT OF WAY.

EQUISTAR PIPELINE NOTES:

1. CONTRACTORS SHALL ADHERE TO THE ATTACHED GENERAL CONSTRUCTION GUIDELINES WHILE WORKING IN THE AREA OF EQUISTAR'S PIPELINES TO MAINTAIN PIPELINE INTEGRITY AND SAFETY.
2. ANY SIGNIFICANT CHANGES TO THE CONSTRUCTION PLAN, INCLUDING BUT NOT LIMITED TO CLEARANCES OR EXCAVATION METHODS, MUST BE REEVALUATED AND APPROVED BY THE EQUISTAR DAMAGE PREVENTION SUPERVISOR.
3. THE STATED MINIMUM CLEARANCE OF 4' IS MAINTAINED FROM THE EQUISTAR PIPELINE.
4. NO DIRECTIONAL DRILLING MAY BE PERFORMED WITHIN 10' OF EQUISTAR'S PIPELINE WITHOUT VISUAL VERIFICATION.
5. NO DIRECTIONAL DRILLING MAY BE PERFORMED WITHIN 4' OF EQUISTAR'S PIPELINE.
6. OUR TECHNICIAN IS ON SITE DURING ANY EXCAVATIONS RELATED TO THE INSTALLATION.

Owner/Operator	Name	Job Title	Office Number	Cell Number	Email Address	Mail Address
Easton Energy Pipeline	Robert Harden		817-988-5614	830-719-0781	robert@refinedland.com	15375 Memorial Drive Suite 850, Houston, TX 77079
Energy Transfer Houston Pipeline Company	Calvin R. Dodd		713-989-2832	713-898-1812	calvin.dodd@energytransfer.com	1300 Main Street Houston, TX 77002
Enterprise Pipeline	Michele Rodriguez	Land-Encroachments			marodriguez@eprod.com	1100 Louisiana St. Houston, TX 77002
Equistar Pipeline Operations	Stacy Jamison		281-387-3850		stacy.jamison@LYB.com	16055 Space Center Blvd, Ste. 350, Houston, TX 77062
Explorer Pipeline	Thomas Martinez		918-493-5153	918-592-8476	tmartinez@expl.com	PO Box 2650 Tulsa, OK 74101
Kinder Morgan	Kinder Morgan		205-325-7287	205-306-3358	KMEncroachmentsGulf @kindermorngan.com	569 Brookwood Village, Suite 749 Birmingham, AL 35209
Magellan Pipeline	Mario Moreno	Damage Prevention Operator	281-615-5085		mario.moreno@magellanlp.com	1313 W. Pasadena Freeway Pasadena, TX 77506
Phillips 66	Scott Robertson	Operation Engineer, Gulf Coast Region	832-857-4974	832-765-3566	scott.j.robertson@p66.com	2331 City West Blvd, Houston, TX, 77042
Shell Pipeline Company	Shell Pipeline		1-800-438-7752		SPLC-Encroachments@shell.com	150 N. Dairy Ashford WCK A0226 Hosuton, TX 77079
Targa Pipeline	Alan Mata	Pipeline Tech	936-776-8451		amata@targaresources.com	10119 TX-146, Mount Belvieu, TX 77580
Valero Pipeline	David L. Delgado	Sr. Staff Right of Way Analyst	210-345-5494	512-923-6809	david.delgado@valero.com	Valero energy Corporation-E2 107J One Valero Way, San Antonio, TX, 78249-1616

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PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
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CITY OF HOUSTON

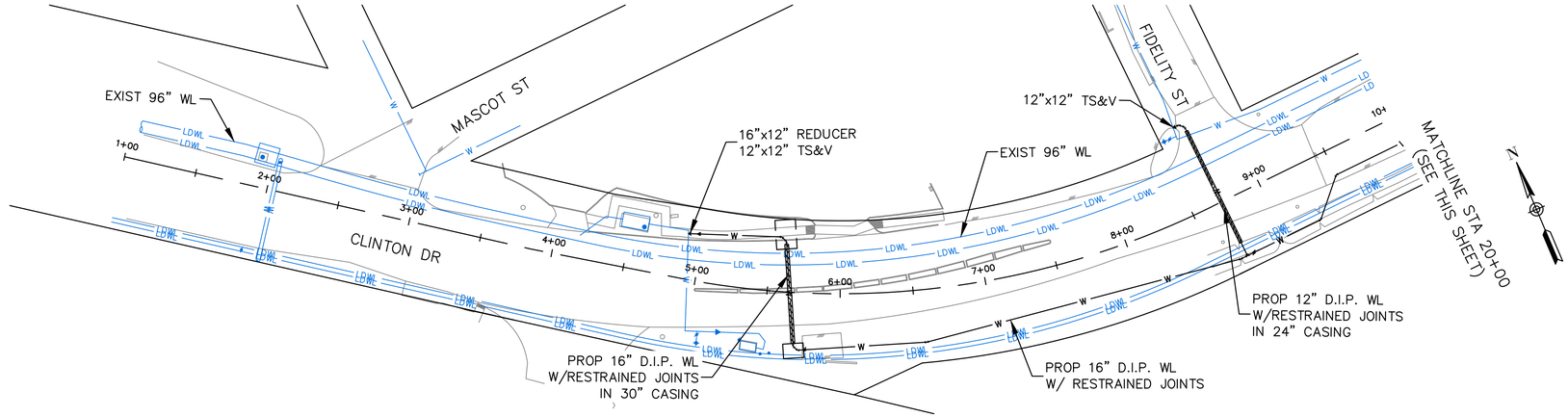
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

GENERAL CONSTRUCTION NOTES (SHEET 3 OF 3)

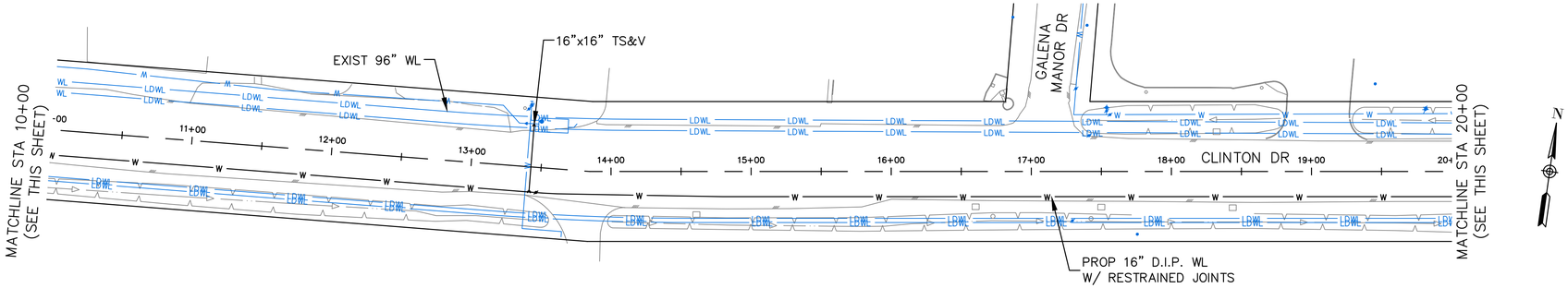
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DRAWING SCALE	
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CITY OF HOUSTON PM	
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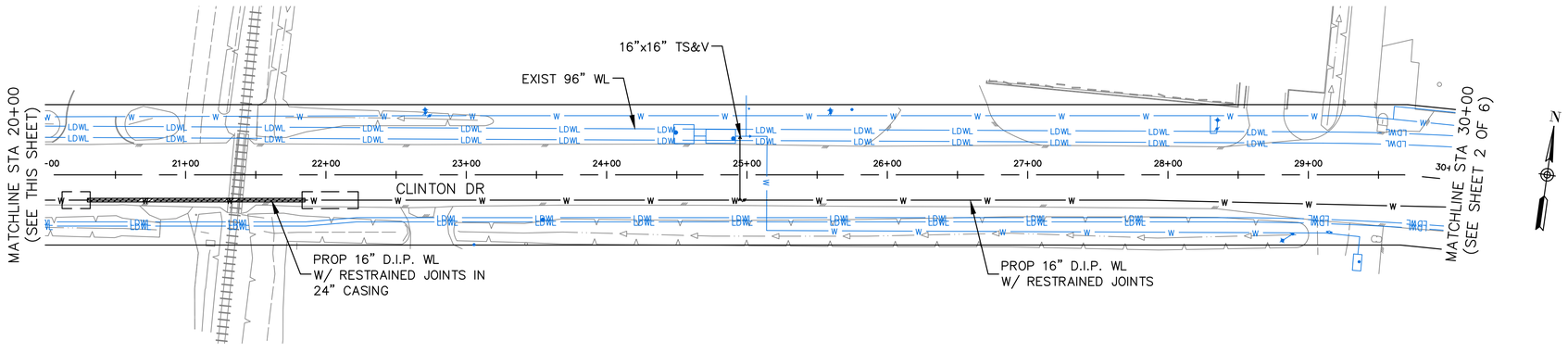
PLAN AND PROFILE SHEET 23 & 24
BEGIN TO STA 5+50

PLAN AND PROFILE SHEET 25 & 26
STA 5+50 TO STA 10+00



PLAN AND PROFILE SHEET 27 & 28
STA 10+00 TO STA 15+00

PLAN AND PROFILE SHEET 29 & 30
STA 15+00 TO STA 20+00



PLAN AND PROFILE SHEET 31 & 32
STA 20+00 TO STA 25+00

PLAN AND PROFILE SHEET 34 & 35
STA 25+00 TO STA 30+00

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

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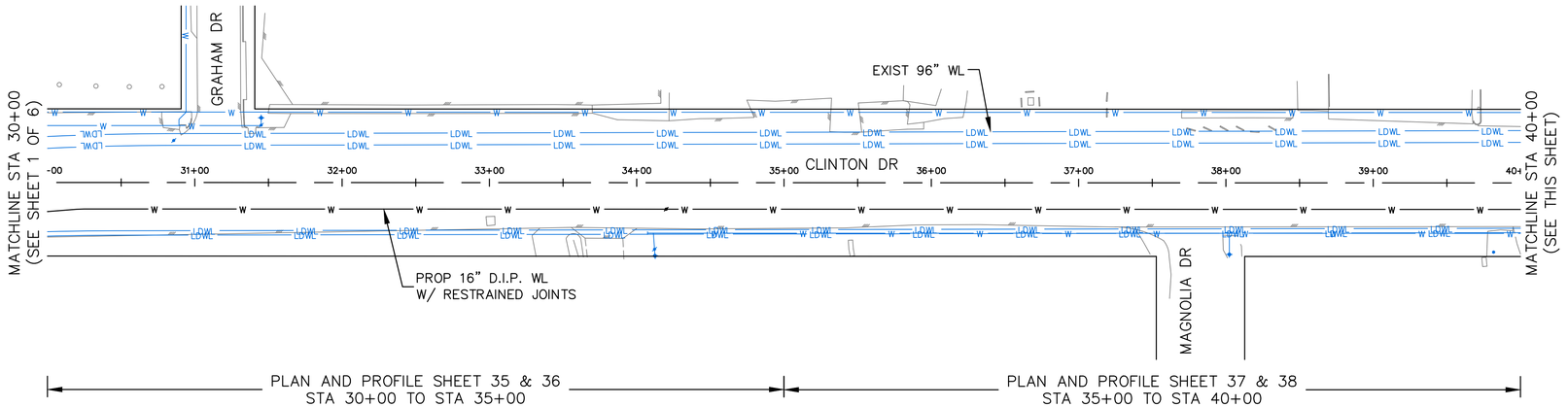
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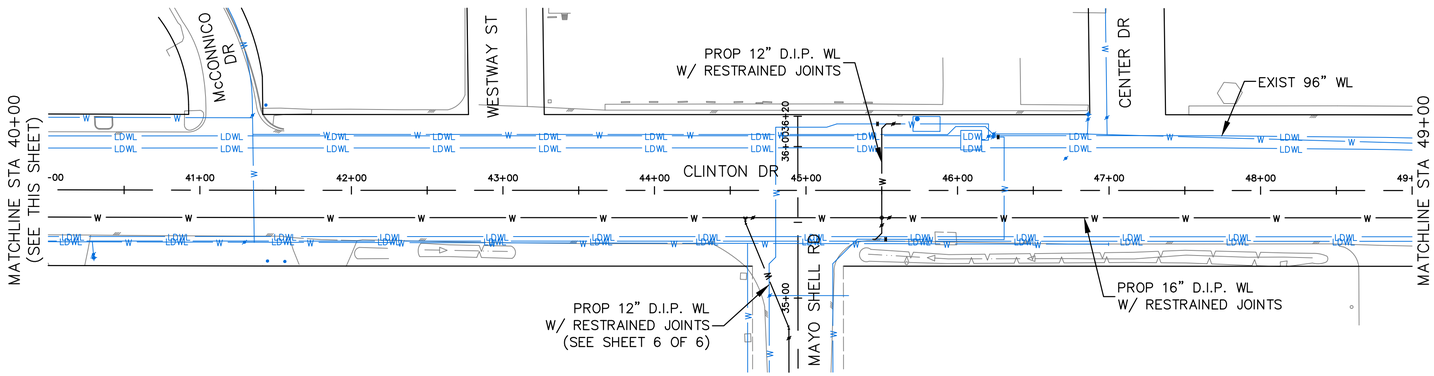
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

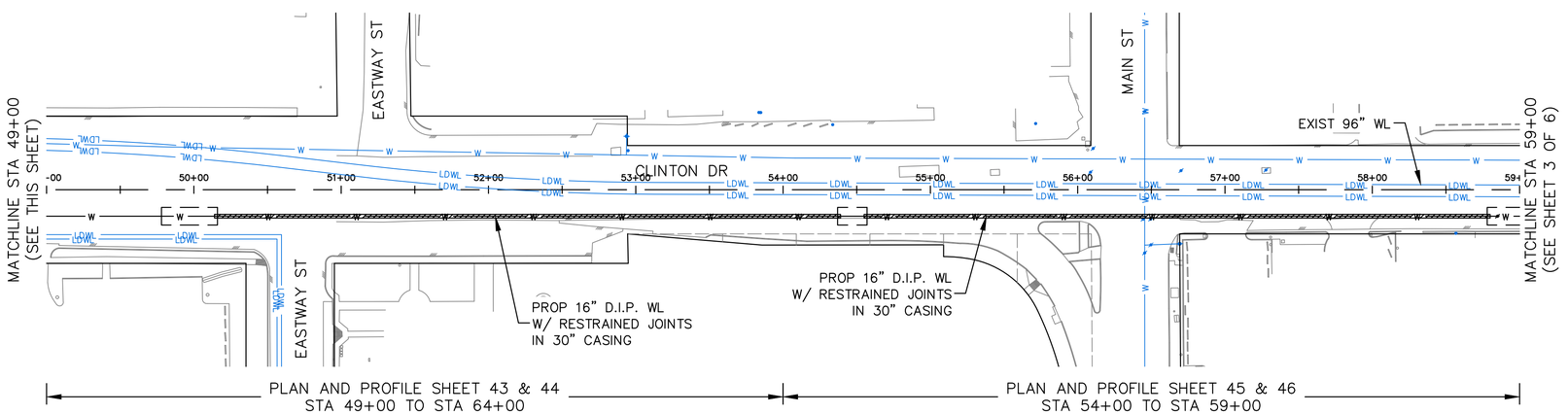
OVERALL LAYOUT
SHEET 1 OF 6

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0' 50' 100'
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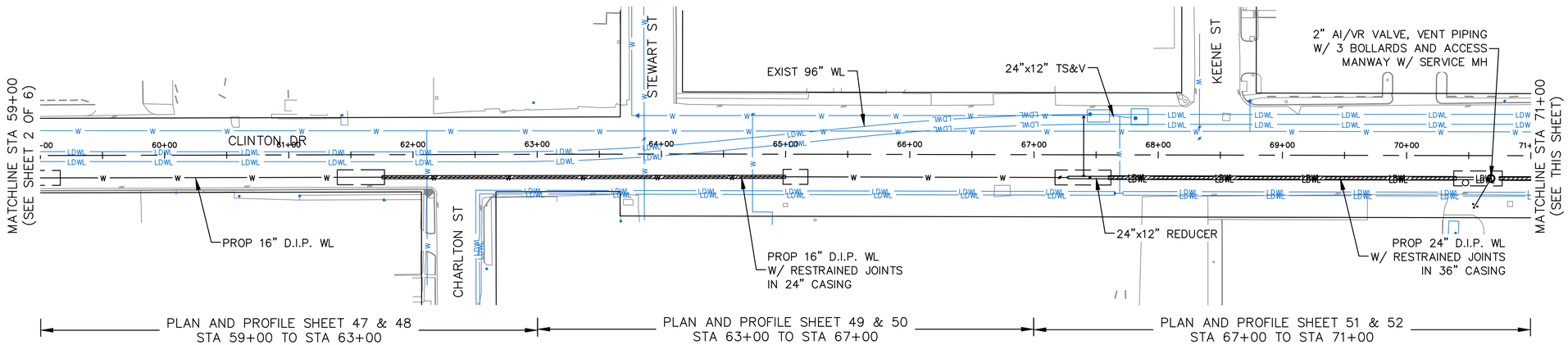
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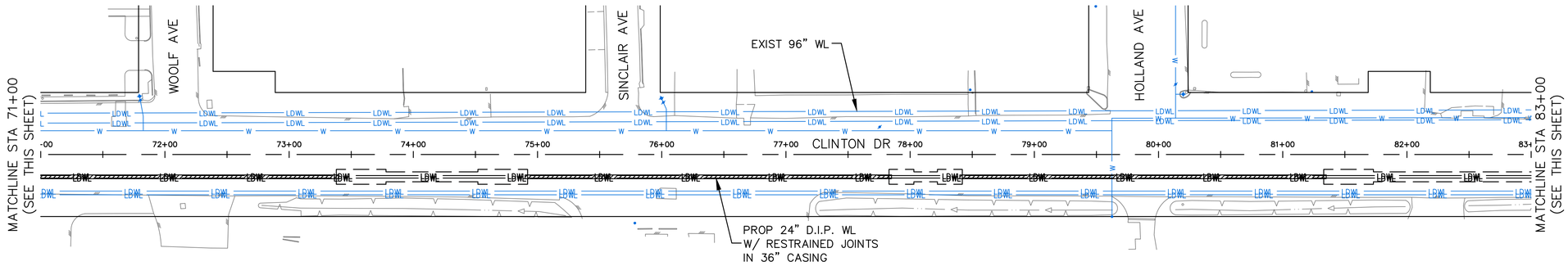
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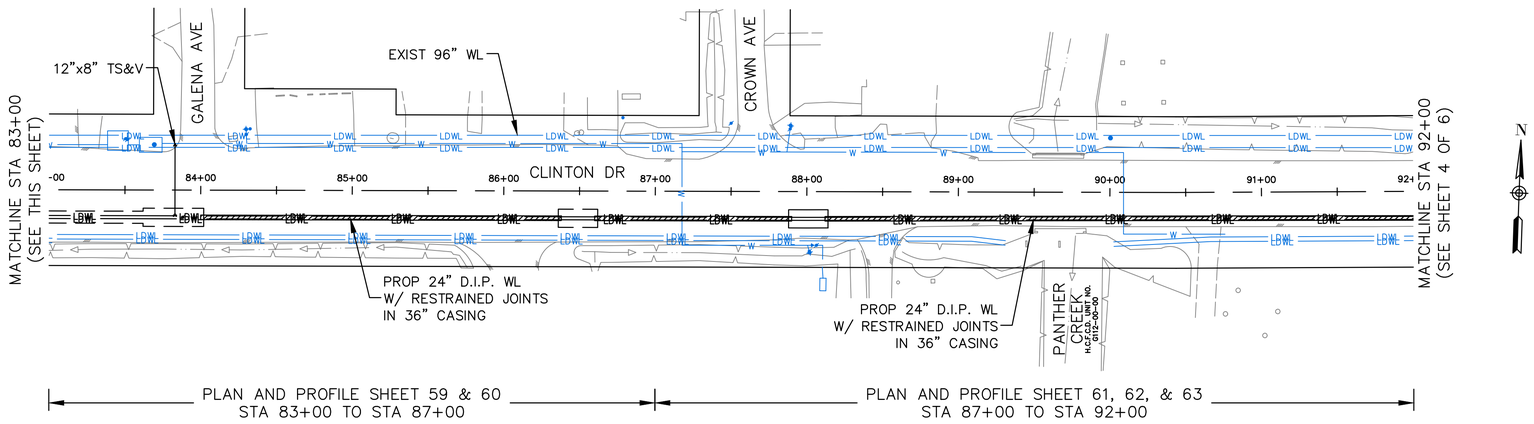
OVERALL LAYOUT
SHEET 2 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 11 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\0 - Overall Layout.dwg plotted on Aug 15, 2025 - 10:09pm







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

NO.	DATE	REVISION	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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

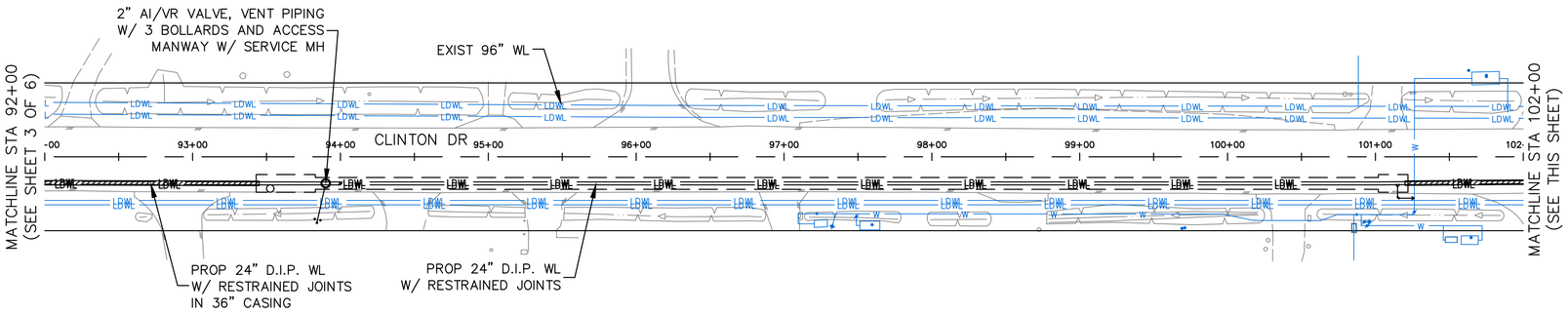
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

OVERALL LAYOUT
SHEET 3 OF 6

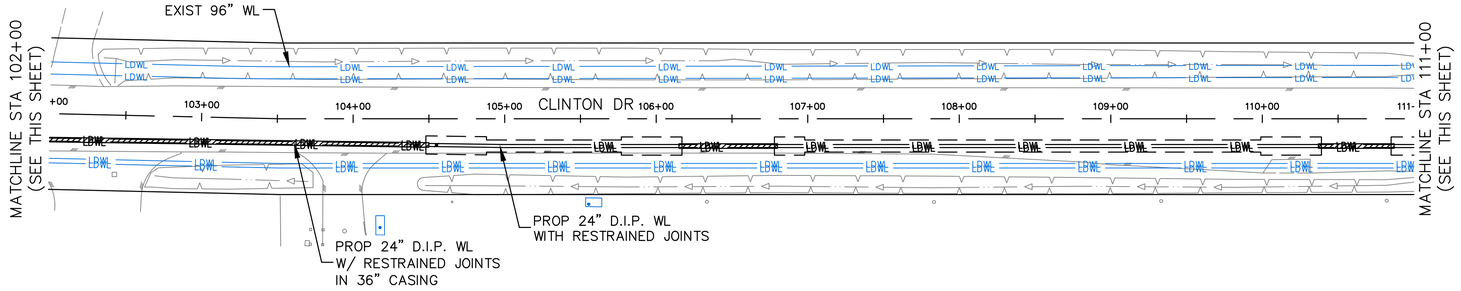
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S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 12 OF 204	

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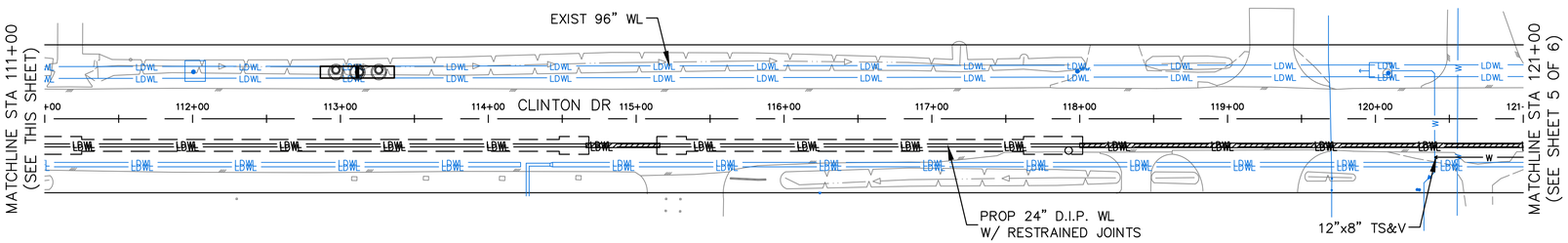
PLAN AND PROFILE SHEET 64, 65, & 66
STA 92+00 TO STA 97+00

PLAN AND PROFILE SHEET 67 & 68
STA 97+00 TO STA 102+00



PLAN AND PROFILE SHEET 69 & 70
STA 102+00 TO STA 107+00

PLAN AND PROFILE SHEET 71 & 72
STA 107+00 TO STA 111+00



PLAN AND PROFILE SHEET 73 & 74
STA 111+00 TO STA 116+00

PLAN AND PROFILE SHEET 75 & 76
STA 116+00 TO STA 121+00

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

NO.	DATE	REVISION	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

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TEXAS REG. NO.: 111684

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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

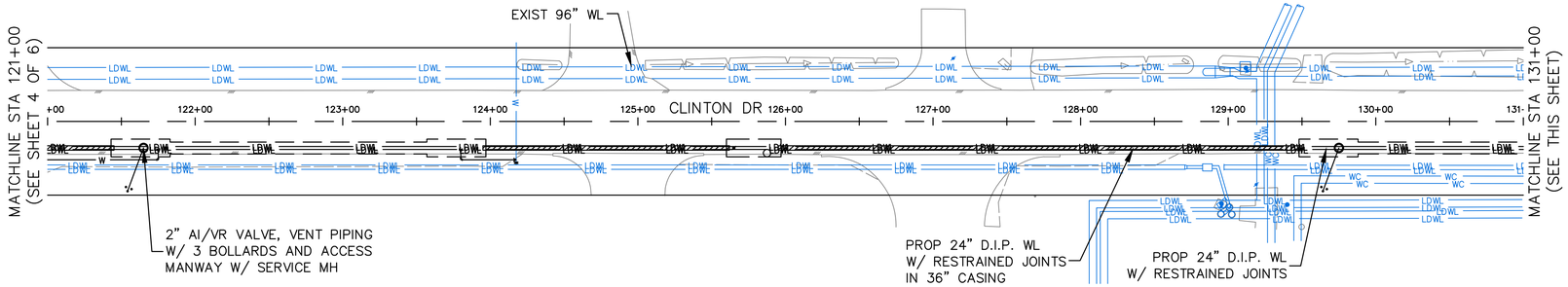
LARGE DIAMETER WATER LINE &
VALVE REPLACEMENT – PACKAGE 3

OVERALL LAYOUT
SHEET 4 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 13 OF 204	

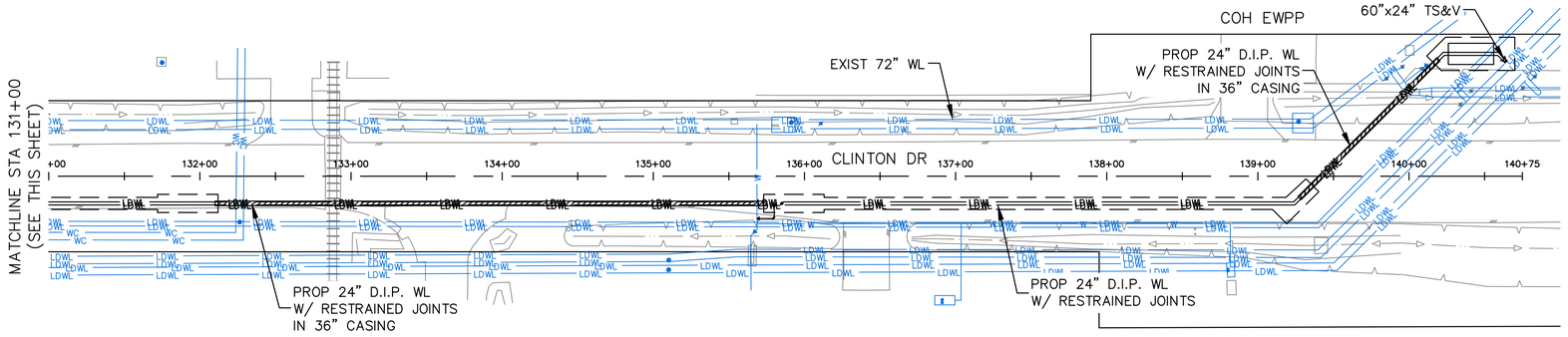
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HORIZ:1"=50'



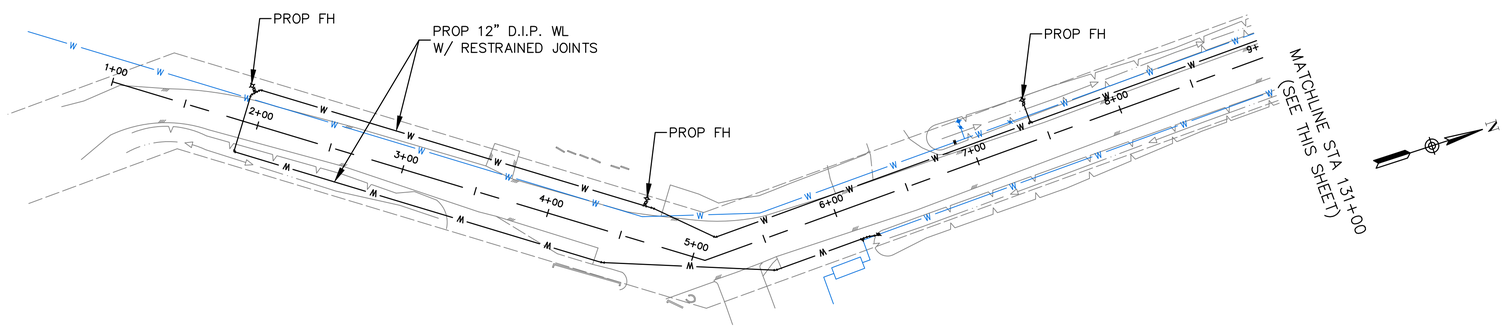
PLAN AND PROFILE SHEET 77 & 78
STA 121+00 TO STA 126+00

PLAN AND PROFILE SHEET 79 & 80
STA 126+00 TO STA 131+00



PLAN AND PROFILE SHEET 81 & 82
STA 131+00 TO STA 136+00

PLAN AND PROFILE SHEET 83 & 84
STA 136+00 TO END



PLAN AND PROFILE SHEET 85
BEGIN TO STA 5+00

PLAN AND PROFILE SHEET 86
STA 5+00 TO STA 9+00

NO.	DATE	REVISION	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

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

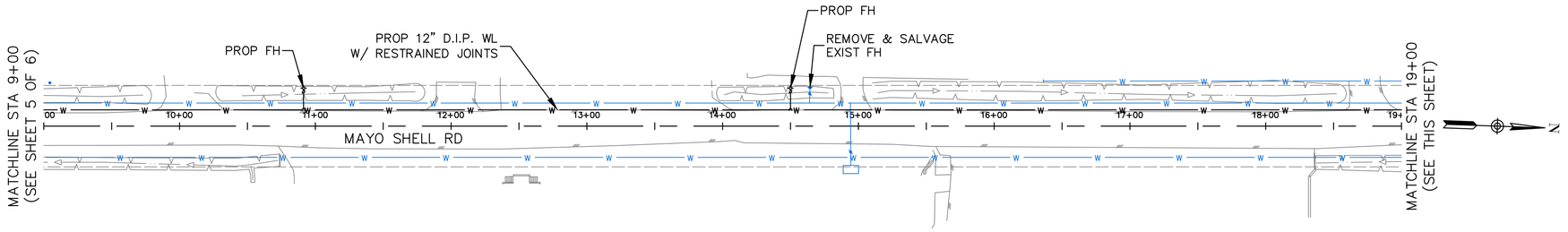
OVERALL LAYOUT
SHEET 5 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 14 OF 204	

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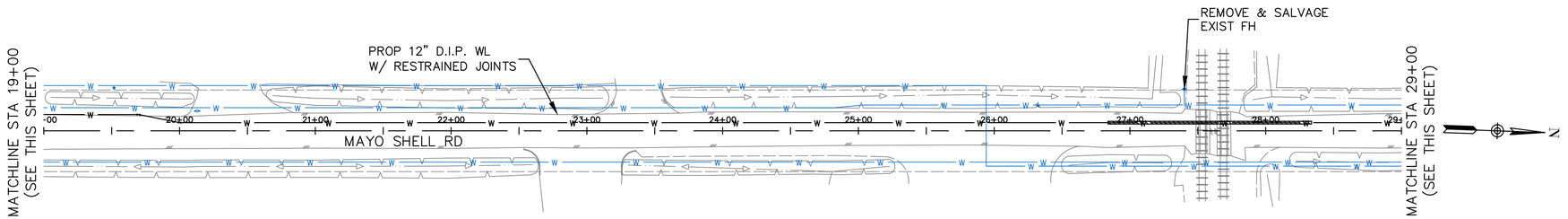
HORIZ:1"=50'

NO.	DATE	REVISION	APP.



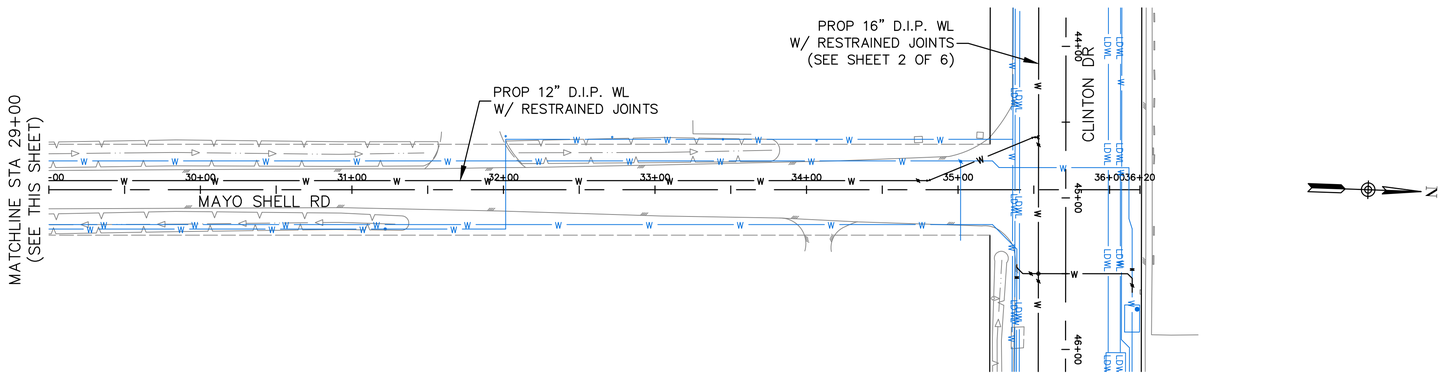
PLAN AND PROFILE SHEET 87
STA 9+00 TO STA 14+00

PLAN AND PROFILE SHEET 88
STA 14+00 TO STA 19+00



PLAN AND PROFILE SHEET 89
STA 19+00 TO STA 24+00

PLAN AND PROFILE SHEET 90
STA 24+00 TO STA 29+00



PLAN AND PROFILE SHEET 91
STA 29+00 TO STA 33+00

PLAN AND PROFILE SHEET 92
STA 33+00 TO END

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

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FB NO.

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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

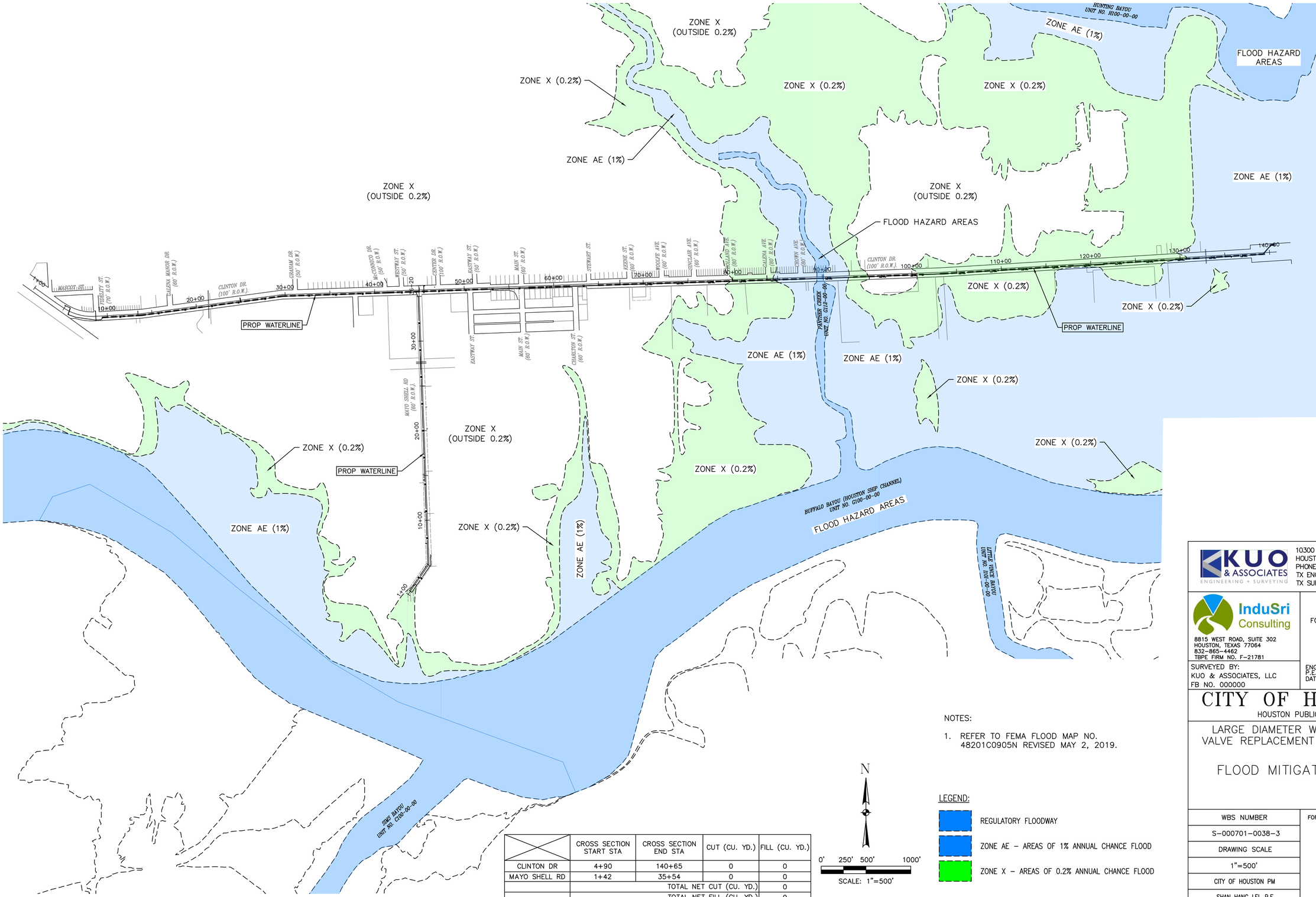
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

OVERALL LAYOUT
SHEET 6 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 15 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\9 - Overall Layout.dwg plotted on Aug 15, 2025 - 10:10pm



	CROSS SECTION START STA	CROSS SECTION END STA	CUT (CU. YD.)	FILL (CU. YD.)
CLINTON DR	4+90	140+65	0	0
MAYO SHELL RD	1+42	35+54	0	0
	TOTAL NET CUT (CU. YD.)			0
	TOTAL NET FILL (CU. YD.)			0

N

0' 250' 500' 1000'

SCALE: 1"=500'

NOTES:

1. REFER TO FEMA FLOOD MAP NO. 48201C0905N REVISED MAY 2, 2019.

LEGEND:

- REGULATORY FLOODWAY
- ZONE AE – AREAS OF 1% ANNUAL CHANCE FLOOD
- ZONE X – AREAS OF 0.2% ANNUAL CHANCE FLOOD

NO.	DATE	REVISION	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

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

FOR INTERIM REVIEW ONLY

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/13/2025

CITY OF HOUSTON

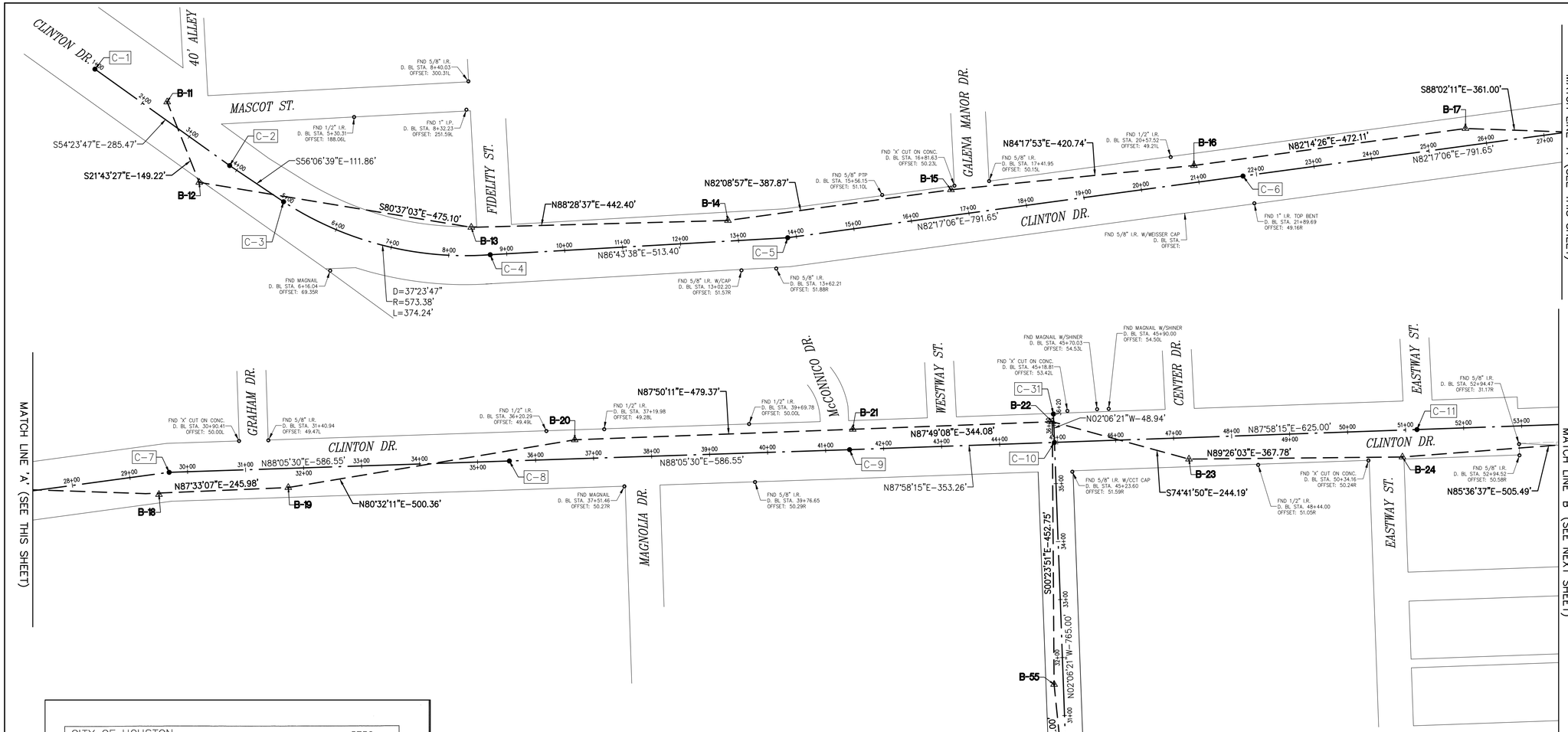
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

FLOOD MITIGATION PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=500'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 16 OF 204	

C:\Users\Votes\OneDrive - InduSri Consulting, LLC\5Projects\202208_Kuo_COH-LDWL & Valve Replacement\Production\DRAWINGS\Overall Flood Plain.dwg plotted on Aug 13, 2025 - 9:42am



NO.	DATE	REVISION	APP.

BENCHMARK:

CITY OF HOUSTON MONUMENT 5756–7710 IS AN BRASS DISK SET IN CONCRETE LOCATED ON THE NORTHSIDE OF THE BRIDGE ON CLINTON DR. APPROXIMATELY 175 EAST OF THE INTERSECTION OF CLINTON DR. AND CROWN ST.

ELEV. 11.58 FEET NAVD 1988, 2001 ADJUSTMENT (PROJECT DATUM)
ELEV. 11.57 FEET NAVD 1988, (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED JULY 14, 2025

VERTICAL DATUM ADJUSTMENT:

THE ELEVATION DIFFERENCE IN BETWEEN THE FLOODPLAIN REFERENCE MARK'S (RM 070475) PUBLISHED DATUM NAVD 1988, 2001 ADJUSTMENT AND DATUM NAVD 1988, (GEOID '18) IS 0.01'.

NAVD 1988, 2001 ADJ. ELEVATION
= NAVD 1988 (GEOID '18) ELEVATION – 0.01 FT

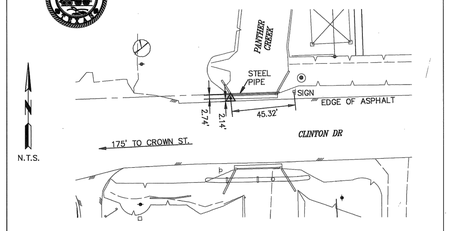
NOTE:

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

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 5756
SITE CONTROL MONUMENT 7710



Project WBS# S–000701–0038–3
Texas Coordinate System of 1983, South Central Zone, U. S. Survey Feet
X= 3,164,842.53
Y= 13,833,174.93
Lat.= 29° 43' 57.08" (N)
Lon.= 95° 13' 47.05" (W)
Reference Frame Used: NAD '83 (2011) (EPOCH: 2010)
Vertical Adjustment used: NAVD '88
General Location: ON THE NORTHSIDE OF THE BRIDGE OF CLINTON DR APPROX. 175FT EAST FROM THE INTERSECTION OF CLINTON DR AND CROWN ST.
Date Set: 11–05–2002 Type of Mark: BRASS DISK (HC FLOODPLAIN RM 070475)
Keymap Page: 496X
Orthometric Elevation =11.57 FEET
Ellipsoid Height= –77.88235 FEET
Geoid: GEOID '18
Datum Source & Adjustment: GPS–STATIC (OBSERVED ON 07–14–2025)

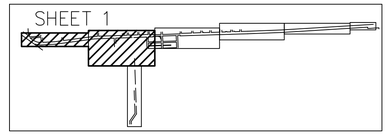
3 Nearest project control points (bearings and distances stated below):
1 N 49° 54' 10" W 23.05'
2 S 52° 47' 30" E 79.05'
3 S 71° 55' 50" E 188.69'

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

STATE OF TEXAS — REGISTERED — KUTUBUL A. M. MAINUDDIN — 6404 — LICENSED PROFESSIONAL LAND SURVEYOR

Date Revised: 07–14–2025
City of Houston, Harris County, Texas



PROJECT MAP

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.

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TEXAS REG. NO.: 6404
ON 08/15/2025 IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

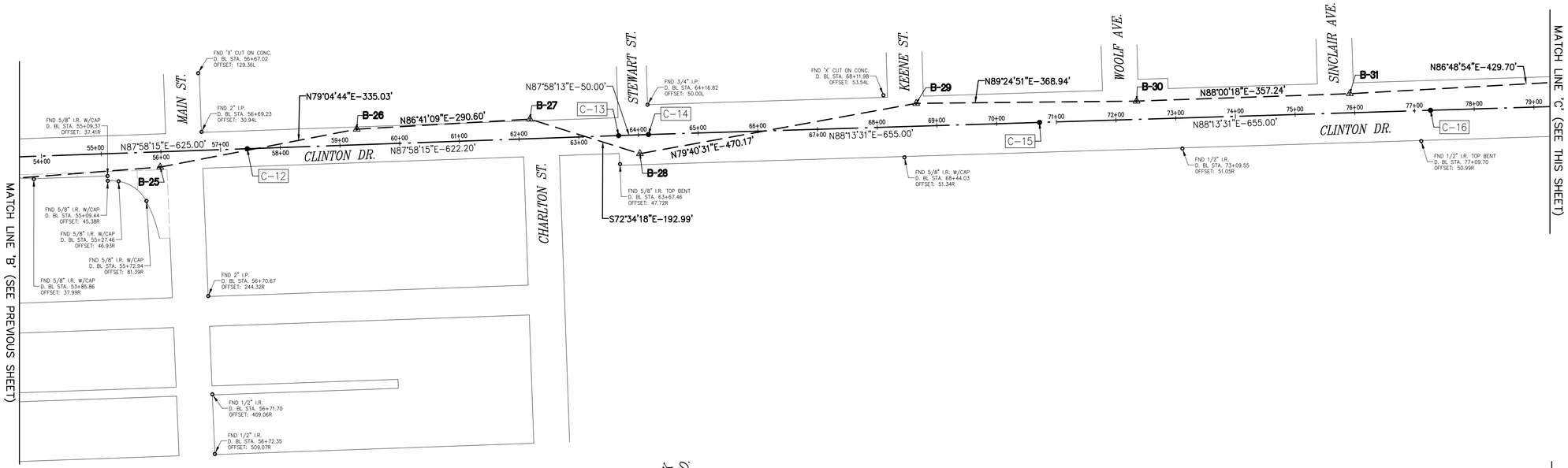
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

SURVEY CONTROL MAP (SHEET 1 OF 6)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
1"=100'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 17 OF 204	

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\SCM\SCM–23082.dwg plotted on Aug 15, 2025 – 5:16pm



APP.		
REVISION		
NO.	DATE	

SCALE: 1" = 100'

BENCHMARK:

CITY OF HOUSTON MONUMENT 5756-7710 IS AN BRASS DISK S CONCRETE LOCATED ON THE NORTHSIDE OF THE BRIDGE ON CL DR. APPROXIMATELY 175 EAST OF THE INTERSECTION OF CLINT DR. AND CROWN ST.

ELEV. 11.58 FEET NAVD 1988, 2001 ADJUSTMENT (PROJECT D
ELEV. 11.57 FEET NAVD 1988, (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFER TO THE CORS DATED JULY 14, 2025

VERTICAL DATUM ADJUSTMENT:

THE ELEVATION DIFFERENCE IN BETWEEN THE FLOODPLAIN REFERENCE MARK'S (RM 070475) PUBLISHED DATUM NAVD 1988, 2001 ADJUSTMENT AND DATUM NAVD 1988, (GEOID '18) IS 0.01'.

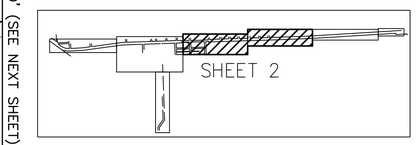
NAVD 1988, 2001 ADJ. ELEVATION
= NAVD 1988 (GEOID '18) ELEVATION – 0.01 FT

NOTE:

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

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



PROJECT MAP

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.

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TEXAS REG. NO.: 6404

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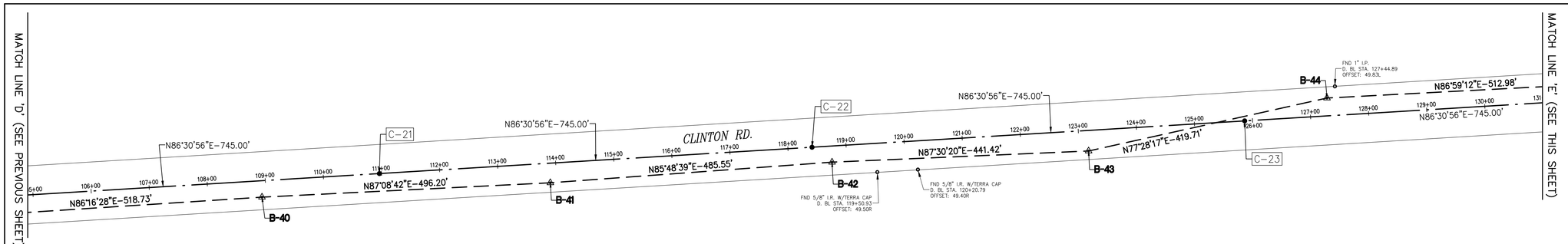
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

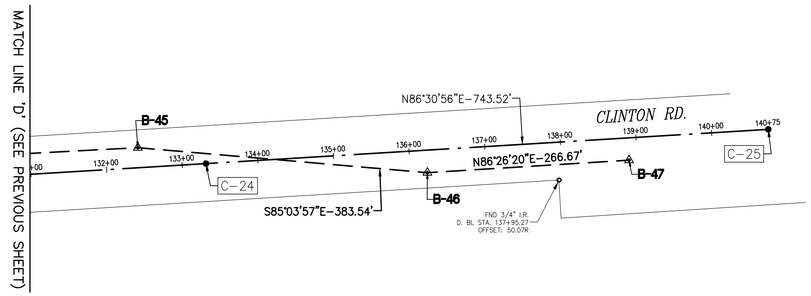
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

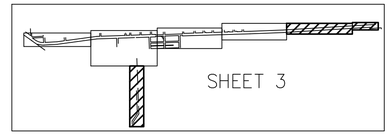
SURVEY CONTROL MAP
(SHEET 2 OF 6)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=100'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 18 OF 204	

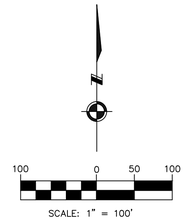
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PROJECT MAP



NO.	DATE	REVISION	APP.

BENCHMARK:

CITY OF HOUSTON MONUMENT 5756-7710 IS AN BRASS DISK S CONCRETE LOCATED ON THE NORTHSIDE OF THE BRIDGE ON CL DR. APPROXIMATELY 175 EAST OF THE INTERSECTION OF CLINT DR. AND CROWN ST.

ELEV. 11.58 FEET NAVD 1988, 2001 ADJUSTMENT (PROJECT D
ELEV. 11.57 FEET NAVD 1988, (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFER TO THE CORS DATED JULY 14, 2025

VERTICAL DATUM ADJUSTMENT:

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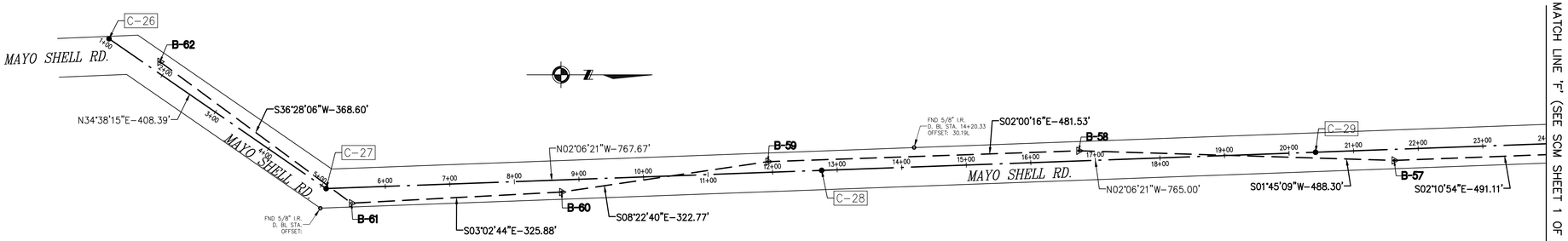
NAVD 1988, 2001 ADJ. ELEVATION
= NAVD 1988 (GEOID '18) ELEVATION - 0.01 FT

NOTE:

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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-11	13,834,773.42	3,156,638.90	13,832,975.14	3,156,228.59	31.13'	2+34.10	26.44L	SET 'X' CUT ON CONC.
B-12	13,834,634.80	3,156,694.13	13,832,836.54	3,156,283.81	31.91'	3+59.71	54.11R	SET 'X' CUT ON CONC.
B-13	13,834,557.35	3,157,162.88	13,832,759.09	3,156,752.50	30.52'	8+39.83	48.73L	SET MAGNAIL W/SHINER
B-14	13,834,569.11	3,157,605.12	13,832,770.85	3,157,194.69	30.88'	12+83.83	35.49L	SET MAGNAIL W/SHINER
B-15	13,834,622.09	3,157,989.35	13,832,823.82	3,157,578.87	29.52'	16+74.75	44.13L	SET 'X' CUT
B-16	13,834,663.89	3,158,408.01	13,832,865.62	3,157,997.47	30.45'	20+95.24	29.35L	SET 5/8" I.R. W/CAP
B-17	13,834,727.63	3,158,875.80	13,832,929.35	3,158,465.20	30.30'	25+67.35	29.72L	SET 1/2" I.R. W/CAP
B-18	13,834,713.80	3,159,259.50	13,832,915.52	3,158,848.85	28.83'	29+45.72	35.50R	SET MAGNAIL W/SHINER
B-19	13,834,725.77	3,159,482.34	13,832,927.49	3,159,071.66	28.76'	31+72.54	33.05R	SET MAGNAIL W/SHINER
B-20	13,834,808.04	3,159,975.89	13,833,009.75	3,159,565.15	28.41'	36+68.55	32.73L	SET MAGNAIL W/SHINER
B-21	13,834,826.14	3,160,454.92	13,833,027.85	3,160,044.11	28.23'	41+47.99	34.85L	SET MAGNAIL W/SHINER
B-22	13,834,839.23	3,160,798.75	13,833,040.94	3,160,387.90	27.42'	44+92.07	35.77L	SET MAGNAIL W/SHINER
B-23	13,834,774.79	3,161,034.28	13,832,976.50	3,160,623.40	27.63'	47+25.17	36.98R	SET 1/2" I.R. W/CAP
B-24	13,834,778.42	3,161,402.04	13,832,980.13	3,160,991.11	25.91'	50+92.83	46.37R	SET 'X' CUT ON CONC.
B-25	13,834,817.11	3,161,906.05	13,833,018.82	3,161,495.05	26.19'	55+97.89	25.56R	SET 'X' CUT ON CONC.
B-26	13,834,880.58	3,162,235.01	13,833,082.28	3,161,823.97	24.89'	59+28.89	26.23L	SET MAGNAIL W/SHINER
B-27	13,834,897.38	3,162,525.12	13,833,099.08	3,162,114.05	24.14'	62+19.42	32.75L	SET MAGNAIL W/SHINER
B-28	13,834,839.58	3,162,709.25	13,833,041.28	3,162,298.15	23.48'	64+01.39	31.54R	SET MAGNAIL W/SHINER
B-29	13,834,923.85	3,163,171.81	13,833,125.54	3,162,760.65	21.82'	68+66.47	38.29L	SET MAGNAIL W/SHINER
B-30	13,834,927.62	3,163,540.73	13,833,129.31	3,163,129.52	23.51'	72+35.33	30.64L	SET MAGNAIL W/SHINER
B-31	13,834,940.05	3,163,897.76	13,833,141.75	3,163,486.50	24.57'	75+92.57	32.01L	SET 1/2" I.R. W/CAP
B-32	13,834,963.93	3,164,326.80	13,833,165.62	3,163,915.49	20.98'	80+22.15	42.59L	SET MAGNAIL W/SHINER
B-33	13,834,898.13	3,164,715.47	13,833,099.83	3,164,304.11	16.47'	84+08.59	35.21R	SET 1/2" I.R. W/CAP

SURVEY BASELINE POINTS DATA (TEMPORARY BENCHMARK)

POINT No.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)	ELEVATION	D. BL STA.	OFFSET	DESCRIPTION
B-34	13,834,914.64	3,165,074.82	13,833,116.34	3,164,663.42	13.24'	87+68.29	29.84R	SET MAGNAIL W/SHINER
B-35	13,834,925.36	3,165,317.16	13,833,127.06	3,164,905.73	11.51'	90+10.85	26.63R	SET 1/2" I.R. W/CAP
B-36	13,834,988.01	3,165,236.58	13,833,189.70	3,164,825.15	9.74'	89+32.24	38.49L	SET 1/2" I.R. W/CAP
B-37	13,834,995.63	3,165,798.78	13,833,197.32	3,165,387.28	22.09'	94+94.60	25.45L	SET MAGNAIL W/SHINER
B-38	13,835,018.55	3,166,293.88	13,833,220.23	3,165,882.31	22.89'	99+90.21	29.45L	SET 1/2" I.R. W/CAP
B-39	13,834,973.90	3,166,680.12	13,833,175.59	3,166,268.50	20.92'	103+73.78	30.41R	SET MAGNAIL W/SHINER
B-40	13,835,007.61	3,167,197.75	13,833,209.29	3,166,786.07	21.00'	108+92.51	28.23R	SET MAGNAIL W/SHINER
B-41	13,835,032.32	3,167,693.34	13,833,234.00	3,167,281.59	17.89'	113+88.68	33.68R	SET MAGNAIL W/SHINER
B-42	13,835,067.79	3,168,177.59	13,833,269.47	3,167,765.78	18.78'	118+74.19	27.71R	SET 'X' CUT ON CONC.
B-43	13,835,087.00	3,168,618.59	13,833,288.68	3,168,206.73	18.36'	123+15.55	35.34R	SET 1/2" I.R. W/CAP
B-44	13,835,178.05	3,169,028.31	13,833,379.71	3,168,616.40	18.72'	127+30.05	30.64L	SET 'X' CUT ON CONC.
B-45	13,835,205.02	3,169,540.59	13,833,406.67	3,169,128.60	16.34'	132+43.01	26.42L	SET 'X' CUT ON CONC.
B-46	13,835,172.03	3,169,922.70	13,833,373.69	3,169,510.67	15.54'	136+22.42	29.73R	SET MAGNAIL W/SHINER
B-47	13,835,188.59	3,170,188.86	13,833,390.25	3,169,776.79	15.26'	138+89.09	29.37R	SET MAGNAIL W/SHINER
B-55	13,834,386.49	3,160,801.89	13,832,588.26	3,160,391.04	27.70'	31+54.28	16.00L	SET MAGNAIL W/SHINER
B-56	13,833,887.08	3,160,852.78	13,832,088.91	3,160,441.92	27.63'	26+53.33	16.51R	SET 1/2" I.R. W/CAP
B-57	13,833,396.33	3,160,871.48	13,831,598.22	3,160,460.62	27.10'	21+62.22	17.16R	SET 1/2" I.R. W/CAP
B-58	13,832,908.25	3,160,856.54	13,831,110.21	3,160,445.68	27.10'	16+75.03	15.70L	SET 1/2" I.R. W/CAP
B-59	13,832,427.02	3,160,873.38	13,830,629.04	3,160,462.52	26.51'	11+93.50	16.55L	SET MAGNAIL W/SHINER
B-60	13,832,107.69	3,160,920.41	13,830,309.75	3,160,509.55	25.49'	8+72.66	18.71R	SET 1/2" I.R. W/CAP
B-61	13,831,782.27	3,160,937.73	13,829,984.37	3,160,526.86	26.07'	5+46.82	24.05R	SET 1/2" I.R. W/CAP
B-62	13,831,485.84	3,160,718.64	13,829,687.99	3,160,307.80	22.06'	1+85.16	15.49L	SET MAGNAIL W/SHINER

DESIGN BASELINE POINTS DATA

POINT No.	D. BL STA.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)
C-1	1+00.00	13,834,829.99	3,156,514.47	13,833,031.70	3,156,104.18
C-2	3+85.47	13,834,663.80	3,156,746.57	13,832,865.53	3,156,336.25
C-3	4+97.32	13,834,601.43	3,156,839.43	13,832,803.16	3,156,429.09
C-4	8+71.56	13,834,510.14	3,157,195.55	13,832,711.89	3,156,785.16
C-5	13+84.96	13,834,539.45	3,157,708.11	13,832,741.20	3,157,297.66
C-6	21+76.61	13,834,645.73	3,158,492.59	13,832,847.46	3,158,082.04
C-7	29+68.26	13,834,752.00	3,159,277.08	13,832,953.72	3,158,866.43
C-8	35+54.81	13,834,771.54	3,159,863.30	13,832,973.25	3,159,452.58
C-9	41+41.36	13,834,791.07	3,160,449.53	13,832,992.78	3,160,038.72
C-10	44+94.62	13,834,803.58	3,160,802.56	13,833,005.29	3,160,391.71
C-11	51+19.62	13,834,825.71	3,161,427.17	13,833,027.42	3,161,016.24
C-12	57+44.62	13,834,847.84	3,162,051.78	13,833,049.55	3,161,640.77
C-13	63+66.82	13,834,869.87	3,162,673.59	13,833,071.58	3,162,262.50
C-14	64+16.82	13,834,871.64	3,162,723.56	13,833,073.35	3,162,312.46
C-15	70+71.82	13,834,891.93	3,163,378.25	13,833,093.63	3,162,967.06
C-16	77+26.82	13,834,912.21	3,164,032.93	13,833,113.91	3,163,621.66
C-17	83+81.82	13,834,932.50	3,164,687.62	13,833,134.19	3,164,276.26
C-18	90+43.61	13,834,952.99	3,165,349.09	13,833,154.68	3,164,937.65
C-19	96+97.55	13,834,977.95	3,166,002.55	13,833,179.63	3,165,591.02
C-20	103+51.48	13,835,002.90	3,166,656.01	13,833,204.59	3,166,244.40
C-21	110+96.48	13,835,048.18	3,167,399.63	13,833,249.86	3,166,987.92
C-22	118+41.48	13,835,093.46	3,168,143.25	13,833,295.13	3,167,731.45
C-23	125+86.48	13,835,138.74	3,168,886.88	13,833,340.41	3,168,474.98
C-24	133+31.48	13,835,184.02	3,169,630.50	13,833,385.68	3,169,218.50
C-25	140+75.00	13,835,229.21	3,170,372.64	13,833,430.86	3,169,960.55
C-26	1+00.00	13,831,406.97	3,160,682.98	13,829,609.12	3,160,272.14
C-27	5+08.39	13,831,742.98	3,160,915.10	13,829,945.09	3,160,504.24
C-28	12+76.06	13,832,510.13	3,160,886.89	13,830,712.14	3,160,476.03
C-29	20+41.06	13,833,274.61	3,160,858.78	13,831,476.52	3,160,447.92
C-30	28+06.06	13,834,039.10	3,160,830.67	13,832,240.91	3,160,419.82
C-31	36+20.00	13,834,852.49	3,160,800.76	13,833,054.19	3,160,389.91

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

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KUO & ASSOCIATES, LLC
FB NO.

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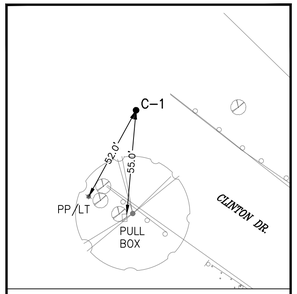
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

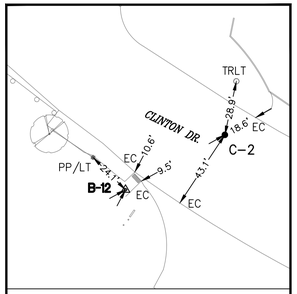
SURVEY CONTROL MAP (SHEET 3 OF 6)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=100'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 19 OF 204	

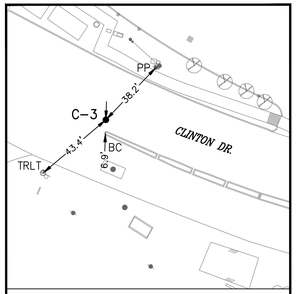
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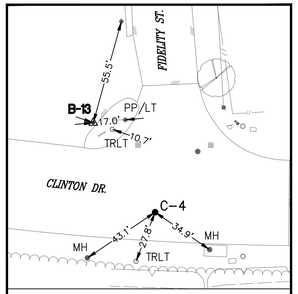
C-1



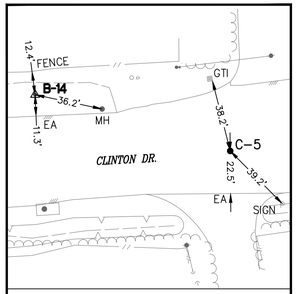
C-2 & T.B.M. B-12



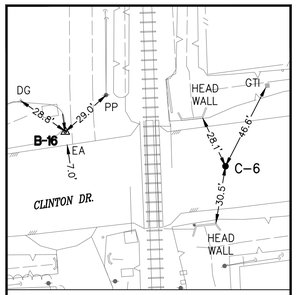
C-3



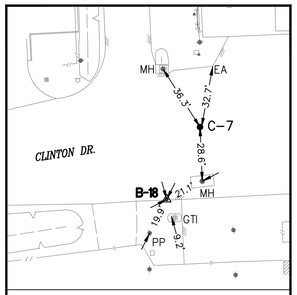
C-4 & T.B.M. B-13



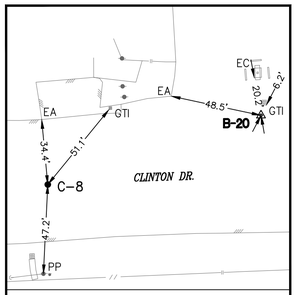
C-5 & T.B.M. B-14



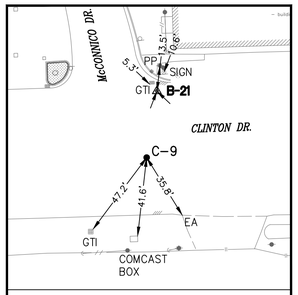
C-6 & T.B.M. B-16



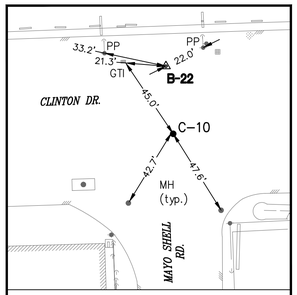
C-7 & T.B.M. B-18



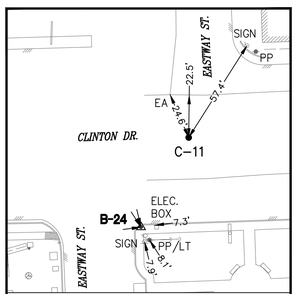
C-8 & T.B.M. B-20



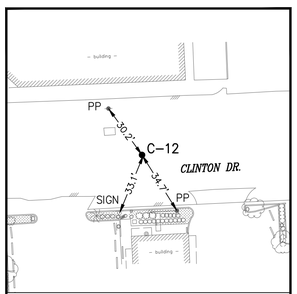
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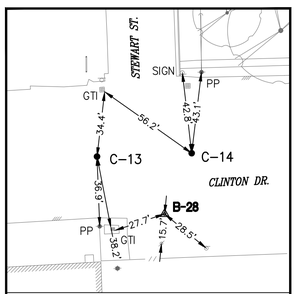
C-10 & T.B.M. B-22



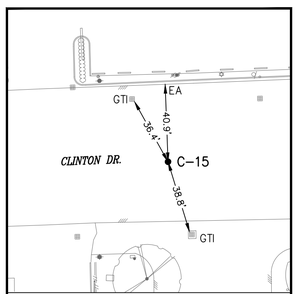
C-11 & T.B.M. B-24



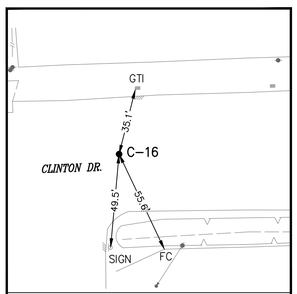
C-12



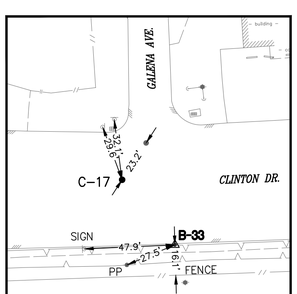
C-13, C-14 & T.B.M. B-28



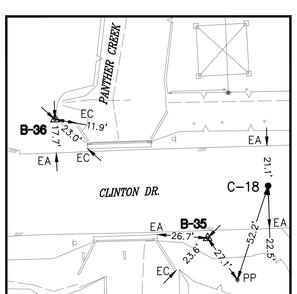
C-15



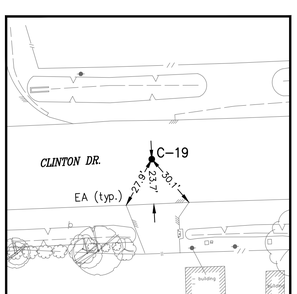
C-16



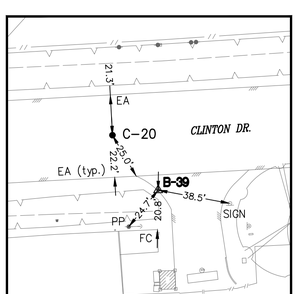
C-17 & T.B.M. B-33



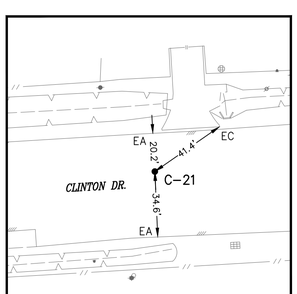
C-18 & T.B.M. B-35, B-36



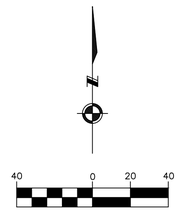
C-19



C-20 & T.B.M. B-39



C-21



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
FOC – FIBER OPTIC CABLE
LT – LIGHT POLE
MB – MAIL BOX
MH – MANHOLE
PP – POWER POLE
PP/LT – POWER POLE W/LIGHT
TRLT – TRAFFIC LIGHT
WM – WATER METER

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.

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KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404

ON 08/15/2025 IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

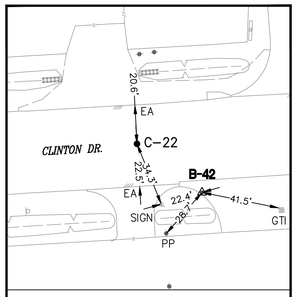
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

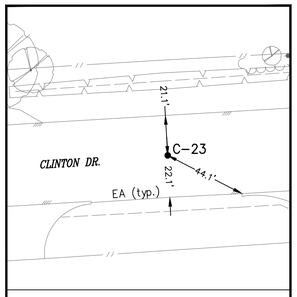
SURVEY CONTROL MAP
(SHEET 4 OF 6)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 20 OF 204	

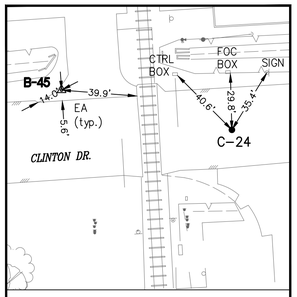
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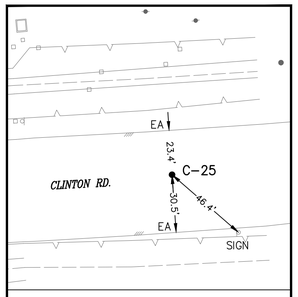
C-22 & T.B.M. B-42



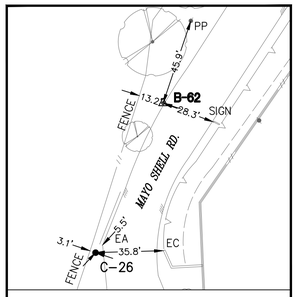
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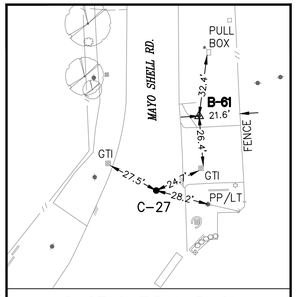
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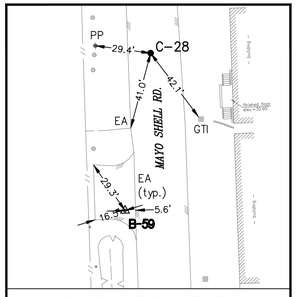
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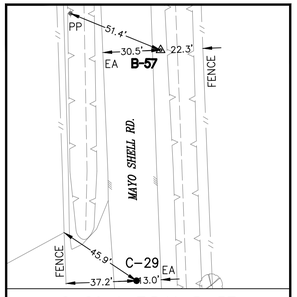
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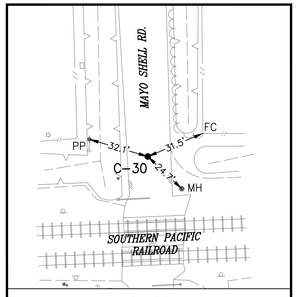
C-27 & T.B.M. B-61



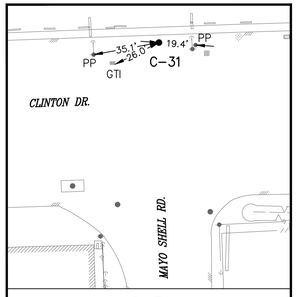
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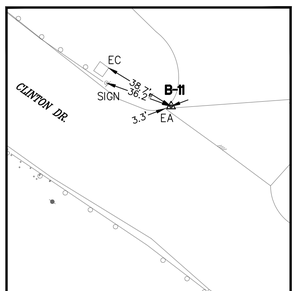
C-29 & T.B.M. B-57



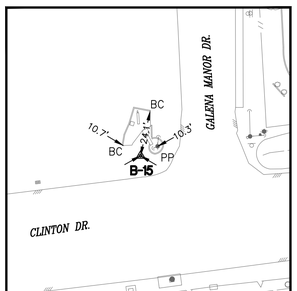
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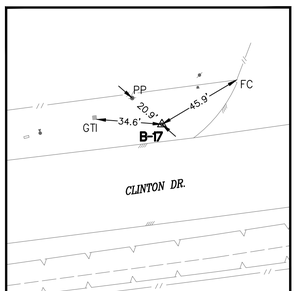
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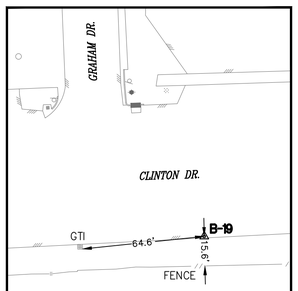
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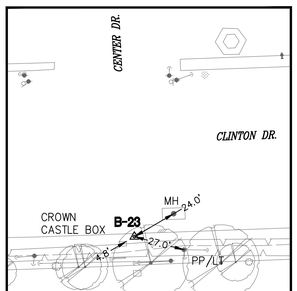
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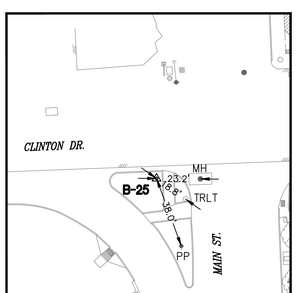
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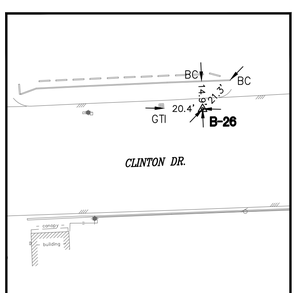
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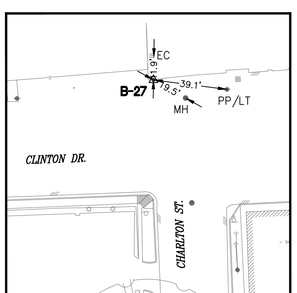
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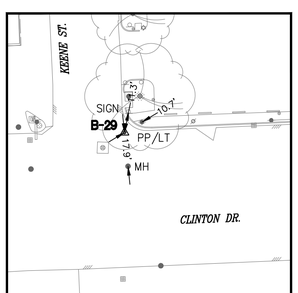
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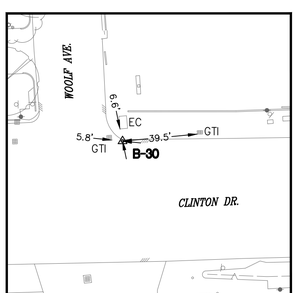
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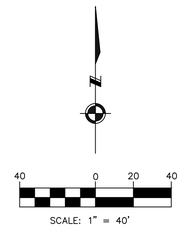
T.B.M. B-27



T.B.M. B-29



T.B.M. B-30



NO.	DATE	REVISION	APP.

EXIST. TOPOGRAPHIC LEGEND

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- B OR BB INLET
- BUSH
- C INLET
- CLEANOUT
- brick column
- DOWN GUY
- E INLET
- ELEC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GATE
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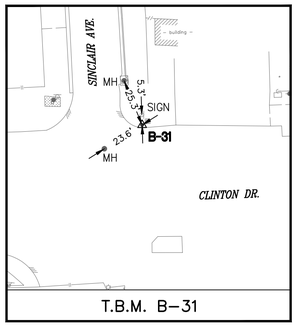
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

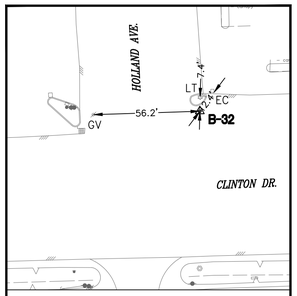
SURVEY CONTROL MAP
(SHEET 5 OF 6)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 21 OF 204	

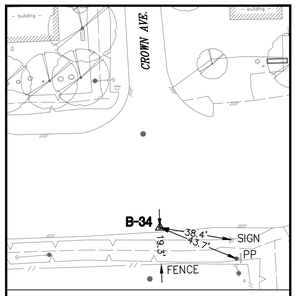
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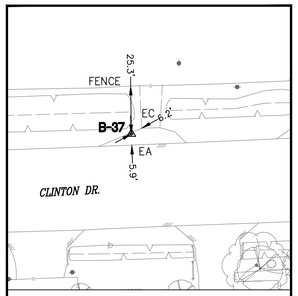
T.B.M. B-31



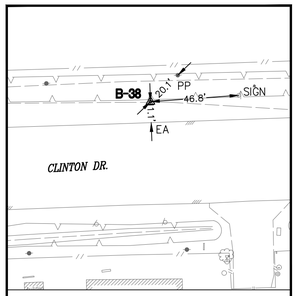
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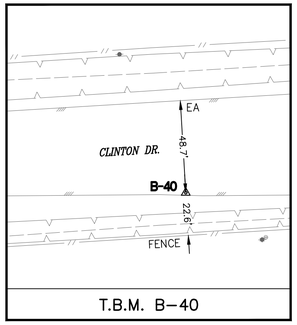
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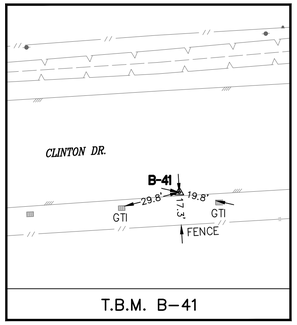
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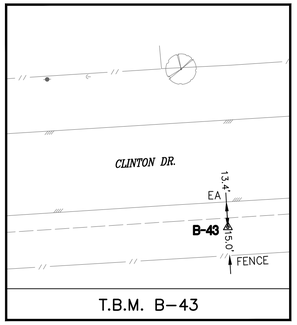
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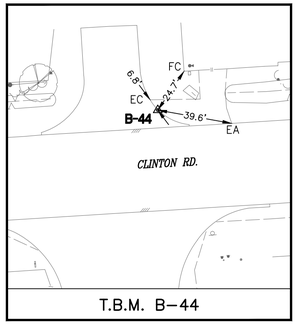
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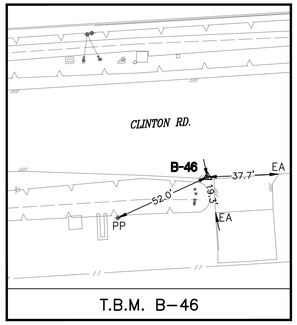
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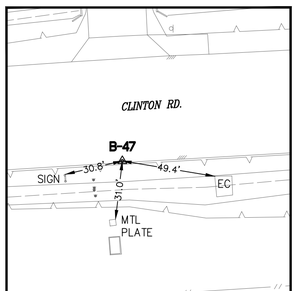
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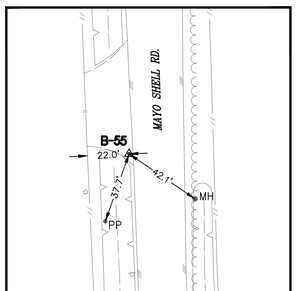
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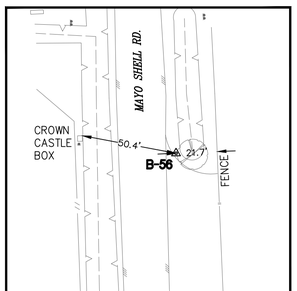
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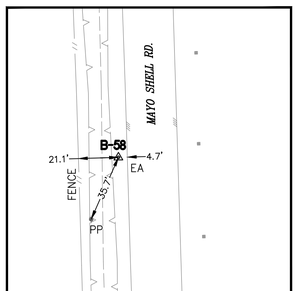
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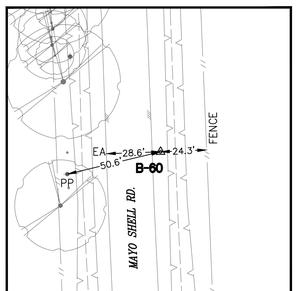
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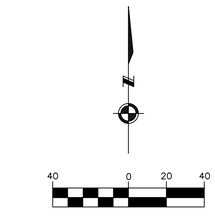
T.B.M. B-56



T.B.M. B-58



T.B.M. B-60



NO.	DATE	REVISION	APP.

EXIST. TOPOGRAPHIC LEGEND

- ASPHALT SYMBOL
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- brick column
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10300 WESTOFFICE DR. SUITE 800
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TX FIRM NO.: F-4578

SURVEYED BY:
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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

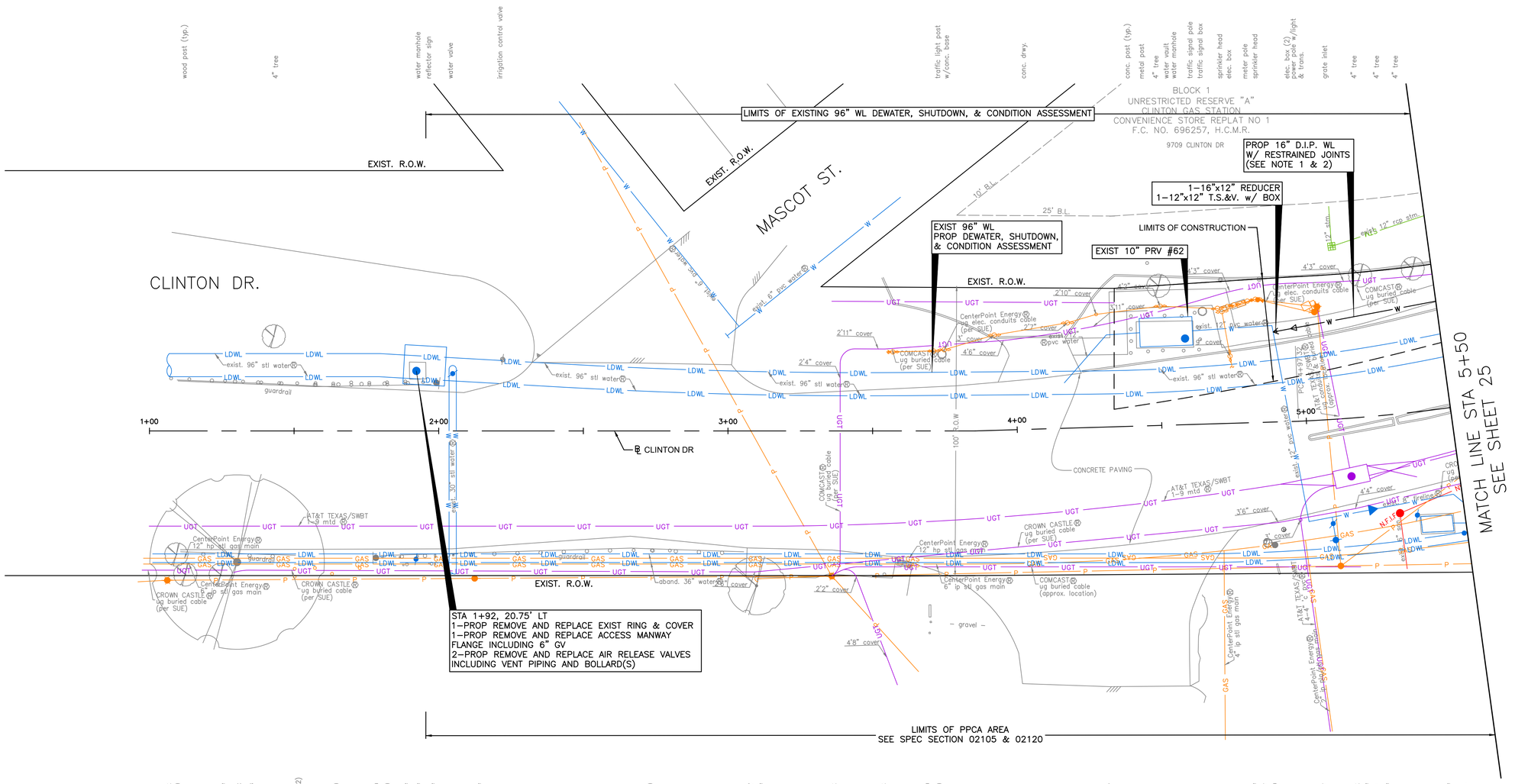
SURVEY CONTROL MAP (SHEET 6 OF 6)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 22 OF 204	

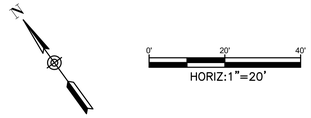
S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\SCM\Swinglies-23082.dwg plotted on Aug 15, 2025 - 5:20pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 24 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-12
SET 'X' CUT ON CONC.
D. BL STA. 3+59.71
OFFSET: 54.11R

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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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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
BEGIN TO STA 5+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 23 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:24pm

SEE SHEET 23 FOR PLAN

STA 1+92
1–PROP REMOVE AND REPLACE EXIST RING & COVER
1–PROP REMOVE AND REPLACE ACCESS MANWAY FLANGE INCLUDING 6" GV
2–PROP REMOVE AND REPLACE AIR RELEASE VALVES INCLUDING VENT PIPING AND BOLLARD(S)

water mh
top 30.94
top of valve not visible
bottom 19.34
unable to see dirty water

water mh
top 31.01
bolted

n–row
n–edge rd
cl–road
s–edge rd
s–row

UGT
AT&T TEXAS/SWBT
1–9 mtd

exist. 36" water
exist. 36" water
exist. 12" water
exist. 12" water
exist. 96" water

PROP 12" WL
PROP 16" WL
6' MIN COVER
exist. 6" fh weld

LIMITS OF PROP 12" D.I. PIPE WITH RESTRAINED JOINTS IN PPCA LIMITS
LIMITS OF PROP 16" D.I. PIPE WITH RESTRAINED JOINTS IN PPCA LIMITS

EXIST 96" WL
PROP DEWATER, SHUTDOWN, & CONDITION ASSESSMENT

PROFILE BREAK

MATCH LINE STA 5+50 SEE SHEET 26

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

34 32 30 28 26 24 22 20 18 16 14 6 4 2 0 −2 −4 −6 −8

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

NO.	DATE	REVISION	APP.

NOTE:
1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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HOUSTON, TX 77042
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TX SURVEY FIRM NO.: 10075600

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SUITE 400
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713–266–6900
TX FIRM NO.: F–2614

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FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

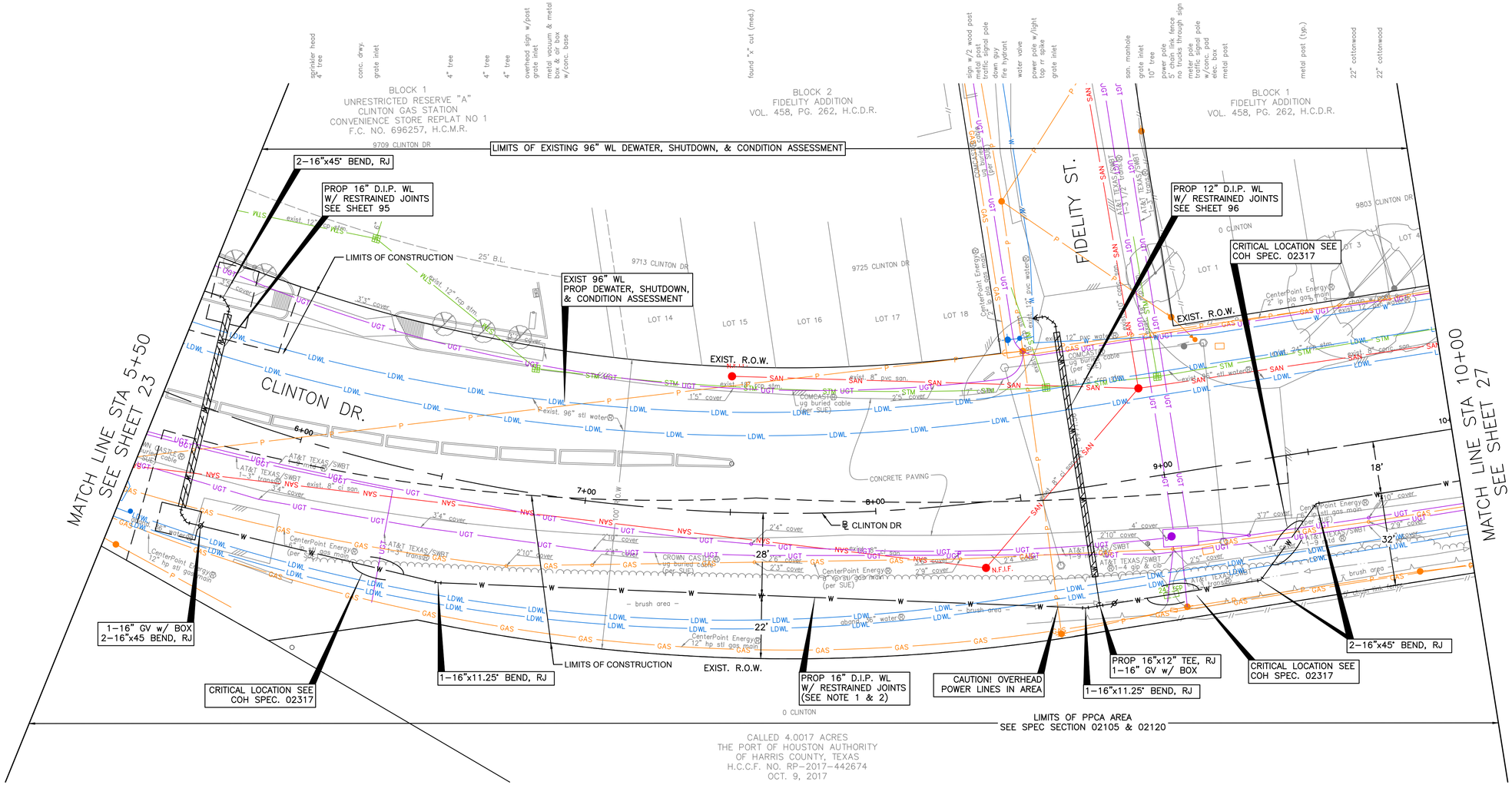
PROFILE
BEGIN TO STA 5+50

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 24 OF 204	

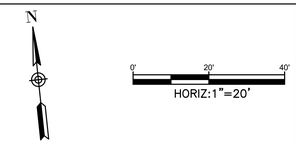
S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Clinton Dr 1.dwg plotted on Aug 15, 2025 – 10:27pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 26 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-13
SET MAGNAIL W/SHINER
D. BL STA. 8+39.83
OFFSET: 48.73L

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ENGINEERING + SURVEYING
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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TX FIRM NO. F-4578

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HOUSTON, TX 77042
713-266-6900
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FOR 96-INCH WATER LINE DESIGN ONLY

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SURVEYED BY:
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FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

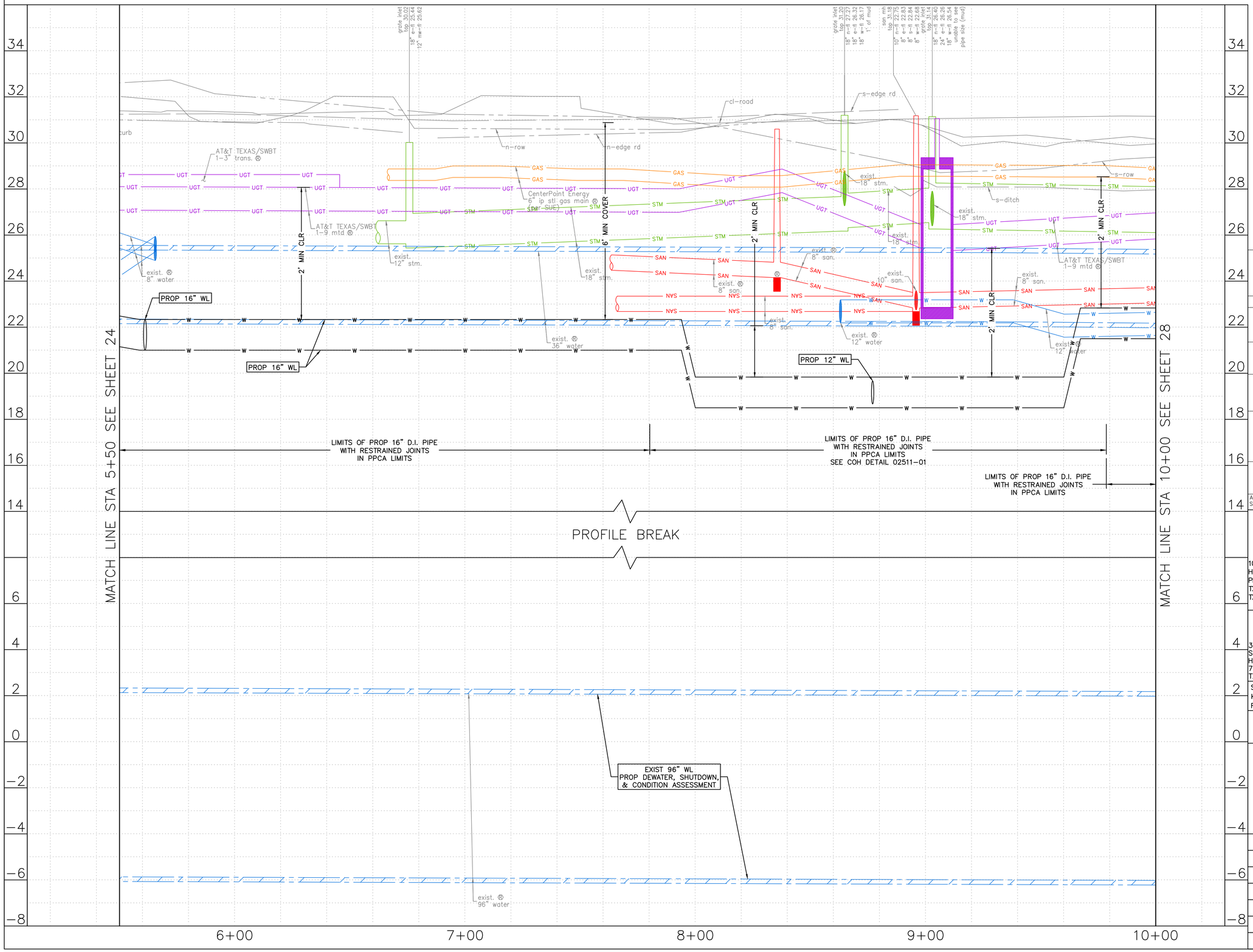
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 5+00 TO STA 10+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 25 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:28pm

SEE SHEET 25 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

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ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
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TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

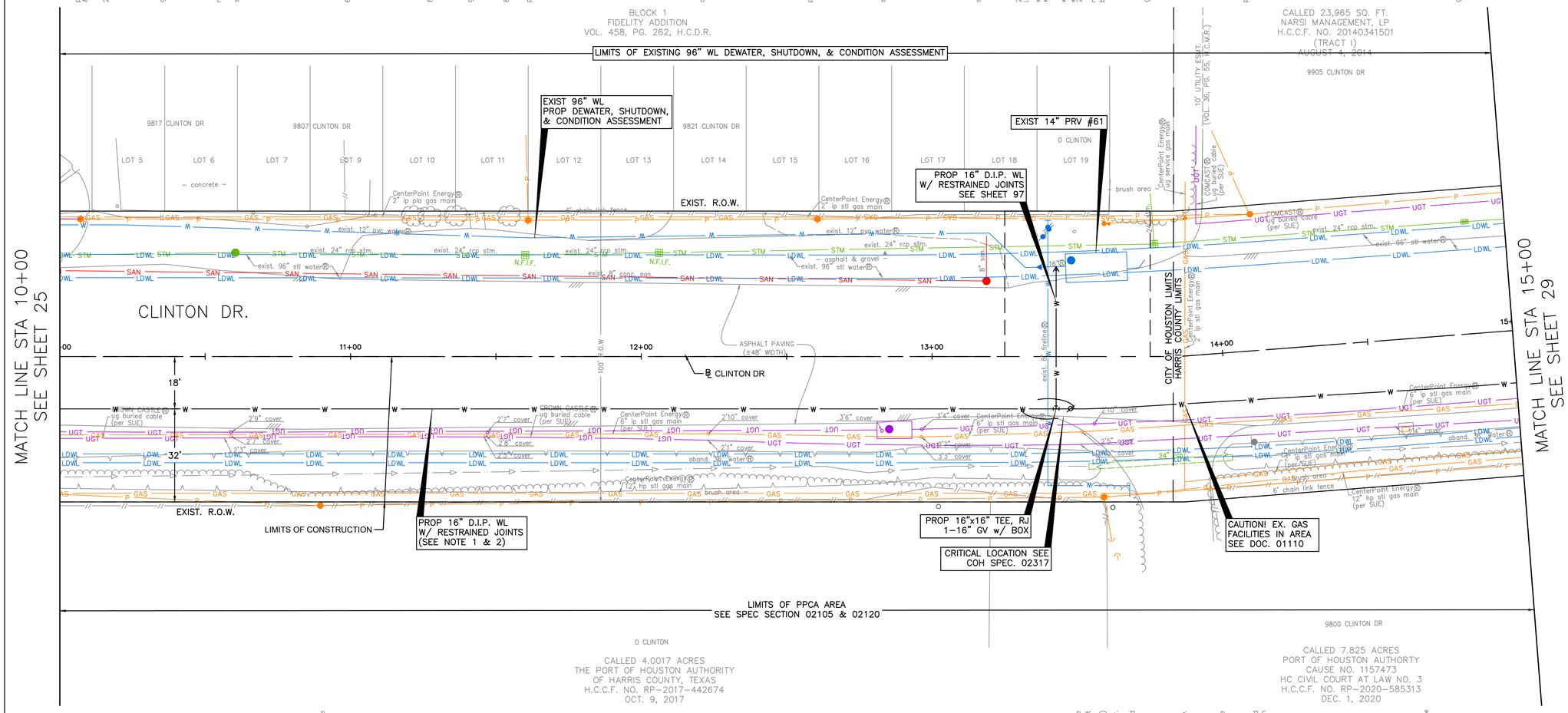
PROFILE
STA 5+50 TO STA 10+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **26** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:31pm

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 28 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-14
SET MAGNAIL W/SHINER
D. BL STA. 12+83.83
OFFSET: 35.49L

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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

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TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Date: 06/02/2025

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Texas Registered Engineering Firm F-2614

SURVEYED BY:
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FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

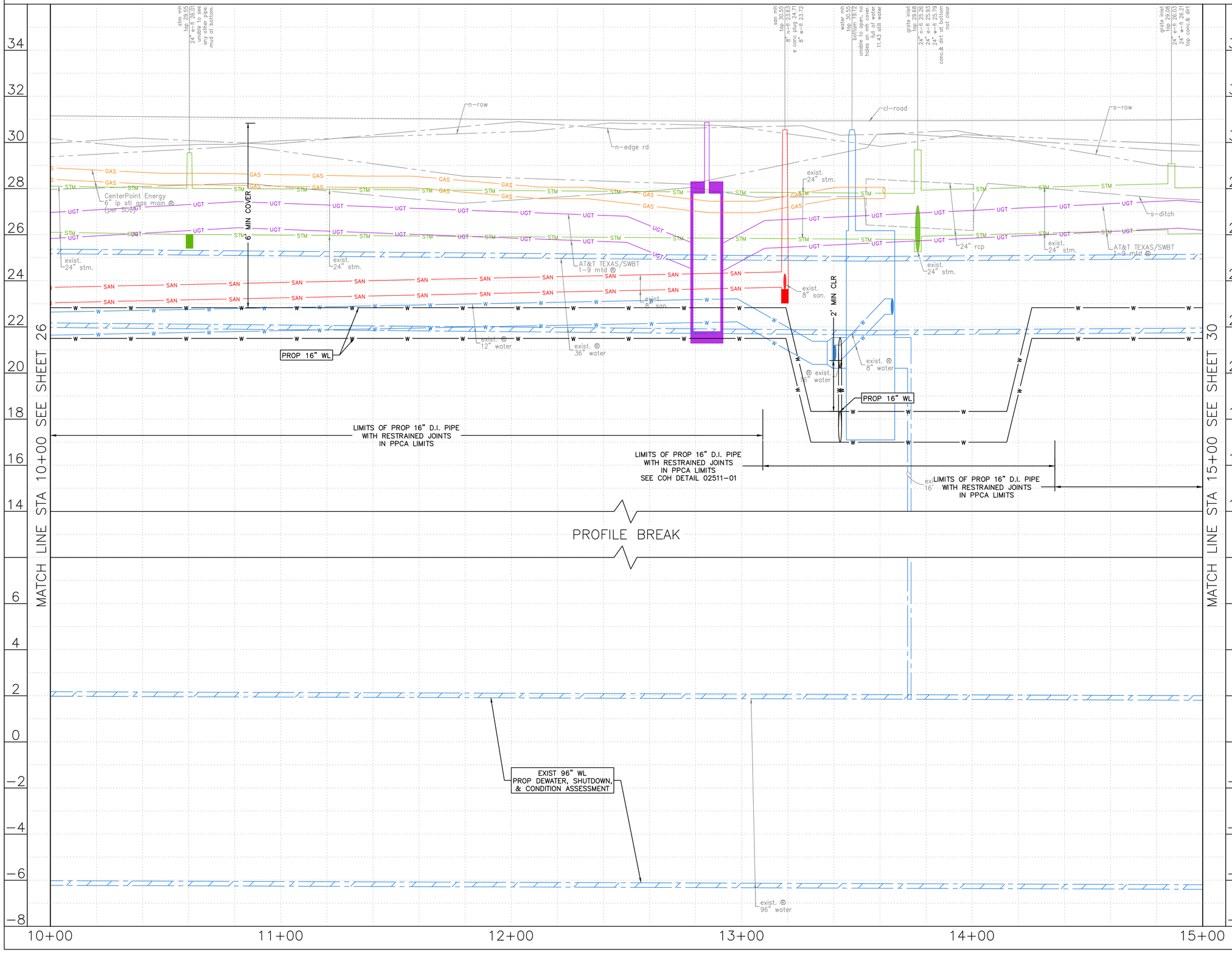
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 10+00 TO STA 15+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 27 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:32pm

SEE SHEET 27 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

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713-266-6900
TX FIRM NO.: F-2614

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Texas Registered Engineering Firm F-2614

SURVEYED BY:
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FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

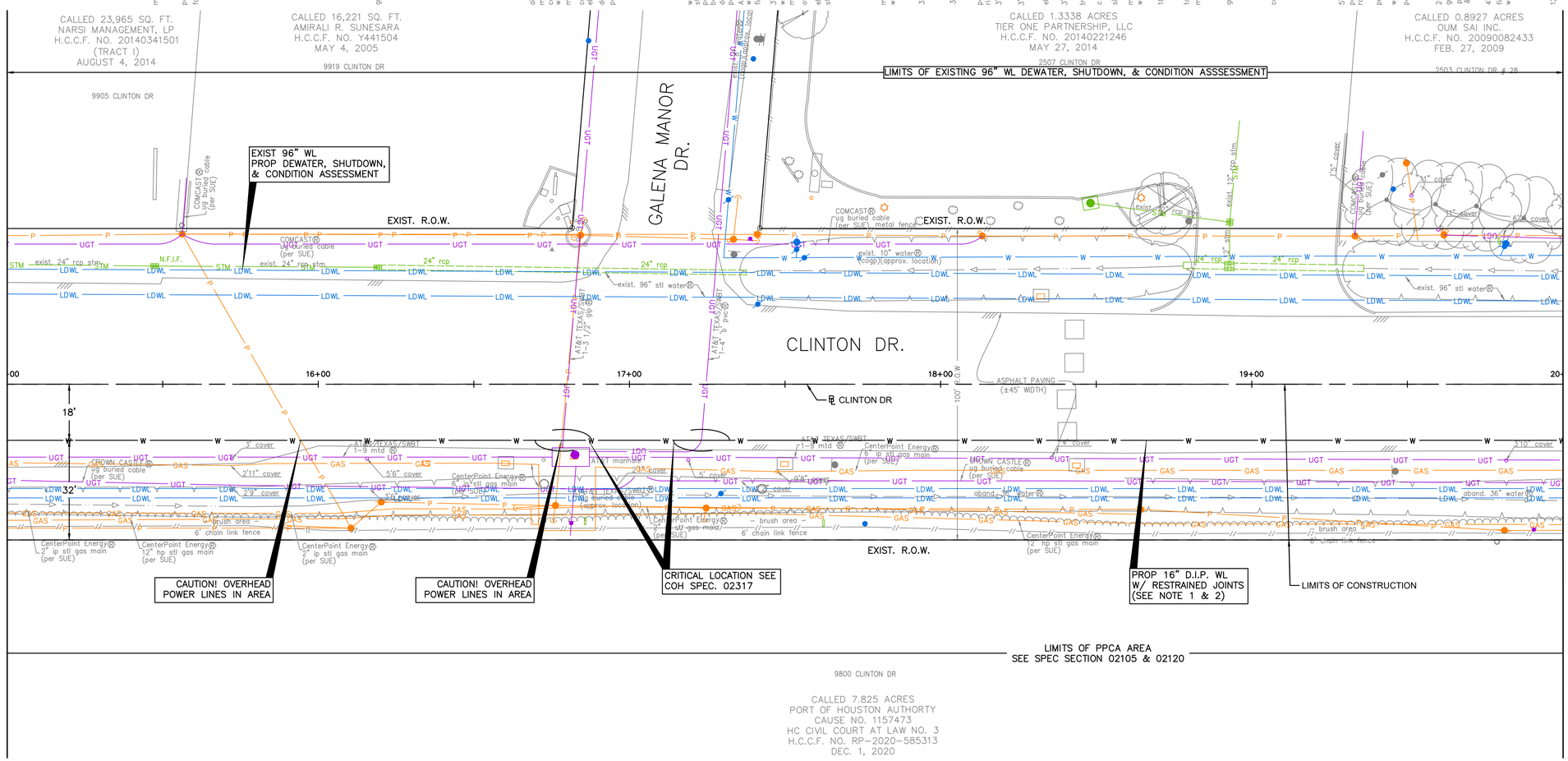
PROFILE
STA 10+00 TO STA 15+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **28** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:35pm

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N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-15
SET 'X' CUT
D. BL STA. 16+74.75
OFFSET: 44.13L

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SURVEYED BY:
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FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

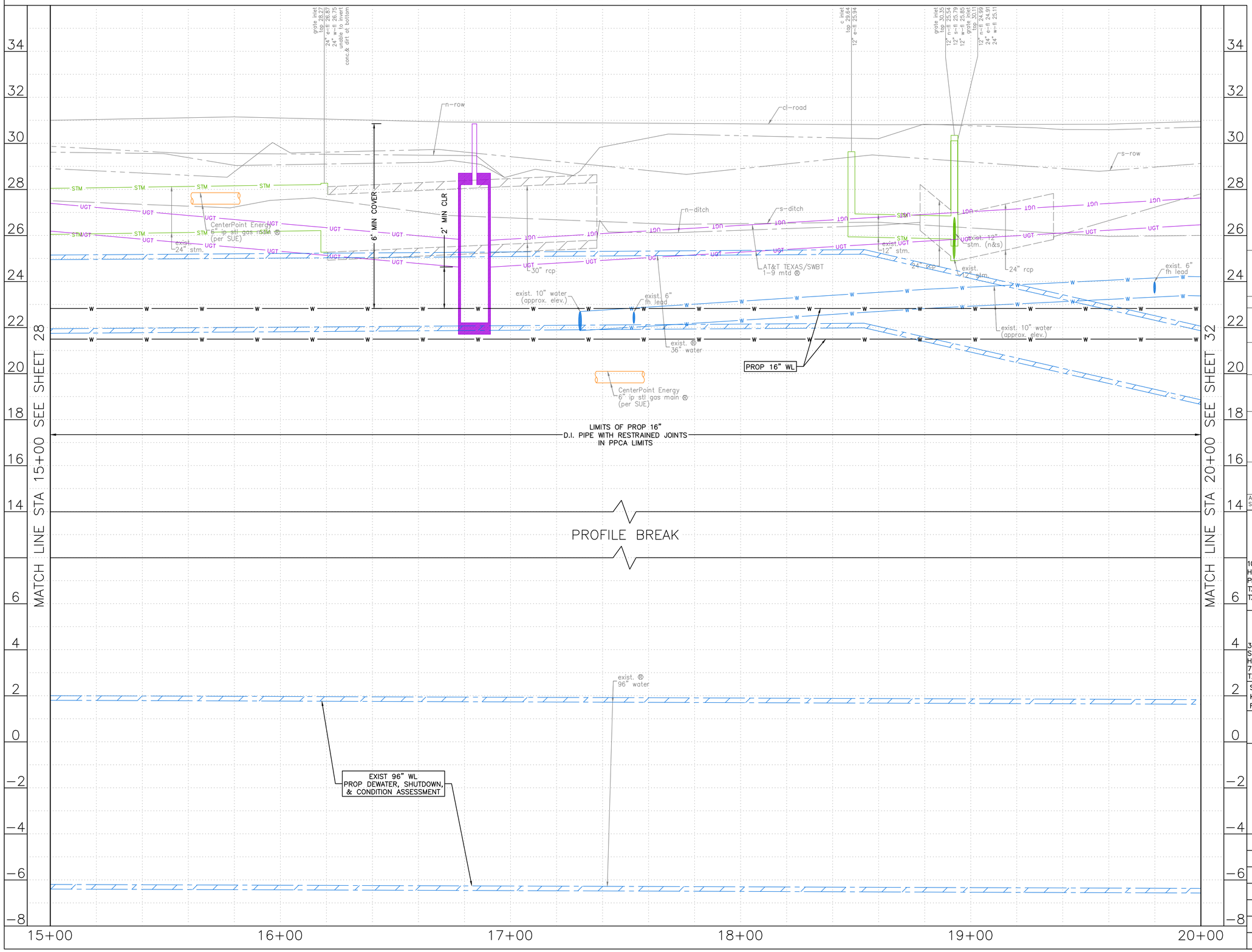
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 15+00 TO STA 20+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **29** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:37pm

SEE SHEET 29 FOR PLAN



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

NO.	DATE	REVISION	APP.

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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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 15+00 TO STA 20+00

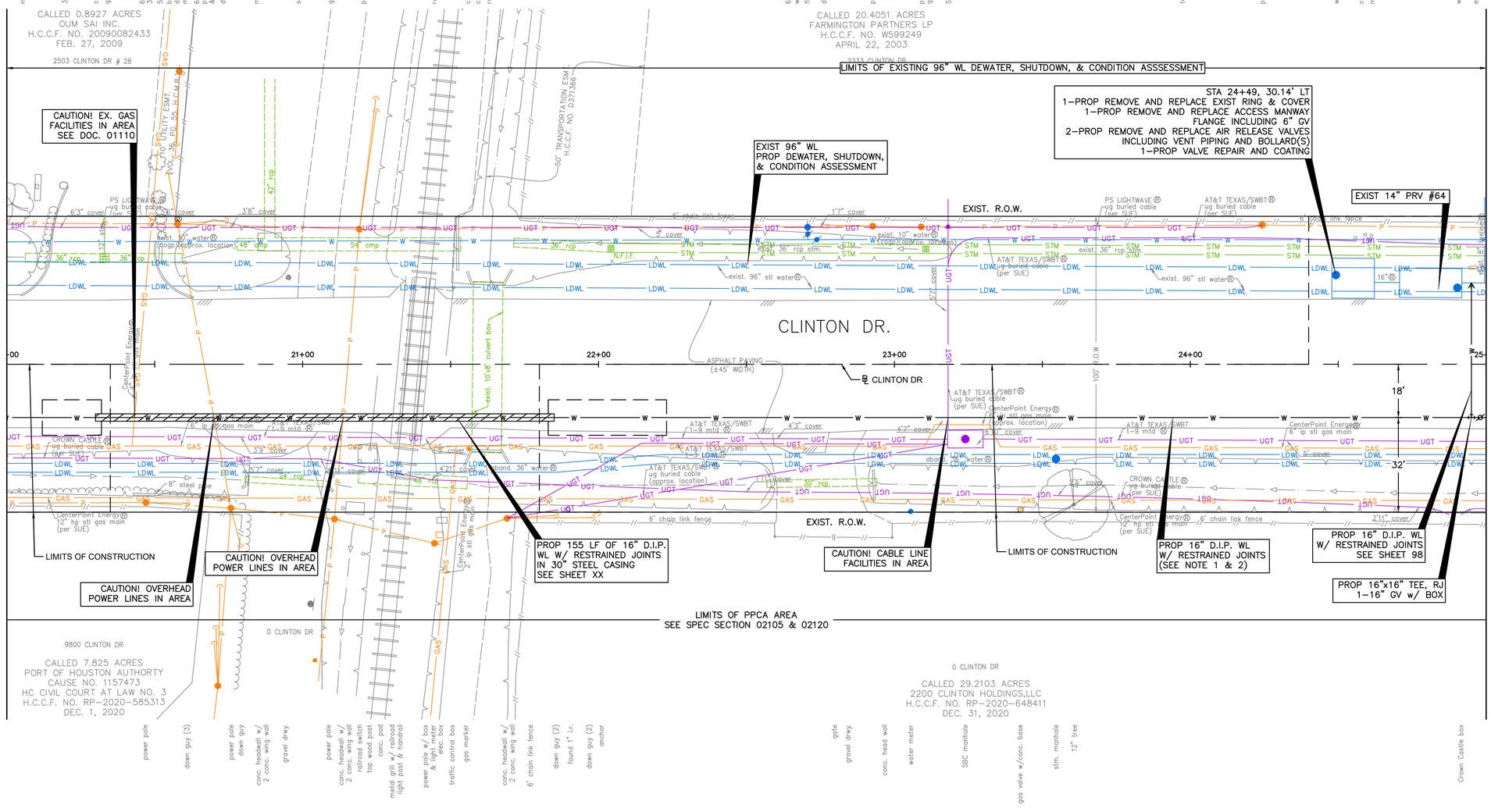
WBS NUMBER
S-000701-0038-3
DRAWING SCALE
H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM
SHAN HANG LEI, P.E.
SHEET NO. 30 OF 204

FOR CITY OF HOUSTON USE ONLY

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:39pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 32 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-16
SET 5/8" I.R. W/CAP
D. STA. 20+95.24
OFFSET: 29.35L

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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

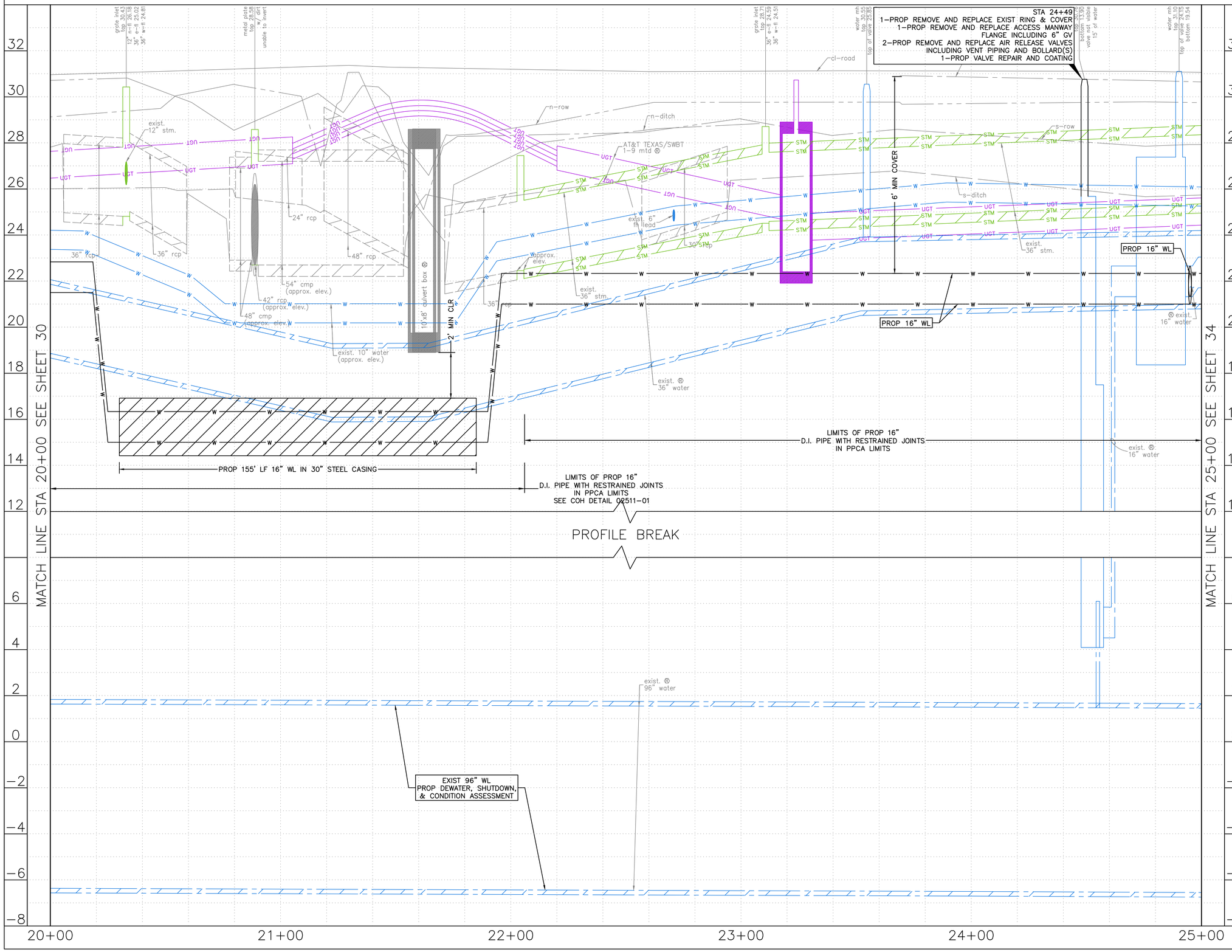
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 20+00 TO STA 25+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 31 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:41pm

SEE SHEET 31 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

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Date

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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713–266–6900
TX FIRM NO.: F–2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96–INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F–2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

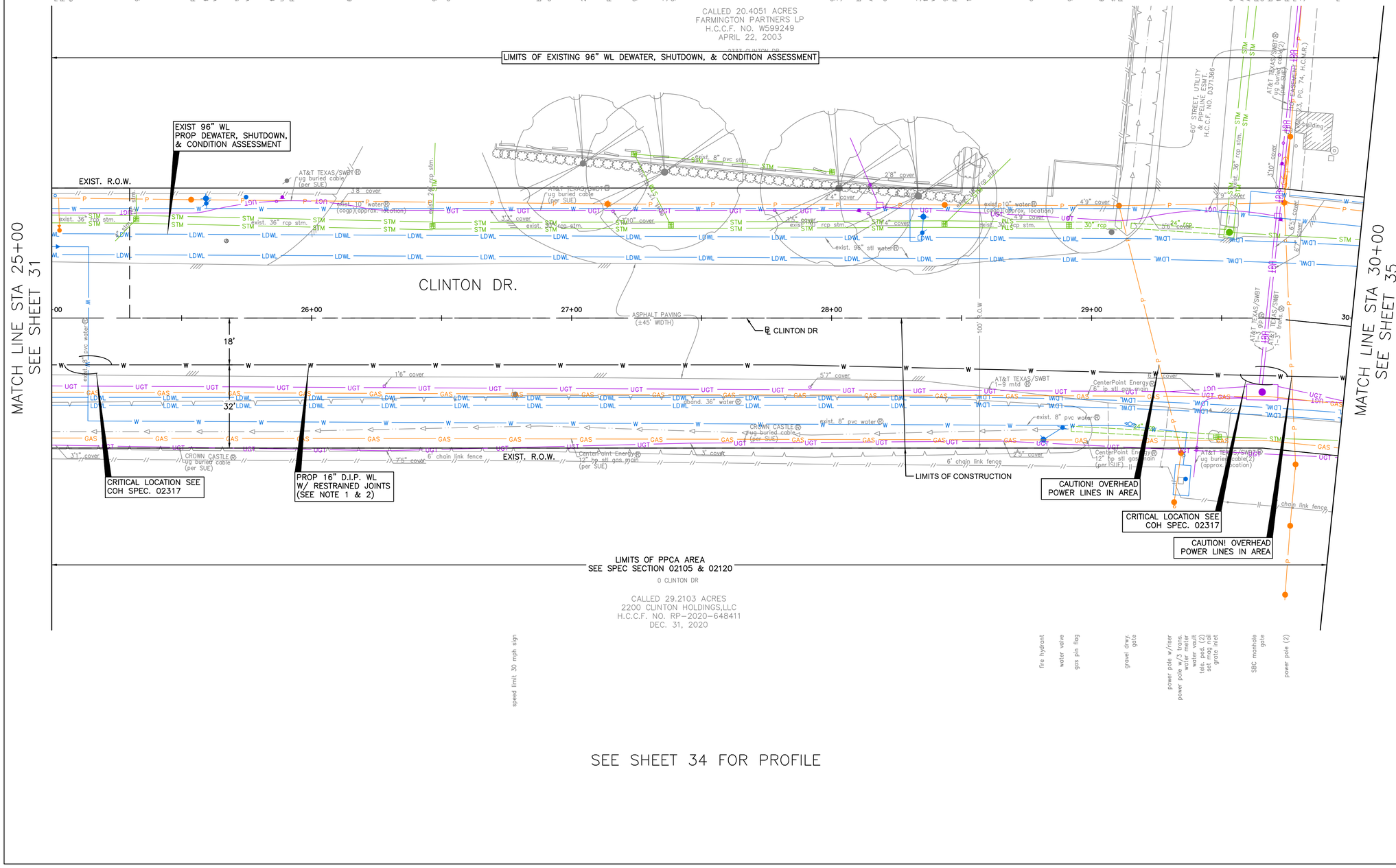
PROFILE
STA 20+00 TO STA 25+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 32 OF 204	

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Clinton Dr 1.dwg plotted on Aug 15, 2025 – 10:43pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-18
SET MAGNAIL W/SHINER
D. BL STA. 29+45.72
OFFSET: 35.50R

NOTICE:
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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

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

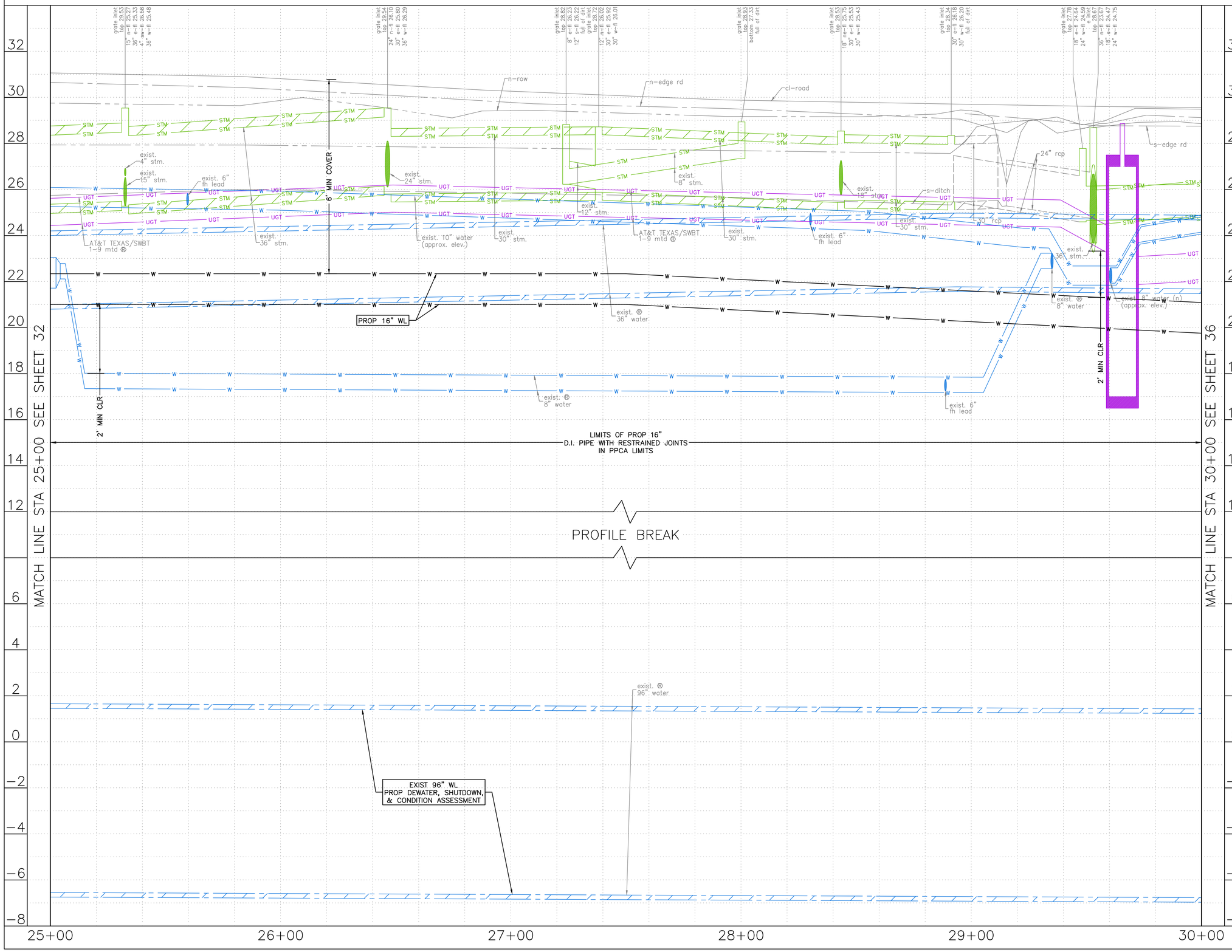
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 25+00 TO STA 30+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 33 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:45pm

SEE SHEET 33 FOR PLAN



NO.	DATE	REVISION	APP.

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

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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VERIFICATION OF PRIVATE UTILITY LINES

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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 25+00 TO STA 30+00

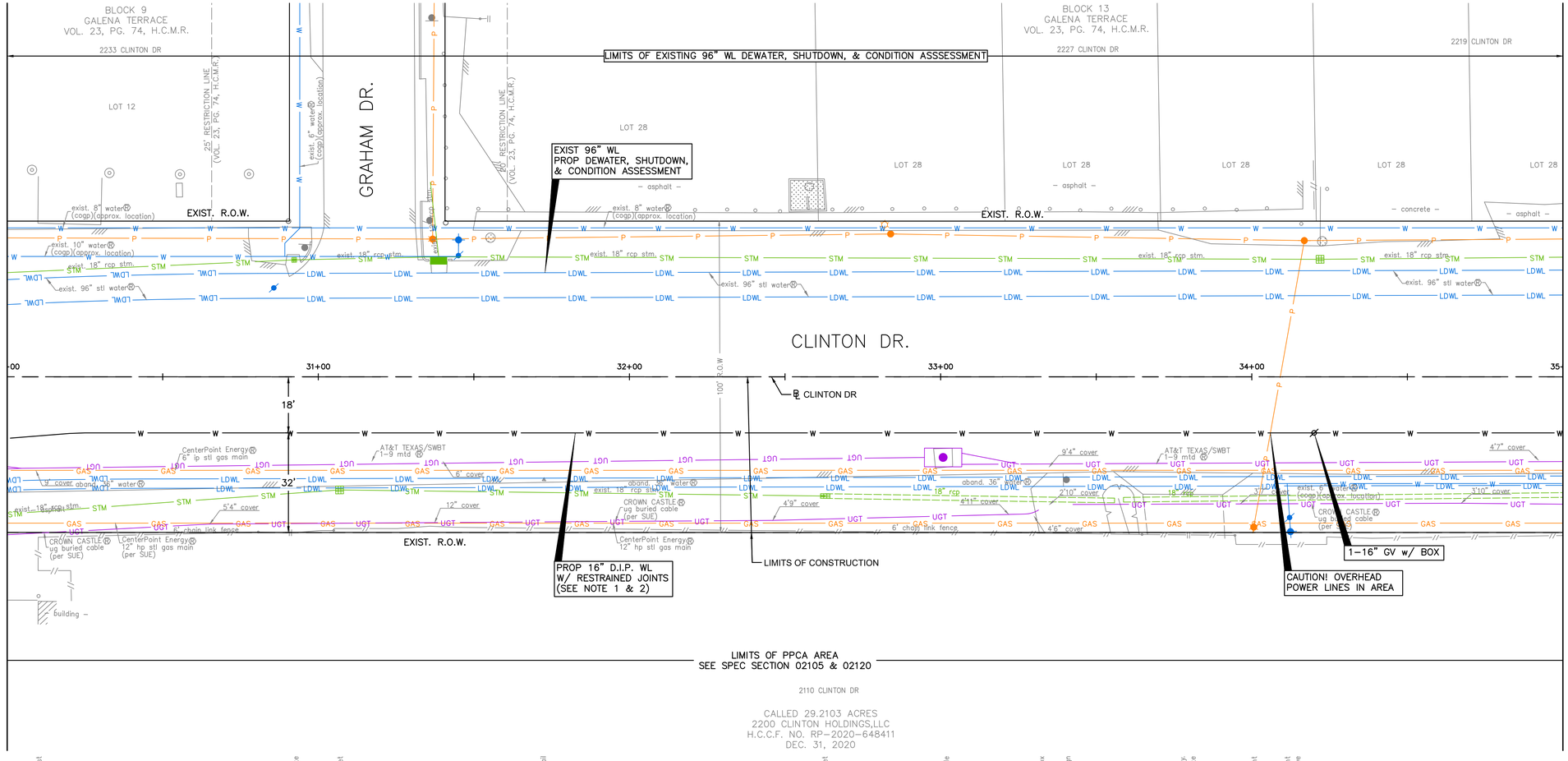
WBS NUMBER
S-000701-0038-3
DRAWING SCALE
H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM
SHAN HANG LEI, P.E.
SHEET NO. **34** OF 204

FOR CITY OF HOUSTON USE ONLY

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 1.dwg plotted on Aug 15, 2025 - 10:48pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 36 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-19
SET MAGNAIL W/SHINER
D. BL STA. 31+72.54
OFFSET: 33.05R

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

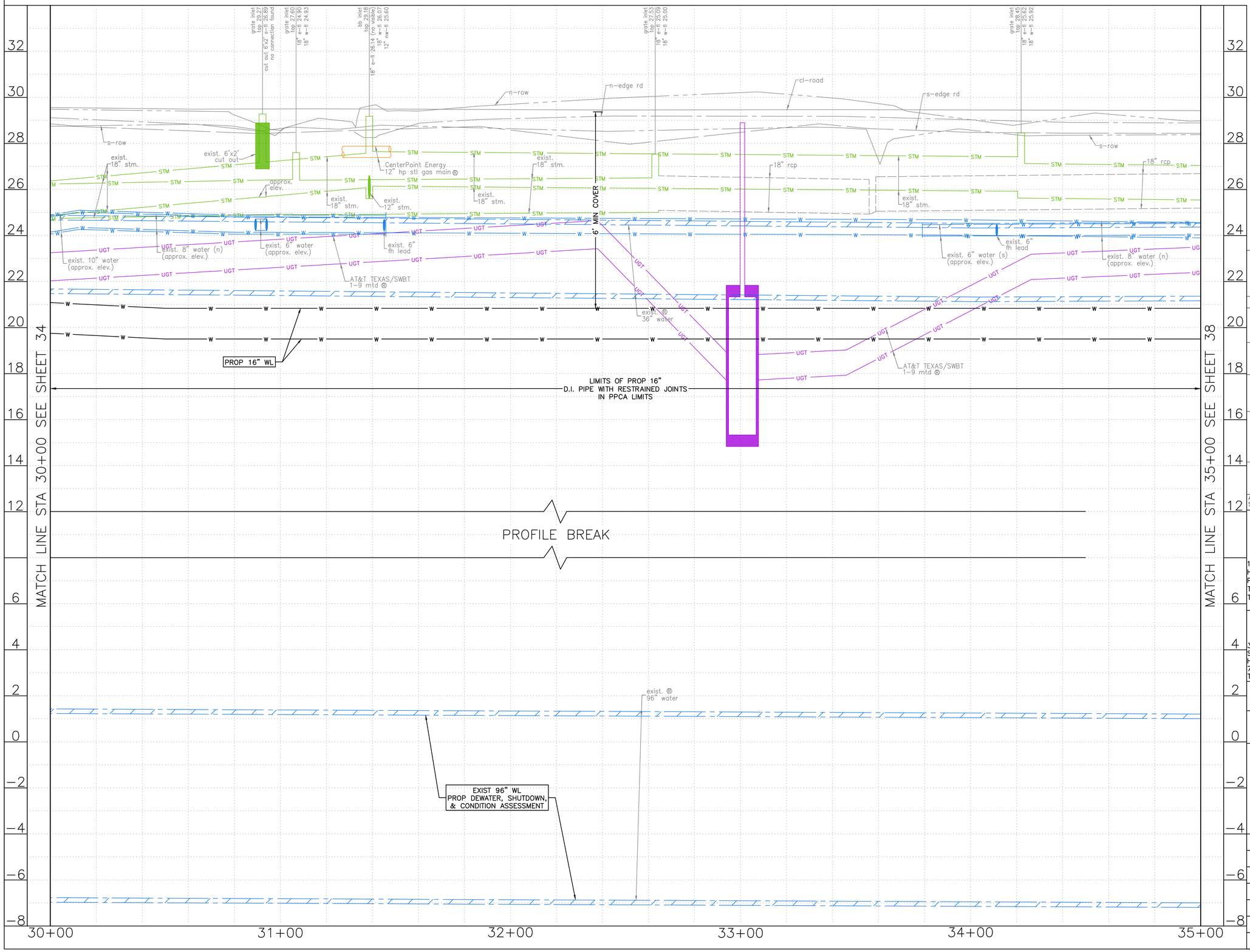
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 30+00 TO STA 35+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 35 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 10:49pm

SEE SHEET 34 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
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PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
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FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Date: 06/02/2025
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Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

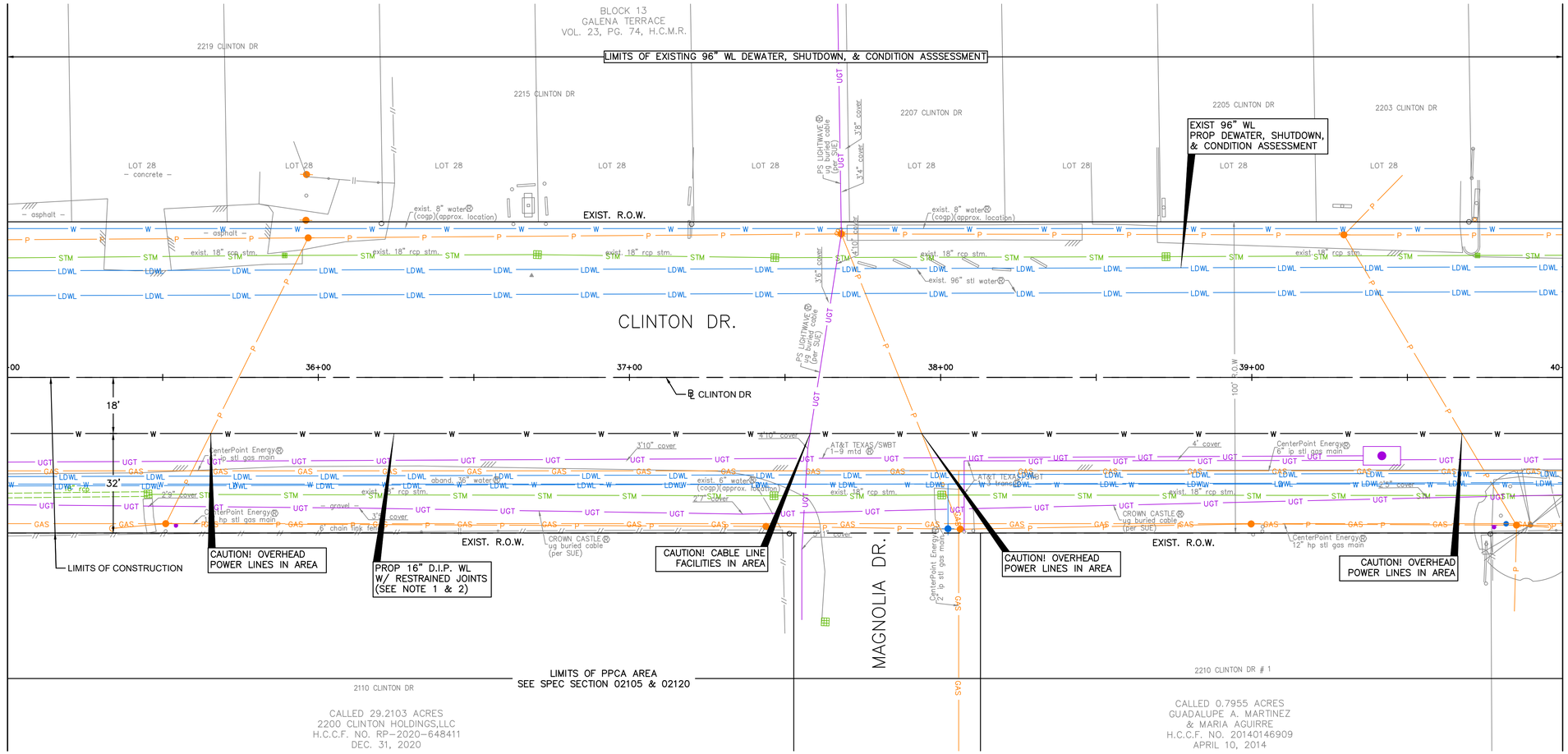
PROFILE
STA 30+00 TO STA 35+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 36 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 10:52pm

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SEE SHEET 38 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

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T.B.M. B-20
SET MAGNAIL W/SHINER
D. BL STA. 36+68.55
OFFSET: 32.73L

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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

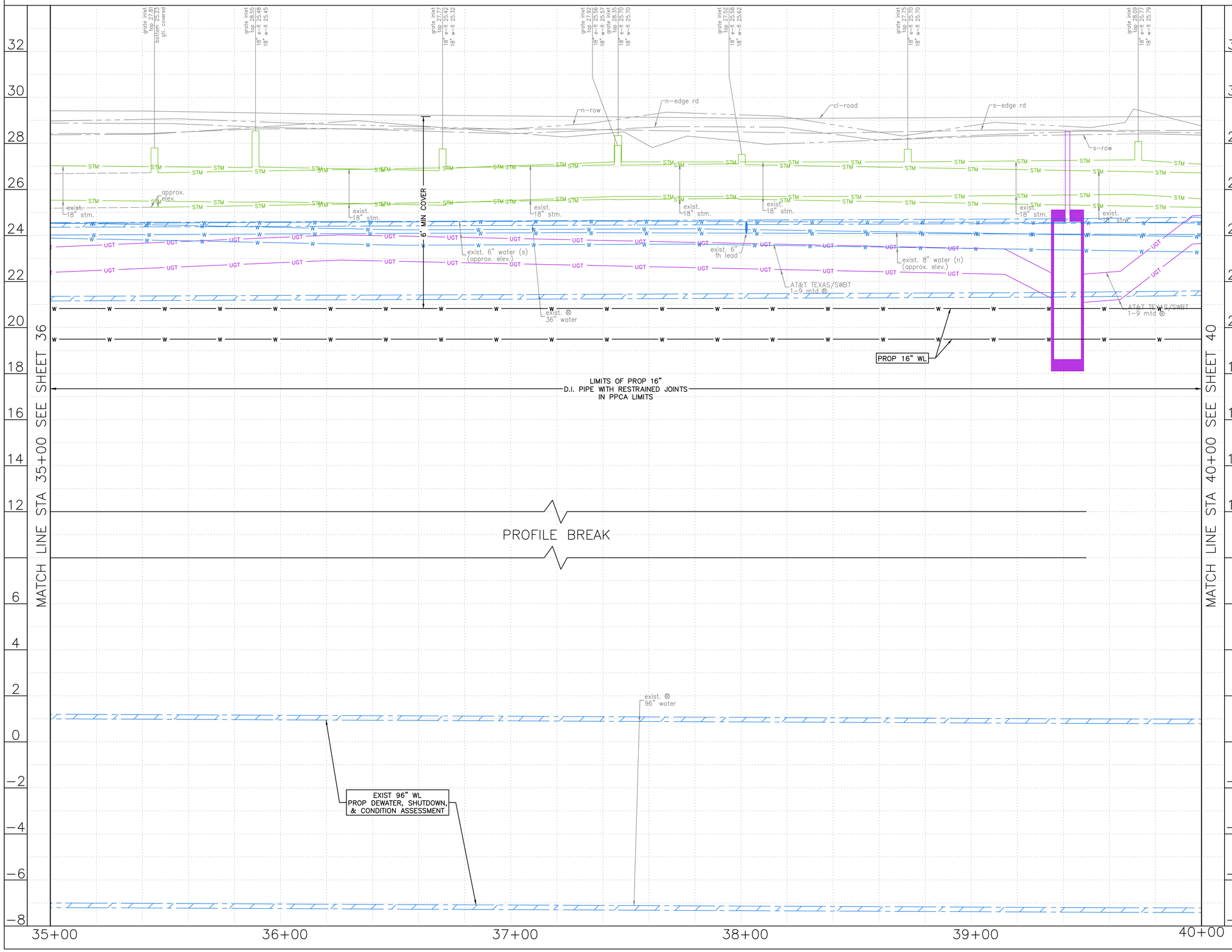
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 35+00 TO STA 40+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 37 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 10:54pm

SEE SHEET 37 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC. TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

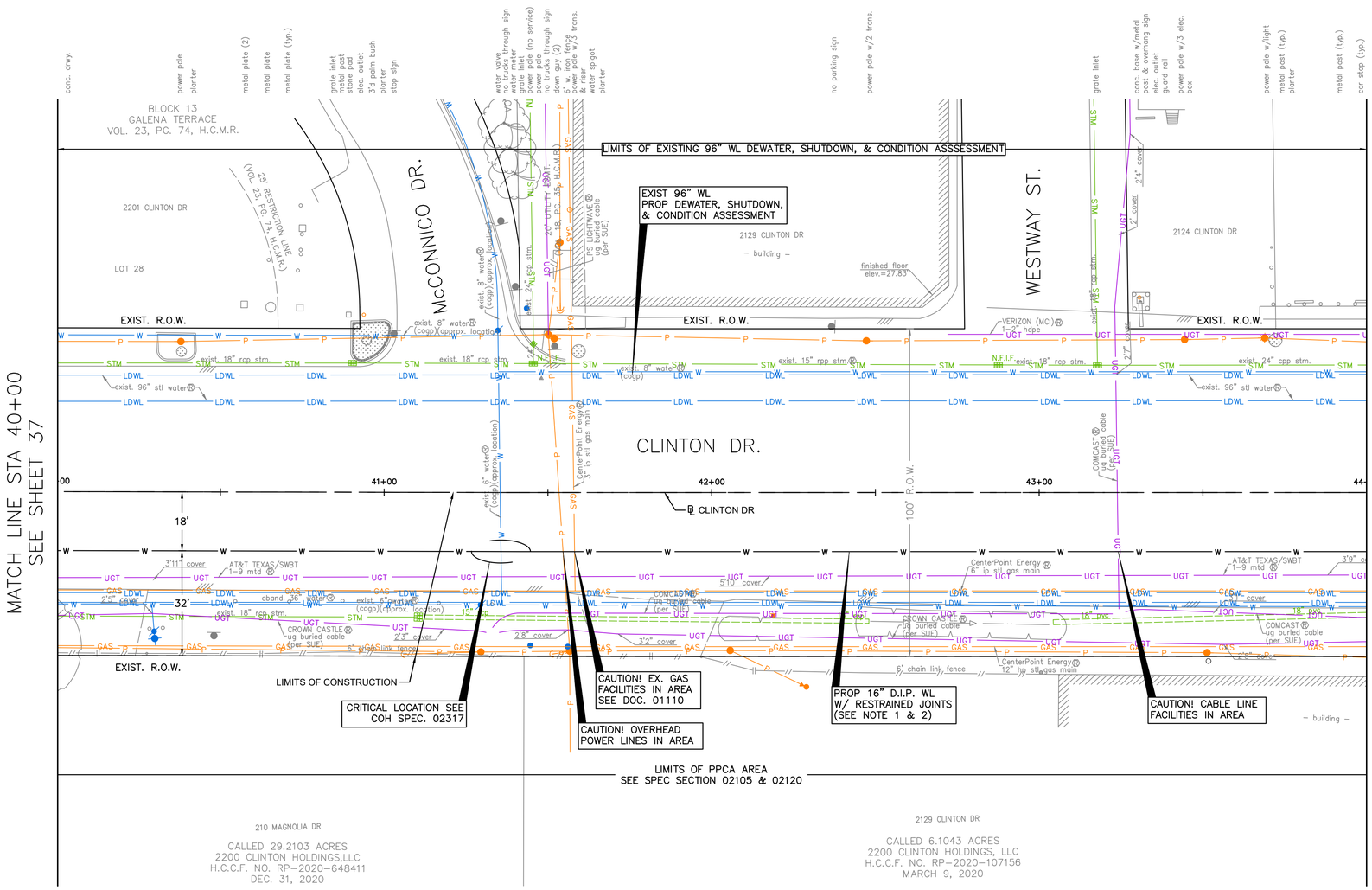
PROFILE
STA 35+00 TO STA 40+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **38** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 10:56pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 40 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-21
SET MAGNAIL W/SHINER
D. BL STA. 41+47.99
OFFSET: 34.85L

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

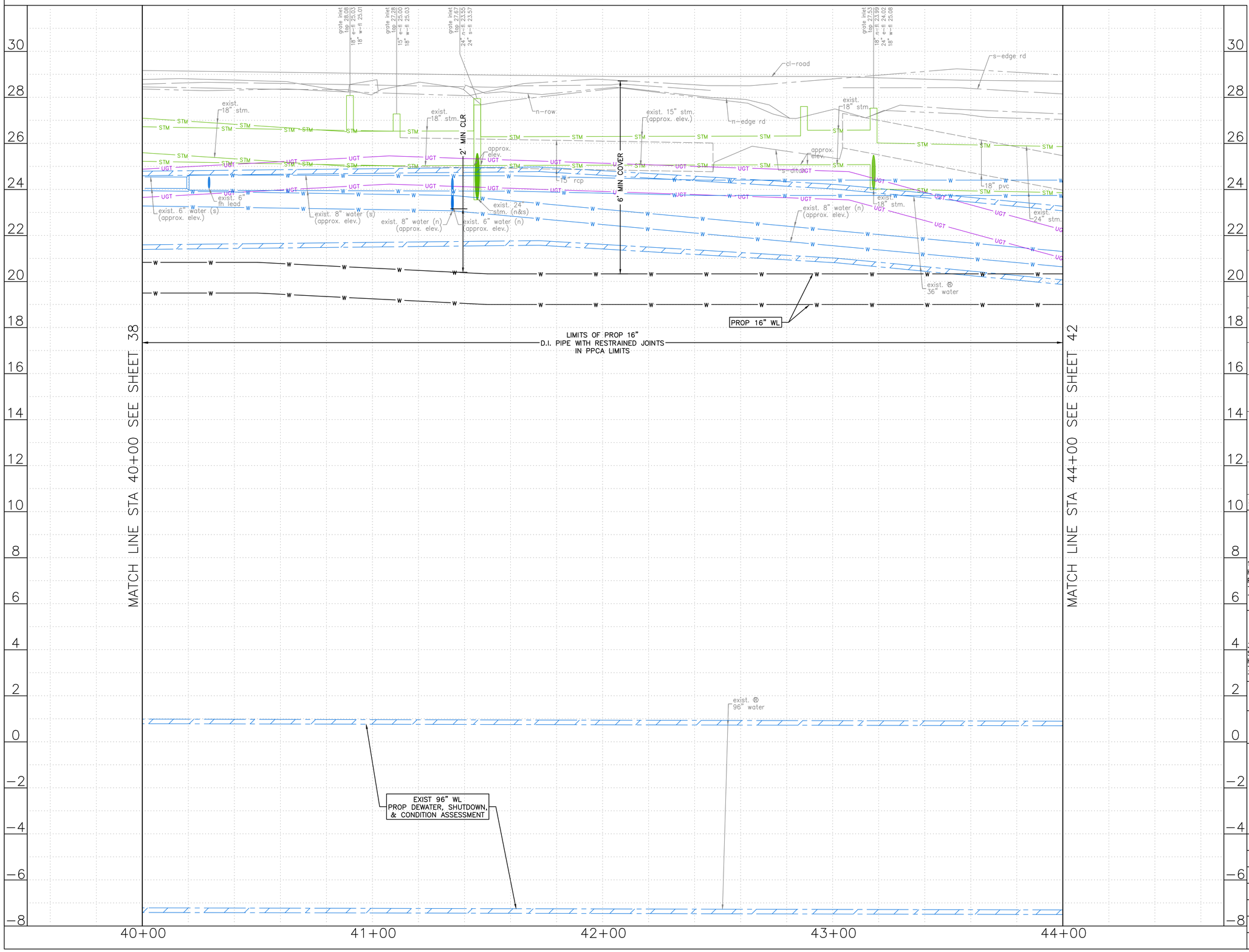
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 40+00 TO STA 44+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 39 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 10:58pm

SEE SHEET 39 FOR PLAN



NO.	DATE	REVISION	APP.

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

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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

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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 40+00 TO STA 44+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **40** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 10:59pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

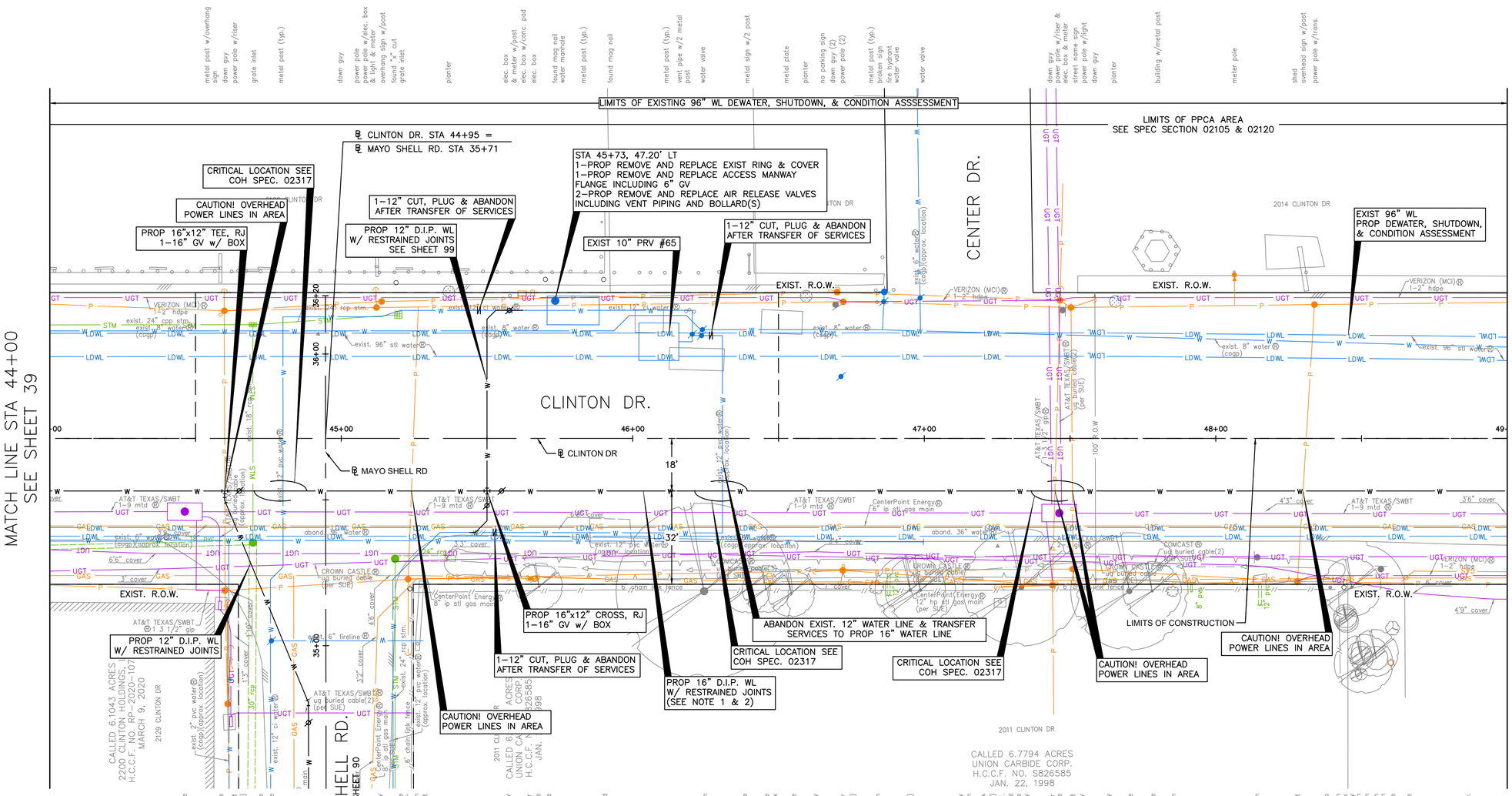
N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-23
SET 1/2" I.R. W/CAP
D. BL STA. 47+25.17
OFFSET: 36.98R



SEE SHEET 42 FOR PROFILE

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

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Signature valid for one year.

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

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TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

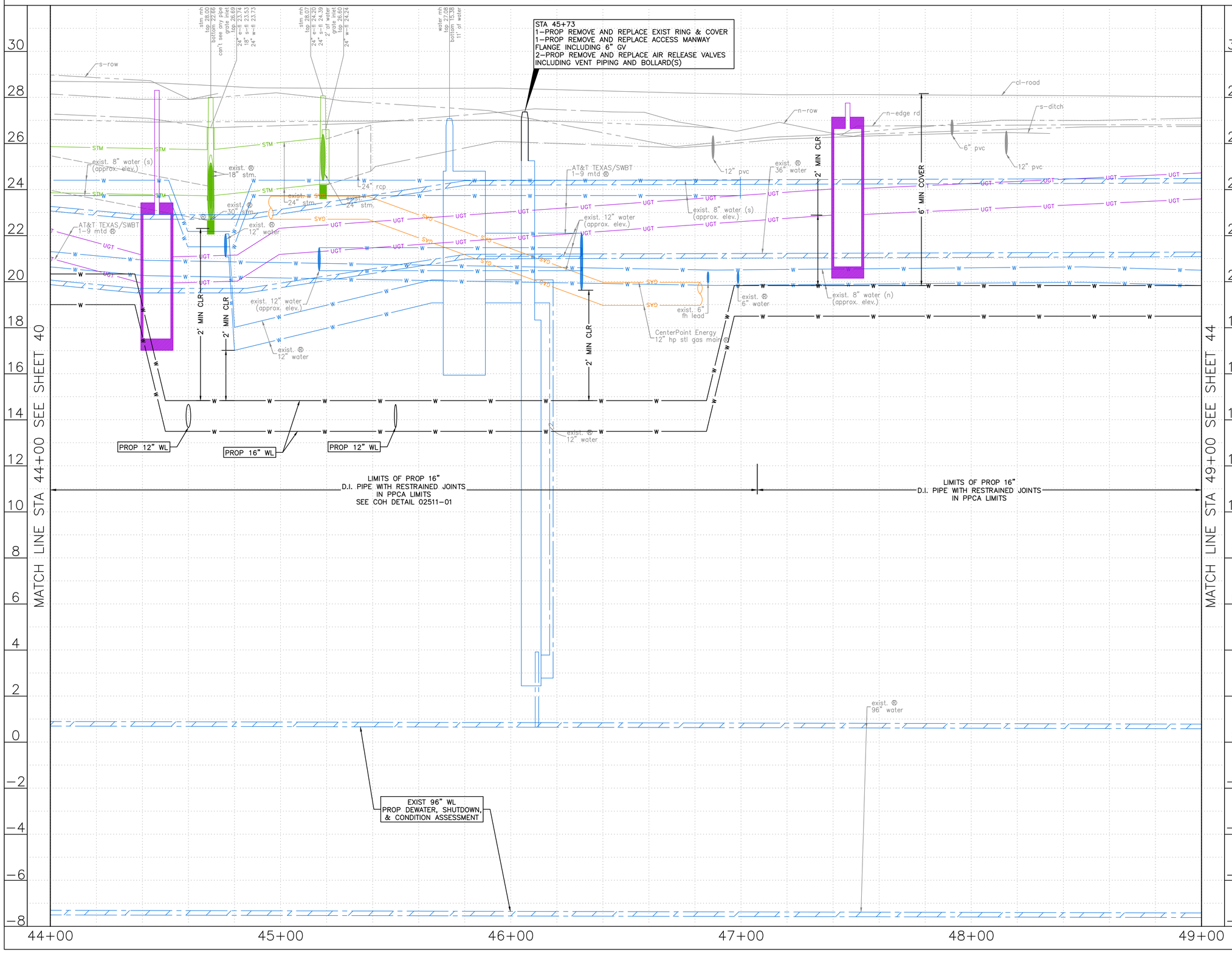
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 44+00 TO STA 49+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 41 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:01pm

SEE SHEET 41 FOR PLAN



NO.	DATE	REVISION	APP.

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

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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

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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
PHONE: 713–975–8769
TX ENGR. FIRM NO.: F–4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713–266–6900
TX FIRM NO.: F–2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96–INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F–2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

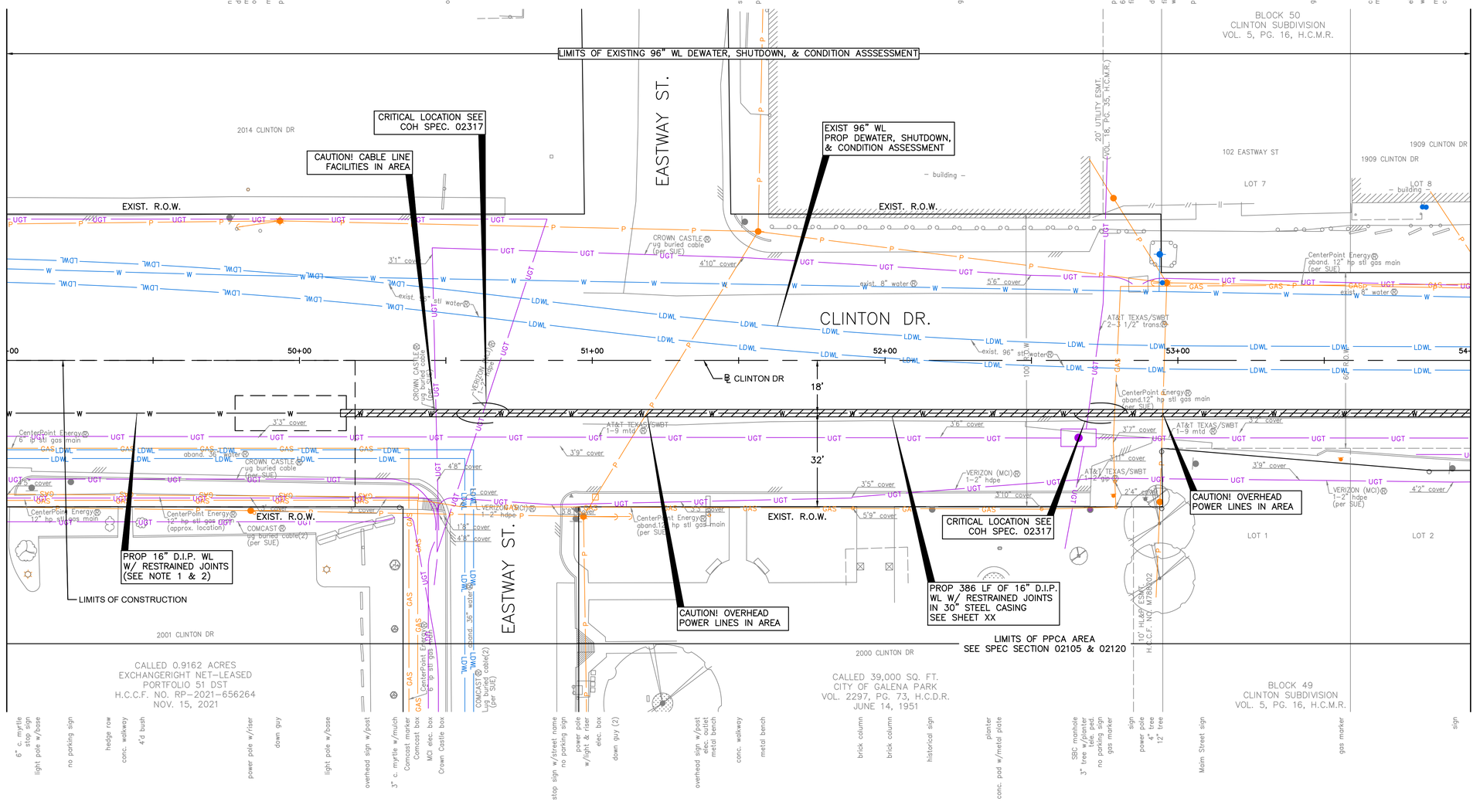
PROFILE
STA 44+00 TO STA 49+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **42** OF 204	

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Clinton Dr 2.dwg plotted on Aug 15, 2025 – 11:02pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 44 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-24
SET 'X' CUT ON CONC.
D. BL STA. 50+92.83
OFFSET: 46.37R

NOTICE:
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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

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Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

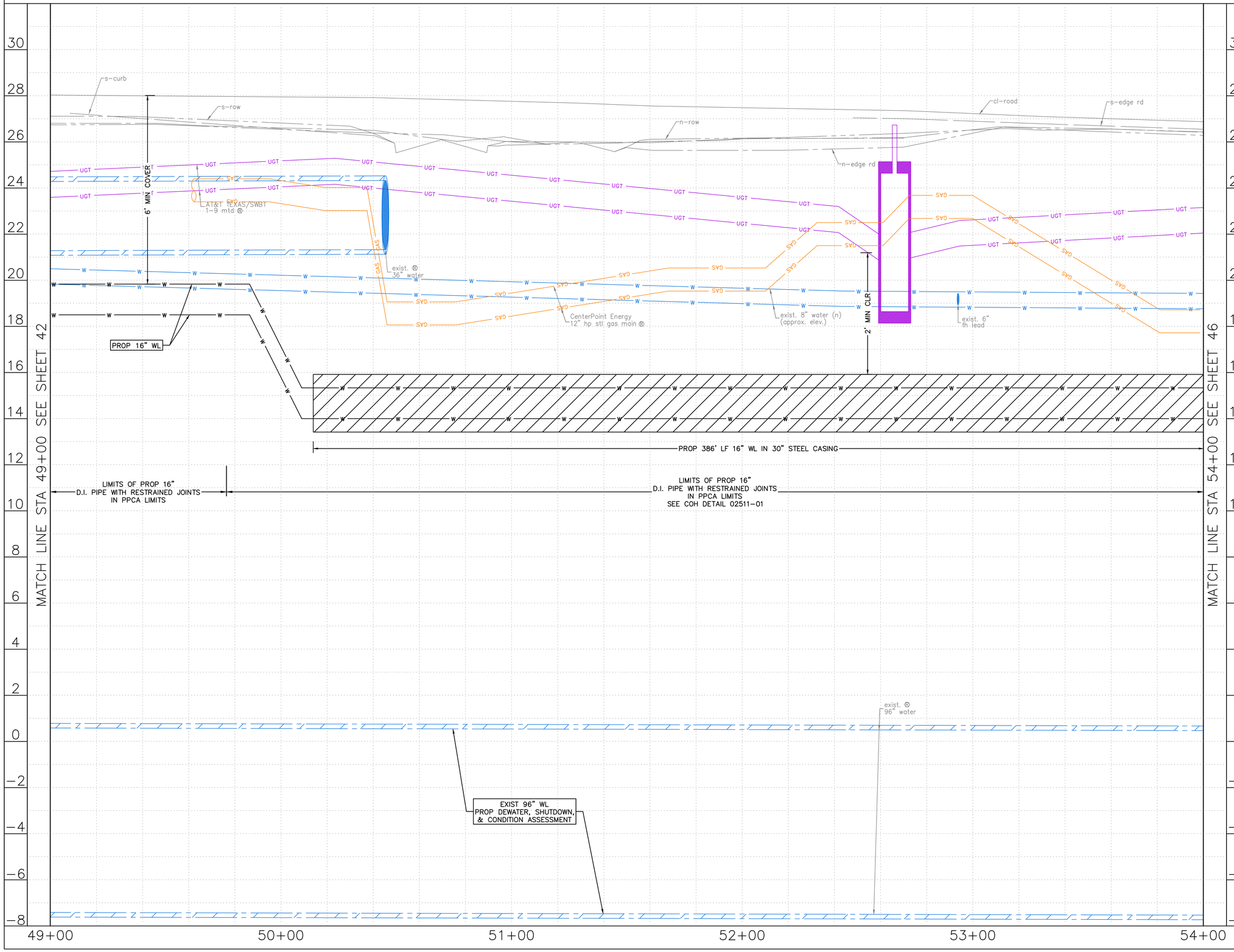
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 49+00 TO STA 54+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 43 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:04pm

SEE SHEET 43 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

CLINTON DRIVE

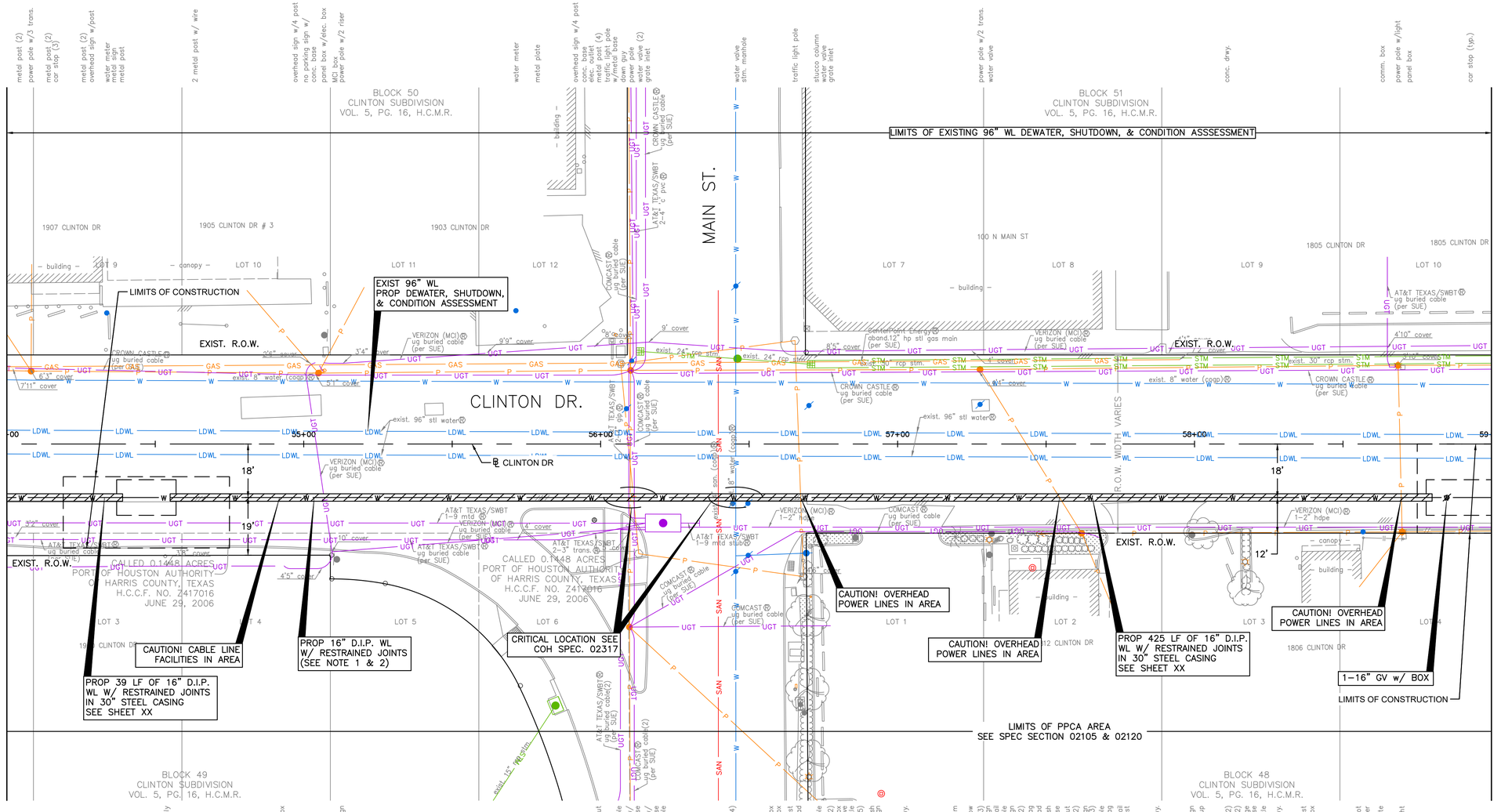
PROFILE
STA 49+00 TO STA 54+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **44** OF 204	

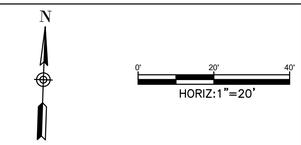
S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:05pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 46 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-25
SET 'X' CUT ON CONC.
D. BL STA. 55+97.89
OFFSET: 25.56R

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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

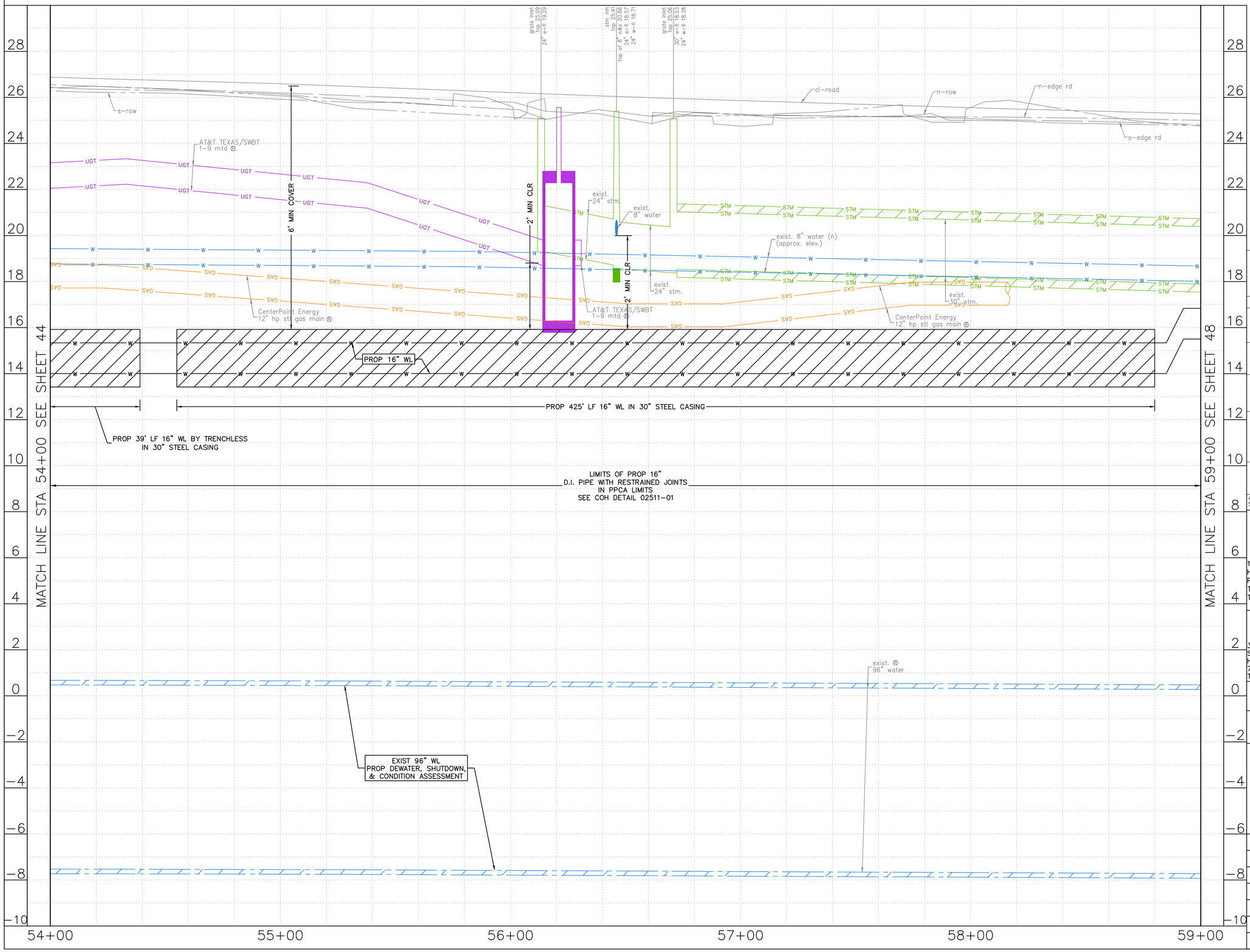
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 54+00 TO STA 59+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **45** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:07pm

SEE SHEET 45 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 54+00 TO STA 59+00

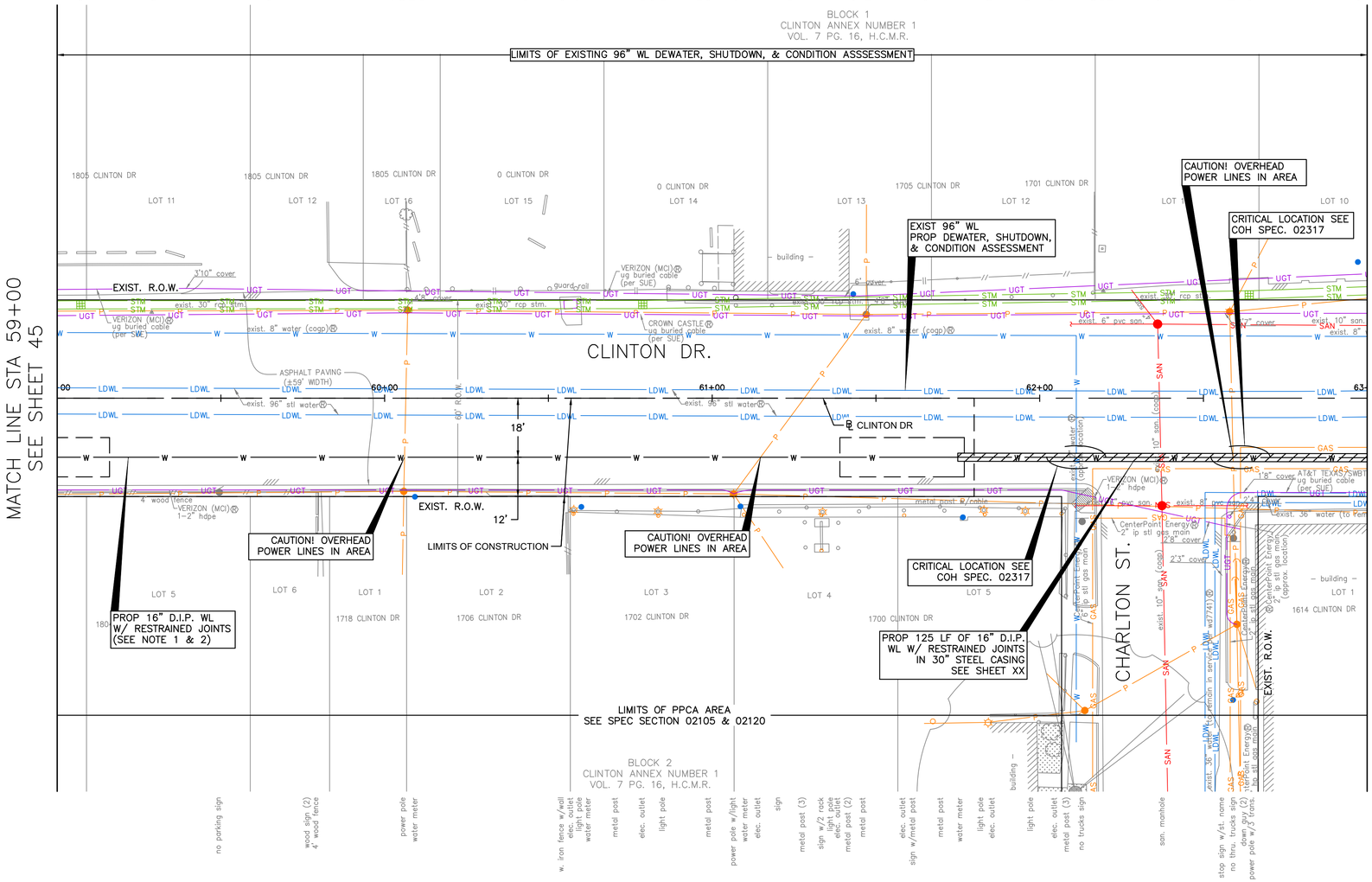
WBS NUMBER	S-000701-0038-3
DRAWING SCALE	H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM	SHAN HANG LEI, P.E.
SHEET NO.	46 OF 204

FOR CITY OF HOUSTON USE ONLY

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:08pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 48 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-27
SET MAGNAIL W/SHINER
D. BL STA. 62+19.42
OFFSET: 32.75L

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

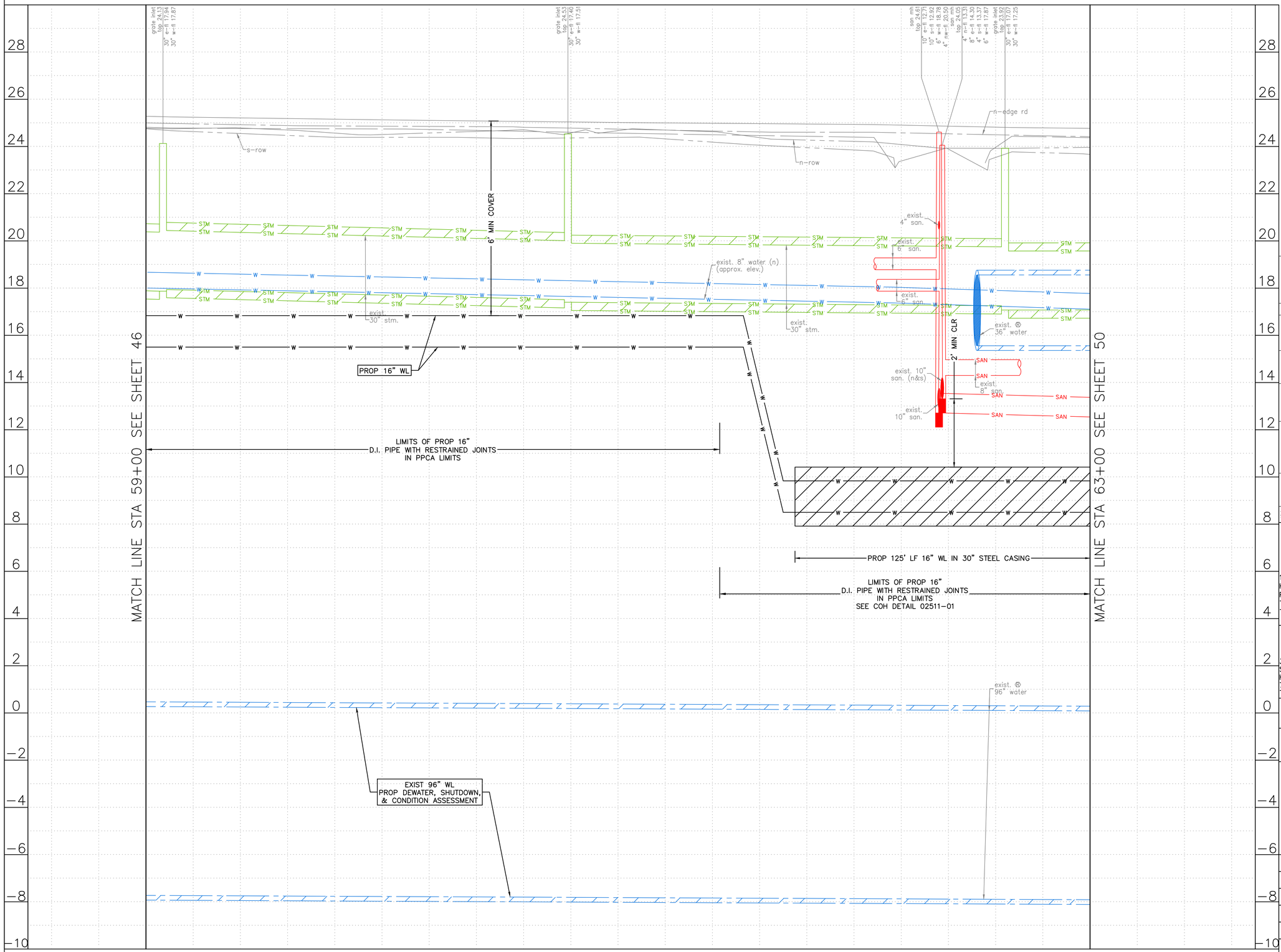
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 59+00 TO STA 63+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **47** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:10pm

SEE SHEET 47 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.this document is released for the purpose of interim review under the authority of:
Engineer:_____
WILLIAM W. BYLAND, PE
Registration Number:_____142061
Date:_____06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

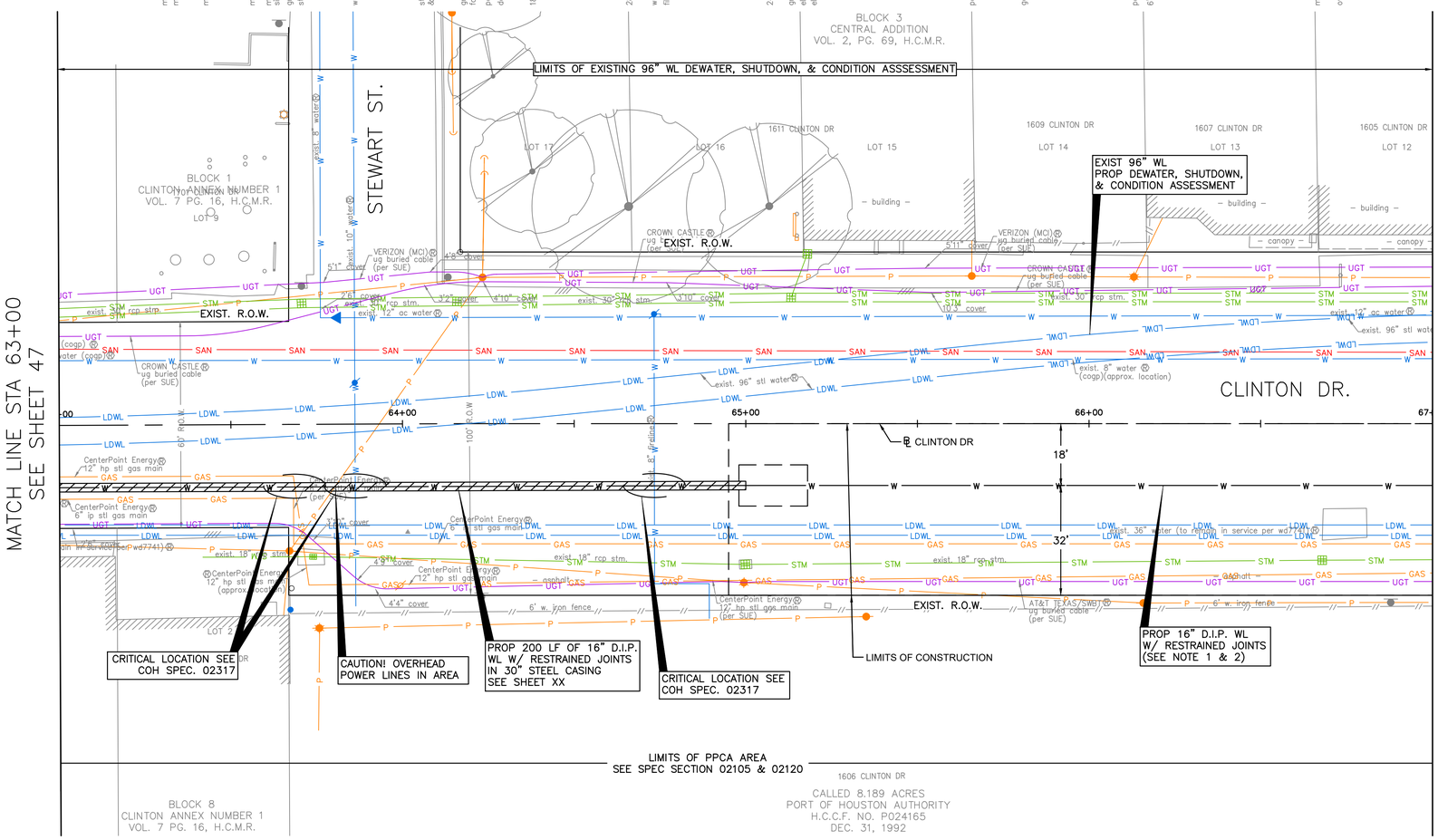
PROFILE
STA 59+00 TO STA 63+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **48** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:11pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



N

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

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-28
SET MAGNAIL W/SHINER
D. BL STA. 64+01.39
OFFSET: 31.54R

NO.	DATE	REVISION	APP.

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYRLAND, PE
Registration Number: 142061
Date: 06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

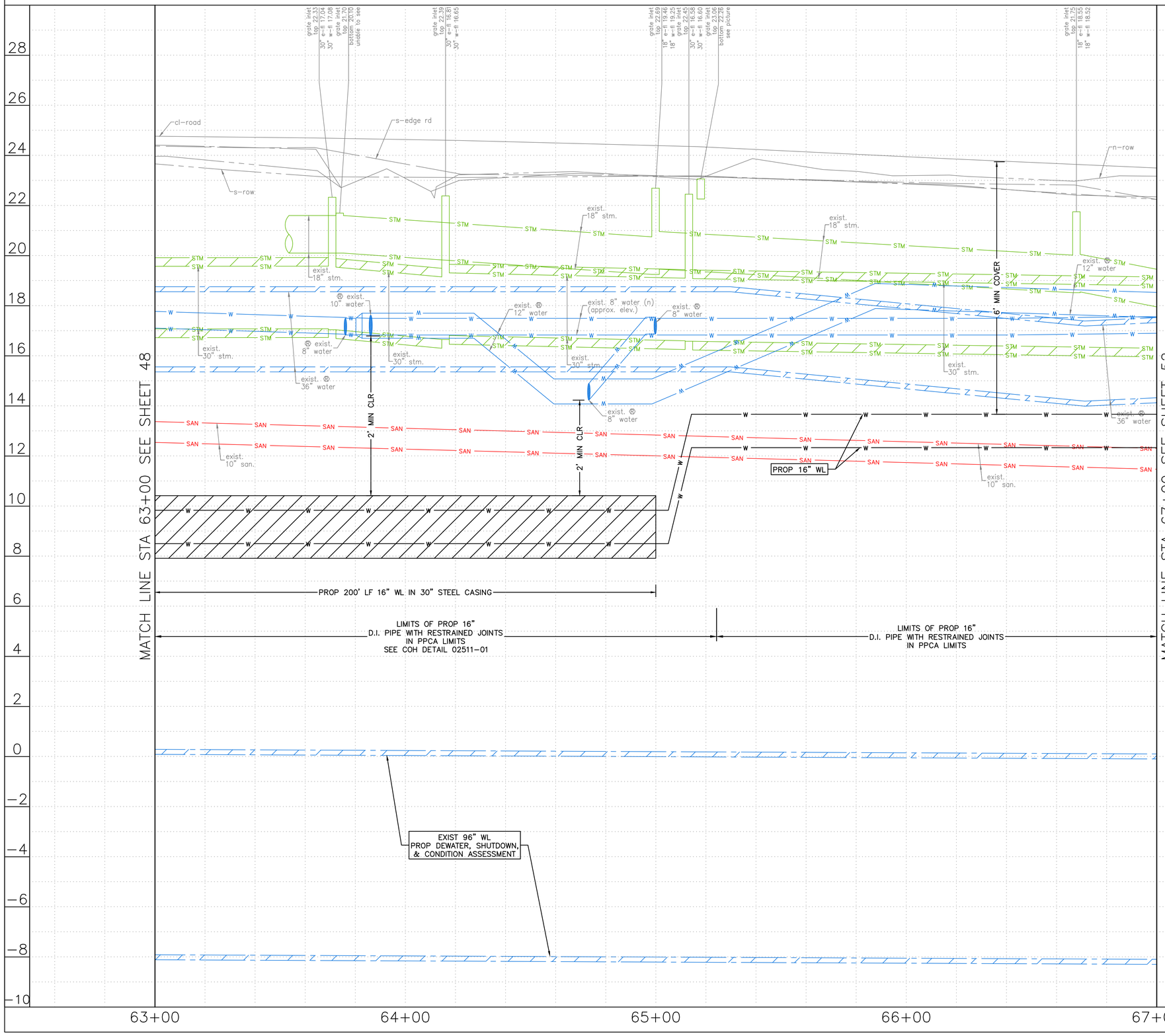
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 63+00 TO STA 67+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 49 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:13pm

SEE SHEET 49 FOR PLAN



NO.	DATE	REVISION	APP.

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

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.this document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

CLINTON DRIVE

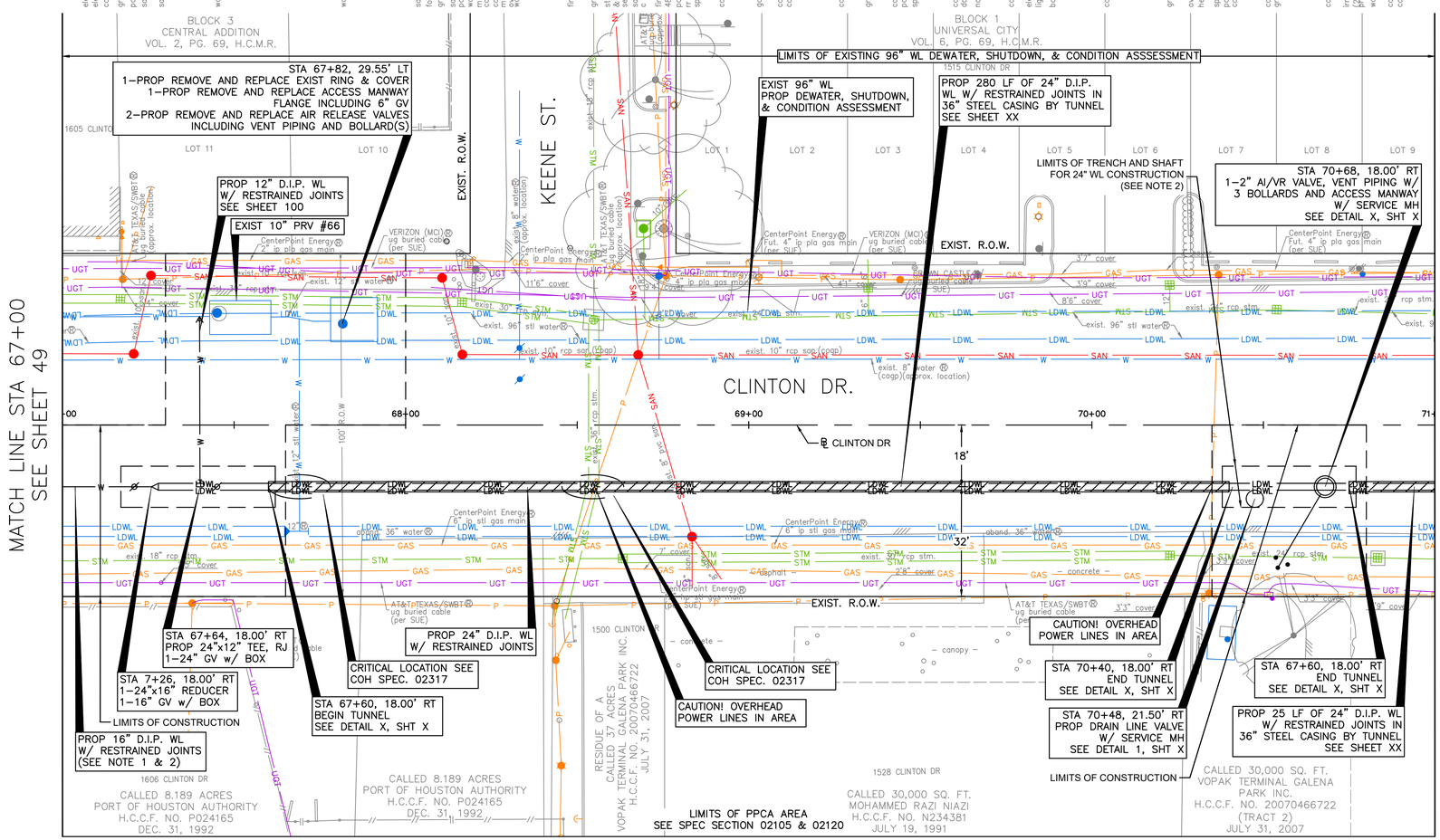
PROFILE
STA 63+00 TO STA 67+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **50** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 2.dwg plotted on Aug 15, 2025 - 11:14pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 52 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-29
SET MAGNAIL W/SHINER
D. BL STA. 68+66.47
OFFSET: 38.29L

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYRLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

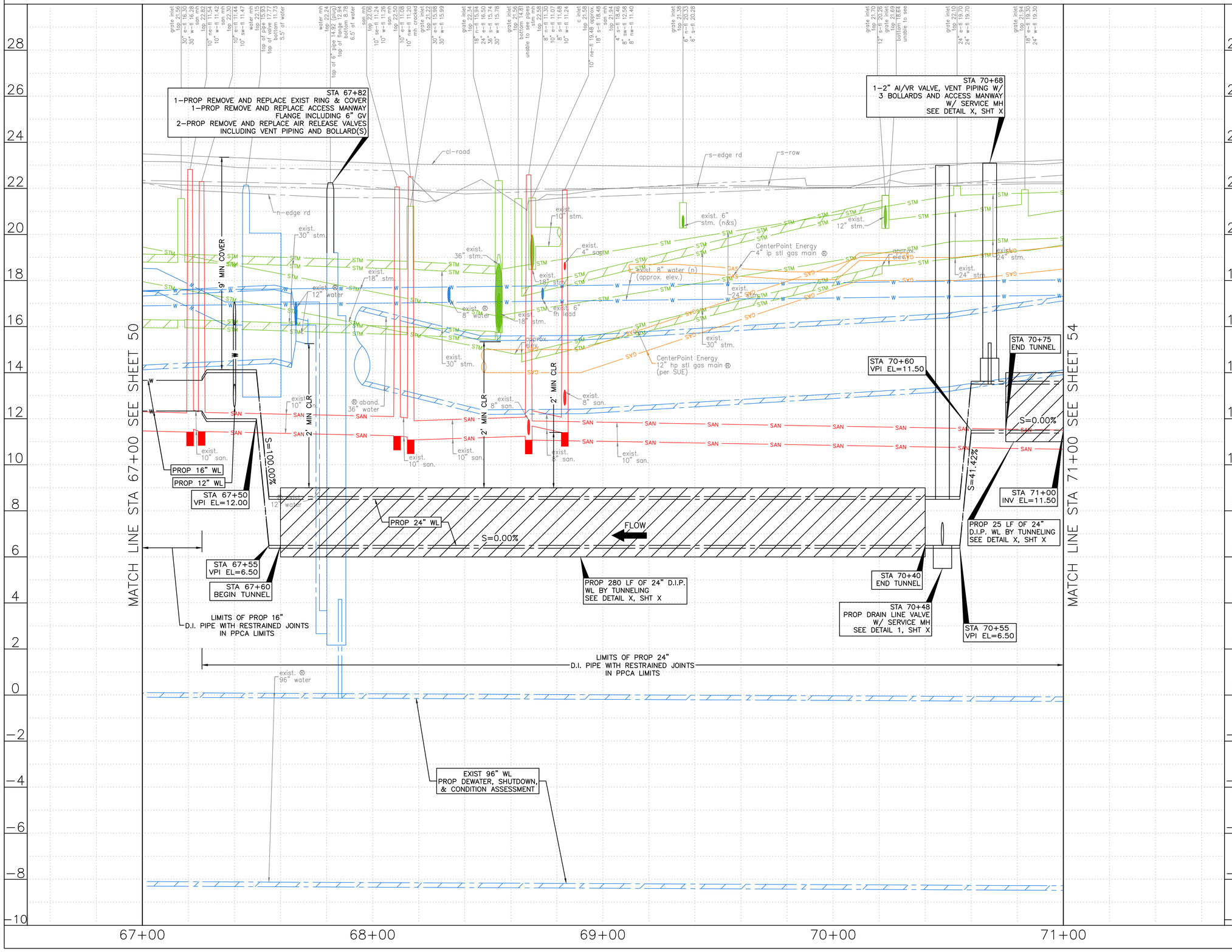
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 67+00 TO STA 71+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 51 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:16pm

SEE SHEET 51 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713–266–6900
TX FIRM NO.: F–2614

FOR 96–INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F–2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

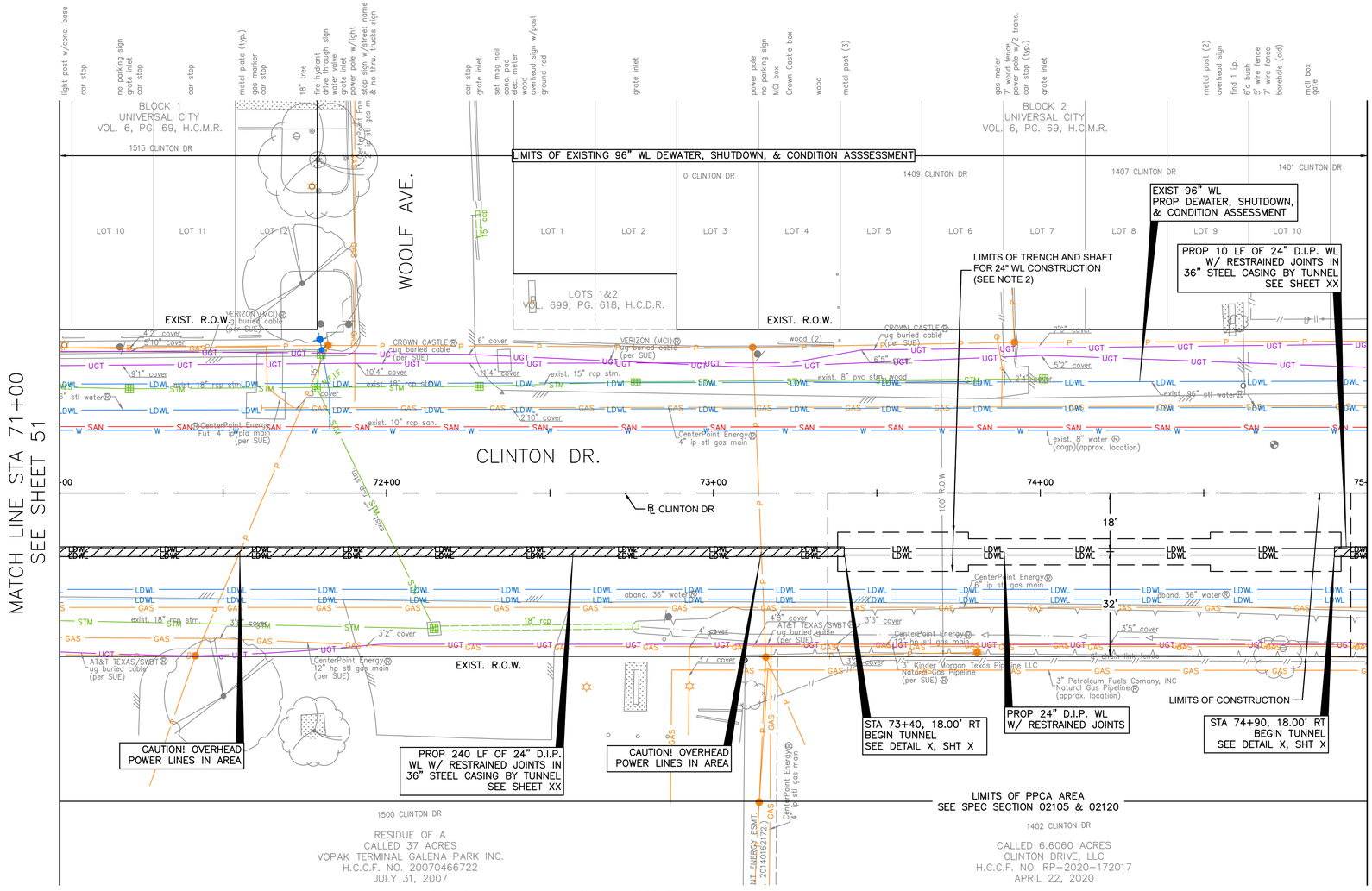
PROFILE
STA 67+00 TO STA 71+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 52 OF 204	

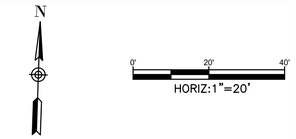
S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Clinton Dr 3.dwg plotted on Aug 15, 2025 – 11:17pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 54 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-30
SET MAGNAIL W/SHINER
D. BL STA. 72+35.33
OFFSET: 30.64L

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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Registration Number: 142061
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Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

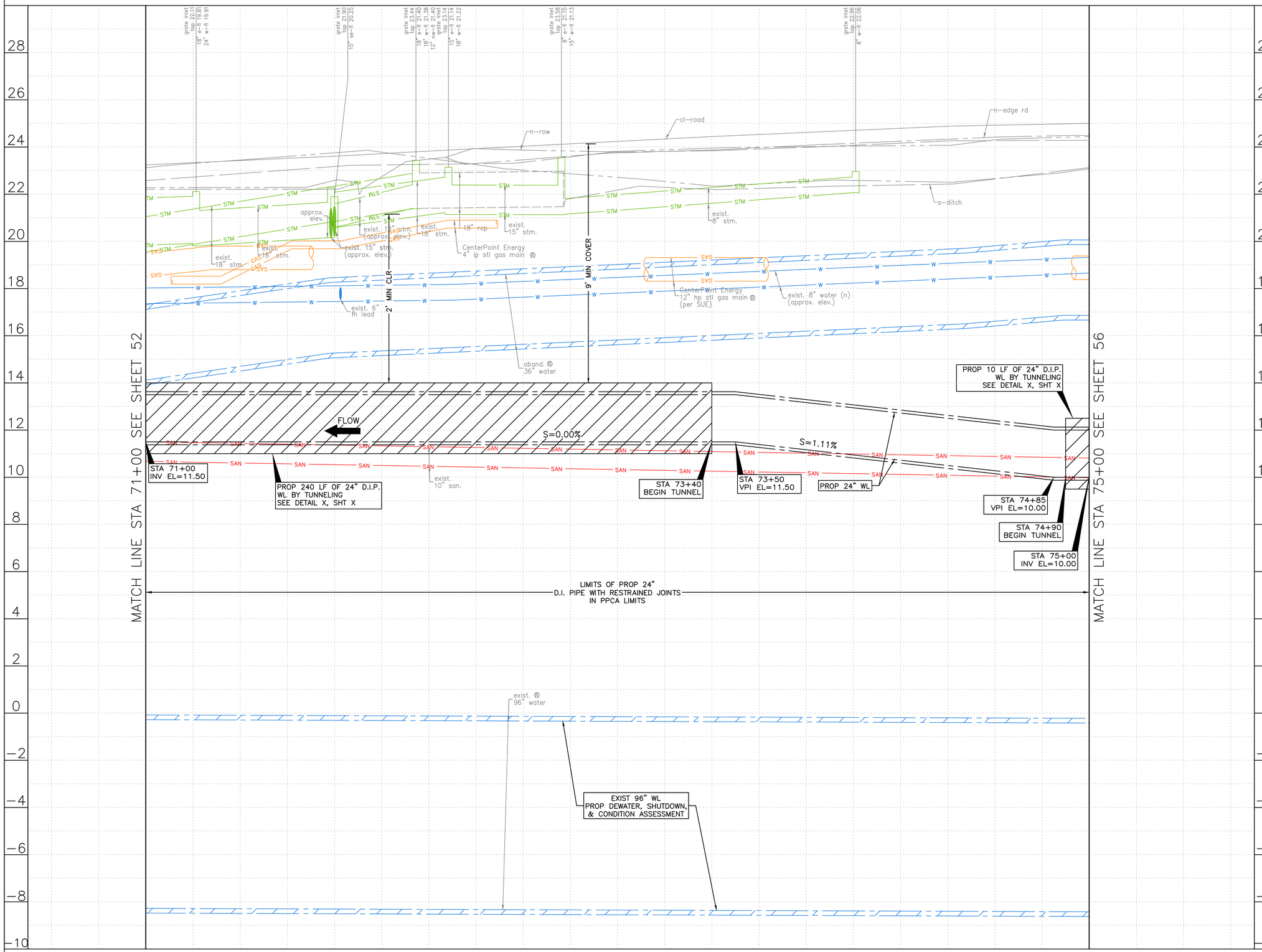
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 71+00 TO STA 75+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 53 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:19pm

SEE SHEET 53 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Signature valid for six months.

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Date

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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

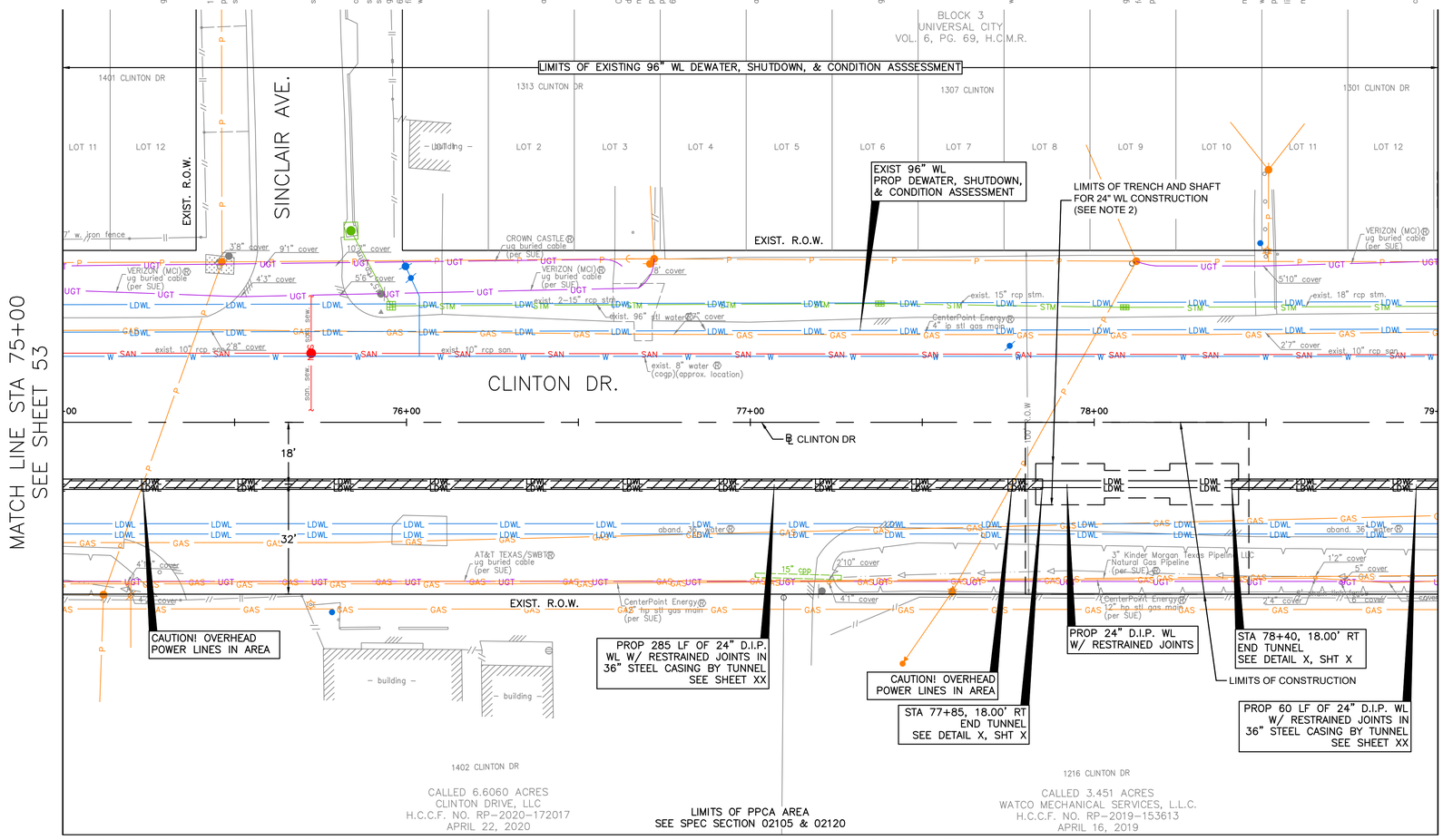
PROFILE
STA 71+00 TO STA 75+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **54** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:20pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 56 FOR PROFILE





NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-31
SET 1/2" I.R. W/CAP
D. BL STA. 75+92.57
OFFSET: 32.01L

NOTICE:
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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

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TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

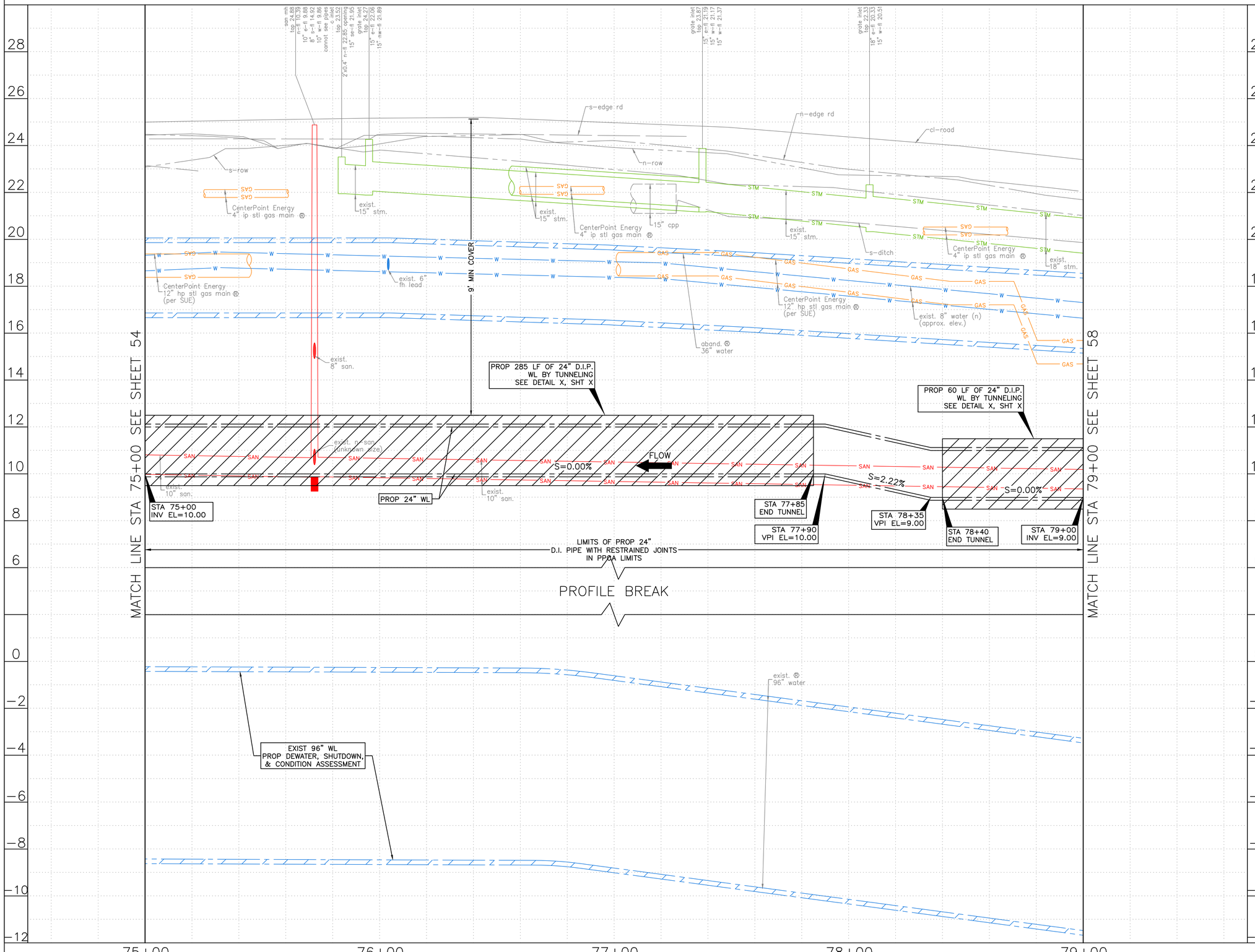
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 75+00 TO STA 79+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 55 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:22pm

SEE SHEET 55 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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VERIFICATION OF PRIVATE UTILITY LINES

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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

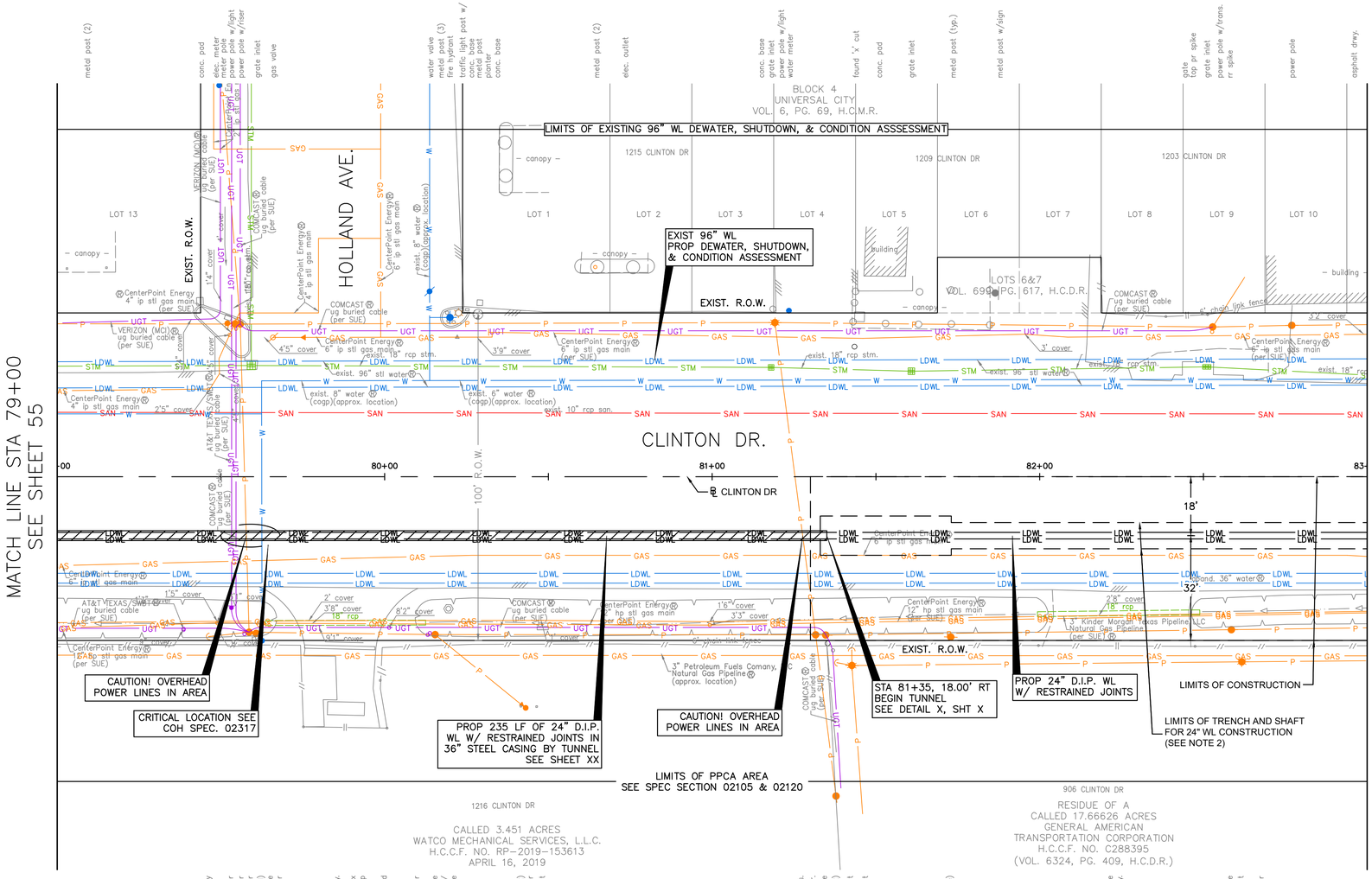
PROFILE
STA 75+00 TO STA 79+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 56 OF 204	

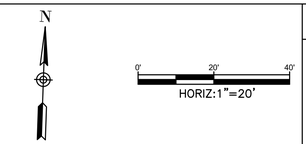
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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 58 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-32
SET MAGNAIL W/SHINER
D. BL STA. 80+22.15
OFFSET: 42.59L

NOTICE:
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VERIFICATION OF PRIVATE UTILITY LINES

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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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

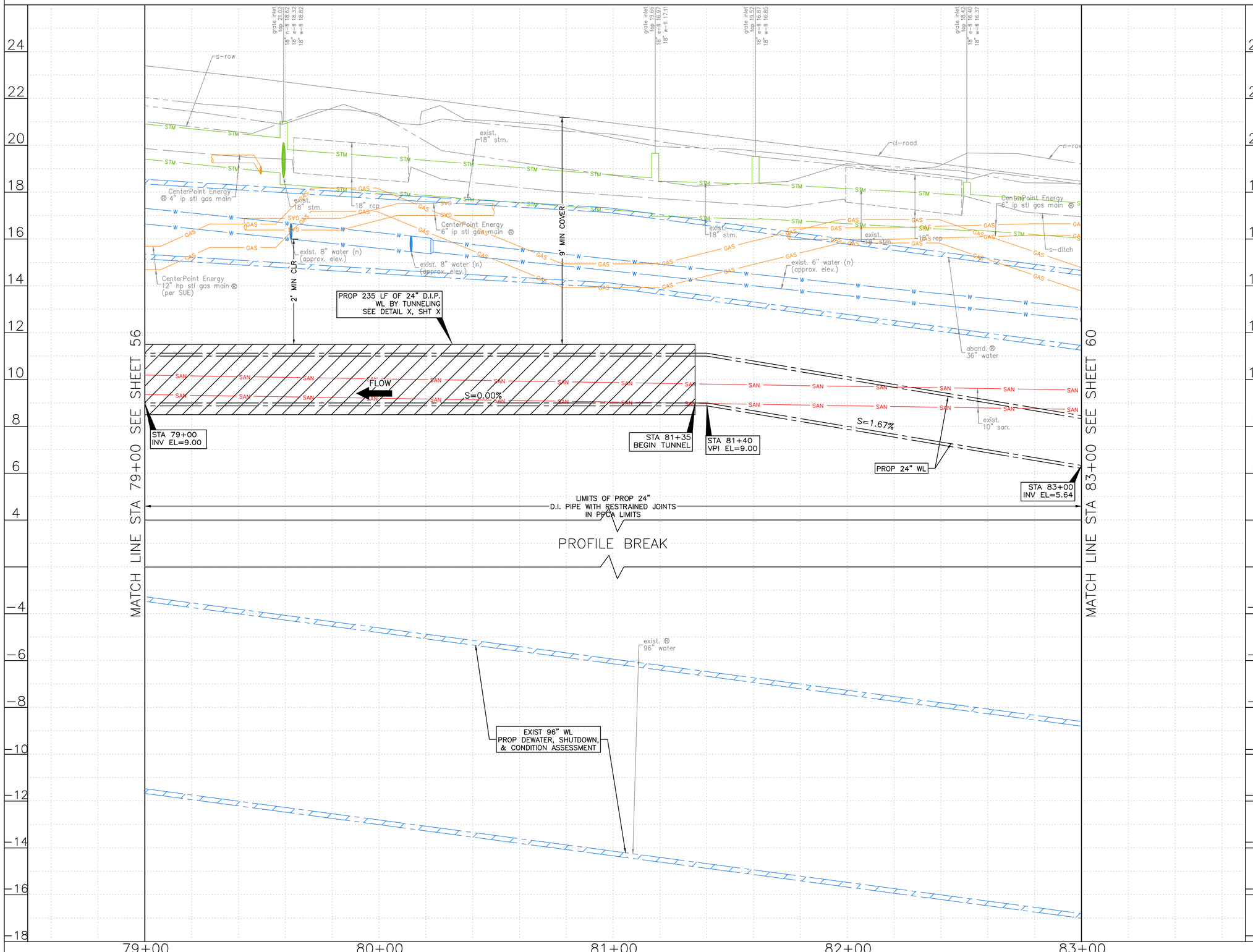
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 79+00 TO STA 83+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 57 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:26pm

SEE SHEET 57 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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Date

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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

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KUO & ASSOCIATES, LLC. TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

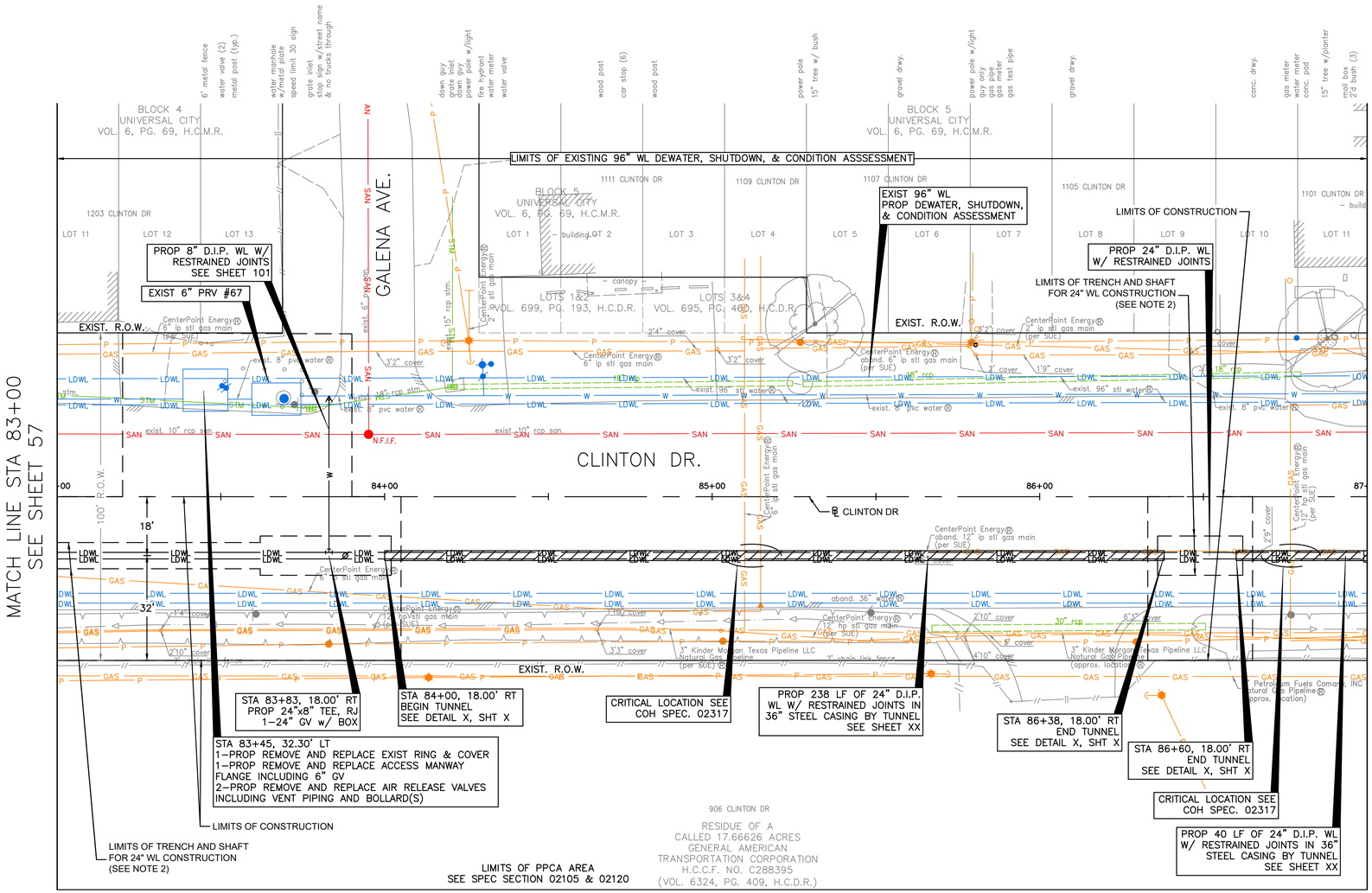
PROFILE
STA 79+00 TO STA 83+00

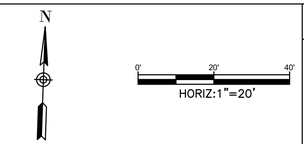
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **58** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:29pm

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.





NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-33
SET 1/2" I.R. W/CAP
D. BL STA. 84+08.59
OFFSET: 35.21R

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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

ON 08/15/2025
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TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

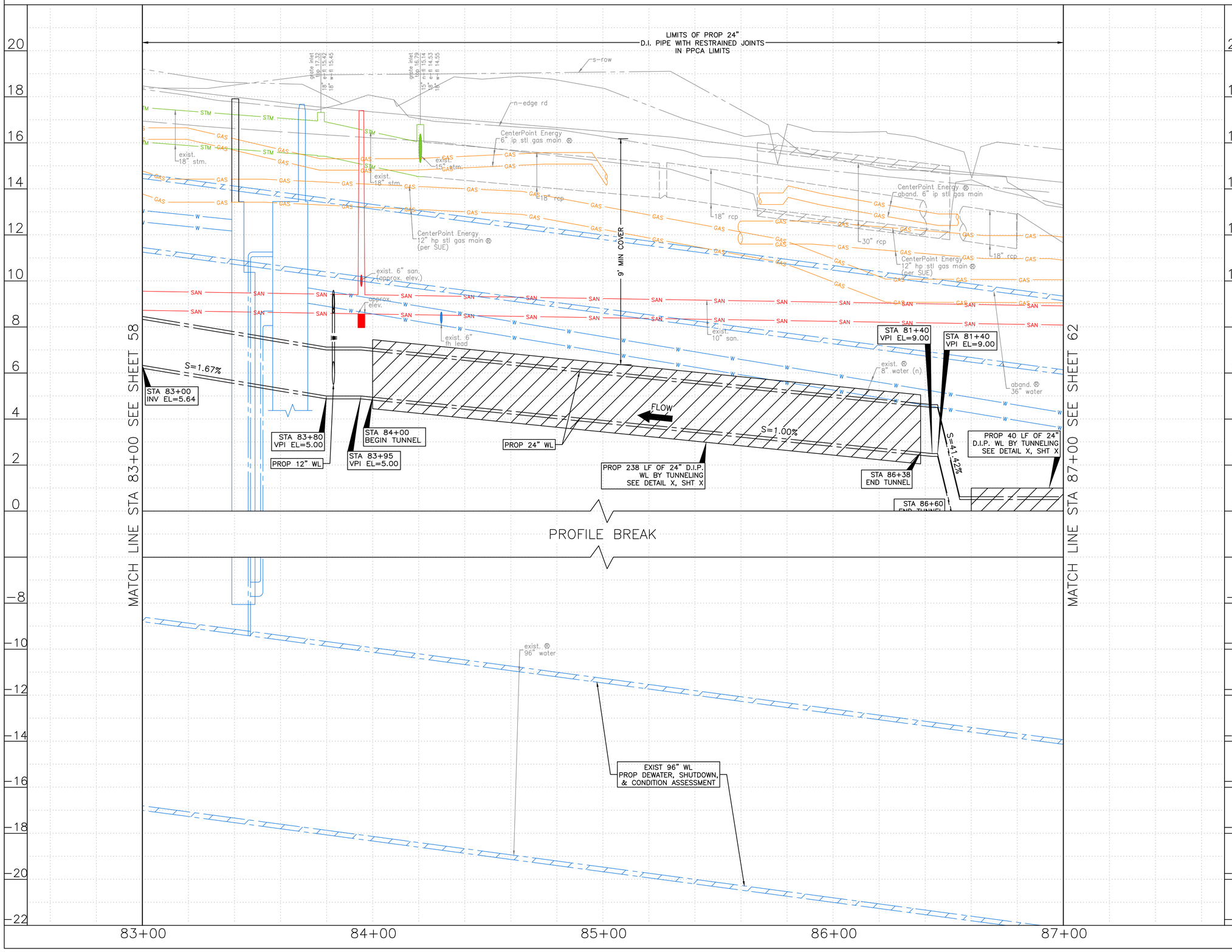
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 83+00 TO STA 87+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **59** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:30pm

SEE SHEET 59 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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Date

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Signature valid for one year.

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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 83+00 TO STA 87+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 60 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:33pm

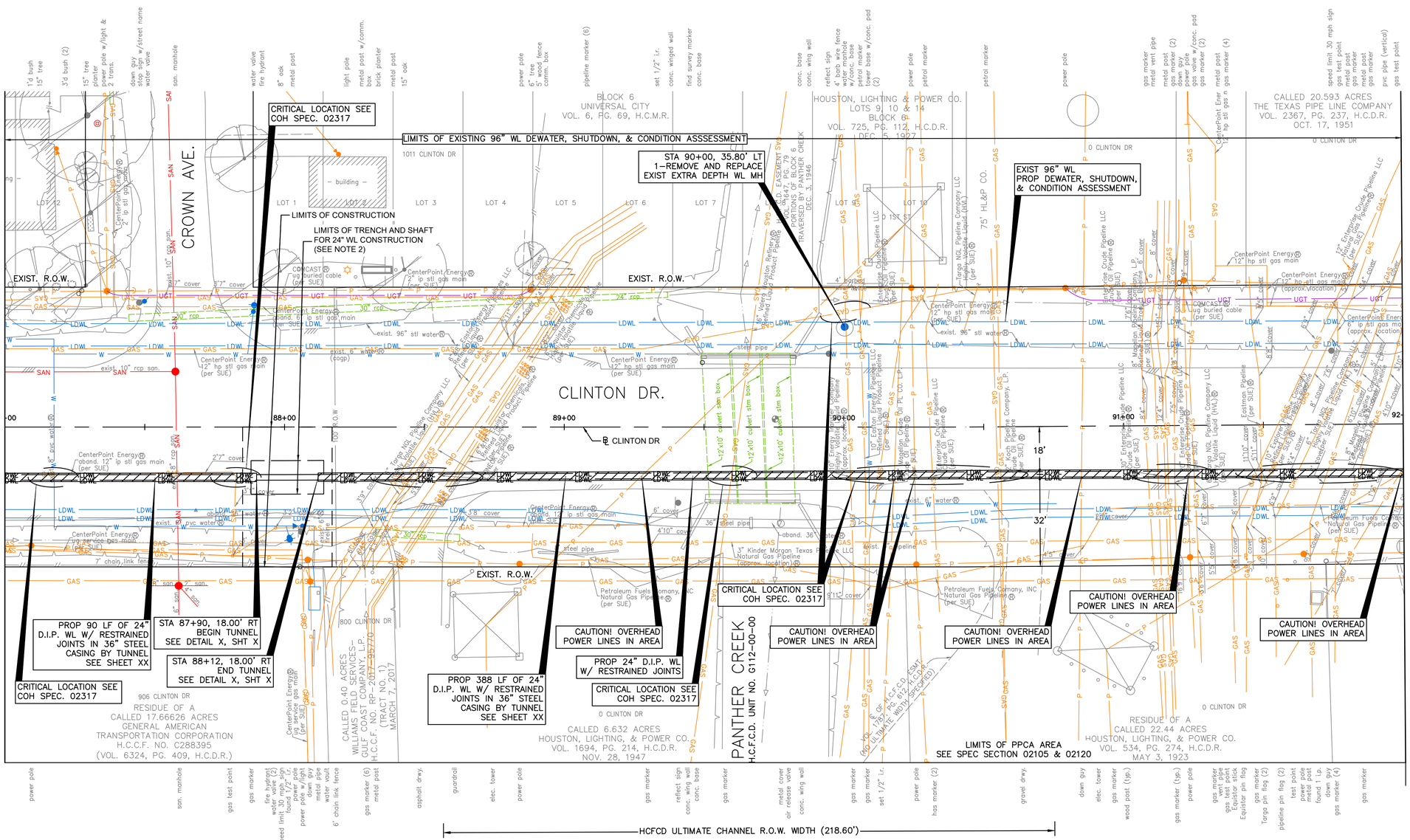
NOTE:

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SITE PLANS MUST BE APPROVED PRIOR TO OBTAINING THE REQUIRED HCFCD RIGHT-OF-WAY NOTIFICATION. BE ADVISED THAT THE HCFCD RIGHT-OF-WAY NOTIFICATION IS SEPARATE FROM THE SITE DEVELOPMENT PERMIT PACKAGE

1.) HCFCD RIGHT-OF-WAY NOTIFICATION (PERMIT)
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FAILURE TO PROVIDE BOTH ITEMS COULD RESULT IN PROJECT DELAYS.



N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-34
SET MAGNAIL W/SHINER
D. BL STA. 87+68.29
OFFSET: 29.84R

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 87+00 TO STA 92+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 61 OF 204	

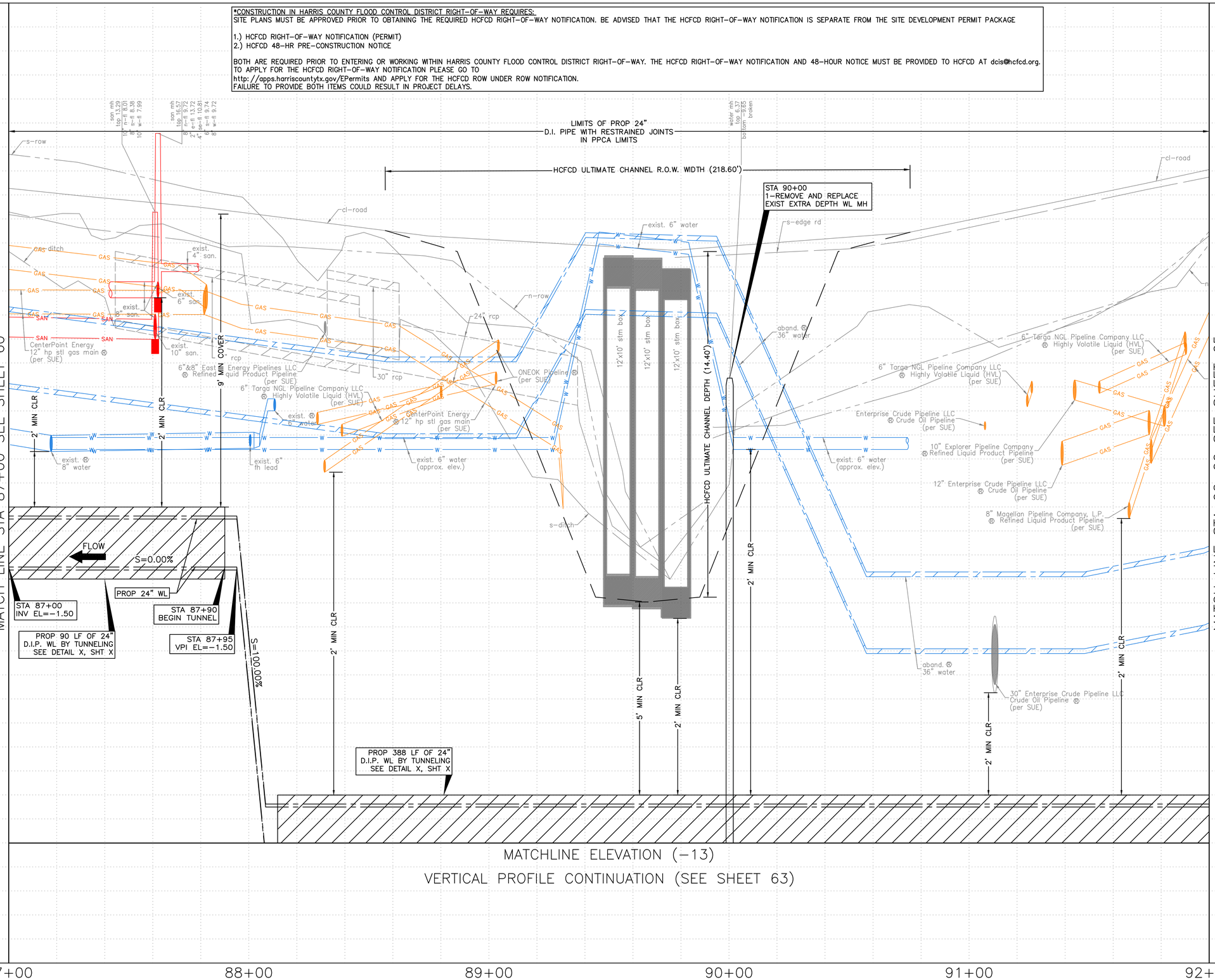
S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:35pm

SEE SHEET 61 FOR PLAN

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

NO.	DATE	REVISION	APP.

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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

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 87+00 TO STA 92+00
(SHEET 1 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 62 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:36pm

SEE SHEET 61 FOR PLAN

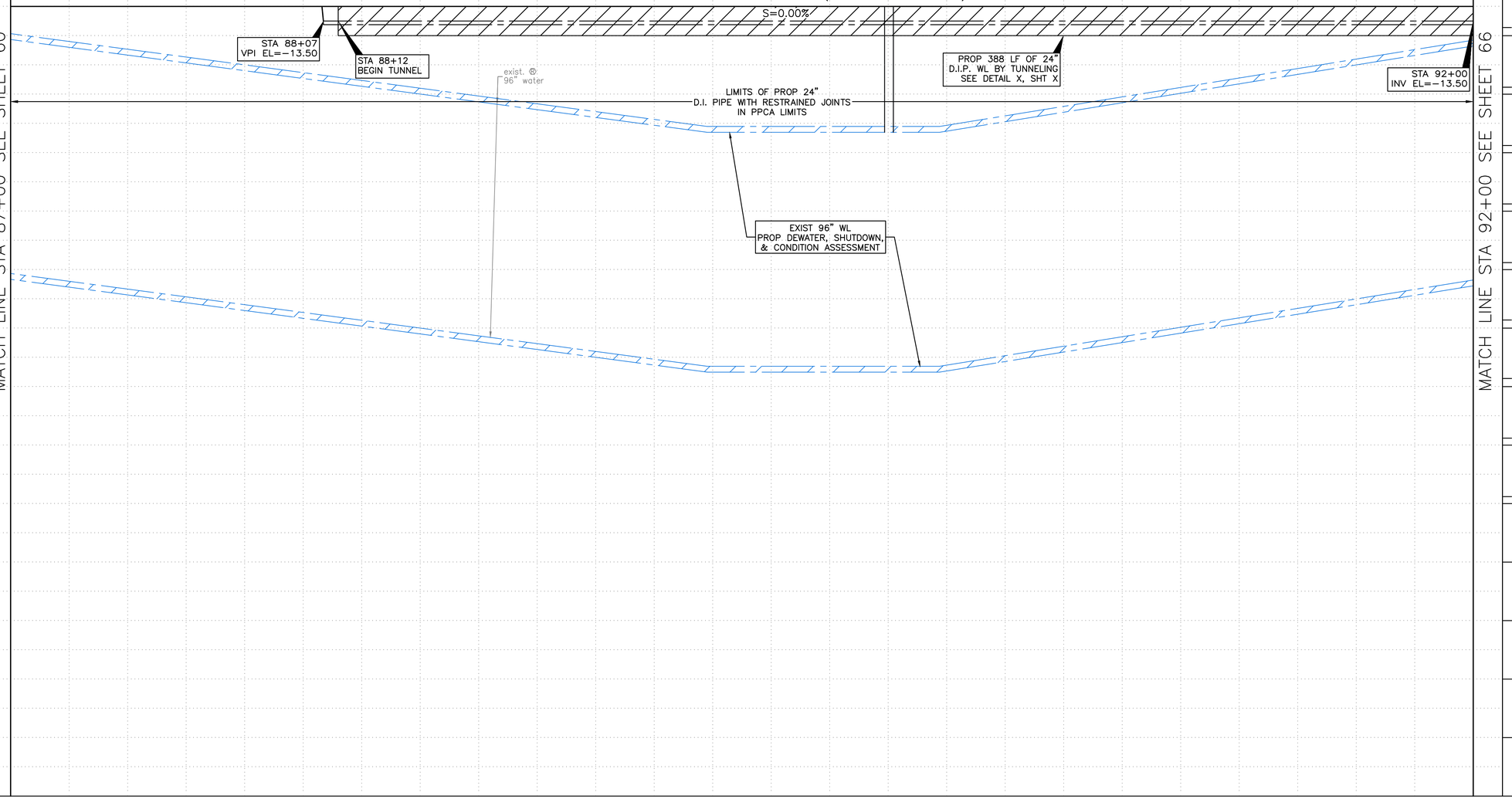
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MATCHLINE ELEVATION (-13)

VERTICAL PROFILE CONTINUATION (SEE SHEET 62)



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

NO.	DATE	REVISION	APP.

NOTE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
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FB NO.

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Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

CLINTON DRIVE

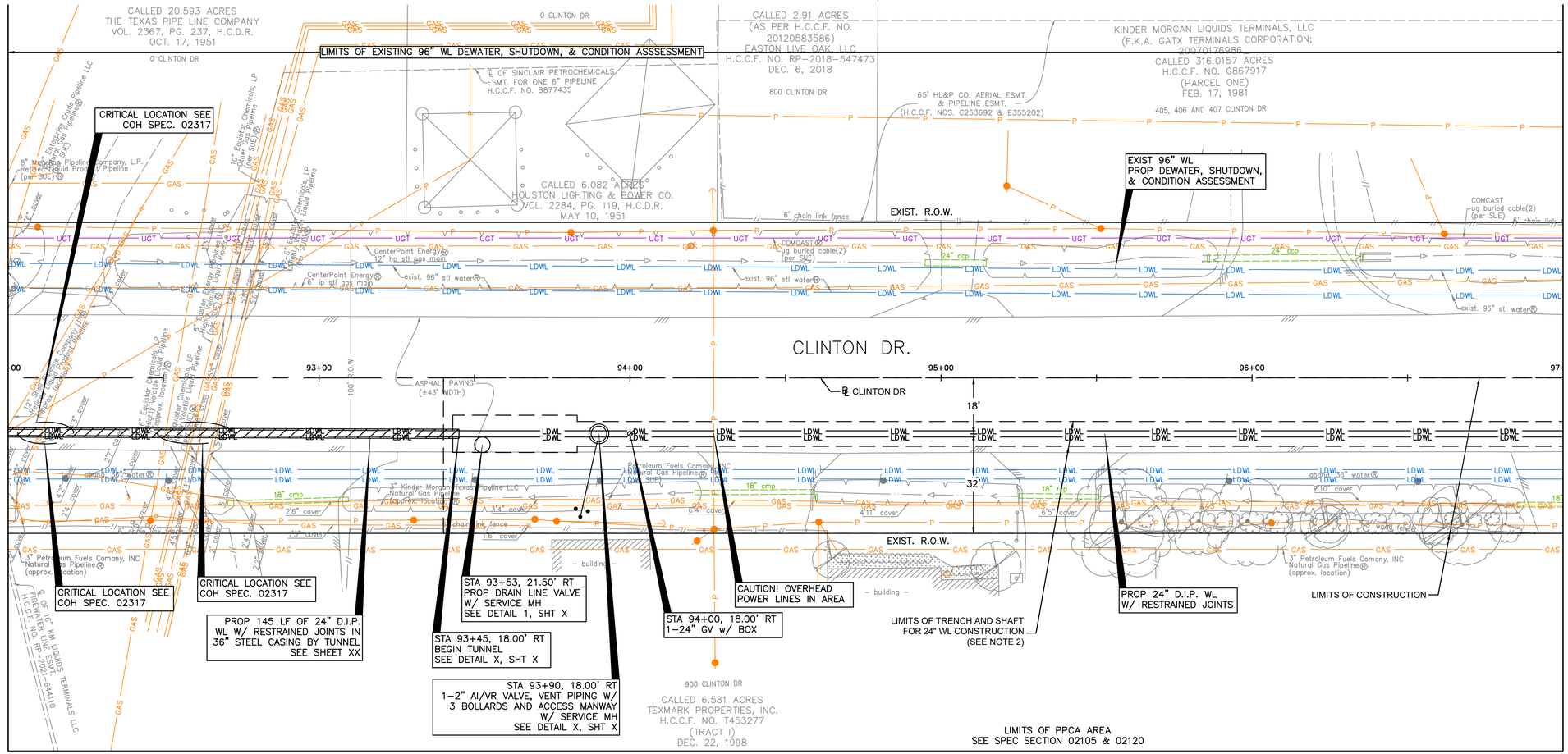
PROFILE
STA 87+00 TO STA 92+00
(SHEET 2 OF 2)

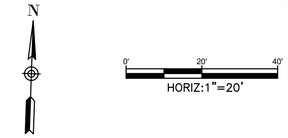
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 63 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 3.dwg plotted on Aug 15, 2025 - 11:38pm

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NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-37
SET MAGNAIL W/SHINER
D. BL STA. 94+94.60
OFFSET: 25.45L

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PHONE: 713-975-8769
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713-266-6900
TX FIRM NO.: F-2614

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Registration Number: 142061
Date: 06/02/2025
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Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 92+00 TO STA 97+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 64 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:39pm

SEE SHEET 64 FOR PLAN

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

STA 93+53
PROP DRAIN LINE VALVE
W/ SERVICE MH
SEE DETAIL 1, SHT X

STA 93+90
1-2" AI/VR VALVE, VENT PIPING W/
3 BOLLARDS AND ACCESS MANWAY
W/ SERVICE MH
SEE DETAIL X, SHT X

s-row
n-row
s-ditch
n-ditch
18" cmp
18" cmp
24" cpp
18" rcp
24" cpp
9' MIN COVER
aband. Ø 36" water
FLOW
S=0.00%
S=100.00%
STA 93+82
VPI EL=8.00
PROP 24" WL
STA 97+00
INV EL=8.00

Ø 6" Equistar Chemicals, LP
Highly Volatile Liquid Pipeline
(PER sue)
GAS
GAS
6" Equistar Chemicals, LP Ø
Highly Volatile Liquid Pipeline
(PER sue)
Ø 6" Equistar Chemicals, LP
Highly Volatile Liquid Pipeline
(approx. location)
Ø10" Equistar Chemicals, LP
Other Gas Pipeline
(per SUE)
Ø 6" Equistar Chemicals, LP
Highly Volatile Liquid Pipeline
(approx. location)
12" Enterprise Crude Pipeline LLC
Crude Oil Pipeline Ø
(per SUE)
GAS

MATCH LINE STA 92+00 SEE SHEET 62
MATCH LINE STA 97+00 SEE SHEET 68

MATCHLINE ELEVATION (-5)
VERTICAL PROFILE CONTINUATION (SEE SHEET 66)

92+00 93+00 94+00 95+00 96+00 97+00

26 24 22 20 18 16 14 12 10 8 6 4 2 0 -2 -4 -6 -8 -10 -12

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

NO.	DATE	REVISION	APP.

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HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 92+00 TO STA 97+00
(SHEET 1 OF 2)

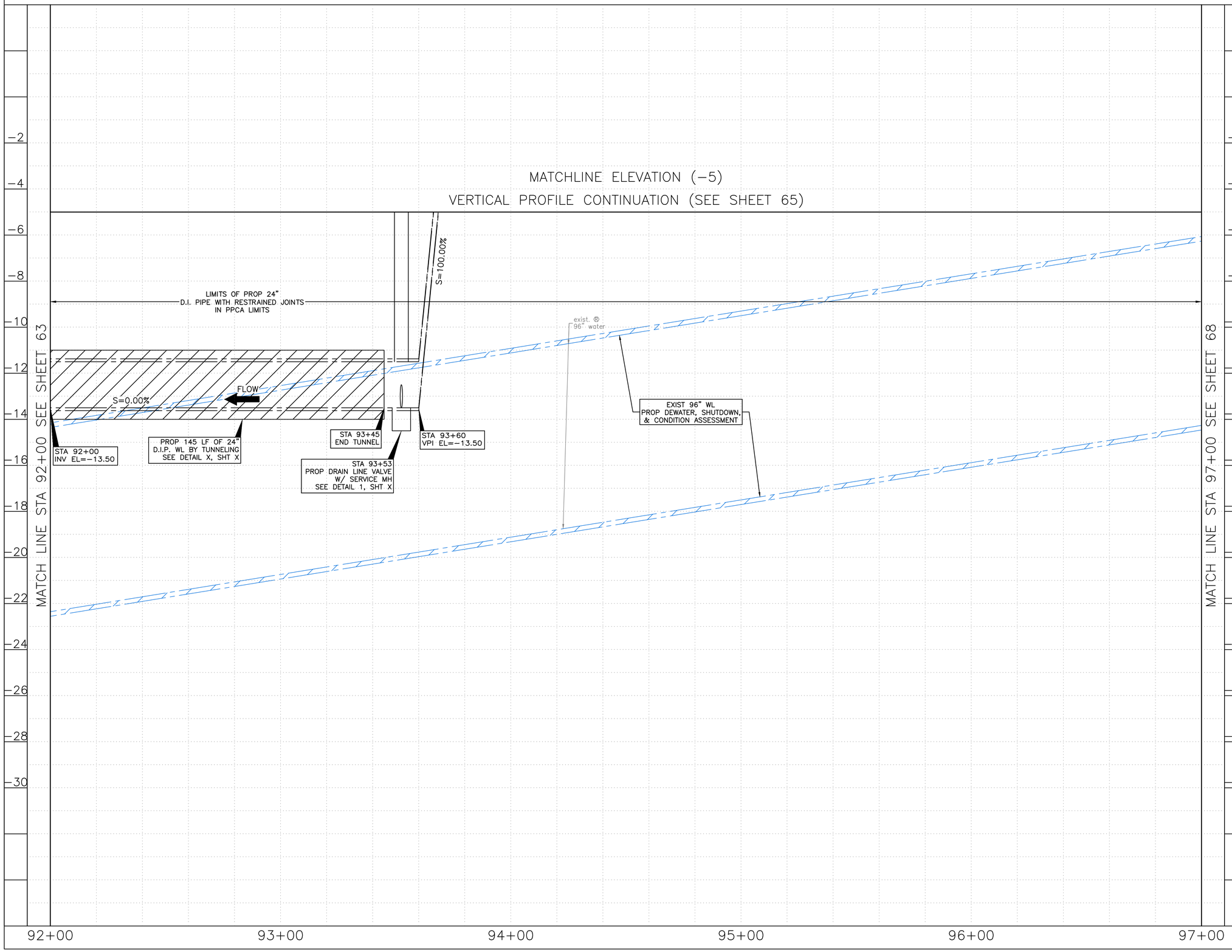
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 65 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:41pm

SEE SHEET 64 FOR PLAN

MATCHLINE ELEVATION (−5)

VERTICAL PROFILE CONTINUATION (SEE SHEET 65)



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025

Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

CLINTON DRIVE

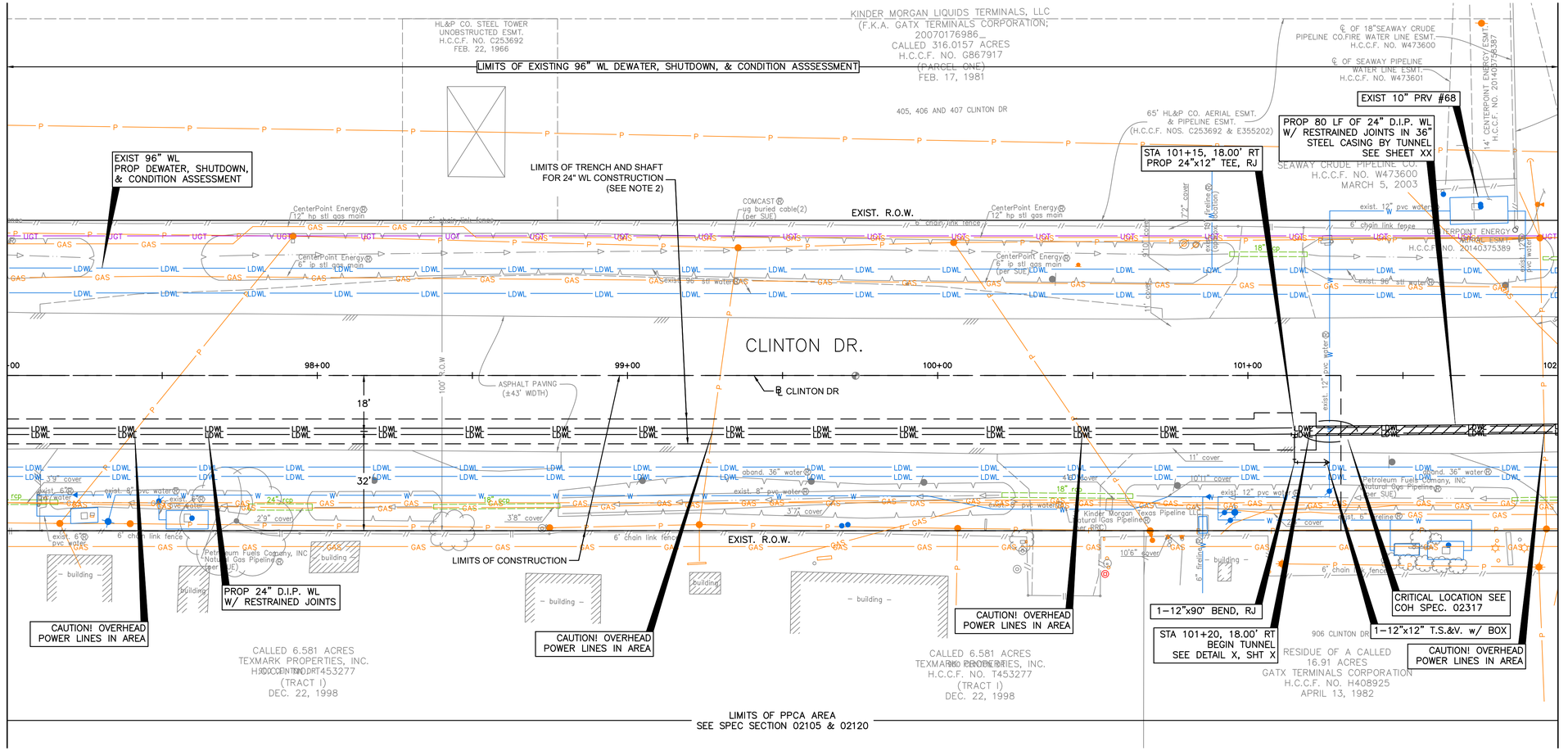
PROFILE
STA 92+00 TO STA 97+00
(SHEET 2 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **66** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:42pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 68 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-38
SET 1/2" I.R. W/CAP
D. BL STA. 99+90.21
OFFSET: 29.45L

NOTICE:
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

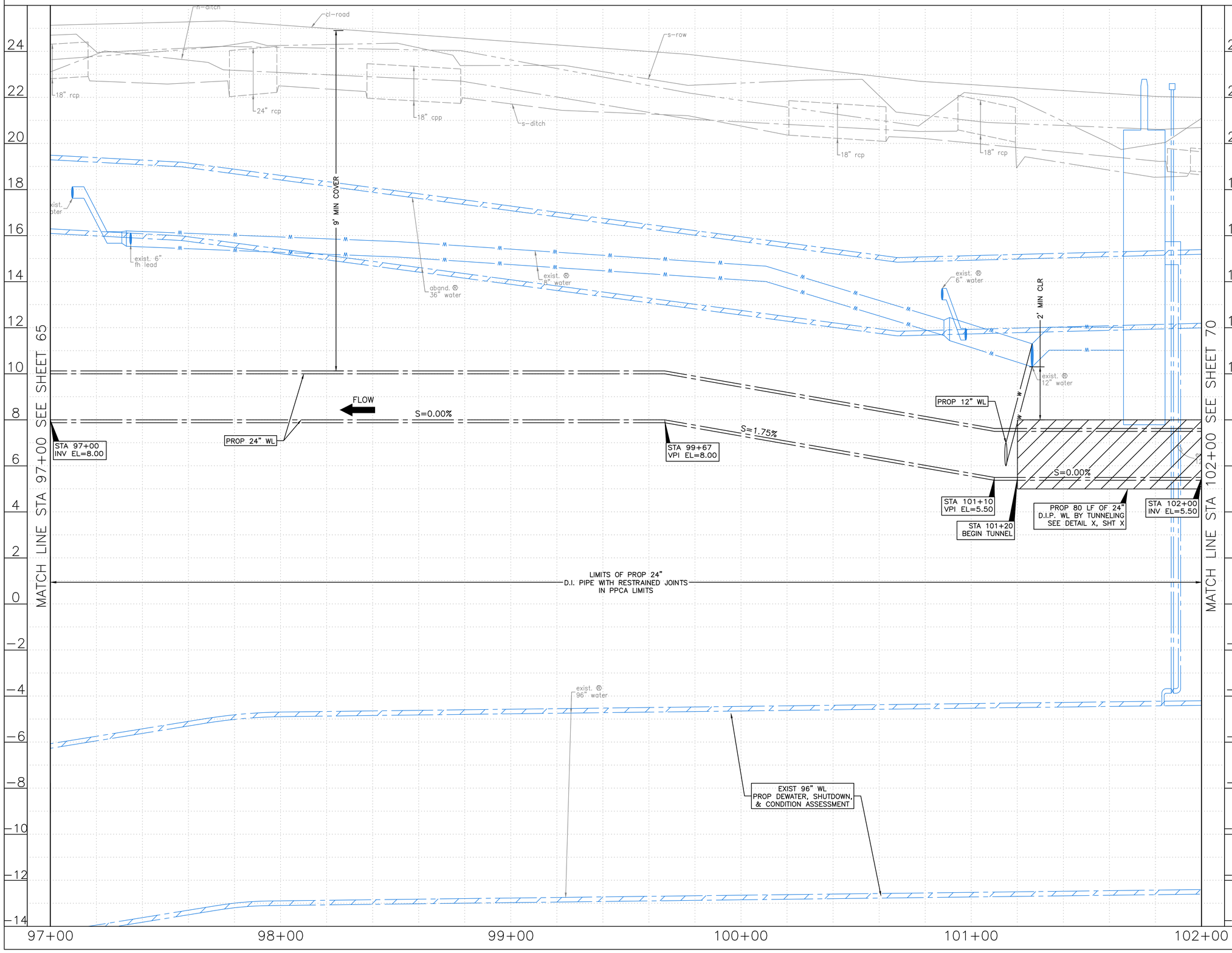
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 97+00 TO STA 102+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **67** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:44pm

SEE SHEET 67 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

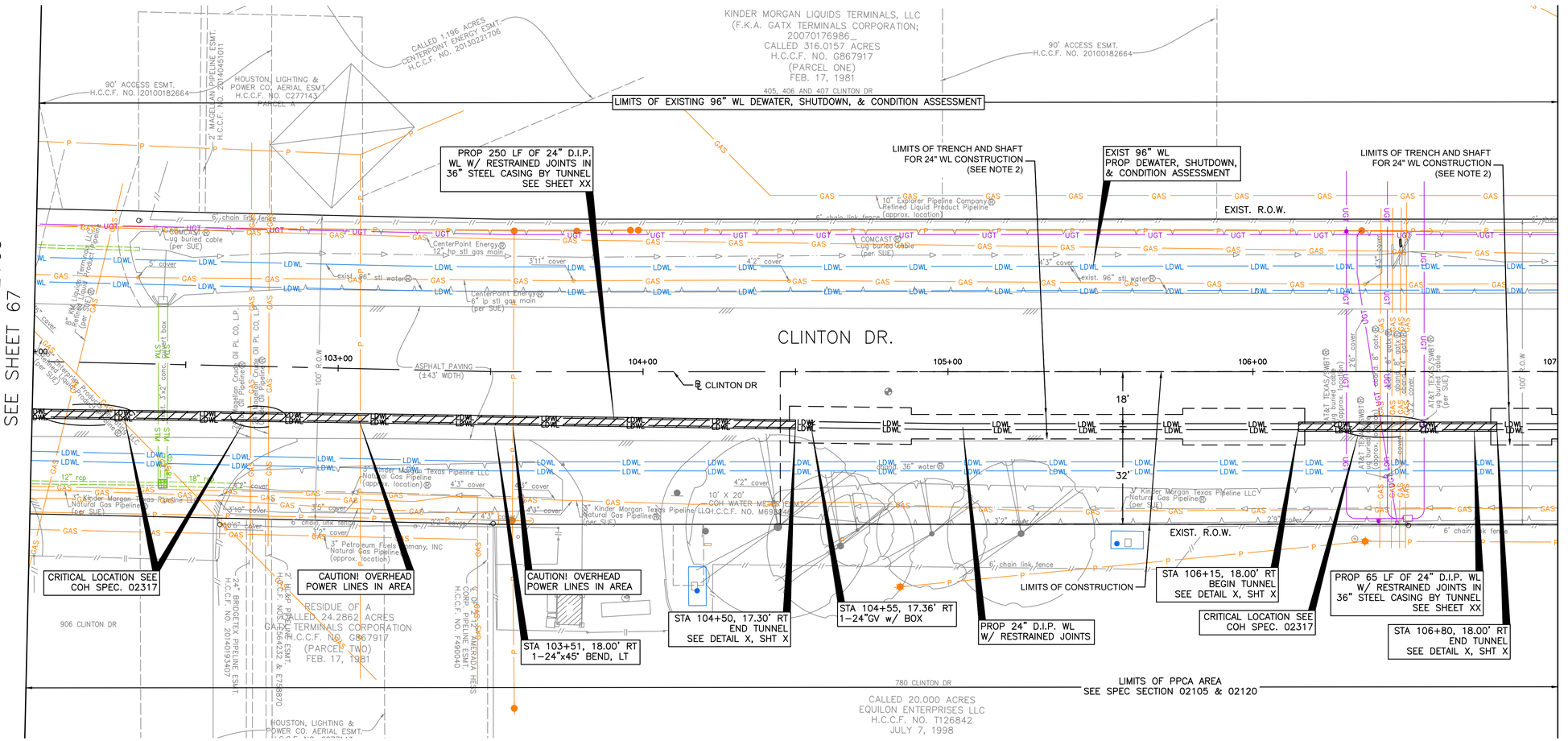
PROFILE
STA 97+00 TO STA 102+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **68** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 – 11:45pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 70 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-39
SET MAGNAIL W/SHINER
D. BL STA. 103+73.78
OFFSET: 30.41R

NOTICE:
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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 SUDHEER GOUD SANGAM, P.E. TEXAS REG. NO.: 111684 ON 08/15/2025 IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC. TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYRLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

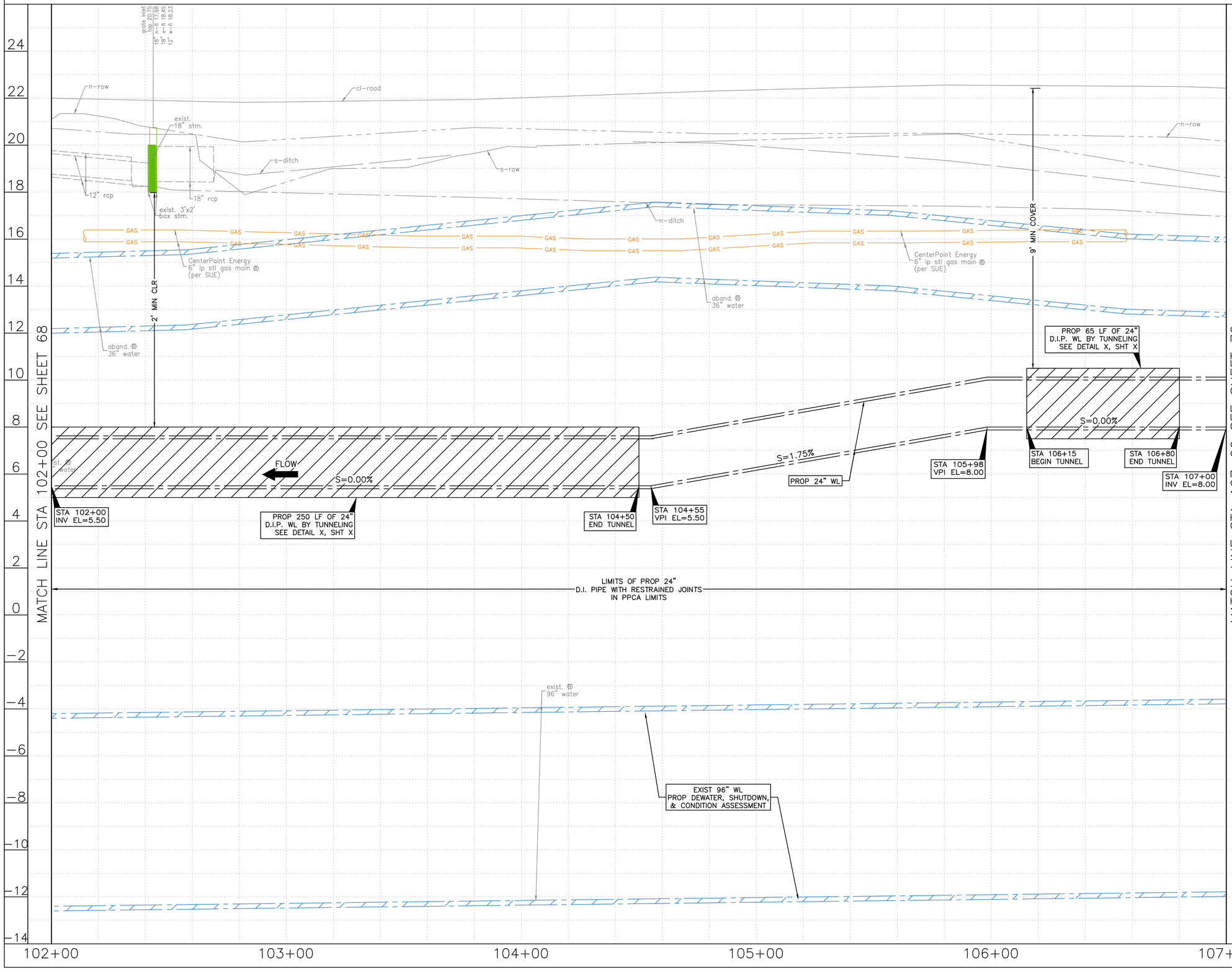
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 102+00 TO STA 107+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 69 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:47pm

SEE SHEET 69 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, 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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

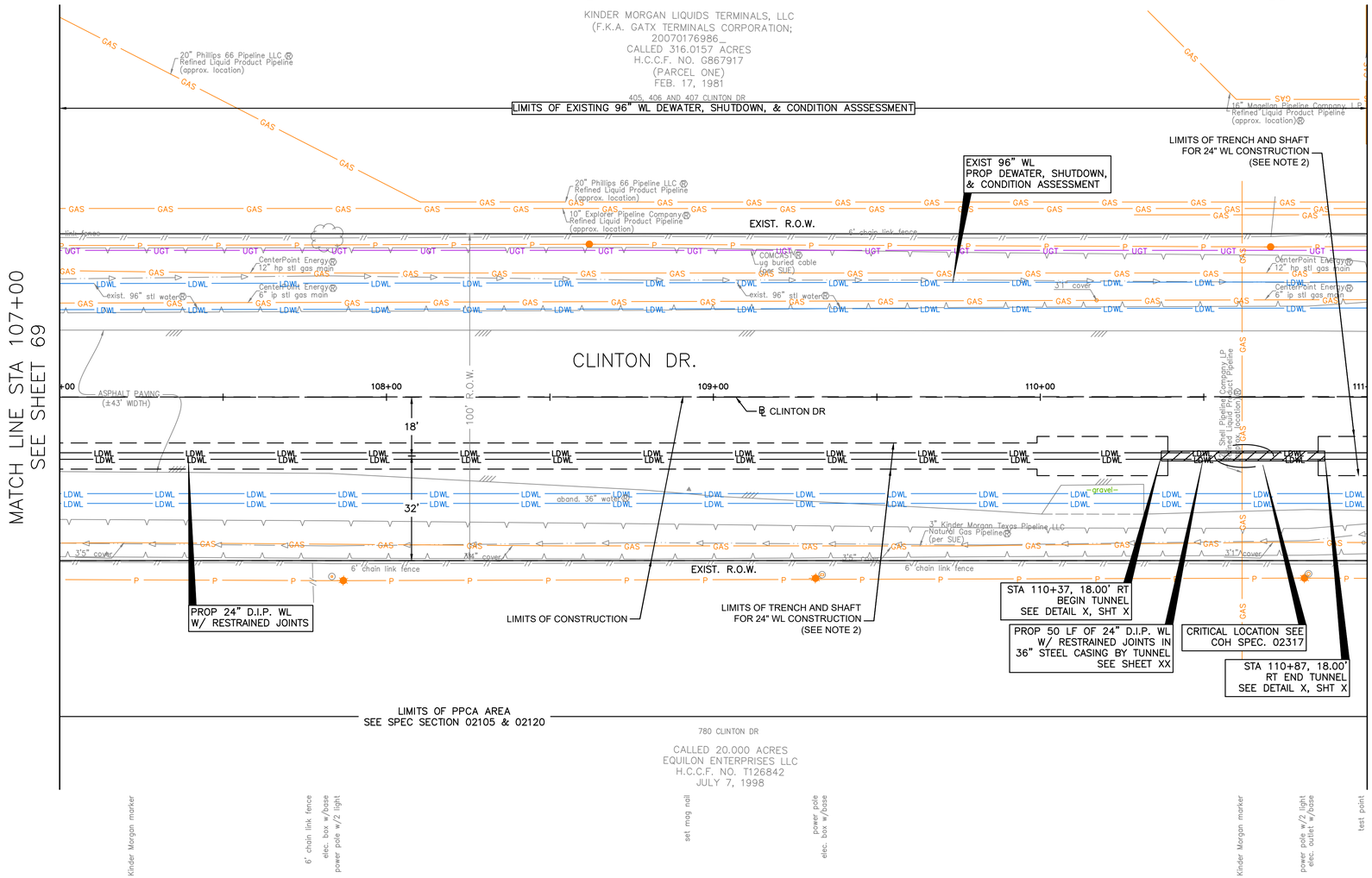
PROFILE
STA 102+00 TO STA 107+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 70 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:48pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 72 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-40
SET MAGNAIL W/SHINER
D. BL STA. 108+92.51
OFFSET: 28.23R

NOTICE:
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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

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TEXAS REG. NO.: 111684
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TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

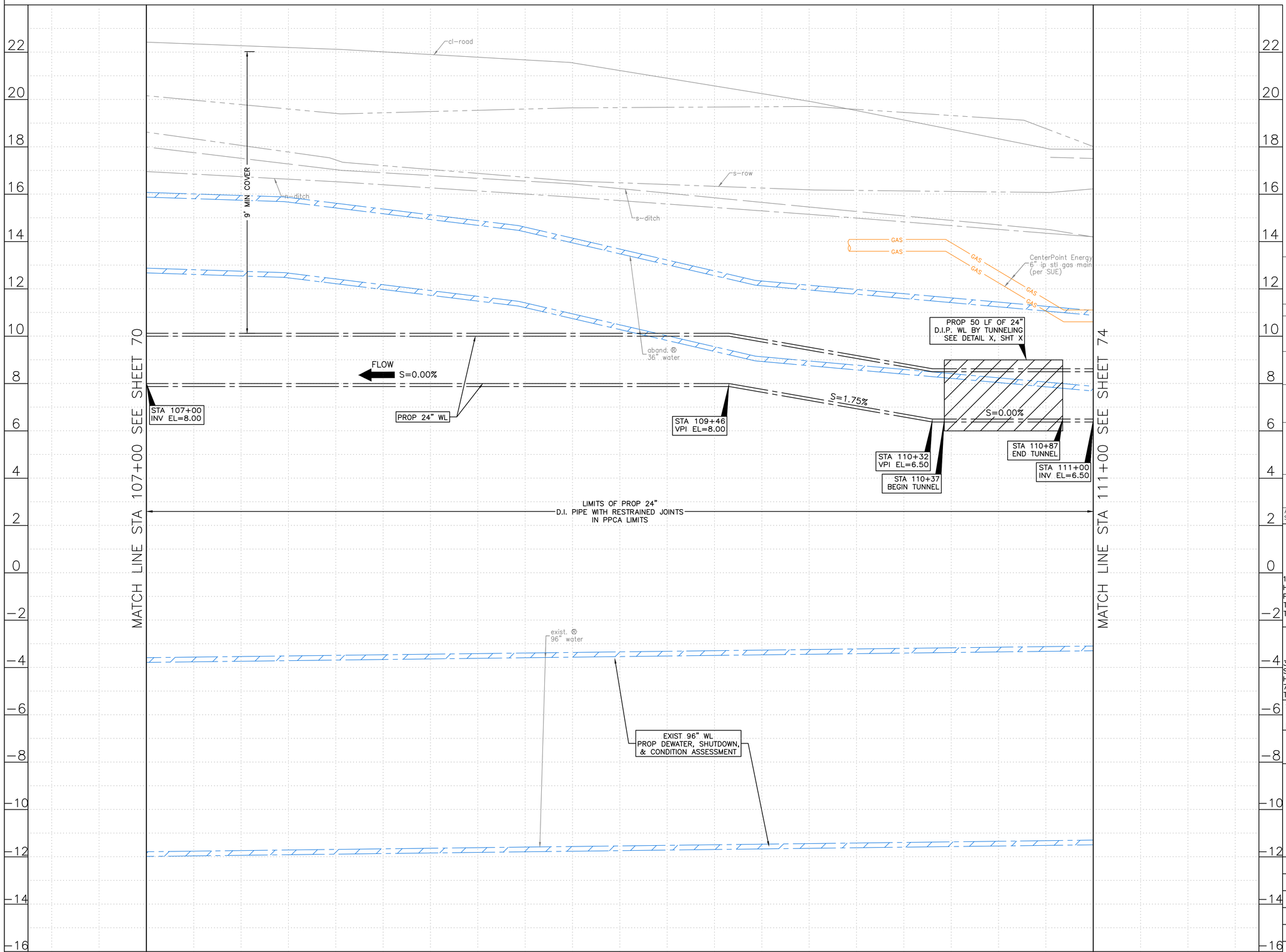
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 107+00 TO STA 111+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 71 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:50pm

SEE SHEET 71 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

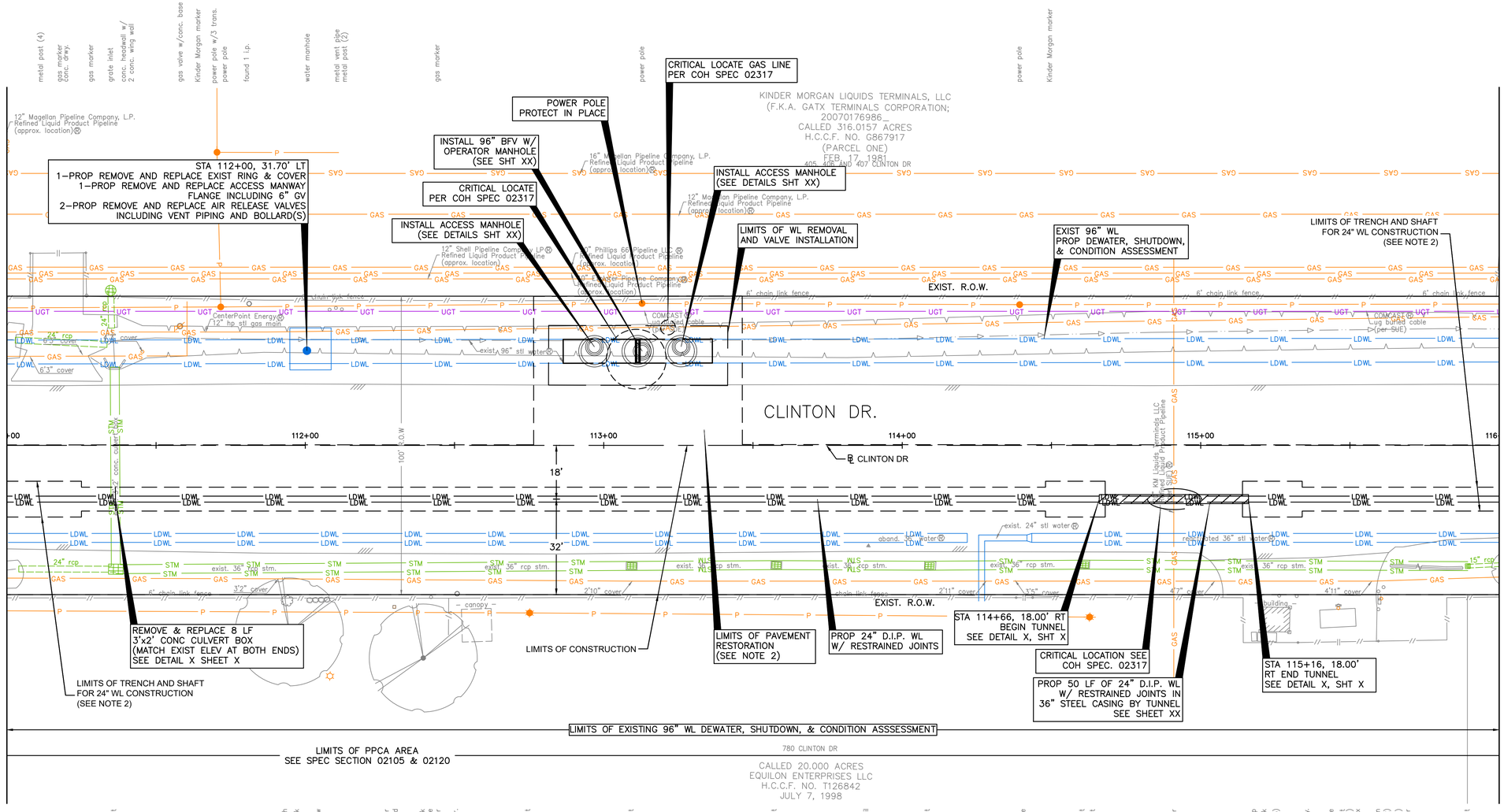
PROFILE
STA 107+00 TO STA 111+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 72 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:51pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.
3. SEE SHEET XX FOR 72" LINE STOP TO BE USED IN ISOLATING THE WATER LINE.
4. PROPOSED 96" BFV TO BE INSTALLED VERTICALLY.
5. CONTRACTOR TO FIELD VERIFY LOCATION PRIOR TO CONSTRUCTION



SEE SHEET 74 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-41
SET MAGNAIL W/SHINER
D. BL STA. 113+88.68
OFFSET: 33.68R

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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

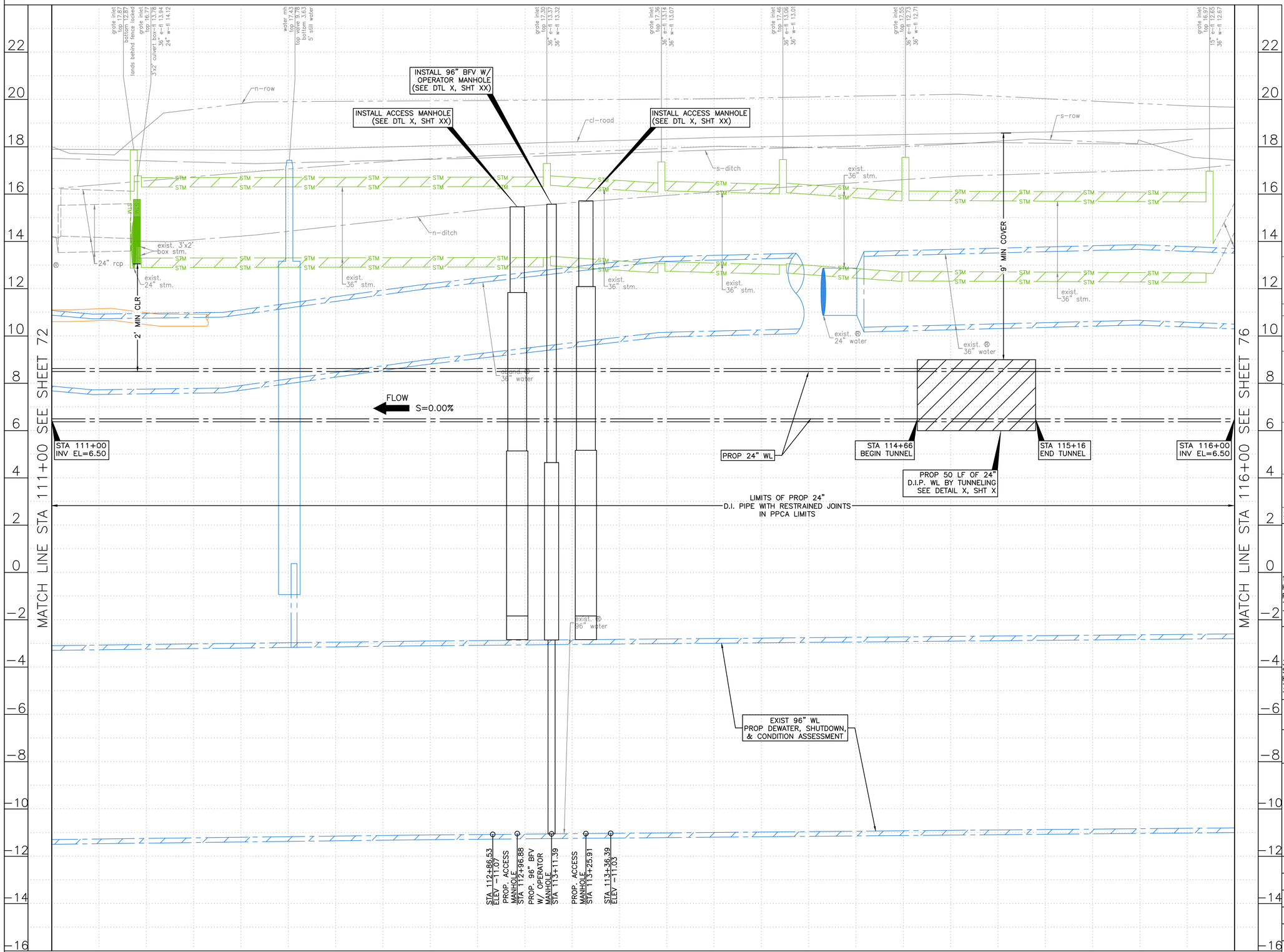
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 111+00 TO STA 116+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 73 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:53pm

SEE SHEET 73 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 111+00 TO STA 116+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 74 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:54pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

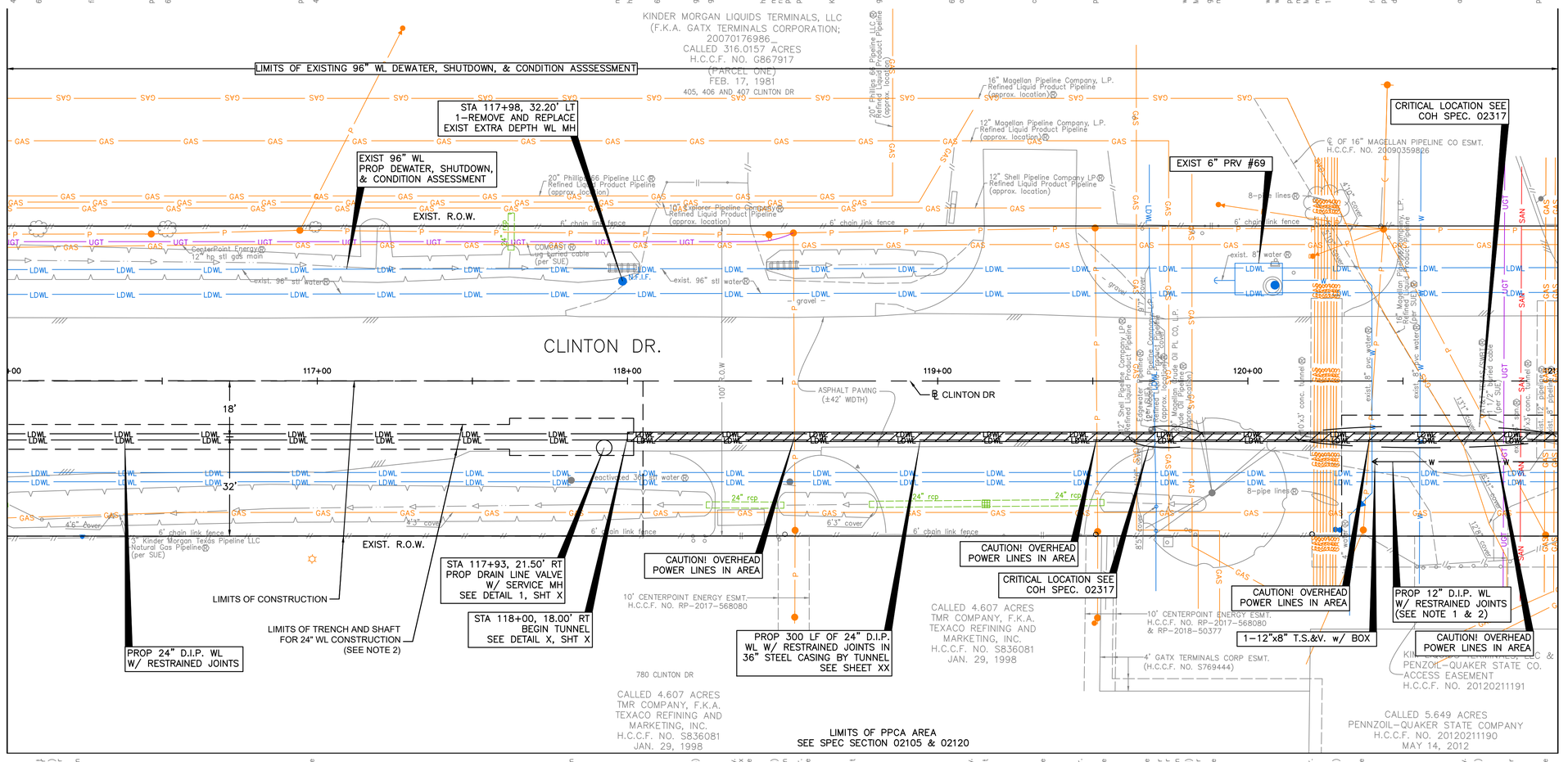
N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-42
SET 'X' CUT ON CONC.
D. BL STA. 118+74.19
OFFSET: 27.71R



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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

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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 116+00 TO STA 121+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 75 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 15, 2025 - 11:56pm

SEE SHEET 75 FOR PLAN

MATCH LINE STA 116+00 SEE SHEET 74

MATCH LINE STA 121+00 SEE SHEET 78

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

grate inlet top 15.16 inv 5.83 24" s 4.83 24" w 4.83

water mh top 19.74 top of valve 14.24 bottom 2.20 0' of water

n-row

n-ditch

approx. elev.

cl-road

n-edge rd

s-edge rd

s-row

24" rcp

s-ditch

9' MIN COVER

15" rcp

exist. Ⓦ 36" water

FLOW S=0.00%

STA 116+00 INV EL=6.50

PROP 24" WL

STA 117+79 VPI EL=6.50

S=100.00%

STA 118+00 BEGIN TUNNEL

PROP 300 LF OF 24" D.I.P. WL BY TUNNELING SEE DETAIL X, SHT X

STA 117+85 VPI EL=0.00

STA 117+93 PROP DRAIN LINE VALVE W/ SERVICE MH SEE DETAIL 1, SHT X

EXIST 96" WL PROP DEWATER, SHUTDOWN, & CONDITION ASSESSMENT

exist. Ⓦ 96" water

S=0.00%

1-20' JOINT OF 12" D.I. PIPE WITH RESTRAINED JOINTS CENTERED UNDER EXIST SANITARY SEWER. FILL BORED HOLE WITH BENTONITE/CLAY MIXTURE

exist. 6" sa

2' MIN CLR

exist. Ⓦ 8" water

exist. Ⓦ 4" water

GAS

M

W

PROP 12" WL

exist. Ⓦ 36" water

2' MIN CLR

16" Magellan P Refined Liquid (per SUE)

exist. Ⓦ 8" water

STA 121+00 INV EL=0.00

116+00 117+00 118+00 119+00 120+00 121+00

0' 20' 40'

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

NO.	DATE	REVISION	APP.

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

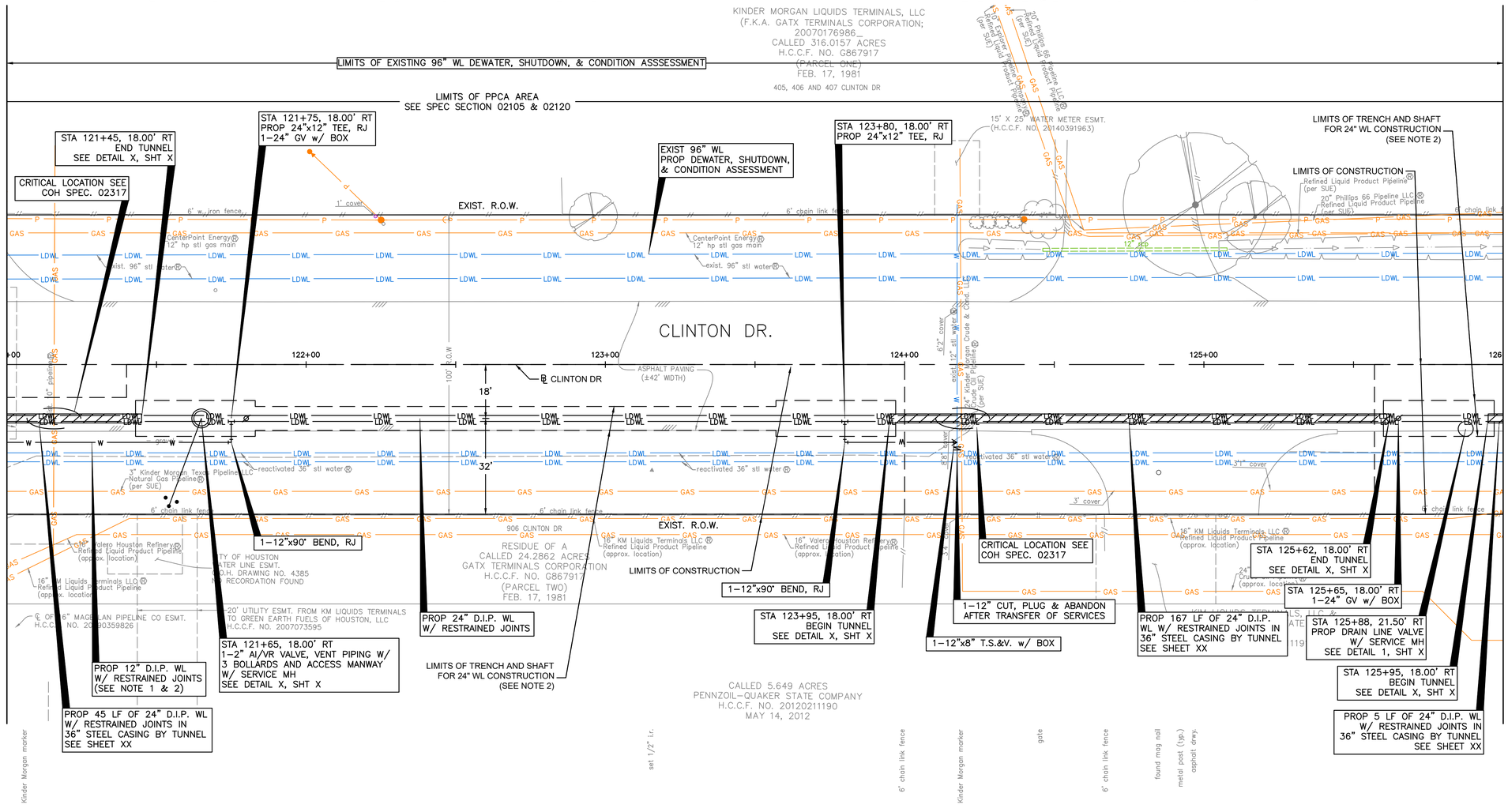
PROFILE
STA 116+00 TO STA 121+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 76 OF 204	

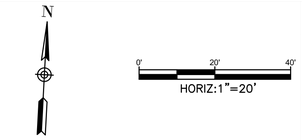
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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 78 FOR PROFILE



NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-43
SET 1/2" I.R. W/CAP
D. BL STA. 123+15.55
OFFFSET: 35.34R

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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 121+00 TO STA 126+00

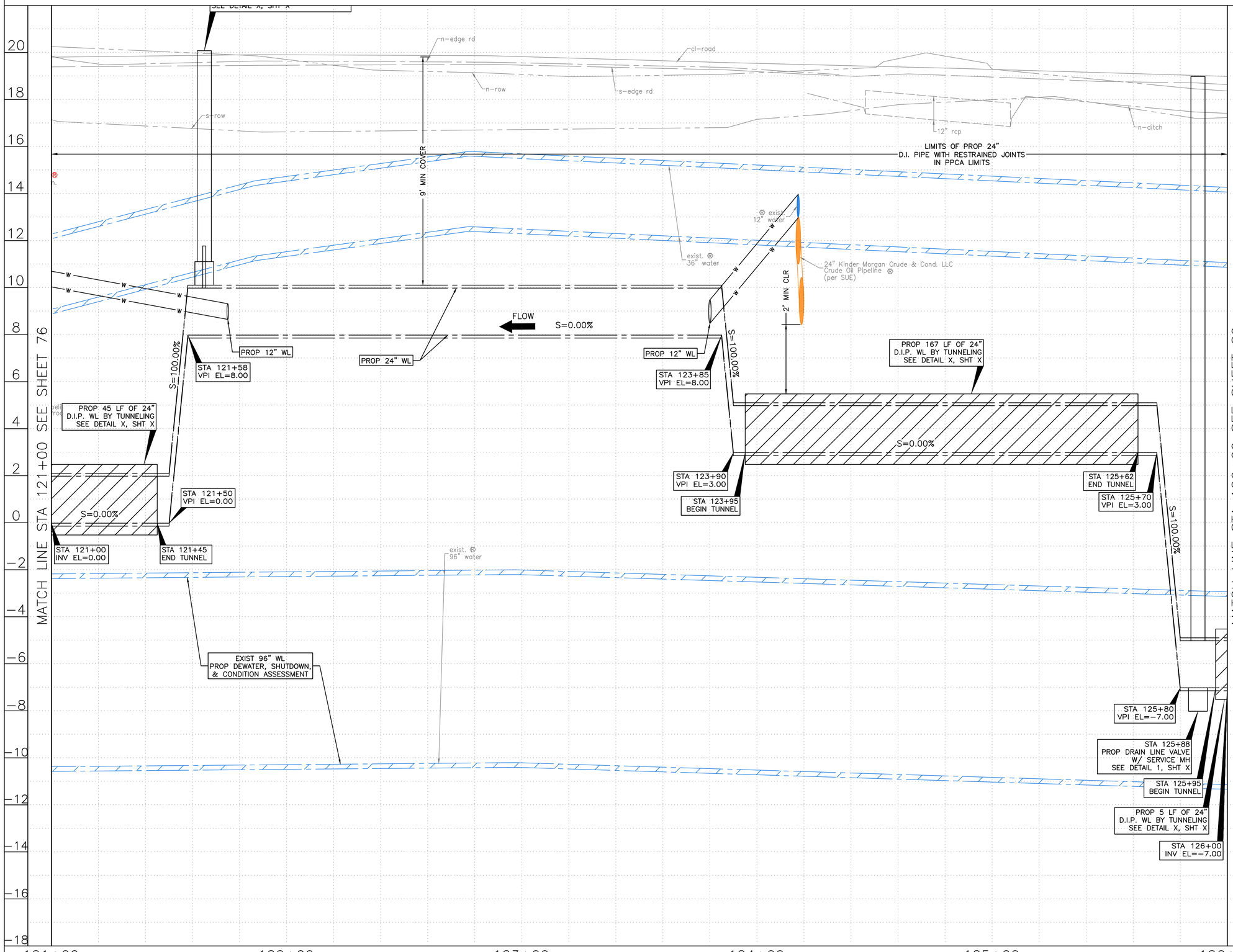
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 77 OF 204	

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SEE SHEET 77 FOR PLAN

STA 121+00 SEE SHEET 76

STA 126+00 SEE SHEET 80



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

NO.	DATE	REVISION	APP.

NOTE:

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ENGINEERING + SURVEYING
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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

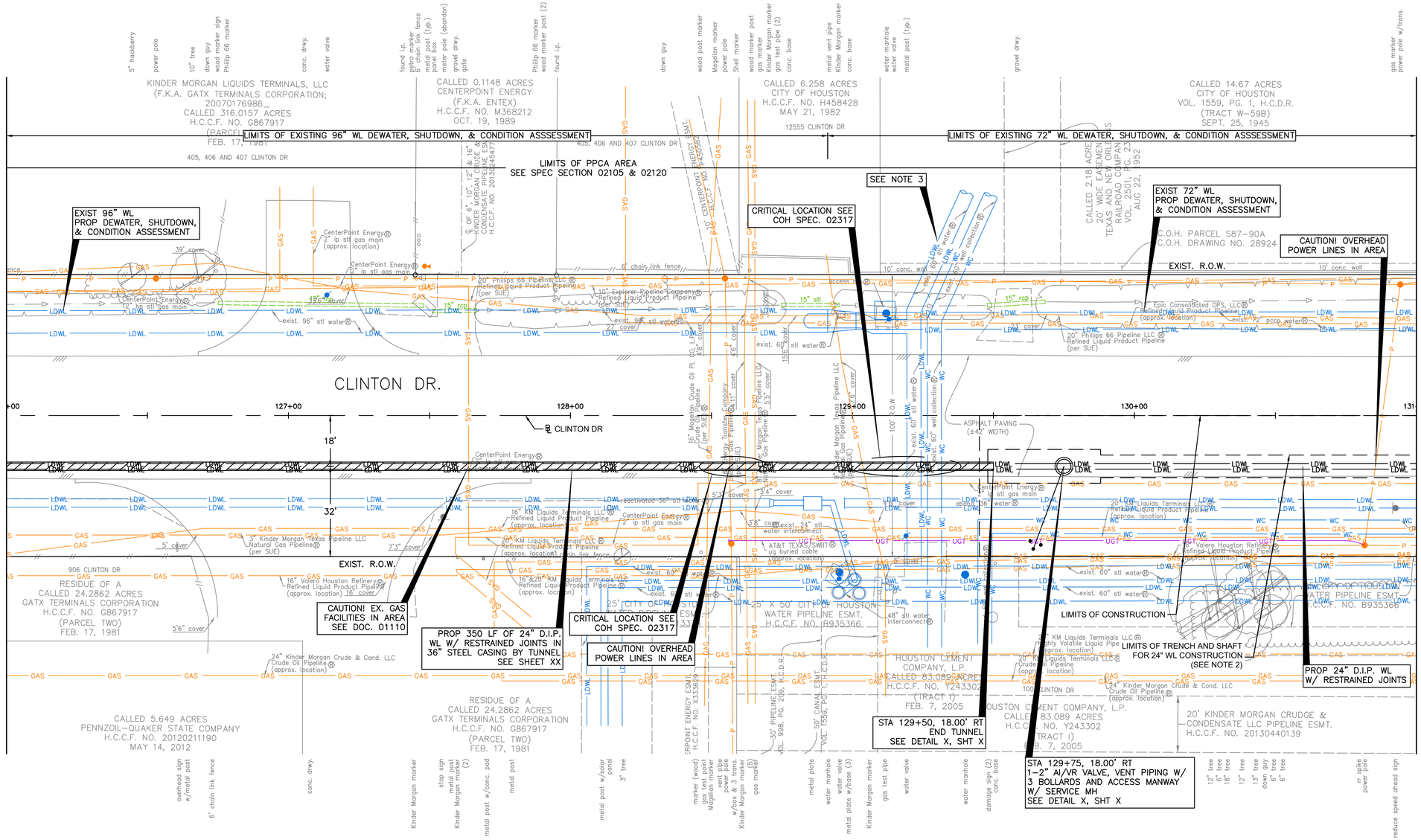
PROFILE
STA 121+00 TO STA 126+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 78 OF 204	

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NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.
3. CONTRACTOR TO CONFIRM LOCATION OF LINE-STOP WITH OWNER REPRESENTATIVE PRIOR TO INSTALLATION



SEE SHEET 80 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-44
SET 'X' CUT ON CONC.
D. BL STA. 127+30.05
OFFSET: 30.64L

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TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E. TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC. TX FIRM NO. F-4578

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TX FIRM NO.: F-2614

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FB NO.

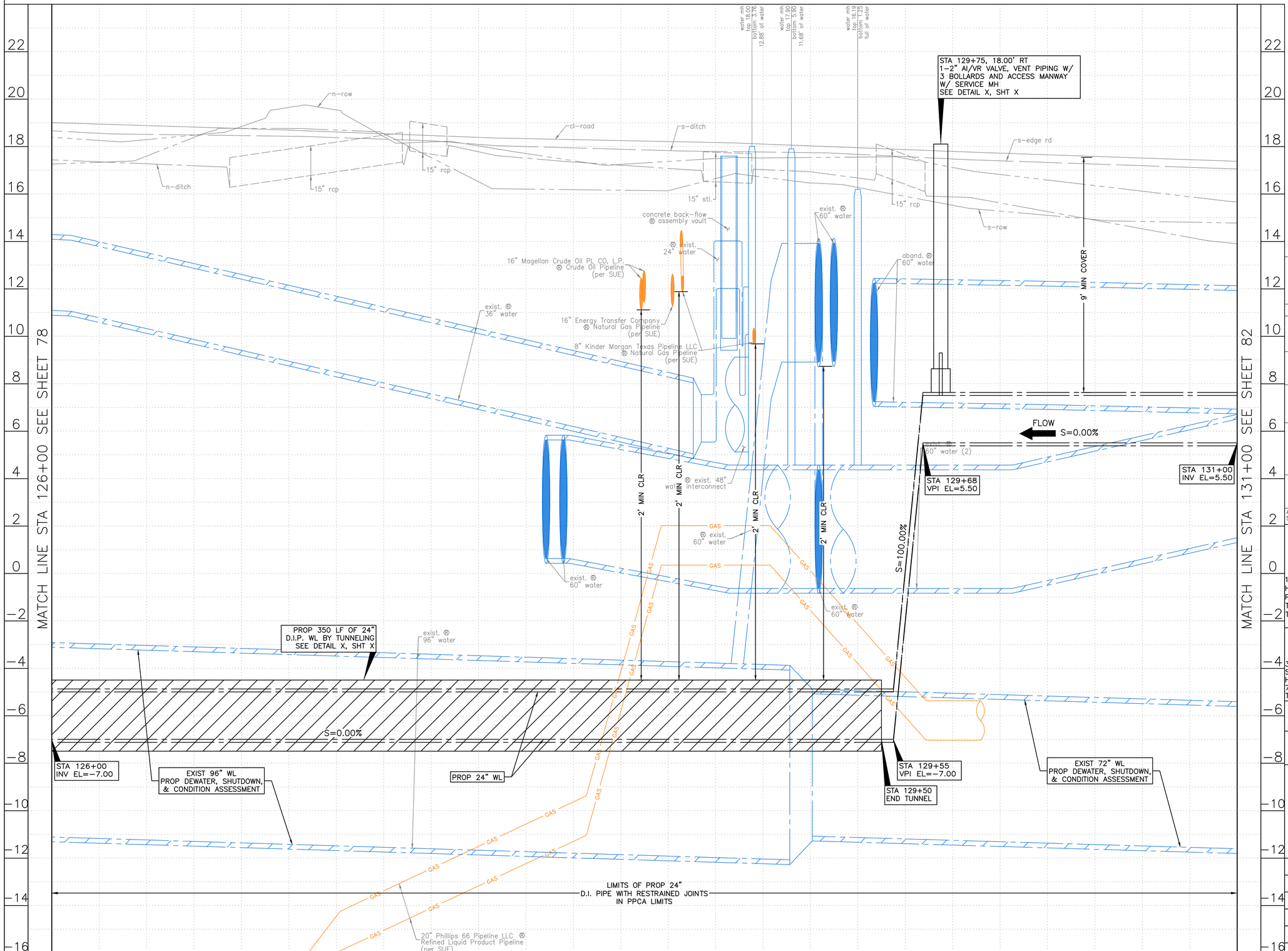
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE
PLAN
STA 126+00 TO STA 131+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 79 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 16, 2025 - 12:02am

SEE SHEET 79 FOR PLAN



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

NO.	DATE	REVISION	APP.

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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
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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713–266–6900
TX FIRM NO.: F–2614

FOR 96–INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F–2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PROFILE
STA 126+00 TO STA 131+00

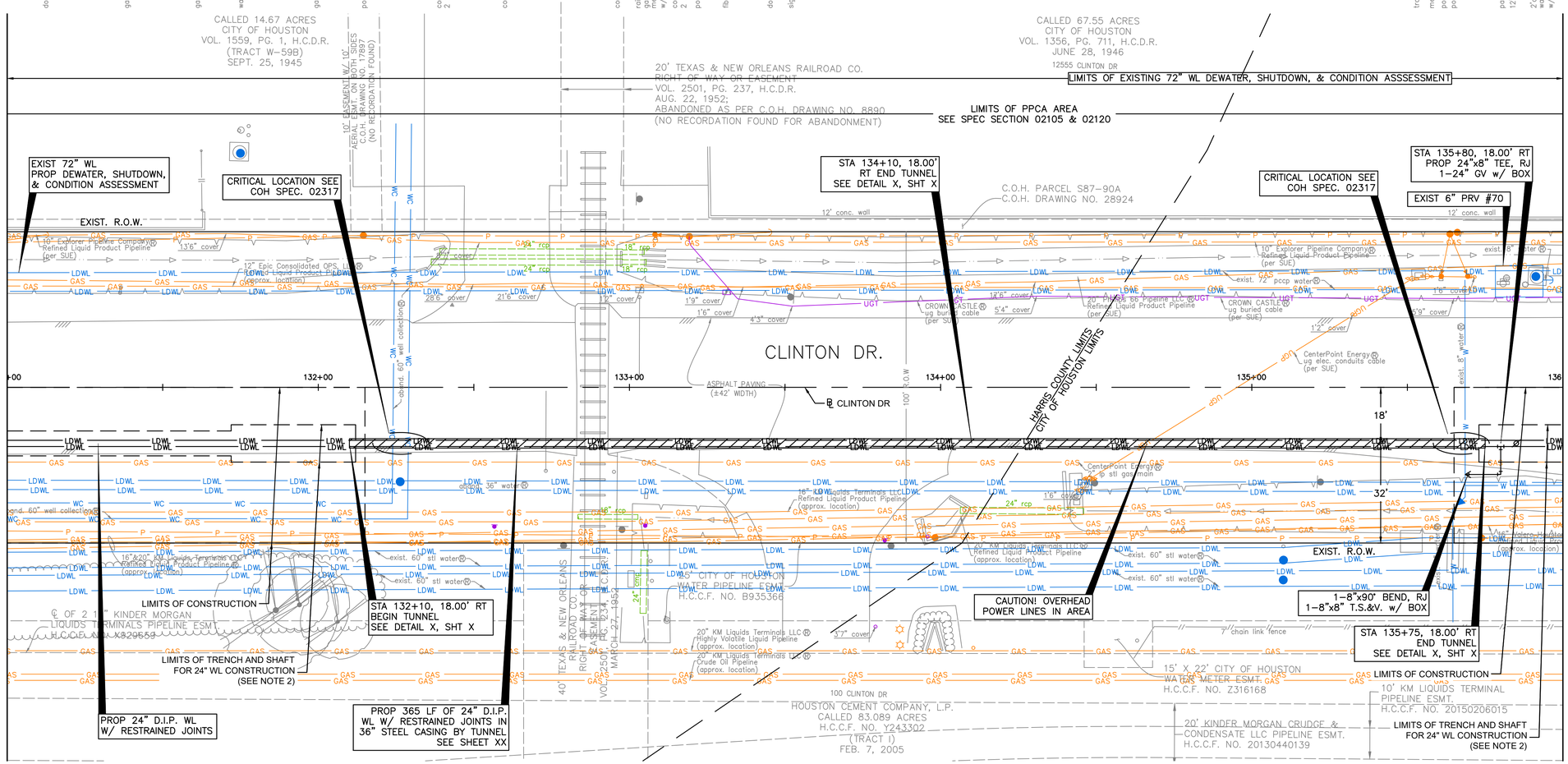
WBS NUMBER	S–000701–0038–3
DRAWING SCALE	H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM	SHAN HANG LEI, P.E.
SHEET NO. 80 OF 204	

FOR CITY OF HOUSTON USE ONLY

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Clinton Dr 4.dwg plotted on Aug 16, 2025 – 12:04pm

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.



SEE SHEET 82 FOR PROFILE

N

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-45
SET 'X' CUT ON CONC.
D. BL STA. 132+43.01
OFFSET: 26.42L

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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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
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Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
CLINTON DRIVE

PLAN
STA 131+00 TO STA 136+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 81 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 16, 2025 - 12:05pm

SEE SHEET 81 FOR PLAN

SEE SHEET 80

SEE SHEET 84

MATCH LINE STA 131+00

MATCH LINE STA 136+00

water mh
top 15.44
bottom 5.24
full of dirt
no mh cover exist

n-row

cl-road

s-row

n-ditch

s-ditch

aband. Ⓣ
60" water

9' MIN COVER

2' MIN CLR

18" rcp

24" rcp (2)

18" rcp (2)

24" rcp

water mh
top 14.67
top valve 13.57
bottom 9.96

water mh
top 15.06
top valve 13.55
bottom 11.34

water mh
top 2.19
bottom -0.37
full of water

20" Phillips 66 Pipeline LLC Ⓣ
Refined Liquid Product Pipeline
(per SUE)

GAS

aband. Ⓣ
60" water

exist. Ⓣ
60" water (2)

exist. Ⓣ
4" water

exist. Ⓣ
8" water

W

S=0.00%

S=41.42%

PROP 24" WL

STA 131+00
INV EL=5.50

STA 131+93
VPI EL=5.50

PROP 365 LF OF 24"
D.I.P. WL BY TUNNELING
SEE DETAIL X, SHT X

FLOW

S=0.00%

STA 132+05
VPI EL=0.05

STA 132+10
BEGIN TUNNEL

STA 135+75
END TUNNEL

PROP 8" WL

STA 136+00
INV EL=0.50

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

exist. Ⓣ
72" water

EXIST 72" WL
PROP DEWATER, SHUTDOWN,
& CONDITION ASSESSMENT

131+00 132+00 133+00 134+00 135+00 136+00

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

NO.	DATE	REVISION	APP.

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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

CLINTON DRIVE

PROFILE
STA 131+00 TO STA 136+00

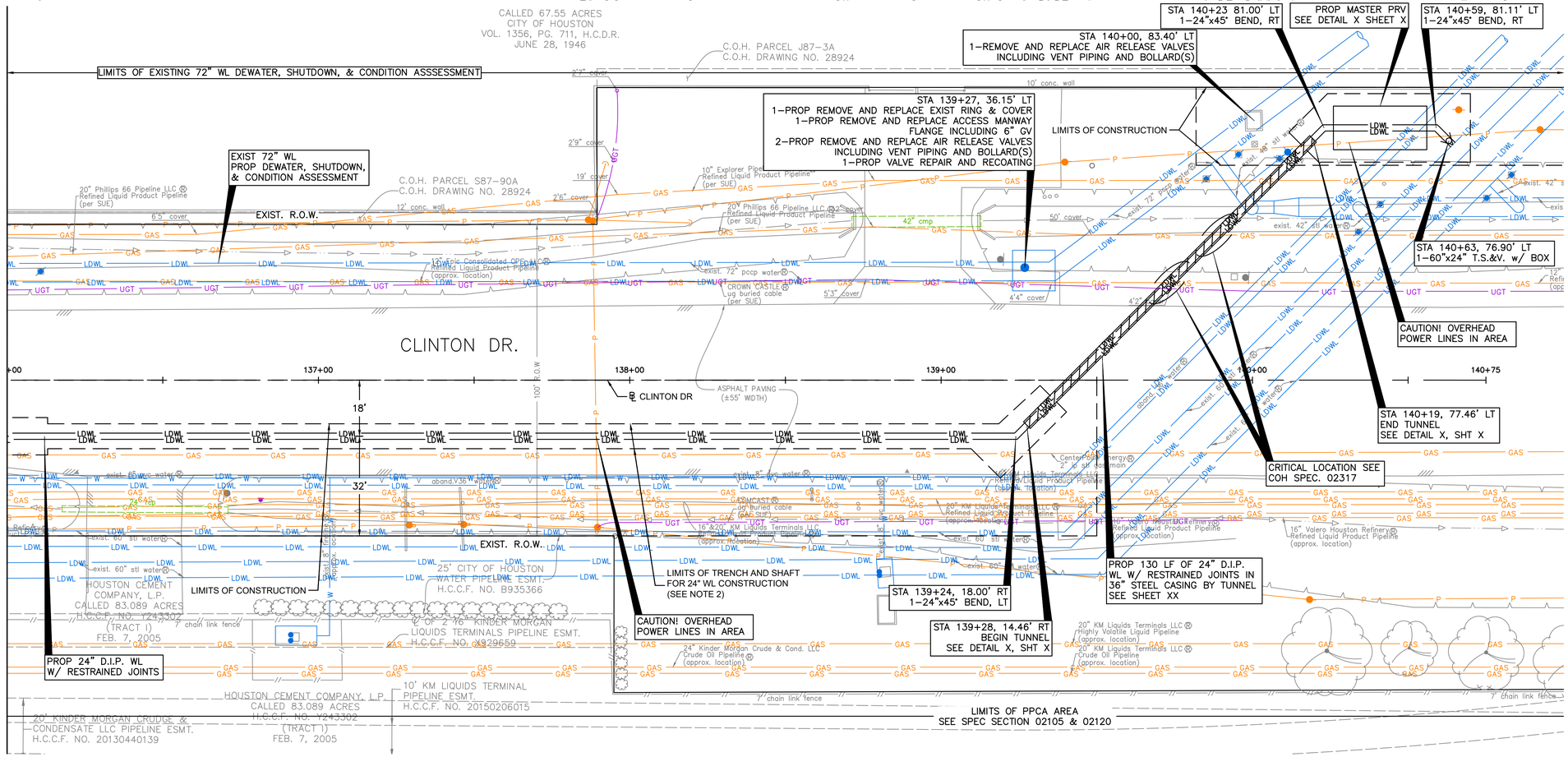
WBS NUMBER
S-000701-0038-3
DRAWING SCALE
H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM
SHAN HANG LEI, P.E.
SHEET NO. 82 OF 204

FOR CITY OF HOUSTON USE ONLY

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 16, 2025 - 12:06pm

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.


MATCH LINE STA 136+00
SEE SHEET 81
LIMITS OF EXISTING 72" WL DEWATER, SHUTDOWN, & CONDITION ASSSESSMENT
EXIST 72" WL
PROP DEWATER, SHUTDOWN,
& CONDITION ASSESSMENT
EXIST. R.O.W.
CALLED 67.55 ACRES
CITY OF HOUSTON
VOL. 1356, PG. 711, H.C.D.R.
JUNE 28, 1946
C.O.H. PARCEL J87-3A
C.O.H. DRAWING NO. 28924
C.O.H. PARCEL S87-90A
C.O.H. DRAWING NO. 28924
CLINTON DR.
CLINTON DR
ASPHALT PAVING
(±55' WIDTH)
100' R.O.W.
18'
32'
EXIST. R.O.W.
LIMITS OF CONSTRUCTION
LIMITS OF TRENCH AND SHAFT
FOR 24" WL CONSTRUCTION
(SEE NOTE 2)
LIMITS OF PPCA AREA
SEE SPEC SECTION 02105 & 02120
STA 140+23 81.00' LT
1-24"x45° BEND, RT
STA 140+00, 83.40' LT
1-REMOVE AND REPLACE AIR RELEASE VALVES
INCLUDING VENT PIPING AND BOLLARD(S)
PROP MASTER PRV
SEE DETAIL X SHEET X
STA 140+59, 81.11' LT
1-24"x45° BEND, RT
STA 139+27, 36.15' LT
1-PROP REMOVE AND REPLACE EXIST RING & COVER
1-PROP REMOVE AND REPLACE ACCESS MANWAY
FLANGE INCLUDING 6" GV
2-PROP REMOVE AND REPLACE AIR RELEASE VALVES
INCLUDING VENT PIPING AND BOLLARD(S)
1-PROP VALVE REPAIR AND RECOATING
STA 140+63, 76.90' LT
1-60"x24" T.S.&V. w/ BOX
CAUTION! OVERHEAD
POWER LINES IN AREA
STA 140+19, 77.46' LT
END TUNNEL
SEE DETAIL X, SHT X
CRITICAL LOCATION SEE
COH SPEC. 02317
PROP 130 LF OF 24" D.I.P.
WL W/ RESTRAINED JOINTS IN
36" STEEL CASING BY TUNNEL
SEE SHEET XX
STA 139+24, 18.00' RT
1-24"x45° BEND, LT
STA 139+28, 14.46' RT
BEGIN TUNNEL
SEE DETAIL X, SHT X
CAUTION! OVERHEAD
POWER LINES IN AREA
PROP 24" D.I.P. WL
W/ RESTRAINED JOINTS
HOUSTON CEMENT
COMPANY, L.P.
CALLED 83.089 ACRES
H.C.C.F. NO. 124302
(TRACT I)
FEB. 7, 2005
HOUSTON CEMENT COMPANY, L.P.
CALLED 83.089 ACRES
H.C.C.F. NO. Y243302
(TRACT I)
FEB. 7, 2005
25' CITY OF HOUSTON
WATER PIPELINE ESMT.
H.C.C.F. NO. B935366
10' KM LIQUIDS TERMINAL
PIPELINE ESMT.
H.C.C.F. NO. 20150206015
20' KINDER MORGAN CRUDE &
CONDENSATE LLC PIPELINE ESMT.
H.C.C.F. NO. 20130440139
LIQUIDS TERMINALS PIPELINE ESMT.
H.C.C.F. NO. X929659
20" Phillips 66 Pipeline LLC
Refined Liquid Product Pipeline
(per SUE)
10" Explorer Pipeline
Refined Liquid Product Pipeline
(per SUE)
20" Phillips 66 Pipeline LLC
Refined Liquid Product Pipeline
(per SUE)
16" Epic Consolidated OPCO LLC
Refined Liquid Product Pipeline
(approx. location)
CROWN CASTLE
1ug buried cable
(per SUE)
24" Kinder Morgan Crude & Cond. LLC
Crude Oil Pipeline
(approx. location)
20" KM Liquids Terminals LLC
Refined Liquid Product Pipeline
(approx. location)
16"&20" KM Liquids Terminals LLC
Refined Liquid Product Pipeline
(approx. location)
20" KM Liquids Terminals LLC
Highly Volatile Liquid Pipeline
(approx. location)
20" KM Liquids Terminals LLC
Crude Oil Pipeline
(approx. location)
16" Valero Houston Refinery
Refined Liquid Product Pipeline
(approx. location)
CENTERPOINT
2" HP gas main
(per SUE)
exist. 72" pccp water
exist. 8" dwv water
exist. 60" stl water
aband. V36" stl water
abandCDW water
exist. 42" stl water
exist. 60" stl water
abandCDW water
exist. 60" stl water
exist. 60" stl water
exist. 42" stl water
exist. 42" stl water
exist. 60" stl water
exist. 60" stl water
exist. 60

SEE SHEET 83 FOR PLAN

MATCH LINE STA 136+00 SEE SHEET 82

water mh
top 12.37
top of cone 4.17
bottom 1.67
12.5' of water

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

STA 139+27, 36.15' LT
1-PROP REMOVE AND REPLACE EXIST RING & COVER
1-PROP REMOVE AND REPLACE ACCESS MANWAY
FLANGE INCLUDING 6" GV
2-PROP REMOVE AND REPLACE AIR RELEASE VALVES
INCLUDING VENT PIPING AND BOLLARD(S)
1-PROP VALVE REPAIR AND RECOATING

cl-road
s-row
24" rcp
s-ditch
n-row
n-ditch
9' MIN COVER
42" cmp
exist. 8" water
(approx. elev.)
exist. 8" water
(approx. elev.)
GAS
GAS
10" Explorer Pipeline Company
Refined Liquid Product Pipeline @
(per SUE)
exist. @
60" water (2)
FLOW
S=0.00%
S=41.42%
PROP 130 LF OF 24"
D.I.P. WL BY TUNNELING
SEE DETAIL X, SHT X
STA 136+00
INV EL=0.50
PROP 24" WL
exist. @
8" water
@ 20" Phillips 66 Pipeline LLC
Refined Liquid Product Pipeline
(per SUE)
STA 139+16
VPI EL=0.50
S=0.00%
10" Explorer Pipeline Company
Refined Liquid Product Pipeline @
(per SUE)
STA 139+24
VPI EL=-2.50
STA 139+28
BEGIN TUNNEL
STA 140+19
END TUNNEL
2' MIN CLR
10" Explorer Pipeline Company
Refined Liquid Product Pipeline @
(per SUE)
exist. @
72" water
EXIST 72" WL
PROP DEWATER, SHUTDOWN,
& CONDITION ASSESSMENT

136+00 137+00 138+00 139+00 140+00

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

NO.	DATE	REVISION	APP.

NOTE:

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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

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TEXAS REG. NO.: 111684

ON 08/15/2025
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TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer:_WILLIAM W. BYRLAND, PE
Registration Number:_142061
Date:_06/02/2025

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

CLINTON DRIVE

PROFILE
STA 136+00 TO END

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **84** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr 4.dwg plotted on Aug 16, 2025 - 12:10am

LIMITS OF PPCA AREA
SEE SPEC SECTION 02105 & 02120

8" tree
metal post (3)
set mag nail
18" group of trees
power pole w/3 trans.
20" group of trees
power pole
metal riser (4)
wood post (2)
8" tree
asphalt drwy.
8" tree
car stop (typ.)
gate
power pole
power pole
grate inlet
metal post

CALLED 71.6545 ACRES
PROLER SOUTHWEST LP
H.C.C.F. NO. 20100533126
DEC. 16, 2010

2–12"x45° BEND, RJ

1–12"x6" TEE, RJ
1–6" GV w/ BOX
1–6" F.H. WITHIN
5' FROM R.O.W.

CAUTION! CABLE LINE
FACILITIES IN AREA

ABANDON EXIST. 12" WATER LINE & TRANSFER
SERVICES TO PROP 12" WATER LINE

1–12"x6" TEE, RJ
1–6" GV w/ BOX
1–6" F.H. WITHIN
5' FROM R.O.W.

1–12"x11.25° BEND, RJ

6' chain link fence
open
exist. 12" ci water
6' chain link fence
quarter drain
1+00
2+00
3+00
4+00
5+
W
GAS
UGT
STM
P
M
AT&T TEXAS/SWBT
ug buried cable
(per SUE)
3'5" cover
MAYO SHELL RD.
ASPHALT PAVING
(±27' WIDTH)
60' R.O.W.
3'7" cover
CenterPenergy
aband. 2" hp stl gas main
(per SUE)
3'6" cover
7'2" cover
AT&T TEXAS/SWBT
ug fiber optic buried cable
(per SUE)
3'6" cover
7'
23'
2" cover
exist. 12" ci water
CenterPenergy
8" hp stl gas main
(per SUE)
4'7" cover
5'5" cover
21'
9'
60' COUNTY OF HARRIS
RIGHT OF WAY OR ESMT.
FOR PUBLIC ROAD PURPOSES
VOL. 1537, PG. 76, H.C.D.R.
R MAYO SHELL RD
7'8" cover
3'5" cover
4'8" cover
CenterPenergy
3" hp stl gas main
(per SUE)
2–24" rcp stm.
6' chain link fence w/corr. wall
6' chain link fence
AT&T TEXAS/SWBT
ug buried cable
(per SUE)
CenterPenergy
8" hp stl gas main
(per SUE)
TEXAS/SWBT
cable
60' COUNTY OF HARRIS
RIGHT OF WAY OR ESMT.
FOR PUBLIC ROAD PURPOSES
VOL. 1537, PG. 76, H.C.D.R.
36" rcp
30" rcp
rcp stm.
stm.

CRITICAL LOCATION SEE
COH SPEC. 02317

1–12"x90° BEND, RJ

CAUTION! OVERHEAD
POWER LINES IN AREA

PROP 12" D.I.P. WL
W/ RESTRAINED JOINTS
(SEE NOTE 1)

CAUTION! CABLE LINE
FACILITIES IN AREA

1–12"x11.25° BEND, RJ

CRITICAL LOCATION SEE
COH SPEC. 02317

CALLED 30.14 ACRES
UNITED STATES GYPSUM COMPANY
VOL. 3082, PG. 429, H.C.D.R.
DEC. 16, 1955

grate inlet (2)
metal post
metal post
conc. headwall
metal post
metal post
power pole
metal sign
power pole
20" group of trees
12" tree
12" tree
column
bush row
3' bush (2)
column
elec. outlet (2)
sensor box
asphalt drwy.
metal post
column

MATCH LINE STA 5+00
SEE SHEET 86

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756–7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B–62
SET MAGNAIL W/SHINER
D. BL STA. 1+85.16
OFFSET: 15.49L

NOTE:
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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

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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD

PLAN & PROFILE
BEGIN TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 85 OF 204	

28 26 24 22 20 18 16 14 12 10

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

LIMITS OF PROP 12"
D.I. PIPE WITH RESTRAINED JOINTS
IN PPCA LIMITS

stm. mh
top 23.91
24" n–fl 19.86
24" s–fl 19.69
30" n–fl 19.42
36" s–fl 19.38
36" w–fl 19.35

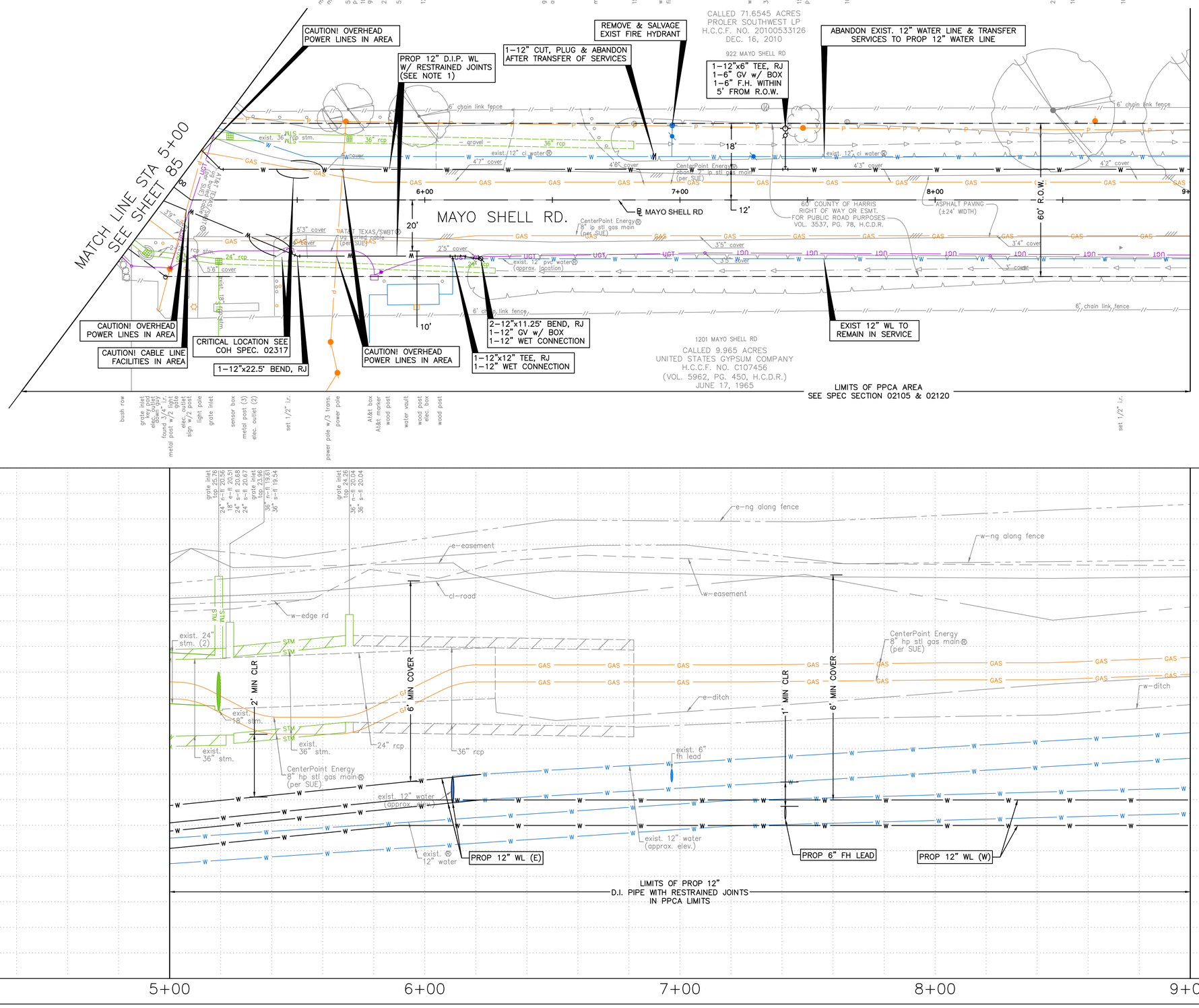
grate inlet
top 24.77
24" n–fl 20.61
24" n–fl 20.80
24" s–fl 20.76
24" s–fl 20.72

grate inlet
top 20.32
36" n–fl 15.20
36" s–fl 15.12

grate inlet
top 20.48
30" n–fl 15.06
24" s–fl 15.16

w–ng along fence
e–easement
cl–road
w–edge rd
e–edge rd
w–easement
e–ng along fence
e–ditch
exist.
36" stm.
exist.
24" stm.
30" rcp
36" rcp
30" rcp
36" rcp
CenterPenergy
8" hp stl gas main
(per SUE)
exist.
36" stm.
exist. 24"
stm. (2)
6' MIN COVER
exist. ⊗
12" water
PROP 6" FH LEAD
PROP 12" WL (W)
PROP 12" WL (E)
PROP 6" FH LEAD

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Mayo Shell Rd.dwg plotted on Aug 16, 2025 – 9:46am



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

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-60
SET 1/2" I.R. W/CAP
D. BL STA. 8+72.66
OFFSET: 18.71R

NOTE:
1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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

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Signature valid for six months.

Date

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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

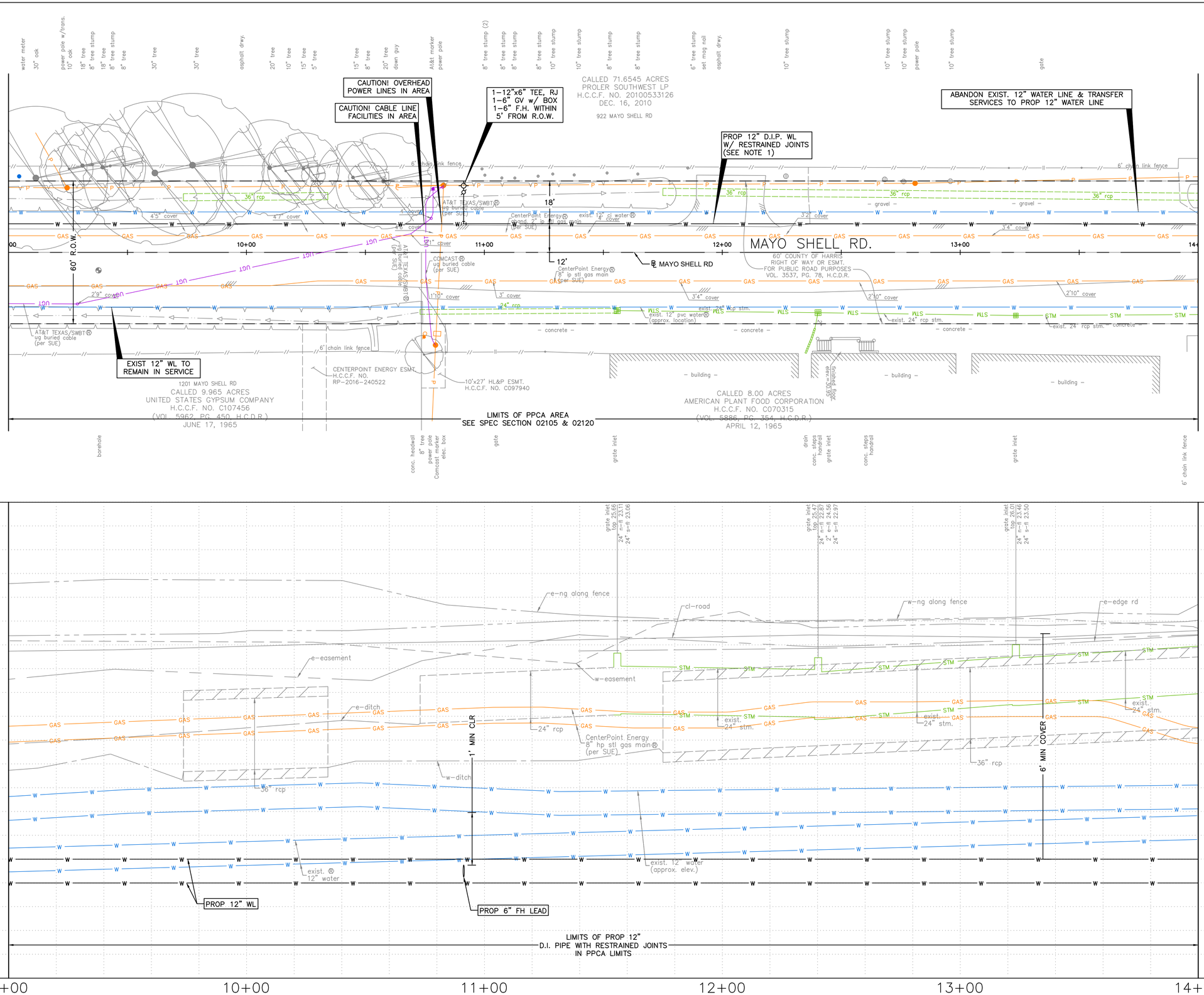
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD

PLAN & PROFILE
STA 5+00 TO STA 9+00

WBS NUMBER	S-000701-0038-3
DRAWING SCALE	H: 1"=20' V: 1"=2'
CITY OF HOUSTON PM	SHAN HANG LEI, P.E.
SHEET NO.	86 OF 204

FOR CITY OF HOUSTON USE ONLY

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 9:49am



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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-59
SET MAGNAIL W/SHINER
D. BL STA. 11+93.50
OFFSET: 16.55L

NOTE:
1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
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Date

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Date

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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

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD
PLAN & PROFILE
STA 9+00 TO STA 14+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 87 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 9:52am

MATCH LINE STA 14+00
SEE SHEET 87

MATCH LINE STA 19+00
SEE SHEET 89

1-12"x6" TEE, RJ
1-6" GV w/ BOX
1-6" F.H. WITHIN
5' FROM R.O.W.

REMOVE & SALVAGE EXIST FIRE HYDRANT

CRITICAL LOCATION SEE COH SPEC. 02317

ABANDON EXIST. 12" WATER LINE & TRANSFER SERVICES TO PROP 12" WATER LINE

PROP 12" D.I.P. WL W/ RESTRAINED JOINTS (SEE NOTE 1)

EXIST 12" WL TO REMAIN IN SERVICE

CITY OF HOUSTON LIMITS
CITY OF GALENA PARK LIMITS

CALLED 19.7861 ACRES
500 MAYO, LP
H.C.C.F. NO. RP-2023-411354
OCT. 27, 2023
500 MAYO SHELL RD

CALLED 71.6545 ACRES
PROLER SOUTHWEST LP
H.C.C.F. NO. 20100533126
DEC. 16, 2010

CALLED 8.00 ACRES
AMERICAN PLANT FOOD CORPORATION
H.C.C.F. NO. C07035
(VOL. 5886, PG. 354, H.C.D.R.)
APRIL 12, 1965

CALLED 17.5856 ACRES
AMERICAN PLANT
FOOD CORPORATION
H.C.C.F. NO. E642744
JAN. 7, 1976

MAYO SHELL RD.

℄ MAYO SHELL RD

60' CITY OF GALENA PARK RIGHT OF WAY OR ESMT. FOR PUBLIC ROAD PURPOSES VOL. 3587, PG. 193, H.C.D.R. MARCH 13, 1958

LIMITS OF PPCA AREA
SEE SPEC SECTION 02105 & 02120

LIMITS OF PROP 12" D.I. PIPE WITH RESTRAINED JOINTS IN PPCA LIMITS

PROP 6" FH LEAD

PROP 12" WL

6' MIN COVER

1' MIN CLR

2' MIN CLR

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

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-58
SET 1/2" I.R. W/CAP
D. BL STA. 16+75.03
OFFSET: 15.70L

NOTE:
1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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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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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD

PLAN & PROFILE
STA 14+00 TO STA 19+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 88 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 9:55am

MATCH LINE STA 19+00
SEE SHEET 88

MATCH LINE STA 24+00
SEE SHEET 90

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

LIMITS OF PPCA AREA
SEE SPEC SECTION 02105 & 02120

CALLED 19.7861 ACRES
500 MAYO, LP
H.C.C.F. NO. RP-2023-411354
OCT. 27, 2023

500 MAYO SHELL RD

CALLED 71.6545 ACRES
PROLER SOUTHWEST LP
H.C.C.F. NO. 20100533126
DEC. 16, 2010

2-12"x11.25° BEND, RJ

PROP 12" D.I.P. WL
W/ RESTRAINED JOINTS
(SEE NOTE 1)

ABANDON EXIST. 12" WATER LINE & TRANSFER SERVICES TO PROP 12" WATER LINE

MAYO SHELL RD.

℄ MAYO SHELL RD

60' CITY OF GALENA PARK
RIGHT OF WAY OR ESMT.
FOR PUBLIC ROAD PURPOSES
VOL. 3587, PG. 193, H.C.D.R.
MARCH 13, 1958

ASPHALT PAVING
(±26' WIDTH)

EXIST 12" WL TO
REMAIN IN SERVICE

903 MAYO SHELL RD
CALLED 17.5856 ACRES
AMERICAN PLANT
FOOD CORPORATION
H.C.C.F. NO. E642744
JAN. 7, 1976

LIMITS OF PROP 12"
D.I. PIPE WITH RESTRAINED JOINTS
IN PPCA LIMITS

6' CITY OF GALENA PARK
RIGHT OF WAY OR ESMT.
FOR PUBLIC ROAD PURPOSES
VOL. 3587, PG. 193, H.C.D.R.
MARCH 13, 1958

6' MIN COVER

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-57
SET 1/2" I.R. W/CAP
D. BL STA. 21+62.22
OFFSET: 17.16R

NOTE:
1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

NO.	DATE	REVISION	APP.

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Date

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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

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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD

PLAN & PROFILE
STA 19+00 TO STA 24+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 89 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 9:58am

MATCH LINE STA 24+00
SEE SHEET 89

MATCH LINE STA 29+00
SEE SHEET 91

CAUTION! OVERHEAD POWER LINES IN AREA

PROP 12" D.I.P. WL W/ RESTRAINED JOINTS (SEE NOTE 1)

ABANDON EXIST. 12" WATER LINE & TRANSFER SERVICES TO PROP 12" WATER LINE

CRITICAL LOCATION SEE COH SPEC. 02317

CAUTION! OVERHEAD POWER LINES IN AREA

REMOVE & SALVAGE EXIST FIRE HYDRANT

PROP 150 LF OF 12" D.I.P. WL W/ RESTRAINED JOINTS IN 24" STEEL CASING

CALLED 19.7861 ACRES
500 MAYO, LP
H.C.C.F. NO. RP-2023-411354
OCT. 27, 2023
500 MAYO SHELL RD

CALLED 71.6545 ACRES
PROLER SOUTHWEST LP
H.C.C.F. NO. 20100533126
DEC. 16, 2010

50' DRIVEWAY ACCESS ESMT.
H.C.C.F. NO. E637573

CALLED 6.1043 ACRES
2200 CLINTON HOLDINGS, LLC
H.C.C.F. NO. RP-2020-107156
MARCH 9, 2020
2129 CLINTON DR

MAYO SHELL RD.

60' CITY OF GALENA PARK RIGHT OF WAY OR ESMT. FOR PUBLIC ROAD PURPOSES VOL. 3587, PG. 193, H.C.D.R. MARCH 13, 1958

EXIST 12" WL TO REMAIN IN SERVICE

CRITICAL LOCATION SEE COH SPEC. 02317

903 MAYO SHELL RD
CALLED 17.5856 ACRES
AMERICAN PLANT FOOD CORPORATION
H.C.C.F. NO. E642744
JAN. 7, 1976

UNION PACIFIC RAILROAD

2011 CLINTON DR
CALLED 6.7794 ACRES
UNION CARBIDE CORP.
H.C.C.F. NO. S826585
JAN. 22, 1998

ASPHALT PAVING (±24' WIDTH)

R MAYO SHELL RD

LIMITS OF PPCA AREA
SEE SPEC SECTION 02105 & 02120

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

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-56
SET 1/2" I.R. W/CAP
D. BL STA. 26+53.33
OFFSET: 16.51R

NOTE:
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NO.	DATE	REVISION	APP.

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FB NO. XXXXXX

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD

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STA 24+00 TO STA 29+00

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S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 90 OF 204	

LIMITS OF PROP 12" D.I. PIPE WITH RESTRAINED JOINTS IN PPCA LIMITS SEE COH DETAIL 02511-01

LIMITS OF PROP 12" D.I. PIPE WITH RESTRAINED JOINTS IN PPCA LIMITS

LIMITS OF PROP 12" D.I. PIPE WITH RESTRAINED JOINTS IN PPCA LIMITS

PROP 12" WL

PROP 150' LF 12" WL IN 24" STEEL CASING

6' MIN COVER

2' MIN CLR

2' MIN CLR

12" Valero Houston Refinery Refined Liquid Product Pipeline (per SUE)

exist. 6" fh lead

exist. 12" water (approx. elev.)

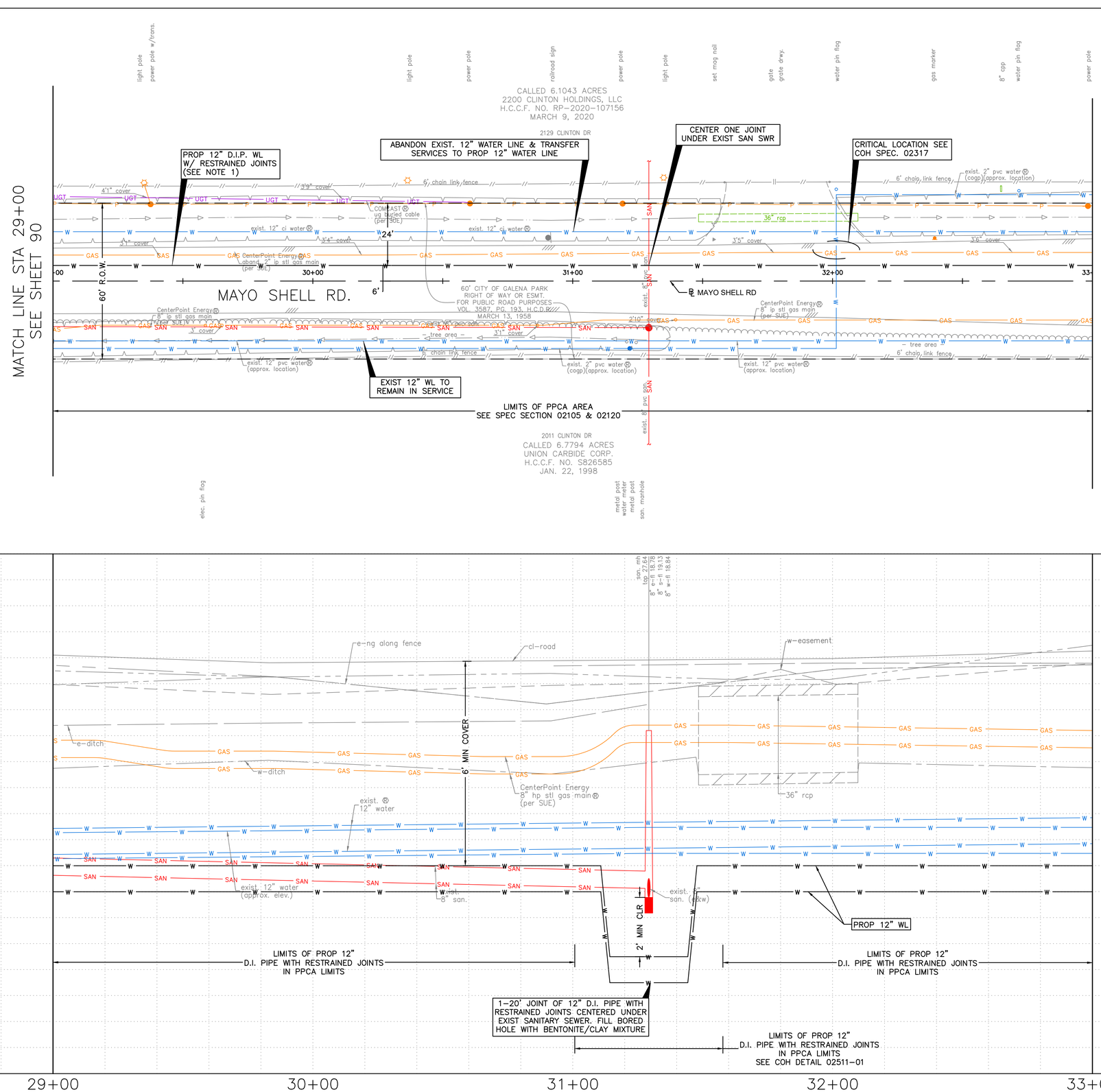
exist. 8" san.

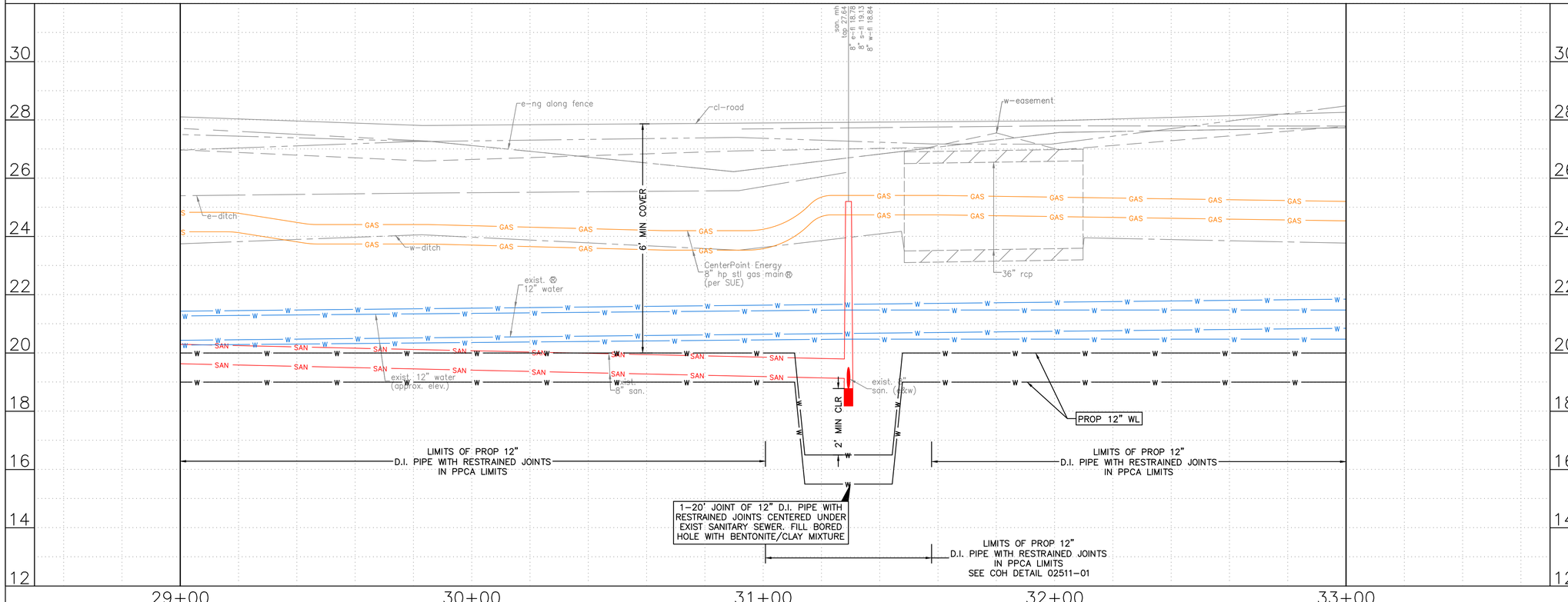
exist. 12" water

CenterPoint Energy 8" hp stl gas main (per SUE)

24+00 25+00 26+00 27+00 28+00 29+00

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 10:01am





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

NO.	DATE	REVISION	APP.

BENCHMARK:
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FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-55
SET MAGNAIL W/SHINER
D. BL STA. 31+54.28
OFFSET: 16.00L

NOTE:
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SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO. XXXXXX

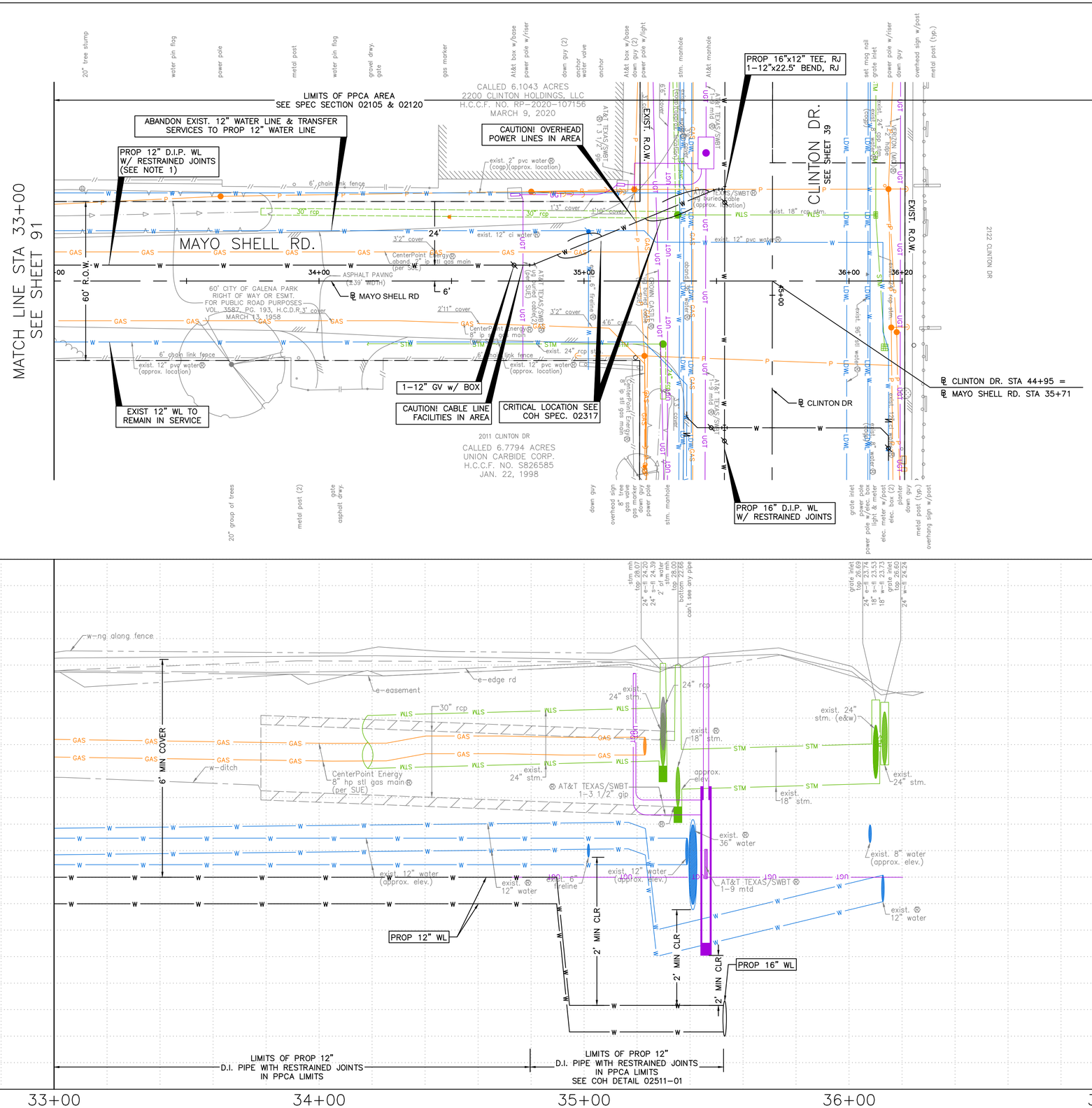
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD
PLAN & PROFILE
STA 29+00 TO STA 33+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 91 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 10:04am



N

0' 20' 40'

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-55
SET MAGNAIL W/SHINER
D. BL STA. 31+54.28
OFFSET: 16.00L

NOTE;

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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

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TX FIRM NO. F-4578

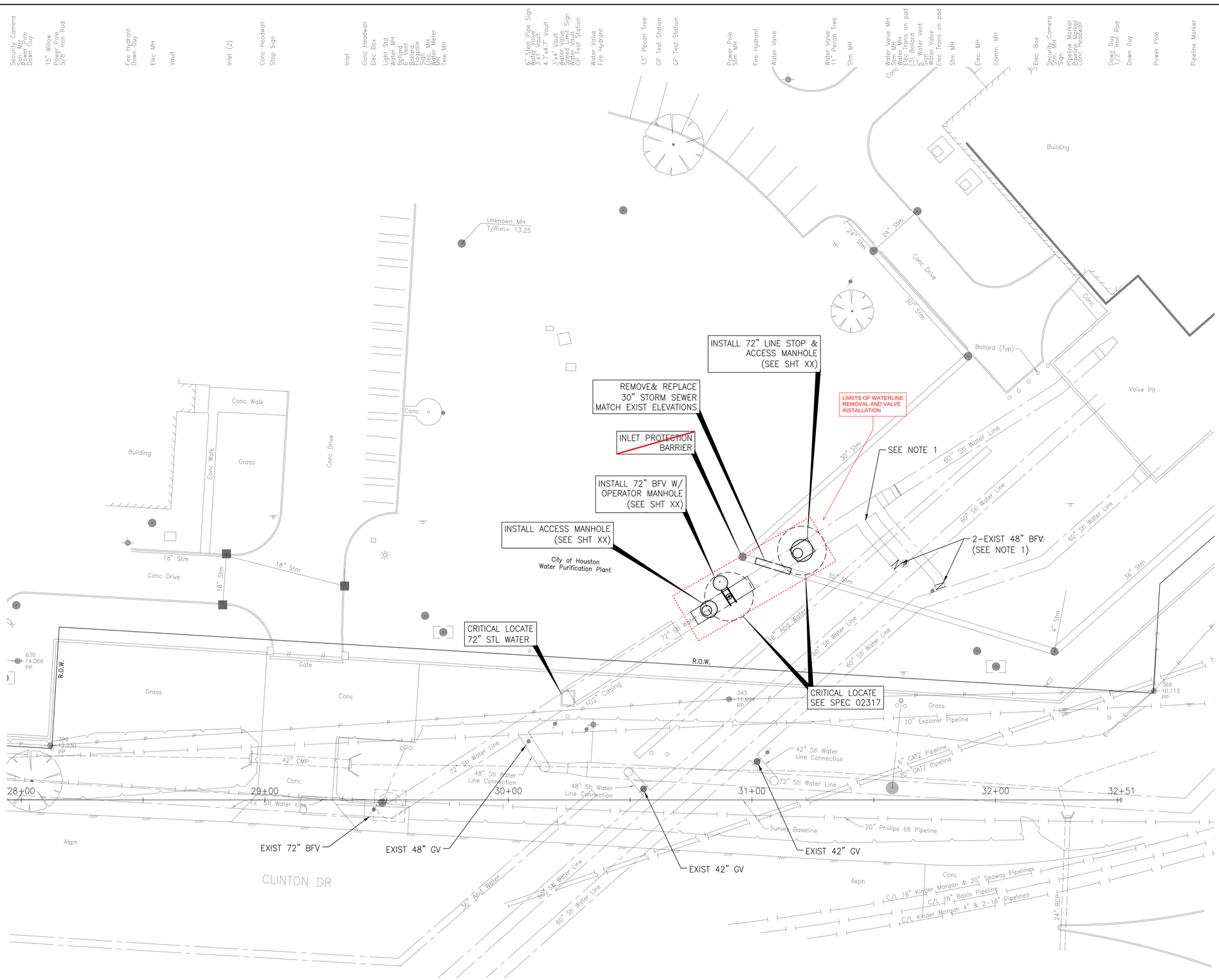
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
MAYO SHELL ROAD

PLAN & PROFILE
STA 33+00 TO END

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **92** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Mayo Shell Rd.dwg plotted on Aug 16, 2025 - 10:07am



(SEE SHEET 94 FOR PROFILE)

N

0 20 40

SCALE: 1"=20'

BENCHMARK:

TBM #2: SURVEY BASELINE STA. 27+79.10, 0.00' RT. TOP OF 5/8" IRON ROD WITH ORANGE CAP ON NORTH SIDE OF CLINTON DR, 9.4' EAST OF RR CROSSING SIGN. ELEV= 15.06 NAVD '88 (GEOID 12B)

TBM #1: SURVEY BASELINE STA. 32+51.48, 0.00' RT. TOP OF 5/8" IRON ROD WITH ORANGE CAP ON NORTH SIDE OF CLINTON DR, 19.5' NORTHEAST OF NORTHEAST CONCRETE WINGWALL AT 24" RCP CULVERT. ELEV= 11.04 NAVD '88 (GEOID 12B)

NOTES:

1. CONTRACTOR TO MINIMIZE LOADING AND PROTECT EXIST WATER LINES. SEE COH SPEC 02614.
2. THE INFORMATION PROVIDED HEREIN IS BASED ON SURVEYS CONDUCTED AT AN EARLIER DATE AND MAY NO LONGER ACCURATELY REFLECT CURRENT SITE CONDITIONS. IT IS IMPERATIVE THAT ALL CONTRACTORS PERFORM A THOROUGH FIELD VERIFICATION TO CONFIRM THE ACCURACY OF THIS DATA BEFORE PROCEEDING WITH ANY INSTALLATION ACTIVITIES. THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ENSURING THAT ALL MEASUREMENTS, CONDITIONS, AND REQUIREMENTS ARE UP-TO-DATE AND COMPLIANT WITH APPLICABLE STANDARDS AND REGULATIONS.

NO.	DATE	REVISION	APP.

LAN

EFF DATE: XXXX-XX-20XX

DWG NO: XXXXX-XX

LOCKWOOD, ANDREWS & NEWNAM, INC.
3700 W SAM HOUSTON PKWY S, SUITE 400
HOUSTON, TX 77042

PH: 713-266-6900
TEXAS REGISTERED ENGINEERING FIRM F-2614

SURVEYED BY:
KUO & ASSOCIATES
FB NO. 000000

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

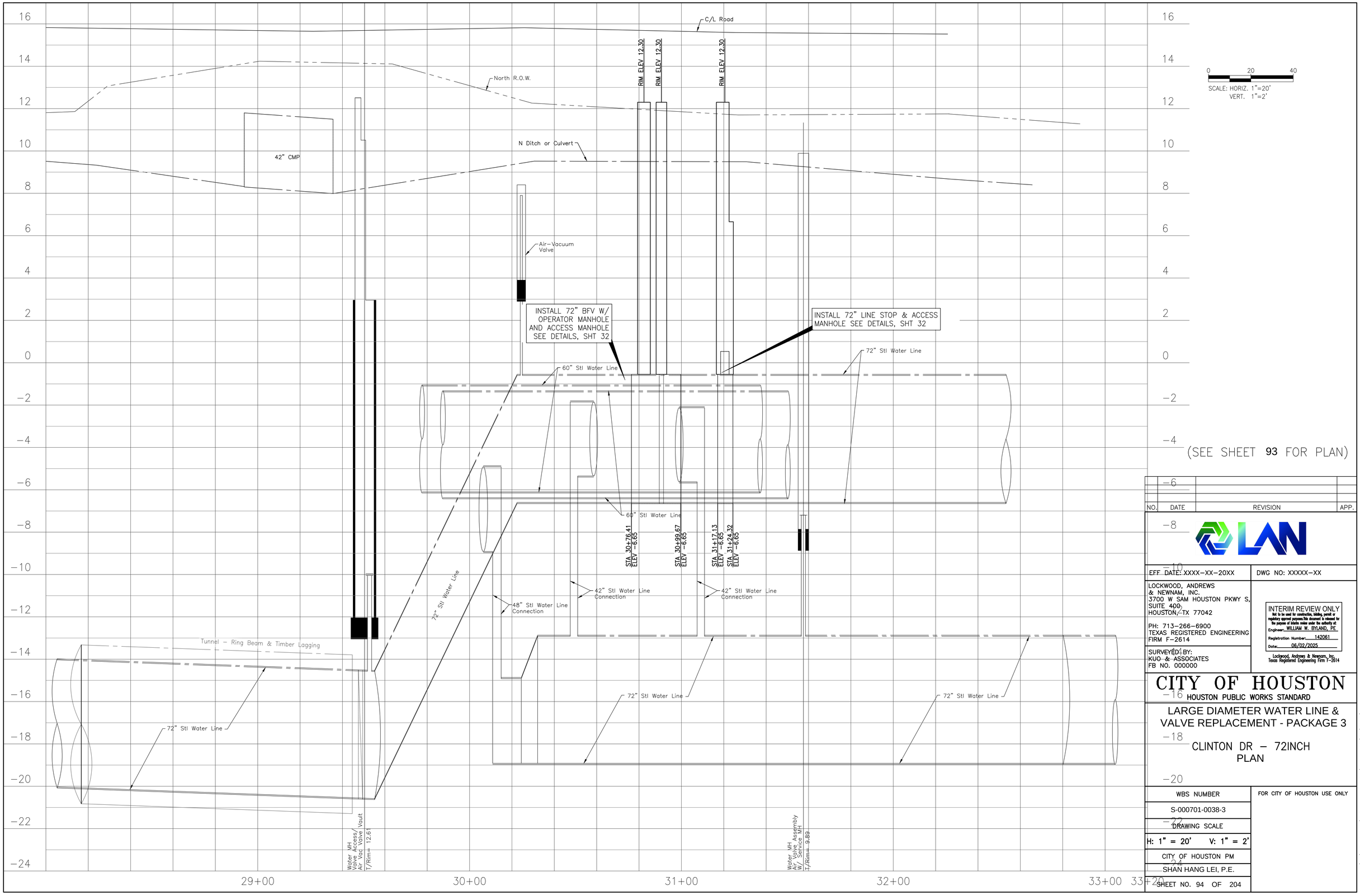
HOUSTON PUBLIC WORKS STANDARD

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

CLINTON DR – 72INCH PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 93 OF 204	

FILE PATH: P:\132\132-10031-001\4-I-BIM-CAD\Civil\Sheets\CH107-SR-72IN VALVE PLAN & SWPPP.dwg



0 20 40

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

(SEE SHEET 93 FOR PLAN)

NO.	DATE	REVISION	APP.

EFF. DATE: XXXX-XX-20XX

DWG NO: XXXXX-XX

LOCKWOOD, ANDREWS & NEWNAM, INC.
3700 W SAM HOUSTON PKWY S, SUITE 400,
HOUSTON, TX 77042

PH: 713-266-6900
TEXAS REGISTERED ENGINEERING FIRM F-2614

SURVEYED BY:
KUO & ASSOCIATES
FB NO. 000000

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Engineer: WILLIAM W. BYLAND, PE
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Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

CLINTON DR - 72INCH

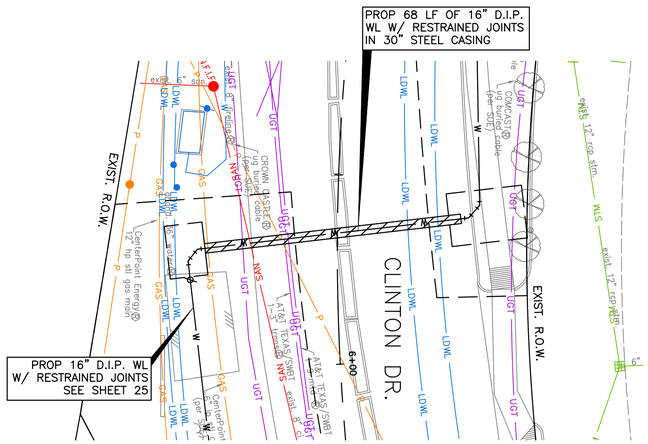
PLAN

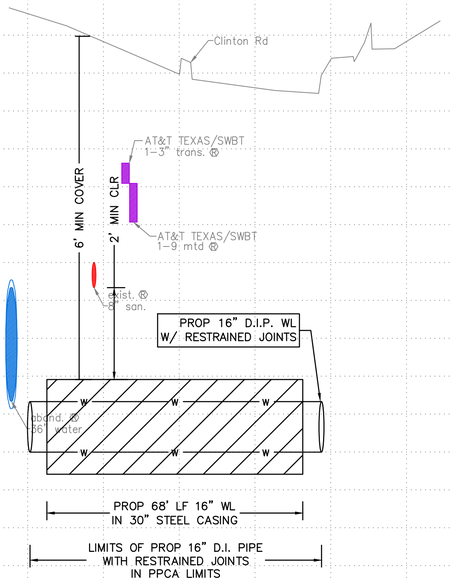
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 94 OF 204	

FILE PATH: P:\132\\32-10031-000\V-4-Production-Working\4-1-BIM-CAD\Civil\Sheets\CS108-36-72IN VALVE PROFILE.dwg

NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.





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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-12
SET 'X' CUT ON CONC.
D. BL STA. 3+59.71
OFFSET: 54.11R

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

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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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYRLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

WATER LINE LATERALS

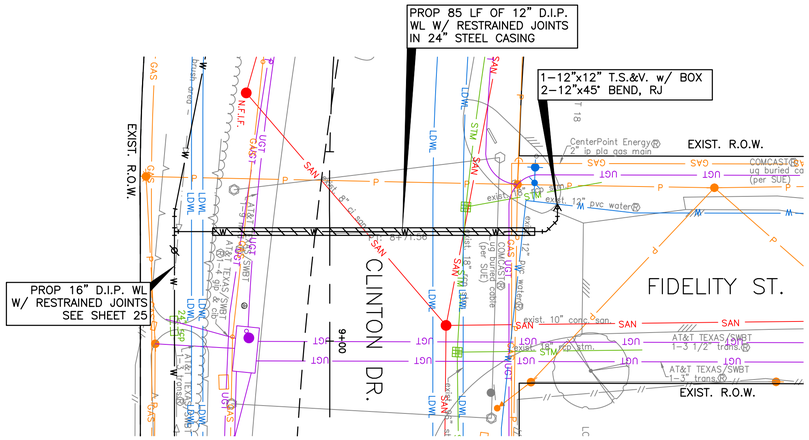
CLINTON DRIVE
PLAN & PROFILE
STA 5+70

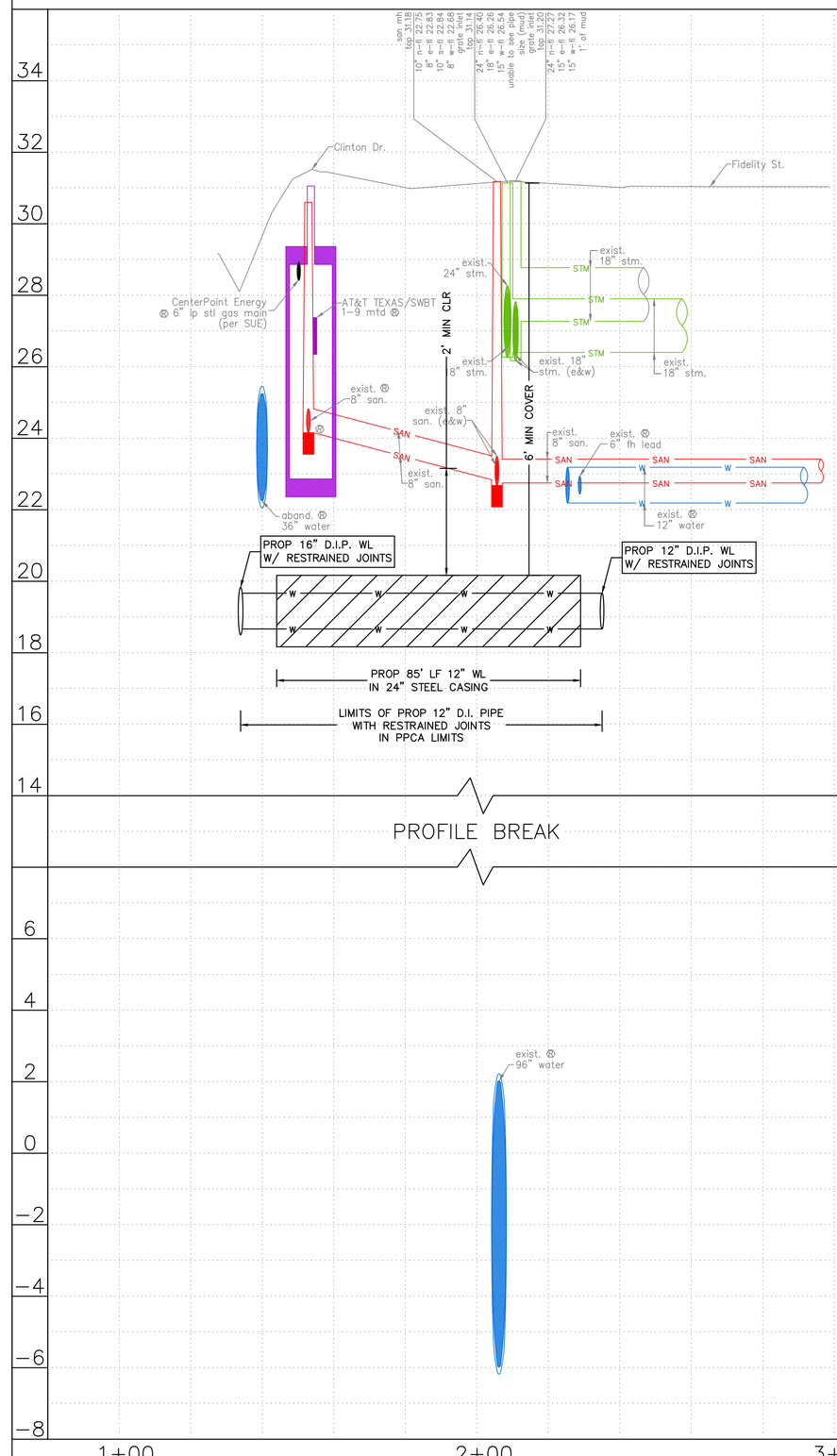
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **95** OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr Laterals.dwg plotted on Aug 16, 2025 - 1:48pm

NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.





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

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-13
SET MAGNAIL W/SHINER
D. BL STA. 8+39.83
OFFSET: 48.73L

NOTICE:
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Date

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Date

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Date

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

NO.	DATE	REVISION	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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
WATER LINE LATERALS

CLINTON DRIVE
PLAN & PROFILE
STA 8+75

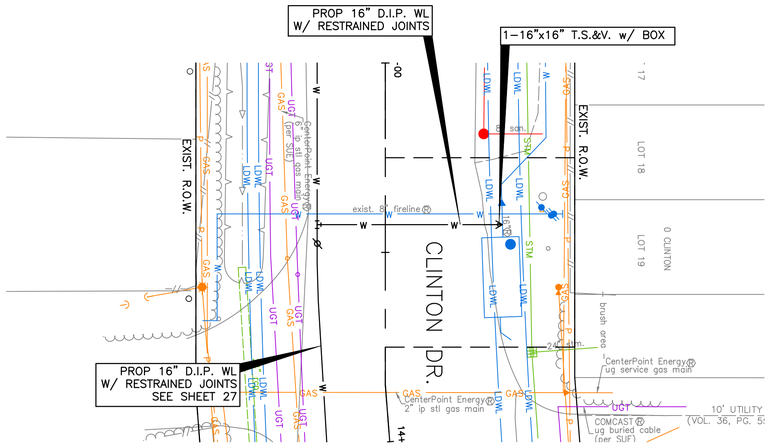
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **96** OF 204	

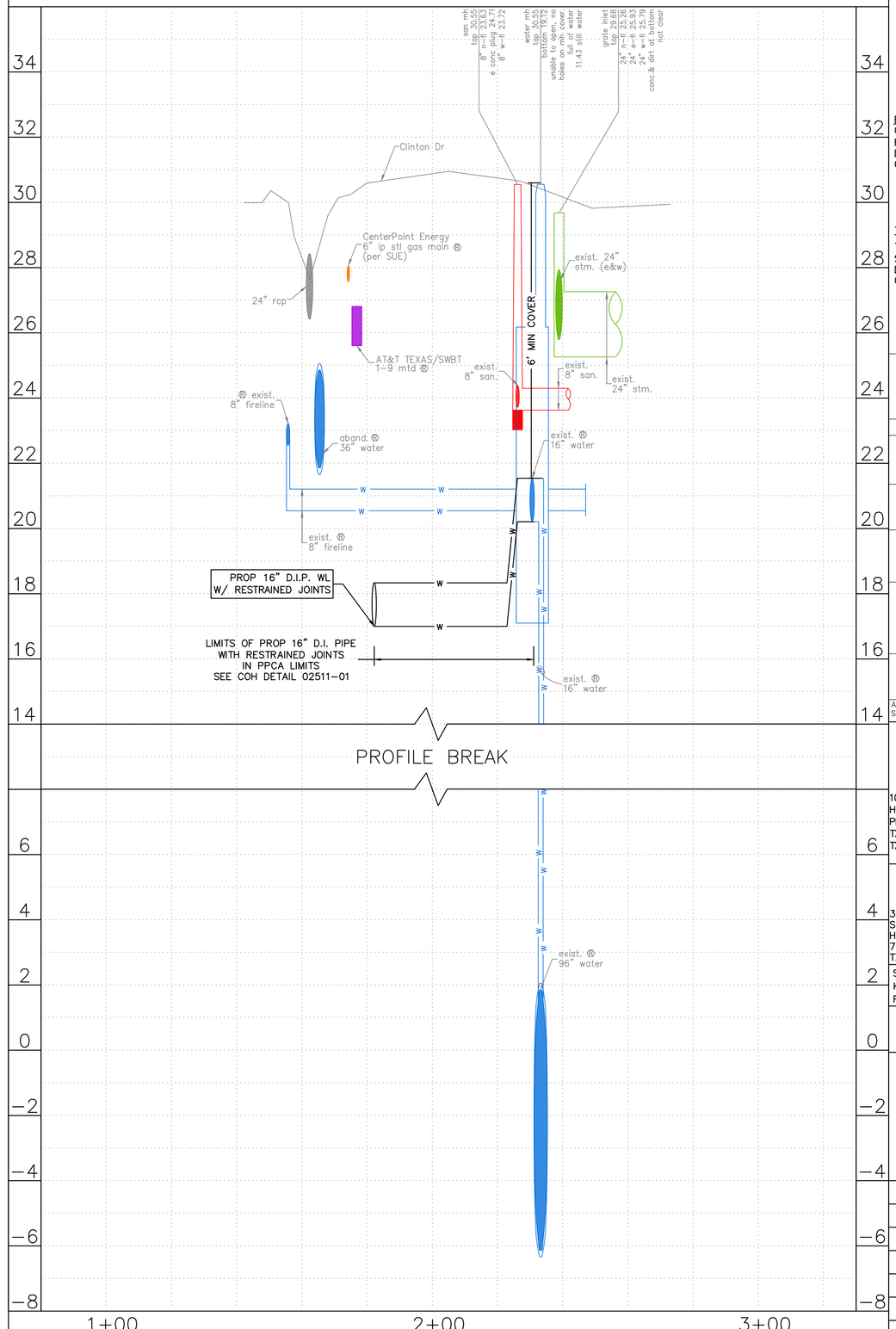
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NOTE:

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.

N





0' 20' 40'

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-14
SET MAGNAIL W/SHINER
D. BL STA. 12+83.83
OFFSET: 35.49L

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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

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ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
WATER LINE LATERALS

CLINTON DRIVE
PLAN & PROFILE
STA 13+50

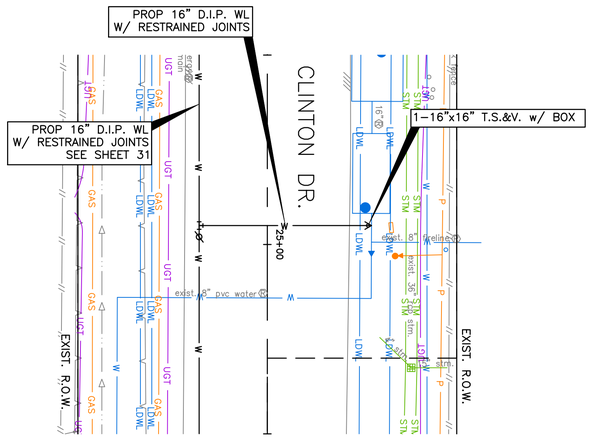
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **97** OF 204	

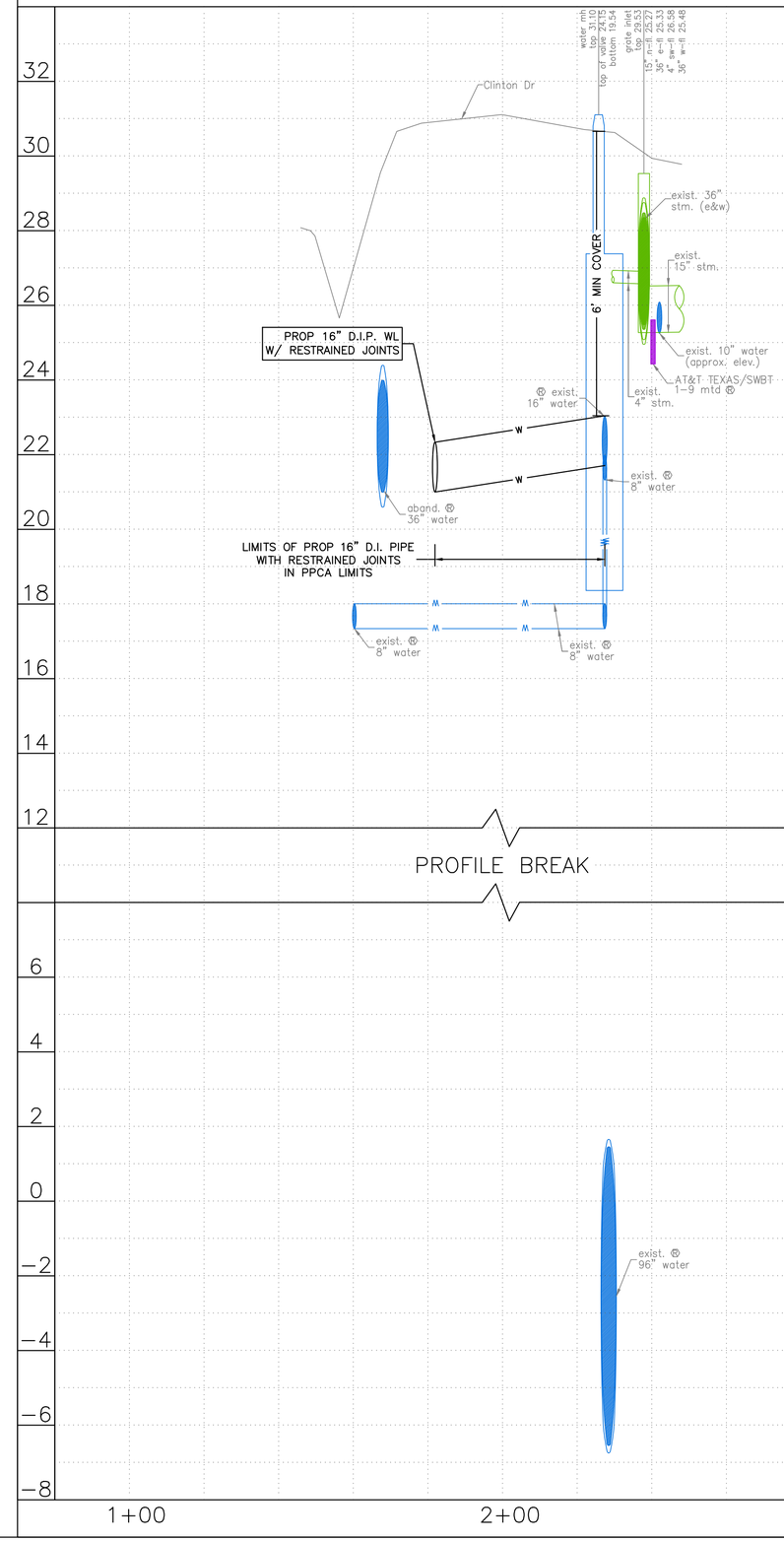
S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet-Clinton Dr Laterals.dwg plotted on Aug 16, 2025 - 1:55pm

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2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.







0' 20' 40'

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-17
SET 1/2" I.R. W/CAP
D. BL STA. 25+67.35
OFFSET: 29.72L

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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

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TEXAS REG. NO.: 111684

ON 08/15/2025
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TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
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Engineer: WILLIAM W. BRYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
WATER LINE LATERALS

CLINTON DRIVE
PLAN & PROFILE
STA 25+00

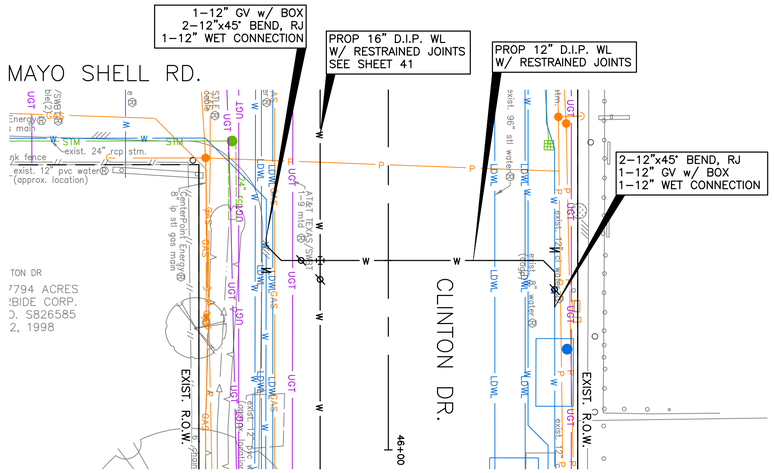
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **98** OF 204	

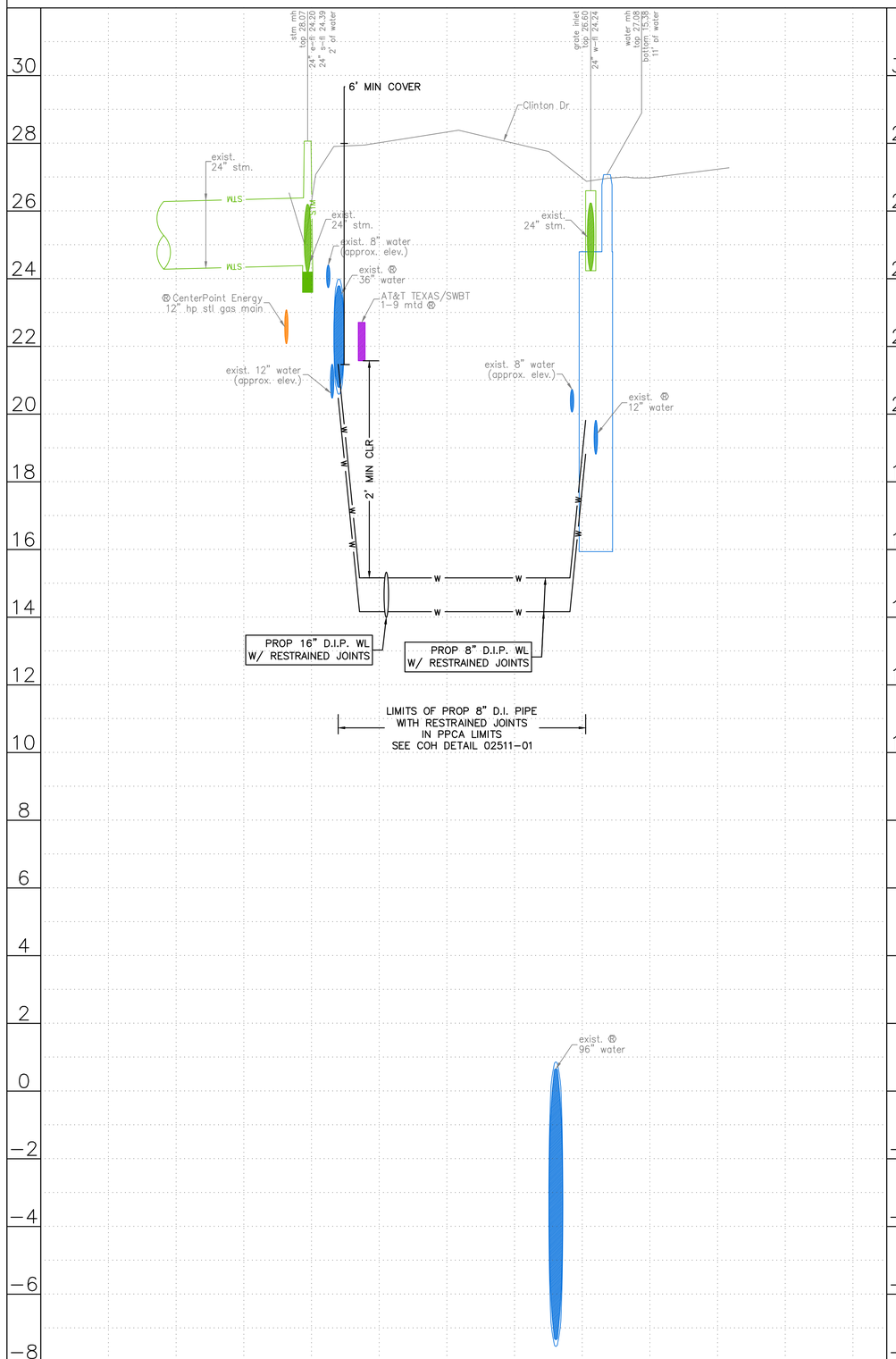
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NOTE:

1. THE PROPOSED 16" AND SMALLER WATER LINES SHALL BE BUILT BY MEANS OF TRENCHLESS CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATIONS OF PITS IN FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
2. SEE SHEETS XX TO XX REGARDING PAVEMENT RESTORATION FOR MORE INFORMATION.







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

BENCHMARK:
C.O.H. MONU. 5756–7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B–22
SET MAGNAIL W/SHINER
D. BL STA. 44+92.07
OFFSET: 35.77L

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.

NO.	DATE	REVISION	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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX. FIRM NO. F–4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713–266–6900
TX FIRM NO.: F–2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96–INCH WATER LINE DESIGN ONLY

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F–2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
WATER LINE LATERALS

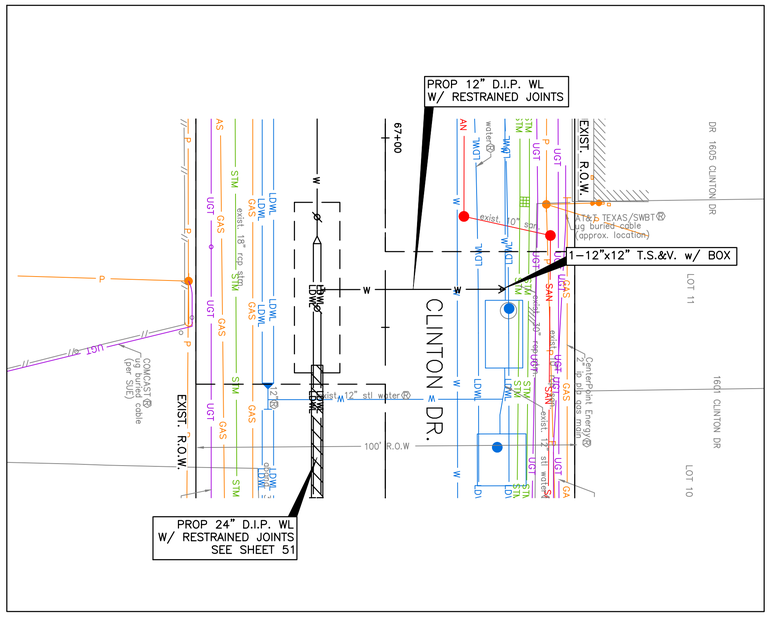
CLINTON DRIVE
PLAN & PROFILE
STA 45+55

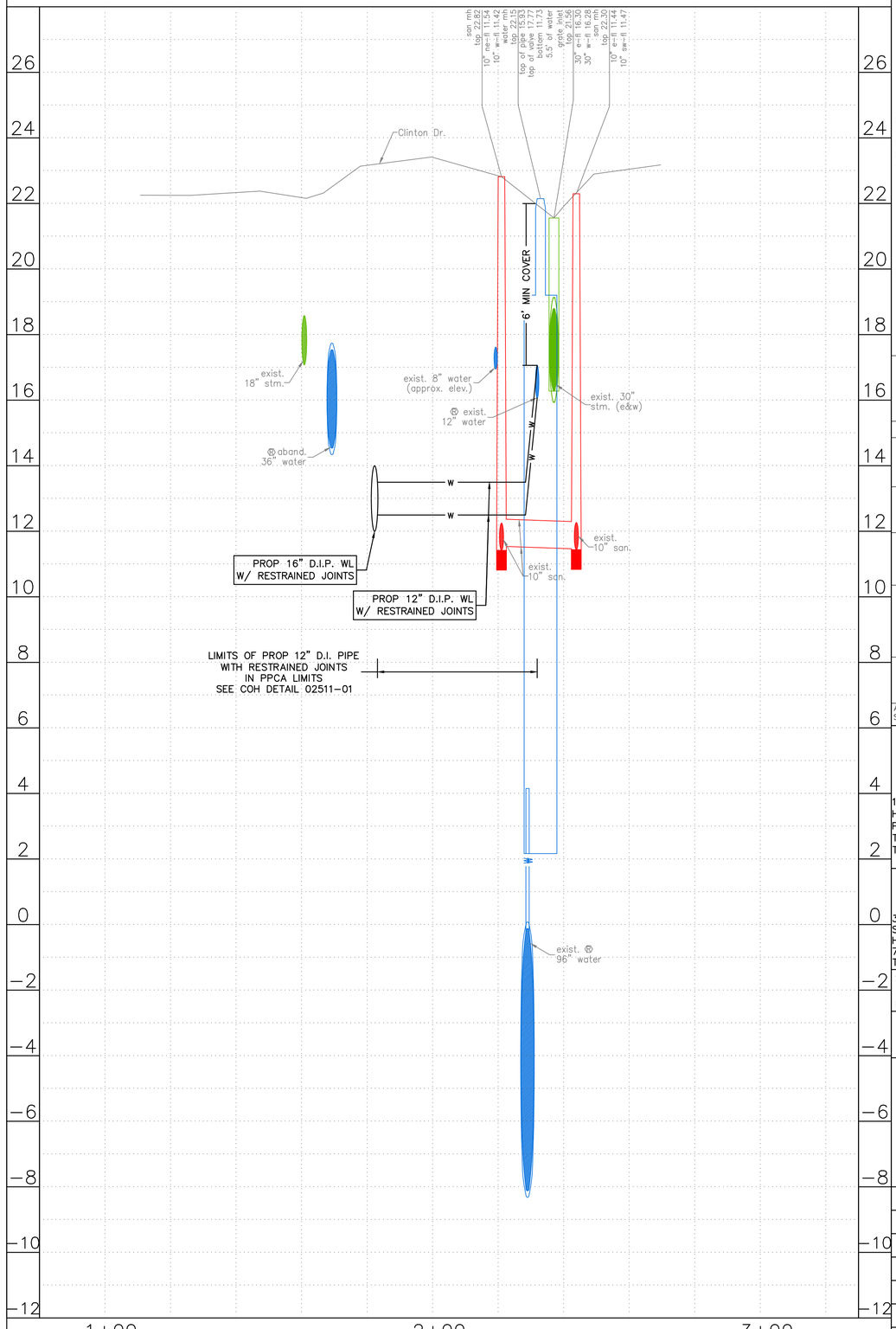
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **99** OF 204	

S:\Proj–2023\23082 (LDWL–Pkg 3–Clinton Dr)\Dwgs\Design\Sheets\P&P Sheet–Clinton Dr Laterals.dwg plotted on Aug 16, 2025 – 2:02pm

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

NO.	DATE	REVISION	APP.

BENCHMARK:
C.O.H. MONU. 5756-7710
FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-29
SET MAGNAIL W/SHINER
D. BL STA. 68+66.47
OFFSET. 38.29L

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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

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
WATER LINE LATERALS

CLINTON DRIVE
PLAN & PROFILE
STA 67+45

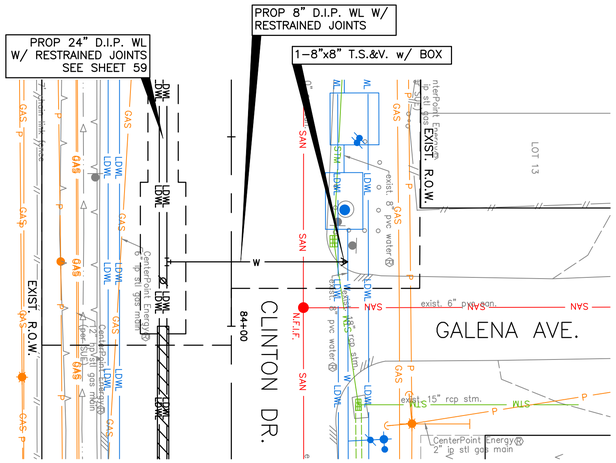
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **100** OF 204	

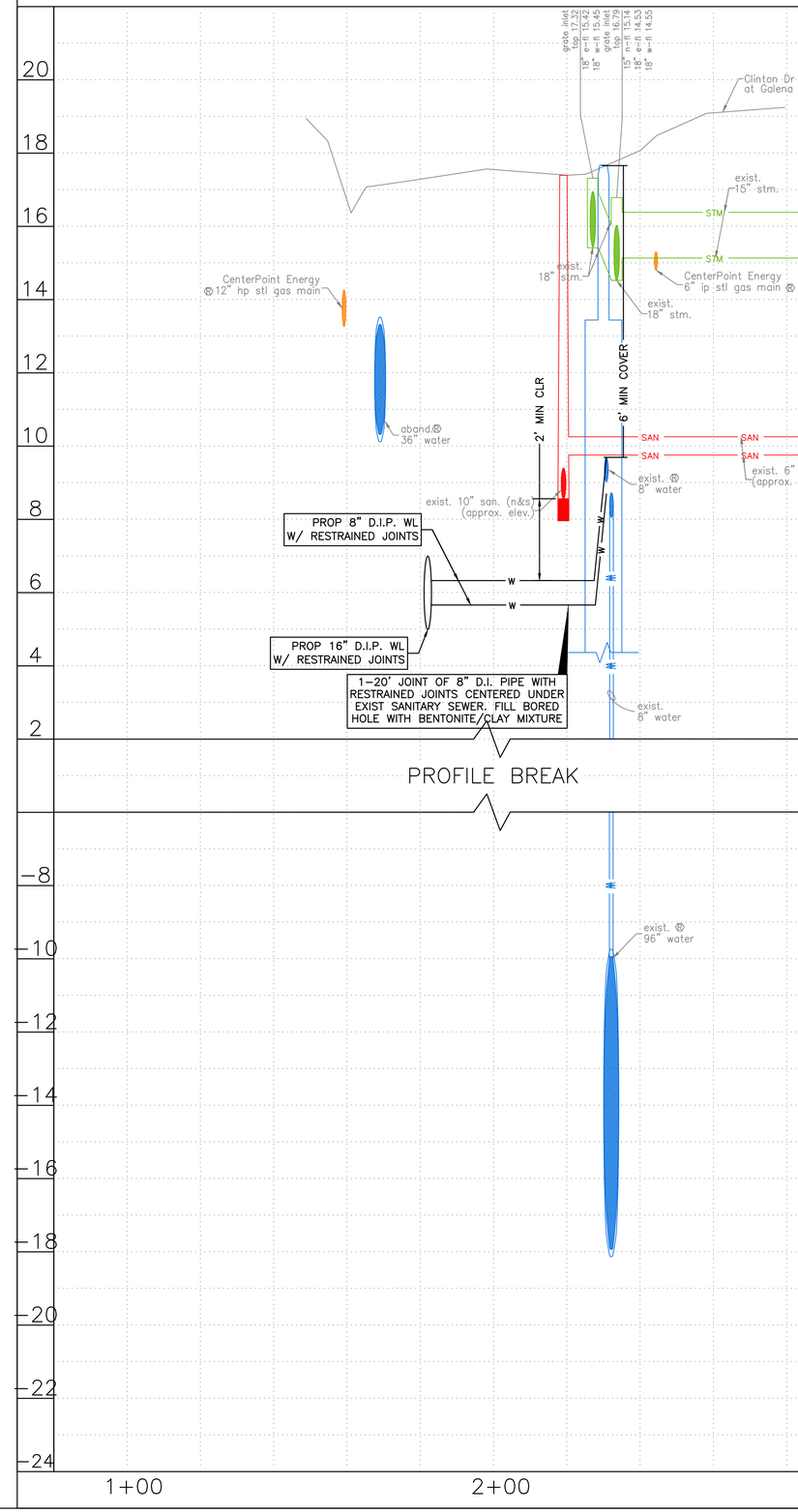
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0' 20' 40'

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

NO.	DATE	REVISION	APP.

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FND BRASS DISC HCFRM NO.(070475)
D. BL STA. 89+49.15
OFFSET: 23.19L

T.B.M.:
T.B.M. B-33
SET 1/2" I.R. W/CAP
D. BL STA. 84+08.59
OFFSET: 35.21R

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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

LAN
3700 W SAM HOUSTON PKWY S
SUITE 400
HOUSTON, TX 77042
713-266-6900
TX FIRM NO.: F-2614

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

FOR 96-INCH WATER LINE DESIGN ONLY

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Engineer: WILLIAM W. BYRLAND, PE
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Date: 06/02/2025
Lockwood, Andrews & Newsom, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

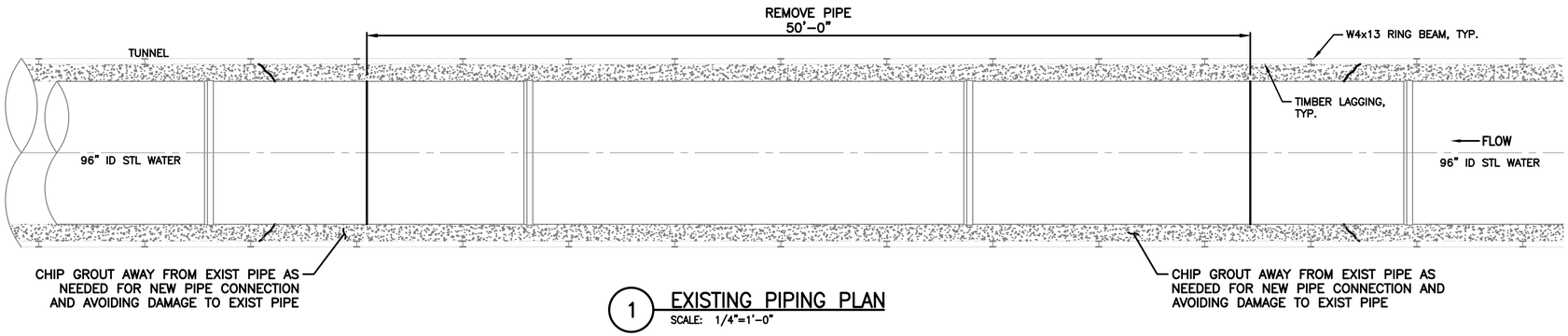
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

WATER LINE LATERALS

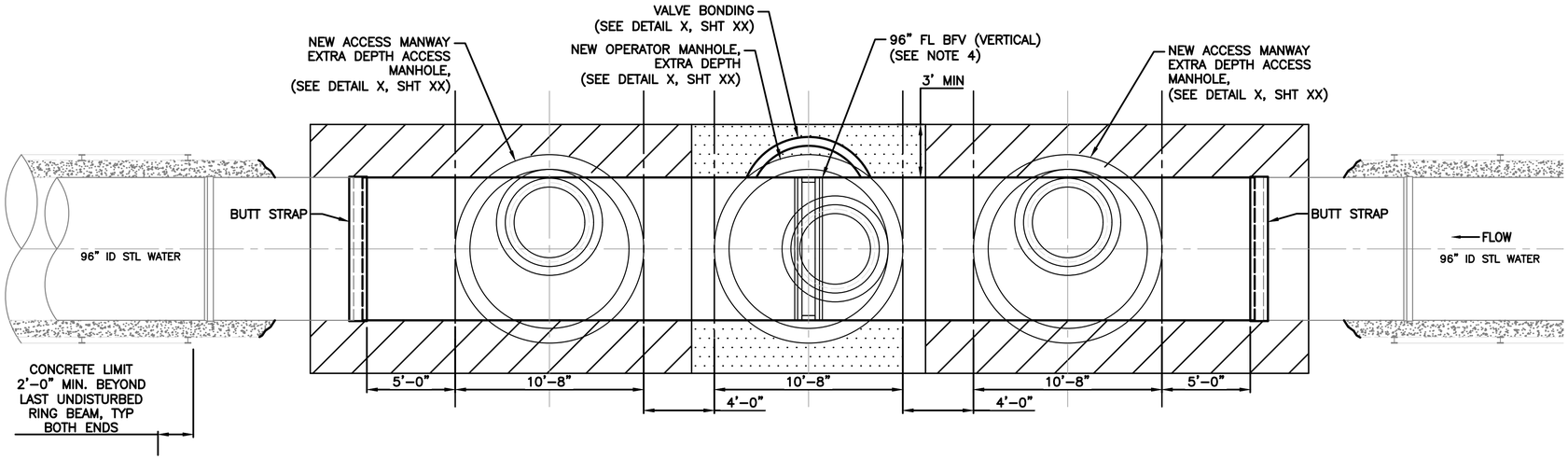
CLINTON DRIVE
PLAN & PROFILE
STA 83+85

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 101 OF 204	

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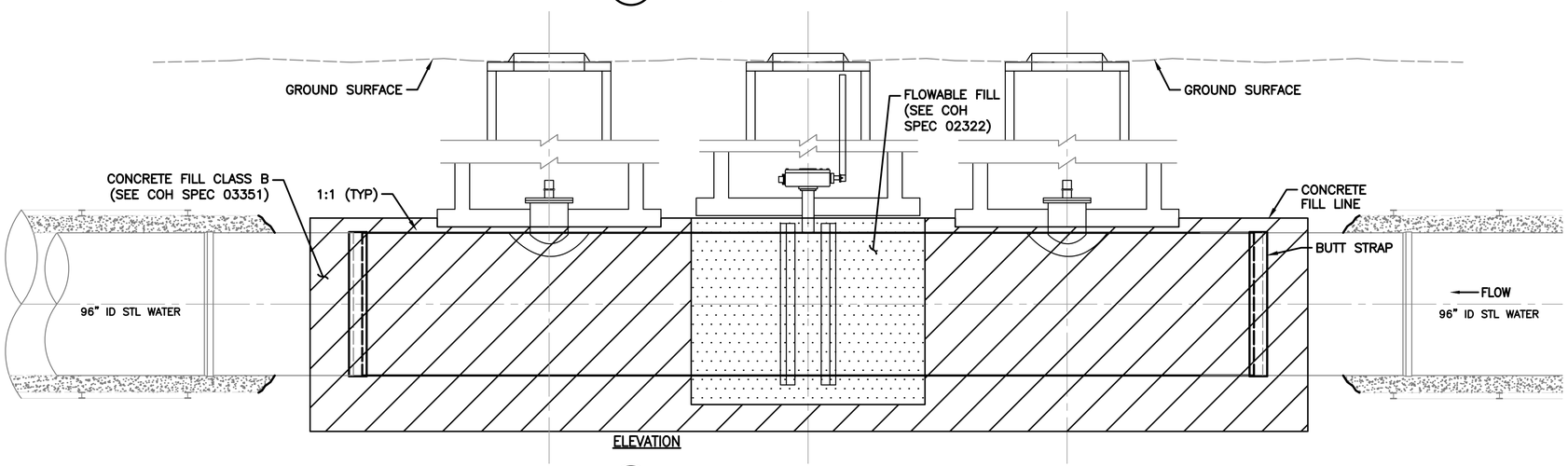


1 EXISTING PIPING PLAN
SCALE: 1/4"=1'-0"



2 PROPOSED PIPING LAYOUT
SCALE: 1/4"=1'-0"

A 31



A SECTION
SCALE: 1/4"=1'-0"

NOTES:

1. PIPE DIMENSIONS SHOWN ARE BASED ON BEST INFORMATION AVAILABLE. CONTRACTOR TO FIELD MEASURE ALL DIMENSIONS PRIOR TO ORDERING MATERIAL. EX. PIPE IS LINED WITH COAL TAR ENAMEL.
2. VALVE & PIPE SHALL BE WRAPPED IN POLYETHYLENE SHEET FOR BOND BREAKER PRIOR TO PLACEMENT OF FILL. ENSURE THAT ALL VALVE COMPONENTS INCLUDING FLANGE, BONNET EXTENSION, AND LOWER BEARING HOUSING BOLTS ARE PROTECTED.
3. SEE COH SPEC 02518 FOR COATING AND LINING REQUIREMENTS.
4. PROPOSED 96" BFV TO BE INSTALLED VERTICALLY.

NO.	DATE	REVISION	APP.

LAN

EFF DATE: XXXX-XX-20XX

DWG NO: XXXXX-XX

LOCKWOOD, ANDREWS & NEWNAM, INC.
3700 W SAM HOUSTON PKWY S, SUITE 400
HOUSTON, TX 77042

PH: 713-266-6900
TEXAS REGISTERED ENGINEERING FIRM F-2614

SURVEYED BY:
KUO & ASSOCIATES
FB NO. 000000

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Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

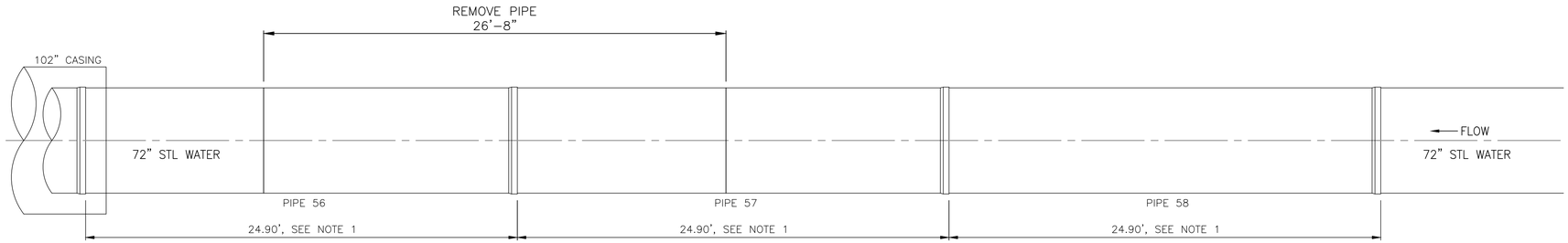
HOUSTON PUBLIC WORKS STANDARD

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

CLINTON DR
96INCH
VALVE SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1/4" = 1'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 102 OF 204	

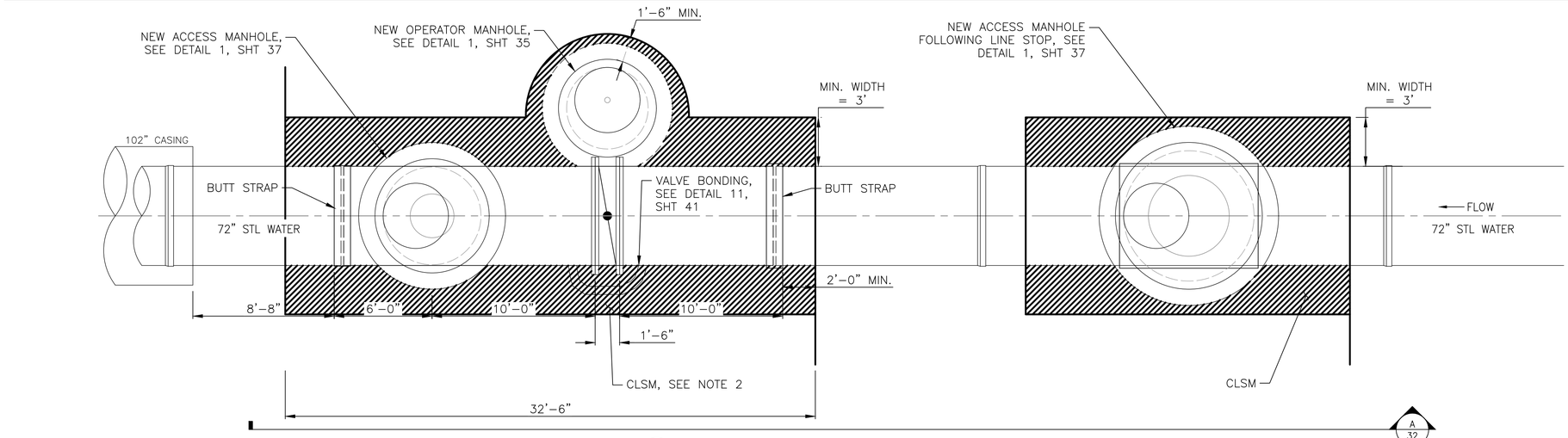
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PLAN

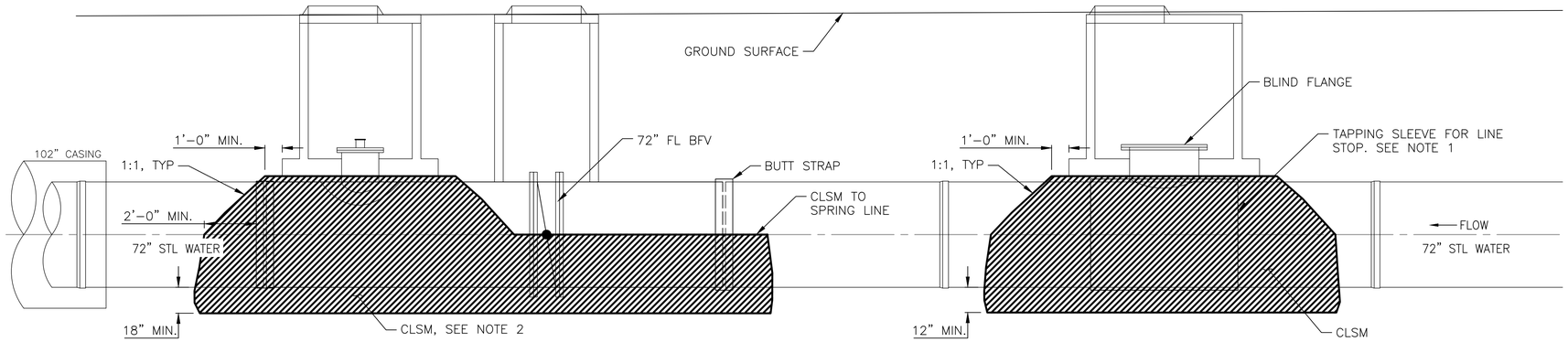
1 EXISTING PIPING LAYOUT

SCALE: 1/4"=1'-0"



2 PROPOSED PIPING LAYOUT

SCALE: 1/4"=1'-0"



ELEVATION

A SECTION

SCALE: 1/4"=1'-0"

NOTES:

1. PIPE DIMENSIONS SHOWN ARE BASED ON LAY SCHEDULE INFORMATION. CONTRACTOR TO FIELD MEASURE ALL DIMENSIONS PRIOR TO ORDERING MATERIAL.
2. VALVE & PIPE SHALL BE WRAPPED IN POLYETHYLENE SHEET FOR BOND BREAKER PRIOR TO PLACEMENT OF FILL. ENSURE THAT ALL VALVE COMPONENTS INCLUDING FLANGE, BONNET EXTENSION, AND LOWER BEARING HOUSING BOLTS ARE PROTECTED.
3. FIELD WELD EACH HARNESS TO EXISTING PIPE PRIOR TO CUTTING PIPE. SEE SUPPLEMENTAL COH SPEC 02511.
4. SEE COH SPEC 02518 FOR COATING AND LINING REQUIREMENTS.

NO.	DATE	REVISION	APP.

LAN

EFF DATE: XXXX-XX-20XX

DWG NO: XXXXX-XX

LOCKWOOD, ANDREWS & NEWNAM, INC.
3700 W SAM HOUSTON PKWY S, SUITE 400
HOUSTON, TX 77042

PH: 713-266-6900
TEXAS REGISTERED ENGINEERING FIRM F-2614

SURVEYED BY:
KUO & ASSOCIATES
FB NO. 000000

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Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON

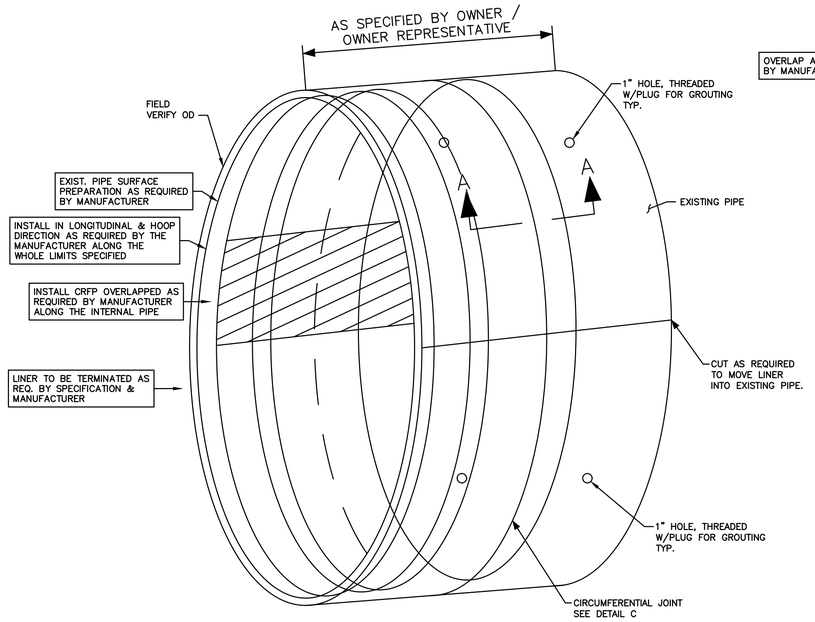
HOUSTON PUBLIC WORKS STANDARD

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

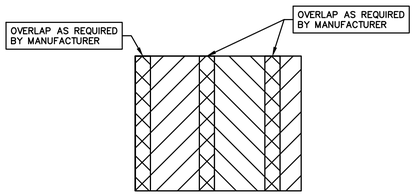
CLINTON DR
72INCH
VALVE SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1/4" = 1'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 103 OF 204	

FILE PATH: P:\137\132-10031-001\V-D-Production-Working\4-1-BIM-CAD\CAD\Sheets\D0502-36-72IN VALVE INSTALLATION DETAILS 2 OF 2_2018-12-20.dwg



STEEL LINER



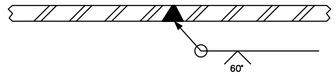
SECTION A–A

NOTES:

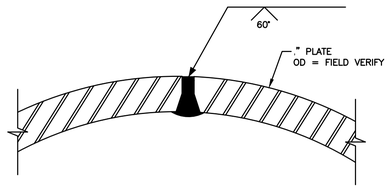
1. CONTRACTOR TO FIELD VERIFY INSIDE DIAMETER OF PIPE.
2. WELD THICKNESS TO MATCH PLATE THICKNESS. IF DIFFERENT THICKNESSES THEN PROVIDE WELD THICKNESS EQUAL TO GREATER OF THE TWO.

DAMAGED PIPE LOCATION

A OPTION #1 – PIPE REPAIR



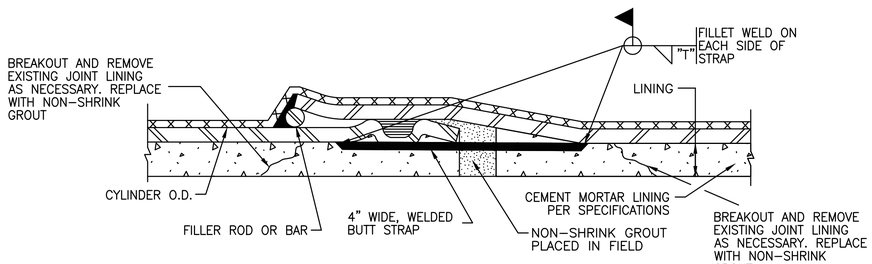
B SPLIT LINER SECTION CIRCUMFERENTIAL JOINTS



C SPLIT SEAM BEVEL SECTION LONGITUDINAL JOINTS

1 INTERNAL REPAIR OF DAMAGED PIPE

(FOR ADJUSTMENTS ONLY AS APPROVED BY ENGINEER AND PIPE MANUFACTURER)

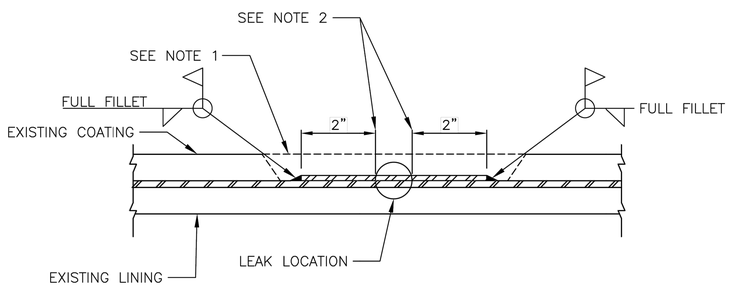


2 FIELD WELDED O–RING – STEEL PIPE JOINT

FLEXIBLE COATING AND CEMENT MORTOR LINING
(FOR ADJUSTMENTS ONLY AS APPROVED BY ENGINEER AND PIPE MANUFACTURER.)

NOTES:

1. BREAKOUT AND REMOVE JOINT LINING FOR ASSESSMENT BY PROJECT MANAGER OR ENGINEER.
2. INSTALL 4" WIDE, BUTT–STRAP ON JOINTS WHERE DIRECTED BY PROJECT MANAGER AND ENGINEER.
3. AFTER ASSESSMENT AND REPAIR, REPLACE NON–SHRINK GROUT REMOVED FOR ASSESSMENT.



NOTE:

1. REMOVE EXISTING COATING TO EXPOSE STEEL CYLINDER.
2. BUTT–STRAP WIDTH, 2–INCHES BEYOND LEAK OR TO COMPETENT STEEL WHICHEVER IS GREATER.

3 STEEL PIPE BUTT–STRAP REPAIR DETAIL

(FOR ADJUSTMENTS ONLY AS APPROVED BY ENGINEER AND PIPE MANUFACTURER)

NO.	DATE	REVISION	APP.

EFF DATE: XXXX–XX–20XX

DWG NO: XXXXX–XX

LOCKWOOD, ANDREWS & NEWNAM, INC.
3700 W SAM HOUSTON PKWY S, SUITE 400
HOUSTON, TX 77042

PH: 713–266–6900
TEXAS REGISTERED ENGINEERING FIRM F–2614

SURVEYED BY:
KUO & ASSOCIATES
FB NO. 000000

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CITY OF HOUSTON

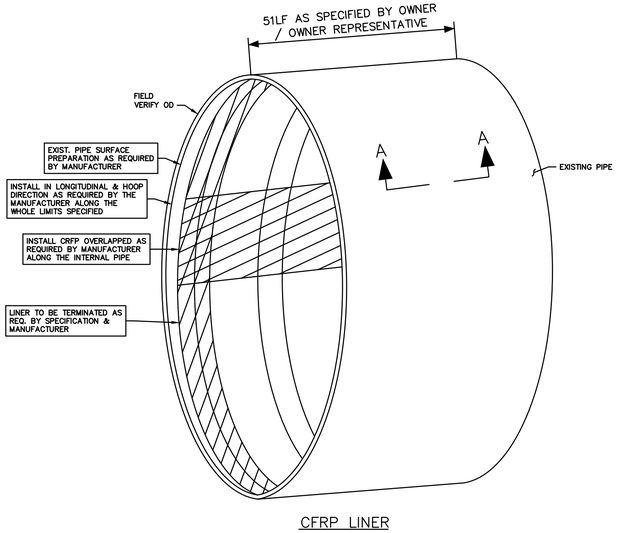
HOUSTON PUBLIC WORKS STANDARD

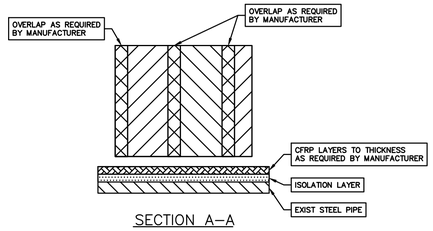
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

CLINTON DR
REPAIR OF DAMAGED PIPE
(SHEET 1 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 104 OF 204	

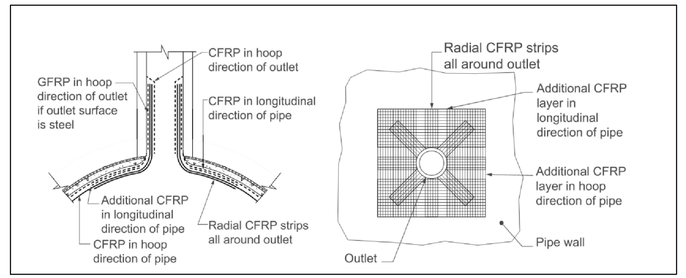
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1 CARBON FIBER–EPOXY LAMINATE & GLASS FIBER REINFORCED PIPE REPAIR

(FOR ADJUSTMENTS ONLY AS APPROVED BY ENGINEER AND MANUFACTURER)



1 CARBON FIBER–EPOXY LAMINATE & & GLASS FIBER REINFORCED OUTLET REPAIR

(FOR ADJUSTMENTS ONLY AS APPROVED BY ENGINEER AND MANUFACTURER)

NO.	DATE	REVISION	APP.

LAN

EFF DATE: XXXX–XX–20XX

DWG NO: XXXXX–XX

LOCKWOOD, ANDREWS & NEWNAM, INC.
3700 W SAM HOUSTON PKWY S, SUITE 400
HOUSTON, TX 77042

PH: 713–266–6900
TEXAS REGISTERED ENGINEERING FIRM F–2614

SURVEYED BY:
KUO & ASSOCIATES
FB NO. 000000

INTERIM REVIEW ONLY
Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:
Engineer: WILLIAM W. BYLAND, PE
Registration Number: 142061
Date: 06/02/2025
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F–2614

CITY OF HOUSTON

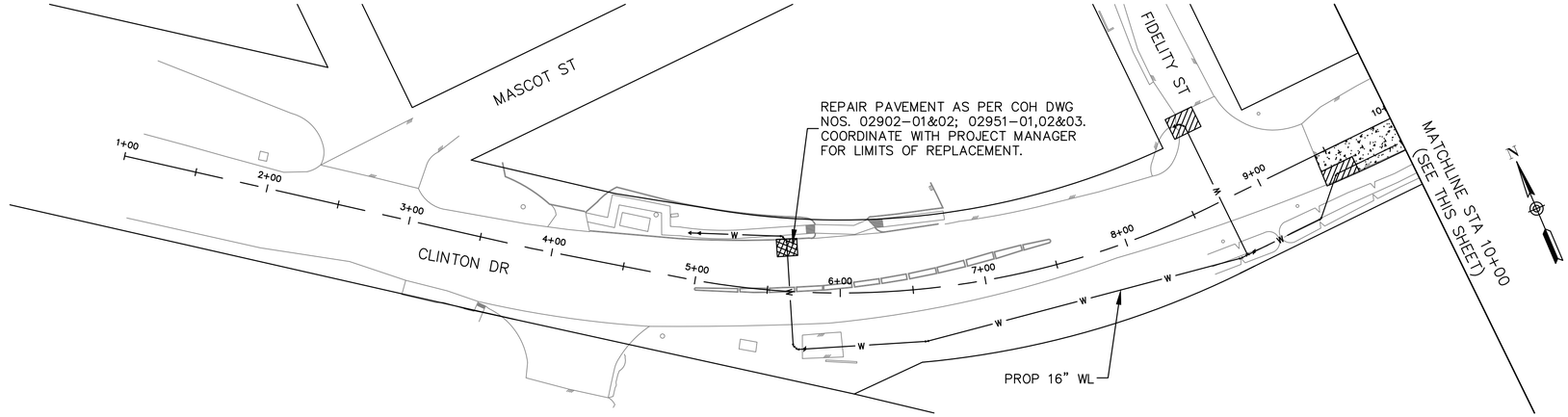
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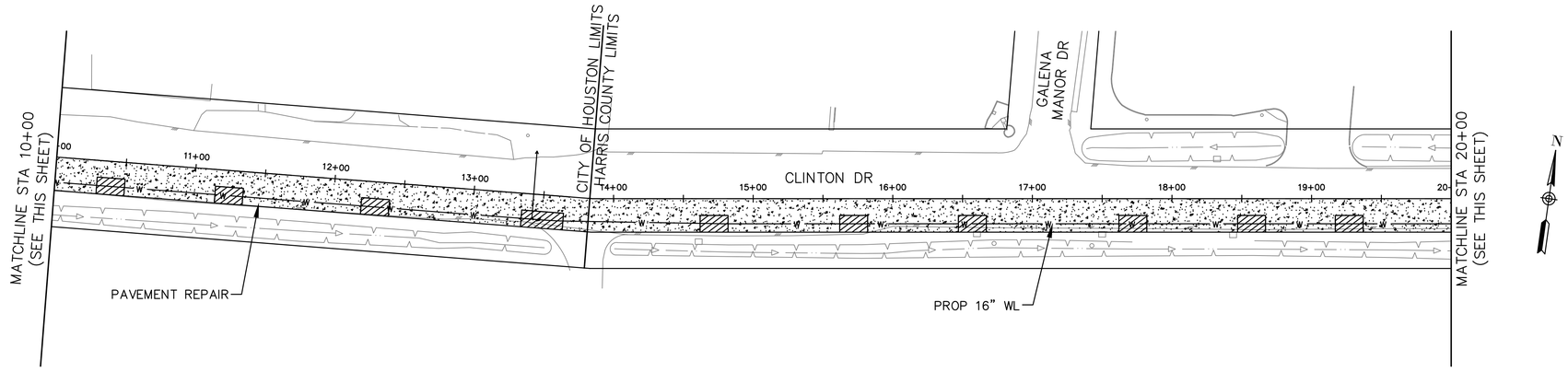
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

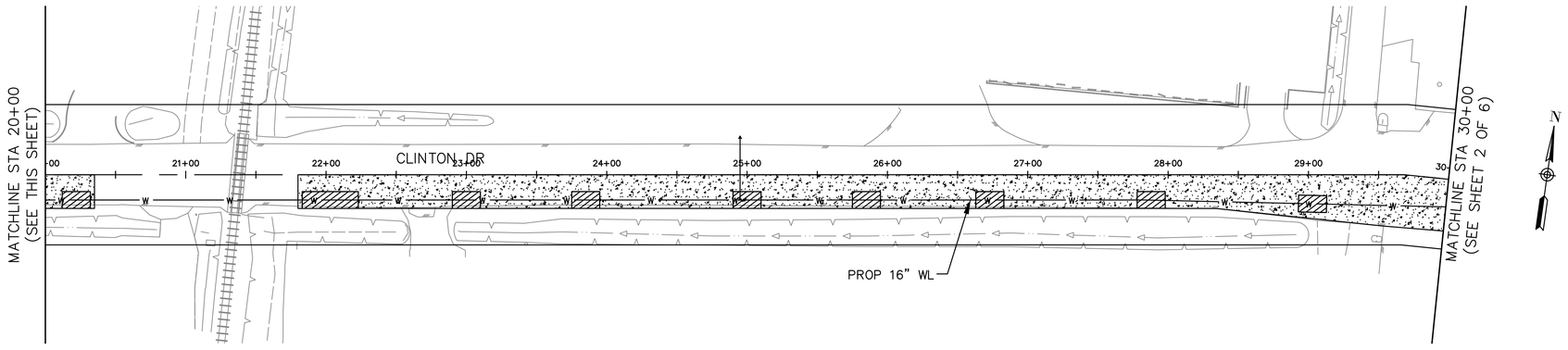
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REPAIR OF DAMAGED PIPE
(SHEET 2 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 105 OF 204	

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

NO.	DATE	REVISION	APP.

LEGEND:

PROP 2" MILL & OVERLAY OF EXISTING ASPHALTIC CONCRETE PAVEMENT.
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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
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC
TX FIRM NO. F-4578

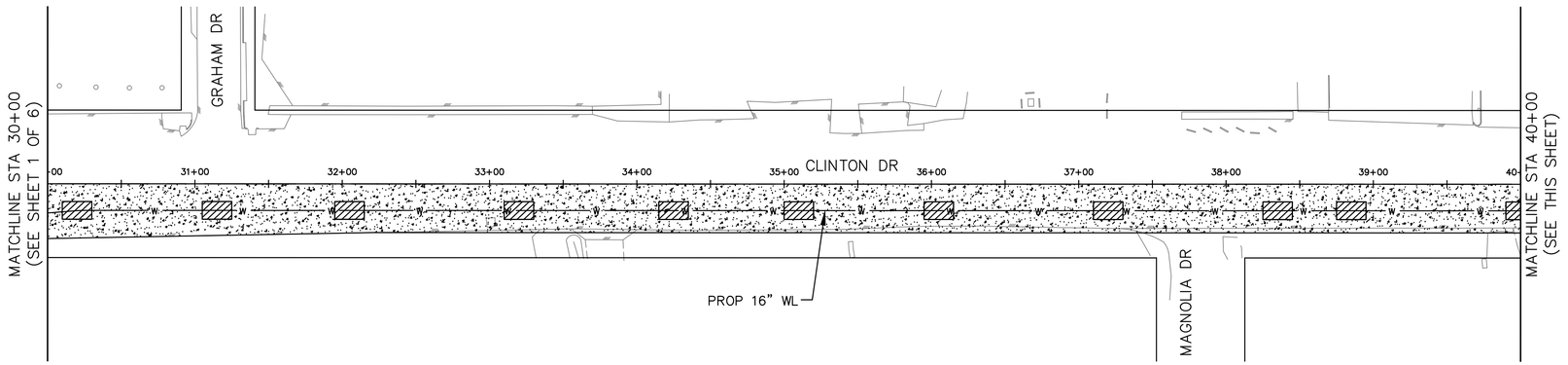
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

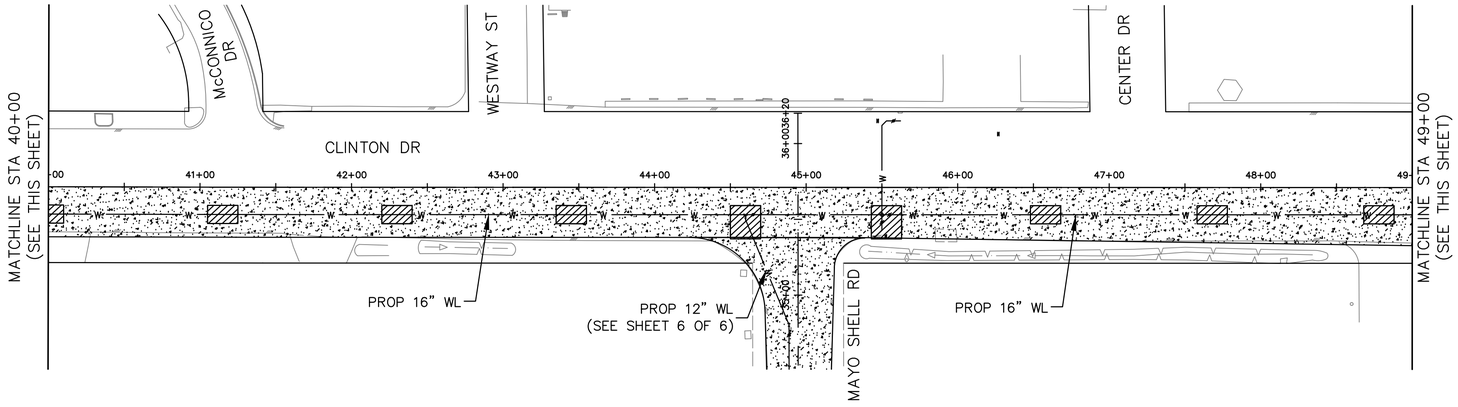
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
PAVEMENT RESTORATION
SHEET 1 OF 6

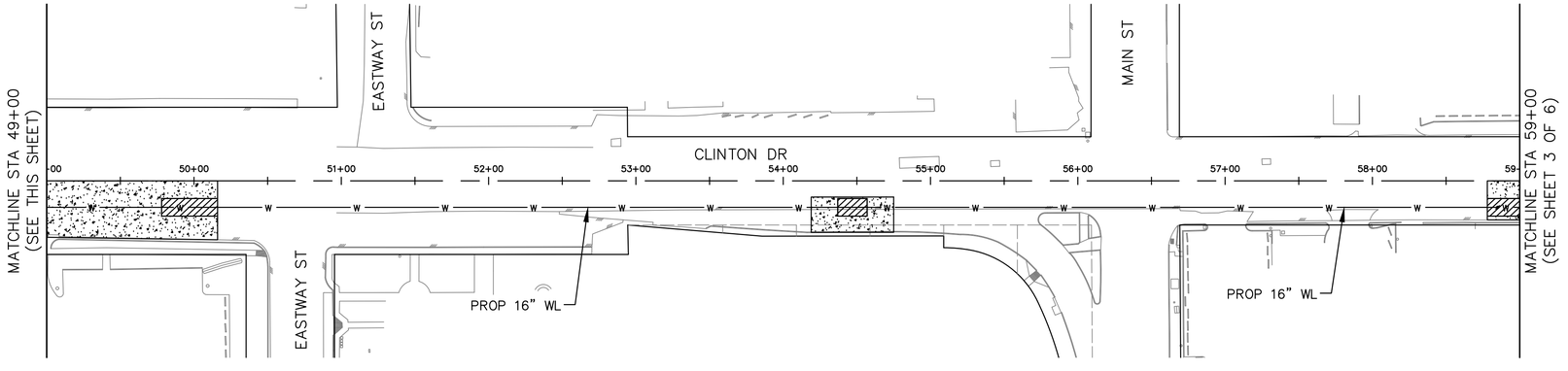
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **106** OF 204	

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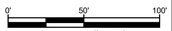












NO.	DATE	REVISION	APP.

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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

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TX FIRM NO. F-4578

SURVEYED BY:
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FB NO.

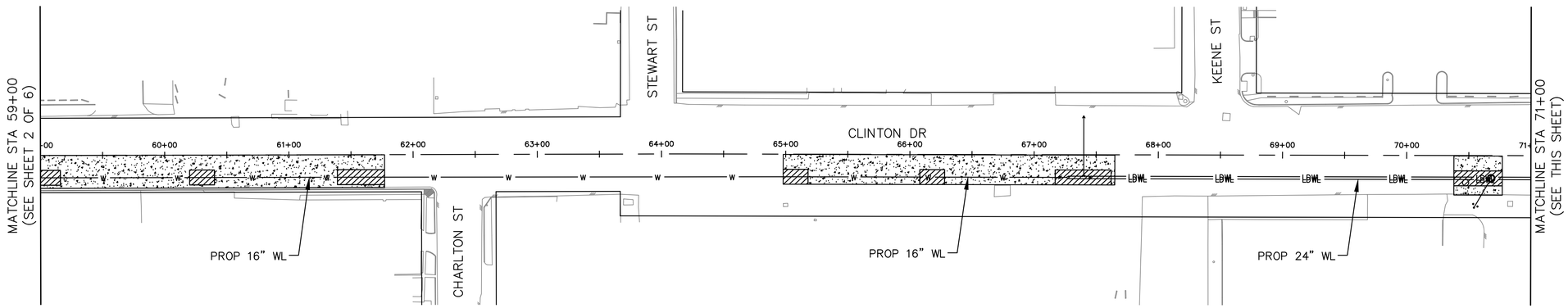
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

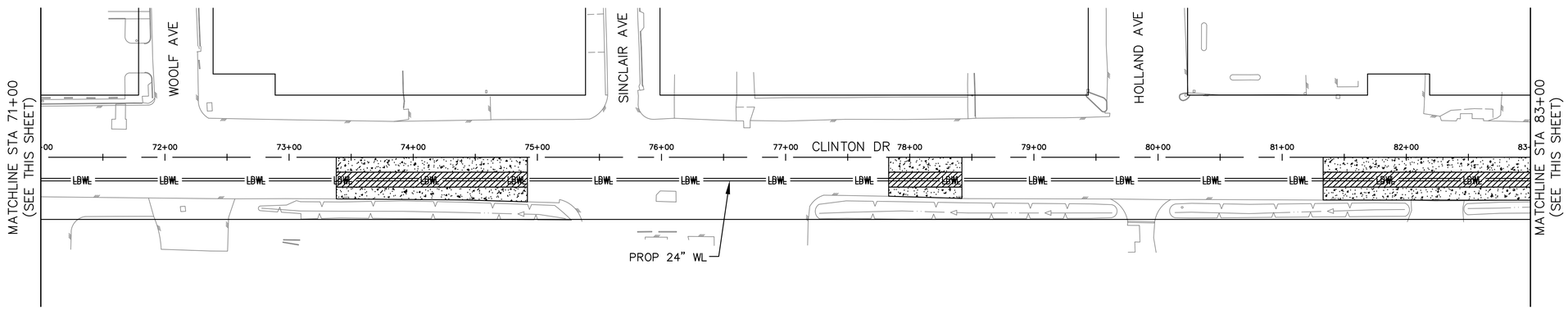
LARGE DIAMETER WATER LINE &
VALVE REPLACEMENT – PACKAGE 3

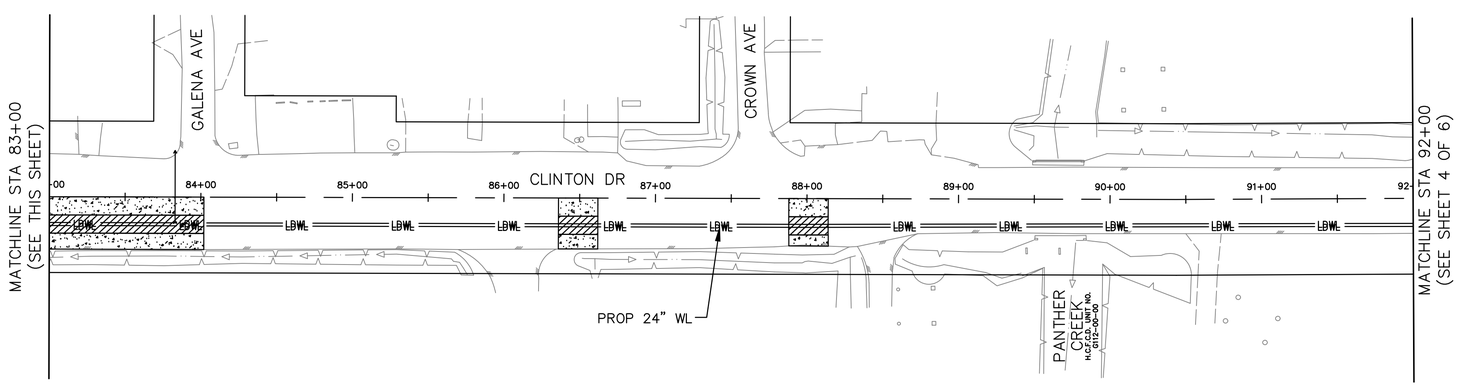
PAVEMENT RESTORATION
SHEET 2 OF 6

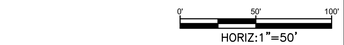
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **107** OF 204	

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NO.	DATE	REVISION	APP.

N

LEGEND:

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TX SURVEY FIRM NO.: 10075600

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SURVEYED BY:
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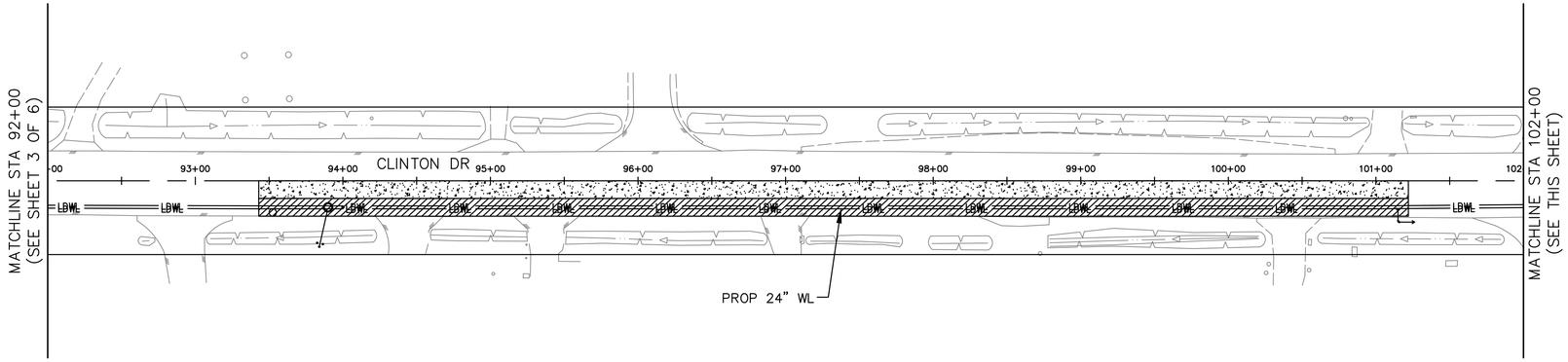
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

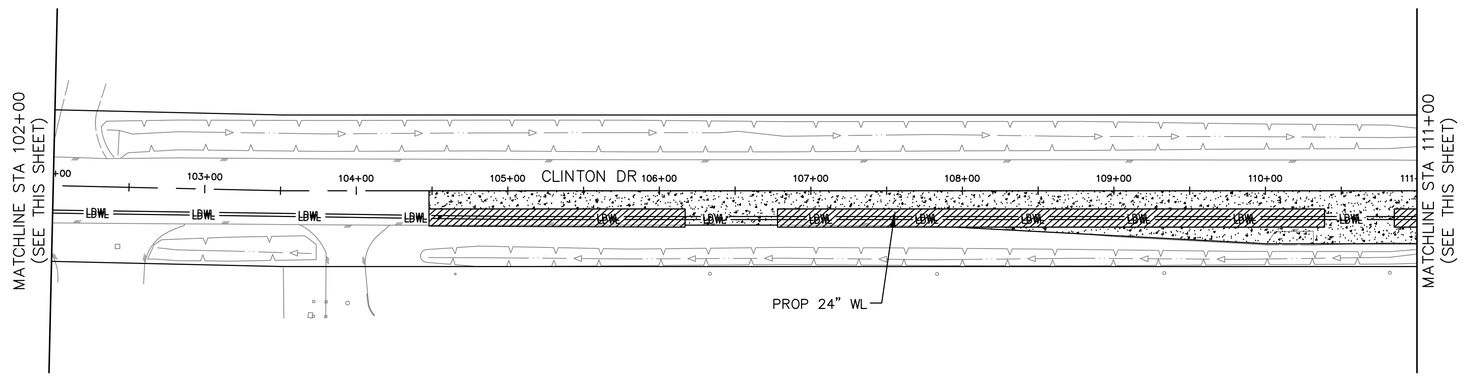
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

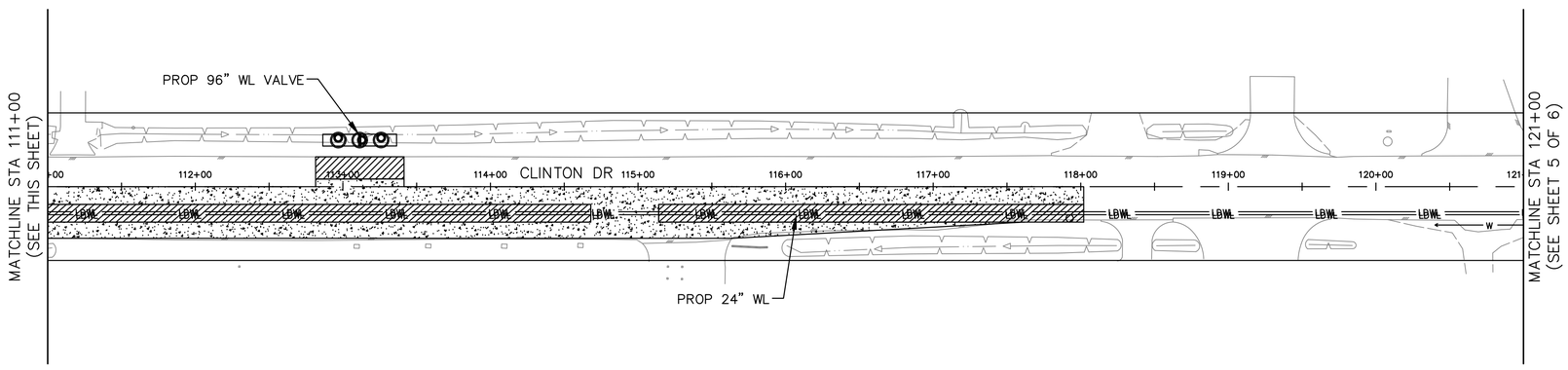
PAVEMENT RESTORATION
SHEET 3 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 108 OF 204	

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NO.	DATE	REVISION	APP.

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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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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SUDHEER GOUD SANGAM, P.E.
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

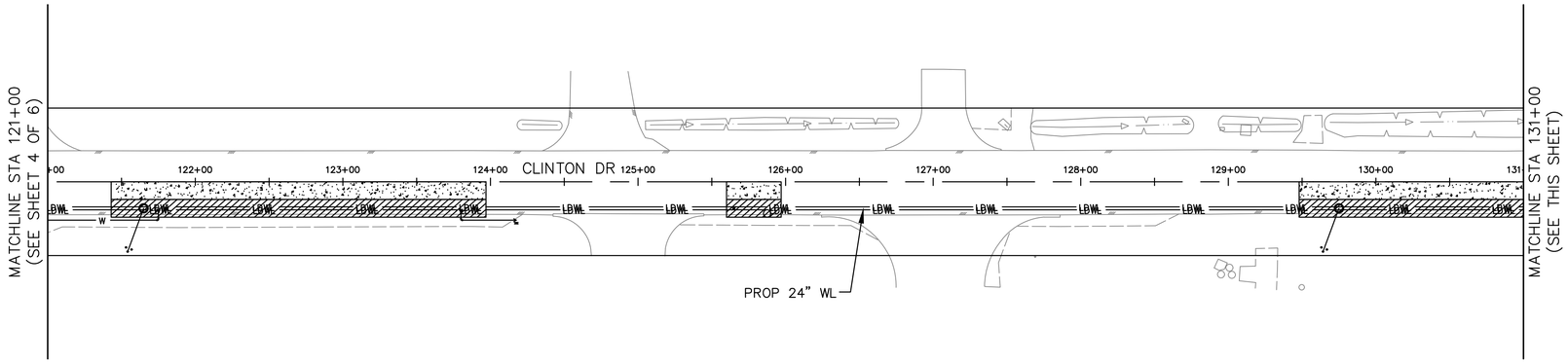
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

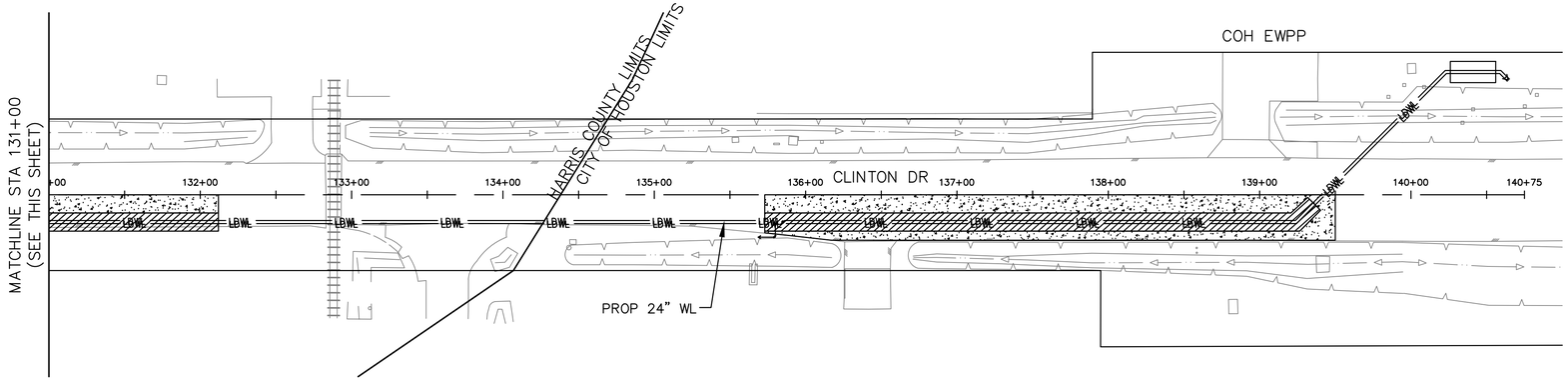
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

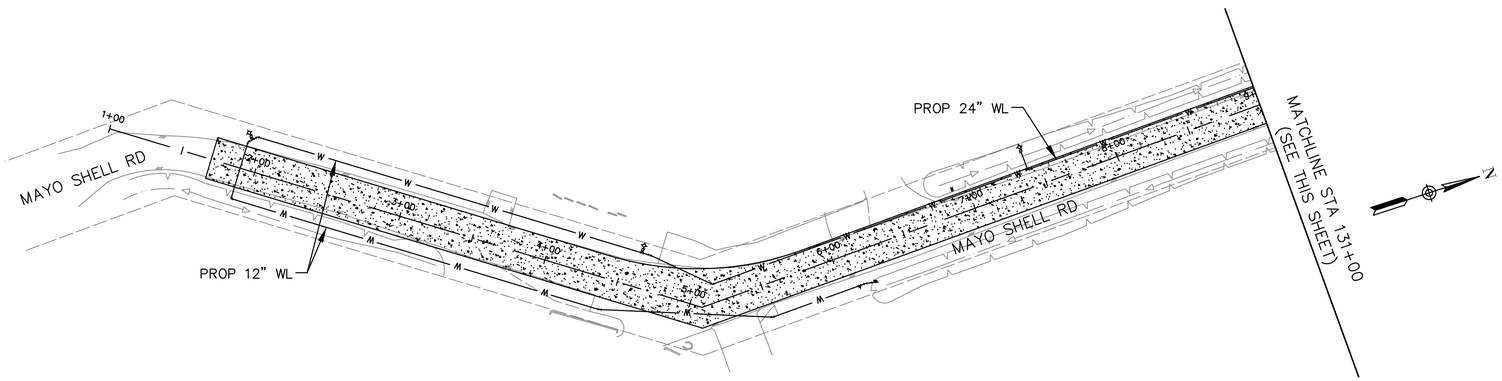
PAVEMENT RESTORATION
SHEET 4 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 109 OF 204	

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

NO.	DATE	REVISION	APP.

LEGEND:

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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

SURVEYED BY:
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FB NO.

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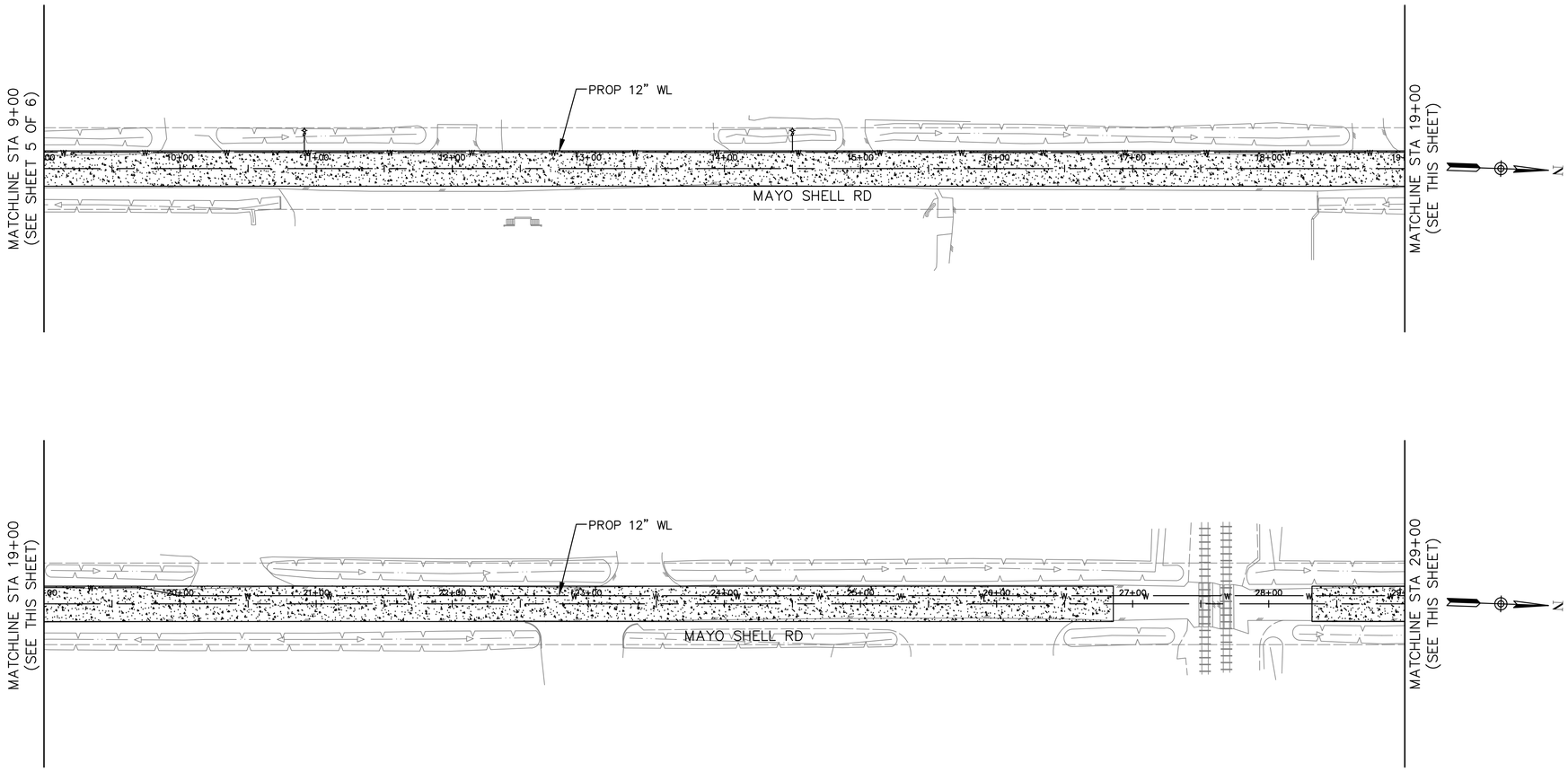
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

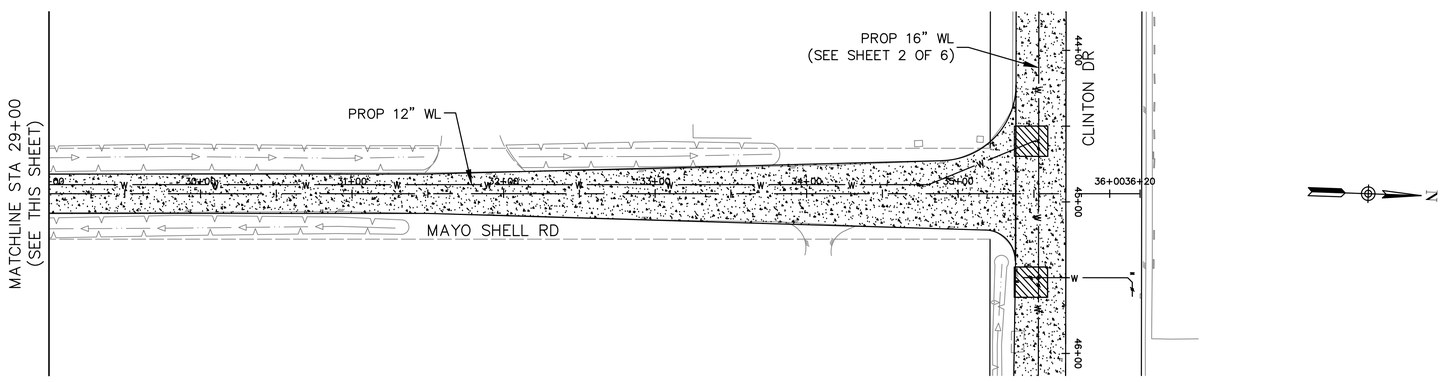
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

PAVEMENT RESTORATION
SHEET 5 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 110 OF 204	

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0' 50' 100'
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NO.	DATE	REVISION	APP.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

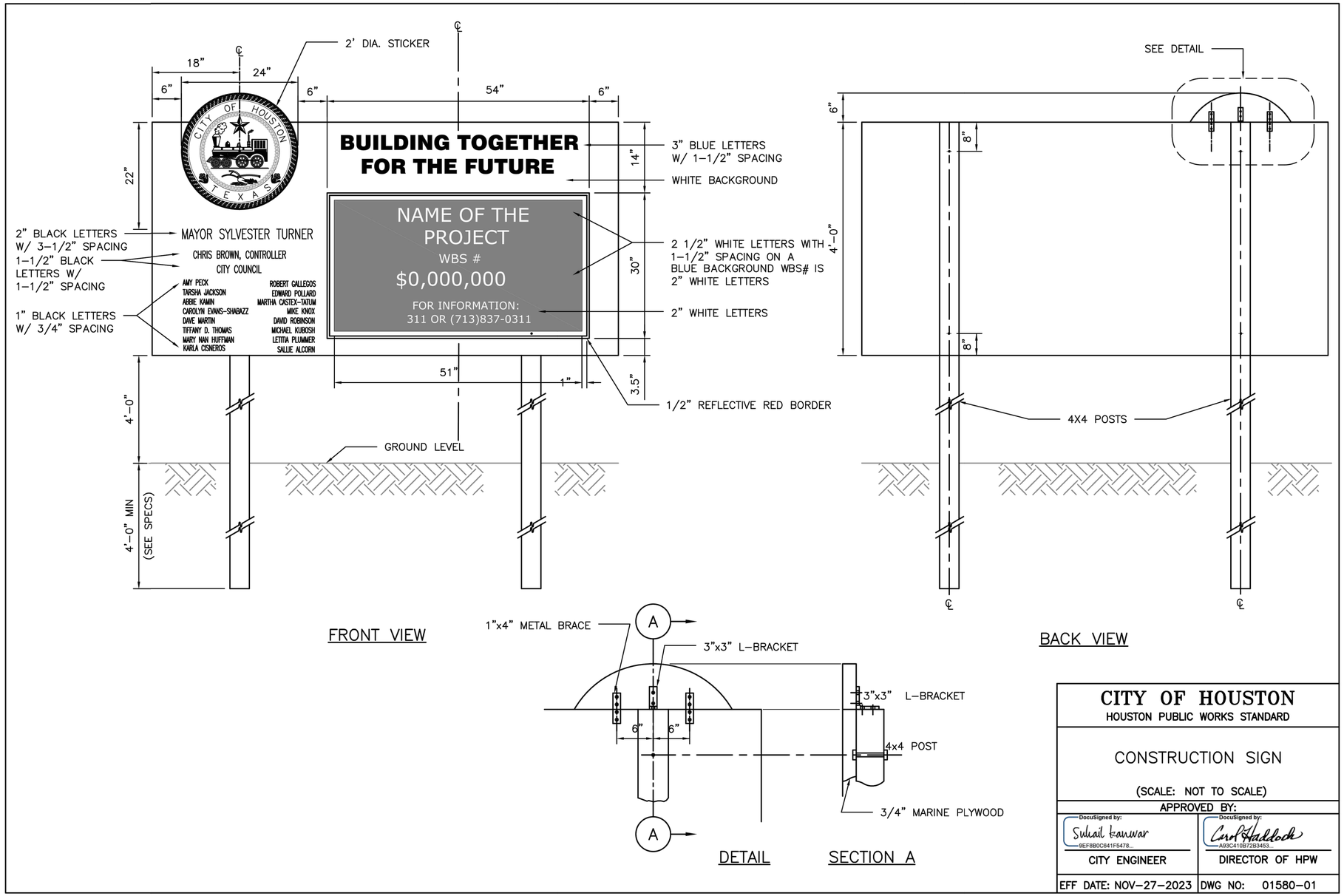
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

PAVEMENT RESTORATION
SHEET 6 OF 6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
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H: 1"=50'	
CITY OF HOUSTON PM	
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SHEET NO. 111 OF 204	

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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.

NO.	DATE	REVISION	APP.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONSTRUCTION SIGN

(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
DocuSigned by: Suhail Kanwar 9EFBB0C641F5478...	DocuSigned by: Carol Haddock A93C410B72B3453...
EFF DATE: NOV-27-2023	DWG NO: 01580-01

KUO & ASSOCIATES
ENGINEERING + SURVEYING
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FB NO.

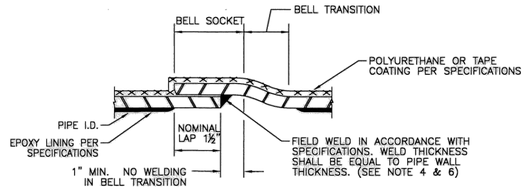
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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE &
VALVE REPLACEMENT – PACKAGE 3
CONSTRUCTION SIGN

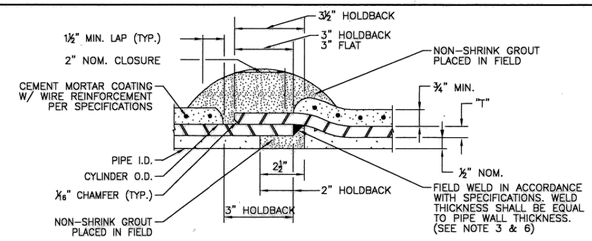
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 112 OF 204	

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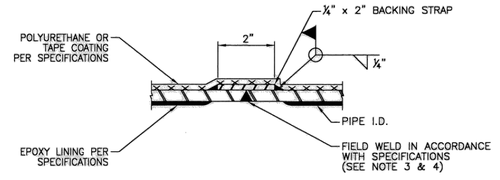
1 LAP–WELD FIELD JOINT – STEEL PIPE JOINT

FLEXIBLE COATING AND LINING



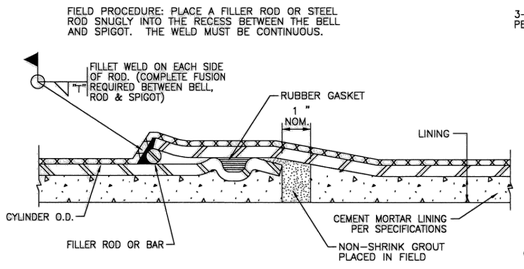
2 LAP–WELD FIELD JOINT – STEEL PIPE JOINT

CEMENT MORTAR LINED & CEMENT MORTAR COATED



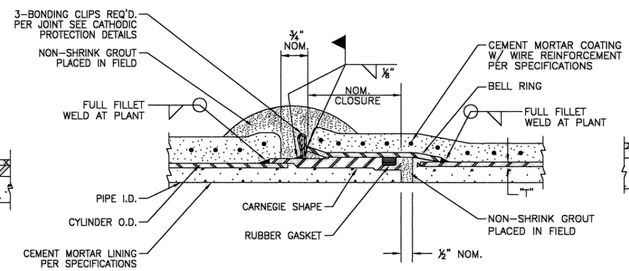
3 BUTT WELD FIELD JOINT – STEEL PIPE JOINT

FLEXIBLE COATING AND LINING



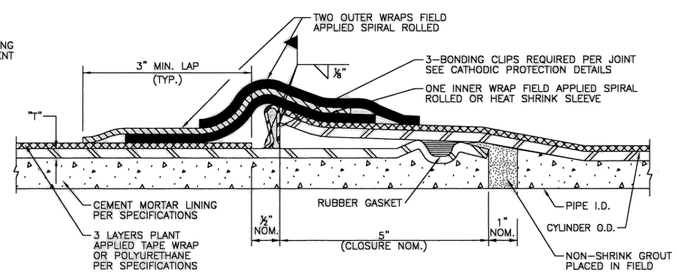
4 FIELD WELDED O–RING – STEEL PIPE JOINT

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:	APPROVED BY:
ACTING CITY ENGINEER	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
PHONE: 713–975–8769
TX ENGR. FIRM NO.: F–4578
TX SURVEY FIRM NO.: 10075600

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684
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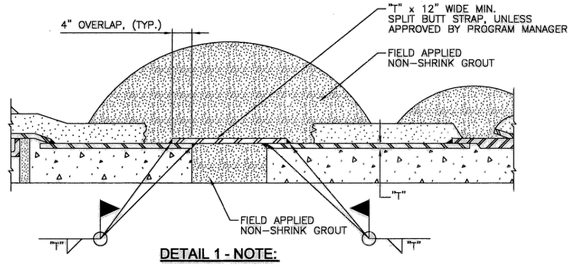
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL
STEEL PIPE DETAILS
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 113 OF 204	

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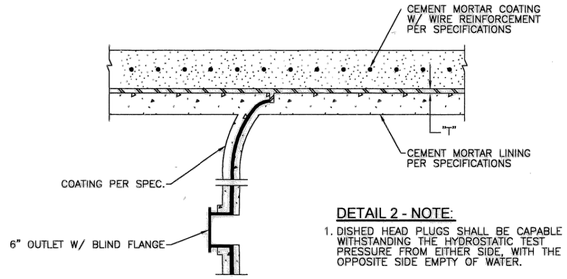


DETAIL 1 - NOTE:

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)

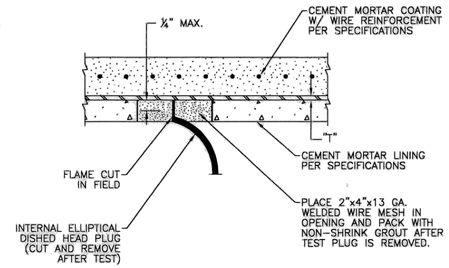


DETAIL 2 - NOTE:

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

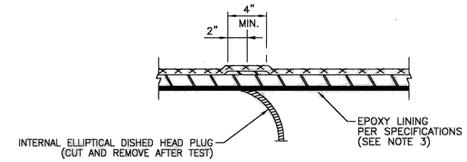
2 INTERNAL ELLIPTICAL DISHED HEAD PLUG

CEMENT MORTAR LINING AND CEMENT MORTAR COATED STEEL PIPE SPECIAL



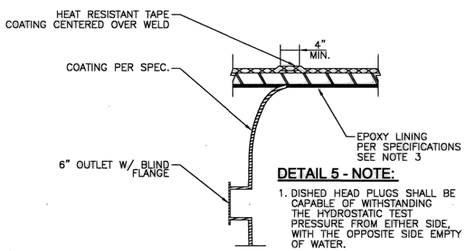
3 INTERNAL ELLIPTICAL DISHED HEAD PLUG REMOVAL

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

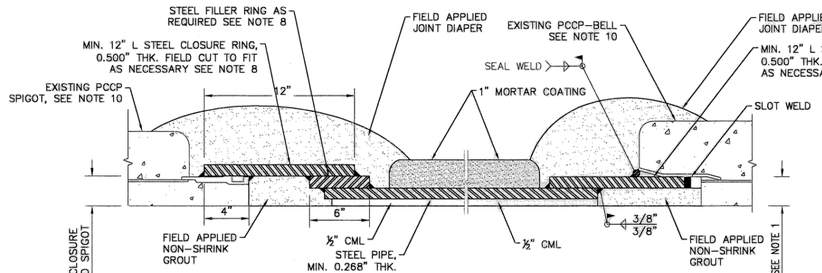


DETAIL 5 - NOTE:

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

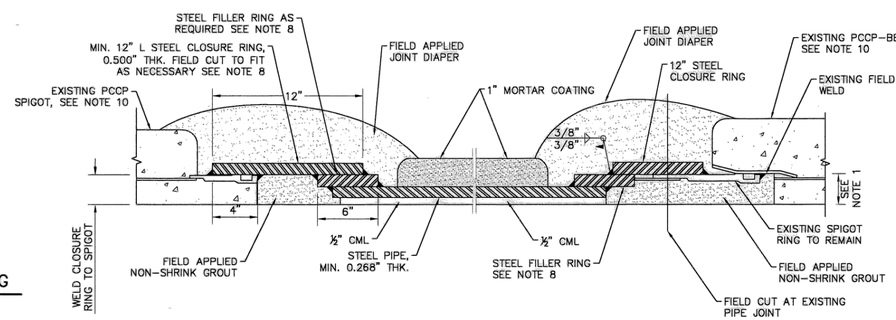
5 INTERNAL ELLIPTICAL DISHED HEAD PLUG

FOR STEEL PIPE WITH FLEXIBLE COATING AND LINING



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

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



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

(OPTION 2: IF EXISTING PIPE JOINT IS 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.

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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684
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TX FIRM NO. F-4578

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FB NO.

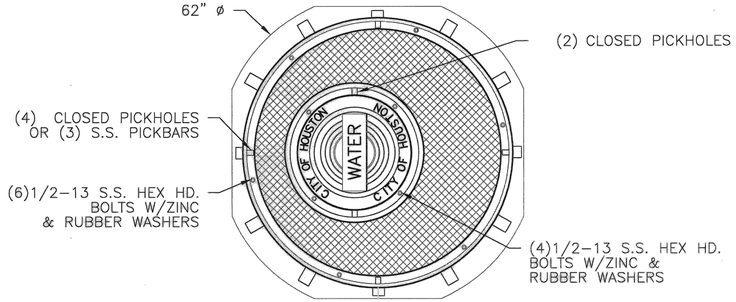
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

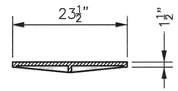
STANDARD LDWL
STEEL PIPE DETAILS
SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 114 OF 204	

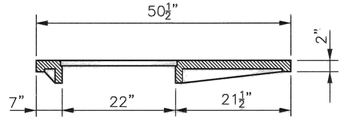
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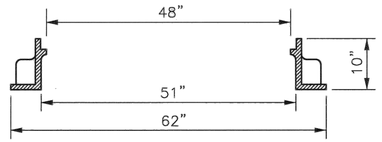
PLAN



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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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

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KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

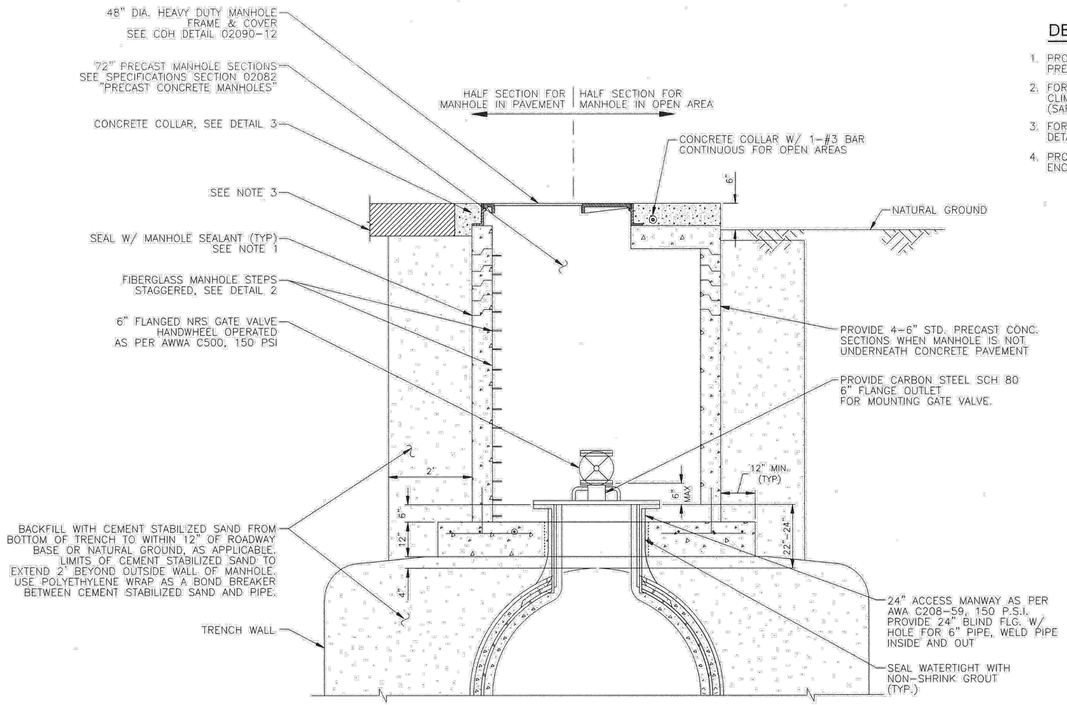
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL HEAVY DUTY MANHOLE FRAME AND COVER DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 115 OF 204	

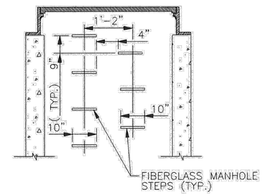
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1 ACCESS MANWAY IN ACCESS MANHOLE
(FOR WATER LINES 36-INCH TO 96-INCH DIAMETER)

DETAIL 1 - NOTES:

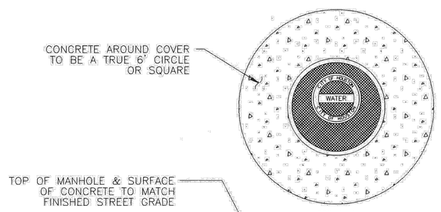
1. PROVIDE RAM-NEK OR APPROVED EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
2. FOR MANHOLES DEEPER THAN 20 FEET, SAFETY CLIMBING RAIL MUST BE PROVIDED. (SAF-T-CLIMB OR APPROVED EQUAL).
3. FOR PAVEMENT REPAIR, SEE COH STANDARD DETAILS 02902-01 & 02902-02.
4. PROVIDE AN APPROVED PETROLATUM BASED TAPE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

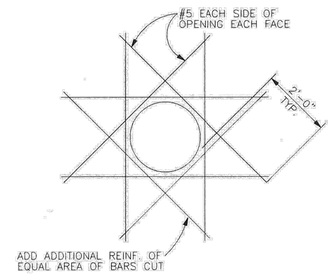
2 MANHOLE STEP DETAIL



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
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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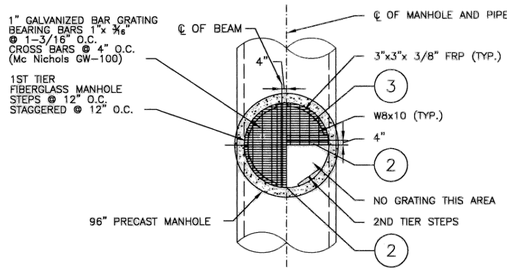
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

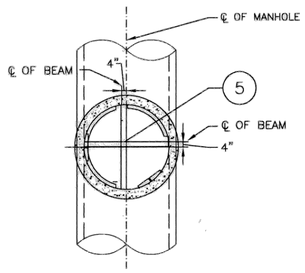
STANDARD LDWL ACCESS MANHOLE DETAILS

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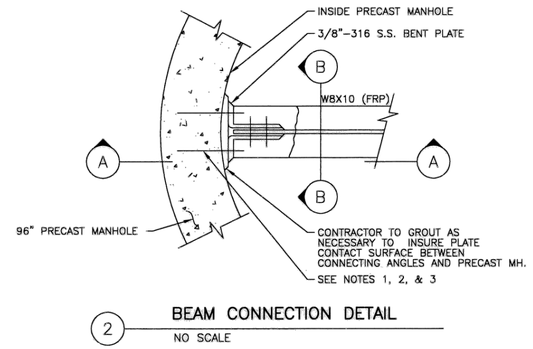
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PLAN VIEW OF LANDING
(W/GRATING SHOWN)



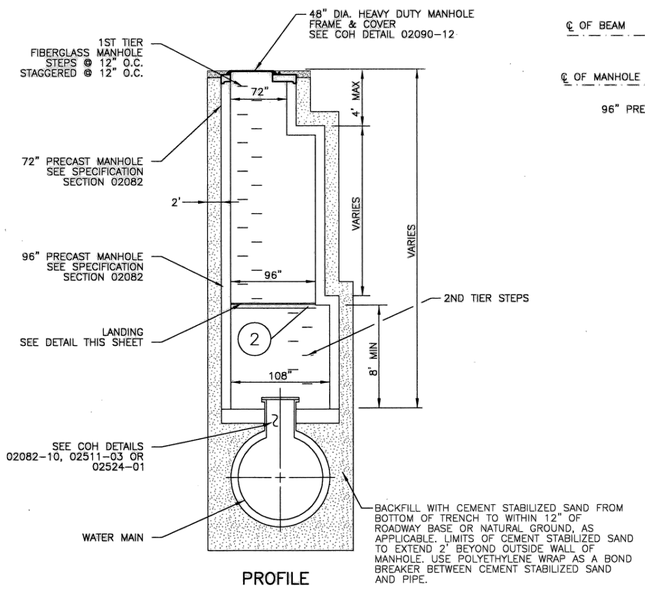
PLAN VIEW OF LANDING
(W/O GRATING SHOWN)



2 BEAM CONNECTION DETAIL
NO SCALE

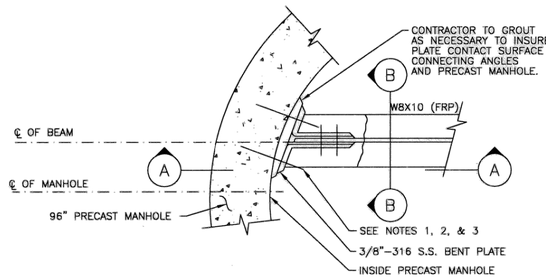
NOTES:

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.

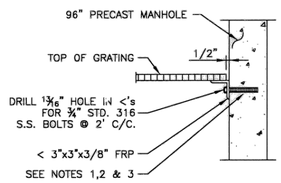


PROFILE

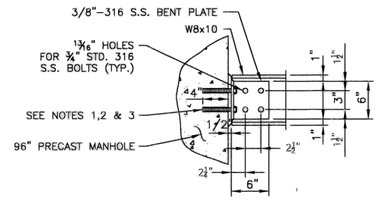
1 EXTRA DEPTH – ACCESS MANHOLE
(SEE PLANS FOR LOCATION)
NO SCALE



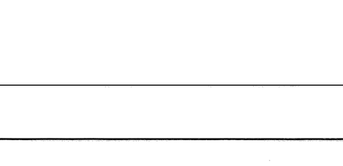
3 BEAM CONNECTION DETAIL
NO SCALE



4 ANGLE CONNECTION DETAIL
NO SCALE



A SECTION
NO SCALE



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
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

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FB NO.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE &
VALVE REPLACEMENT – PACKAGE 3

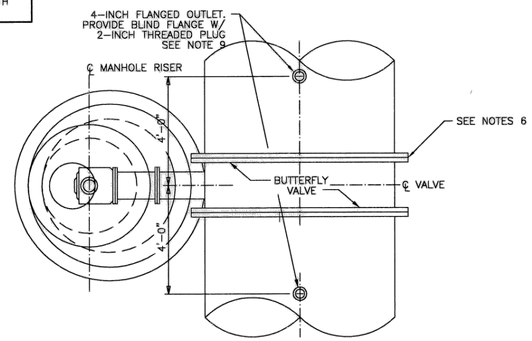
STANDARD LDWL DETAILS
EXTRA DEPTH MANHOLE

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 117 OF 204	

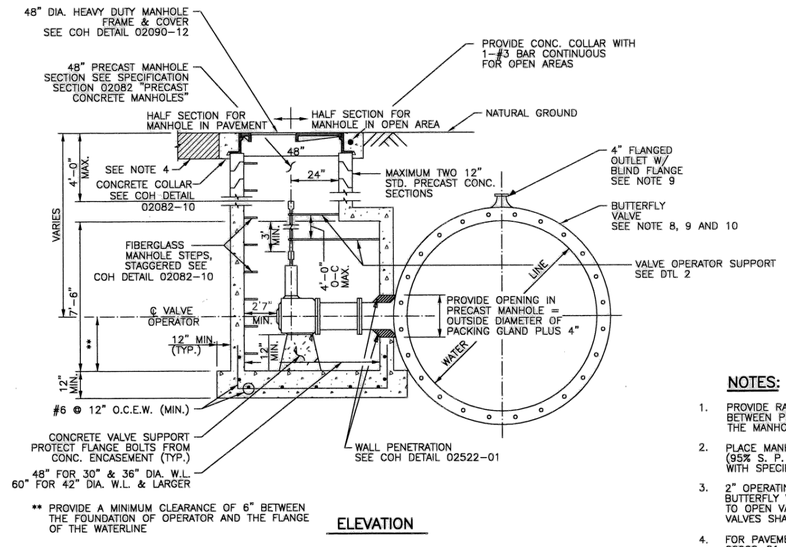
S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\Sheets\Standard Details.dwg plotted on Aug 16, 2025 - 10:00am

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

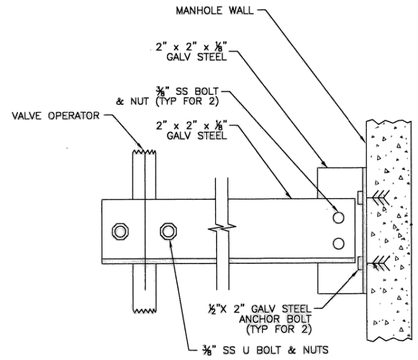


** PROVIDE A MINIMUM CLEARANCE OF 6" BETWEEN THE FOUNDATION OF OPERATOR AND THE FLANGE OF THE WATERLINE

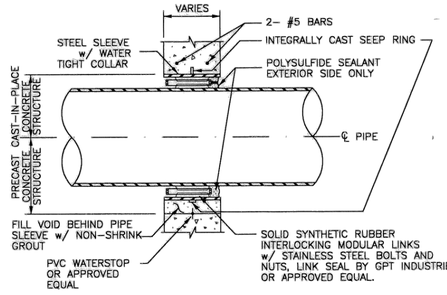
ELEVATION

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.

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TX SURVEY FIRM NO.: 10075600

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TX FIRM NO. F–4578

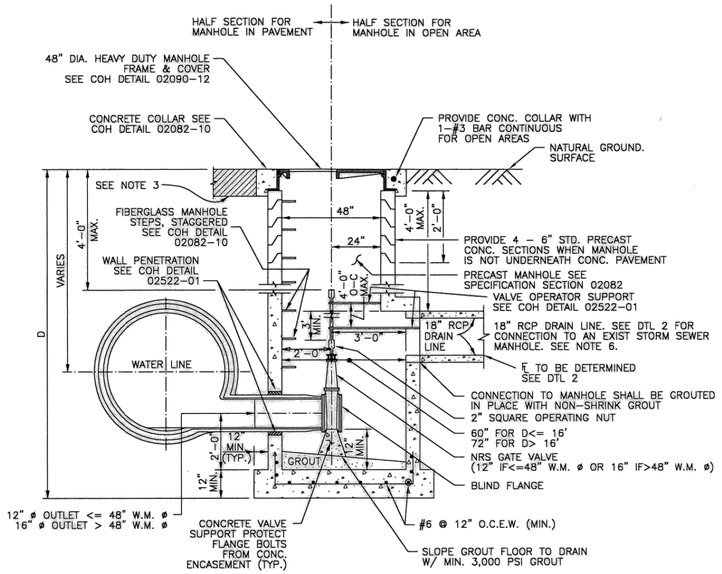
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

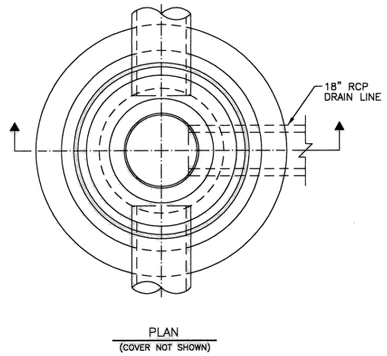
STANDARD LDWL
BUTTERFLY VALVE AND
OPERATOR MANHOLE DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 118 OF 204	

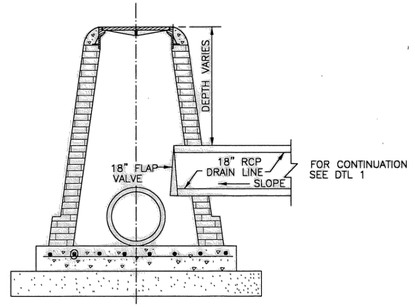
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1 SERVICE MANHOLE FOR DRAINLINE VALVE CONNECTION



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.

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TX SURVEY FIRM NO.: 10075600

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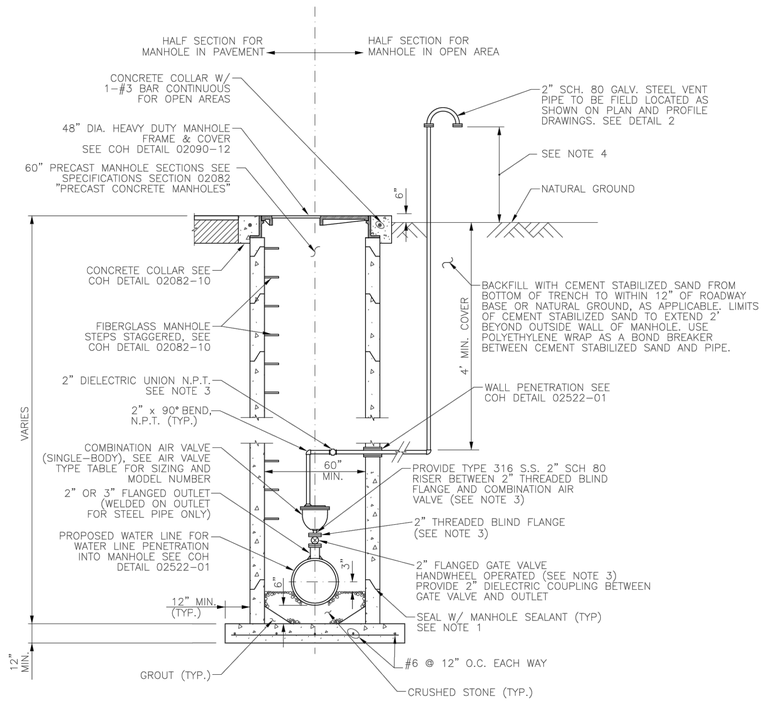
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

STANDARD LDWL
DRAIN LINE VALVE DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 119 OF 204	

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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	

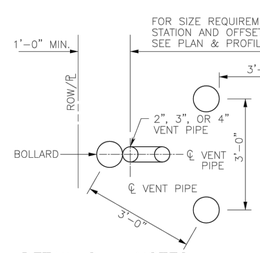
COMBINATION AIR VALVE & TYPE TABLE

(FOR WATER LINES SMALLER THAN 36" DIAMETER)

(1) OR APPROVED EQUAL.

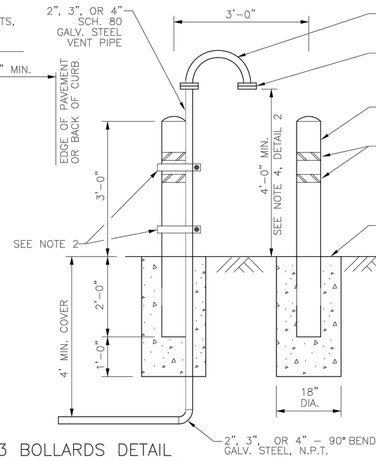
DETAIL 1 - NOTES:

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.

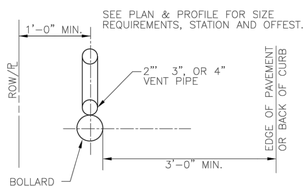


DETAIL 2 - NOTES:

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
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TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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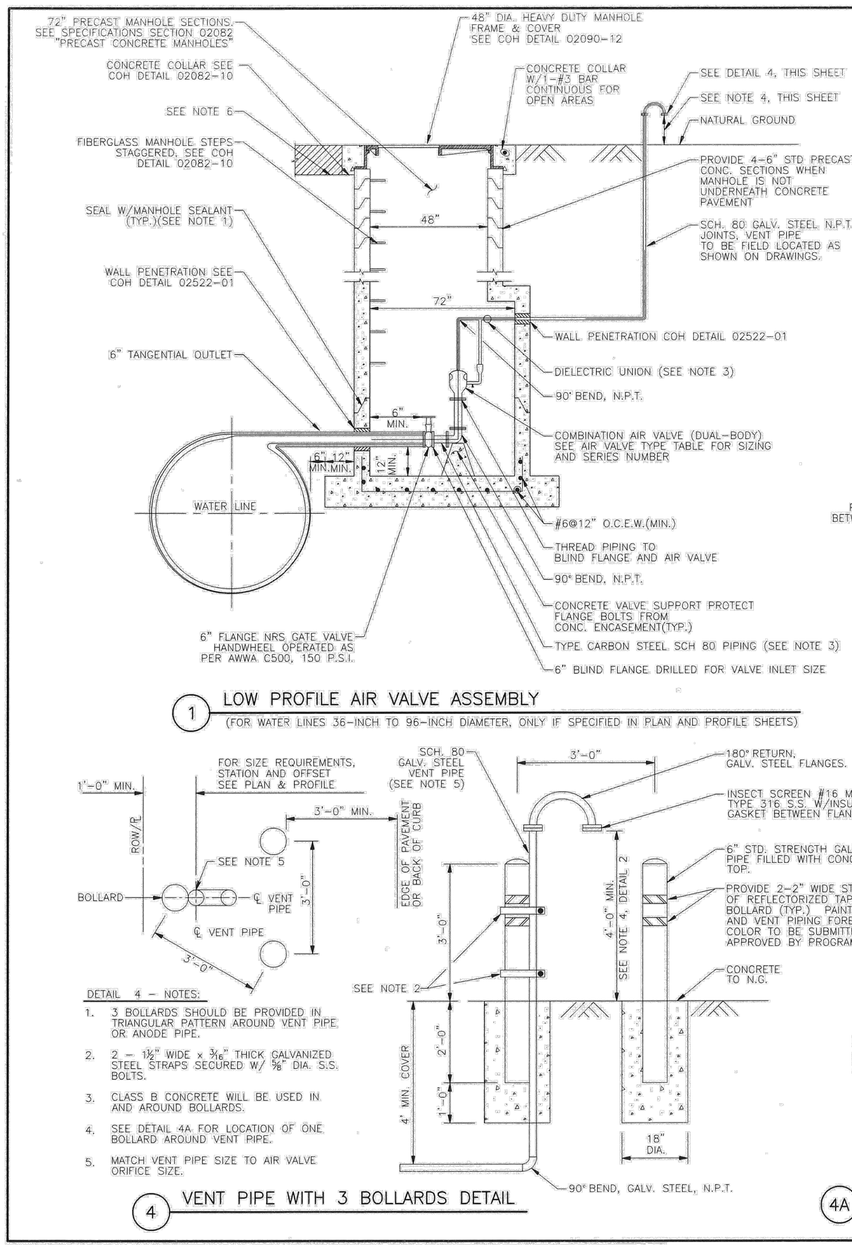
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

STANDARD LDWL COMBINATION AIR VALVE ASSEMBLY IN SERVICE MANHOLE DETAIL

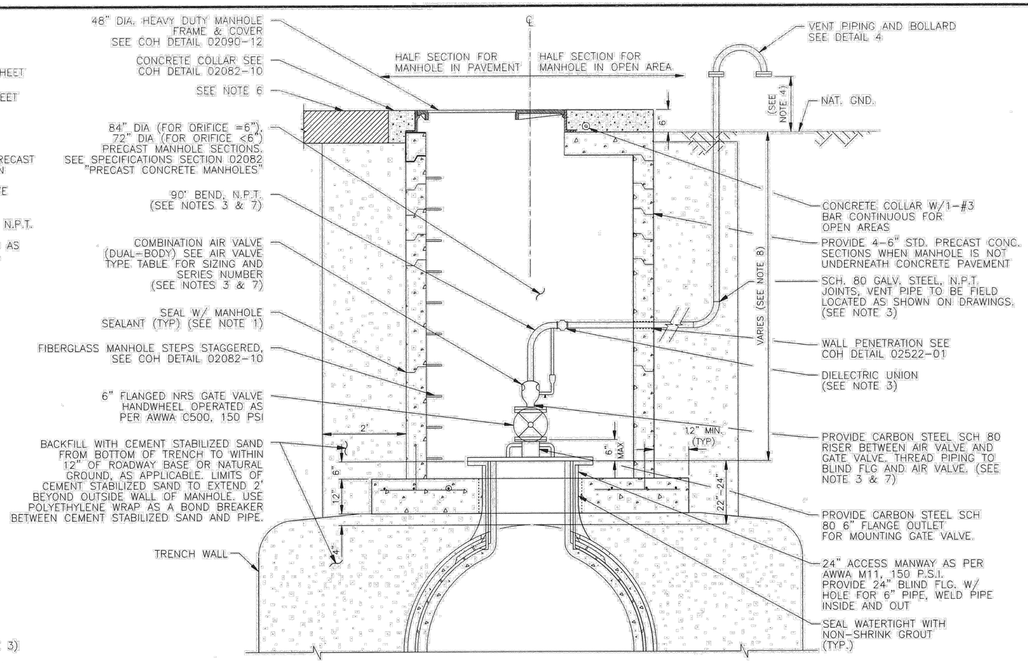
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **120** OF 204	

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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)

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

		VACUUM (AI/VR)		AIR RELEASE		
WATER MAIN DIAMETER	MANUFACTURER (1)	SERIES	ORIFICE SIZE	SERIES	INLET SIZE (NPT)	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:

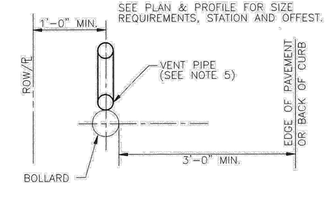
(1) OR APPROVED EQUAL.

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

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/ 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.
5. MATCH VENT PIPE SIZE TO AIR VALVE ORIFICE SIZE.

4 VENT PIPE WITH 3 BOLLARDS DETAIL



4A VENT PIPE WITH 1 BOLLARD DETAIL

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

NO.	DATE	REVISION	APP.

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10300 WESTOFFICE DR. SUITE 800
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PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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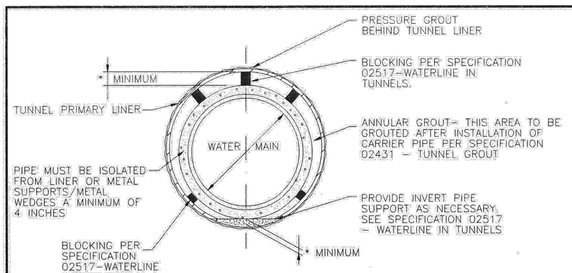
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL
AIR VALVE ASSEMBLY
IN SERVICE MANHOLE DETAIL

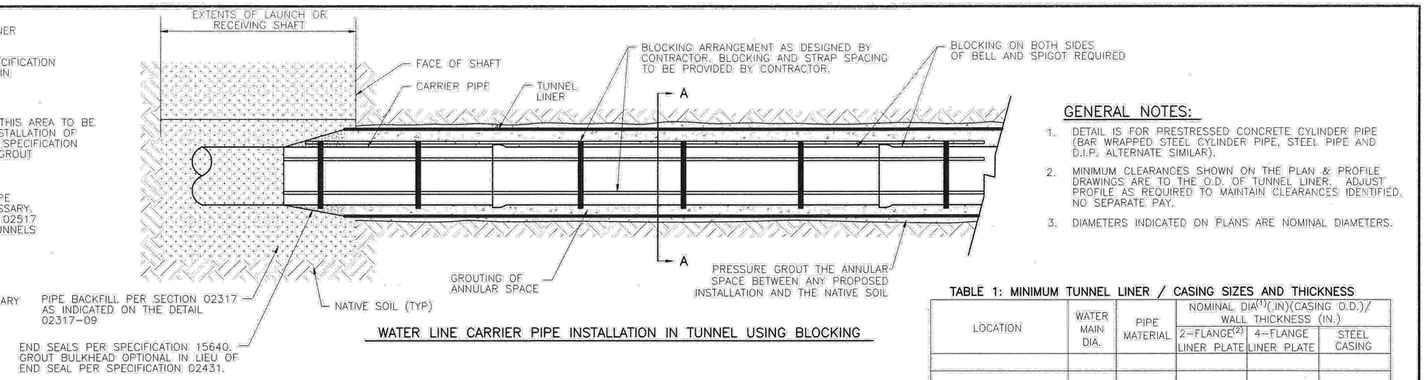
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 121 OF 204	

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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:

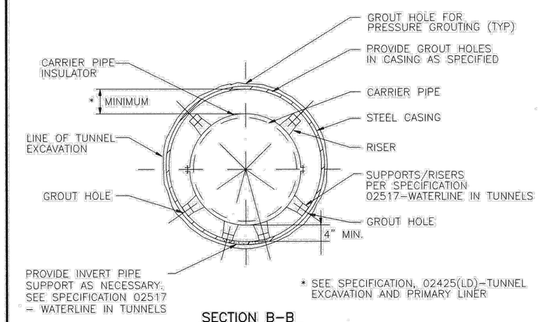
1. DETAIL IS FOR PRESTRESSED CONCRETE CYLINDER PIPE (BAR WRAPPED STEEL CYLINDER PIPE, STEEL PIPE AND D.I.P. ALTERNATE SIMILAR).
2. MINIMUM CLEARANCES SHOWN ON THE PLAN & PROFILE DRAWINGS ARE TO THE O.D. OF TUNNEL LINER. ADJUST PROFILE AS REQUIRED TO MAINTAIN CLEARANCES IDENTIFIED. NO SEPARATE PAY.
3.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

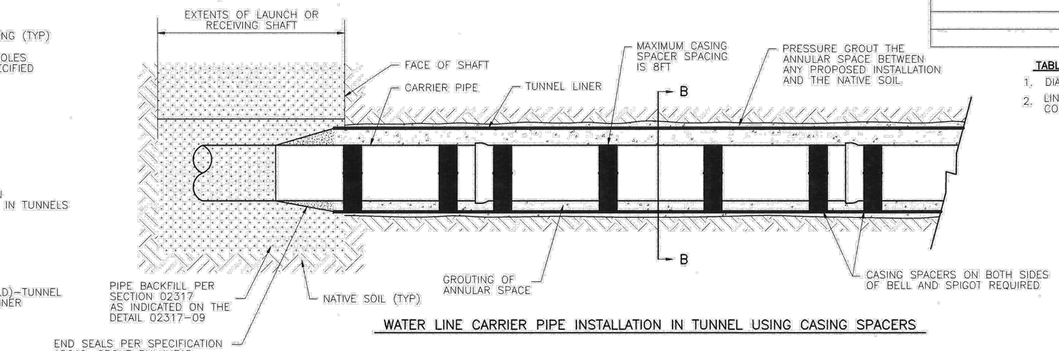
TABLE 1 – NOTES:

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

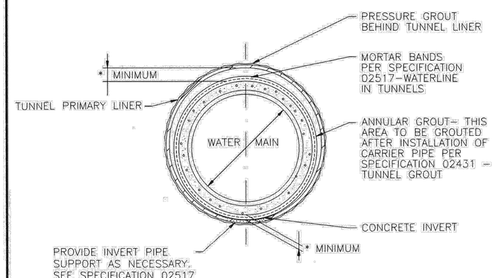


SECTION B–B

2 WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING CASING SPACERS

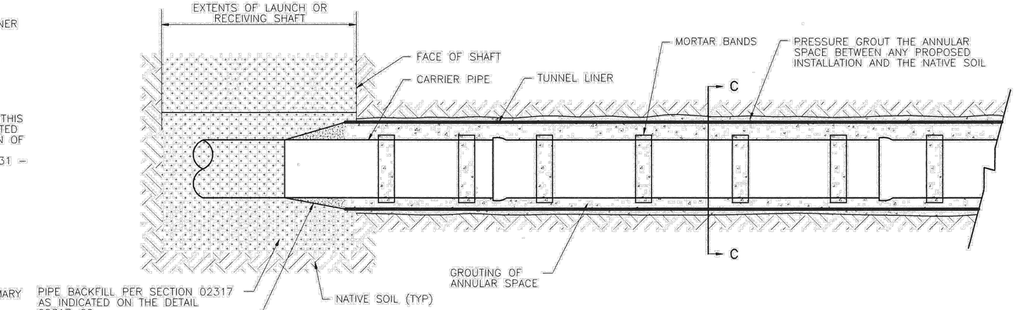


WATER LINE CARRIER PIPE INSTALLATION IN TUNNEL USING CASING SPACERS



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:
Sunil Kanwar, CITY ENGINEER	Paul J. Puddock, DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 02517-01

NO.	DATE	REVISION	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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

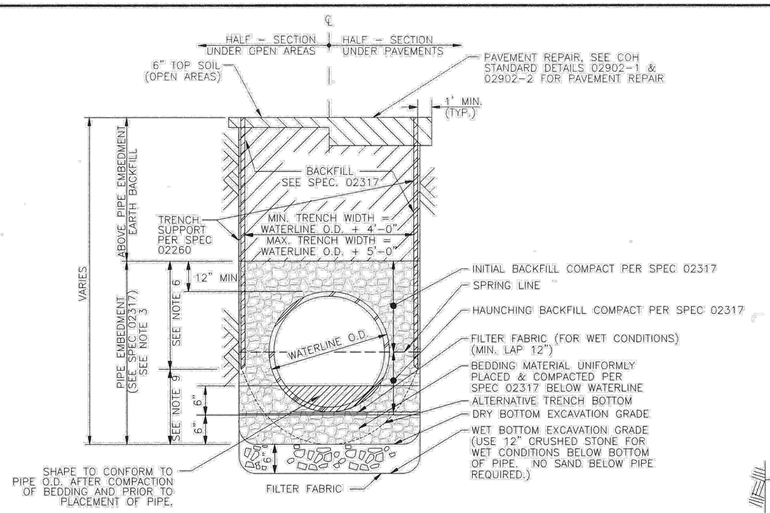
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL
TUNNEL AND CASING DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **122** OF 204	

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1 EXCAVATION & BACKFILL DETAIL

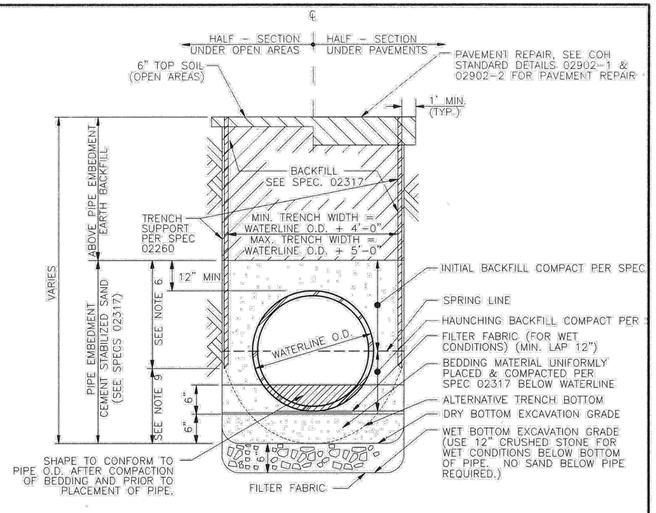
NO SCALE

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

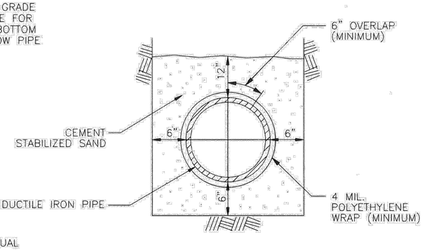
NO SCALE

DETAIL APPLICABLE IN FOLLOWING LIMITS:

– WATER MAIN WITH DEPTH OF COVER GREATER THAN 16 FT

– TUNNEL SHAFT LIMITS

– PPCA LIMITS

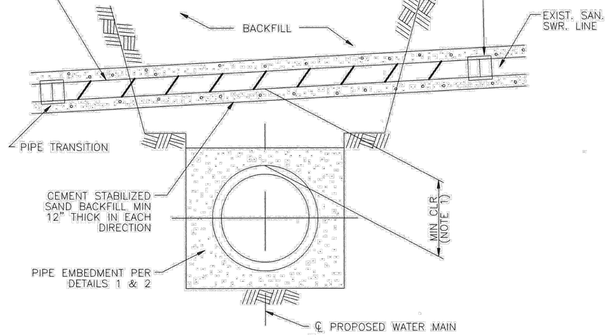


EMBEDMENT AND CORROSION PROTECTION FOR SANITARY SEWER DUCTILE IRON PIPE

4 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.

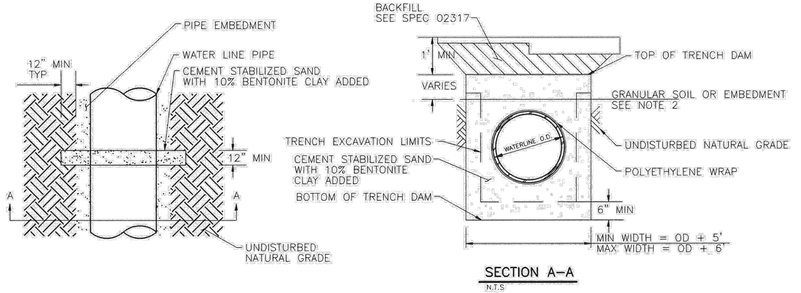


3 EXISTING SANITARY CROSSING OVER/UNDER PROPOSED WATER LINE

NO SCALE

DETAIL 3 – NOTES:

1. REFER TO MINIMUM CLEARANCE REQUIRED IN DRAWINGS.



SECTION A–A

N.T.S.

5 TRENCH DAM DETAIL

NO SCALE

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

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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10300 WESTOFFICE DR. SUITE 800
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PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC. TX FIRM NO. F-4578

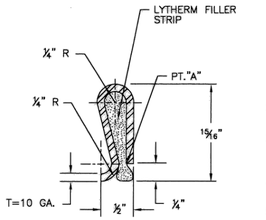
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL EXCAVATION AND BACKFILL DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 123 OF 204	

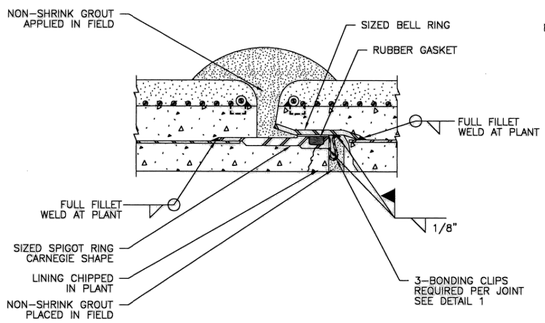
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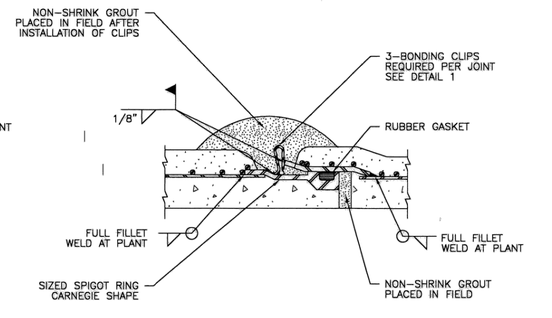
DETAIL 1 – NOTES:

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.

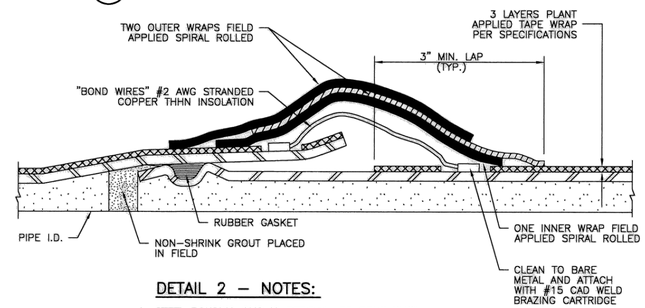
1 STEEL BONDING CLIP DETAIL



2 BONDED JOINT – EMBEDDED CYLINDER PIPE

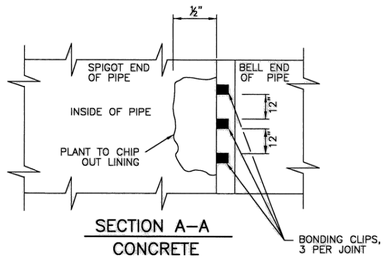


3 BONDED JOINT – BAR WRAPPED CYLINDER PIPE
(SIMILAR FOR LINED CYLINDER PIPE)

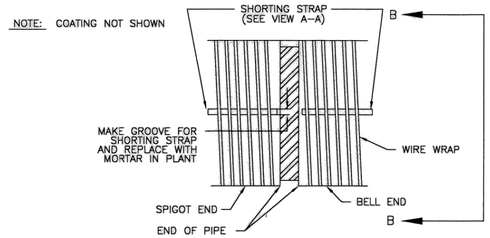


DETAIL 2 – NOTES:

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.

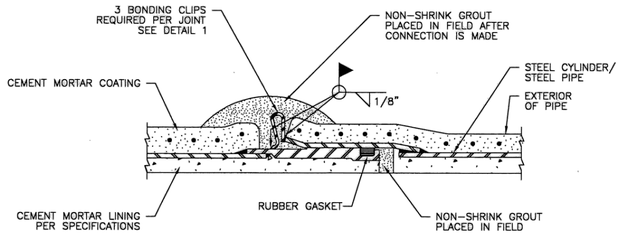


SECTION A–A
CONCRETE

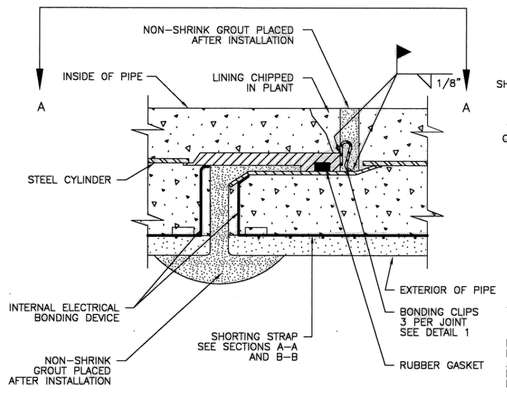


SECTION A–A
REINFORCEMENT

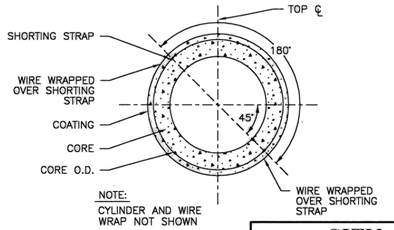
4 O–RING STEEL PIPE JOINT DETAIL
(CEMENT MORTAR LINED & TAPE WRAPPED SHOWN. FLEXIBLE LINING SIMILAR)



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
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HOUSTON, TX 77042
PHONE: 713–975–8769
TX ENGR. FIRM NO.: F–4578
TX SURVEY FIRM NO.: 10075600

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F–4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

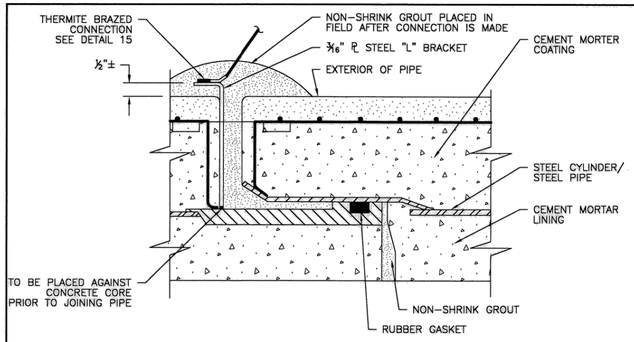
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

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

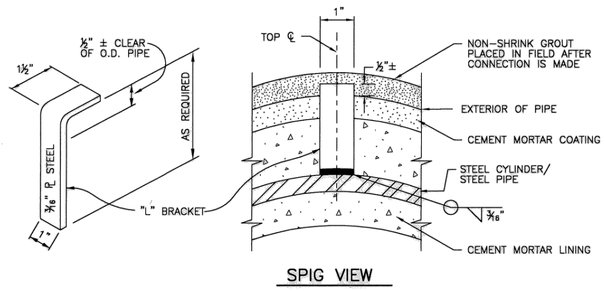
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
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N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
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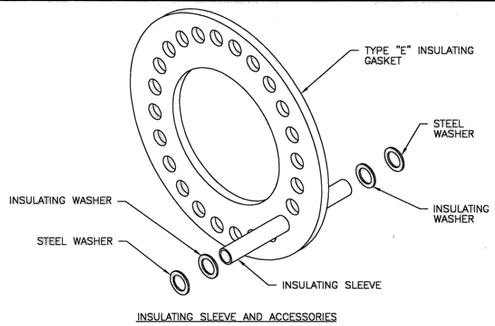


7 TEST LEAD CONNECTION DETAIL



SPIG VIEW

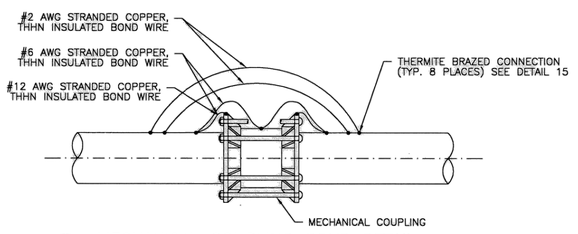
8 "L" BRACKET DETAIL



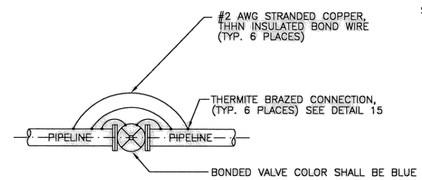
INSULATING SLEEVE AND ACCESSORIES

9 ISOLATION FLANGE ASSEMBLY

SEE AWWA M11 FOR FLANGE BOLT TIGHTENING SEQUENCE

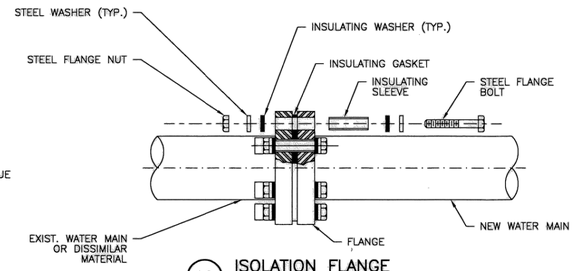


10 MECHANICAL COUPLING BOND DETAIL



11 VALVE BONDING ARRANGEMENT

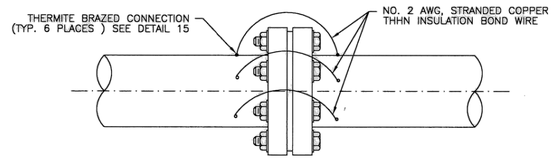
MAINLINE WITH CATHODIC PROTECTION



12 ISOLATION FLANGE

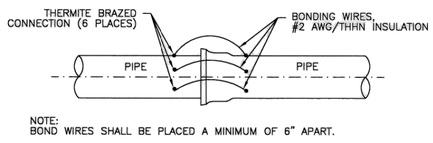
DETAIL 12 – NOTES:

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



13 ELECTRICAL BONDING ACROSS FLANGE

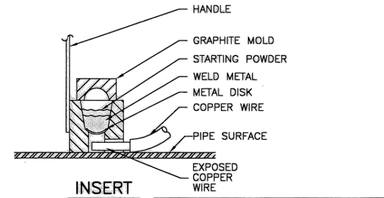
NOTE: BOND WIRES SHALL BE PLACED A MINIMUM OF 6" APART.



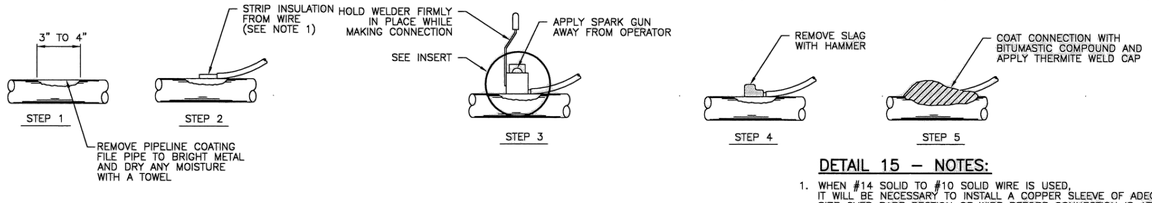
NOTE:
BOND WIRES SHALL BE PLACED A MINIMUM OF 6" APART.

14 BELL & SPIGOT BONDING ARRANGEMENT

DUCTILE IRON PIPE



INSERT



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

KUO & ASSOCIATES
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PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

ON 08/15/2025
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FB NO.

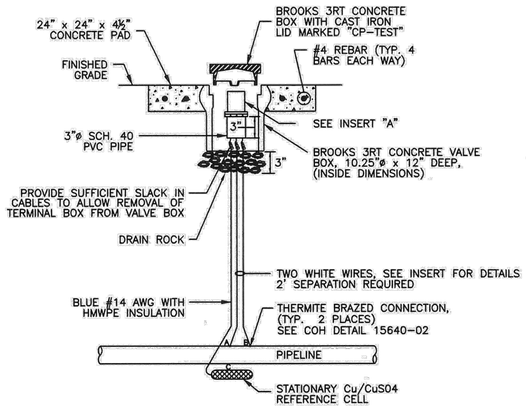
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR JOINT BONDING
SHEET 2 OF 2

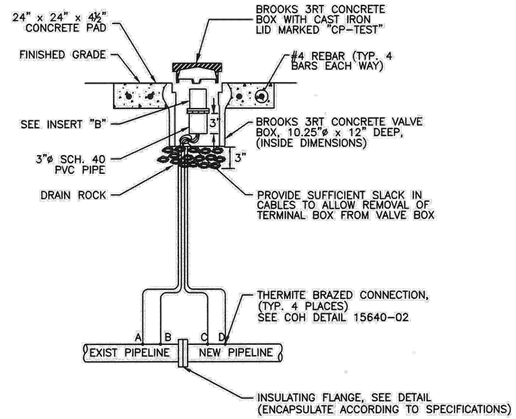
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **125** OF 204	

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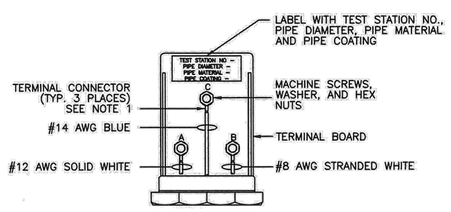
1 FLUSH MOUNTED POTENTIAL TEST STATION

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

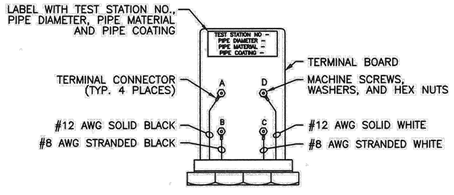
WIRE CODING:
* WIRES A & B ARE BLACK, WIRES C & D ARE WHITE
* WIRES A & D ARE #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRES B & C ARE #8 AWG TW STRANDED SINGLE CONDUCTOR
* BLACK WIRES ATTACHED TO UNPROTECTED OR EXISTING PIPE
* WHITE WIRES ATTACHED TO PROTECTED OR NEW PIPE



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:	APPROVED BY:
Suhail Kanwar, CITY ENGINEER	Carol Haddock, DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 15641-01

NO.	DATE	REVISION	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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684
ON 08/15/2025
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TX FIRM NO. F-4578

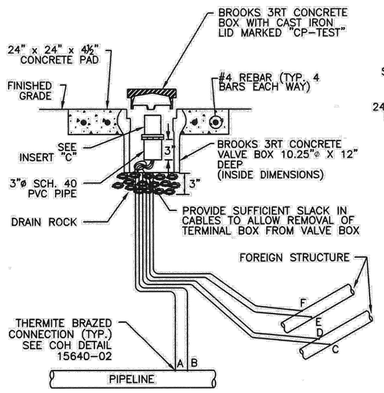
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
SHEET 1 OF 3

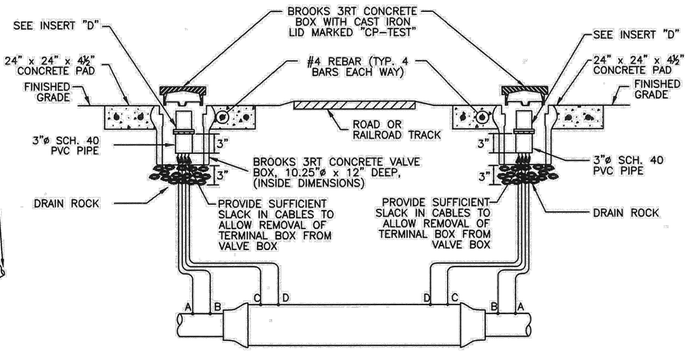
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **126** OF 204	

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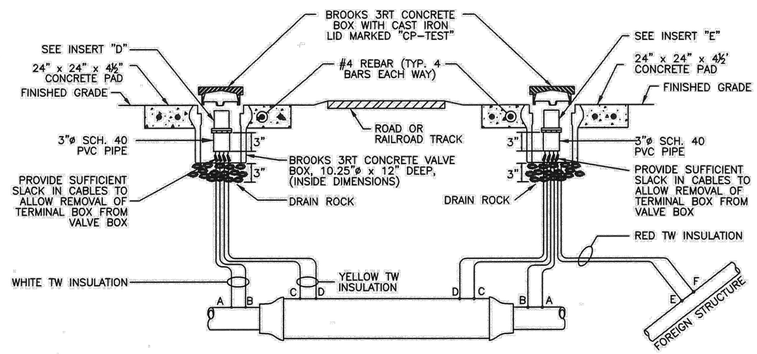
DETAIL 3 – NOTES:

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)

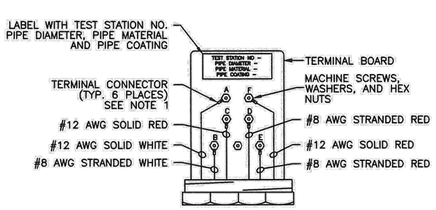


DETAIL 5 – NOTES:

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



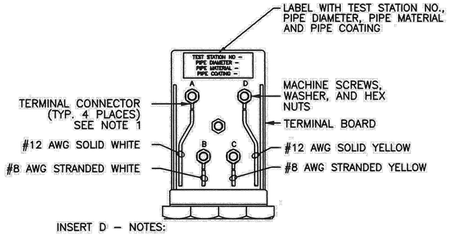
INSERT C – NOTES:

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



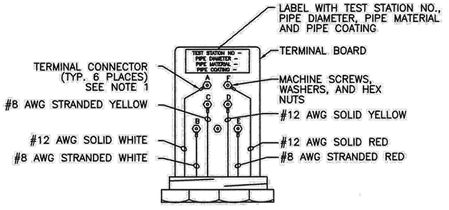
INSERT D – NOTES:

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

NO.	DATE	REVISION	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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX. FIRM NO. F-4578

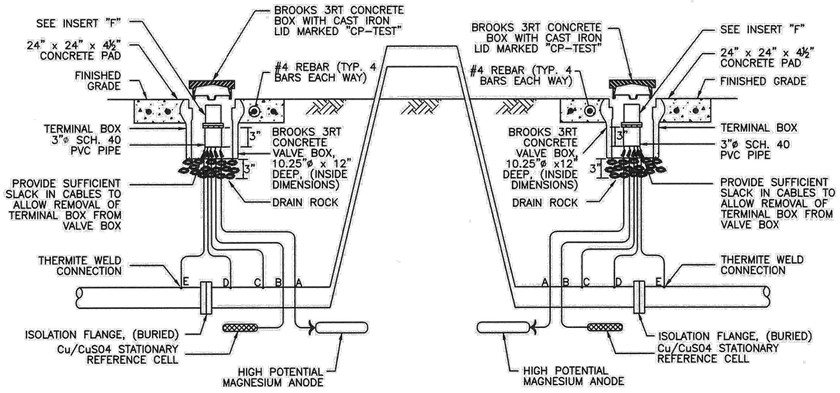
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

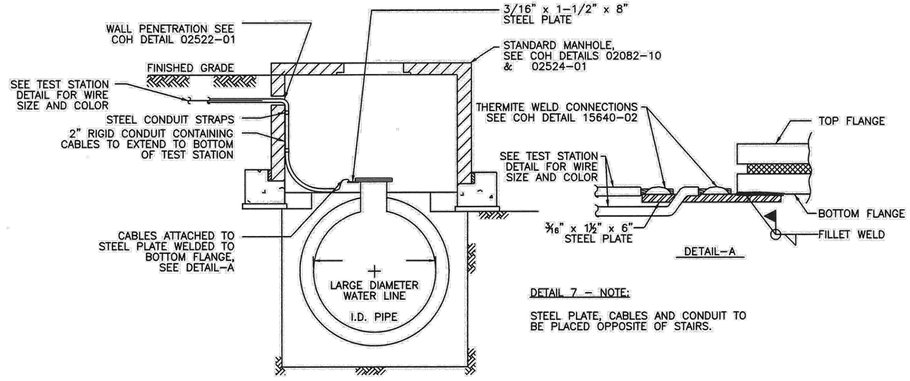
STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
SHEET 2 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **127** OF 204	

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

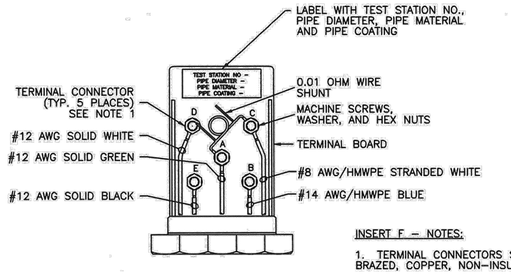


DETAIL 7 – NOTE:

STEEL PLATE, CABLES AND CONDUIT TO BE PLACED OPPOSITE OF STAIRS.

7 TEST STATION INSTALLATION IN MANHOLE

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
STANDARD LDWL CATHODIC PROTECTION DETAILS FOR TEST STATIONS (SHEET 3 OF 3) (NOT TO SCALE)	
APPROVED BY: Suhail Kanwal CITY ENGINEER	APPROVED BY: Carol Haddock 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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

ON 08/15/2025
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FB NO.

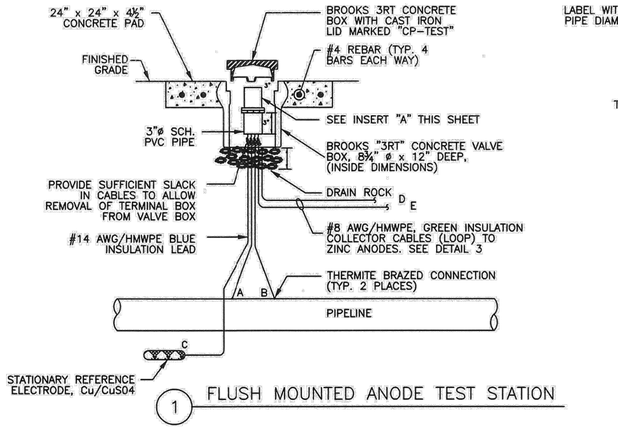
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

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

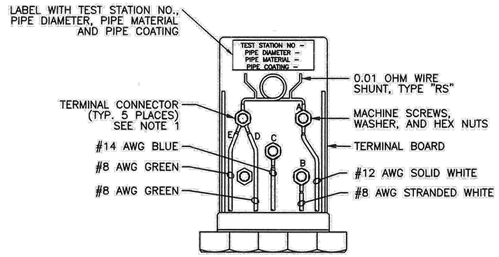
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 128 OF 204	

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1 FLUSH MOUNTED ANODE TEST STATION

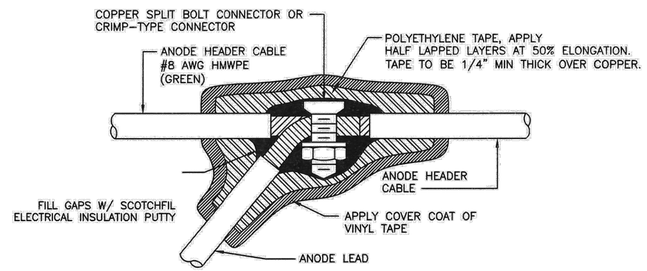
WIRE CODING:
* WIRES A & B ARE WHITE
* WIRE A IS #12 AWG TW SOLID SINGLE CONDUCTOR WIRE
* WIRE B IS #8 AWG TW STRANDED SINGLE CONDUCTOR WIRE
* WIRE C IS BLUE #14 AWG/HMWPE LEAD WIRE TO REFERENCE ELECTRODE
* WIRES D & E ARE GREEN #8 AWG ANODE LEAD WIRE TO ANODE GROUND BED



INSERT A – NOTES:

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

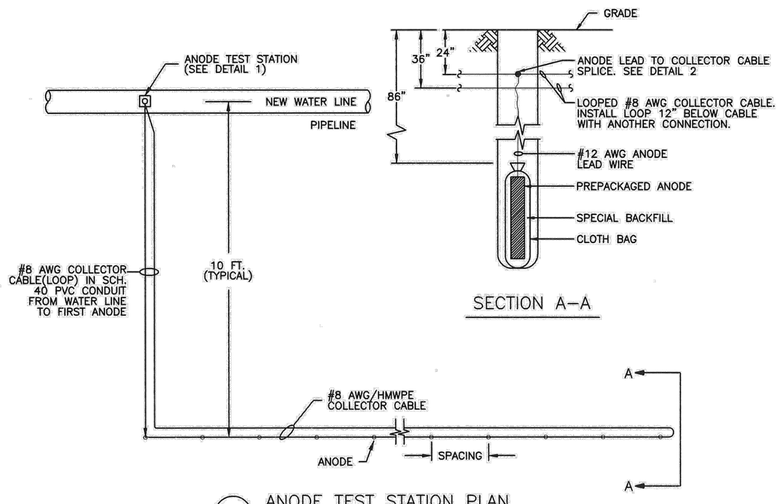
INSERT "A"



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

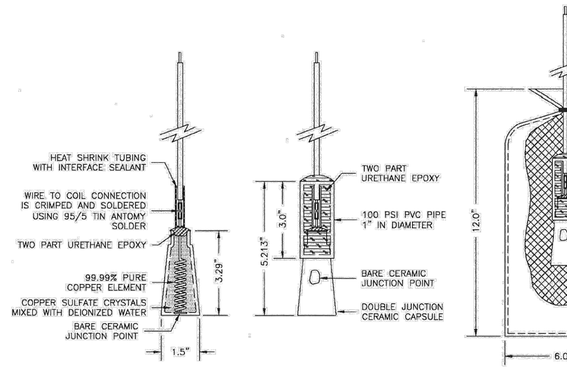
2 SPLICE DETAIL



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:	APPROVED BY:
Suhail Kanwar, CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL - 01 - 2021	DWG NO: 16640-01

NO.	DATE	REVISION	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

SURVEYED BY:
KUO & ASSOCIATES, LLC
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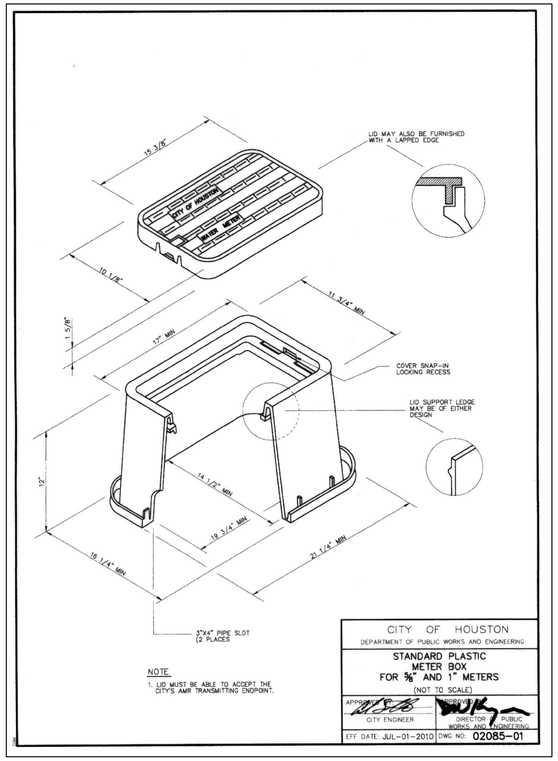
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD LDWL
CATHODIC PROTECTION
DETAILS FOR TEST STATIONS
AND ANODES

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DRAWING SCALE	
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CITY OF HOUSTON PM	
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SHEET NO. **129** OF 204	

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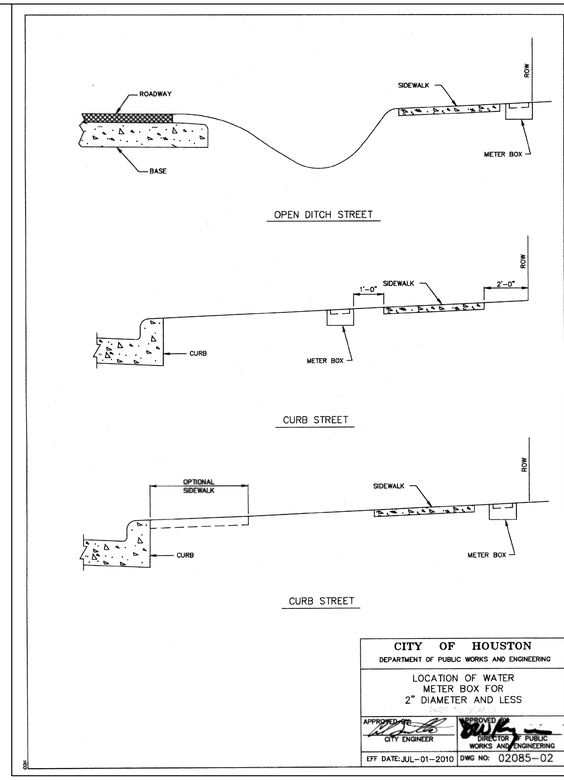


NOTE.
1. LID MUST BE ABLE TO ACCEPT THE CITY'S AMR TRANSMITTING ENDPOINT.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STANDARD PLASTIC METER BOX FOR ⅝" AND 1" METERS
(NOT TO SCALE)

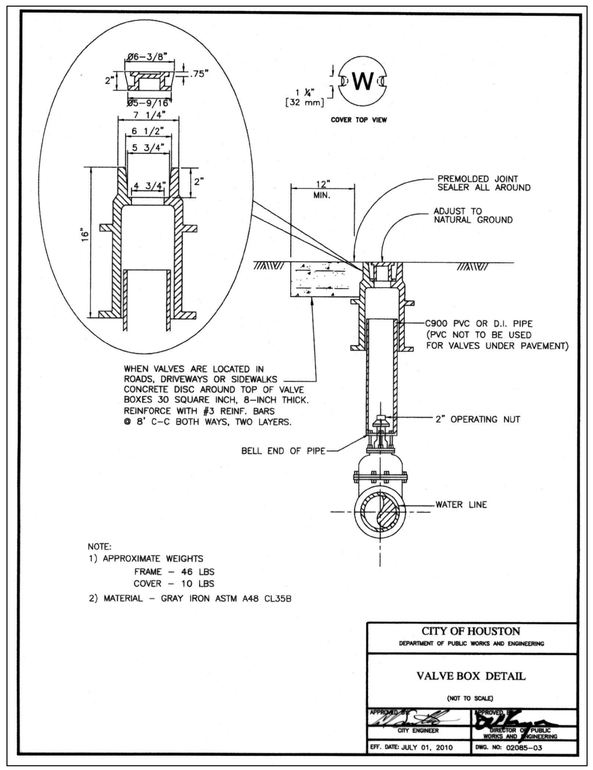
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: JUL-01-2010 | DWG NO: 02085-01



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

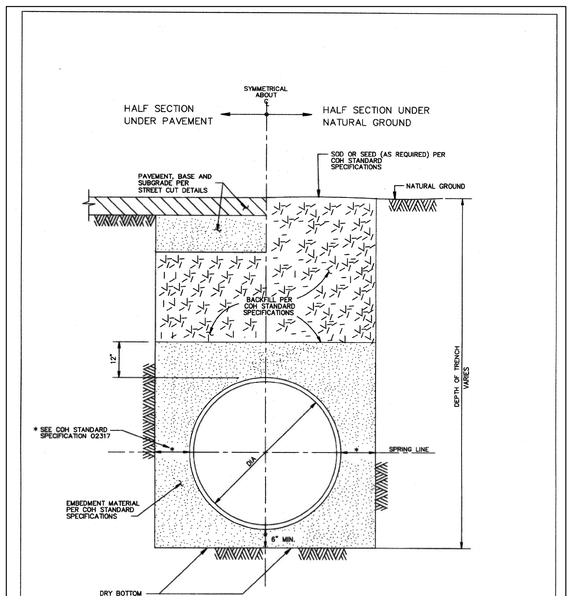


NOTE:
1) APPROXIMATE WEIGHTS
FRAME – 46 LBS
COVER – 10 LBS
2) MATERIAL – GRAY IRON ASTM A48 CL35B

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

VALVE BOX DETAIL
(NOT TO SCALE)

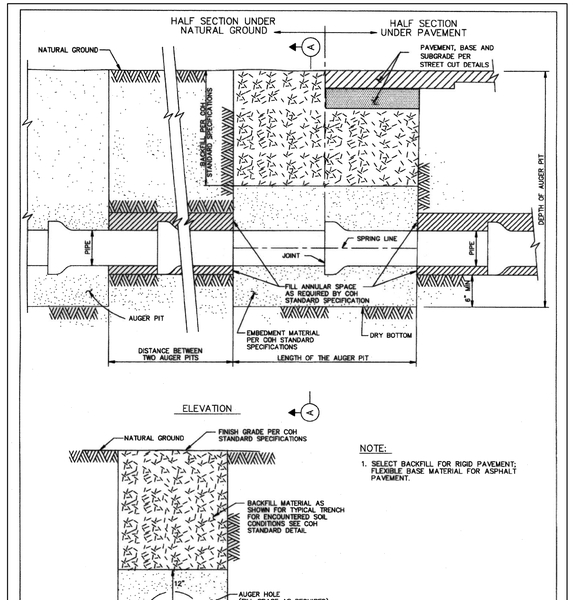
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: JULY 01, 2010 | DWG. NO: 02085-03



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



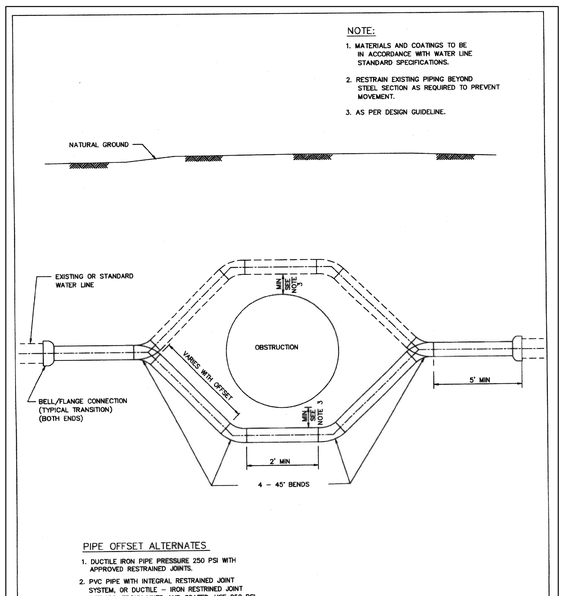
NOTE:
1. SELECT BACKFILL FOR RIGID PAVEMENT; FLEXIBLE BASE MATERIAL FOR ASPHALT PAVEMENT.

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

NOTE:
1. MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH WATER LINE STANDARD SPECIFICATIONS.
2. RESTRAIN EXISTING PIPING BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.
3. AS PER DESIGN GUIDELINE.



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.

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

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TEXAS REG. NO.: 111684
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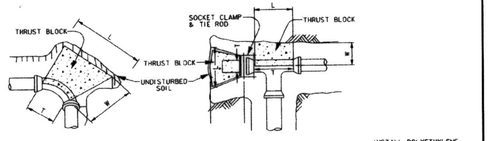
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD SDWL DETAILS
SHEET 1 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **130** OF 204	

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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:

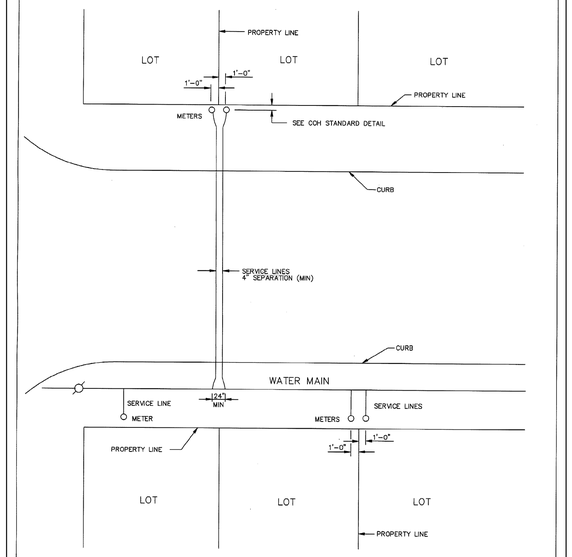
1. DEPTH "W" MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE.
2. BLOCKING MUST BE PLACED AGAINST UNDISTURBED EARTH. WHERE THIS IS NOT POSSIBLE, THE FILL BETWEEN THE BEARING SURFACE AND UNDISTURBED SOIL MUST BE COMPACTED TO AT LEAST 90% STANDARD PROCTOR DENSITY.
3. PROVIDE CONCRETE IN ACCORDANCE 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
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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

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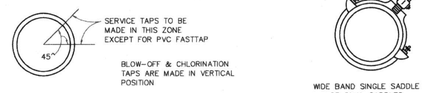
TYPICAL 3/4" THROUGH 2" SERVICE ARRANGEMENTS
(NOT TO SCALE)

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

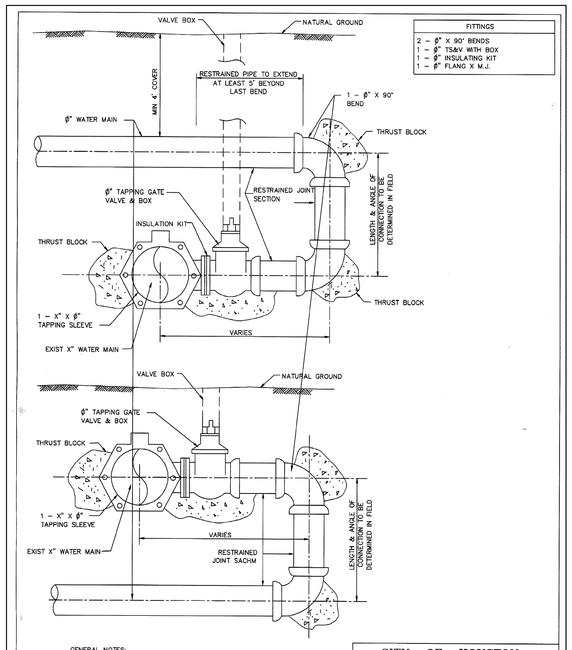


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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SERVICE TAPS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JUL-01-2010 DWG NO: 02512-02



FITTINGS
2 – Φ" X 90° BENDS
1 – Φ" TS&V WITH BOX
1 – Φ" INSULATING KIT
1 – Φ" FLANG X M.J.

GENERAL NOTES:

1. X" AND Φ" 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.

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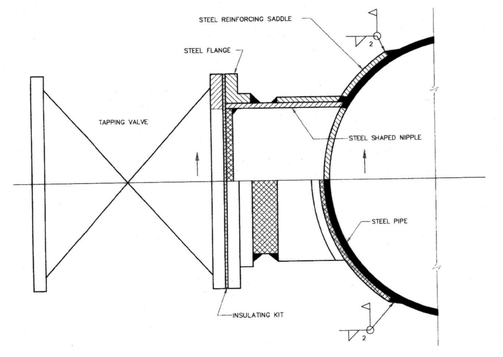
BACK TAP ON EXISTING LINE
(NOT TO SCALE)

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.

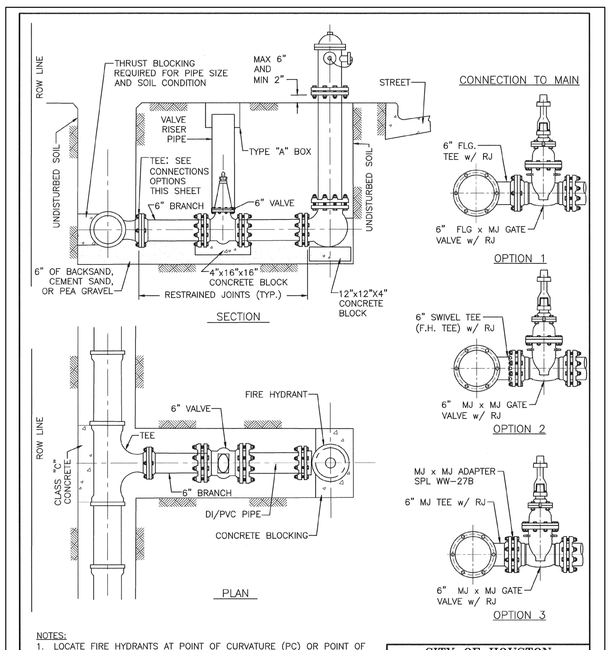


CITY OF HOUSTON
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STANDARD TAP TO EXISTING STEEL MAIN
(NOT TO SCALE)

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
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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

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

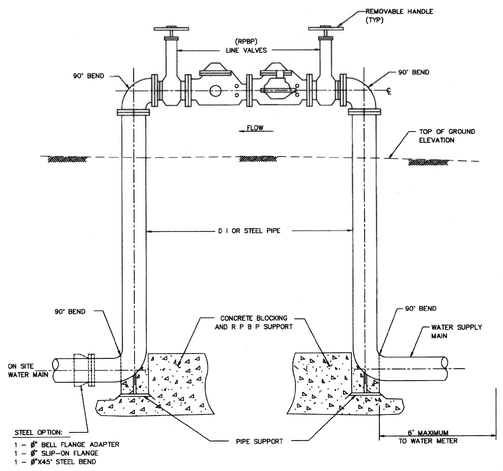
STANDARD SDWL DETAILS SHEET 2 OF 3

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CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 131 OF 204	

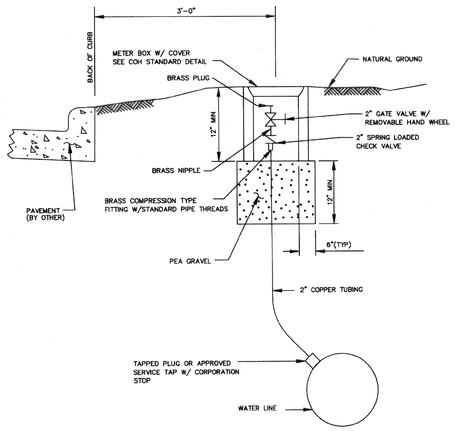
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GENERAL NOTES:

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 BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02523-01



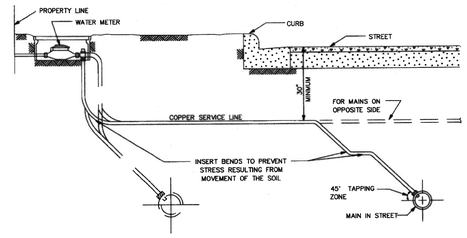
GENERAL NOTES:

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.

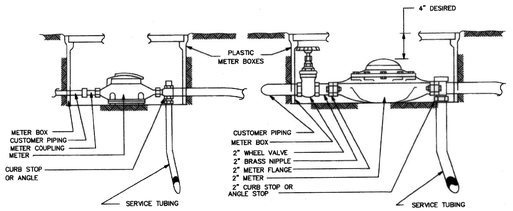
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
PERMANENT BLOW-OFF-DETAIL (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02524-01

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 BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02526-01

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CITY OF HOUSTON

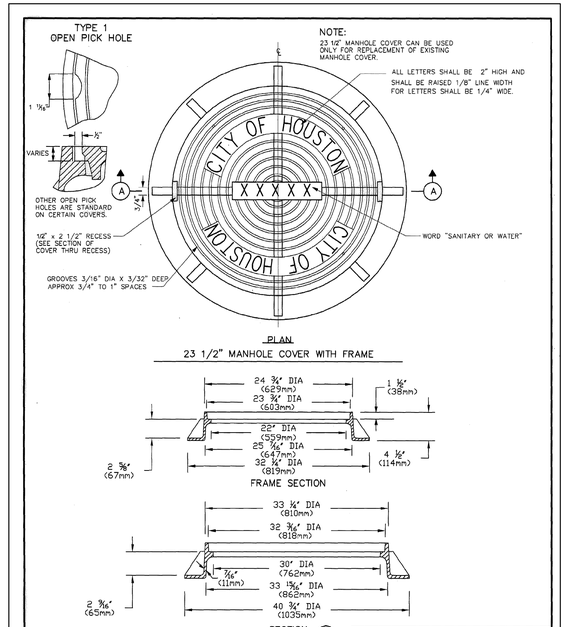
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD SDWL DETAILS
SHEET 3 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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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

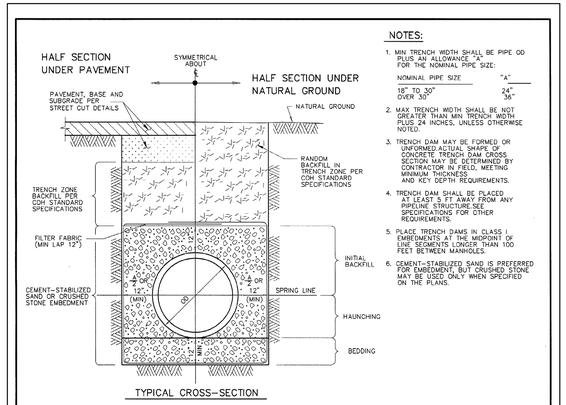
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

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



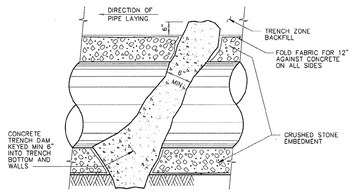
TYPICAL CROSS-SECTION

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.



LONGITUDINAL SECTION ALONG PIPE ℄ AT EMBEDMENT TRENCH DAM

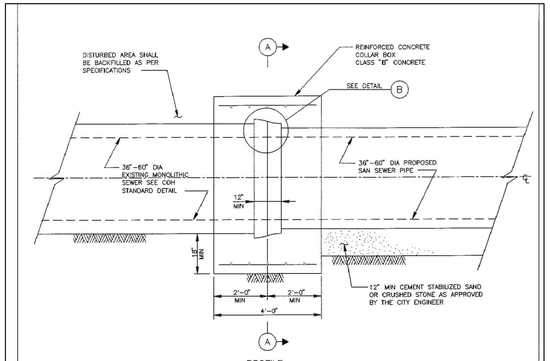
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER EMBEDMENT AND TRENCH ZONE BACKFILL FOR DRY OR WET STABLE TRENCH

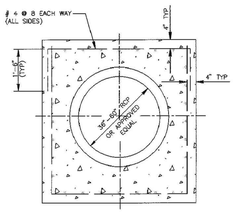
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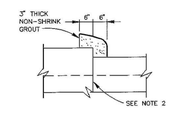
EFF DATE: JUL-01-2016 | DWG NO: 02317-01



PROFILE



SECTION A



DETAIL B

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.

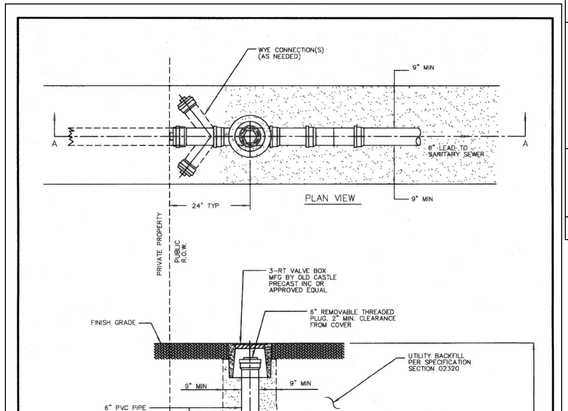
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

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



SECTION A-A

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.

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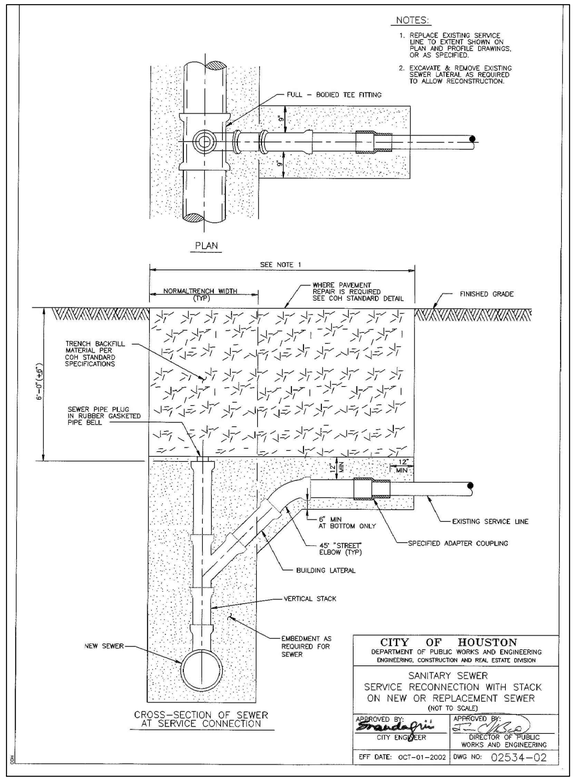
STANDARD CLEANOUT DETAIL ON SERVICE LEAD

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 | DWG NO: 02534-05

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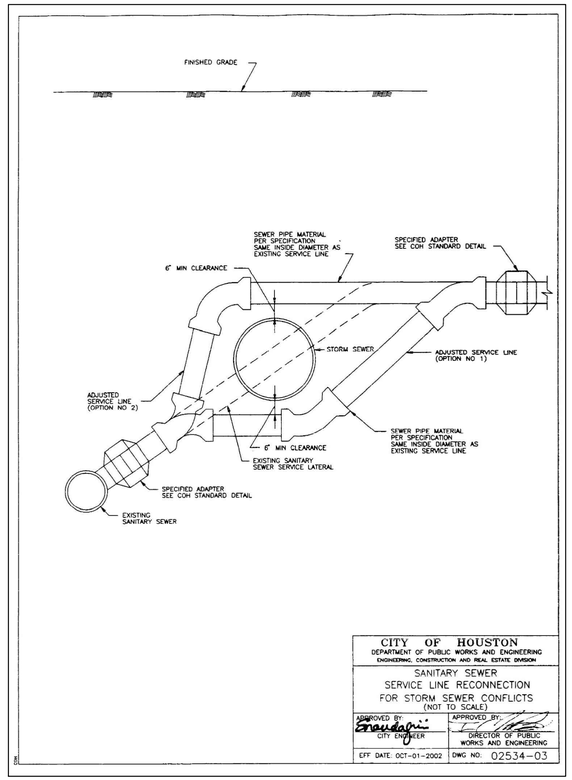
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

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



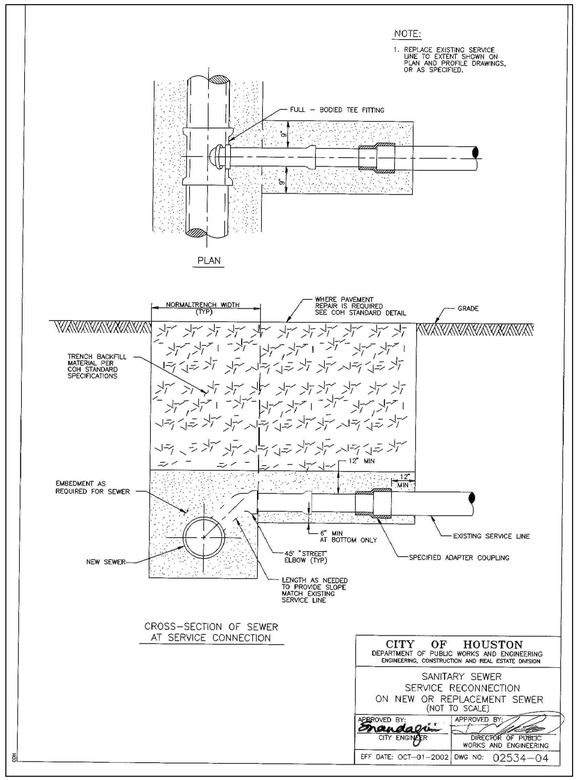
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SANITARY SEWER SERVICE LINE RECONNECTION FOR STORM SEWER CONFLICTS

(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

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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD SANITARY SEWER DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 133 OF 204	

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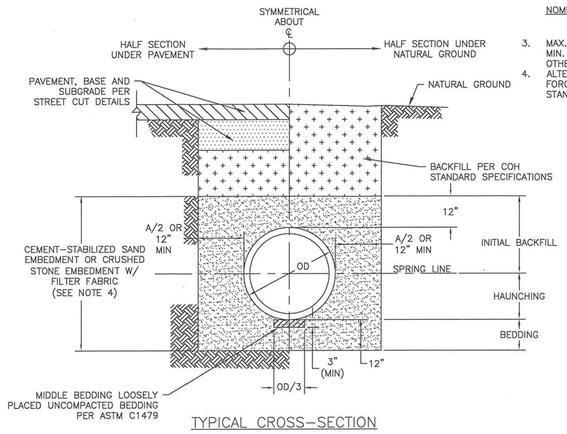
02317–03

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.



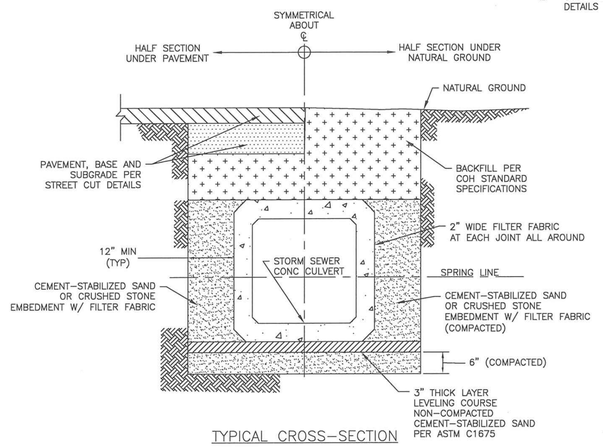
TYPICAL CROSS–SECTION

SANITARY OR STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH
NTS

02317–05

NOTES:

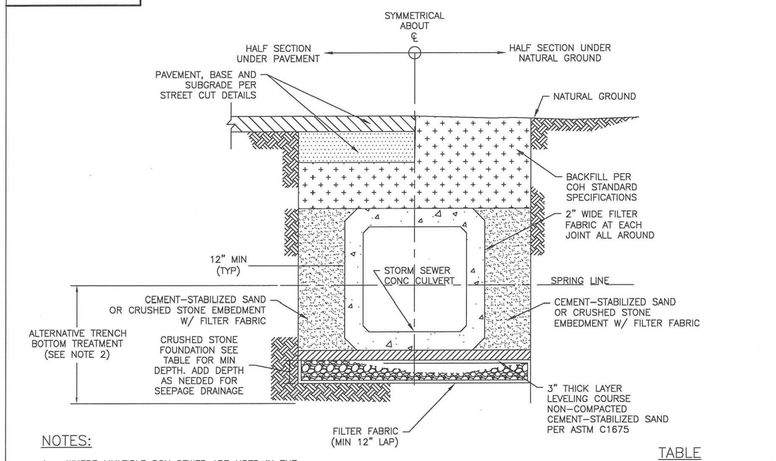
1. WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
2. SUBGRADE AND PAVEMENT FOR STREET CUT DETAILS – 02951.



TYPICAL CROSS–SECTION

PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH
NTS

02317–06



NOTES:

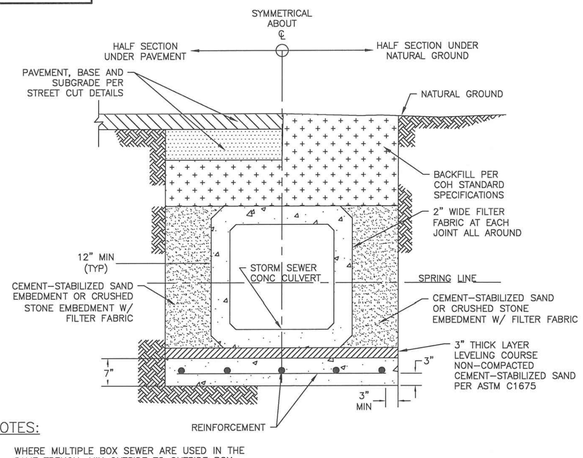
1. WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
2. ALTERNATIVE TRENCH BOTTOM TREATMENT MAY BE USED AS APPROVED BY THE CITY OF ENGINEERS AND AS PAID FOR IN THE PROPOSAL.

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
ENGINEERING + SURVEYING
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HOUSTON, TX 77042
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

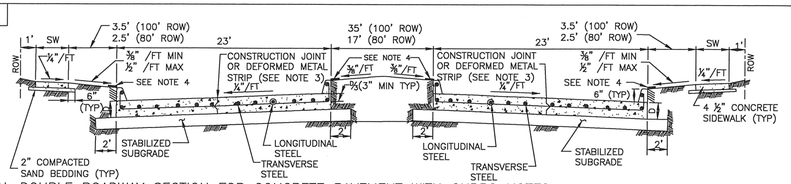
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD SANITARY SEWER AND STORM SEWER BEDDING & BACKFILL DETAILS

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S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
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SHAN HANG LEI, P.E.	
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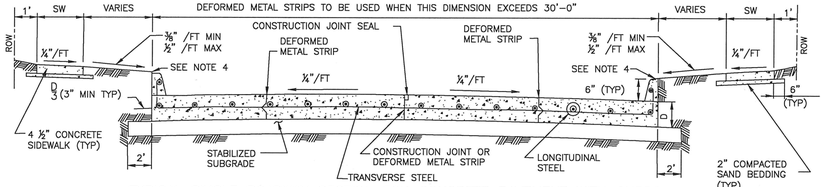
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02751-01



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

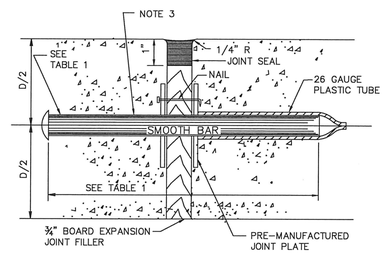
REINFORCING STEEL BAR SIZES AND SPACINGS FOR VARIOUS PAVEMENT THICKNESSES (D) WITH:
MAXIMUM TRANSVERSE CONTROL JOINT SPACING = 20'-0"
MAXIMUM EXPANSION JOINT SPACING = 80'-0"
fc' = 4,000 PSI/28 DAYS AND FY = 60,000 PSI

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

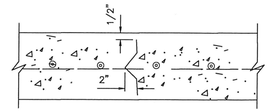
MINIMUM LAP LENGTH (L):
A. # 4 BARS ; L = 22 INCHES
B. # 5 BARS ; L = 27 INCHES
C. # 6 BARS ; L = 32 INCHES

CONCRETE PAVEMENT DETAILS
NTS

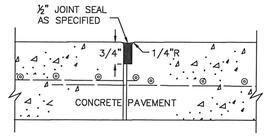
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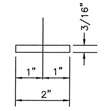
SECTION
DOWEL TYPE EXPANSION JOINT
N.T.S.



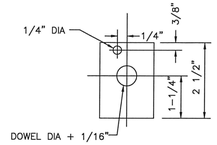
SECTION
DEFORMED METAL STRIP
N.T.S.



SECTION
CONSTRUCTION JOINT SEAL
N.T.S.



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: _____ DEPUTY DIRECTOR
APPROVED BY: _____ DIRECTOR OF HOUSTON PUBLIC WORKS
EFFECTIVE DATE: JUL-01-2020
FOR CITY OF HOUSTON USE ONLY

SHEET NO.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

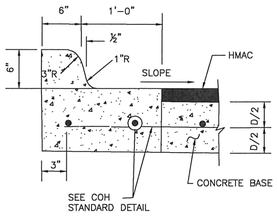
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD STREET PAVING AND SIDEWALK DETAILS
SHEET 1 OF 2

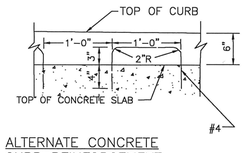
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N.T.S.	
CITY OF HOUSTON PM	
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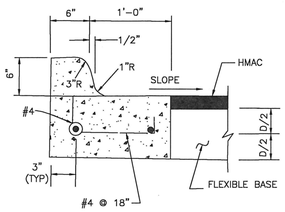
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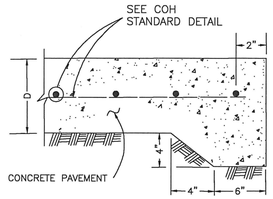
ESPLANADE CURB CONNECTED TO CONCRETE BASE



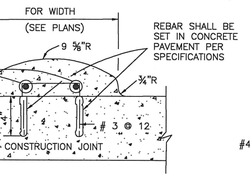
ALTERNATE CONCRETE CURB REINFORCEMENT



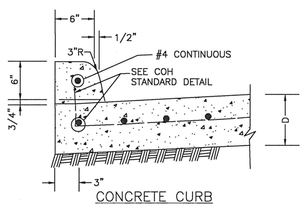
ESPLANADE CURB CONNECTED TO FLEXIBLE BASE



STANDARD CONCRETE PAVING HEADER

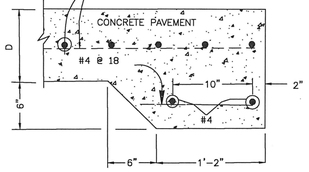


MOUNTABLE CURB

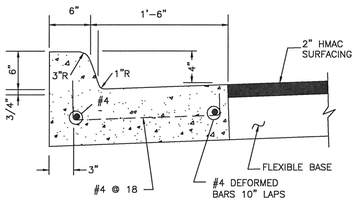


CONCRETE CURB

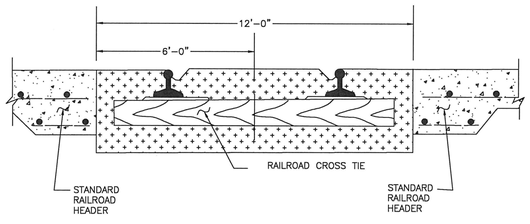
WHEN CONCRETE CURB IS TO BE PLACED EXISTING CONCRETE USE BASE #4 @ 18x10" LONG, DOWELED AND SET IN EPOXY GROUT, SET #4 DOWELS, 25" LONG AT 12" C-C WHEN PAVEMENT SECTION POURED.



STANDARD RAILROAD HEADER



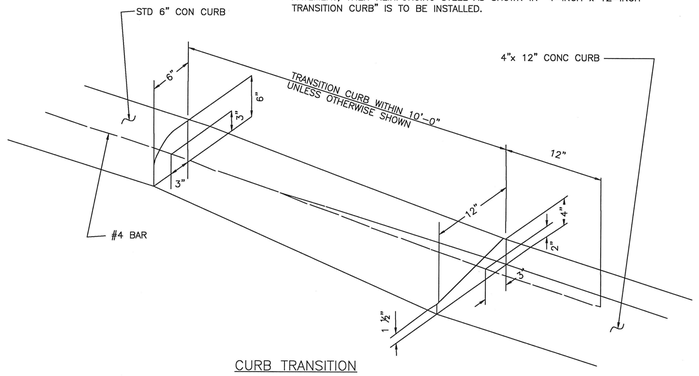
MONOLITHIC CURB AND GUTTER



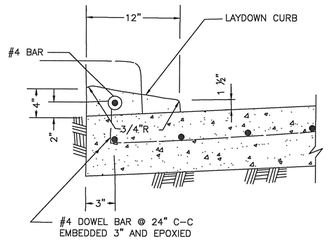
STANDARD RAILROAD CROSSING – SINGLE TRACK

4"x12" MONOLITHIC AND TRANSITION CURB NOTES:

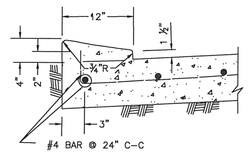
1. 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS NON-RESIDENTIAL STREETS, AND RESIDENTIAL STREETS.
2. TRANSITIONS FROM 6- INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10-FOOT TRANSITION CURB IS NOT POURED MONOLITHICALLY 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:	APPROVED BY:
CITY ENGINEER	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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

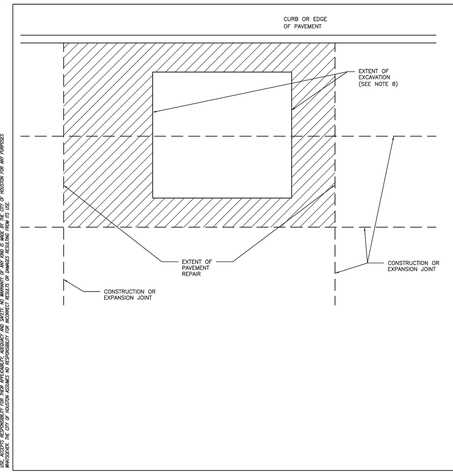
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STANDARD STREET PAVING AND SIDEWALK DETAILS
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 136 OF 204	

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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)

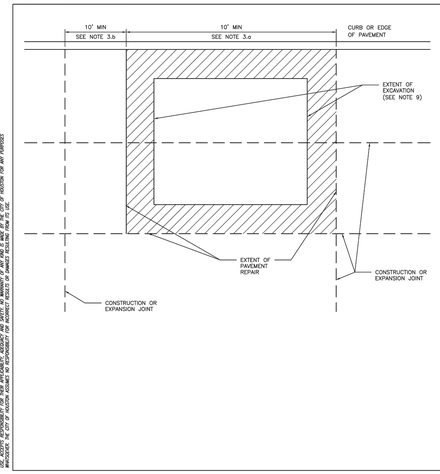
APPROVED BY:

Shakil Bawaner — CITY ENGINEER
HANG NGUYEN — CITY TRAFFIC ENGINEER
Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV-27-2023 DWG NO: 02951-01

DISCLAIMER:
IN NO WAY SHALL THE STANDARDS CONTAINED IN THE STATE ENGINEERING PRACTICE ACT, THE SEVEN REQUIREMENTS OF THE BOARD OF PROFESSIONAL ENGINEERS OR THE SEALS REQUIREMENTS OF ANY AGENCY BE WAIVED BY ANY ACTION OF THE CITY OF HOUSTON, THROUGH THE USE OF THESE STANDARDS OR OTHERWISE. ALL CITY OF HOUSTON STANDARDS ARE WITH DISCLAIMERS AS TO THE ENGINEER'S RESPONSIBILITY FOR ACCURACY, ADEQUACY AND APPLICABILITY OF ANY STANDARD TO ANY PARTICULAR USE. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR ACCURACY, ADEQUACY OR SUITABILITY OF ANY STANDARD FOR ANY PURPOSE.

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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)

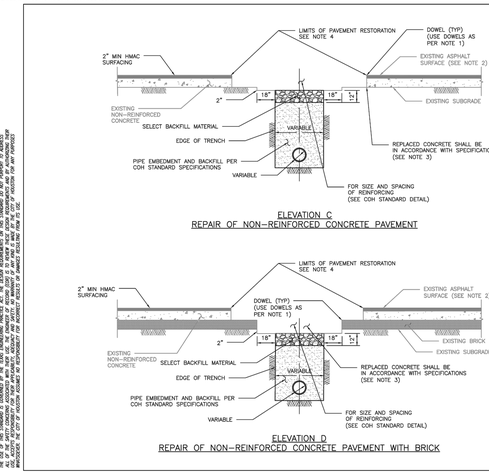
APPROVED BY:

Shakil Bawaner — CITY ENGINEER
HANG NGUYEN — CITY TRAFFIC ENGINEER
Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV-27-2023 DWG NO: 02951-02

DISCLAIMER:
IN NO WAY SHALL THE STANDARDS CONTAINED IN THE STATE ENGINEERING PRACTICE ACT, THE SEVEN REQUIREMENTS OF THE BOARD OF PROFESSIONAL ENGINEERS OR THE SEALS REQUIREMENTS OF ANY AGENCY BE WAIVED BY ANY ACTION OF THE CITY OF HOUSTON, THROUGH THE USE OF THESE STANDARDS OR OTHERWISE. ALL CITY OF HOUSTON STANDARDS ARE WITH DISCLAIMERS AS TO THE ENGINEER'S RESPONSIBILITY FOR ACCURACY, ADEQUACY AND APPLICABILITY OF ANY STANDARD TO ANY PARTICULAR USE. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR ACCURACY, ADEQUACY OR SUITABILITY OF ANY STANDARD FOR ANY PURPOSE.

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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)

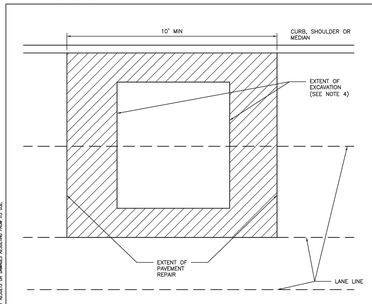
APPROVED BY:

Shakil Bawaner — CITY ENGINEER
HANG NGUYEN — CITY TRAFFIC ENGINEER
Carl Haddock — DIRECTOR OF HPW

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)

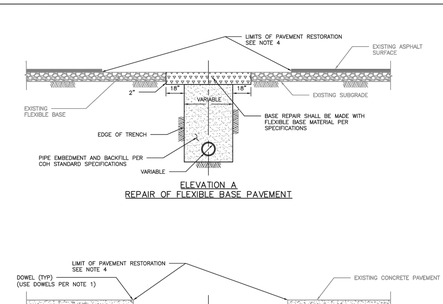
APPROVED BY:

Shakil Bawaner — CITY ENGINEER
HANG NGUYEN — CITY TRAFFIC ENGINEER
Carl Haddock — DIRECTOR OF HPW

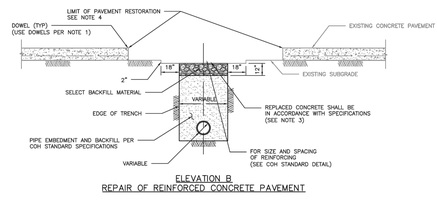
EFF DATE: NOV-27-2023 DWG NO: 02951-03

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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:

Shakil Bawaner — CITY ENGINEER
HANG NGUYEN — CITY TRAFFIC ENGINEER
Carl Haddock — DIRECTOR OF HPW

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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

COH STANDARD STREET CUT PAVEMENT REPLACEMENT DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **137** OF 204	

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GENERAL PAVEMENT MARKING NOTES:

1. PRIOR TO START OF CONSTRUCTION, ALL EXISTING PAVEMENT MARKINGS WITHIN THE AREA OF CONSTRUCTION SHALL BE INVENTORIED AND DOCUMENTED JOINTLY BY THE CITY INSPECTOR 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. ALL OTHER PAVEMENT MARKINGS SHALL BE APPLIED 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 CAN BE SET AT 200 FEET 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 (RPMS) 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 02762. 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 IMPLEMENTATION.
14. BLUE RPMS 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).

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.
			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. Sec. 02764 Equivalent	Description
C	Clear	Type I-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

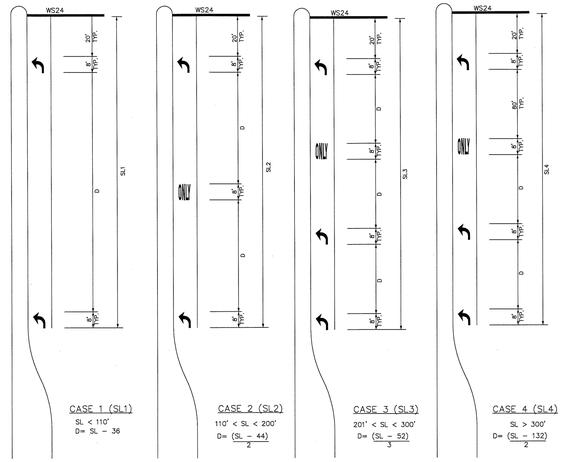
- Color
- Pattern
- Width of stripe
- RPM spacing
- RPM type
- RPM spacing
- RPM Type

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

GENERAL NOTES AND LEGENDS

(NOT TO SCALE)

COH TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-01



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.

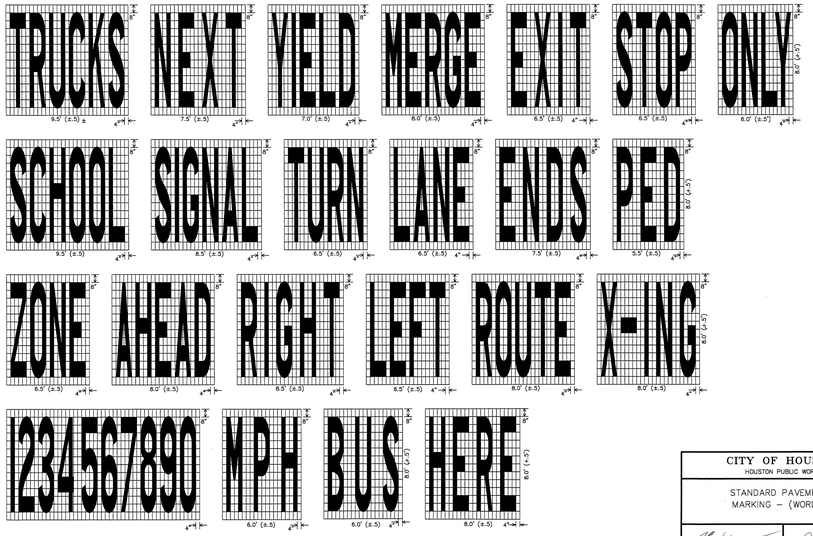
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LEFT/RIGHT-TURN "ONLY" AND ARROW SPACING

(NOT TO SCALE)

COH TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-02

NO.	DATE	REVISION	APP.

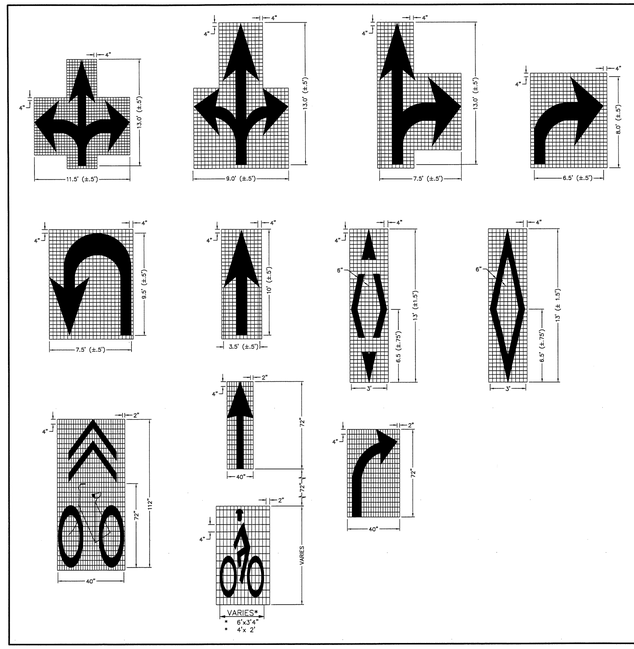


CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD PAVEMENT MARKING - (WORDS)

(NOT TO SCALE)

COH TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-03



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 50 FEET, OR AS INDICATED ON THE PLANS.
4. MARKINGS CONSIDERED APPROPRIATE FOR USE WHEN WARRANTED INCLUDE THE FOLLOWING:

   A. REGULATORY
      STOP
      RIGHT (LEFT) TURN ONLY, SYMBOL ARROWS.

   B. WARNING
      STOP AHEAD
      SIGNAL AHEAD
      SCHOOL
      SCHOOL X-ING
      PED X-ING
      R X R (SEE SHEET 01510-08 DETAILS)
      OTHER WORDS 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.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STANDARD PAVEMENT MARKING - SYMBOLS

(NOT TO SCALE)

COH TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-04

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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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HOUSTON PUBLIC WORKS

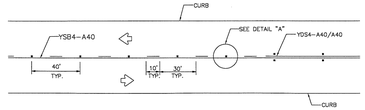
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

COH STANDARD PAVEMENT MARKING DETAILS SHEET 1 OF 4

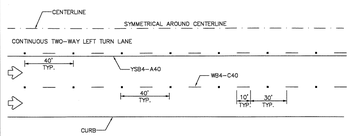
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 138 OF 204	

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CENTERLINE & FOR ALL TWO LANE STREETS WITH PASSING ZONE

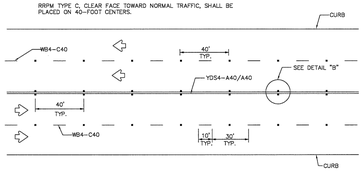


CENTERLINE & LANE LINES FOR TWO-WAY LEFT TURN LANE



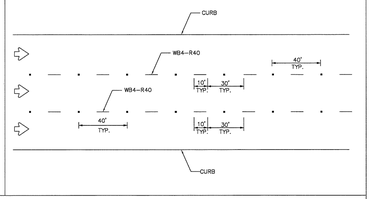
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY STREETS

RRPM TYPE C, CLEAR FACE TOWARD NORMAL TRAFFIC, SHALL BE PLACED ON 40-FOOT CENTERS.

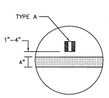


LANE LINES FOR ONE-WAY MULTILANE STREET

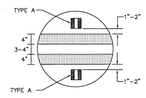
RRPM TYPE R SHALL HAVE CLEAR FACE TOWARD NORMAL TRAFFIC AND RED FACE TOWARD WRONG-WAY TRAFFIC.



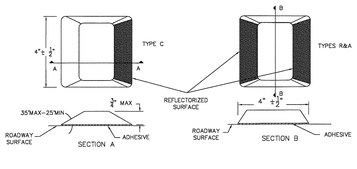
DETAIL "A"



DETAIL "B"



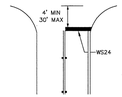
REFLECTIVE RAISED PAVEMENT MARKERS



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 WAYS 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 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

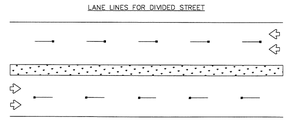


CITY OF HOUSTON
HOUSTON PUBLIC WORKS

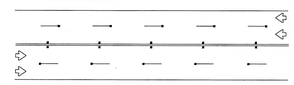
STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-05

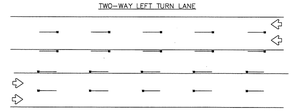
LANE LINES FOR DIVIDED STREET



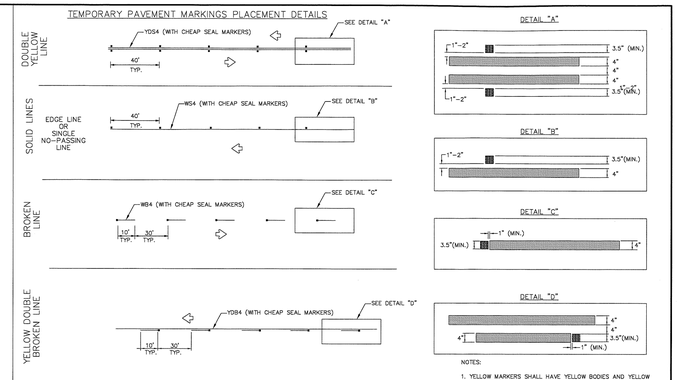
LANE & CENTER LINES FOR MULTILANE UNDIVIDED STREETS



TWO-WAY LEFT TURN LANE



TEMPORARY PAVEMENT MARKINGS PLACEMENT DETAILS



DETAIL "A"

DETAIL "B"

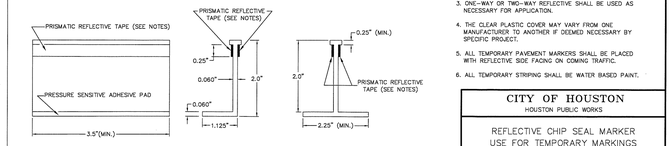
DETAIL "C"

DETAIL "D"

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.

TEMPORARY CHIP SEAL MARKER DETAIL

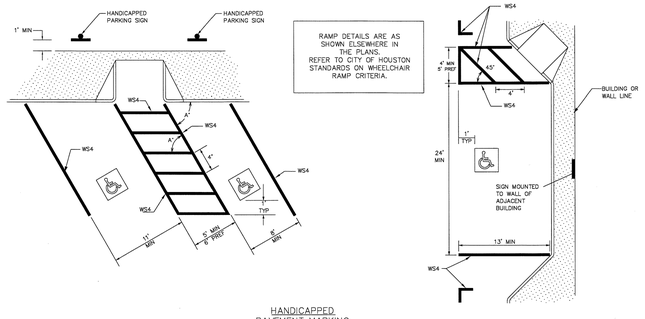


CITY OF HOUSTON
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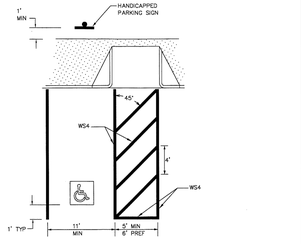
REFLECTIVE CHIP SEAL MARKER USE FOR TEMPORARY MARKINGS
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-06

TYPICAL ACCESSIBLE PARKING SPACE DIMENSIONS



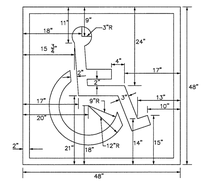
RAMP DETAILS ARE AS SHOWN ELSEWHERE IN THE PLANS. REFER TO CITY OF HOUSTON STANDARDS ON WHEELCHAIR RAMP CRITERIA.



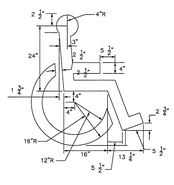
NOTES:

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



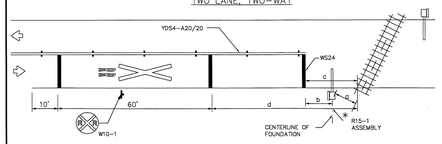
SYMBOL ONLY
SYMBOL: BLUE OR WHITE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

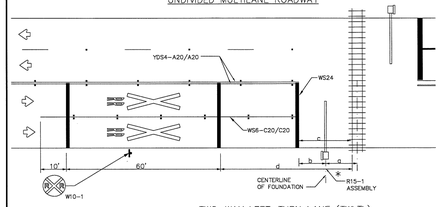
PAVEMENT MARKINGS FOR ACCESSIBLE PARKING
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-07

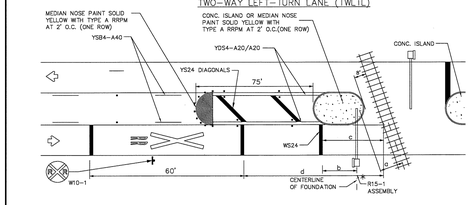
TWO LANE, TWO-WAY



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.

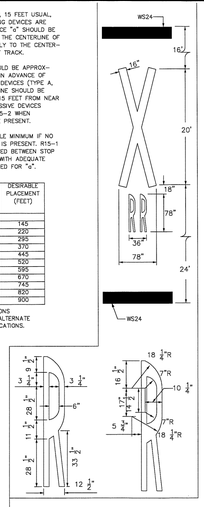
b = STOP LINES SHOULD BE APPROX-IMATELY 8 FEET IN ADVANCE OF ACTIVE WARNING DEVICES (TYPE A, E OR F). STOP LINE SHOULD BE APPROXIMATELY 15 FEET FROM NEAR RAIL IF ONLY PASSIVE DEVICES (R15-1, PLUS R15-2 WHEN APPLICABLE) ARE PRESENT.

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.



W10-1 (30" DIA.)

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

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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FB NO.

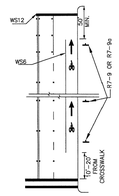
CITY OF HOUSTON
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LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

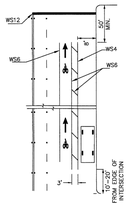
COH STANDARD PAVEMENT MARKING DETAILS SHEET 2 OF 4

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S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
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SHEET NO. **139** OF 204	

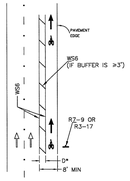
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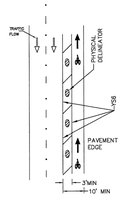
STANDARD BIKE LANES
NO ON-STREET PARKING
ALONG BICYCLE LANE



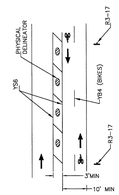
STANDARD BIKE LANES
ON-STREET PARKING
ALONG BICYCLE LANE



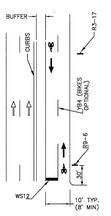
BUFFERED BIKE LANES
*DELINEATOR REQUIRED IF D<2'



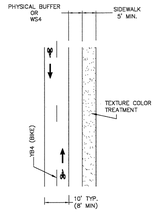
SEPARATED BIKE LANES
ONE-WAY (CONTRA-FLOW)



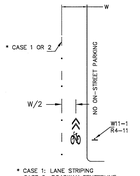
SEPARATED BIKE LANES
TWO-WAY



TWO-WAY SIDE PATH

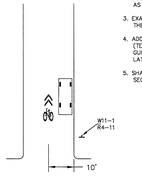


SIDEPATH WITH DEDICATED
SIDEWALK



ROADWAY WITH SHARED LANE

- NEIGHBORHOOD BIKEWAY
- COLLECTOR / THOROUGHFARE
- 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.

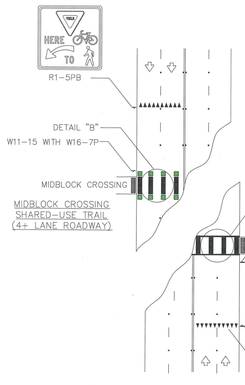
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

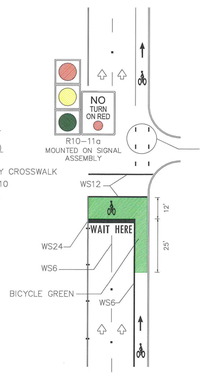
BICYCLE LANE
PAVEMENT MARKINGS

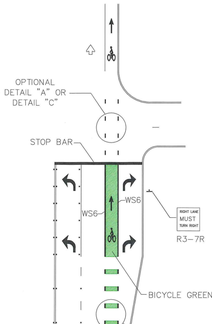
(NOT TO SCALE)

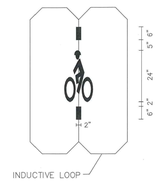
CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-09

USE OF TREATMENTS ON THIS SHEET MUST BE PRE-APPROVED BY THE CITY TRAFFIC ENGINEER

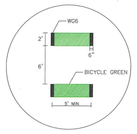




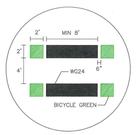




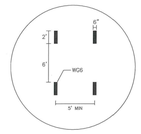
DETAIL "A"



DETAIL "B"



DETAIL "C"



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.

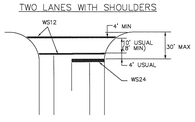
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

BICYCLE INTERSECTION TREATMENTS

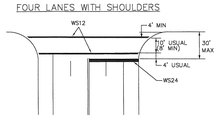
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CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-09A

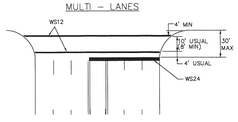
TWO LANES WITH SHOULDERS



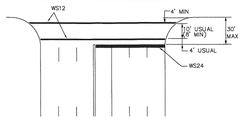
FOUR LANES WITH SHOULDERS



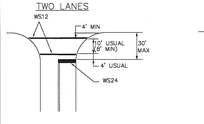
MULTI - LANES



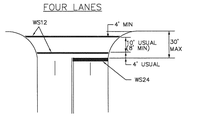
MULTI - LANE WITH MEDIAN



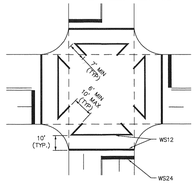
TWO LANES



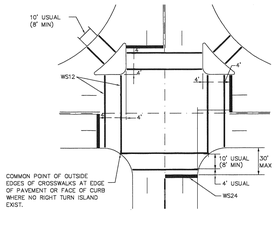
FOUR LANES



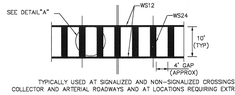
EXCLUSIVE PEDESTRIAN PHASE



INTERSECTION WITH RIGHT - TURN ISLANDS

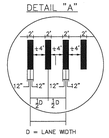


HIGH VISIBILITY CROSSWALK DETAIL



TYPICALLY USED AT SIGNALIZED AND NON-SIGNALIZED CROSSINGS ON COLLECTOR AND ARTERIAL ROADWAYS AND AT LOCATIONS REQUIRING EXTRA EMPHASIS.

DETAIL "A"



NOTES:

1. CROSSWALKS AND STOP LINES SHALL BE WHITE.
2. "D" IS EQUAL TO ONE HALF THE WIDTH OF TRAVEL LANE.

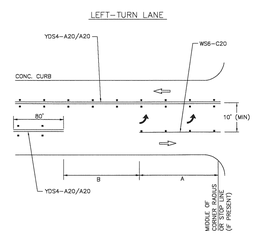
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TYPICAL CROSSWALK
DETAILS

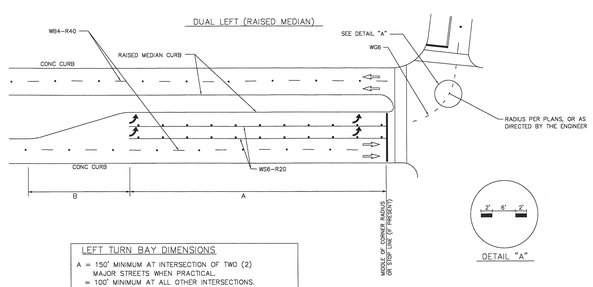
(NOT TO SCALE)

CITY TRAFFIC ENGINEER / CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2018	DWG NO: 01510-10

LEFT-TURN LANE



DUAL LEFT (RAISED MEDIAN)



LEFT TURN BAY DIMENSIONS

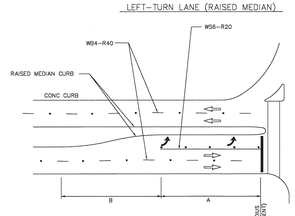
A = 150' MINIMUM AT INTERSECTION OF TWO (2) MAJOR STREETS WHEN PRACTICAL.
= 100' MINIMUM AT ALL OTHER INTERSECTIONS.

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.

DETAIL "A"

LEFT-TURN LANE (RAISED MEDIAN)



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
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

SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.

KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

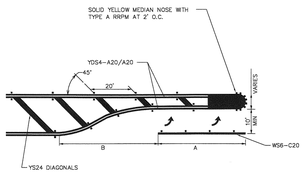
COH STANDARD PAVEMENT MARKING DETAILS SHEET 3 OF 4

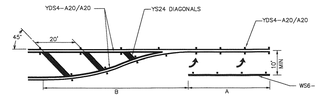
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S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **140** OF 204	

NO.	DATE	REVISION	APP.

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PAINTED MEDIAN LEFT TURN BAY DETAILS





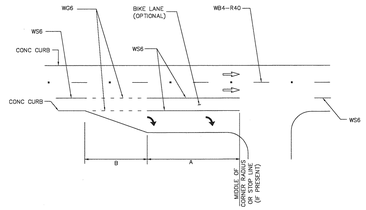
LEFT TURN BAY DIMENSIONS

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

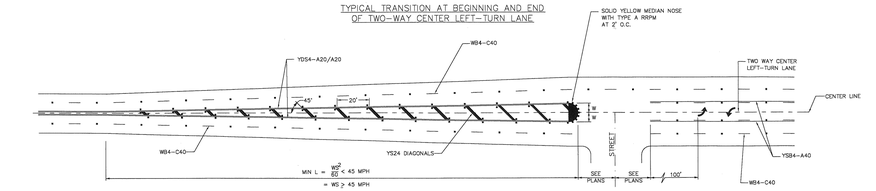


NOTES:

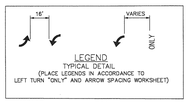
1. STORAGE LENGTHS LONGER THAN THE MINIMUMS LISTED ON THIS DRAWING MAY BE DETERMINED USING TRAFFIC ENGINEERING ANALYSIS OR APPROXIMATE CALCULATIONS.
2. FOR THE PLACEMENT OF PAVEMENT ARROWS AND WORDS SEE LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET.
3. REFER TO APPLICABLE STANDARD PAVEMENT MARKINGS WITH 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



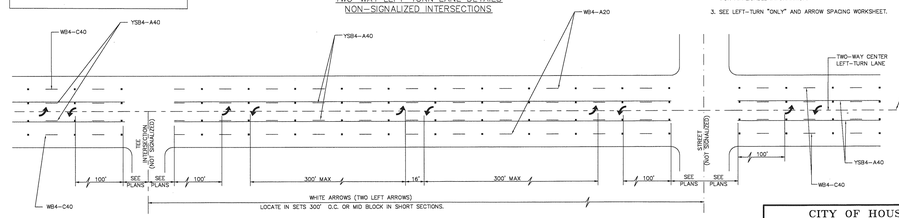
W = WIDTH OF OFFSET (FT)
S = POSTED SPEED (MPH)
L = LENGTH OF CROSSHATCHING (FT)



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.

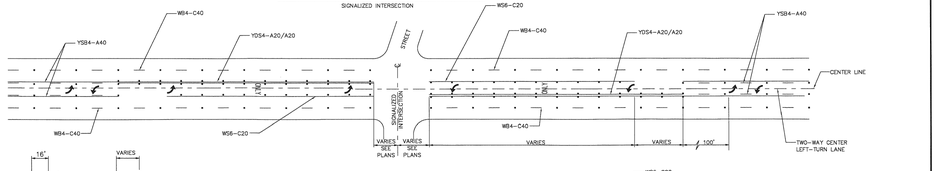
TWO-WAY LEFT-TURN LANE DETAILS NON-SIGNALIZED INTERSECTIONS



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

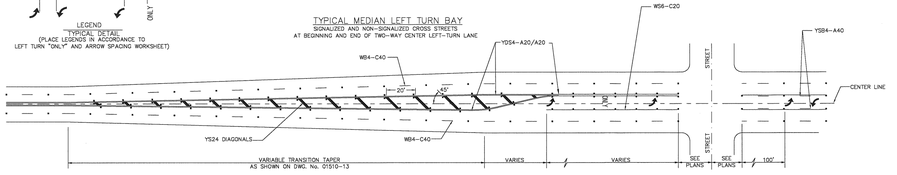
SIGNALIZED INTERSECTION





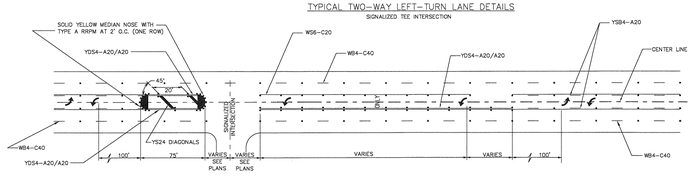
TYPICAL MEDIAN LEFT TURN BAY

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
AT BEGINNING AND END OF TWO-WAY CENTER LEFT-TURN LANE



TYPICAL TWO-WAY LEFT-TURN LANE DETAILS

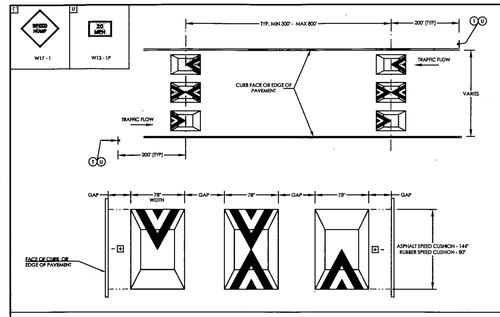
SIGNALIZED TEE INTERSECTION



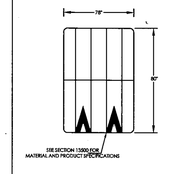
NOTE:

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

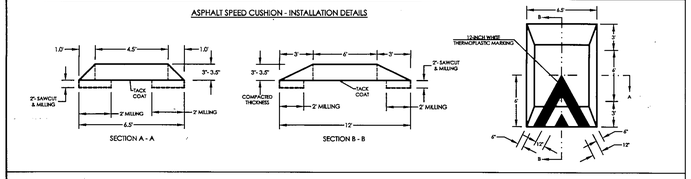


RUBBER SPEED CUSHION



INSTALL PER MANUFACTURER'S SPECIFICATIONS

ASPHALT SPEED CUSHION - INSTALLATION DETAILS

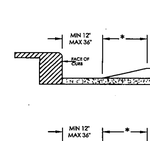


TYPICAL SPEED CUSHIONS ARRANGEMENT FOR A GIVEN PAVEMENT WIDTH

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)
14	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	18	78	12	78	12	78	15				
26	3	20	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	34	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 APPROACH. RATHER THERE SHOULD BE A MINIMUM OF 6 FEET FROM THE EDGE OF A DRIVEWAY, WHEN 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 2" - 3.5" IN HEIGHT.
16. CONTRACTOR SHALL NOTIFY GARY DRAKE (832-395-2997) 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
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684

ON 08/15/2025
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KUO & ASSOCIATES, LLC
FB NO.

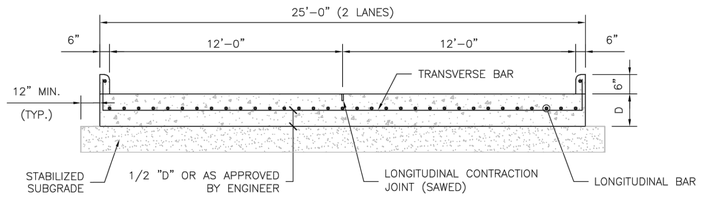
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

COH STANDARD PAVEMENT MARKING DETAILS SHEET 4 OF 4

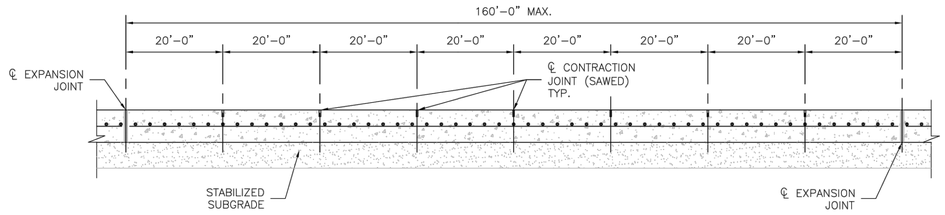
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **141** OF 204	

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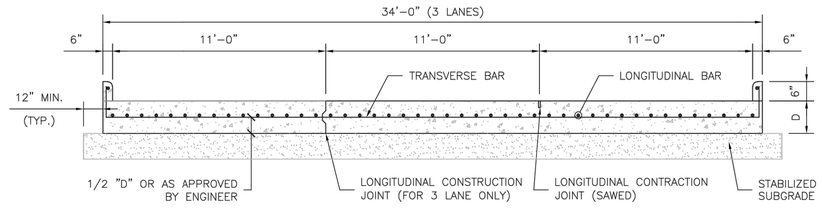
SPACING OF LONGITUDINAL JOINT (2 LANES) (NEW CONSTRUCTION)

HORIZONTAL SCALE: 1" = 3'-0"
VERTICAL SCALE: 1" = 1'-6"



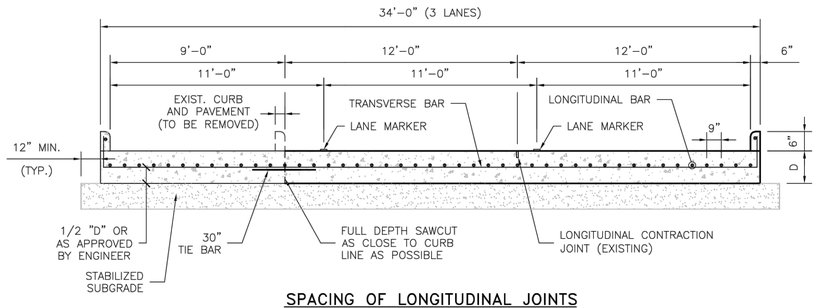
SPACING OF TRANSVERSE EXPANSION AND CONTRACTION JOINTS

HORIZONTAL SCALE: 1" = 12'-0"
VERTICAL SCALE: 1" = 1'-6"



SPACING OF LONGITUDINAL JOINTS (3 LANES) (NEW CONSTRUCTION)

HORIZONTAL SCALE: 1" = 3'-0"
VERTICAL SCALE: 1" = 1'-6"

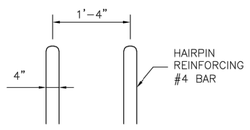


SPACING OF LONGITUDINAL JOINTS (WIDENING)

HORIZONTAL SCALE: 1" = 3'-0"
VERTICAL SCALE: 1" = 1'-6"

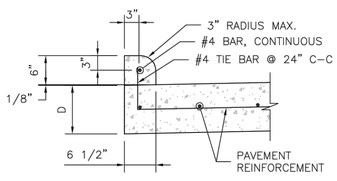
SUBGRADE AND PAVEMENT NOTES:

1. TYPICAL STABILIZED SUBGRADE THICKNESS IS 8 INCHES.
2. TYPICAL PAVEMENT THICKNESS (D) IS 10 INCHES.
3. TYPICAL REINFORCING STEEL BAR SIZE AND SPACING ARE:
   a. LONGITUDINAL: #5 BARS @ 9 INCH SPACING
   b. TRANSVERSE: #5 BARS @ 36 INCH SPACING
4. REINFORCEMENT SHALL NOT BE PLACED WITHIN 3 INCHES FROM THE EDGE OF PAVEMENT.
5. FOR HEAVY INDUSTRIAL TRAFFIC, PAVEMENT THICKNESS (D) AND REINFORCING STEEL BAR SIZE AND SPACING WILL BE AS PER GEOTECHNICAL RECOMMENDATION.
6. ALL RIENFORCING STEEL BARS SHALL BE GRADE 60 STEEL UNLESS OTHERWISE SPECIFIED.



ALTERNATE VERTICAL REINFORCEMENT

SCALE: 1" = 1'-6"



TYPICAL CONCRETE CURB REINFORCING DETAILS

SCALE: 1" = 1'-0"

GENERAL NOTES:

1. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND STEEL REINFORCEMENT, REFER TO THE GOVERNING SPECIFICATION ITEM 360 "CONCRETE PAVEMENT."
2. CONCRETE SHALL BE CLASS P, 4,000 PSI @ 28 DAYS IN ACCORDANCE WITH SPECIFICATION ITEM 421 "HYDRAULIC CEMENT CONCRETE."
3. THE CHAIRS USED TO SUPPORT THE BAR MATS SHALL BE OF SUFFICIENT STRUCTURAL QUALITY AND NUMBER TO HOLD THE MAT WITHIN THE PLACEMENT HEIGHT, AND SHALL BE OF A TYPE APPROVED BY THE ENGINEER. SPACING OF BAR SUPPORT CHAIRS SHALL BE 3'-0" MAXIMUM.
4. SAWED CONTRACTION JOINTS SHALL BE USED FOR LONGITUDINAL JOINTS WHEREVER MORE THAN ONE LANE WIDTH IS PLACED IN A SINGLE POUR. KEYED CONSTRUCTION JOINTS SHALL BE USED AT ALL OTHER JOINTS.
5. ALL SAW CUTTING SHOWN ON THIS DETAIL SHALL BE INCIDENTAL TO SPECIFICATION ITEM 360 "CONCRETE PAVEMENT."
6. D = THICKNESS OF CONCRETE PAVEMENT.
   - FOR DEVELOPMENT PROJECTS SEE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR THE APPROVAL AND ACCEPTANCE OF INFRASTRUCTURE."
   - FOR PUBLIC PROJECTS SEE HCED 1988 DESIGN GUIDELINES.
7. JOINT SEALANT SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATION ITEM 360 "CONCRETE PAVEMENT."

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

HARRIS COUNTY ENGINEERING DEPARTMENT

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ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: CONCRETE PAVEMENT DETAILS

CIVIL STANDARD: CP-13

DRAWN BY: JDZ

CK'D BY: PDG

PRECINCT 1 & 3 (1 OF 3)

SCALE: AS NOTED

DATE: 10/10/23

SHEET NO: /

NO.	DATE	REVISION	APP.

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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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TEXAS REG. NO.: 111684

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TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

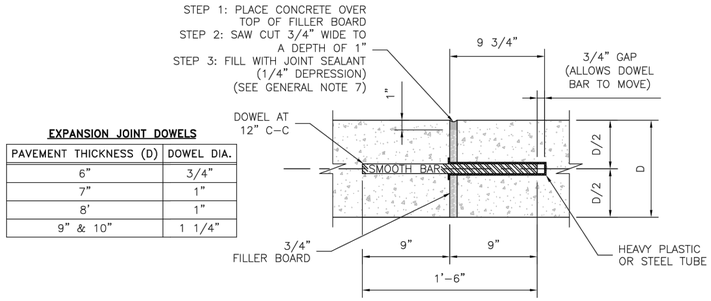
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

HARRIS COUNTY CONCRETE PAVEMENT DETAIL SHEET 1 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 142 OF 204	

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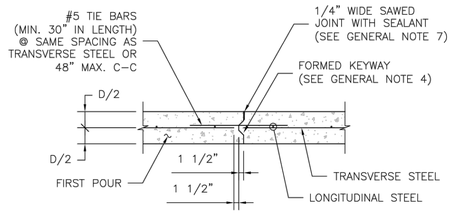
EXPANSION JOINT DOWELS

PAVEMENT THICKNESS (D)	DOWEL DIA.
6"	3/4"
7"	1"
8'	1"
9" & 10"	1 1/4"

DOWEL TYPE EXPANSION JOINT
SCALE: 1" = 3"

NOTES FOR DOWEL EXPANSION JOINT:

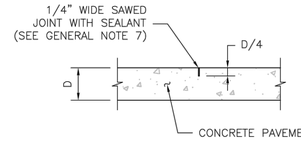
1. EXPANSION JOINT SHALL BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED AT A MAXIMUM DISTANCE OF 160 FEET.
2. CENTER DOWEL HORIZONTALLY ON JOINT.
3. EXPANSION JOINT BARS SHALL BE HELD PARALLEL TO THE FINISHED CONCRETE SURFACE.



LONGITUDINAL CONSTRUCTION JOINT
SCALE: 1" = 1'-6"

NOTES FOR CONSTRUCTION JOINT:

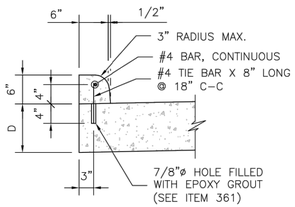
1. SAWED JOINTS SHALL BE CLEANED IN ACCORDANCE WITH SPECIFICATION ITEM 438 "JOINT SEALANTS."
2. JOINT SEALANT SHALL FILL THE JOINT FROM BOTTOM TO 1/4" BELOW CONCRETE PAVEMENT SURFACE.



CONTRACTION JOINT (SAWED)
SCALE: 1" = 1'-6"

NOTES FOR CONTRACTION JOINT:

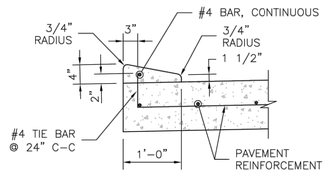
1. 20'-0" MAXIMUM SPACING BETWEEN TRANSVERSE CONTRACTION JOINTS.
2. SAWED JOINTS SHALL BE CLEANED IN ACCORDANCE WITH SPECIFICATION ITEM 438 "JOINT SEALANTS."
3. JOINT SEALANT SHALL FILL THE JOINT FROM BOTTOM TO 1/4" BELOW CONCRETE PAVEMENT SURFACE.



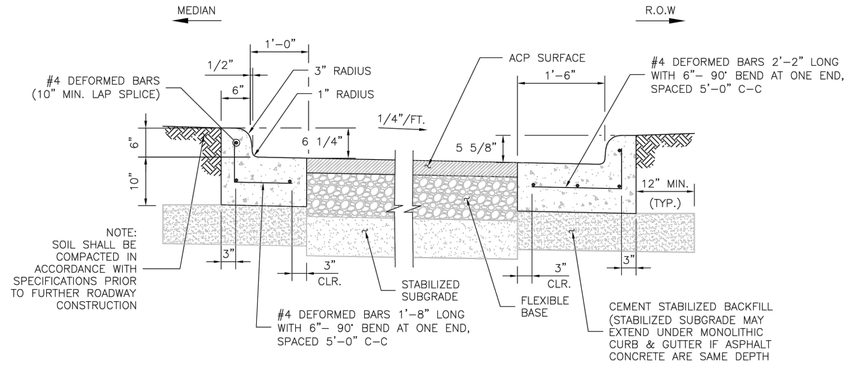
DRILLED-IN CONCRETE CURB FOR CONCRETE PAVEMENT
SCALE: 1" = 1'-0"

NOTES FOR CURB:

1. AT EACH PAVEMENT CONTRACTION JOINT, PROVIDE A 1/4" THICK PRE-MOLDED EXPANSION JOINT AT THE FULL WIDTH AND HEIGHT OF THE CURB.
2. FOR EACH PAVEMENT EXPANSION JOINT, THE PRE-MOLDED EXPANSION JOINT FILLER MATERIAL SHALL BE THE FULL WIDTH AND HEIGHT OF THE CURB.



4" X 12" CURB
SCALE: 1" = 1'-0"



6" COMBINED CURB AND GUTTER
SCALE: 1" = 1'-0"

NO.	REVISIONS	DATE	NAME

HARRIS COUNTY ENGINEERING DEPARTMENT

FOR INTERIM REVIEW ONLY

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ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: CONCRETE PAVEMENT DETAILS

CIVIL STANDARD: CP-13

DRAWN BY: JDZ

PRECINCT 1 & 3 (2 OF 3)

DATE: 10/10/23

CK'D BY: PDG

SCALE: AS NOTED

SHEET NO: 2

NO.	DATE	REVISION	APP.

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PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

SURVEYED BY:
KUO & ASSOCIATES, LLC
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TEXAS REG. NO.: 111684
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TX FIRM NO. F-4578

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

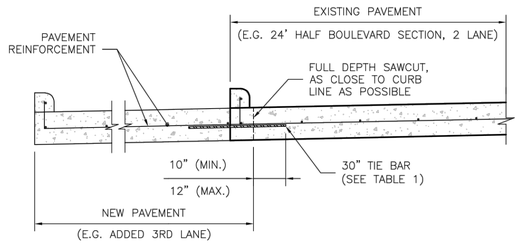
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

HARRIS COUNTY CONCRETE PAVEMENT DETAIL SHEET 2 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
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N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 143 OF 204	

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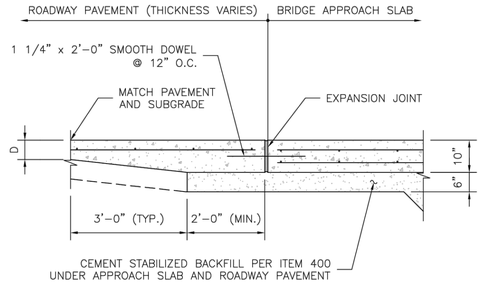


TYPICAL CONCRETE ROADWAY WIDENING DETAIL

SCALE: 1" = 1'–0"

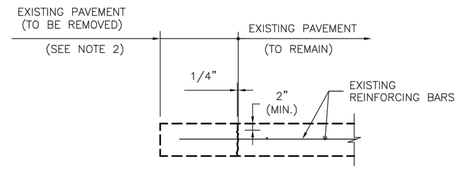
TABLE 1
(CONSTRUCTION JOINT TIE BARS)

TIE BAR SIZE	PAVEMENT DEPTH
#5 BAR	7" AND LESS
#6 BAR	GREATER THAN 7"
TIE BAR SHALL BE DRILLED INTO EXISTING PAVEMENT (MIN. 10", MAX. 12") AND EPOXIED. (SEE ITEM 361)	

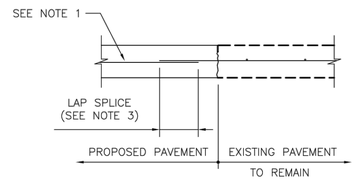


TYPICAL SECTION PAVING TIE–IN TO BRIDGE APPROACH SLAB

SCALE: 1" = 1'–6"



STEP 1 DEMOLITION OF EXISTING PAVEMENT



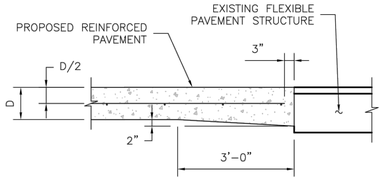
STEP 2 CONSTRUCTION OF NEW PAVEMENT

CONCRETE TO CONCRETE STANDARD PAVEMENT TIE–IN

SCALE: 1" = 1'–6"

NOTES FOR STANDARD PAVEMENT TIE–IN:

1. REINFORCING CENTERED IN PROPOSED PAVEMENT, 3" CLEAR AT EDGES.
2. SAWCUT 2" DEEP MINIMUM AND REMOVE 2'–0" EXISTING PAVEMENT OR PAVEMENT WITH CURB. EXPOSE AND CLEAN EXISTING REINFORCING.
3. 24 BAR DIAMETER LAP SPLICE OR WELD, IF DIRECTED.
4. IF NO EXPOSED REINFORCING STEEL EXISTS, HORIZONTAL TIE BARS SHALL BE GRADE 60, 30" LONG DRILLED AND EMBEDDED 15" INTO THE CENTER OF THE EXISTING CONCRETE SLAB WITH EPOXY OR APPROVED EQUAL. SIZE OF TIE BARS SHALL CONFORM TO TO TABLE 1. TIE BARS SHALL BE PLACED 24" CENTER TO CENTER.
5. ALTERNATIVELY, THE CONTRACTOR MAY CHOOSE TO USE FULL DEPTH SAWCUT WITH DRILLED IN TIE BARS (AS SHOWN IN THE "TYPICAL CONCRETE ROADWAY WIDENING DETAIL" ON THIS SHEET. IF THE CONTRACTOR SO CHOOSES, THE SAWCUTTING AND TIE BARS WILL BE AT HIS OWN EXPENSE (THESE ITEMS WILL ONLY BE PAID FOR IF HARRIS COUNTY REQUIRES THE FULL DEPTH SAWCUT AND TIE BARS).

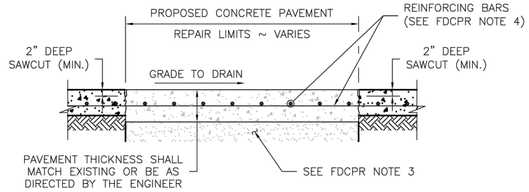


TYPICAL PAVING HEADER

SCALE: 1" = 1'–6"

NOTES FOR PAVING HEADER:

1. ADDITIONAL CONCRETE FOR PAVING HEADER SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAVING BID ITEMS.
2. DISTURBED MATERIAL IN THE FLEXIBLE PAVEMENT WILL BE BACKFILLED WITH ASPHALT CONCRETE PAVEMENT (ACP). THE ACP WILL BE CONSIDERED INCIDENTAL TO VARIOUS PAVING BID ITEMS.



FULL DEPTH CONCRETE PAVEMENT REPAIR

HORIZONTAL SCALE: 1" = 3'–0"
VERTICAL SCALE: 1" = 1'–6"

FULL DEPTH CONCRETE PAVEMENT REPAIR (FDCPR) NOTES:

1. SAWCUT LIMITS SHALL BE AS DIRECTED BY ENGINEER.
2. EXISTING CONCRETE VERTICAL FACES SHALL BE CLEANED OF ALL DELETERIOUS LOOSE MATERIAL PRIOR TO CONCRETE PLACEMENT.
3. FOR REPAIR/REPLACE AREAS, A 6 INCH DEPTH BASE SHALL BE REMOVED AND REPLACED WITH CEMENT STABILIZED BEDDING AND BACKFILL PER ITEM 400.
4. REINFORCEMENT FOR PAVEMENT 7" THICK AND LESS SHALL BE NO. 4 BARS AT 18" SPACING IN EACH DIRECTION. REINFORCEMENT FOR PAVEMENT GREATER THAN 7" THICK SHALL BE NO. 5 BARS AT 18" IN EACH DIRECTION.
5. ALTERNATIVELY, THE CONTRACTOR MAY CHOOSE TO USE FULL DEPTH SAWCUT WITH DRILLED IN TIE BARS (AS SHOWN ON THE "TYPICAL CONCRETE ROADWAY WIDENING DETAIL" DRAWING). IF THE CONTRACTOR SO CHOOSES, THE SAWCUTTING AND TIE BARS WILL BE AT HIS OWN EXPENSE (THESE ITEMS WILL ONLY BE PAID FOR IF HARRIS COUNTY REQUIRES THE FULL DEPTH SAWCUT AND TIE BARS).

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

HARRIS COUNTY ENGINEERING DEPARTMENT

FOR INTERIM REVIEW ONLY

DOCUMENT INCOMPLETE: NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES

ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: CONCRETE PAVEMENT DETAILS

CIVIL STANDARD: CP–13

DRAWN BY: JDZ | CK'D BY: PDG | PRECINCT 1 & 3 (3 OF 3) | SCALE: AS NOTED | DATE: 10/10/23 | SHEET NO: /

NO.	DATE	REVISION	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

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

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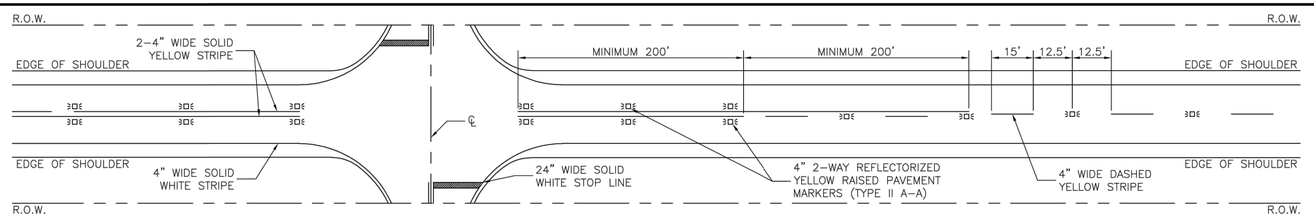
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

HARRIS COUNTY CONCRETE PAVEMENT DETAIL SHEET 3 OF 3

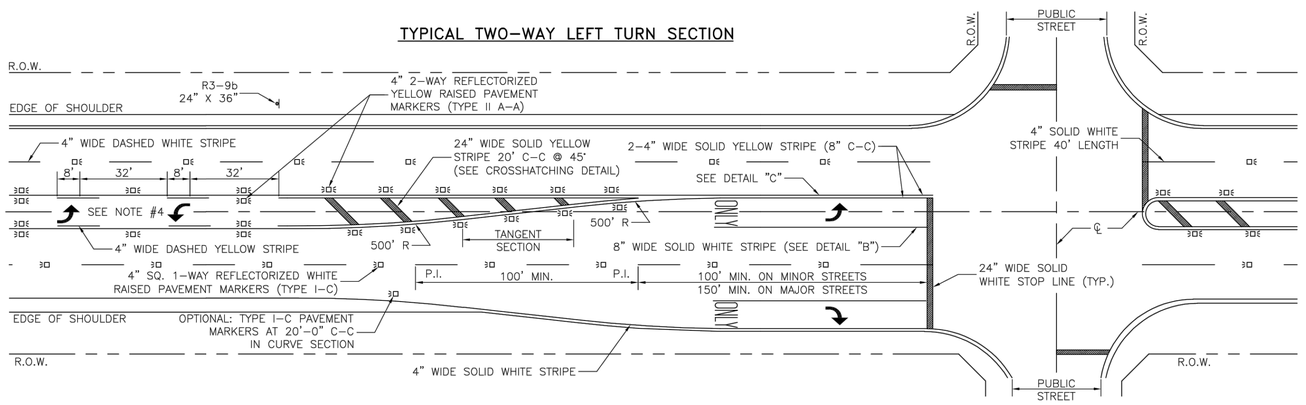
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **144** OF 204	

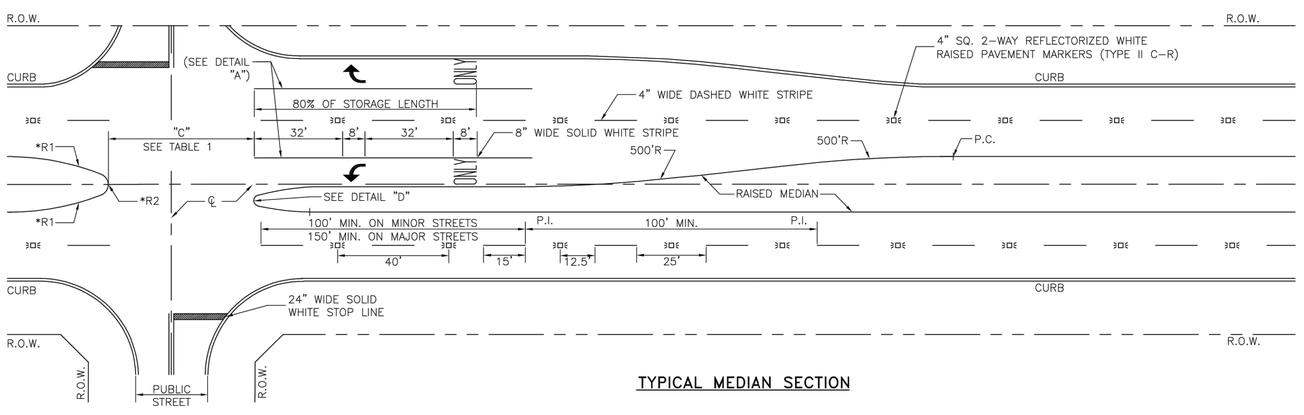
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TYPICAL TWO LANE TWO–WAY ROAD



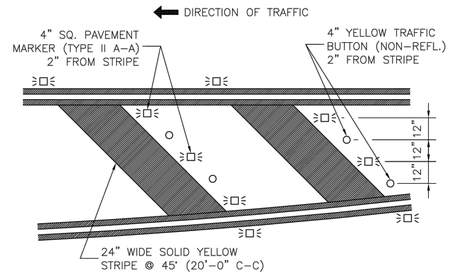


TYPICAL MEDIAN SECTION

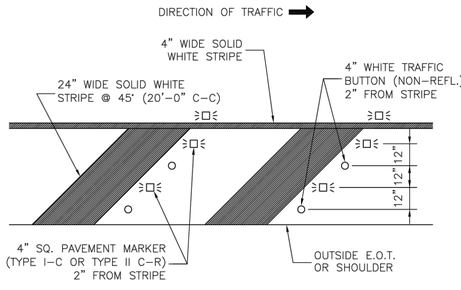
NOTES:

1. ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
2. ALL TRAFFIC BUTTONS AND MARKERS SHALL BE INSTALLED ADJACENT TO STRIPES (APPROXIMATELY 2").
3. LEFT TURN STORAGE BAYS SHALL BE A MIN. OF 100' ON MINOR STREETS AND A MIN. 150' ON MAJOR STREETS.
4. REPEAT ARROWS AT APPROXIMATELY 1000' INTERVALS WITHIN TWO–WAY LEFT TURN SECTION.
5. WHEN PAVEMENT MARKINGS EXTEND INTO OR CONTINUE THROUGH AN INTERSECTION AREA, THEY SHALL BE THE SAME COLOR AND AT LEAST THE SAME WIDTH AS THE LINE MARKINGS THEY EXTEND.
6. WHEN CROSSWALK MARKINGS ARE USED WITHIN AN ESTABLISHED SCHOOL ZONE AREA, CONTINENTAL TYPE MARKINGS SHALL BE USED.
7. ADDITIONAL SET OF "WORD" AND "ARROW" PAVEMENT MARKINGS SHALL BE USED WHEN TURN LANE STORAGE LENGTH IS 160 FEET OR GREATER.

CROSSHATCHING DETAIL



OUTSIDE EDGE CROSSHATCHING DETAIL



NO.	REVISIONS	DATE	NAME

HARRIS COUNTY ENGINEERING DEPARTMENT

FOR INTERIM REVIEW ONLY

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ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: PAVEMENT MARKING DETAILS (1 OF 2)

TRAFFIC STANDARD: PM

DRAWN BY: JDZ

DATE: 12/14/17

CK'D BY: BSH

SCALE: NONE

SHEET NO:

NO.	DATE	REVISION	APP.

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PHONE: 713–975–8769
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TX SURVEY FIRM NO.: 10075600

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TEXAS REG. NO.: 111684

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LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

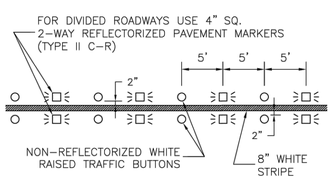
HARRIS COUNTY STANDARD PAVEMENT MARKING DETAIL SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 145 OF 204	

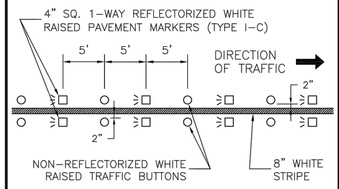
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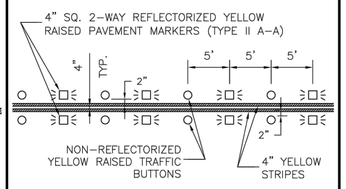
DETAIL "A"
(FOR DIVIDED ROADWAYS)



DETAIL "B"
(FOR UNDIVIDED ROADWAYS)

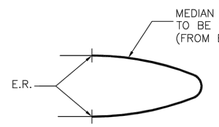


DETAIL "C"

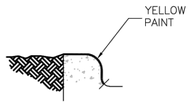


DETAIL "D"

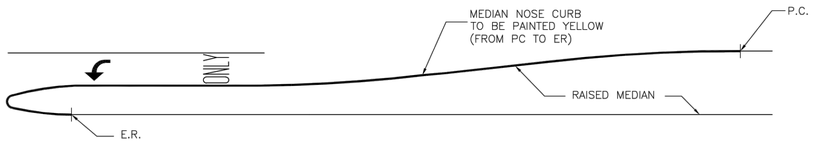
* PAINT FROM THE BACK OF CURB TO THE GUTTER LINE



TYPICAL MEDIAN NOSE



TYPICAL CURB SECTION



RAISED MEDIAN WITH TURN BAY

PAVEMENT MARKER LEGEND

SYMBOL	DESCRIPTION
≥□≤	4" x 4" REFLECTORIZED RAISED PAVEMENT MARKER
□≤	INDICATED DIRECTION OF TRAFFIC FLOW
○	NON-REFLECTIVE 4" DIA. RAISED TRAFFIC BUTTON

RADIUS DIMENSIONS

MEDIAN	*R1	*R2
≤10'	N/A	W/2
>10' ≤40'	90'	W/5
>40'	N/A	N/A

TABLE 1
TYPICAL MEDIAN OPENING "C"

MEDIAN INTERRUPTION	(1) NO LTB	(1) 1 LTB	(1) 2 LTB
PRIVATE DRIVE	45'	52.5'	60'
UNDIVIDED STREET <40'	45'	52.5' (2)	60'
44'	50'	55' (2)	60'
DIVIDED STREET	D+22'	D+22'	D+22'

NOTES:

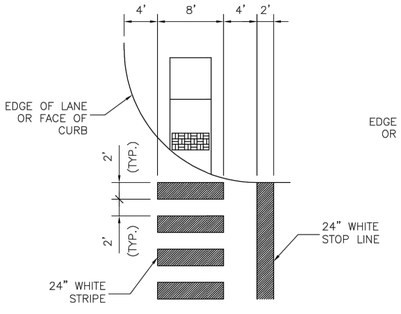
(1) LTB = LEFT TURN BAY

(2) DISTANCE FROM CENTERLINE OF OPENING TO MEDIAN NOSE WITH LEFT TURN LANE IS 30' FOR RIGHT ANGLE INTERSECTIONS, FOR INTERSECTIONS OTHER THAN 90°, APPLY DESIGN VEHICLE TURNING TEMPLATE TO DETERMINE DIMENSION TO MEDIAN NOSE CUT OFF.

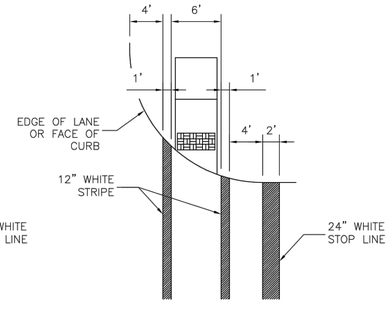
(3) D = WIDTH OF DIVIDED STREET

TYPICAL CROSSWALK PLACEMENT

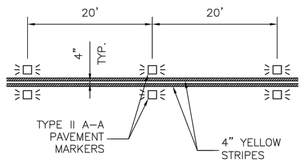
CONTINENTAL TYPE



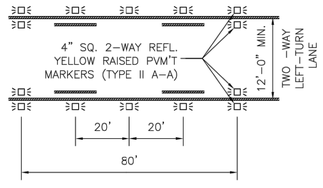
STANDARD TYPE



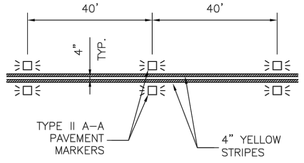
CENTER LINE DETAIL CURVE SECTION



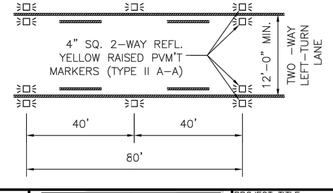
TWO-WAY LEFT TURN CURVE SECTION



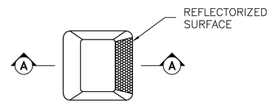
CENTER LINE DETAIL TANGENT SECTION



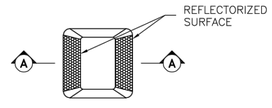
TWO-WAY LEFT TURN TANGENT SECTION



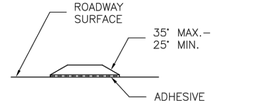
RAISED PAVEMENT MARKERS



TYPE I (TOP VIEW)



TYPE II (TOP VIEW)



SECTION A-A

NO.	REVISIONS	DATE	NAME

HARRIS COUNTY ENGINEERING DEPARTMENT

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ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: PAVEMENT MARKING DETAILS (2 OF 2)

TRAFFIC STANDARD: PM

DRAWN BY: JDZ

DATE: 12/14/17

CK'D BY: BSH

SCALE: NONE

SHEET NO: /

NO.	DATE	REVISION	APP.

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

SURVEYED BY:
KUO & ASSOCIATES, LLC
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CITY OF HOUSTON
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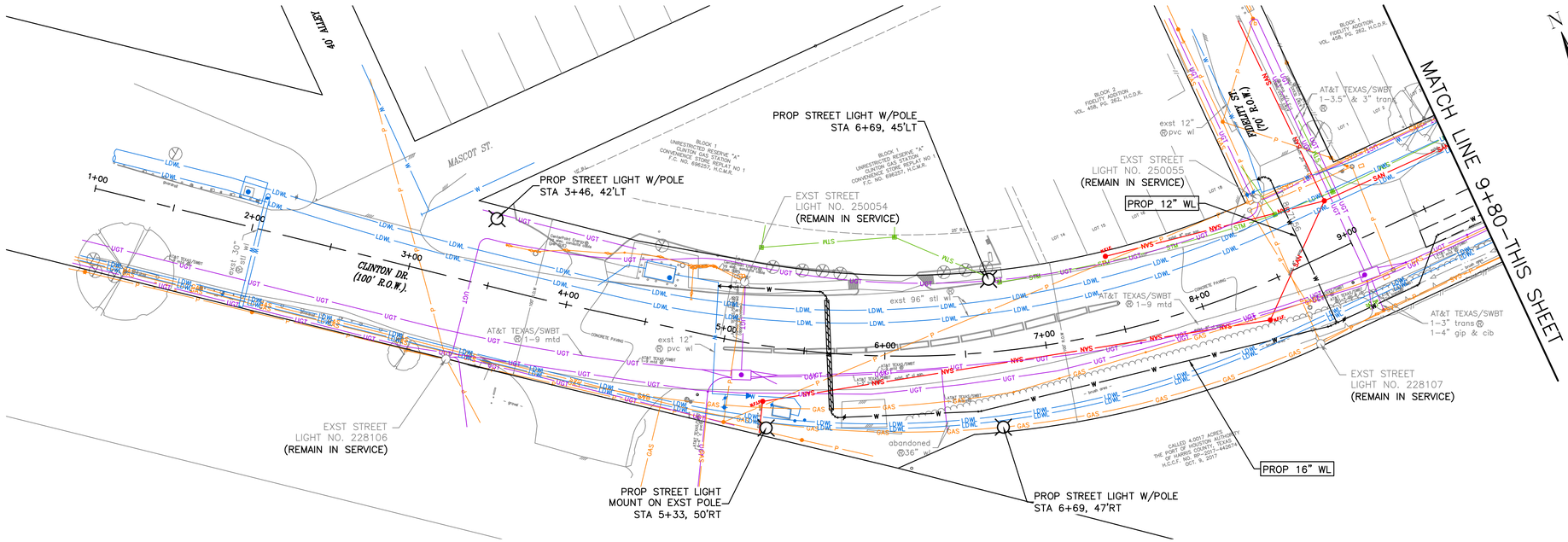
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

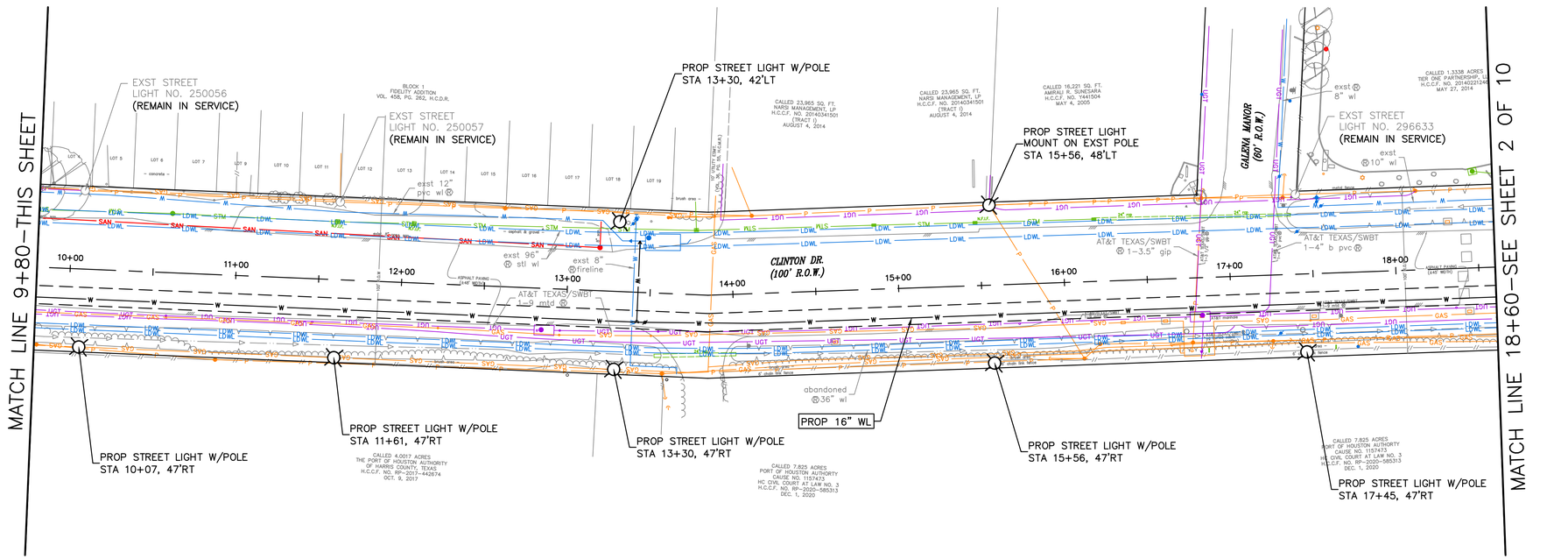
HARRIS COUNTY STANDARD PAVEMENT MARKING DETAIL SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. **146** OF 204	

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KUO & ASSOCIATES
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TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

FOR INTERIM REVIEW ONLY

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

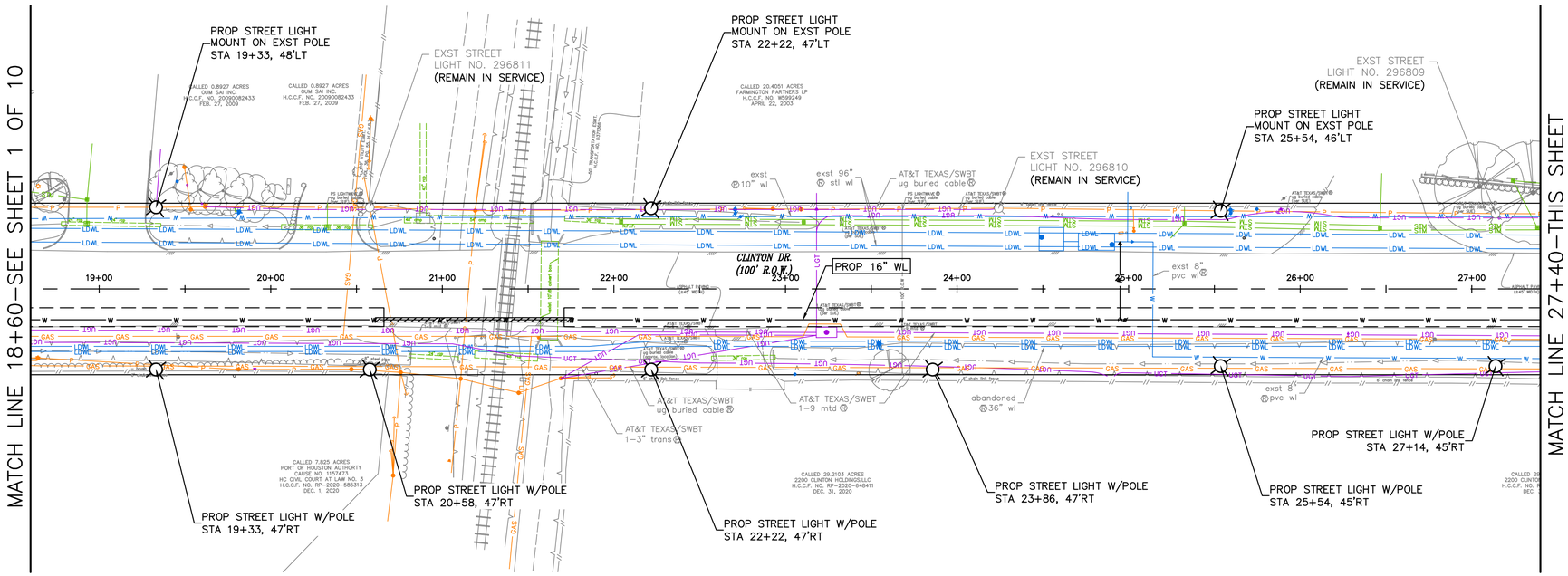
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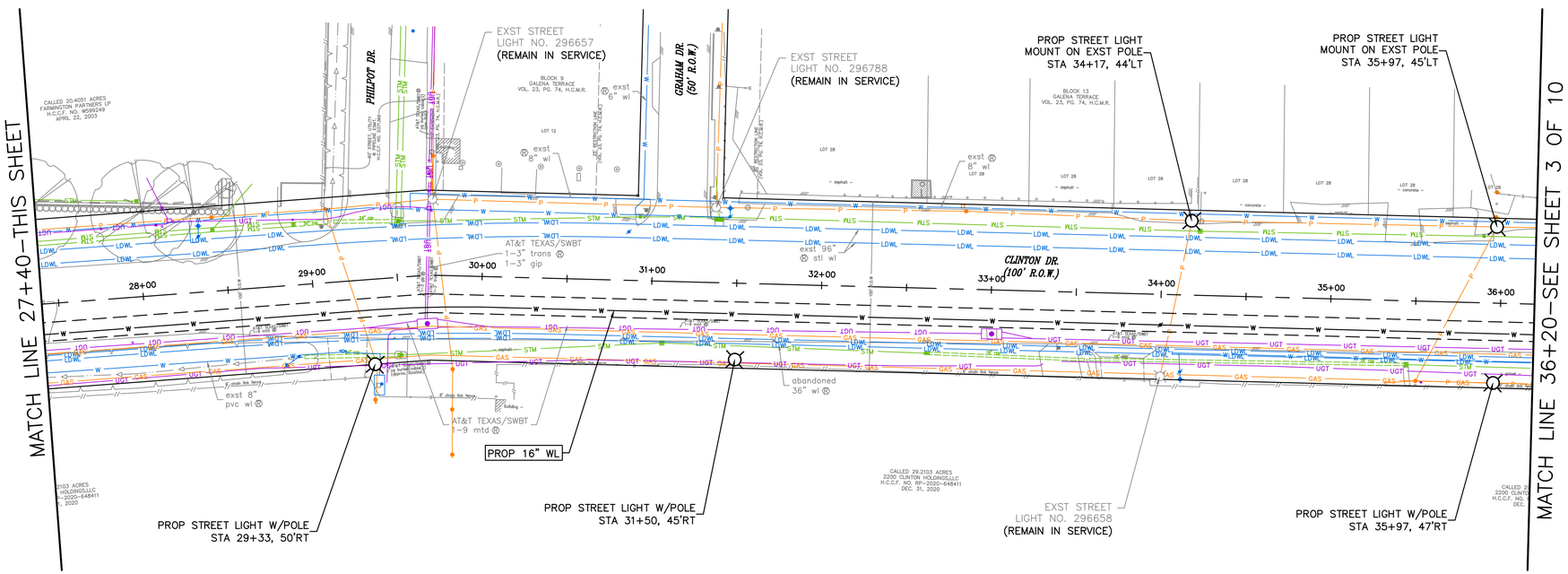
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (1 OF 10)

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S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 147 OF 204	

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NO.	DATE	REVISION	APP.

LEGEND:

- PROPOSED STREET LIGHTING INSTALL BY CENTERPOINT ENERGY
- PROPOSED PULL BOX TO BE INSTALL BY THE CONTRACTOR
- PROPOSED 2" PVC CONDUIT TO BE INSTALLED BY THE CONTRACTOR
- EXIST STREET LIGHT

NOTES:

1. CONTRACTOR TO INSTALL PVC CONDUITS, PULL BOXES AND FOUNDATION/STANDARDS PER CENTERPOINT ENERGY (CNP) SPECIFICATIONS
2. STREET LIGHT STANDARDS SHALL NORMALLY BE INSTALLED IN ROAD RIGHTS OF WAY 3 – 4 FEET BACK OF CURB.
3. CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING PULL BOXES AND WARNING TAPE FROM CNP.
4. THE INFORMATION CONTAINED HEREIN IS THE BEST AVAILABLE AS OF THE DATE OF PUBLICATION OF THESE PLANS AND SPECIFICATIONS. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT CNP TO DETERMINE IF THERE ARE ANY ADDITIONAL REQUIREMENTS ASSOCIATED WITH INTERIM LIGHTING, CONSTRUCTION PHASING, OR OTHER ISSUES WHICH MAY IMPACT THIS INSTALLATION.

KUO & ASSOCIATES ENGINEERING + SURVEYING
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ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

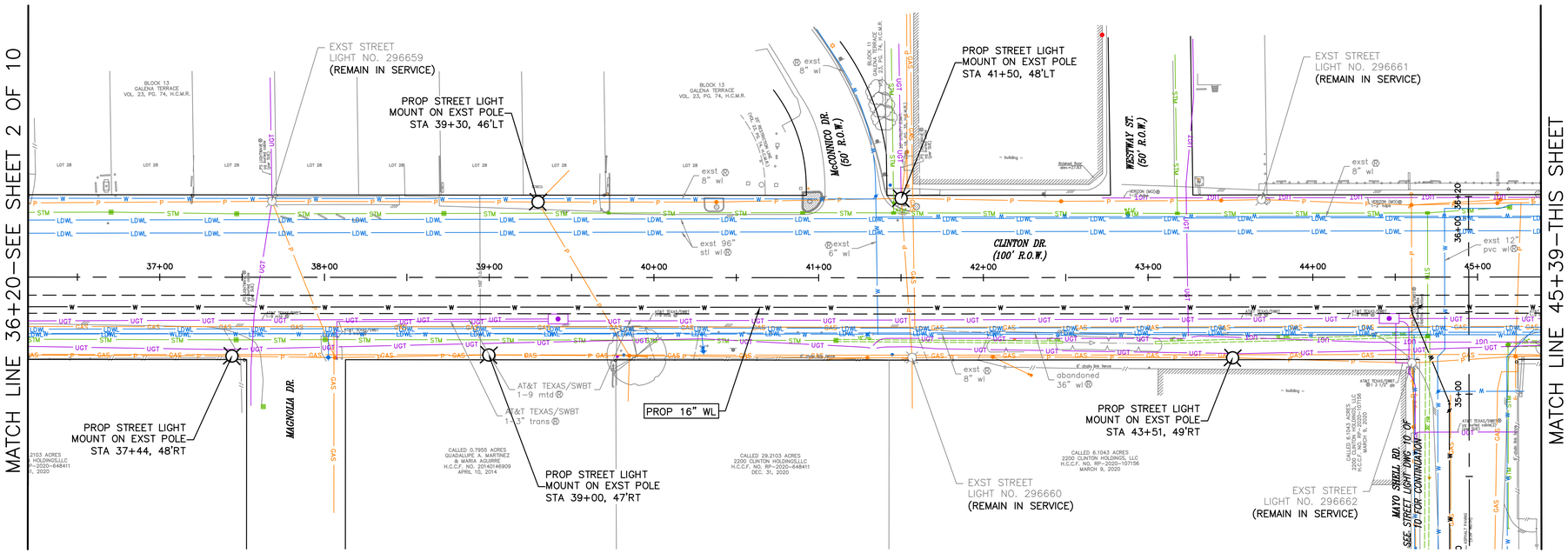
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

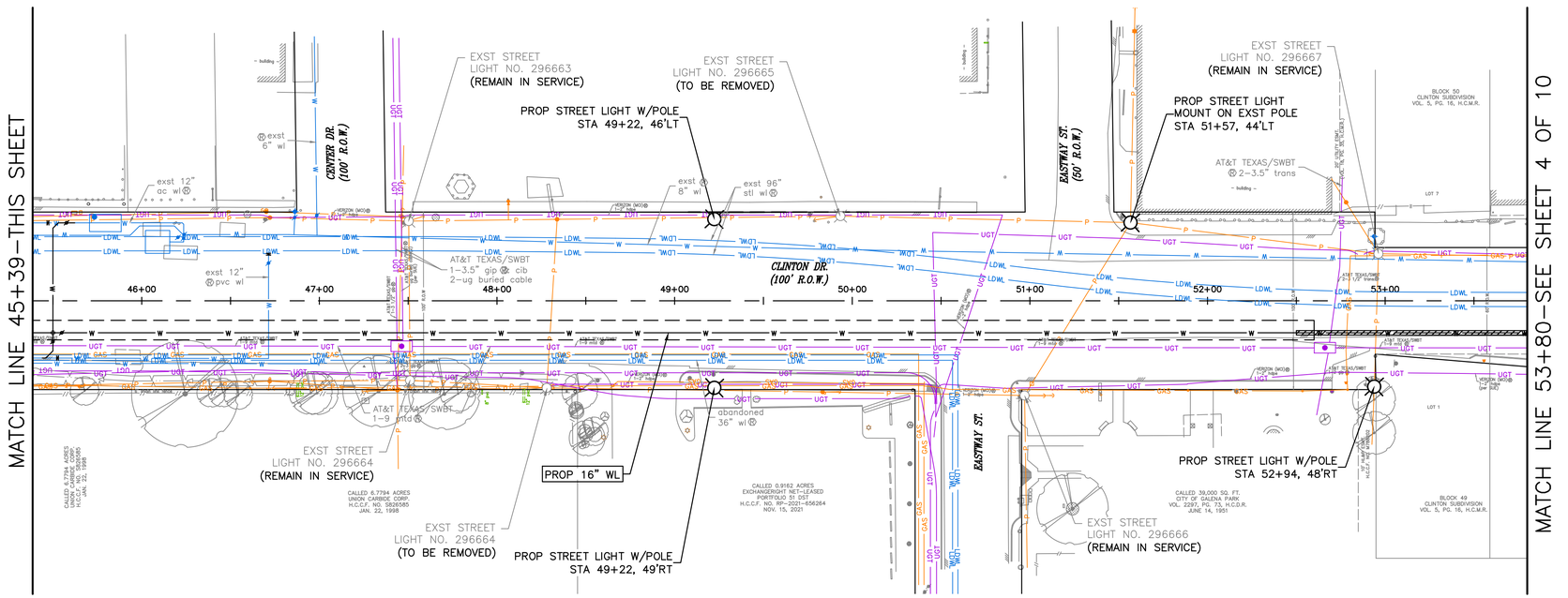
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (2 OF 10)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 148 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

N

LEGEND:

- PROPOSED STREET LIGHTING INSTALL BY CENTERPOINT ENERGY
- PROPOSED PULL BOX TO BE INSTALL BY THE CONTRACTOR
- PROPOSED 2" PVC CONDUIT TO BE INSTALLED BY THE CONTRACTOR
- EXIST STREET LIGHT

NOTES:

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NO.	DATE	REVISION	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

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832–865–4462
TBPE FIRM NO. F–21781

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

FOR INTERIM REVIEW ONLY

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

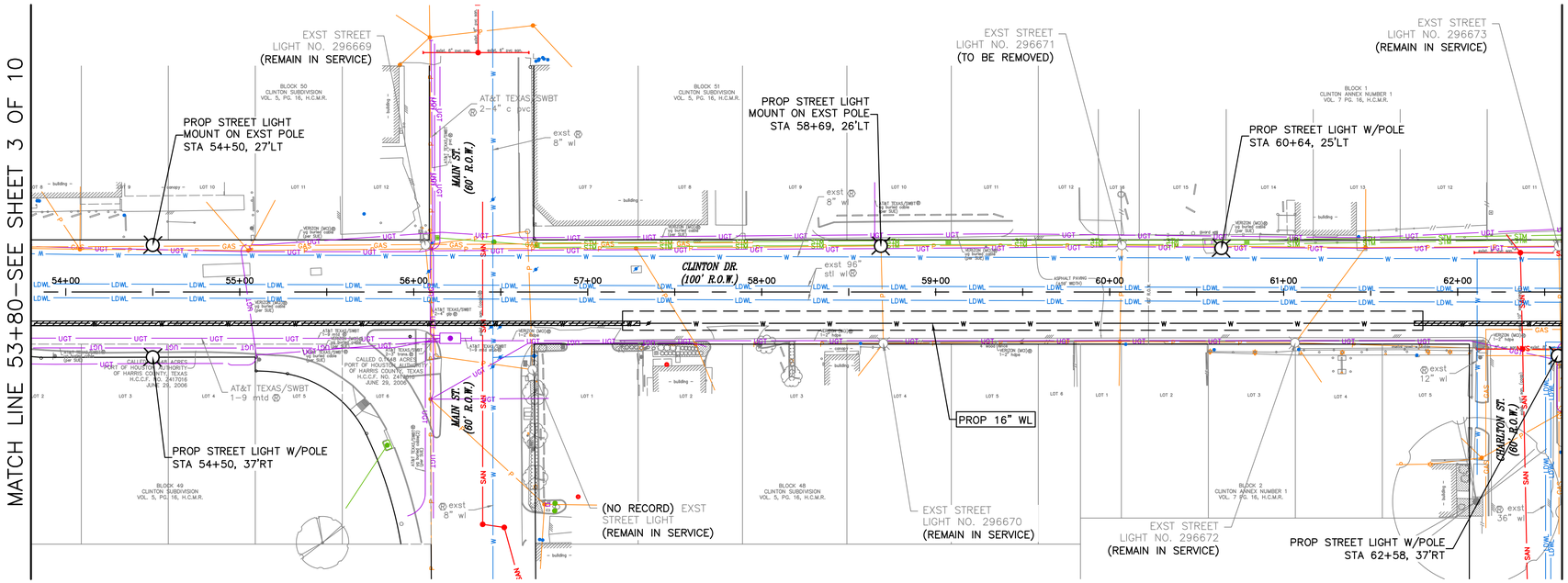
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

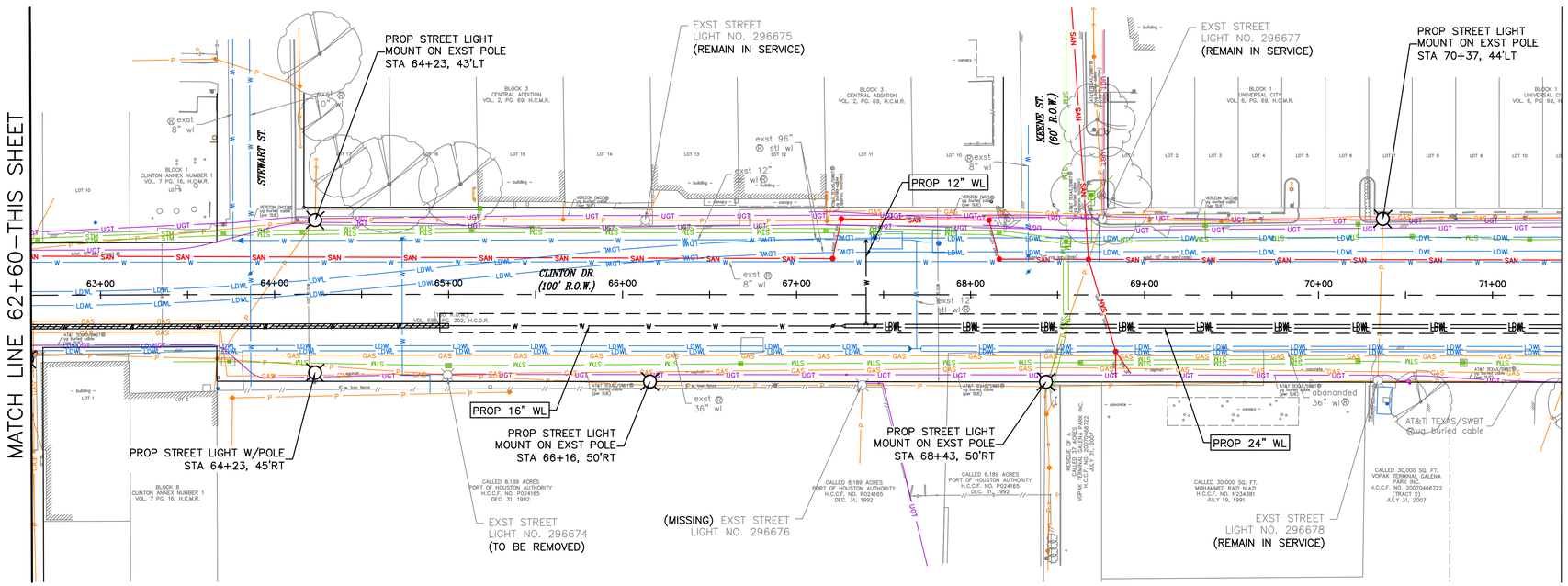
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

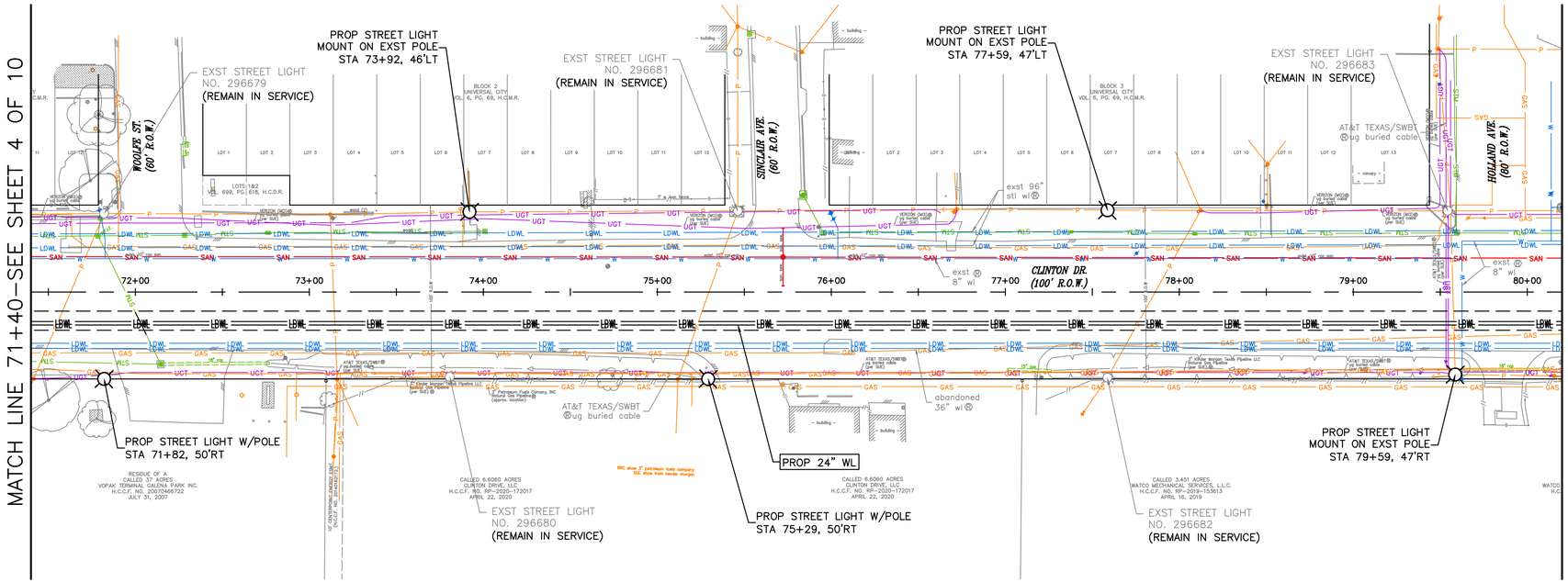
STREET LIGHTING (3 OF 10)

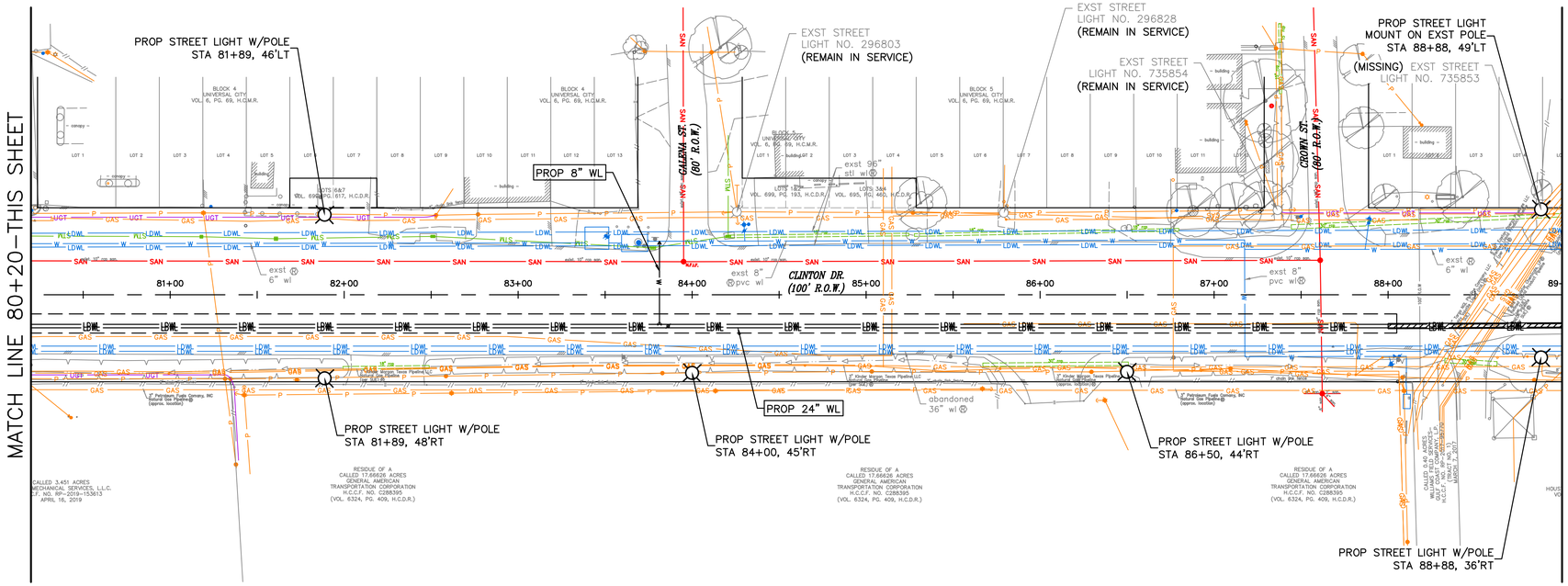
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 149 OF 204	

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MATCH LINE 62+60–THIS SHEET
MATCH LINE 71+40–SEE SHEET 5 OF 10
PROP STREET LIGHT MOUNT ON EXST POLE STA 64+23, 43'LT
PROP STREET LIGHT W/POLE STA 64+23, 45'RT
EXST STREET LIGHT NO. 296675 (REMAIN IN SERVICE)
EXST STREET LIGHT NO. 296677 (REMAIN IN SERVICE)
PROP STREET LIGHT MOUNT ON EXST POLE STA 70+37, 44'LT
STEWART ST.
KEENE ST. (60' R.O.W.)
CLINTON DR. (100' R.O.W.)
PROP 12" WL
PROP 16" WL
PROP STREET LIGHT MOUNT ON EXST POLE STA 66+16, 50'RT
PROP STREET LIGHT MOUNT ON EXST POLE STA 68+43, 50'RT
PROP 24" WL
EXST STREET LIGHT NO. 296674 (TO BE REMOVED)
(MISSING) EXST STREET LIGHT NO. 296676
EXST STREET LIGHT NO. 296678 (REMAIN IN SERVICE)
AT&T TEXAS/SWBT 2–4" c pvc
AT&T TEXAS/SWBT 1–9 mtd
AT&T TEXAS/SWBT 4–4" c pvc
AT&T TEXAS/SWBT 1–2" hdpe
AT&T TEXAS/SWBT 1–4" hdpe
AT&T TEXAS/SWBT 1–6" hdpe
AT&T TEXAS/SWBT 1–8" hdpe
AT&T TEXAS/SWBT 1–12" hdpe
AT&T TEXAS/SWBT 1–4" hdpe (for SVS)
AT&T TEXAS/SWBT 1–6" hdpe (for SVS)
AT&T TEXAS/SWBT 1–8" hdpe (for SVS)
AT&T TEXAS/SWBT 1–12" hdpe (for SVS)
AT&T TEXAS/SWBT 1–4" hdpe (for SVS)
AT&T TEXAS/SWBT 1–6" hdpe (for SVS)
AT&T TEXAS/SWBT 1–8" hdpe (for SVS)
AT&T TEXAS/SWBT 1–12" hdpe (for SVS)
AT&T TEXAS/SWBT abandoned 1–4" hdpe (for SVS)
AT&T TEXAS/SWBT abandoned 1–6" hdpe (for SVS)
AT&T TEXAS/SWBT abandoned 1–8" hdpe (for SVS)
AT&T TEXAS/SWBT abandoned 1–12" hdpe (for SVS)
AT&T TEXAS/SWBT 1–4" hdpe (for SVS)
AT&T TEXAS/SWBT 1–6" hdpe (for SVS)
AT&T TEXAS/SWBT 1–8" hdpe (for SVS)
AT&T TEXAS/SWBT





0' 20' 40' 80'

SCALE: 1"=40'

N

NO.	DATE	REVISION	APP.

LEGEND:

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TX SURVEY FIRM NO.: 10075600

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

FOR INTERIM REVIEW ONLY

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

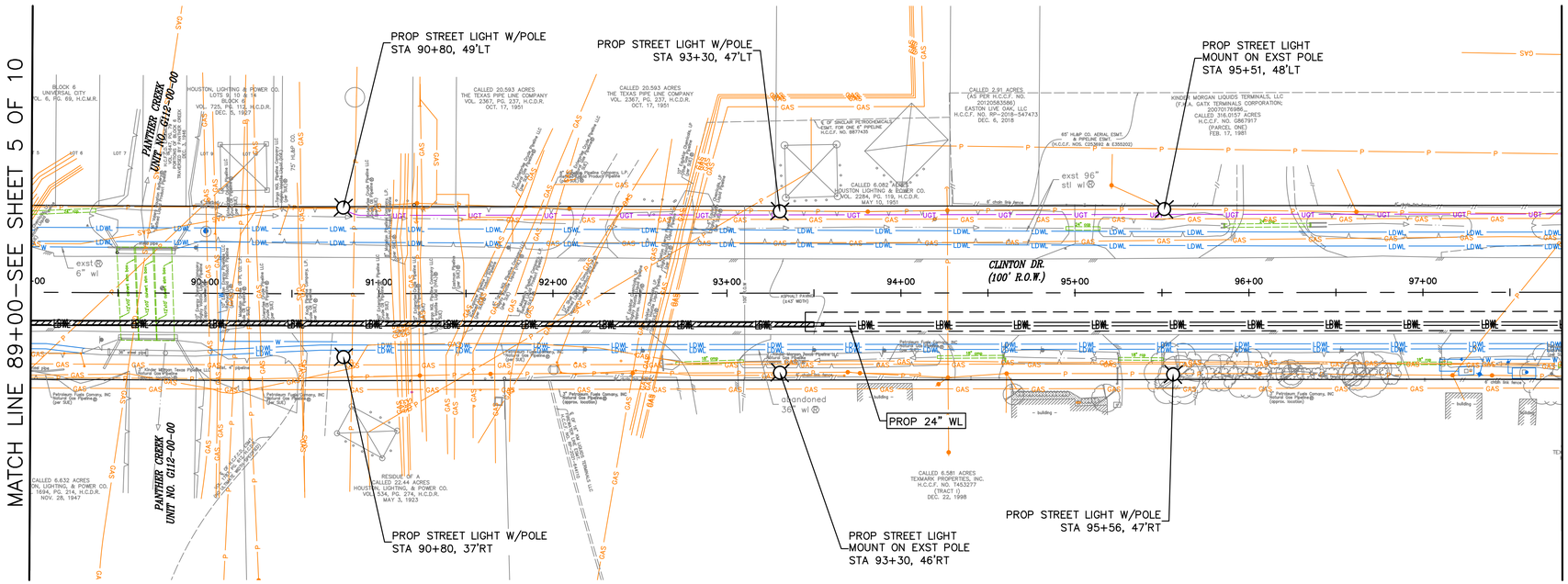
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

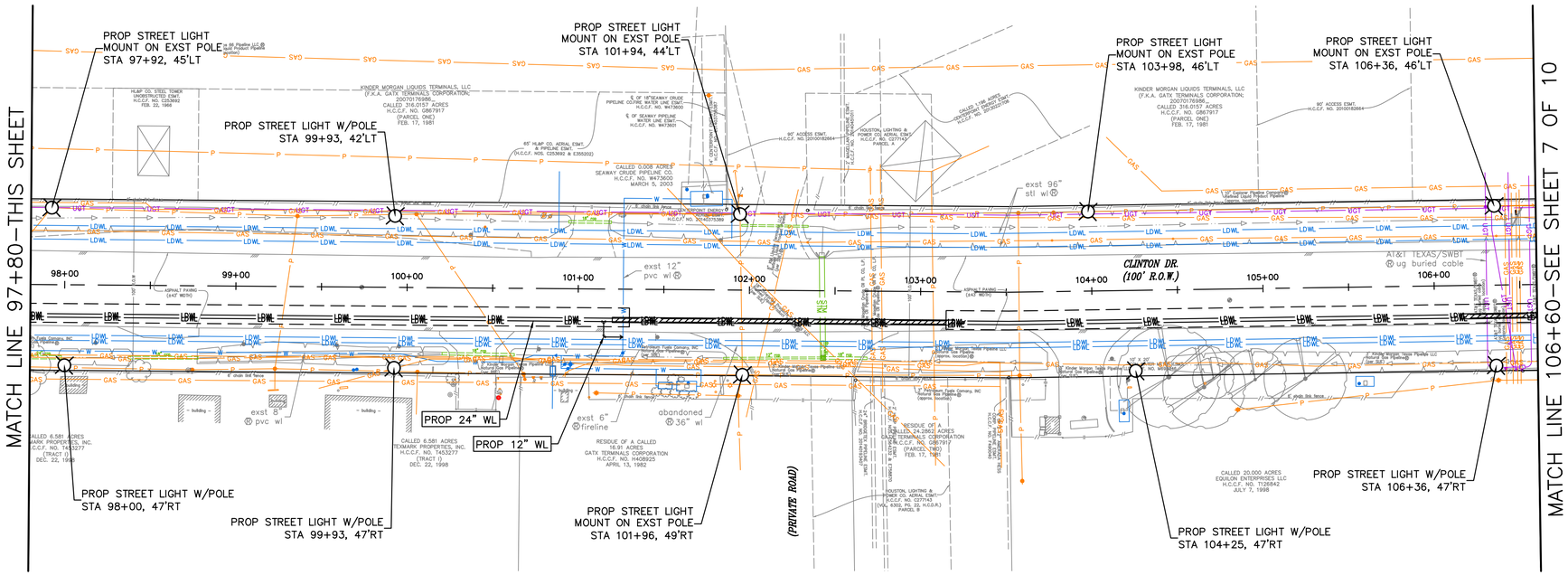
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (5 OF 10)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 151 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

N

NO.	DATE	REVISION	APP.

LEGEND:

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TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

FOR INTERIM REVIEW ONLY

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KUO & ASSOCIATES, LLC
FB NO. 000000

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

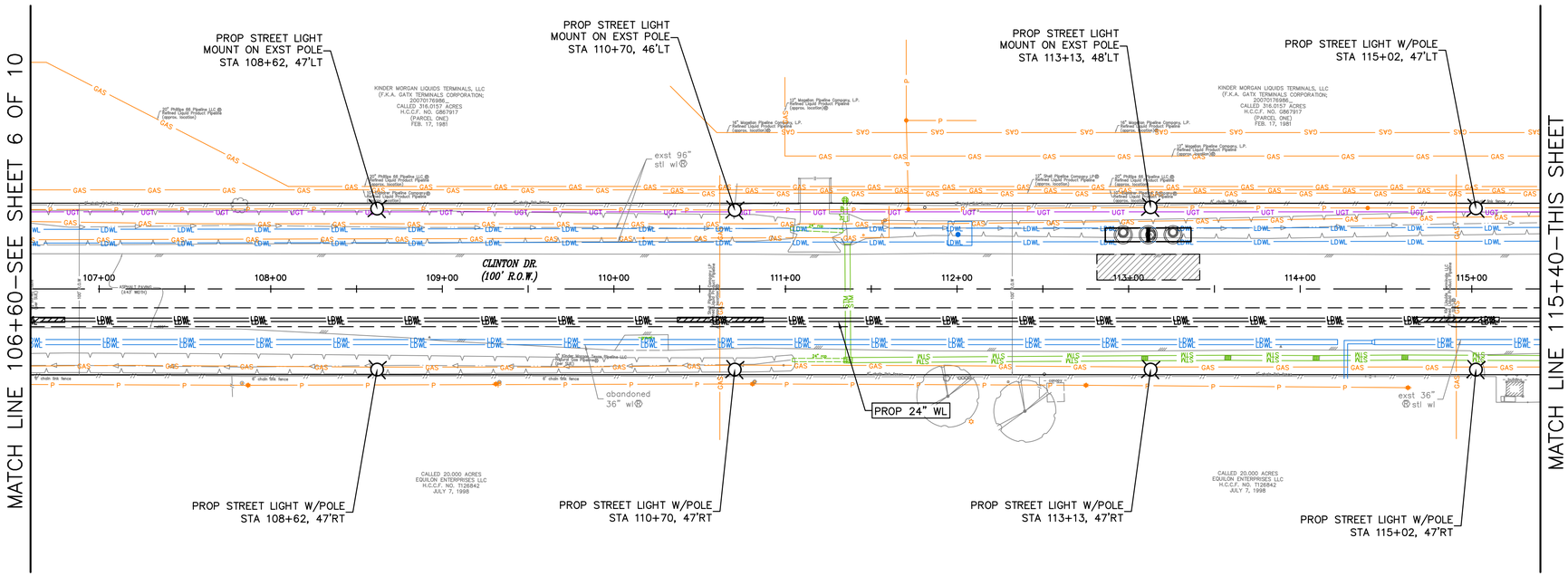
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

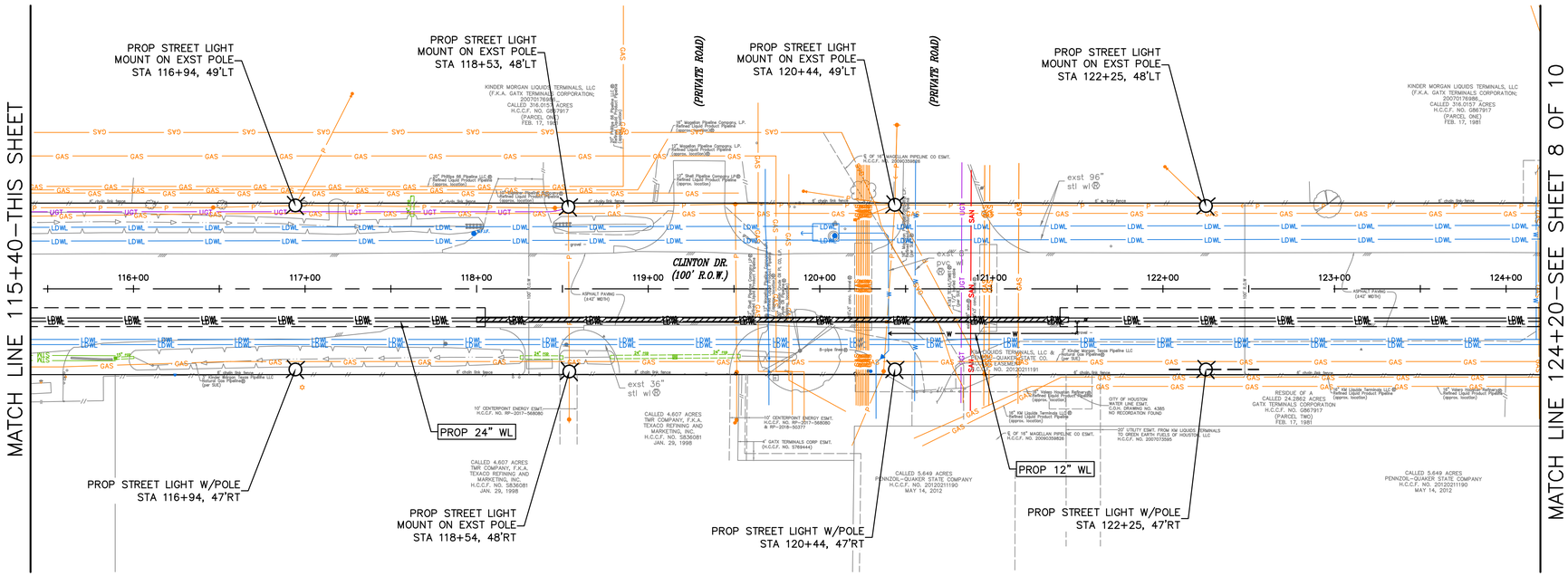
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (6 OF 10)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 152 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

N

NO.	DATE	REVISION	APP.

LEGEND:

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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

FOR INTERIM REVIEW ONLY

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

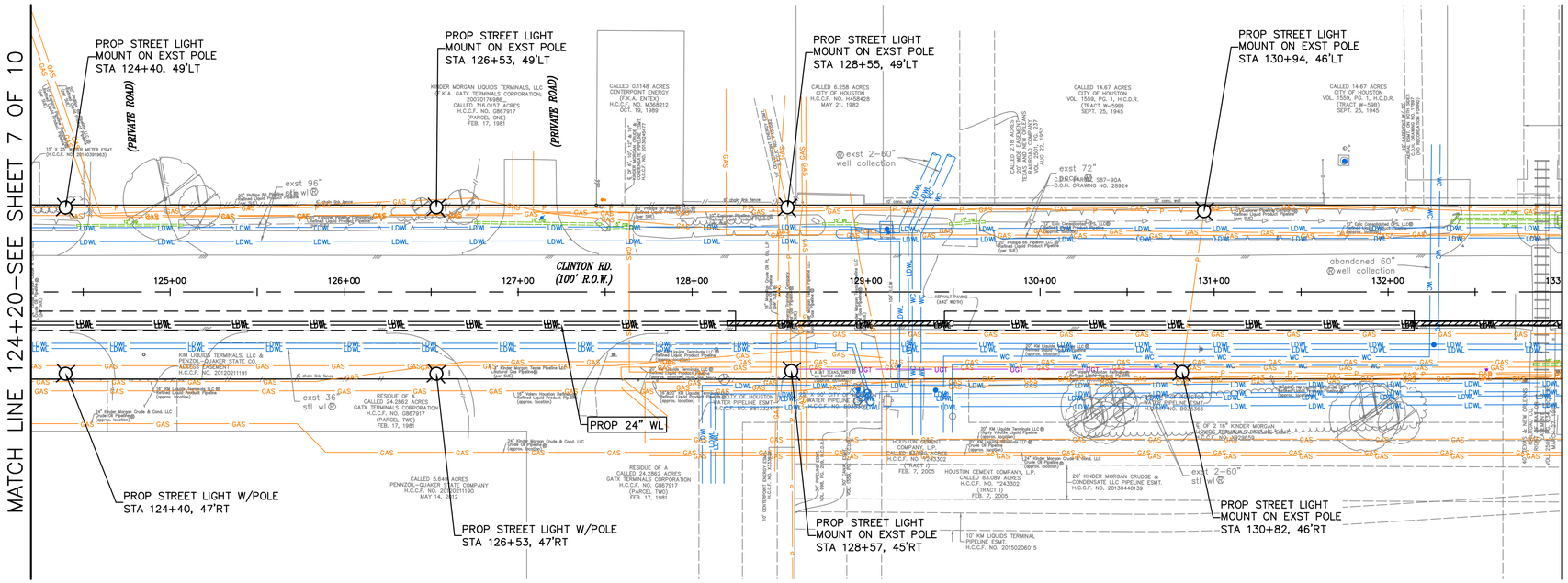
CITY OF HOUSTON
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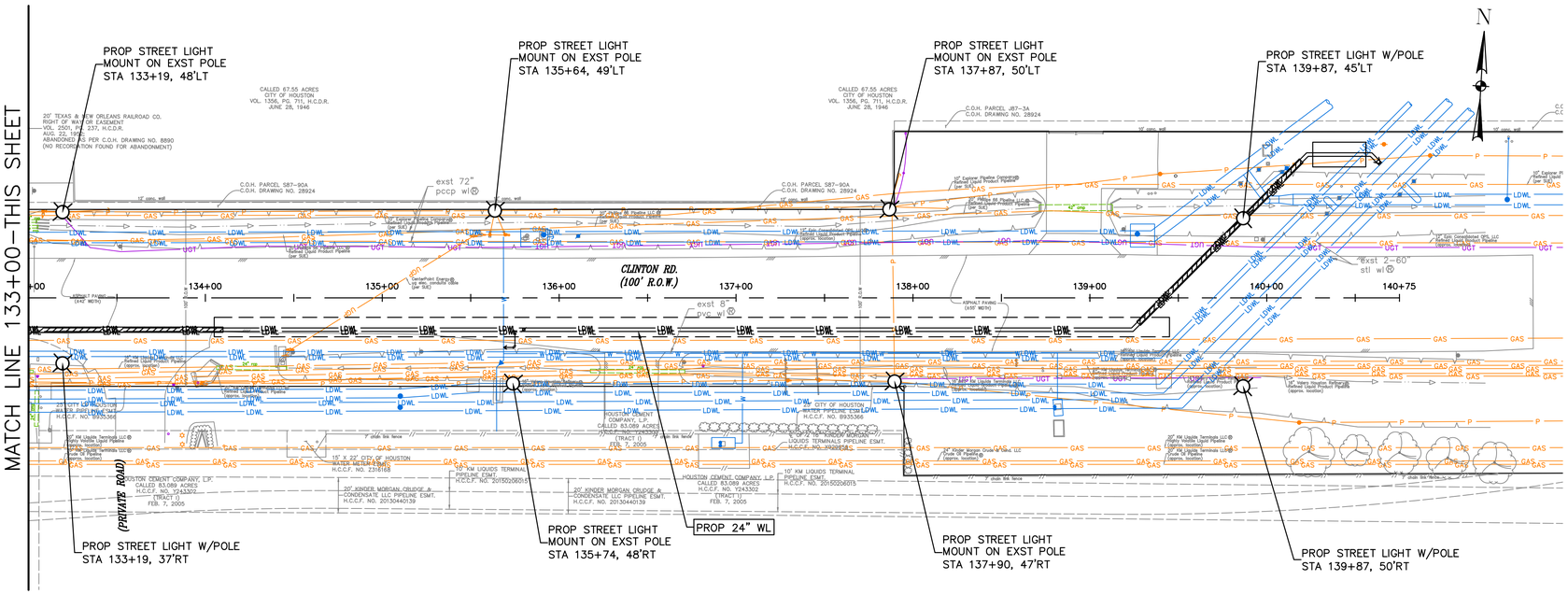
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (7 OF 10)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 153 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

N

NO.	DATE	REVISION	APP.

LEGEND:

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P.E. LICENSE No. 88614
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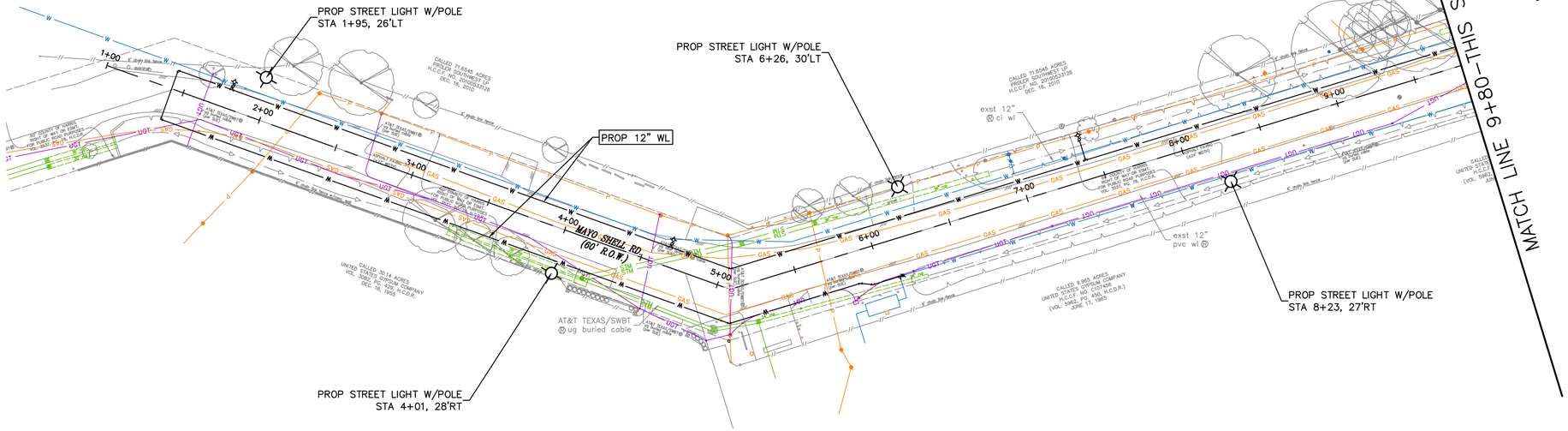
CITY OF HOUSTON
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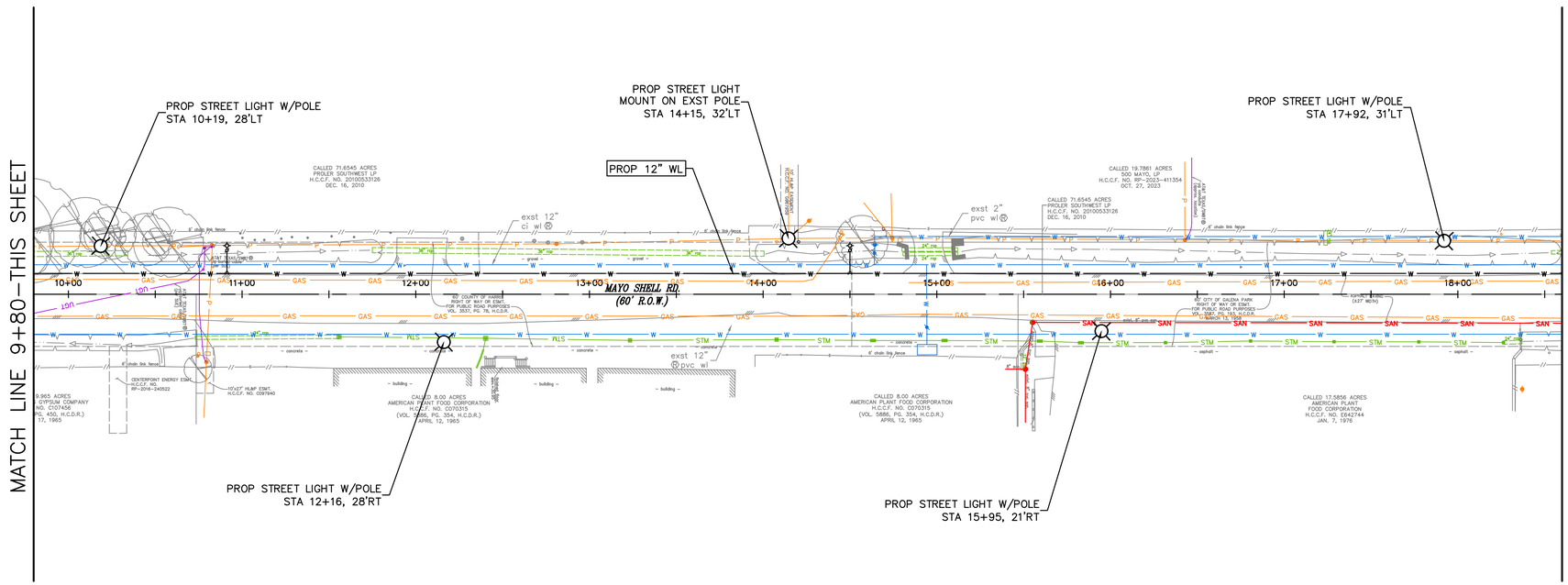
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (8 OF 10)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 154 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

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FB NO. 000000

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

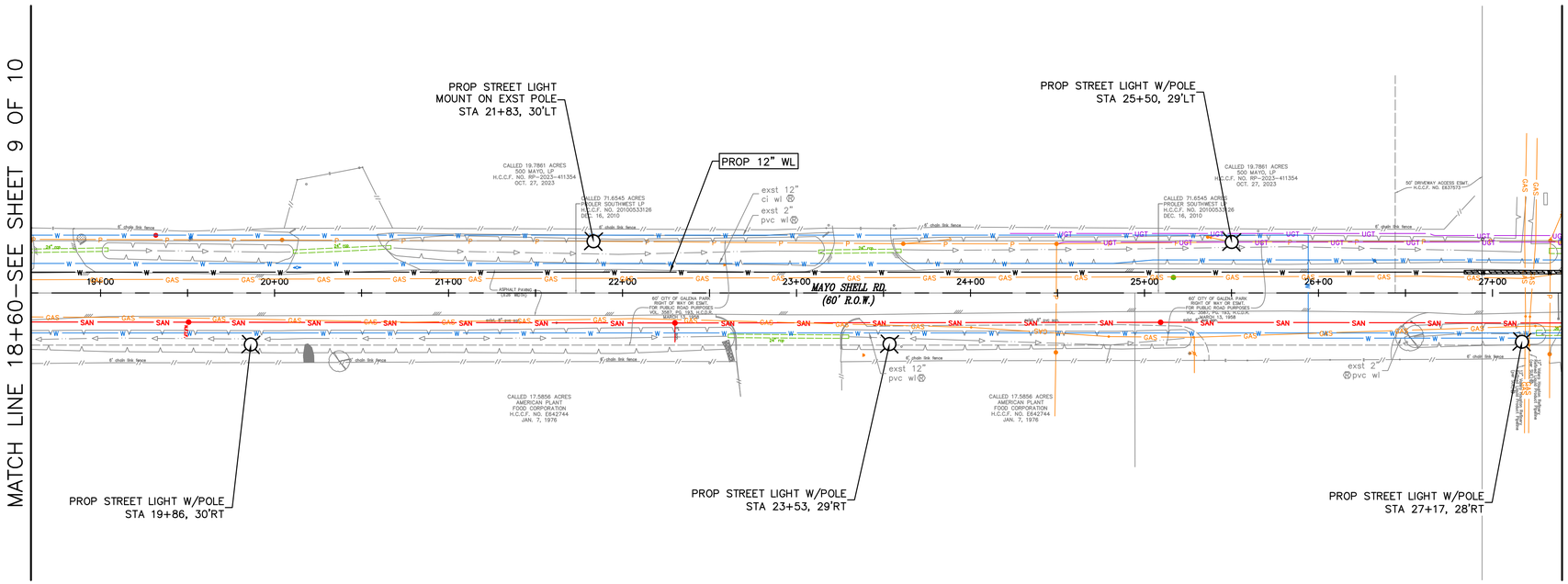
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (9 OF 10)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 155 OF 204	

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ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STREET LIGHTING (10 OF 10)

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CITY OF HOUSTON PM	
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SHEET NO. 156 OF 204	

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TRAFFIC CONTROL NOTES

1. THE TRAFFIC CONTROL SIGNS, DEVICES, AND BARRICADES ON THESE DRAWINGS CONSTITUTE MINIMUM REQUIREMENTS AND ARE NOT INTENDED TO COVER SPECIAL CIRCUMSTANCES OR OTHER CONDITIONS THAT MAY ARISE DUE TO UNFORESEEN FIELD CONDITIONS. THE CONTRACTOR SHALL PLACE AND MAINTAIN SUFFICIENT ADDITIONAL SIGNS, BARRICADES, AND WARNING DEVICES TO WARN THE PUBLIC AND PROVIDE FOR THE SAFE MOVEMENT OF TRAFFIC AND THE CONSTRUCTION ZONE SAFETY. WHERE PROJECT REQUIREMENTS ARE NOT FULLY SATISFIED BY THE STANDARDS SHOWN HEREON "THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL GOVERN.
2. CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE MOST RECENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND APPROVED TRAFFIC CONTROL PLAN.
3. BARRICADES, SIGNS, CHANNELIZING DEVICES, AND TRAFFIC HANDLING DEVICES AS SHOWN SHALL BE ADJUSTED TO FIT FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
4. ALL TEMPORARY SIGNS AND PAVEMENT MARKINGS INSTALLED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TEXAS M.U.T.C.D., UNLESS SPECIFICALLY DIRECTED BY THE TRAFFIC ENGINEER OR SPECIFIED ON THESE PLANS.
5. CONTRACTOR SHALL PROVIDE ACCESS TO ALL BUSINESSES AND RESIDENCES ALONG THIS PROJECT AT ALL TIMES DURING CONSTRUCTION UNLESS OTHERWISE AUTHORIZED SPECIFICALLY BY THE ENGINEER.
6. ALL EXISTING STOP SIGNS, STREET NAME SIGNS, AND WARNING SIGNS SHALL BE MAINTAINED IN PLACE DURING THE ENTIRE PERIOD OF CONSTRUCTION BY THE CONTRACTOR. SIGNS IN CONFLICT WITH TRAFFIC CONTROL SIGNS SHALL BE COVERED.
7. NO WORK WILL BE PERFORMED IN THE ACTIVE TRAVELED LANES INCLUDING LOADING AND UNLOADING OF TRUCKS.
8. THE ENGINEER MAY DIRECT THE CONTRACTOR TO FURNISH ADDITIONAL SIGNS, BARRICADES, AND CHANNELIZING DEVICES AS REQUIRED TO MAINTAIN TRAFFIC AND CONSTRUCTION ZONE SAFETY DURING CONSTRUCTION. ANY SUCH ADDITIONAL SIGNS, BARRICADES, ETC. SHALL BE CONSIDERED A PART OF THE LUMP SUM PAY ITEM.
9. WHEN DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PROVIDE FLAGGERS TO DIRECT TRAFFIC. FLAGGERS SHALL BE OFF-DUTY UNIFORMED POLICE OFFICERS AND SHALL BE PAID FOR BY THE CONTRACTOR. THIS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY OR TAKING OTHER STEPS AND PROVIDING OTHER PERSONNEL WHICH THE CONTRACTOR MAY DEEM NECESSARY FOR PROTECTION OF WORK AND THE PUBLIC.
10. WHEN USING MORE THAN ONE FLAGGER, THE FLAGMEN SHALL BE USE TWO WAY RADIOS CONTACT AT ALL TIMES.
11. CONTRACTOR SHALL ENSURE THAT ALL BARRICADES, SIGNS, CHANNELIZING DEVICES, WARNING LIGHTS, AND TRAFFIC HANDLING DEVICES ARE MAINTAINED IN A CLEAN FUNCTIONAL CONDITION AT ALL TIMES.
12. ALL SIGNS, WARNING DEVICES, AND BARRICADES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR, INCLUDING ACTS OF VANDALISM OR ACCIDENT.
13. ALL CONSTRUCTION SIGNS MOUNTED ON BARRICADES SHALL BE EQUIPPED WITH TYPE "A" WARNING LIGHTS (TWO PER STRUCTURE).
14. PORTABLE SIGNS MAY BE PROVIDED BETWEEN LOCATIONS AS REQUIRED FOR CONSTRUCTION. THESE HAVE TO BE APPROVED BY THE TRAFFIC ENGINEER.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL TEMPORARY AND EXISTING PAVEMENT MARKINGS IN A GOOD VISIBLE CONDITION THROUGHOUT THE LENGTH OF THE PROJECT.
16. THE CONTRACTOR SHALL SEQUENCE THE CONSTRUCTION IN SUCH A MANNER THAT NO ADJACENT CROSS STREETS AND MEDIAN OPENINGS ARE CLOSED AT SAME TIME UNLESS SPECIFIED ON THESE PLANS.
17. THE CONTRACTOR SHALL MAINTAIN BARRICADES AND SAFETY FENCES AT EACH SITE WHERE PEDESTRIAN TRAFFIC IS EVIDENT.
18. THE CONSTRUCTION SIGNS, WARNING DEVICES, AND BARRICADES SHALL REMAIN IN PLACE UNTIL THEIR REMOVAL IS DIRECTED BY THESE PLANS OR BY THE ENGINEER.
19. THE CONTRACTOR SHALL REMOVE ALL EXISTING STRIPING AND SIGNS, WHICH ARE IN CONFLICT WITH THE CONSTRUCTION SIGNS AND STRIPING. EXISTING PAVEMENT MARKINGS SHALL BE REMOVED IN AREAS WHERE TRAFFIC IS DIRECTED TO CROSS THEM. THE SIGNS SHALL BE PROPERLY STORED IN A SAFE PLACE UNTIL THE CONSTRUCTION HAS BEEN COMPLETED.
20. AT THE CONCLUSION OF CONSTRUCTION, THE CONTRACTOR SHALL RESTORE ALL PAVEMENT MARKINGS TO NEW CONDITION WITH TRAFFIC PAINT STRIPES, RAISED PAVEMENT MARKER BUTTONS AND RE-INSTALL THE SIGNS AT THEIR EXISTING LOCATION OR AS DIRECTED ON THE PLANS.
21. CONSTRUCTION IN ANY AREA THAT IS ADVERSELY AFFECTING TRAFFIC FLOW AND SAFETY, MUST BE PURSUED DILIGENTLY BY THE CONTRACTOR. IF, IN THE OPINION OF THE ENGINEER, THE CONTRACTOR IS NOT DIRECTLY PURSUING THE CONSTRUCTION IN THOSE AREAS, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO CHANGE HIS/HER WORK SCHEDULE TO EXPEDITE COMPLETION IN THOSE AREAS OF CONCERN.
22. CONTRACTOR SHALL PERFORM WORK DURING THE PERIOD OF 7:00 AM TO 7:00 PM, SEVEN DAYS A WEEK ON RESIDENTIAL STREETS.
23. NO SHORT-TERM 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, UNLESS DIRECTED BY THE COUNTY ENGINEER.
24. LANE CLOSURES SHALL BE DURING OFF-PEAK HOURS ONLY (MONDAY THROUGH FRIDAY 9 A.M. TO 4 P.M.) UNIFORMED PEACE OFFICERS OR FLAGGERS IN RADIO CONTACT ARE REQUIRED TO DIRECT TRAFFIC DURING LANE CLOSURES.
25. CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS EXCEPT DURING FLAGGING OPERATION OR PROVIDE DETOURS AROUND CONSTRUCTION SITE AND PROVIDE PUBLIC NOTIFICATION.
26. CONTRACTOR SHALL COVER OPEN EXCAVATIONS WITH STEEL PLATES ANCHORED PROPERLY DURING NON-WORKING HOURS AND OPEN LANES FOR NORMAL TRAFFIC FLOW AS DIRECTED BY THE ENGINEER.
27. OFF DUTY UNIFORMED PEACE OFFICERS ARE REQUIRED TO DIRECT TRAFFIC WHENEVER ADDITIONAL TRAFFIC LANES ARE TEMPORARILY BLOCKED FOR CONSTRUCTION PURPOSES. NO ADDITIONAL LANES SHALL BE BLOCKED MON-FRI BETWEEN THE HOURS OF 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM.
28. APPROVED COPIES OF "TRAFFIC CONTROL PLANS" AND LANE/SIDEWALK CLOSURE PERMITS SHALL BE AVAILABLE FOR INSPECTION AT JOB SITE AT ALL TIMES. CONTRACTOR MUST SECURE "HARRIS COUNTY RIGHT OF WAY NOTIFICATION" FROM HARRIS COUNTY ENGINEERING DEPARTMENT BEFORE CLOSING A LANE/SIDEWALK. THE REQUEST MUST BE MADE AT LEAST TEN BUSINESS DAYS PRIOR TO THE DATE FOR WHICH THE CLOSURE IS SOUGHT. NOTE THAT WORKING HOURS MAY BE RESTRICTED OR THE REQUEST MAY BE DENIED.
29. IN THE EVENT THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF TRAFFIC CONTROL DURING THE CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING AND SUBMITTING AN ALTERNATE SET OF "TRAFFIC CONTROL PLANS" TO HARRIS COUNTY ENGINEERING DEPARTMENT FOR REVIEW AND APPROVAL NO LESS THAN 20 WORKING DAYS PRIOR TO IMPLEMENTATION DATE. PLANS SHALL BE TO SCALE AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, AND SHALL BECOME PART OF THE CONTRACT. APPROVED COPIES OF THE "TRAFFIC CONTROL PLANS" AND LANE/SIDEWALK CLOSURE PERMITS SHALL BE AVAILABLE FOR INSPECTION AT JOB SITE AT ALL TIMES.
30. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING HARRIS COUNTY ENGINEERING DEPARTMENT FOR REMOVAL AND INSTALLATION OF ANY PARKING RESTRICTIONS AND TRAFFIC SIGNAL ALTERATIONS MADE NECESSARY BY THESE PLANS. THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT AT LEAST FIVE (5) WORKING DAYS PRIOR TO IMPLEMENTATION OF TRAFFIC ROUTING AROUND THE CONSTRUCTION AREA, AND AGAIN UPON COMPLETION OF WORK AT EACH SITE.
31. THE CONTRACTOR SHALL CONDUCT HIS OPERATION IN A MANNER SUCH THAT TRUCKS AND OTHER VECHICLES DO NOT CREATE A DIRT NUISANCE OR SAFETY HAZARD IN ANY PUBLIC OR PRIVATE STREET.
32. THE CONTRACTOR AND SUBCONTRACTORS SHALL COMPLY WITH ALL FEDERAL STATE AND LOCAL LAWS CODES AND ORDINANCES APPLICABLE TO THE WORK AND ALL REQUIREMENTS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS HAVING JURISDICTION. IF THE ABOVE LAWS, CODES, OR ORDINANCES CONFLICT WITH SPECIFICATIONS THEN THE LAWS, CODES OR ORDINANCES SHALL GOVERN EXCEPT WHERE SPECIFICATIONS EXCEEDS THEM IN QUALITY OR QUANITY OF MATERIAL OR LABOR. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED IN CONNECTION WITH THE EXECUTION OF THE WORK. UNDER NO CIRCUMSTANCES SHALL ANY WORK BE STARTED BEFORE THE REQUIRED PERMITS ARE OBTAINED THE ENGINEER SHALL BE FURNISHED WITH CERTIFIED COPIES IF HE SO REQUESTS.
33. DESIGN SPEED FOR T.C.P. IS 35 MPH ON ALL MAJOR/MINOR STREETS (EXCEPT AS NOTED) AND 30 MPH ON ALL OTHER STREETS.
34. ALL BARRICADES, SIGNS, STRIPING, CHANNELIZATION DEVICES, AND ALL EQUIPMENT INCIDENTALS, AND LABOR REQUIRED TO CONSTRUCT BARRICADES AND SIGNS, ETC. AS SHOWN IN THE DETAILS ON THESE PLANS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR TRAFFIC HANDLING.
35. THE CONTRACTOR SHALL ADJUST ALL UTILITIES THAT MAY AFFECT TRAFFIC FLOW PRIOR TO TRAFFIC DISRUPTION.
36. THE CONTRACTOR SHALL MAINTAIN A 1' SAFETY BUFFER BETWEEN TRENCH AND LPCB.
37. WORK IN AREAS THAT REQUIRE FLAGGING OPERATIONS SHALL BE RESTRICTED TO THE HOURS OF 9:00 AM – 4:00 PM MONDAY THRU FRIDAY, UNLESS DIRECTED BY THE ENGINEER.
38. DRIVEWAY ACCESS WILL BE MAINTAINED OPEN AFTER WORKING HOURS. A MINIMUM OF ONE DRIVEWAY ACCESS WILL BE MAINTAINED OPEN AT ALL TIMES TO COMMERCIAL, APARTMENTS, AND/OR NON-RESIDENTIAL DEVELOPMENTS.
39. THE LENGTH OF THE WORK ZONE MUST BE RESTRICTED TO 1,000 LINEAR FEET WITHIN THE HARRIS COUNTY ROW OR EASEMENTS. THE CONSTRUCTION ZONE WILL BE A ROLLING CONSTRUCTION ZONE WITH APPROPRIATE TRANSITIONS ON EACH END UNLESS OTHERWISE SHOWN IN PLANS AND SPECIFICATIONS.
40. PEDESTRIAN TRAFFIC: CARE SHALL BE TAKEN TO PROVIDE FOR TEMPORARY PEDESTRIAN TRAFFIC AND CROSSING AT AREAS SUCH AS SCHOOLS, PARKS, AND SHOPPING AREAS.

SITE SPECIFIC NOTES

1. 48 HOUR NOTICE: CONTRACTOR SHALL NOTIFY HARRIS COUNTY PRIOR TO COMMENCING CONSTRUCTION AND/OR BACKFILLING ANY UTILITIES. CONTRACTOR(S) TO CONTACT PUBLIC REVIEW DEPARTMENT @ (713-274-2931) OR PUBLIC.REVIEW@HCPID.ORG.
2. CONTRACTOR SHALL COORDINATE WITH BUSINESS OWNERS FOR PLACEMENT OF TEMPORARY BUSINESS SIGNS AND DRIVEWAY LANE CLOSURES ONE (1) MONTH PRIOR TO CONSTRUCTION.

STREET NAMES	POSTED SPEED LIMIT
MAJOR/MINOR STREETS:	
CLINTON DRIVE (GALENA MANOR TO PANTHER CREEK)	30 MPH
CLINTON DRIVE (MASCOT ST TO GALENA MANOR & PANTHER CREEK TO FEDERAL RD)	45 MPH
MAYO SHELL ROAD	30 MPH

LENGTH FOR LONGITUDINAL BUFFER		TYPICAL SIGN SPACING, TAPER LENGTHS, AND SUGGESTED SPACING OF CHANNELIZING DEVICES				
Posted Speed (mph)	Length in Feet (B)	Posted Speed (mph)	Sign Spacing "X"	Min. Desirable Taper Length "L" 10' Offset	11' Offset	12' Offset
20	35					
25	55					
30	90	30	120'	150'	165'	180'
35	120	35	160'	205'	225'	245'
40	155	40	240'	265'	295'	320'
45	195	45	320'	450'	495'	540'
50	280	50	400'	500'	550'	600'
55	335	55	500'	550'	605'	660'

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10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
TX SURVEY FIRM NO.: 10075600

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN GENERAL NOTES

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 157 OF 204	

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PHASE	DESCRIPTION
PHASE I	CONSTRUCT 3–FT TEMPORARY ASPHALT PAVEMENT SHOULDER ALONG THE OUTSIDE WESTBOUND LANE WHERE NO PAVEMENT SHOULD EXIST. WHERE PAVEMENT SHOULDER EXIST, REPLACE EXISTING DETERIORATED SECTIONS AND SECTIONS WITH UNEVEN TRAVEL LINE BETWEEN EDGE OF TRAVEL LANE AND SHOULDER. AVOID PLACING TEMP SHOULDER AT RAILROAD CROSSING GATES. CONSTRUCT SHOULDER BY CLOSING OUTER LANE USING THE TCP–3 (TYPICAL TRAFFIC CONTROL PLAN FOR EXTERIOR LANES CLOSURE). BUILD TEMPORARY SHOULDER TO ACCOMMODATE FUTURE 11~FT TRAVEL LANES DURING PHASE II. REMOVE EXISTING SOIL, AND REGRADE/MODIFY DITCHES AS NECESSARY. MAINTAIN MINIMUM 1~11–FT FT WIDE WESTBOUND LANE AT ALL TIMES.
PHASE II	IMPLEMENT ROLLING CLOSURE EASTBOUND (TCP–2) AND MAINTAIN 1~11–FT WIDE TRAVEL LANE IN EACH DIRECTION USING WESTBOUND LANES. TRANSITION TRAFFIC TO EASTBOUND LANE PRIOR TO CROSS SIGNALIZED INTERSECTIONS. AT SIGNALIZE INTERSECTIONS, USE TCP–3 (TYPICAL TRAFFIC CONTROL PLAN FOR EXTERIOR LANES CLOSURES). CONSTRUCT PROPOSED WATER LINE USING A COMBINATION OF TRENCHLESS AND OPEN–CUT CONSTRUCTION. AT OPEN–CUT SECTIONS OR AUGER PIT LOCATION, REPAIR SECTION UP TO 2–INCHES BELOW FINAL GRADE AND TAPER EDGES OF TRAVEL LANE FOR FUTURE OVERLAY. FINAL 2–INCHES TO BE INSTALLED DURING PHASE III STEP A OPERATIONS. MAINTAIN MINIMUM 1~11–FT FT WIDE TRAVEL LANE AT ALL TIMES.
PHASE III A	BEGIN TO MILL AND OVERLAY THE EXISTING ROADWAY OUTER EASTBOUND TRAVEL LANE BY IMPLEMENTING TCP–3 (TYPICAL TRAFFIC CONTROL PLAN FOR EXTERIOR LANES CLOSURE). MILL AND OVERALL AS SHOWN ON DRAWINGS LIMITS, DO NOT BEGIN PHASE III STEP B UNTIL WORK HAS BEEN COMPLETED MAINTAIN MINIMUM 1~11–FT FT WIDE TRAVEL LANE AT ALL TIMES.
PHASE III B	ONCE THE PHASE III A HAS BEEN COMPLETED, BEGIN TO MILL AND OVERLAY THE INNER EASTBOUND LANE BY IMPLEMENTING TCP–4 (TYPICAL TRAFFIC CONTROL PLAN FOR INTERIOR LANES CLOSURE). MILL AND OVERALL AS SHOWN ON DRAWINGS LIMITS. MAINTAIN MINIMUM 1~11–FT FT WIDE TRAVEL LANE AT ALL TIMES.
PHASE IV	IMPLEMENT TCP–7 & TCP–8 AND MAINTAIN ONE 11–FT WIDE TRAVEL LANE IN EITHER NORTH OR SOUTH BOUND ALONG MAYO SHELL ROAD AS NECESSARY. CONSTRUCT PROPOSED WATER LINE USING A COMBINATION OF TRENCHLESS CONSTRUCTION AND OPEN–CUT CONSTRUCTION. AT OPEN–CUT SECTIONS OR AUGER PITS, REPAIR LOCATIONS AS WORK PROGRESSES TO OPEN TWO WAY TRAFFIC AFTER WORKING HOURS.
PHASE V	IMPLEMENT TCP–3 (TYPICAL TRAFFIC CONTROL PLAN FOR EXTERIOR LANES CLOSURE) AND BEGIN TO DO CONDITION ASSESSMENT FOR THE EXISTING 96–INCH WATER LINE. MAINTAIN MINIMUM 1~11–FT FT WIDE TRAVEL LANE AT ALL TIMES.

NO.	DATE	REVISION	APP.

NOTE(S):

1. CONTRACTOR SHALL INSTALL ADVANCE WARNING SIGNS AT LEAST 7 DAYS PRIOR TO COMMENCING WORK.
2. PRIOR TO CONSTRUCTION ACROSS DRIVEWAYS, COORDINATE WITH PROPERTY OWNERS TO PROVIDE ACCESS TO BUSINESS AND RESIDENTS AT ALL TIMES.

KUO & ASSOCIATES
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TX SURVEY FIRM NO.: 10075600

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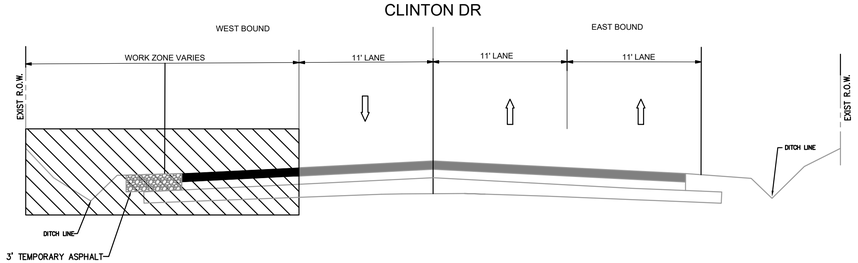
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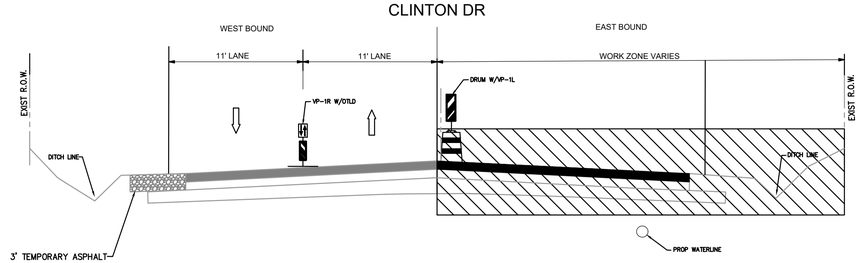
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
TRAFFIC CONTROL PLAN
SEQUENCE OF CONSTRUCTION PHASE DETAILS
(SHEET 1 OF 2)

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CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 158 OF 204	

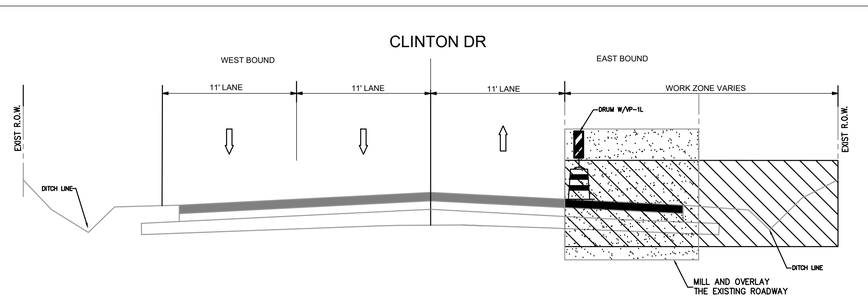
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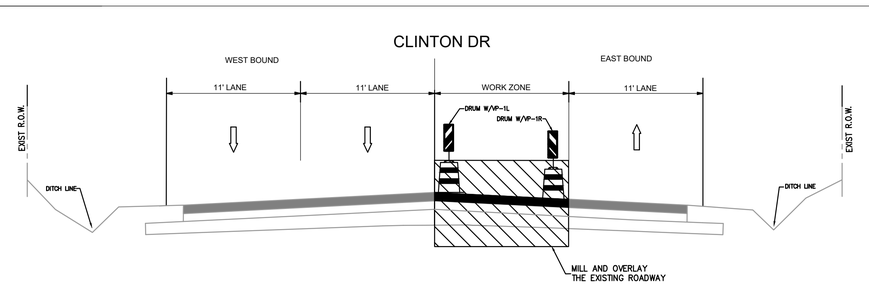
PHASE I TYPICAL SECTION (LIMITS - BEGIN TO END)



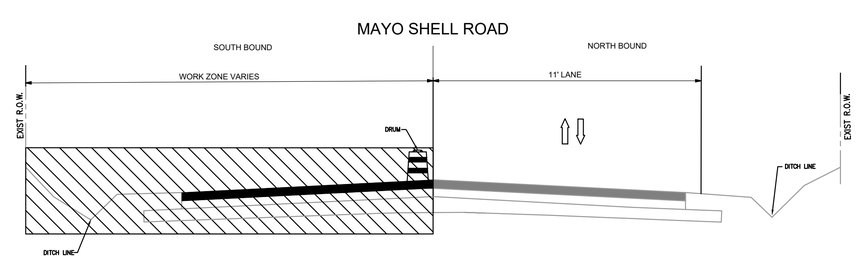
PHASE II TYPICAL SECTION



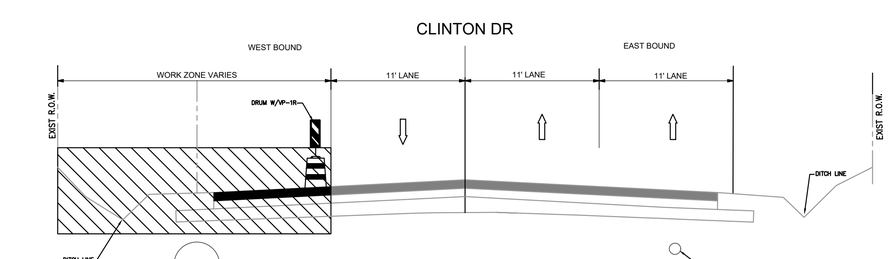
PHASE III A TYPICAL SECTION (LIMITS - BEGIN TO END)



PHASE III B TYPICAL SECTION (LIMITS - BEGIN TO END)



PHASE IV TYPICAL SECTION (MAYO SHELL RD)



PHASE V TYPICAL SECTION

NO.	DATE	REVISION	APP.

LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

NOTES:

1. PRIOR TO CONSTRUCTION ACROSS DRIVEWAYS, COORDINATE WITH PROPERTY OWNERS TO PROVIDE ACCESS TO BUSINESSES AND RESIDENTS AT ALL TIMES.

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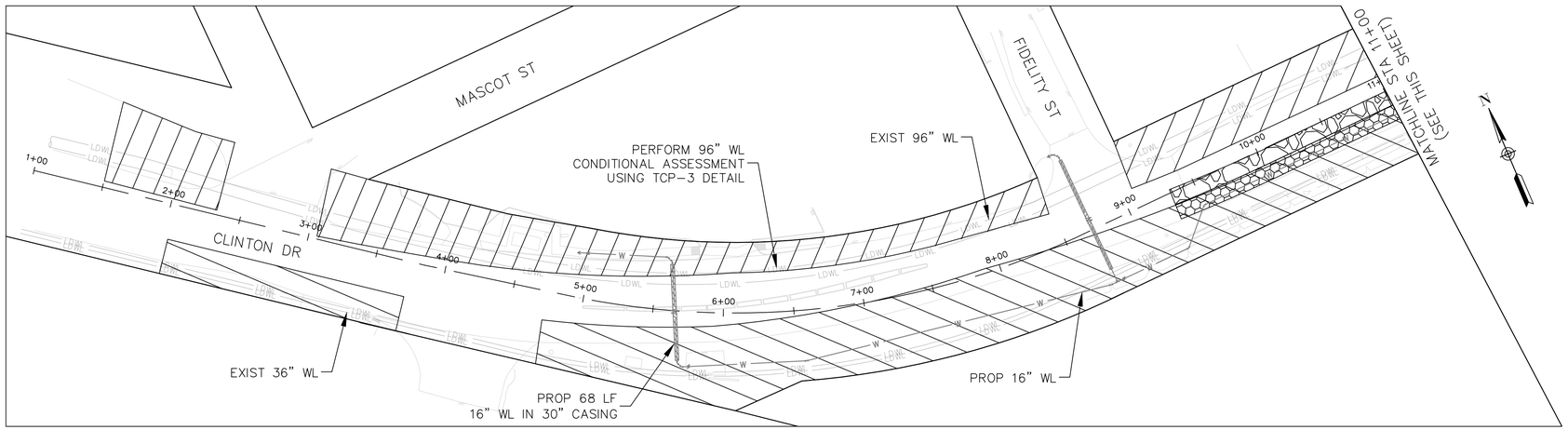
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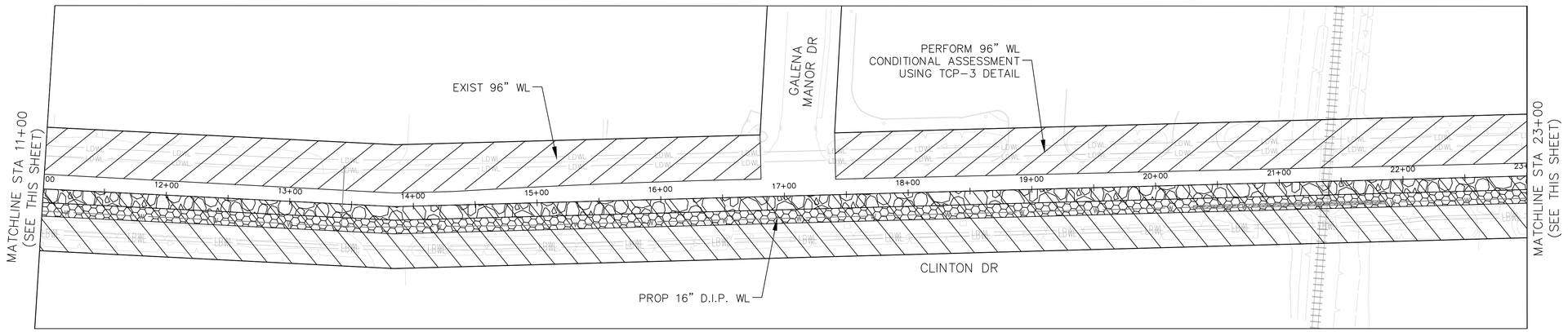
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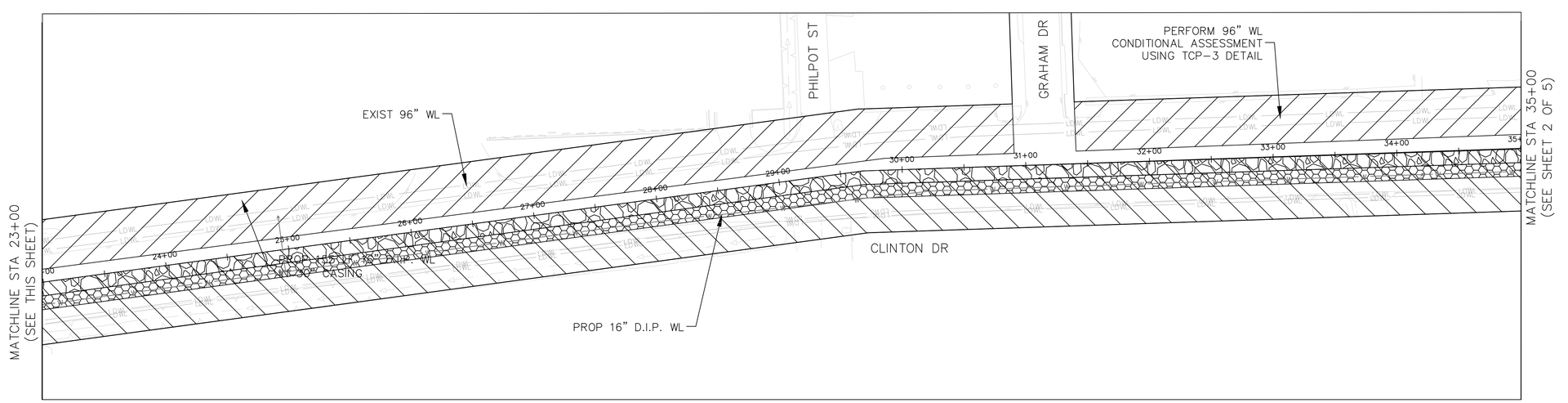
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
TRAFFIC CONTROL PLAN
SEQUENCE OF CONSTRUCTION PHASE DETAILS
(SHEET 2 OF 2)

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

NO.	DATE	REVISION	APP.

LEGEND

- PHASE 1 – TEMP. 3-FT ASPH SHOULDER
- PHASE II
- PHASE III A
- PHASE III B
- PHASE IV
- PHASE V

NOTES:

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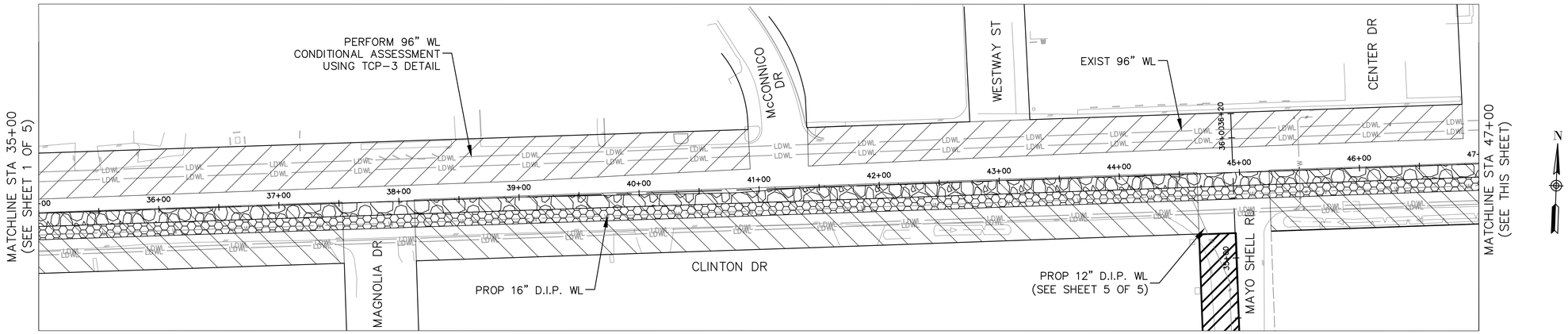
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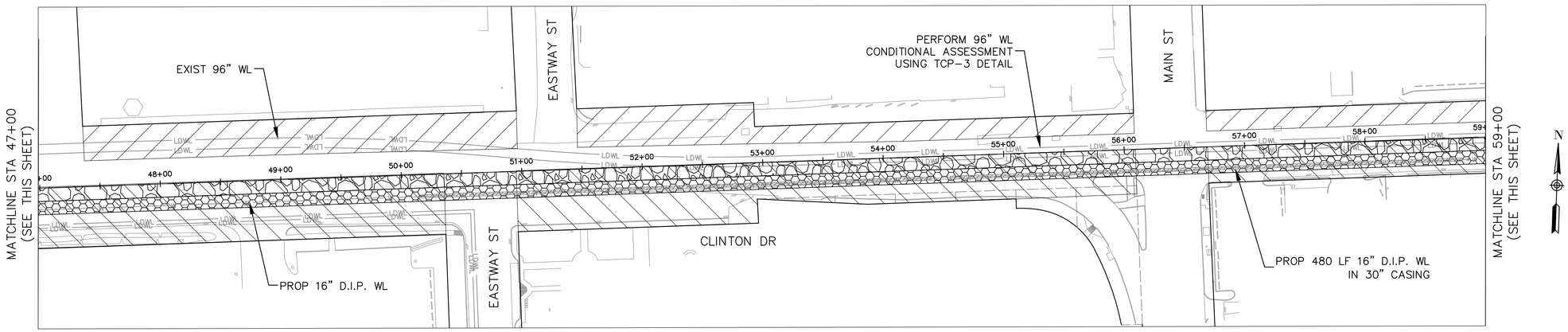
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

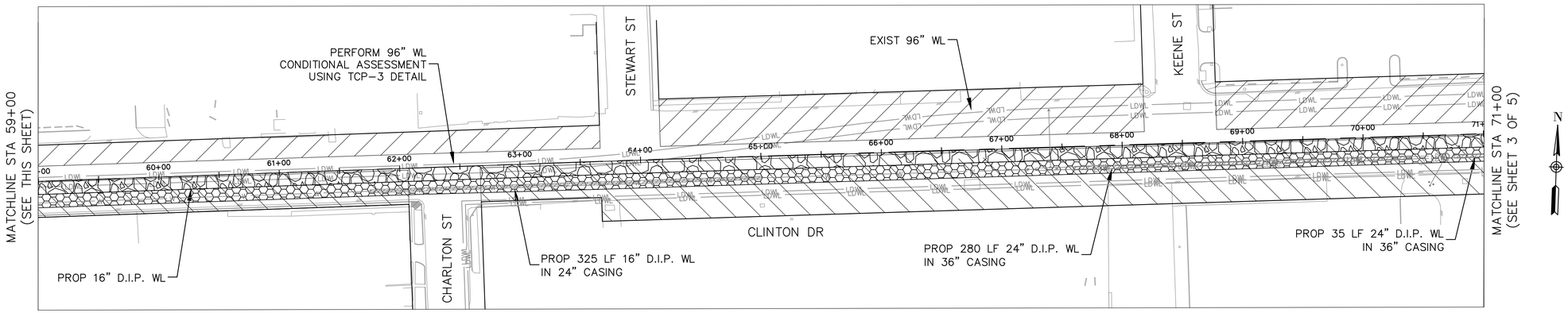
TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION (SHEET 1 OF 5)

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0' 50' 100'
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NO.	DATE	REVISION	APP.

LEGEND

- PHASE 1 – TEMP. 3-FT ASPH SHOULDER
- PHASE II
- PHASE III A
- PHASE III B
- PHASE IV
- PHASE V

NOTES:

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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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

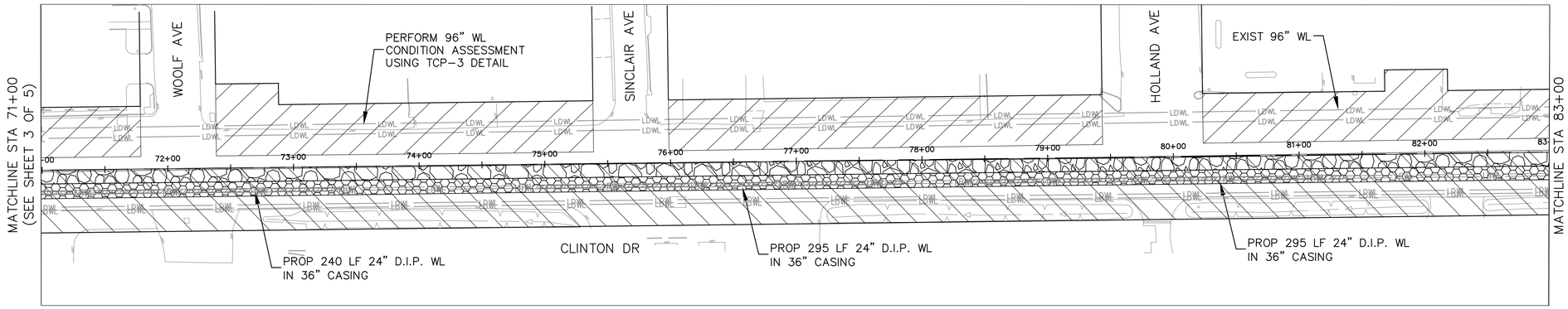
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

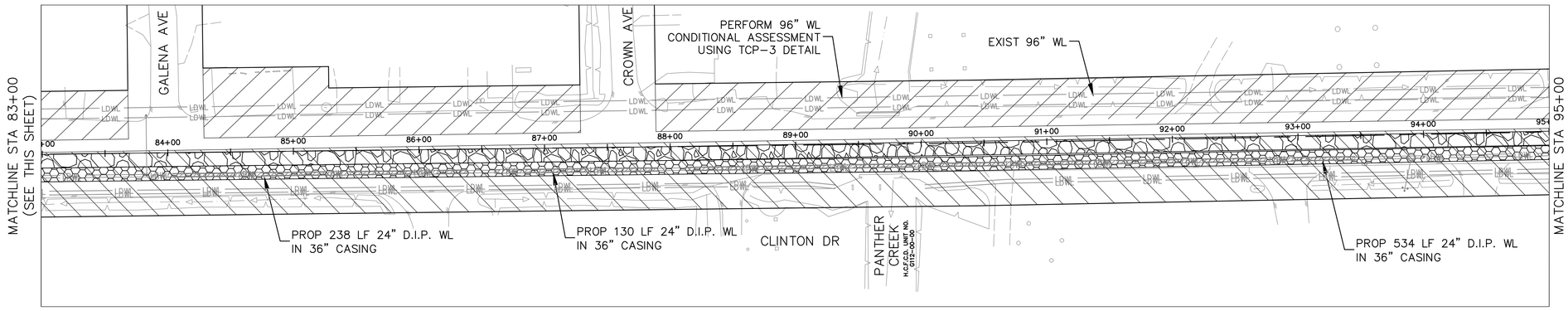
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

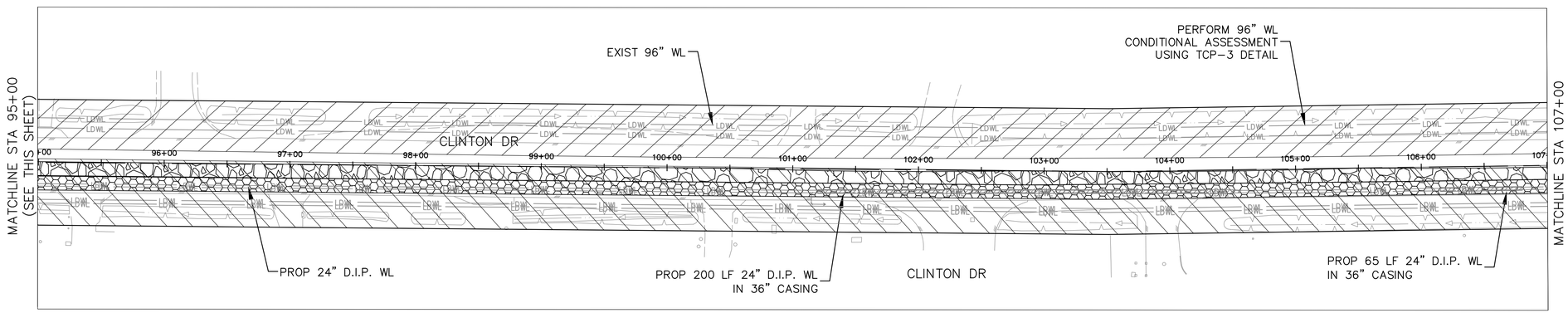
TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION (SHEET 2 OF 5)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 161 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\TCP\23082-TCP-SOC.dwg plotted on Aug 15, 2025 - 5:23pm







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

NO.	DATE	REVISION	APP.

N

LEGEND

- PHASE 1 – TEMP. 3-FT ASPH SHOULDER
- PHASE II
- PHASE III A
- PHASE III B
- PHASE IV
- PHASE V

NOTES:

1. PRIOR TO CONSTRUCTION ACROSS DRIVEWAYS, COORDINATE WITH PROPERTY OWNERS TO PROVIDE ACCESS TO BUSINESSES AND RESIDENTS AT ALL TIMES.

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HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
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TX FIRM NO. F-4578

SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON

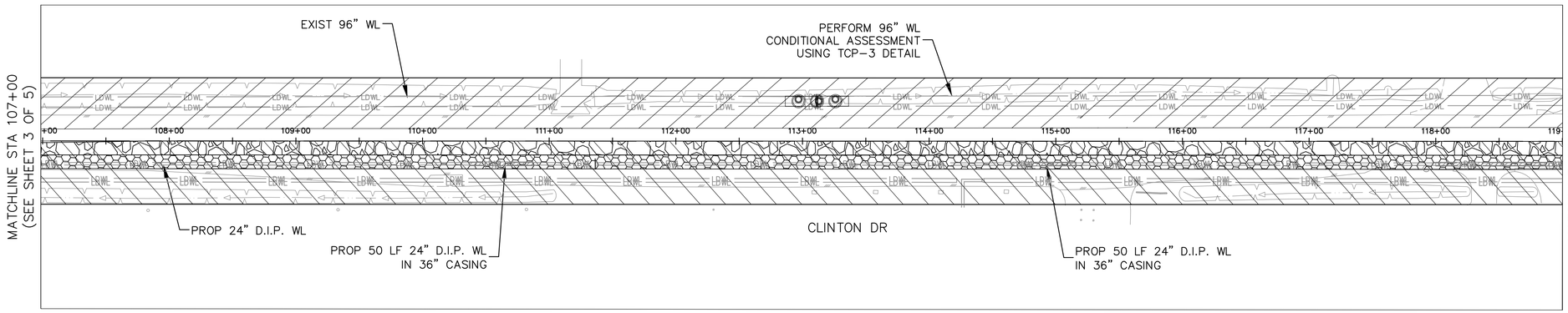
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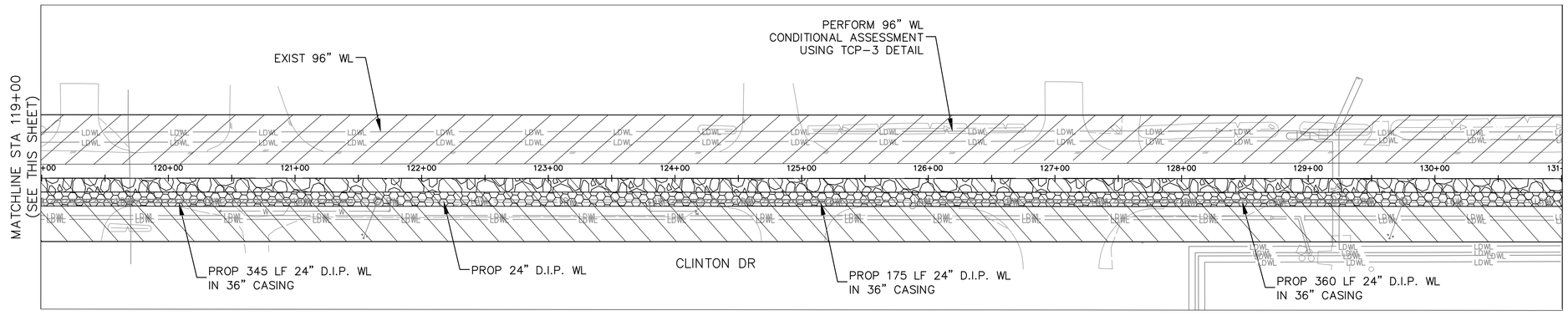
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

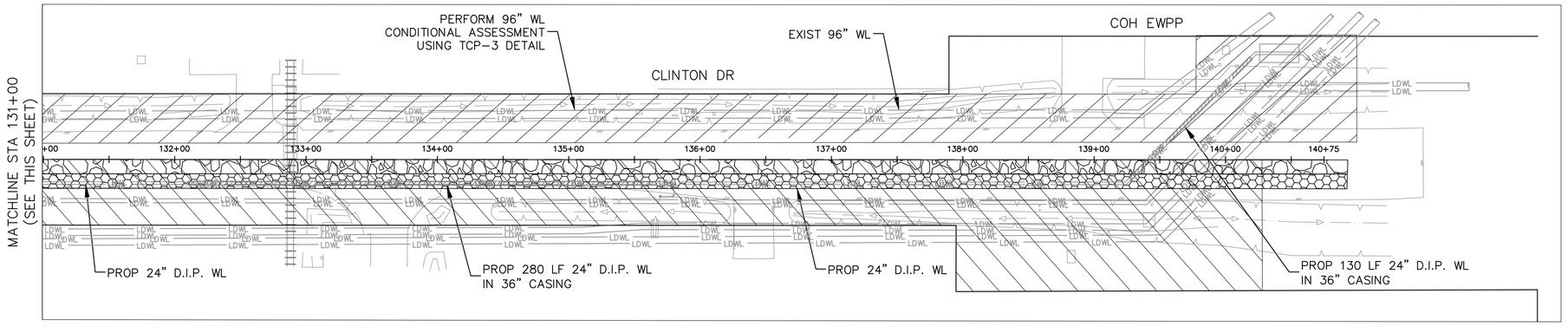
TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION (SHEET 3 OF 5)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 162 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\TCP\23082-TCP-SOC.dwg plotted on Aug 15, 2025 - 5:24pm







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

NO.	DATE	REVISION	APP.

LEGEND

- PHASE 1 – TEMP. 3-FT ASPH SHOULDER
- PHASE II
- PHASE III A
- PHASE III B
- PHASE IV
- PHASE V

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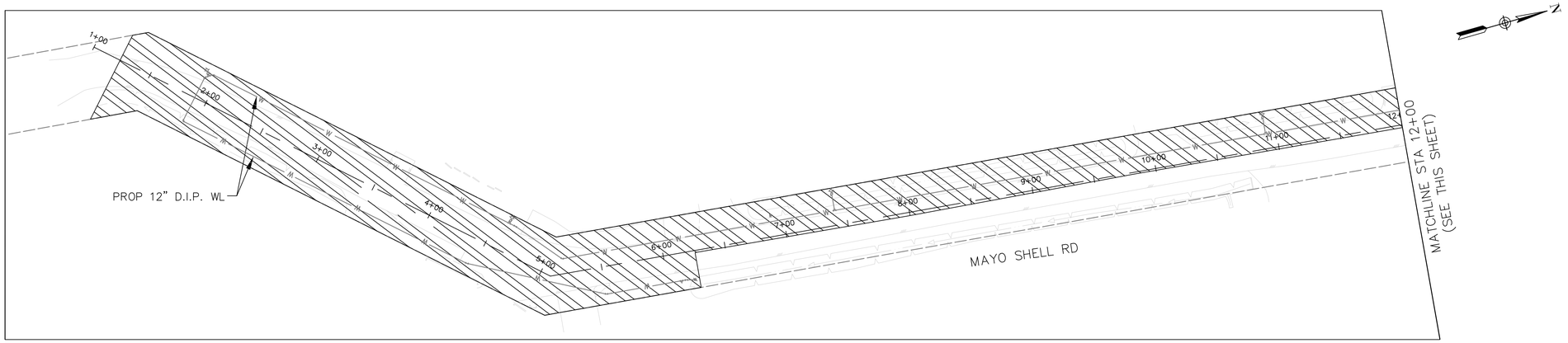
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HOUSTON PUBLIC WORKS

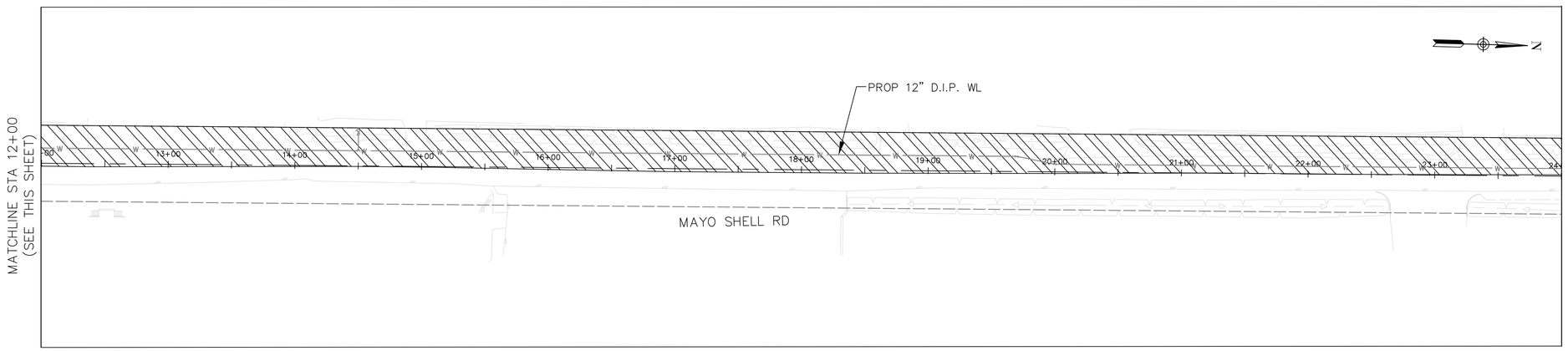
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

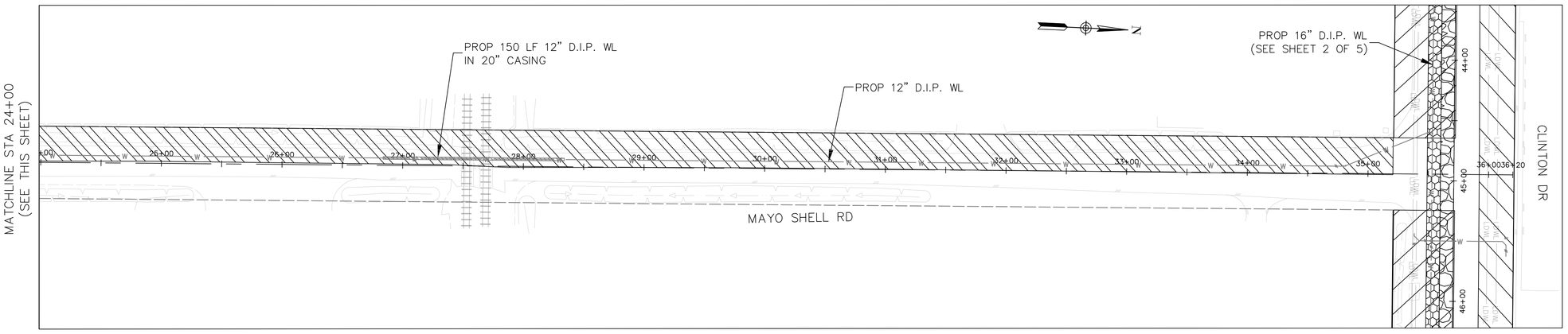
TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION (SHEET 4 OF 5)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 163 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\TCP\23082-TCP-SOC.dwg plotted on Aug 15, 2025 - 5:24pm







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

NO.	DATE	REVISION	APP.

LEGEND

- PHASE 1 – TEMP. 3-FT ASPH SHOULDER
- PHASE II
- PHASE III A
- PHASE III B
- PHASE IV
- PHASE V

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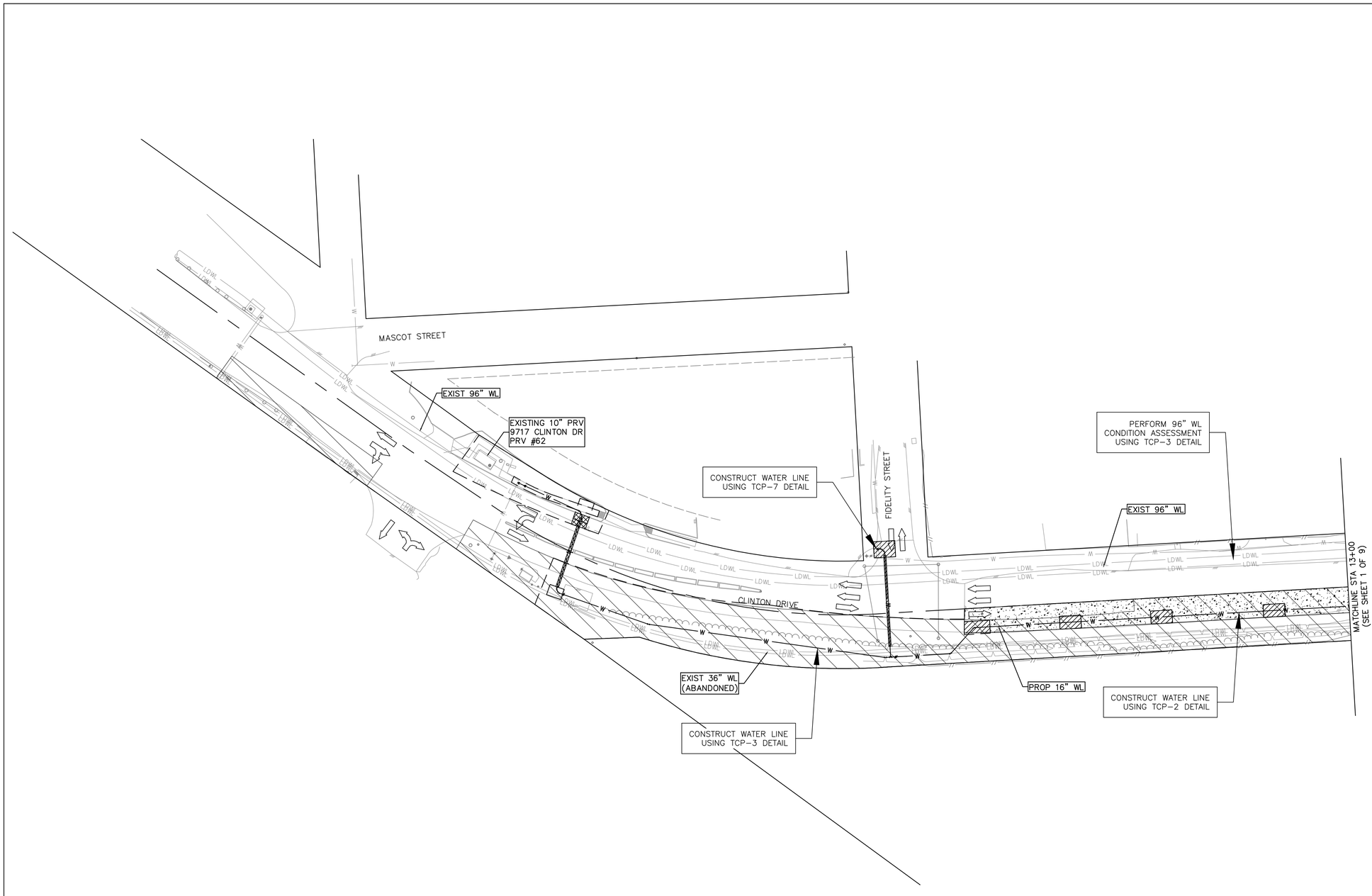
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION (SHEET 5 OF 5)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 164 OF 204	

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N

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

NO.	DATE	REVISION	APP.

NOTE(S):

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7. FOR TRAFFIC CONTROL PLAN (TCP) DETAILS, SEE SHEET XXX THRU SHEET XXX.

LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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

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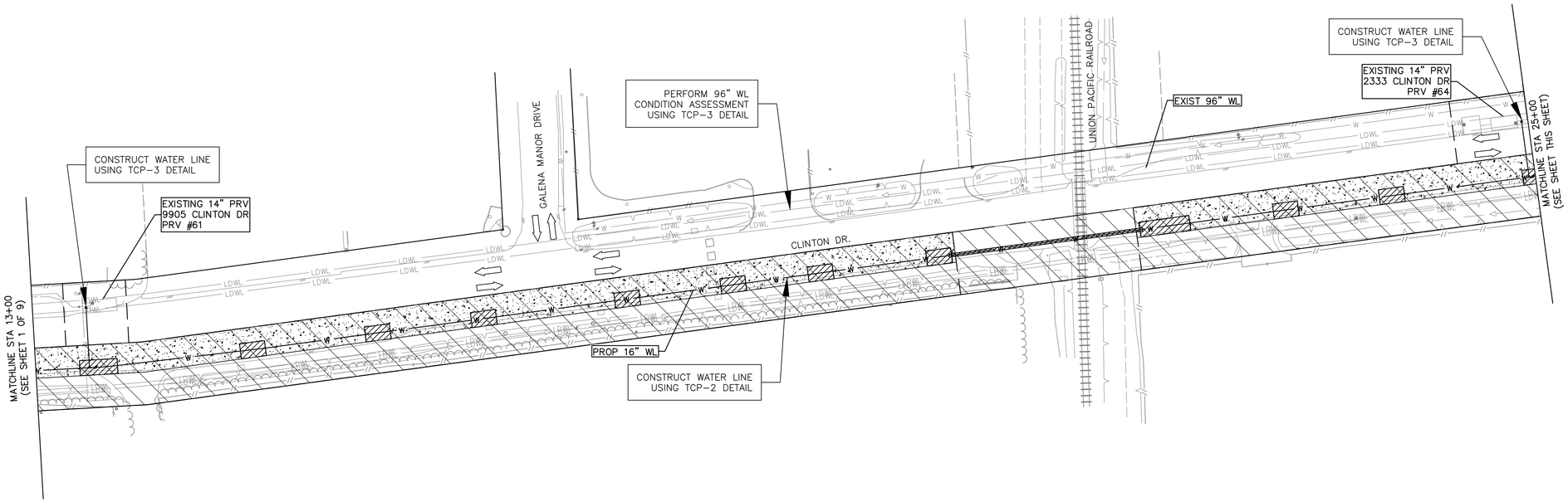
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

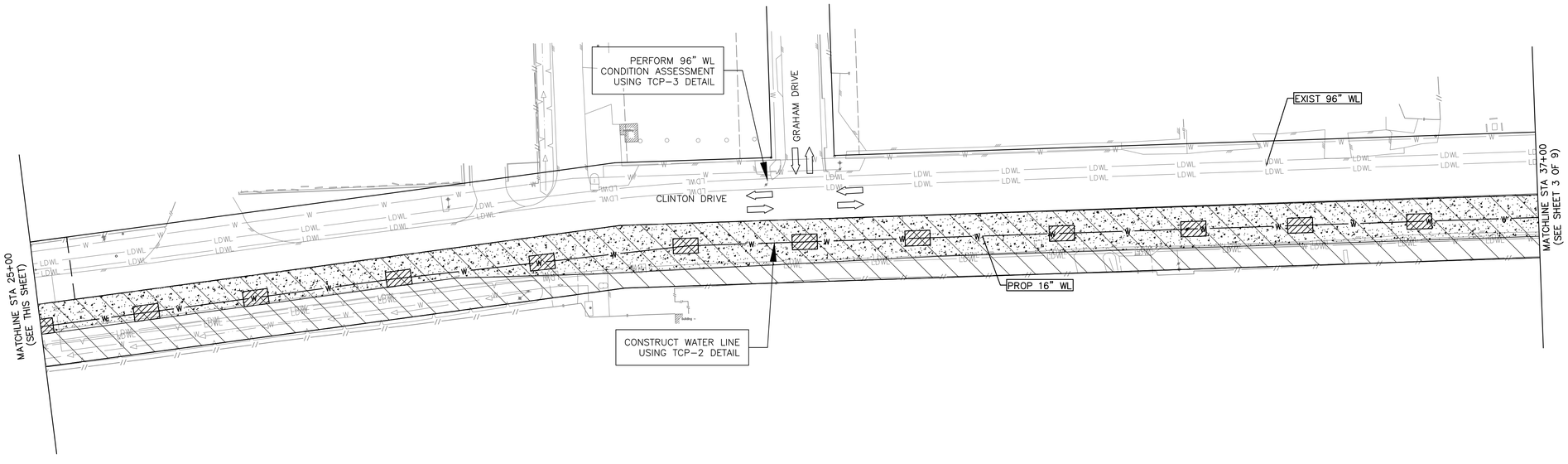
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 1 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 165 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\TCP\23082-TCP Phase II Set.dwg plotted on Aug 15, 2025 - 5:33pm





N

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

NO.	DATE	REVISION	APP.

NOTE(S):

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7. FOR TRAFFIC CONTROL PLAN (TCP) DETAILS, SEE SHEET XXX THRU SHEET XXX.

LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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

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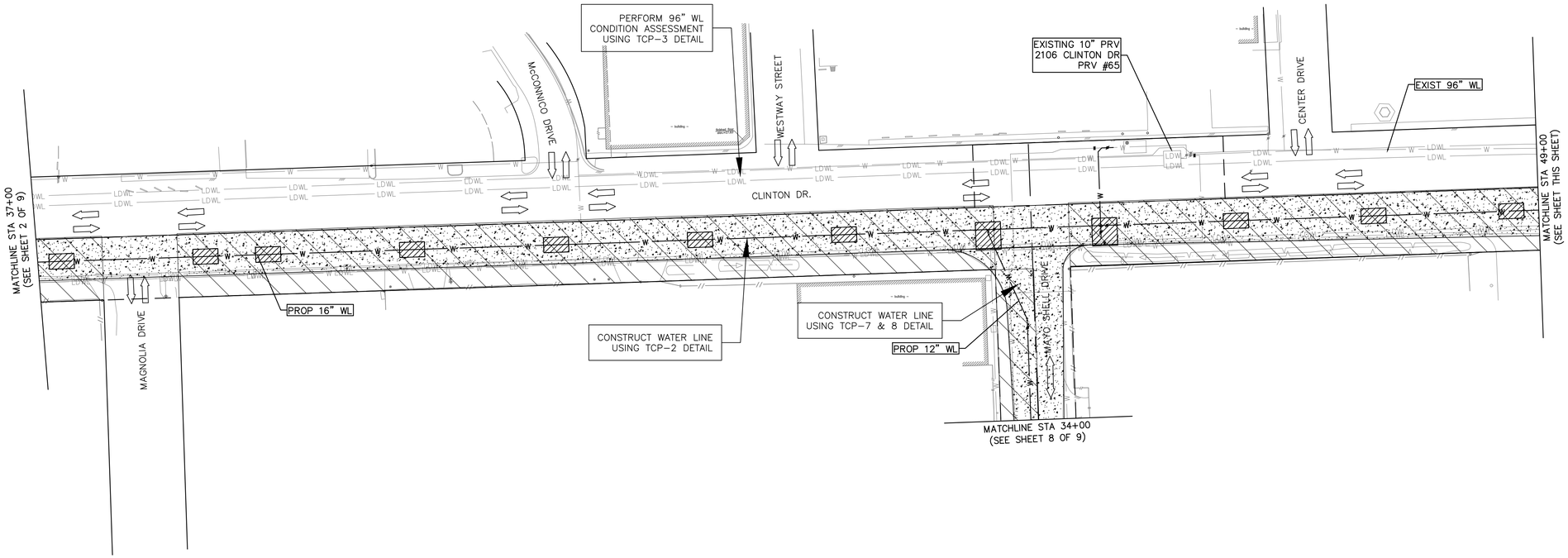
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

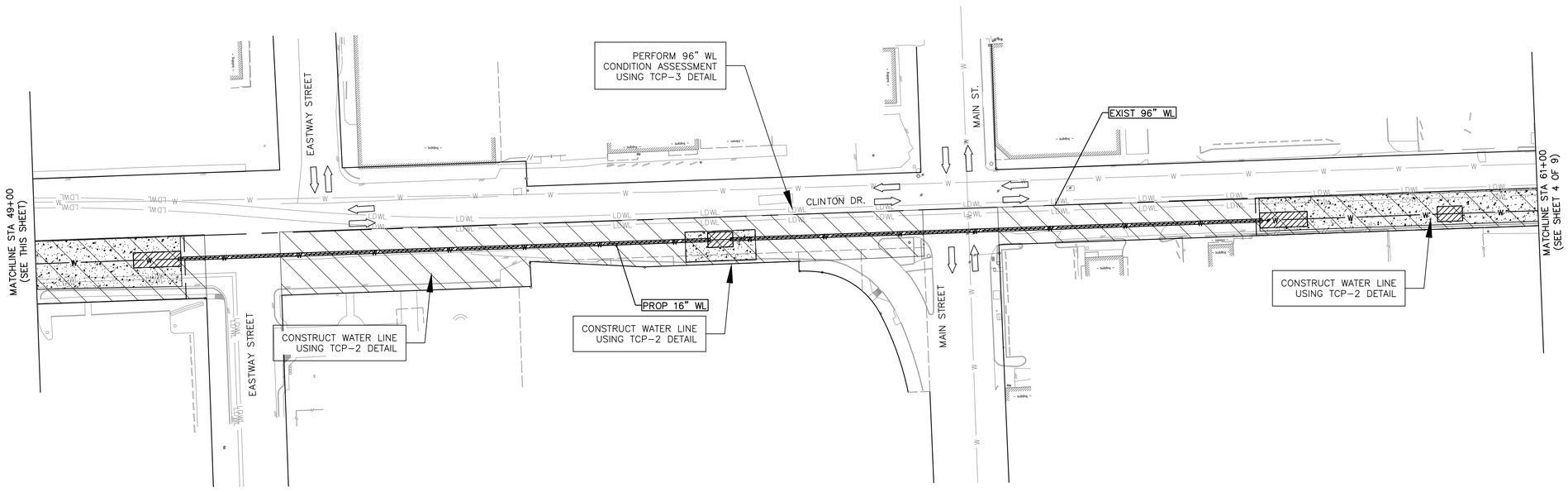
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 2 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 166 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\TCP\23082-TCP Phase II Sat.dwg plotted on Aug 15, 2025 - 5:33pm





N

0' 50' 100'

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7. FOR TRAFFIC CONTROL PLAN (TCP) DETAILS, SEE SHEET XXX THRU SHEET XXX.

LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
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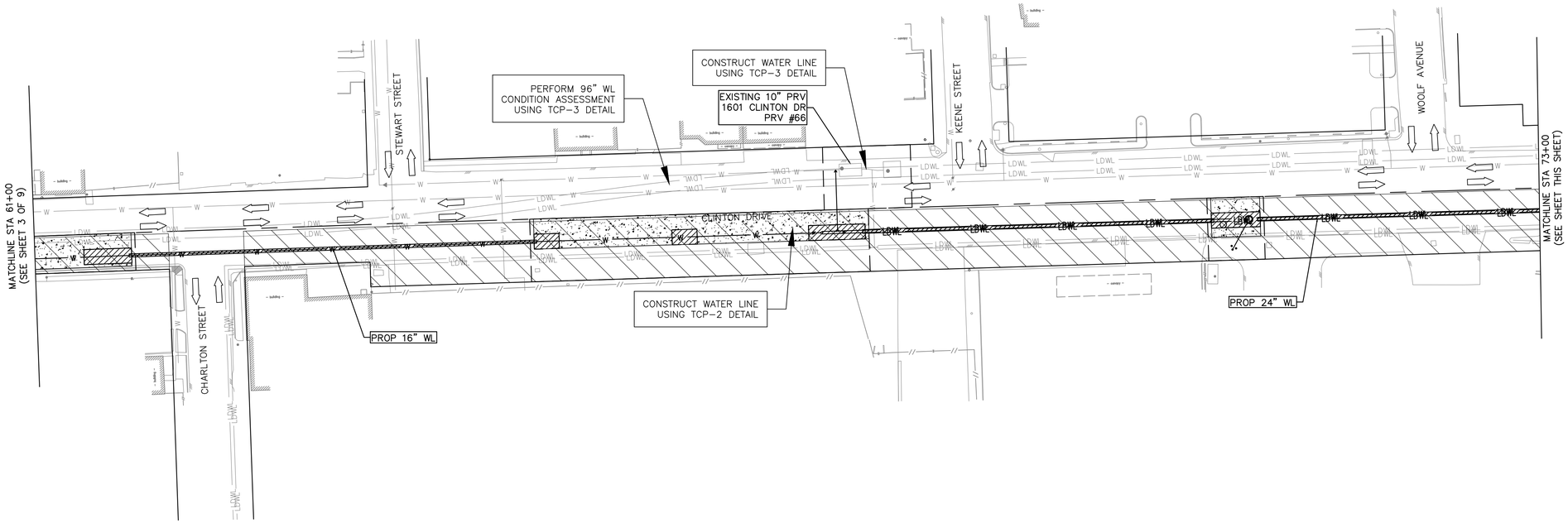
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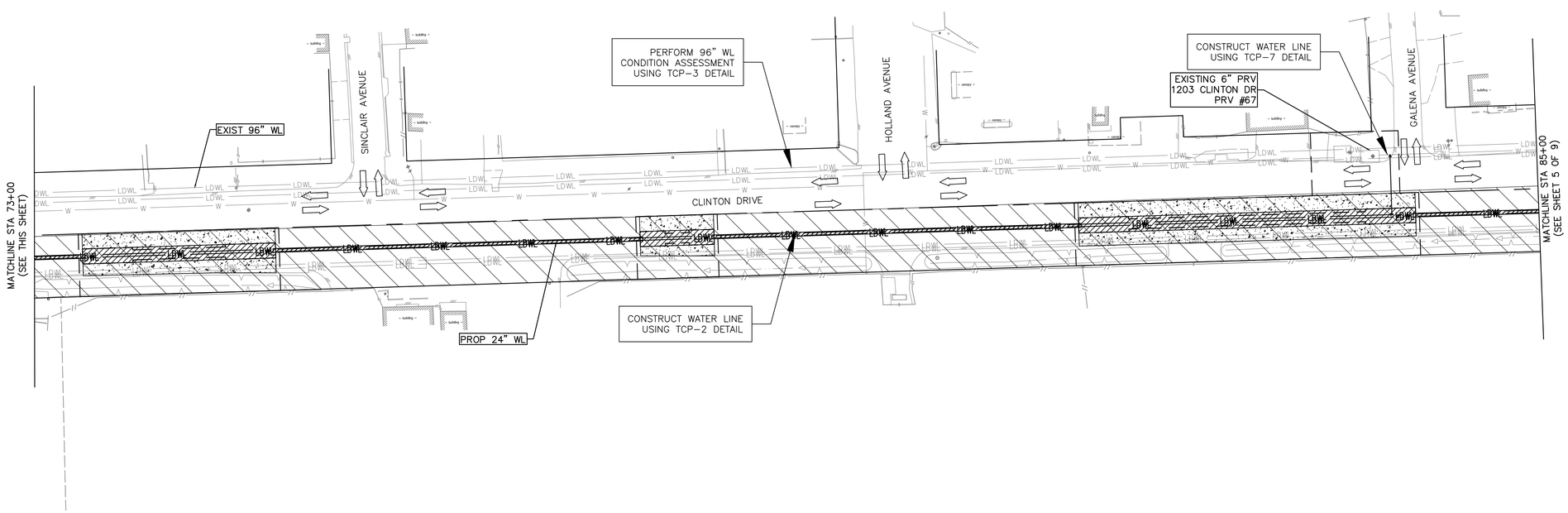
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 3 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 167 OF 204	

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NO.	DATE	REVISION	APP.

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LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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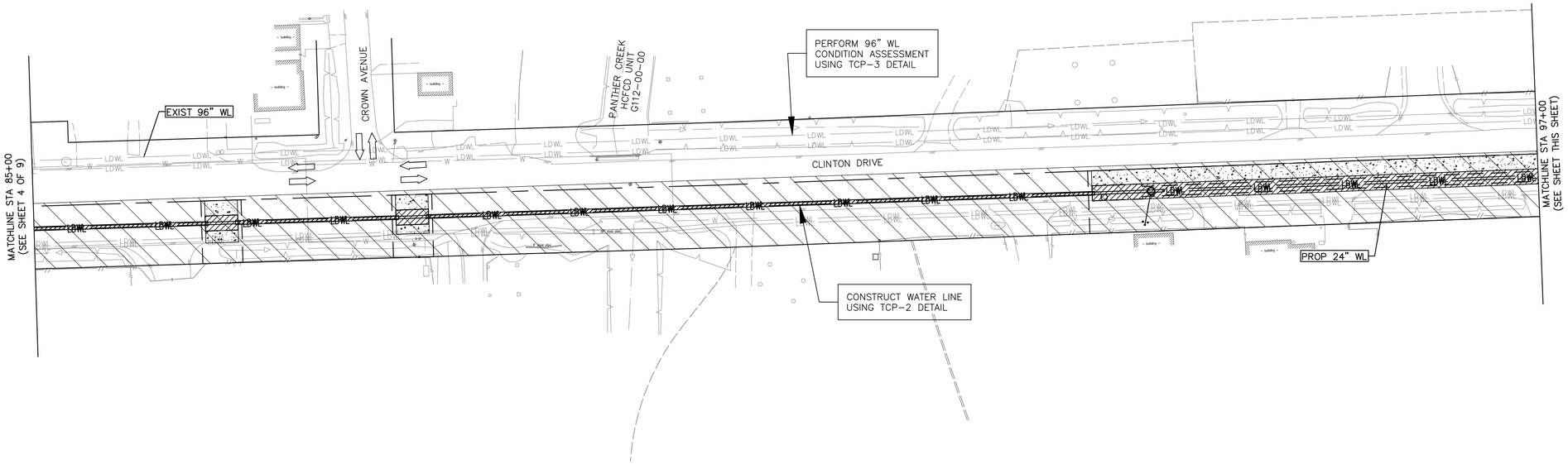
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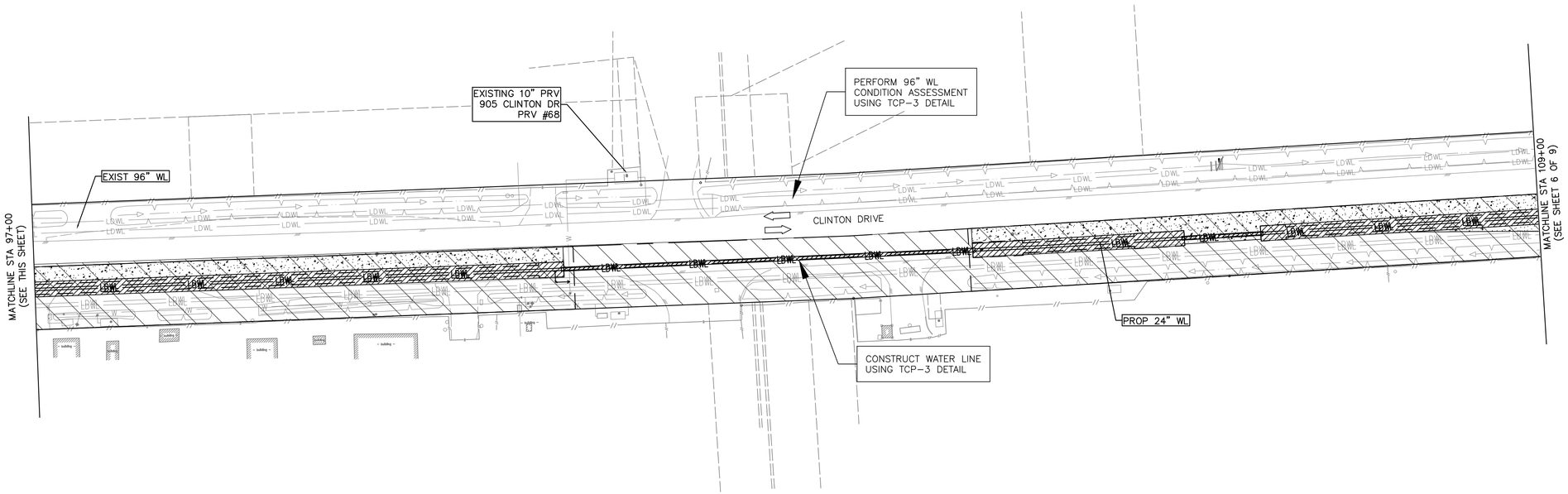
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 4 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 168 OF 204	

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N

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WORK ZONE

TRAFFIC FLOW DIRECTION

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TEXAS REG. NO.: 111684
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

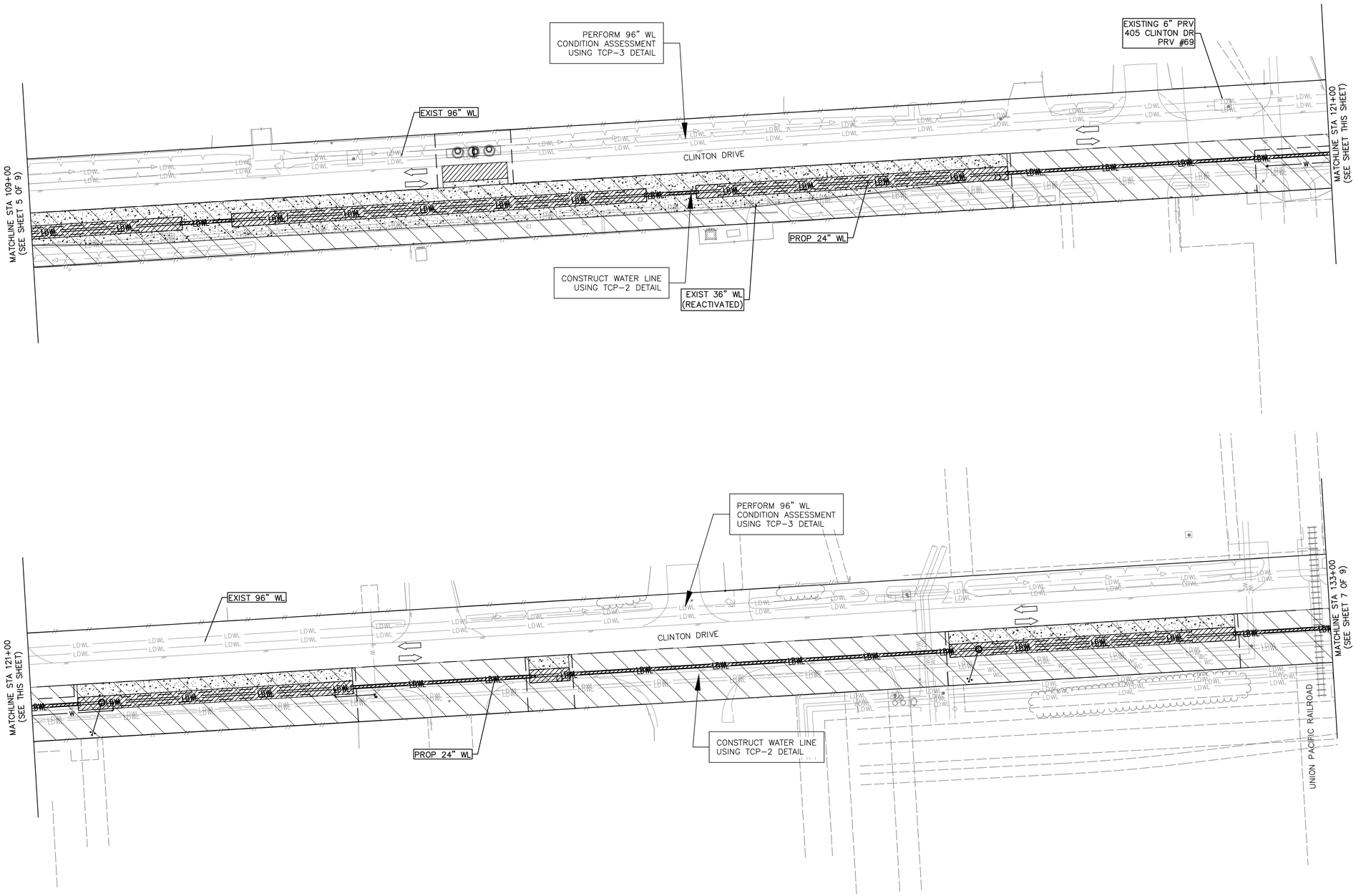
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 5 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 169 OF 204	

S:\Proj-2023\23082 (LDWL-Pkg 3-Clinton Dr)\Dwgs\Design\TCP\23082-TCP Phase II Set.dwg plotted on Aug 15, 2025 - 5:34pm



N

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

NO.	DATE	REVISION	APP.

NOTE(S):

1. CONTRACTOR SHALL INSTALL ADVANCE WARNING SIGNS AT LEAST 7 DAYS PRIOR TO COMMENCING WORK.
2. PROPOSED WATER LINES TO BE CONSTRUCTED IN A COMBINATION OF TRENCHLESS AND OPEN-CUT CONSTRUCTION. CONTRACTOR TO DETERMINE THE LOCATION OF THE PITS IN FIELD, SUBJECT TO CITY ENGINEERS APPROVAL. REFER TO DRAWINGS FOR TRENCHLESS OR OPEN-CUT CONSTRUCTION LIMITS.
3. CHANNELIZING DEVICE SPACING MAY BE ADJUSTED TO PROVIDE ACCESS TO PRIVATE/COMMERCIAL PROPERTIES, AND INTERSECTIONS.
4. CONTRACTOR SHALL PROVIDE ACCESS TO PRIVATE AND COMMERCIAL PROPERTIES AT ALL TIMES.
5. REFER TO TRAFFIC CONTROL PLANS STANDARD DETAILS FOR LANE CLOSURES AND CONSTRUCTION AT INTERSECTIONS.
6. ALL OPEN PIT/EXCAVATION TO BE PROTECTED BY LOW PROFILE CONCRETE TRAFFIC BARRIERS AND /OR COVERED WITH STEEL PLATES AFTER CONSTRUCTION HOURS AND OPEN THE STREET FOR TRAFFIC AS REQUIRED.
7. FOR TRAFFIC CONTROL PLAN (TCP) DETAILS, SEE SHEET XXX THRU SHEET XXX.

LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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

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TX FIRM NO. F-4578

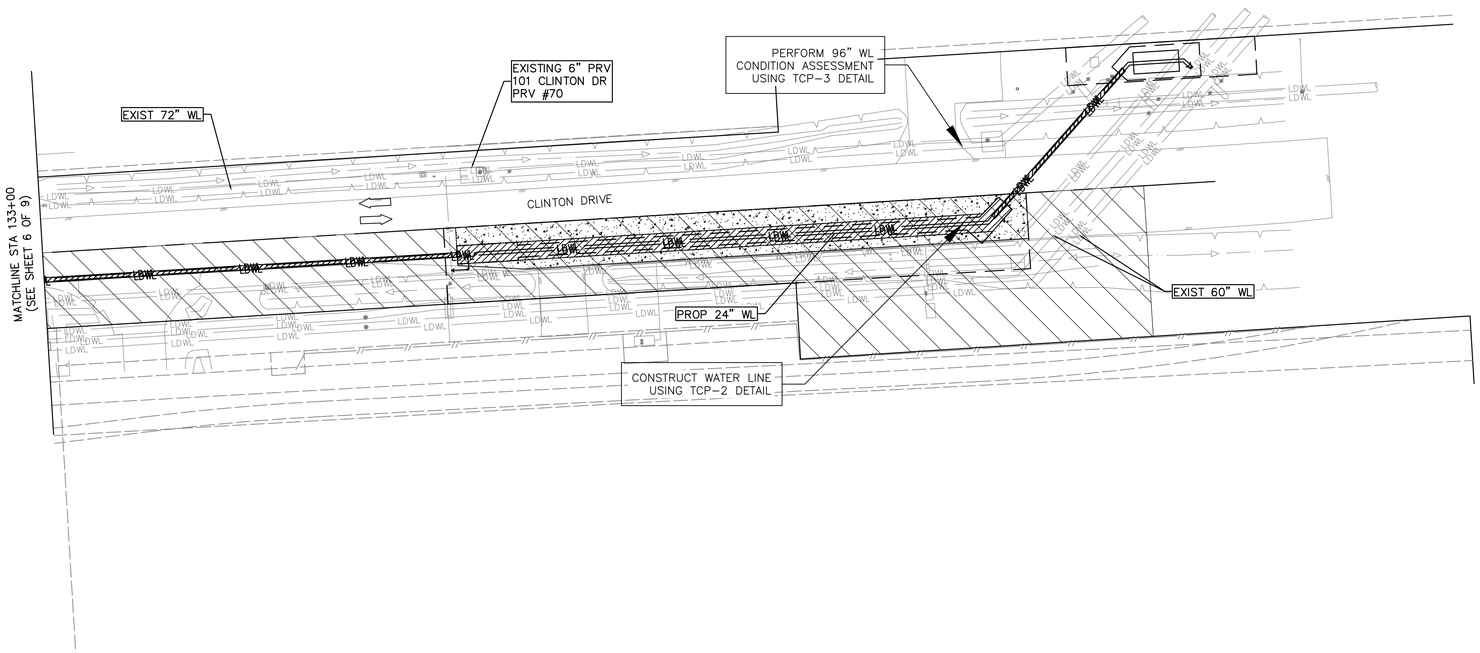
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 6 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 170 OF 204	

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N

0' 50' 100'

HORIZ:1"=50'

NO.	DATE	REVISION	APP.

NOTE(S):

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LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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

SURVEYED BY:
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KUO & ASSOCIATES, LLC.
TX FIRM NO. F-4578

CITY OF HOUSTON

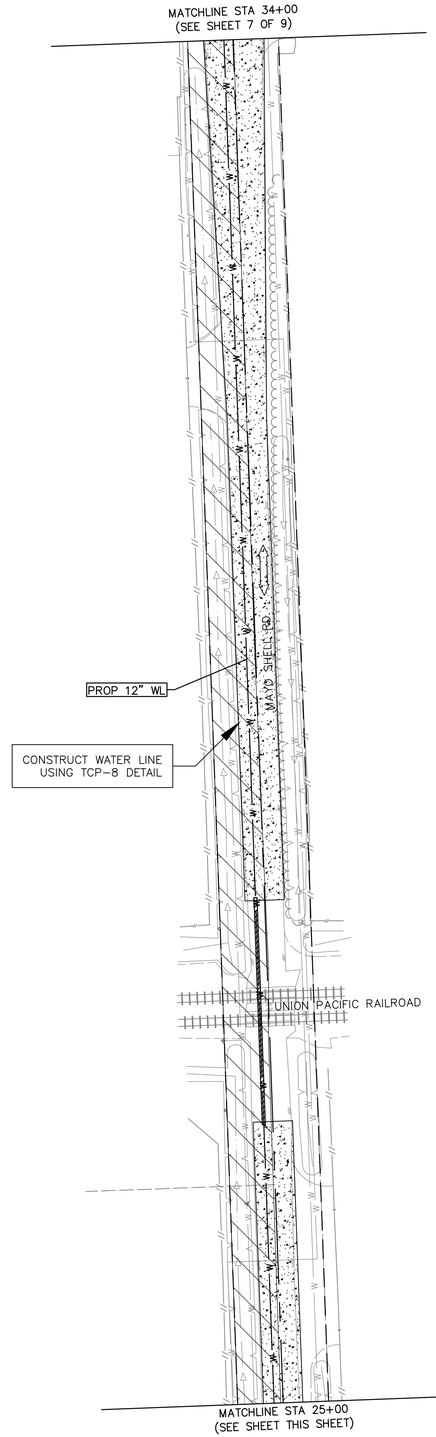
HOUSTON PUBLIC WORKS

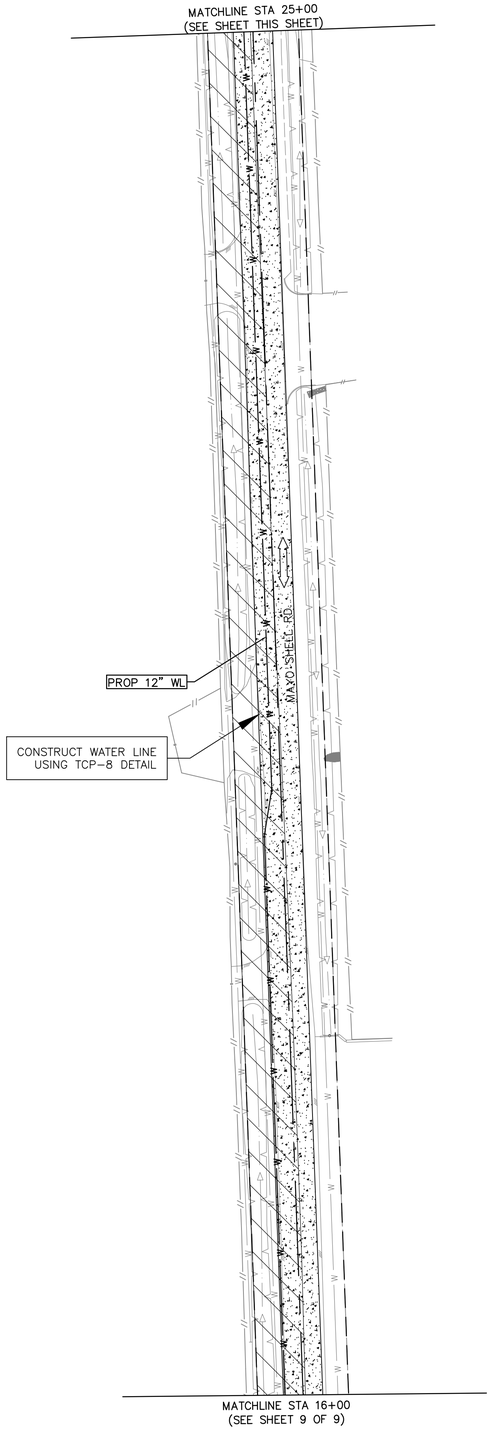
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

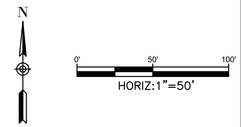
TRAFFIC CONTROL PLAN PHASE II (SHEET 7 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 171 OF 204	

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NO.	DATE	REVISION	APP.

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LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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

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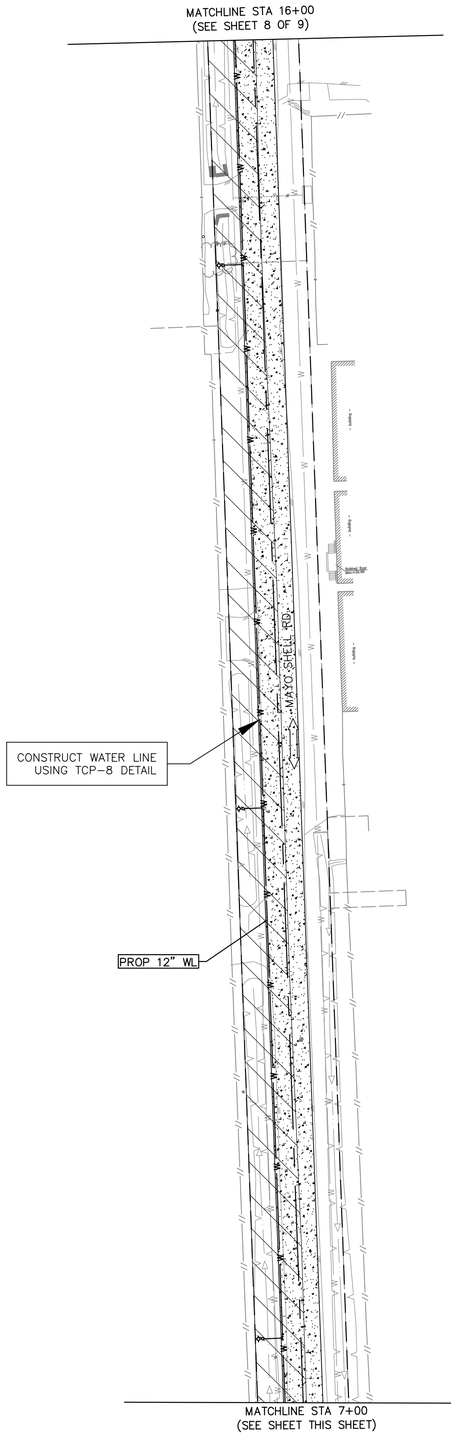
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

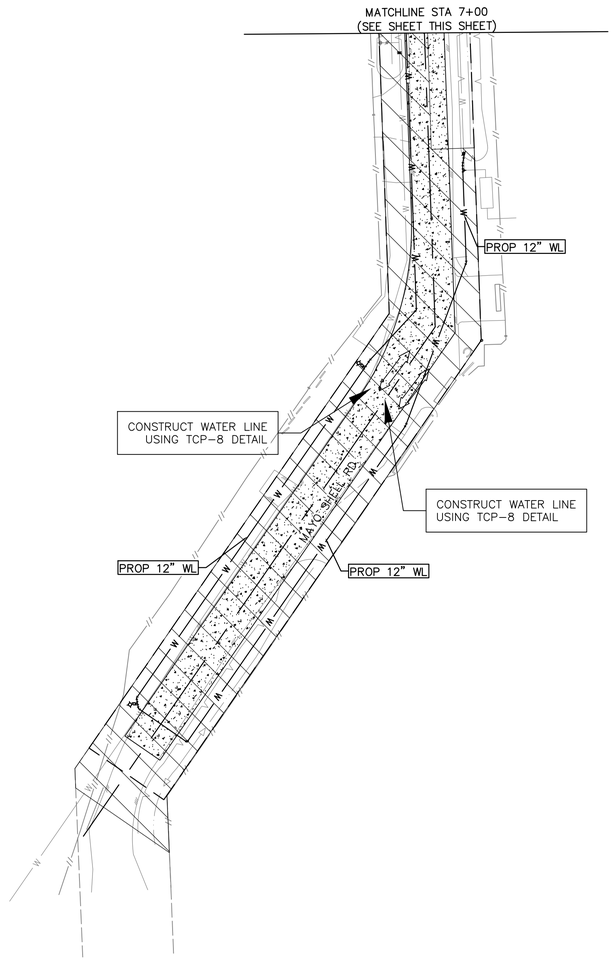
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

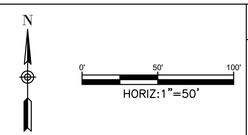
TRAFFIC CONTROL PLAN PHASE II (SHEET 8 OF 9)

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H: 1"=50'	
CITY OF HOUSTON PM	
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SHEET NO. 172 OF 204	

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NO.	DATE	REVISION	APP.

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LEGEND

WORK ZONE

TRAFFIC FLOW DIRECTION

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

SURVEYED BY:
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FB NO.

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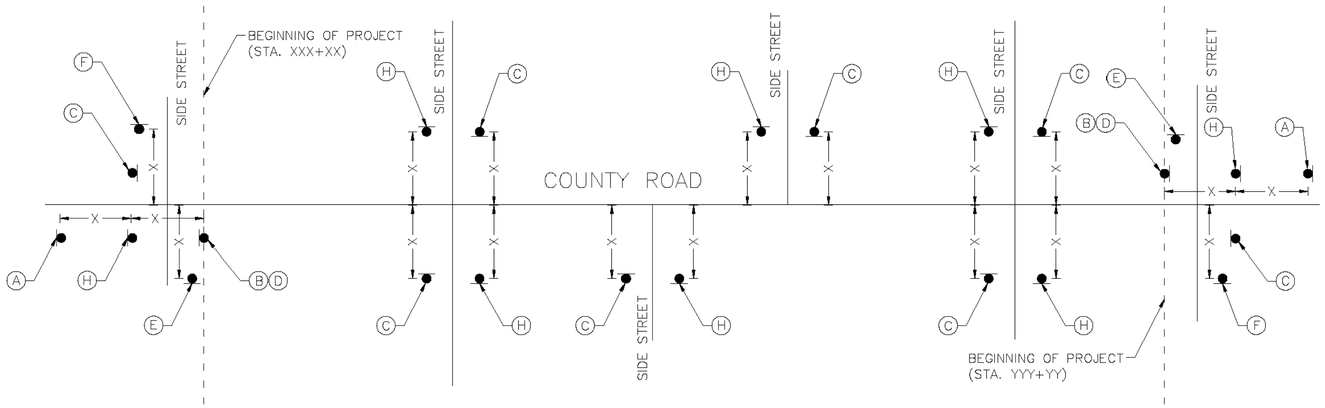
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN PHASE II (SHEET 9 OF 9)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=50'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 173 OF 204	

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WORK ZONE SIGNS

(A) OBEY WARNING SIGNS STATE LAW — R20-3T

(B) ROAD WORK NEXT YY MILES — G20-1

(C) END ROAD WORK — G20-2

(D) NAME ADDRESS CITY STATE CONTRACTOR — G20-6

(E) ROAD WORK NEXT YY MILES → — G20-1br

(F) ROAD WORK ← NEXT YY MILES — G20-1bl

(G) ROAD WORK ← NEXT XX MILES NEXT YY MILES → — G20-1a

(H) ROAD WORK AHEAD — CW20-1D

XX MPH — CW13-1P (SEE NOTE 2)

TRAFFIC CONTROL PLAN SECTION SHALL BE COMPLETED BY ENGINEER

ROADWAY	POSTED SPEED	TAPER LENGTH	SPACING CHANNELIZING DEVICES		SIGN SPACING	BUFFER SPACE
			TAPER	TANGENT		

LEGEND

	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths "L" * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "A" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

GENERAL NOTES

1. Flags attached to signs where shown are OPTIONAL.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol are OPTIONAL.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. Contractor shall provide and install traffic control devices in conformance with part VI of Texas Manual on Uniform Traffic Control Devices (TMUTCD – Latest edition with revisions) during construction.
7. No lanes shall be blocked from 7am to 9am and 4pm to 6:30pm Monday thru Friday.
8. Off duty uniformed law enforcement officers/flaggers are required to direct traffic when applicable.
9. If project is within 400 feet from a signalized intersection, the Contractor shall contact Harris County Engineering Department, Traffic Signal Maintenance at (713) 881-3210 five (5) days prior to the start of construction.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

HARRIS COUNTY ENGINEERING DEPARTMENT

CONSULTANT LOGO (LAYER "C-NON-PRINT")

ENGINEERS SEAL (LAYER "C-NON-PRINT")

PROJECT TITLE:

SHEET DESCRIPTION: TRAFFIC CONTROL PLAN (PROJECT APPROACH SIGNING)

TRAFFIC STANDARD: TCP-PAS

DRAWN BY: BSH | CK'D BY: BSH | SCALE: NONE | DATE: 10/10/23 | SHEET NO: /

NO.	REVISION	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

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KUO & ASSOCIATES, LLC. TX FIRM NO. F-4578

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FB NO.

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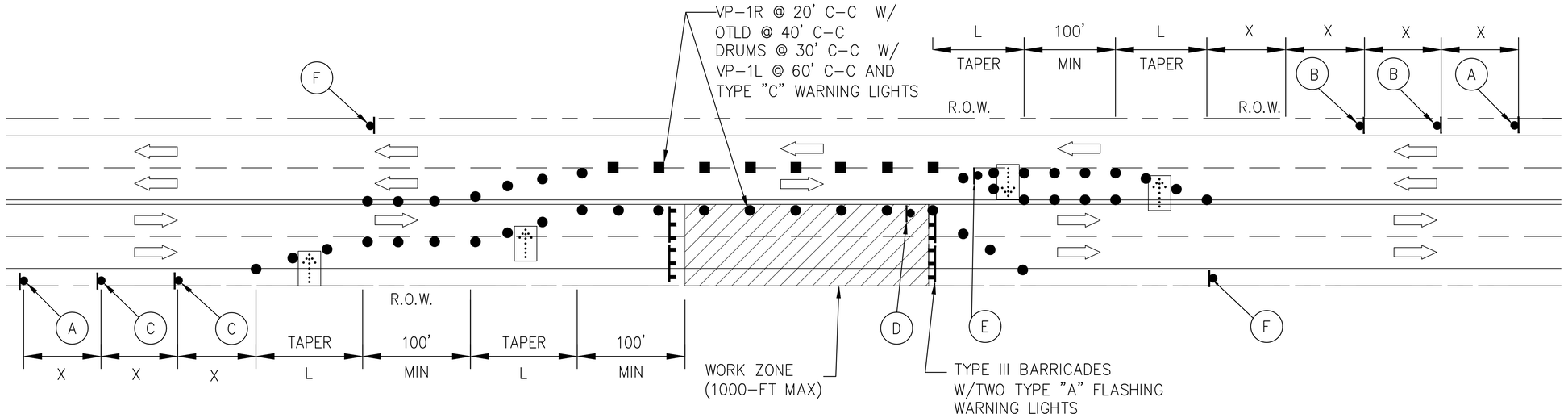
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN TCP-1

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 174 OF 204	

J:\Engineering Specs\HC Standard Traffic Drawings-Master File\2023 Update Standard Traffic Drawings\5-Traffic Control Plan\TCP-PAS_23.10.10.dwg

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ROLLING CLOSURE EASTBOUND (TCP-2)

NOTES:

A. SEE SHEET# 1 FOR TRAFFIC CONTROL GENERAL NOTES

LEGEND

- WORK ZONE
- SIGN ON POST
- TRAFFIC FLOW DIRECTION
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- CHANNELIZING DEVICE

NO.	DATE	REVISION	APP.

A	B	C	D	E	F
UTILITY WORK AHEAD	LEFT LANE CLOSED / AHEAD	RIGHT LANE CLOSED / AHEAD			END ROAD WORK
CW21-7D 48 X 48	CW20-5L 48 X 48 PLAQUE 30 X 12	CW20-5R 48 X 48 PLAQUE 30 X 12	CW1-4R 30 X 30	CW1-6aT 30 X 30	G20-2a 48 X 24

8"-12"	8"-12"	CHEVRON	CHEVRON		MOUNTING HOLES FOR VERTICAL PANEL OR CHEVRON
VP-1L	VP-1R	CW1-8L 18 x 24	CW1-8R 18 x 24	TYPE III BARRICADE	36" PLASTIC DRUM

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 WESTOFFICE DR. SUITE 800
HOUSTON, TX 77042
PHONE: 713-975-8769
TX ENGR. FIRM NO.: F-4578
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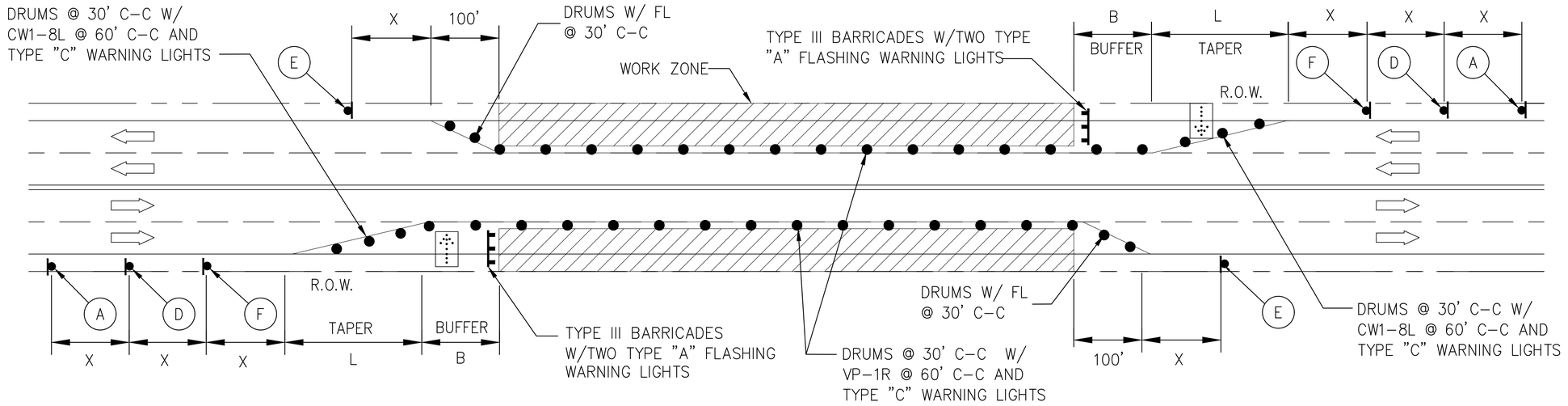
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LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

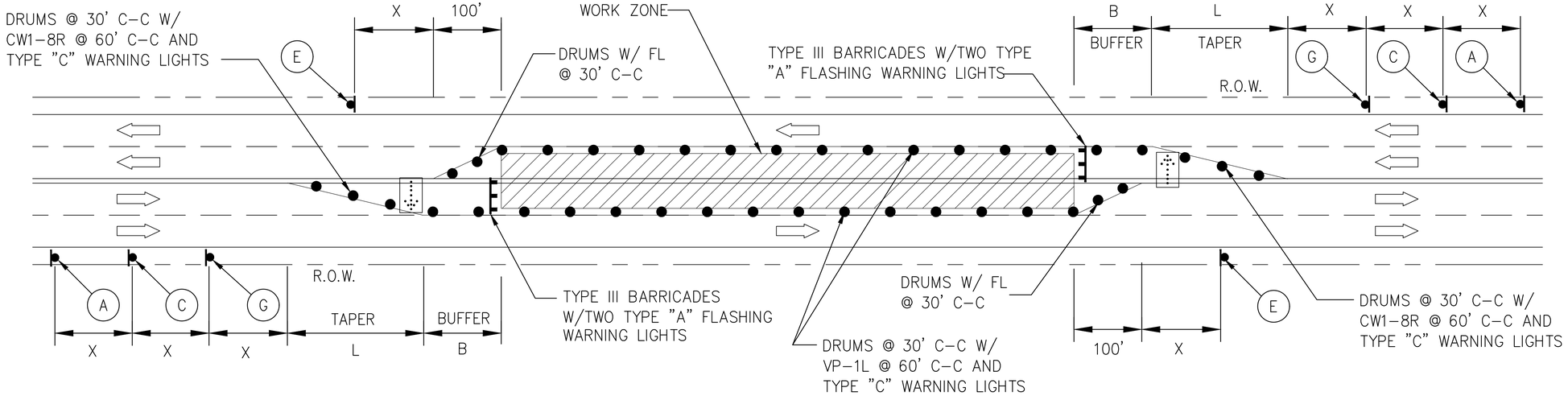
TRAFFIC CONTROL PLAN
TCP-2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 175 OF 204	

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TYPICAL TRAFFIC CONTROL PLAN FOR EXTERIOR LANES CLOSURE (TCP-3)



TYPICAL TRAFFIC CONTROL PLAN FOR INTERIOR LANES CLOSURE (TCP-4)

A	C	D	E	F	G						
UTILITY WORK AHEAD	LEFT LANE CLOSED / AHEAD	RIGHT LANE CLOSED / AHEAD	END ROAD WORK			8"-12"	8"-12"	CHEVRON	CHEVRON		MOUNTING HOLES FOR VERTICAL PANEL OR CHEVRON
CW21-7D 48 X 48	CW20-5L 48 X 48 PLAQUE 30 X 12	CW20-5R 48 X 48 PLAQUE 30 X 12	G20-2a 48 X 24	CW4-2R 36 X 36	CW4-2L 36 X 36	VP-1L	VP-1R	CW1-8L 18 x 24	CW1-8R 18 x 24	TYPE III BARRICADE	36" PLASTIC DRUM

NOTES:

A. SEE SHEET# 1 FOR TRAFFIC CONTROL GENERAL NOTES

LEGEND

- WORK ZONE
- SIGN ON POST
- TRAFFIC FLOW DIRECTION
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- CHANNELIZING DEVICE

NO.	DATE	REVISION	APP.

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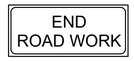
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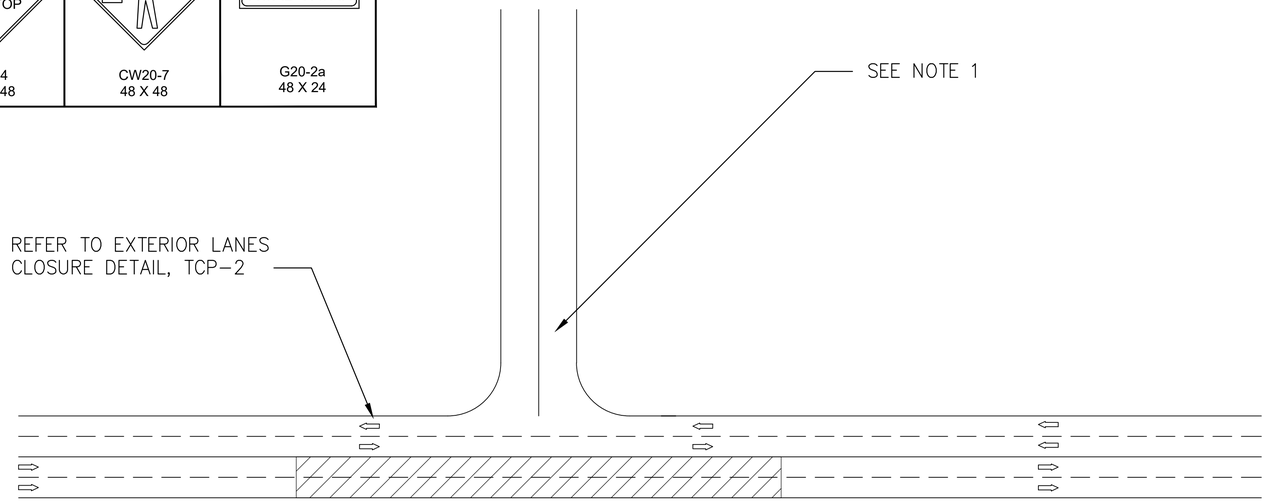
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
TRAFFIC CONTROL PLAN
TCP-3 & TCP-4

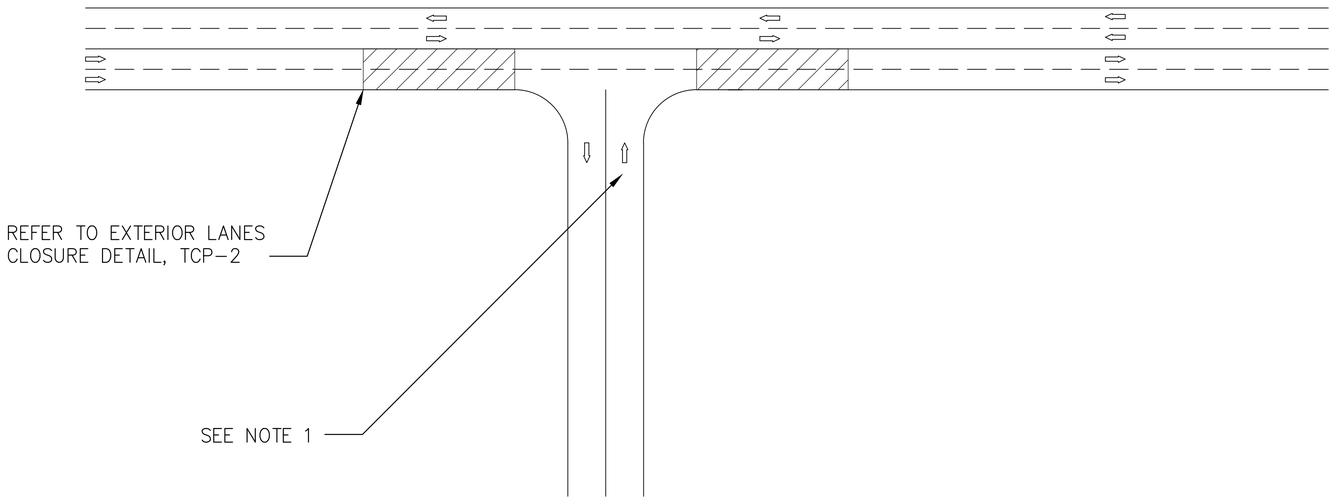
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S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 176 OF 204	

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A	B	C	D	E
M4-2T 6 X VARIES STREET NAME *				
				
CW21-7D 48 X 48	CW20-4 48 X 48	W3-4 48 X 48	CW20-7 48 X 48	G20-2a 48 X 24



TYPICAL 3-WAY INTERSECTION LANE CLOSURE (TCP-5)



TYPICAL 3-WAY INTERSECTION LANE CLOSURE (TCP-6)

NO.	DATE	REVISION	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

SURVEYED BY:
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FB NO.

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TEXAS REG. NO.: 111684

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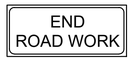
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE &
VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN
TCP-5 & TCP-6

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 177 OF 204	

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A	B	C	D	E
M4-2T 6 X VARIES STREET NAME *				
				
CW21-7D 48 X 48	CW20-4 48 X 48	W3-4 48 X 48	CW20-7 48 X 48	G20-2a 48 X 24

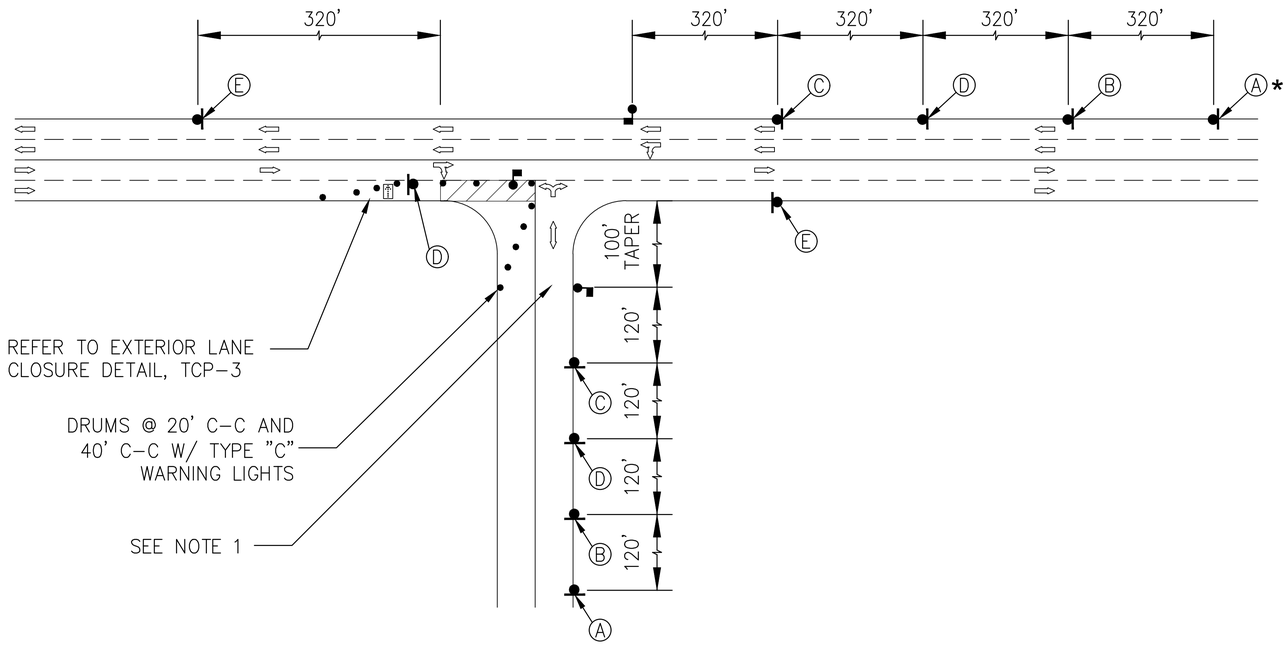
NOTES:

1. UNIFORMED PEACE OFFICERS TO ASSIST WITH TRAFFIC MOVEMENTS AT INTERSECTION.

NO.	DATE	REVISION	APP.

LEGEND

- WORK ZONE
- SIGN ON POST
- TRAFFIC FLOW DIRECTION
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- CHANNELIZING DEVICE



TYPICAL 3-WAY INTERSECTION LANE CLOSURE (TCP-7)

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

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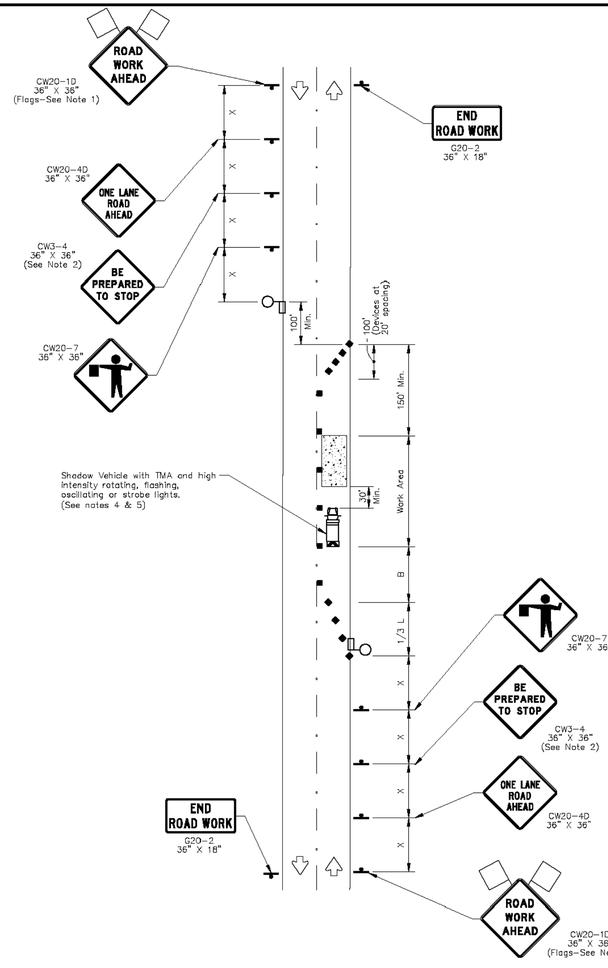
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

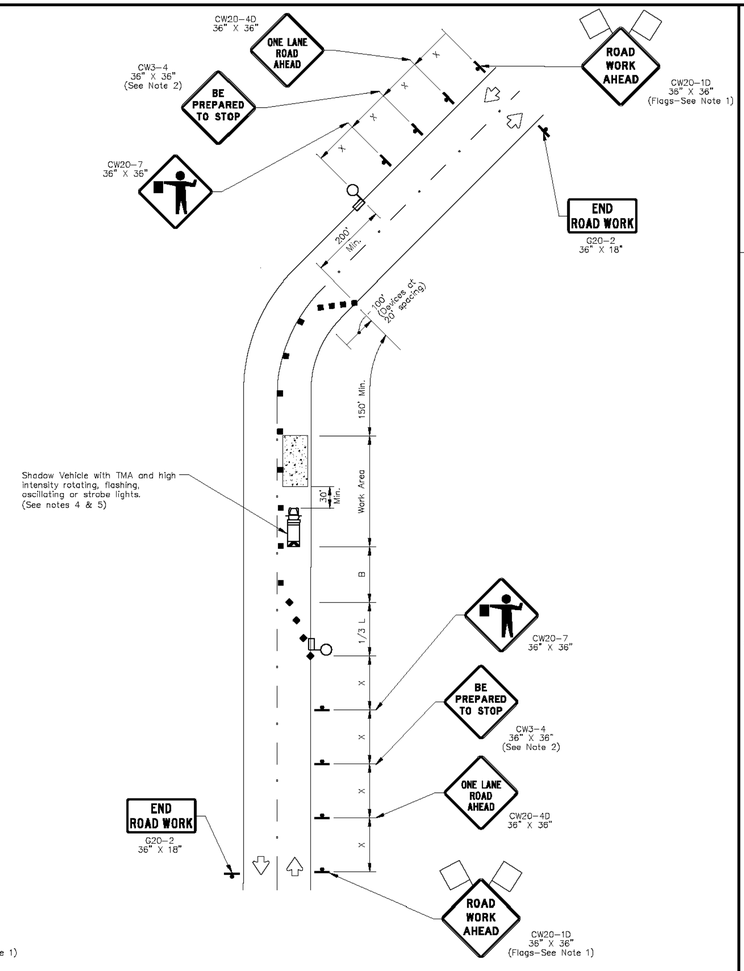
TRAFFIC CONTROL PLAN
TCP-7

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
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ONE-LANE TWO-WAY SINGLE LANE CLOSURE
CONTROL WITH FLAGGERS
(ON STRAIGHT SECTION OF ROADWAY)



ONE-LANE TWO-WAY SINGLE LANE CLOSURE
CONTROL WITH FLAGGERS
(ON CURVED SECTION OF ROADWAY)

TRAFFIC CONTROL PLAN SECTION SHALL BE COMPLETED BY ENGINEER

ROADWAY	POSTED SPEED	TAPER LENGTH	SPACING CHANNELIZING DEVICES		SIGN SPACING	BUFFER SPACE
			TAPER	TANGENT		

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * "L"			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing * "A" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

GENERAL NOTES

1. Flags attached to signs where shown are OPTIONAL.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol are OPTIONAL.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. Contractor shall provide and install traffic control devices in conformance with part VI of Texas Manual on Uniform Traffic Control Devices (TMUTCD – Latest edition with revisions) during construction.
7. Flaggers should use two-way radios or other methods of communication to control traffic.
8. Length of work space should be based on the ability of flaggers to communicate.
9. If the work space is located near horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distances to the flagger and a queue of stopped vehicles (see table above).
10. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.
12. No lanes shall be blocked from 7am to 9am and 4pm to 6:30pm Monday thru Friday.
13. Off duty uniformed law enforcement officers required to direct traffic when applicable.
14. If project is within 400 feet from a signalized intersection, the Contractor shall contact Harris County Engineering Department, Traffic Signal Maintenance at (713) 881-3210 five (5) days prior to the start of construction.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

HARRIS COUNTY ENGINEERING DEPARTMENT

FOR INTERIM REVIEW ONLY

DOCUMENT INCOMPLETE:
NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES

ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: TRAFFIC CONTROL PLAN (ONE-LANE, TWO-WAY OPERATION)

TRAFFIC STANDARD: TCP-12

DRAWN BY: BSH
CK'D BY: BSH
SCALE: NONE
DATE: 10/10/23
SHEET NO:

NO.	REVISION	APP.

NO.	DATE

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

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TRAFFIC CONTROL PLAN
TCP-8

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
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SHEET NO. 179 OF 204	

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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.

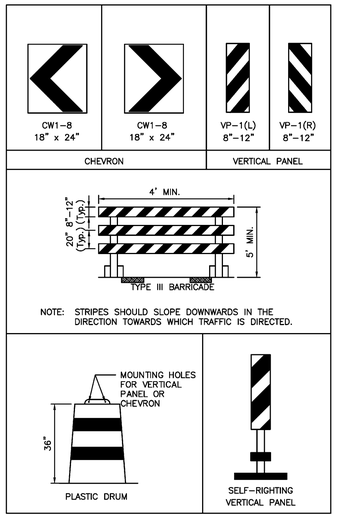
J. SPACING MAY BE ADJUSTED TO PROVIDE DRIVEWAYS, INTERSECTIONS AND /OR MEDIAN OPENINGS.

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" 10' OFFSET	11' OFFSET	12' OFFSET	SUGGESTED MAXIMUM SPACING OF DEVICE 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

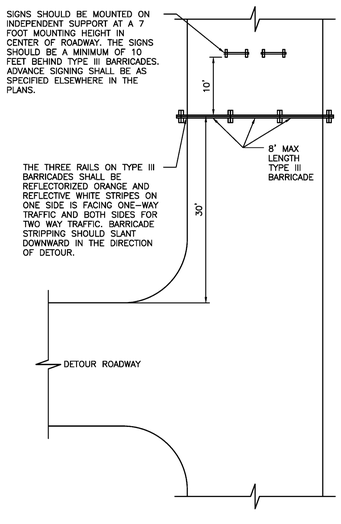
POSTED SPEED (MPH)	DISTANCE "D" (FEET)
30	200
35	250
40	305
45	360
50	425
55	495



CHANNELIZATION AND BARRICADES

LEGEND:

- SIGN
- FLAGGER
- APPROVED CHANNELIZATION DEVICE
- BARRICADE
- FLASHING ARROW PANEL
- AREA UNDER CONSTRUCTION
- EXISTING TRAVEL WAY
- TRAFFIC CONTROL PLAN DETOUR TRAVEL WAY



PLAN VIEW
TYPE III BARRICADE (POST AND SKID)
TYPICAL APPLICATION

APPROVED BY:	APPROVED BY:
DocuSigned by: Sukat Kunwar 9EF9B0C61F5479...	DocuSigned by: HANG NGUYEN 95A2EFDA7084C0...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock A92C41087253453...	
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

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
TRAFFIC CONTROL PLAN
COH STANDARD DETAILS
(SHEET 1 OF 2)

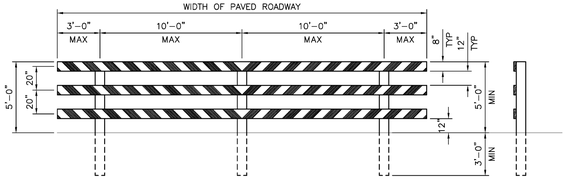
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DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 180 OF 204	

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 PURPOSE WHATSOEVER. THE CITY OF HOUSTON ISSUES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

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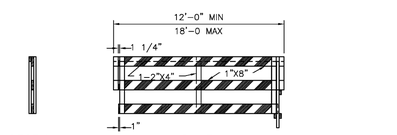
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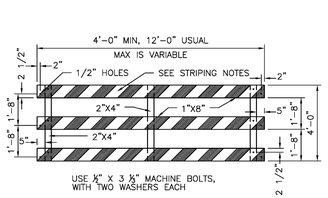


TYPE III BARRICADE FOR END OF ROAD

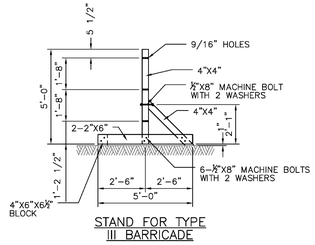
FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND RELFLECTIVE WHITE STRIPES ON SIDE FACING TRAFFIC



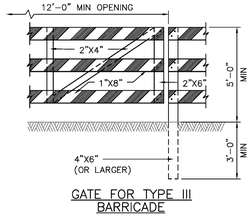
DEMOUNTABLE TYPE III BARRICADE



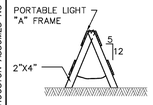
PANEL FOR TYPE III BARRICADE



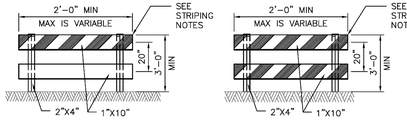
STAND FOR TYPE III BARRICADE



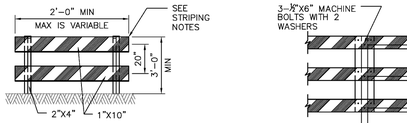
GATE FOR TYPE III BARRICADE



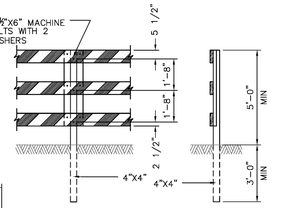
"A" FRAME



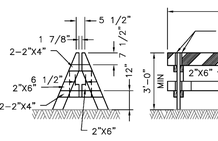
TYPE I



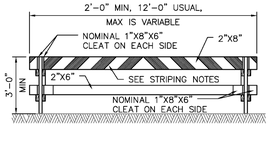
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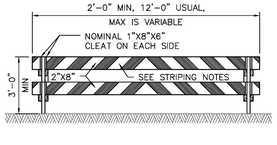
POST FOR TYPE III BARRICADE



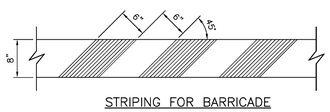
DEMOUNTABLE



TYPE I



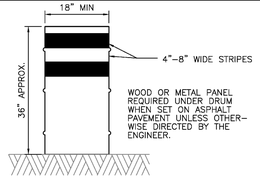
TYPE II



STRIPING FOR BARRICADE

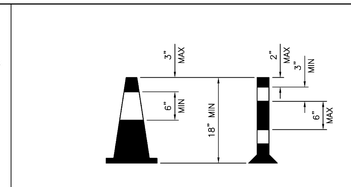
BARRICADE NOTES:

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.



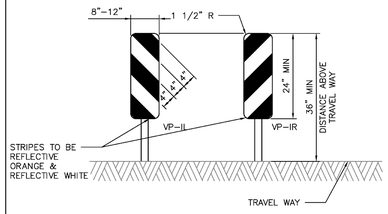
DRUMS

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.



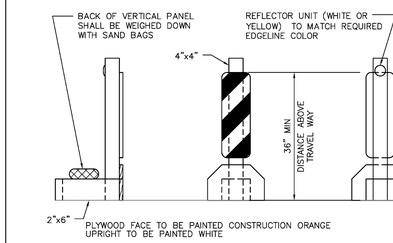
CONES

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.

NO.	DATE	REVISION	APP.

APPROVED BY:	APPROVED BY:
DocuSigned by: Sulad Kunwar	DocuSigned by: HANG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER

APPROVED BY:
DocuSigned by: Carl Haddock
DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: NOV-27-2023 | DWG NO: 01555-14

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

BARRICADE AND CHANNELIZING DEVICES

DRAWING SCALE
NOT TO SCALE

FOR CITY OF HOUSTON USE ONLY

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

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SUDHEER GOUD SANGAM, P.E.
TEXAS REG. NO.: 111684
ON 08/15/2025
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES.
KUO & ASSOCIATES, LLC
TX FIRM NO. F-4578

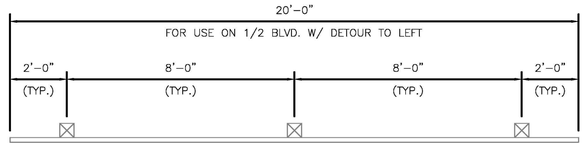
SURVEYED BY:
KUO & ASSOCIATES, LLC
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

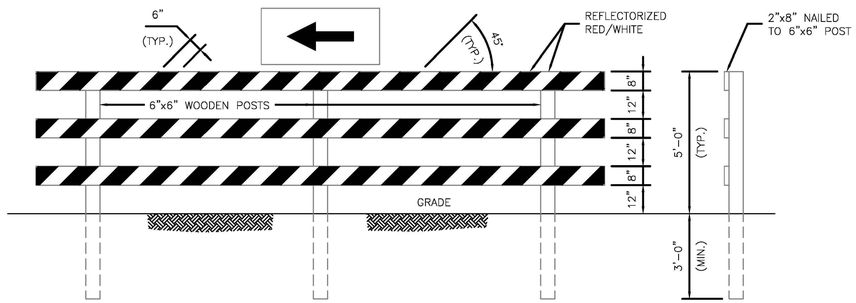
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3
TRAFFIC CONTROL PLAN
COH STANDARD DETAILS
(SHEET 2 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 181 OF 204	

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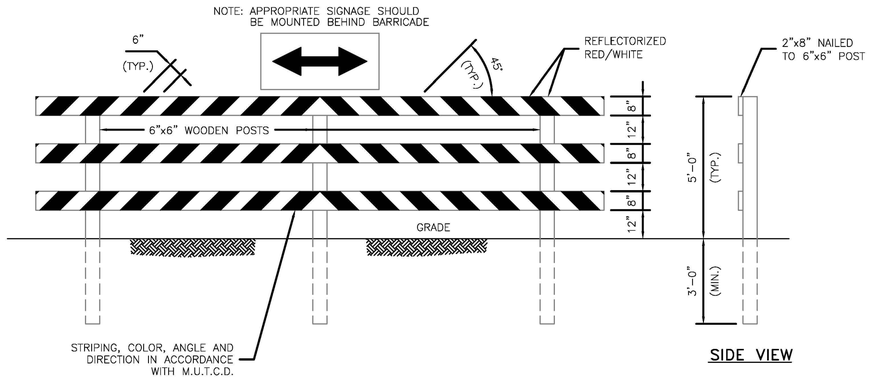


PLAN VIEW



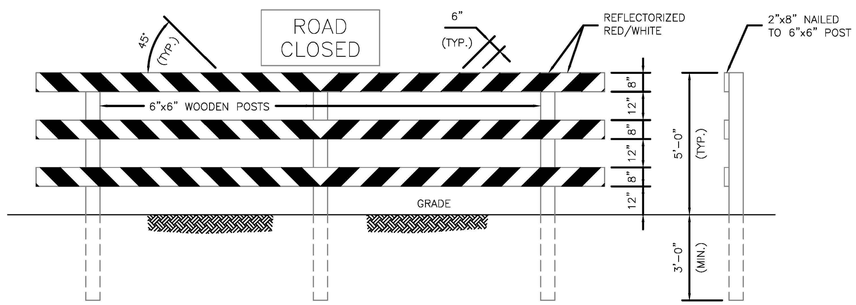
FRONT VIEW SIDE VIEW

DETOUR ROUTE



FRONT VIEW SIDE VIEW

T–INTERSECTION



FRONT VIEW SIDE VIEW

ROAD CLOSED – NO OUTLET

APPLICATION: PERMANENT AND SEMI–PERMANENT CLOSURE OF ROADWAY OR ROADWAY TERMINATION

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

HARRIS COUNTY
ENGINEERING DEPARTMENT

FOR INTERIM REVIEW ONLY

DOCUMENT INCOMPLETE:
NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES

ENGINEER: NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: TYPE III BARRICADE DETAILS

TRAFFIC STANDARD: T3B

DRAWN BY: JDZ

DATE: 8/18/17

CK'D BY: BSH

SCALE: 1" = 2'–0"

SHEET NO: /

NO.	DATE	REVISION	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

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FB NO.

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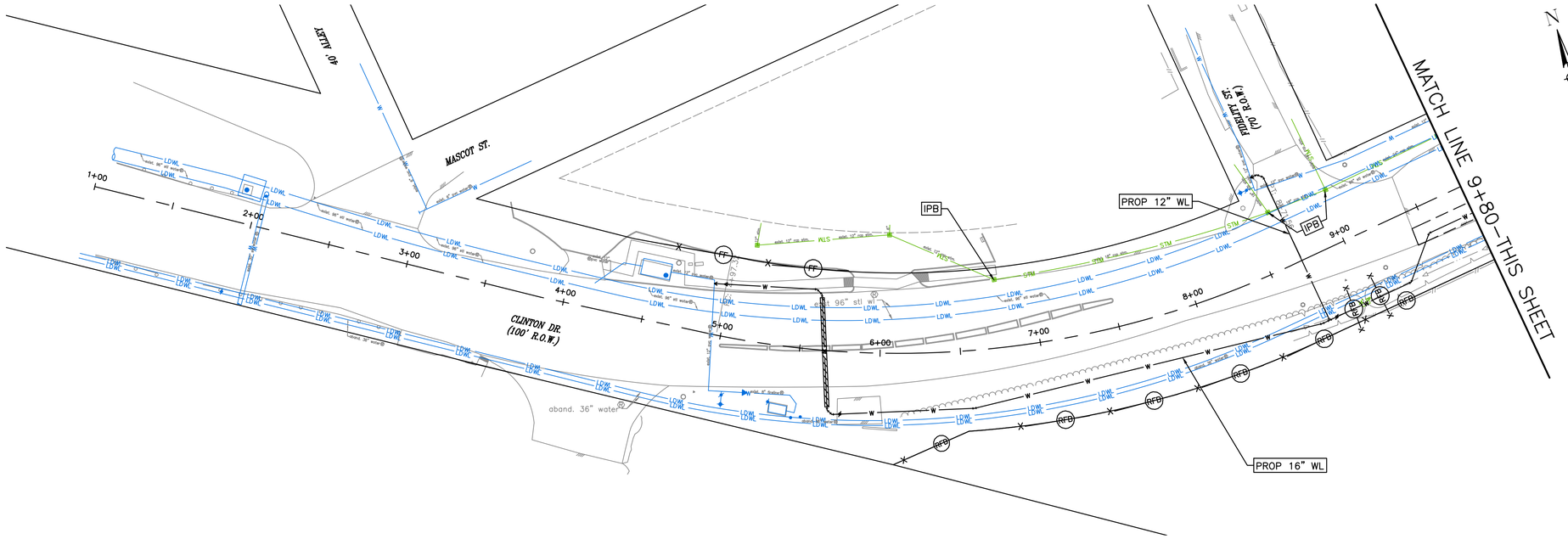
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

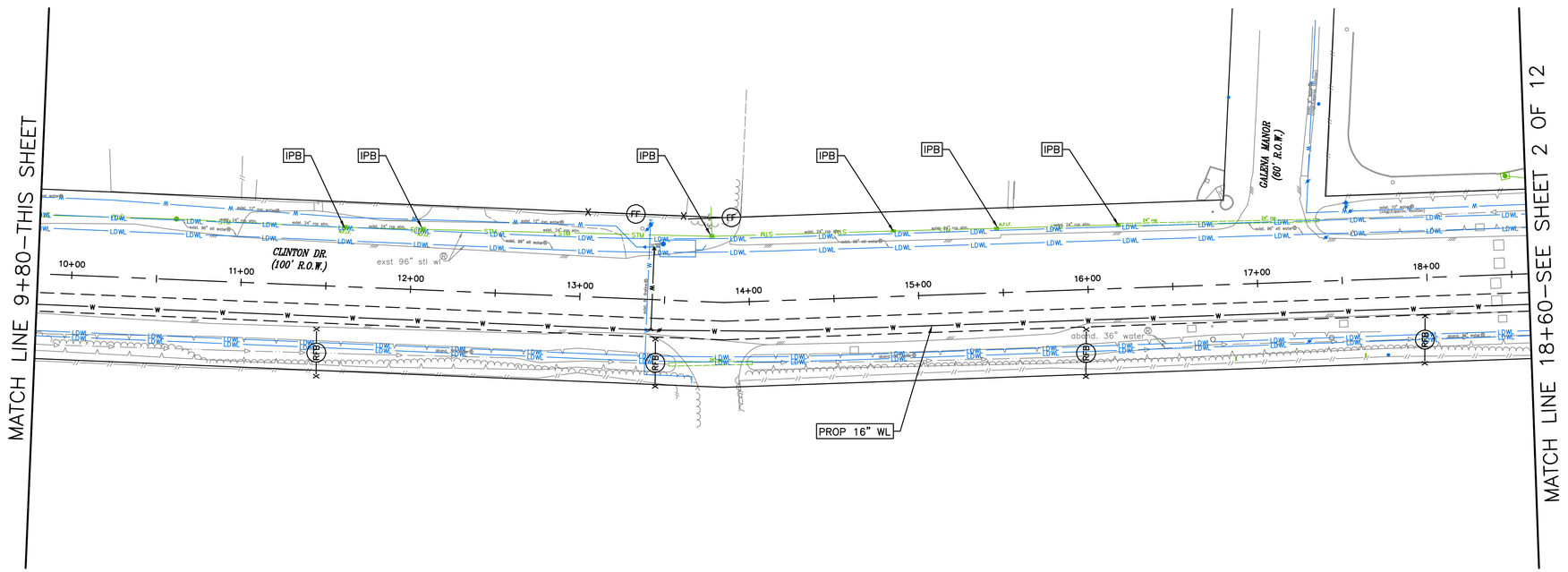
TRAFFIC CONTROL PLAN
HC STANDARD DETAILS
(SHEET 1 OF 1)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 182 OF 204	

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0' 20' 40' 80'
SCALE: 1"=40'

N

LEGEND:

- X—RFB—X REINFORCED FILTER FABRIC BARRIER
- X—FF—X FILTER FABRIC BARRIER
- IPB INLET PROTECTION BARRIER

NO.	DATE	REVISION	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

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

FOR INTERIM REVIEW ONLY

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

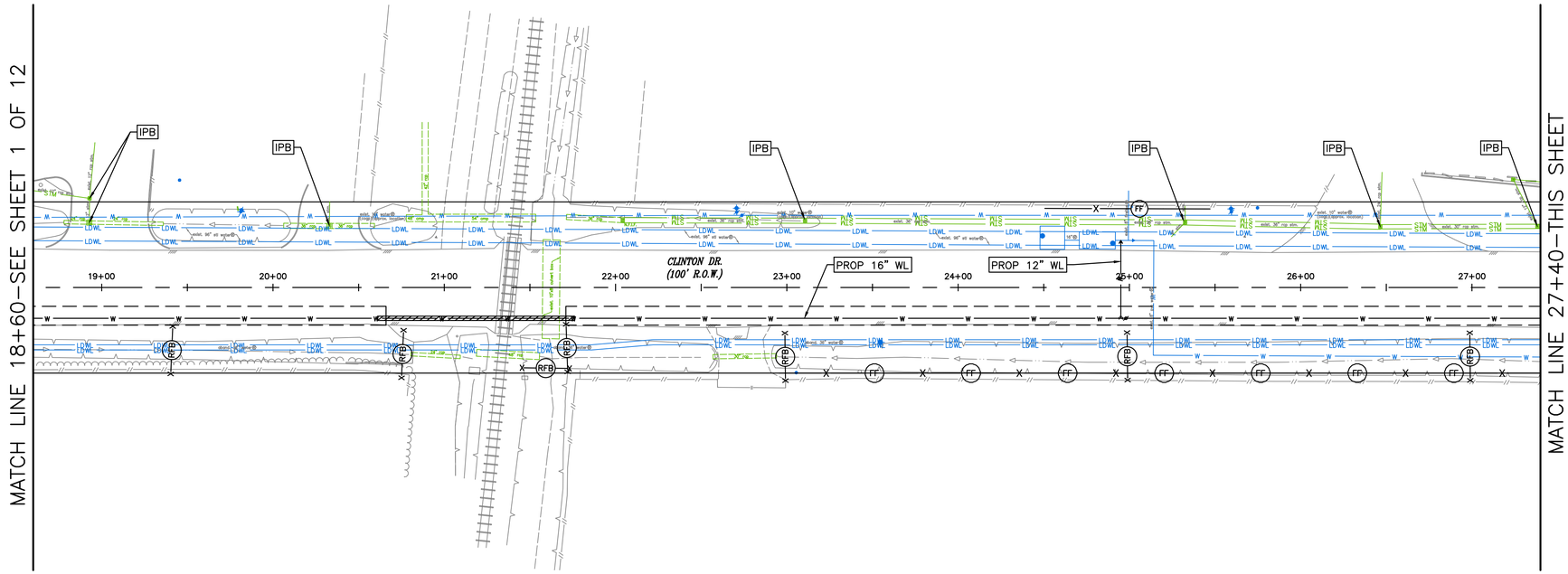
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

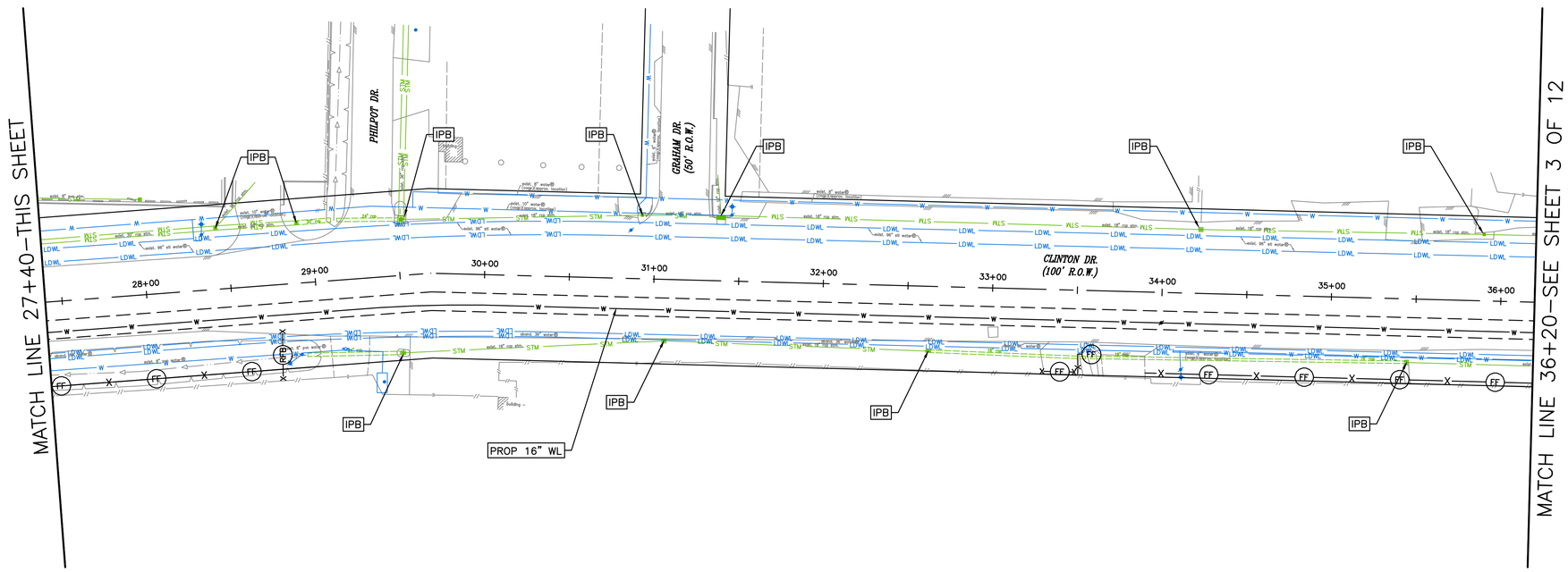
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (1 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 183 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

N

LEGEND:

- X—(RFB)—X REINFORCED FILTER FABRIC BARRIER
- X—(FF)—X FILTER FABRIC BARRIER
- [IPB] INLET PROTECTION BARRIER

NO.	DATE	REVISION	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

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832–865–4462
TBPE FIRM NO. F–21781

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

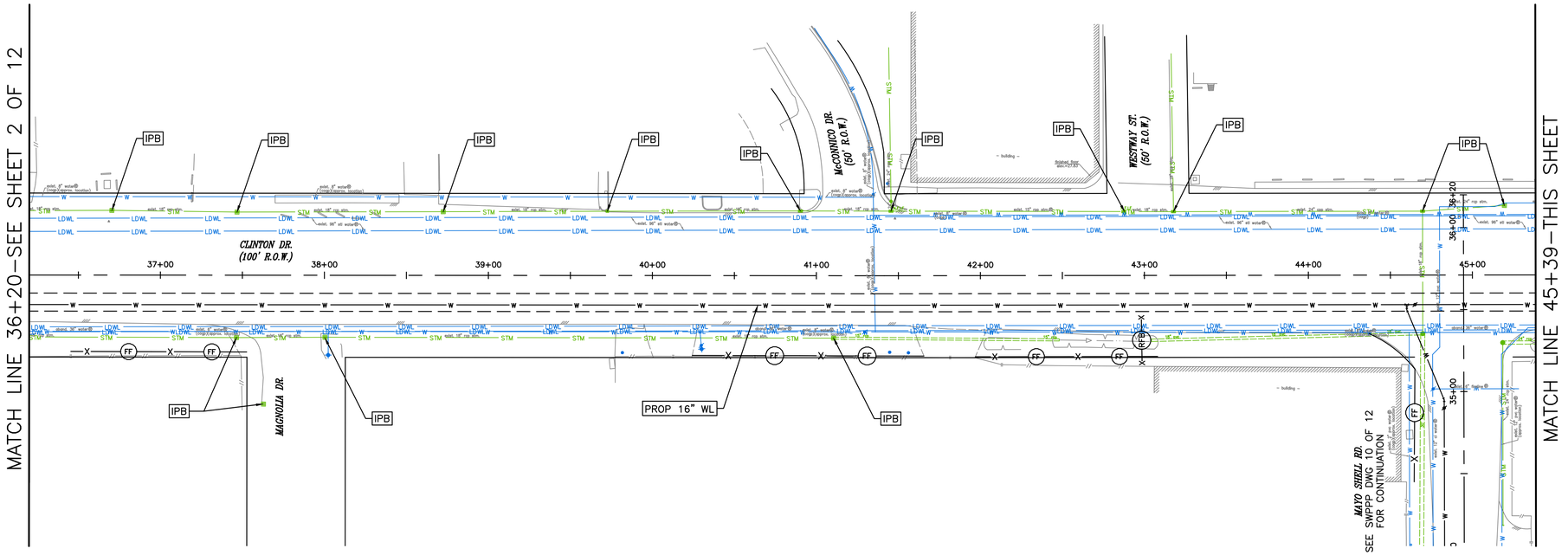
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

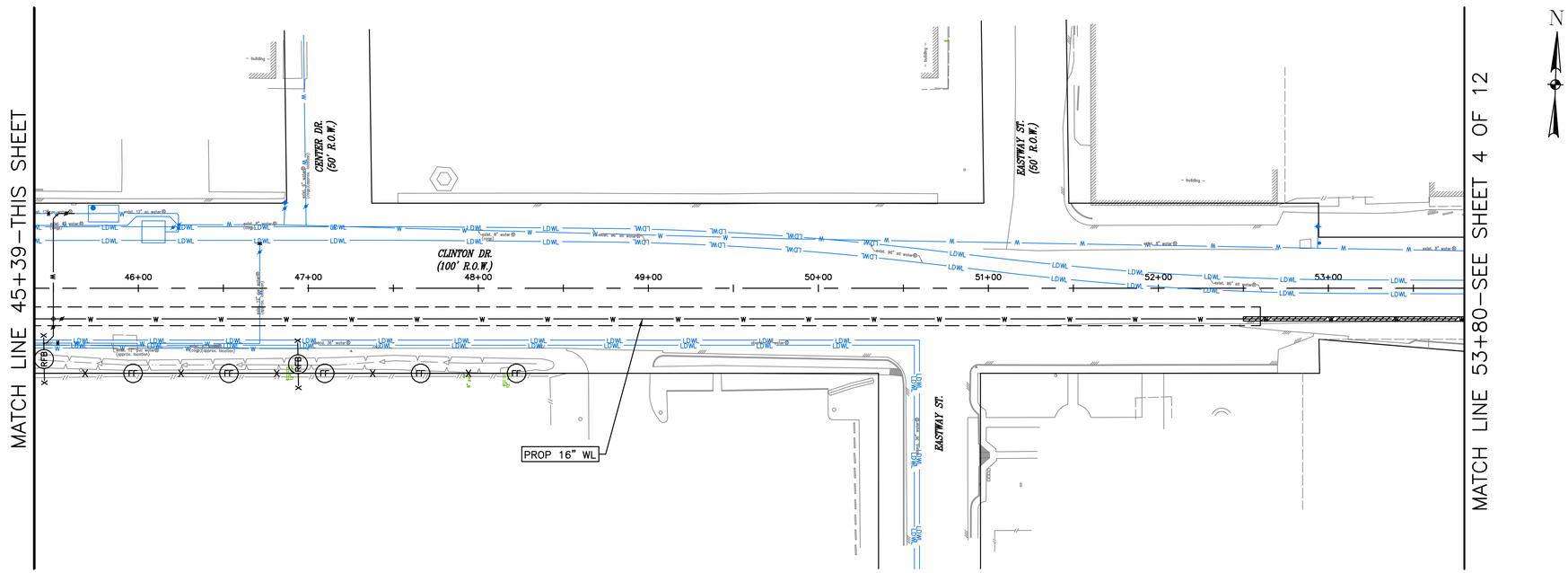
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (2 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 184 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

N

LEGEND:

- X—(RFB)—X REINFORCED FILTER FABRIC BARRIER
- X—(FF)—X FILTER FABRIC BARRIER
- [IPB] INLET PROTECTION BARRIER

NO.	DATE	REVISION	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

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832–865–4462
TBPE FIRM NO. F–21781

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

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

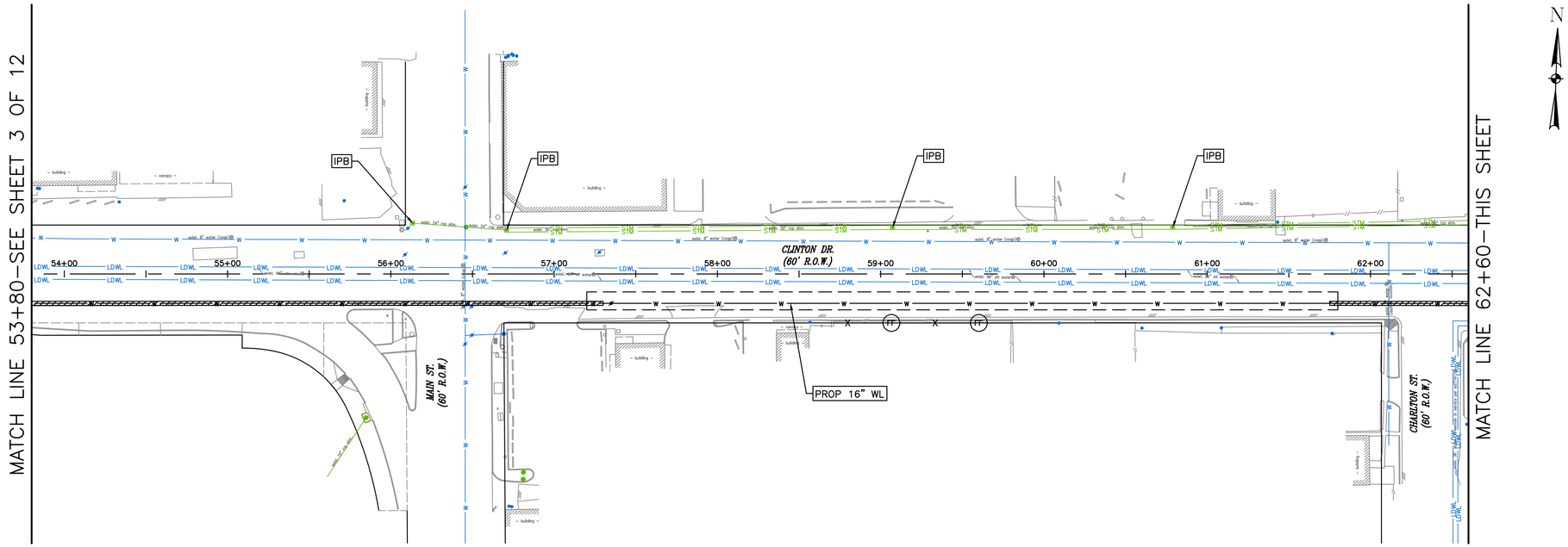
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

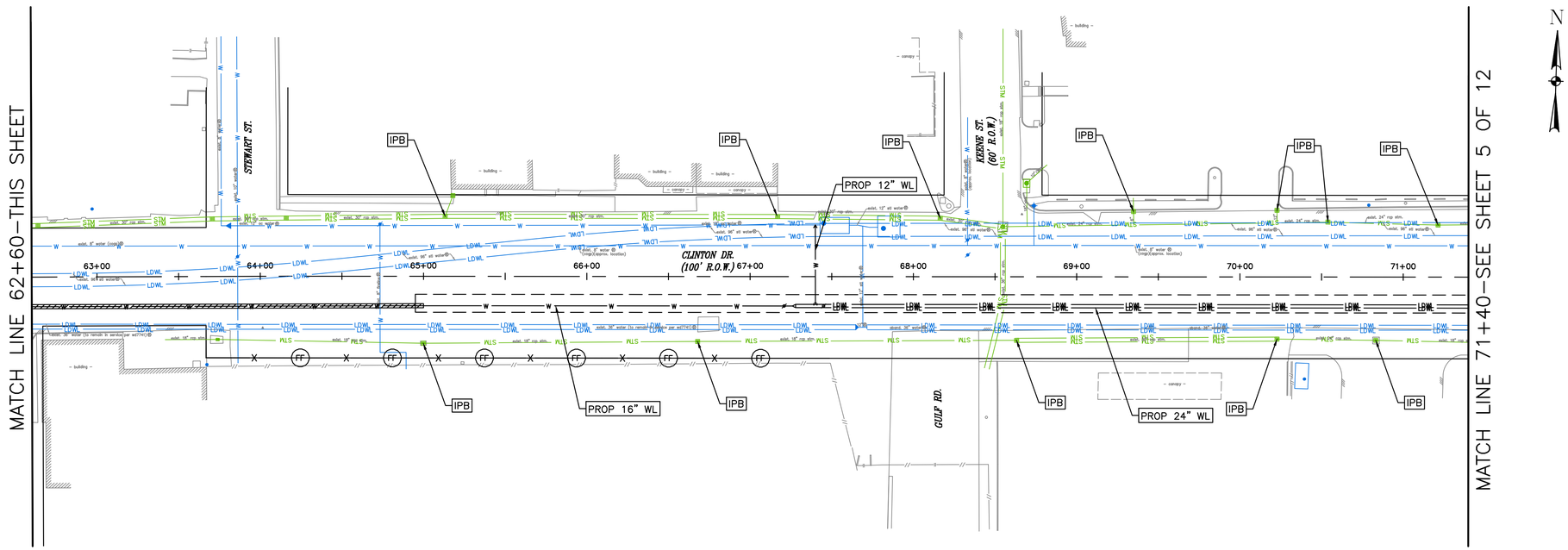
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (3 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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1"=40'	
CITY OF HOUSTON PM	
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SHEET NO. 185 OF 204	

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N

0' 20' 40' 80'
SCALE: 1"=40'

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ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

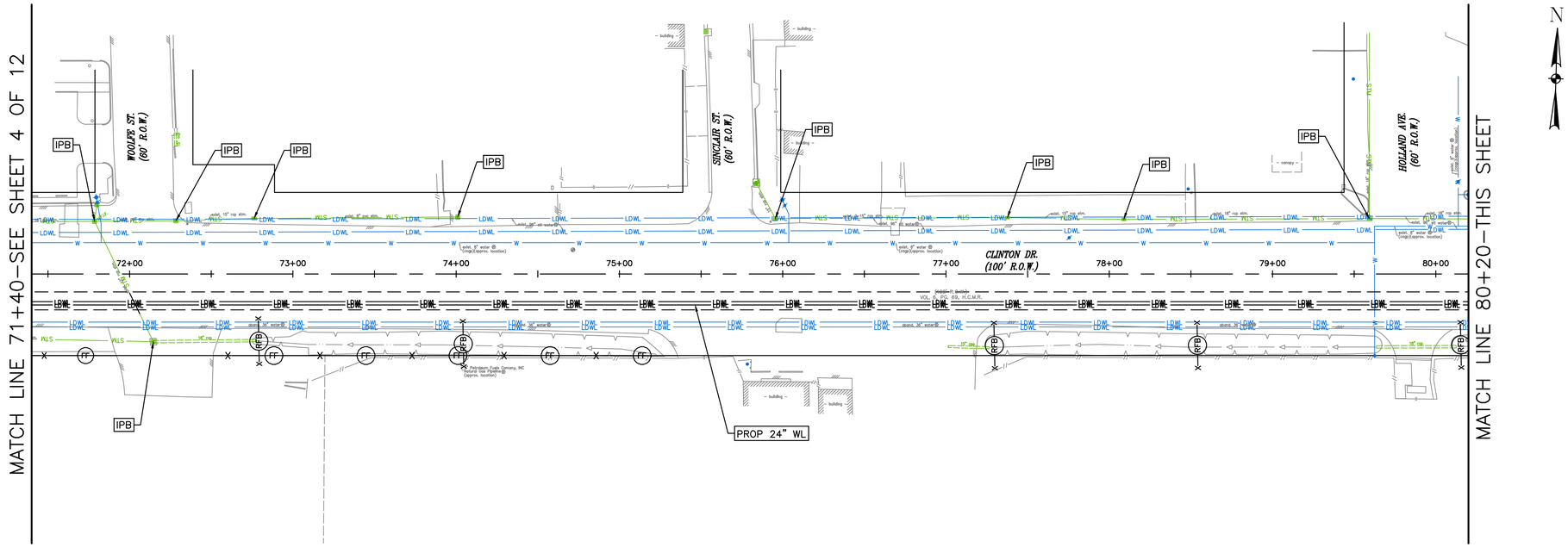
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HOUSTON PUBLIC WORKS

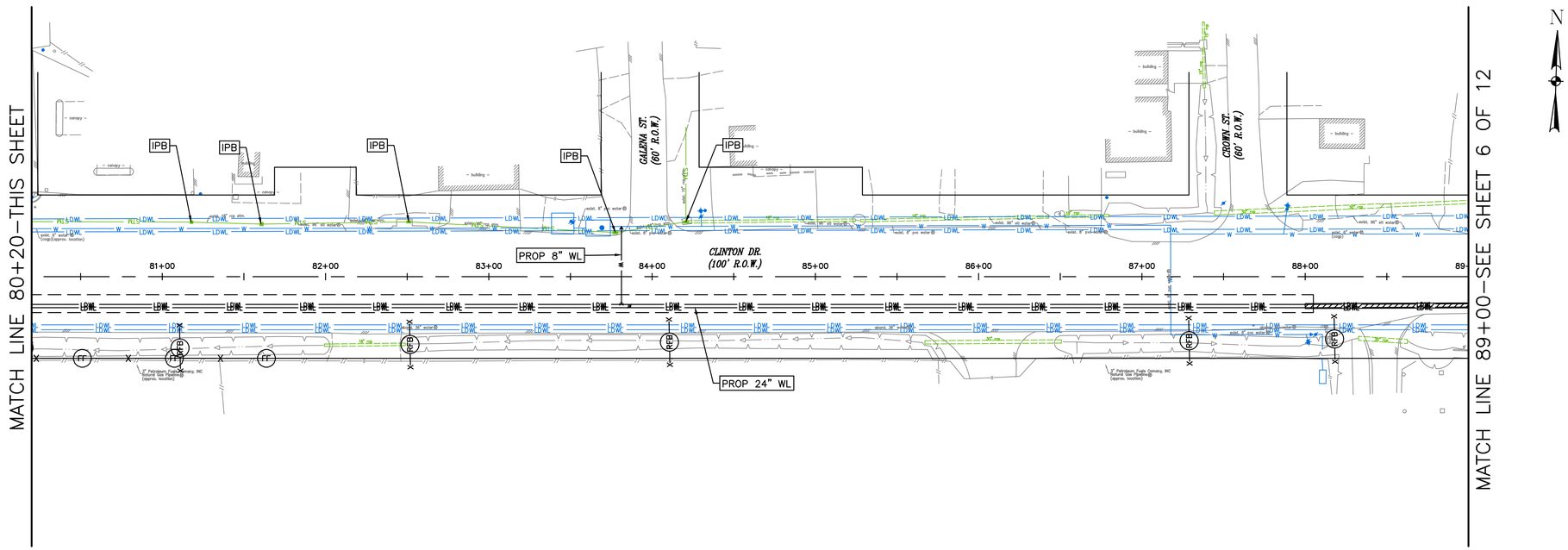
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (4 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 186 OF 204	

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0' 20' 40' 80'

SCALE: 1"=40'

NO.	DATE	REVISION	APP.

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- IPB INLET PROTECTION BARRIER

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ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
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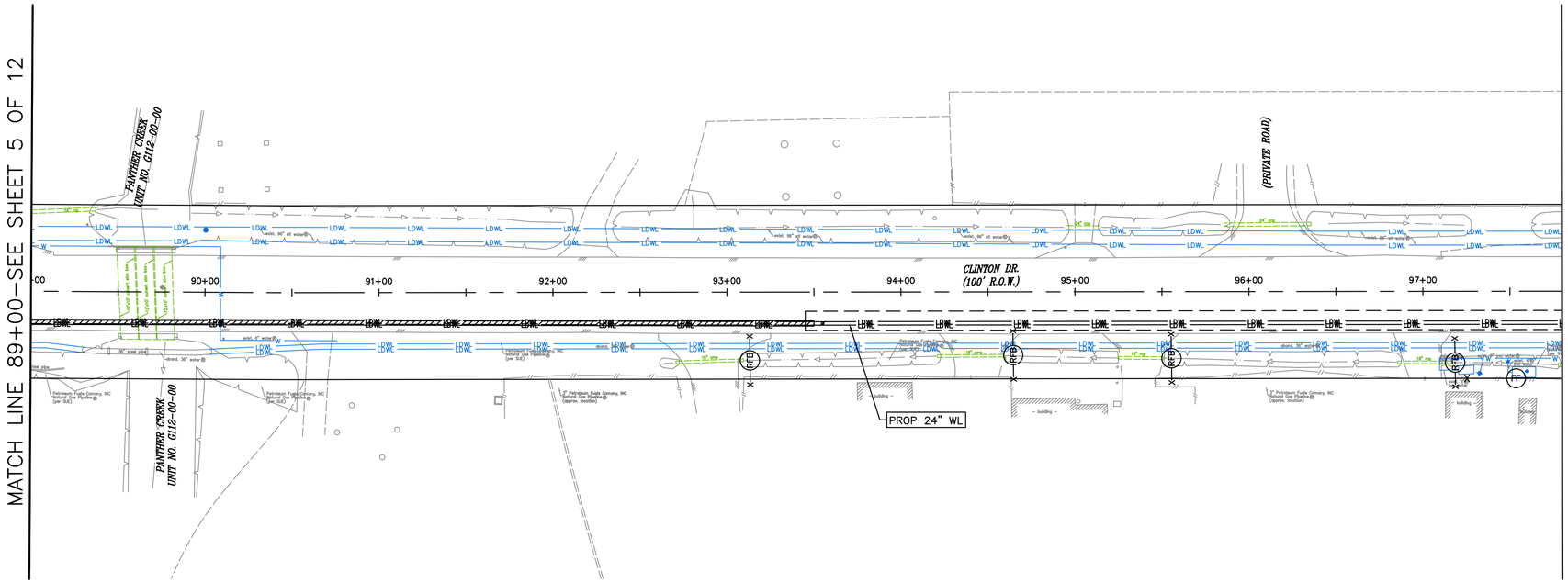
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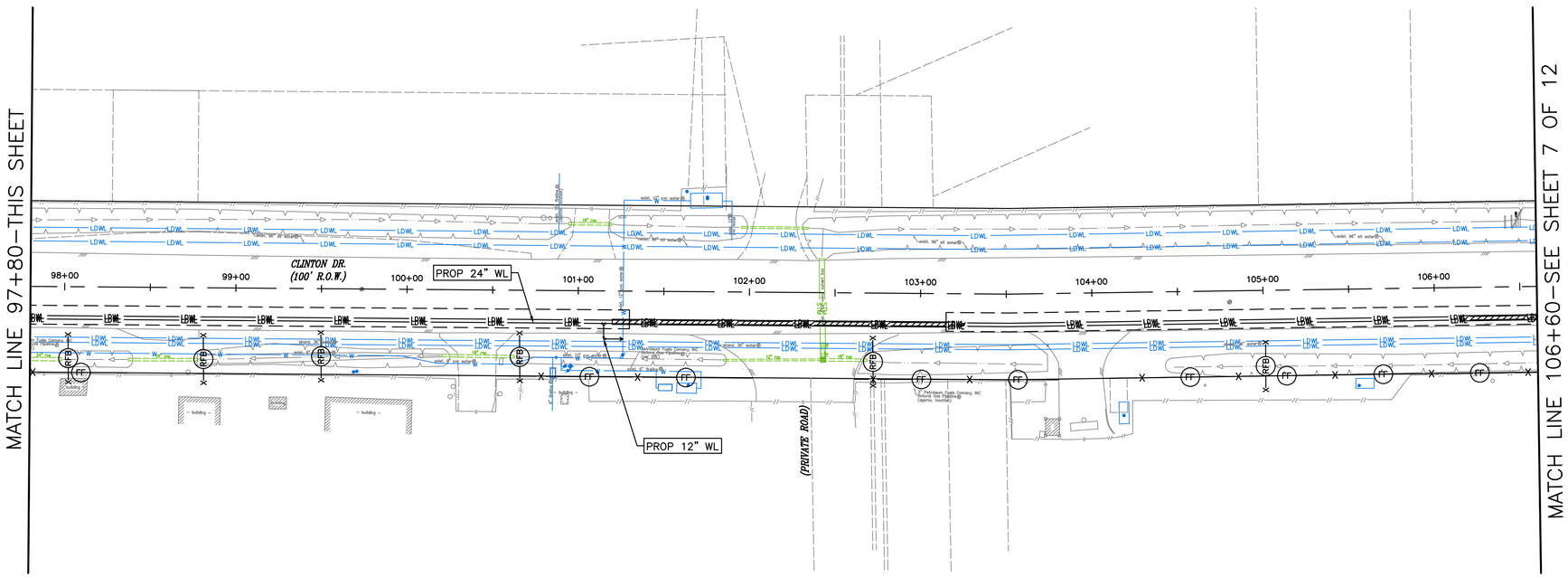
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (5 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 187 OF 204	

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0' 20' 40' 80'
SCALE: 1"=40'

N

NO.	DATE	REVISION	APP.

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- [IPB] INLET PROTECTION BARRIER

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FB NO. 000000

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

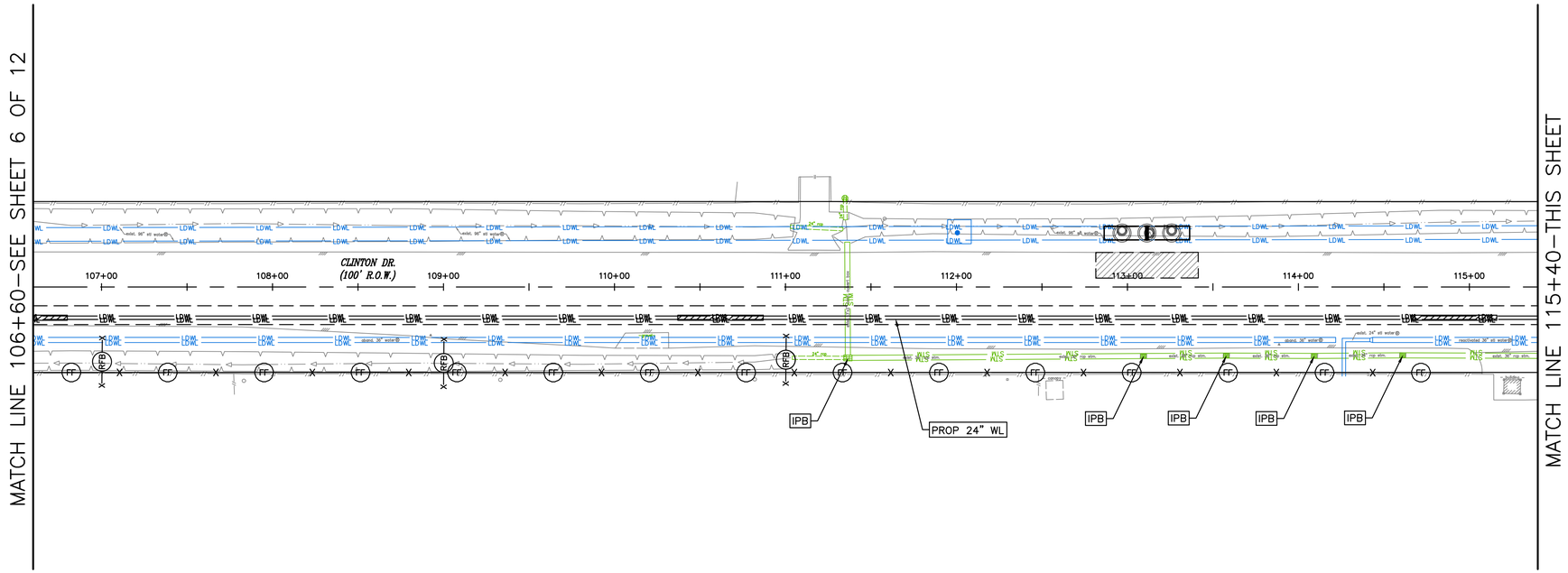
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

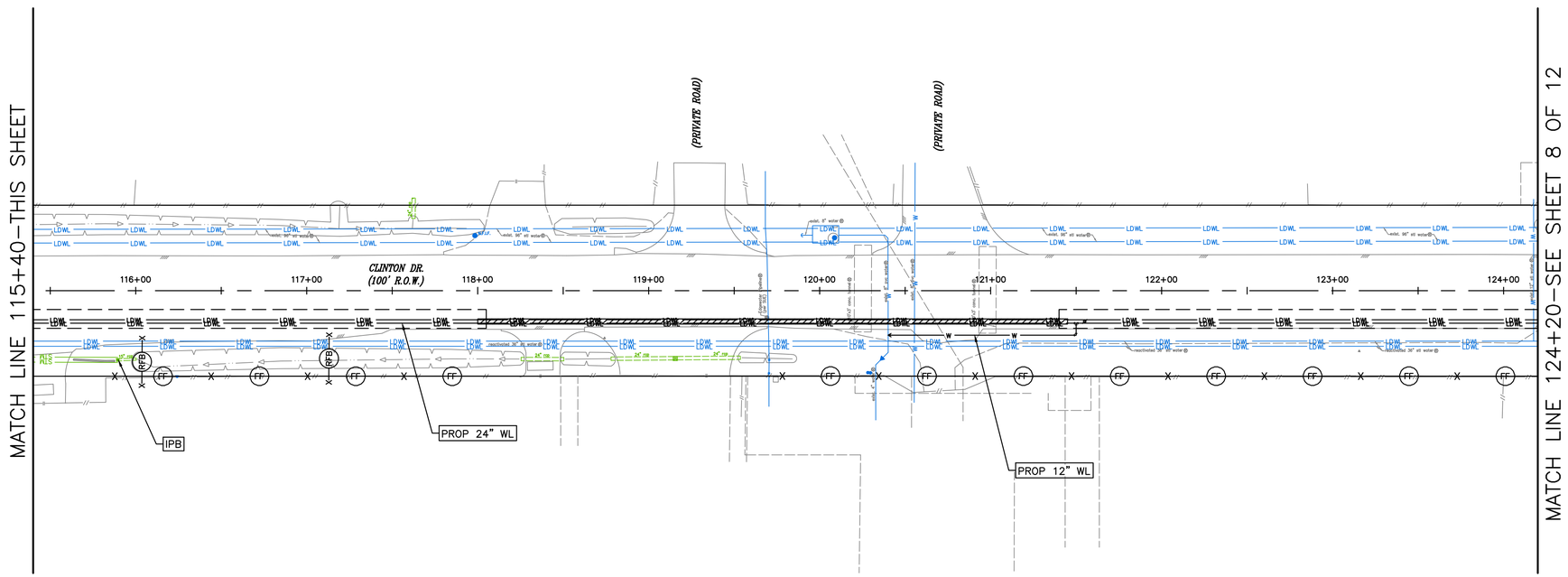
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (6 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 188 OF 204	

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0' 20' 40' 80'
SCALE: 1"=40'

NO.	DATE	REVISION	APP.

LEGEND:

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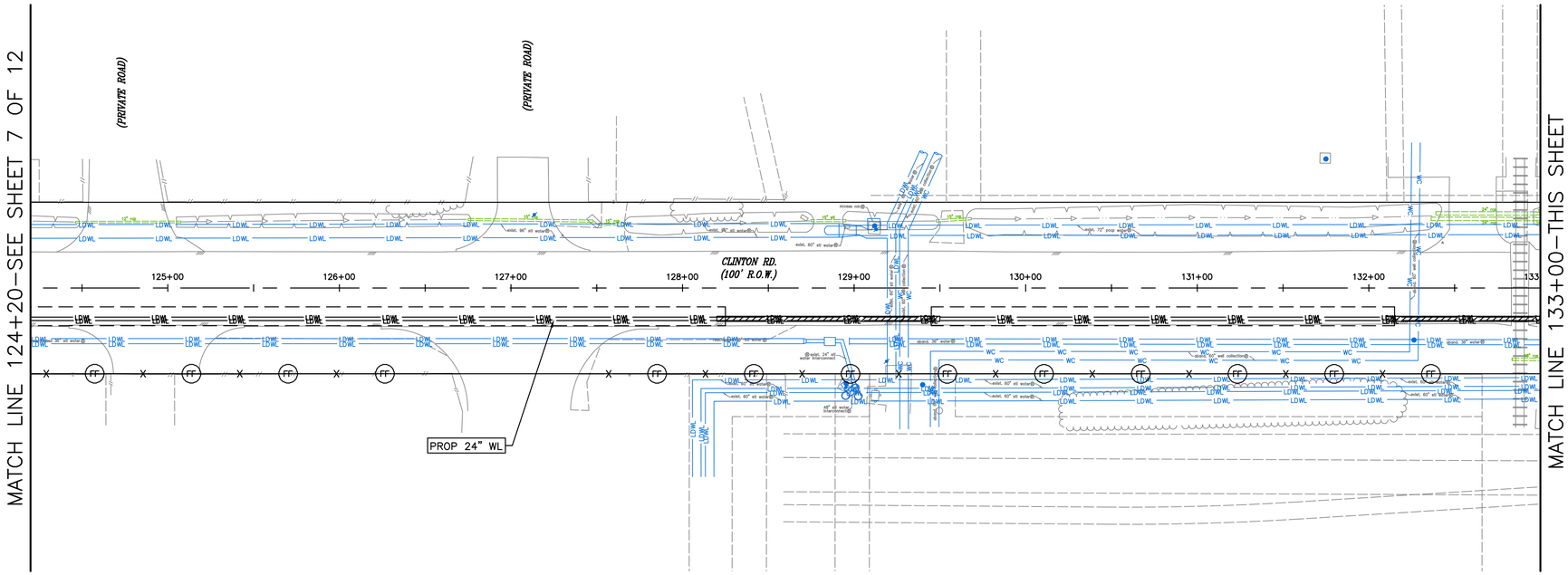
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

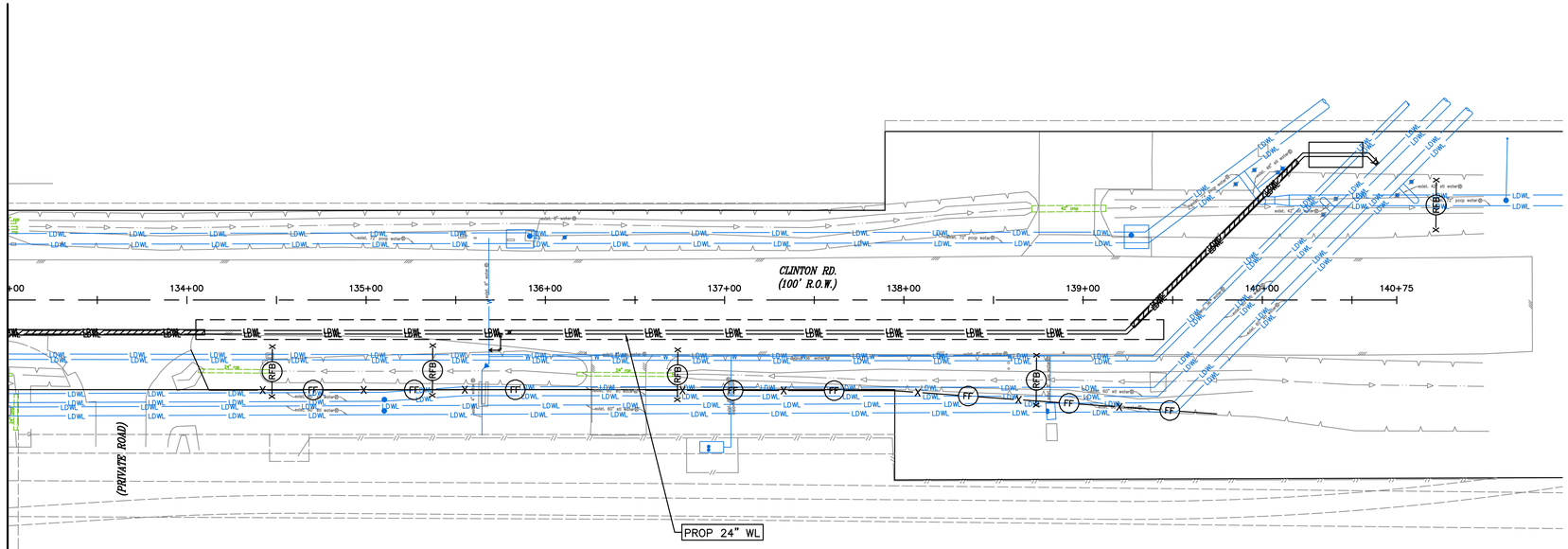
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (7 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 189 OF 204	

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0' 20' 40' 80'
SCALE: 1"=40'

N

LEGEND:

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- X—(FF)—X FILTER FABRIC BARRIER
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ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

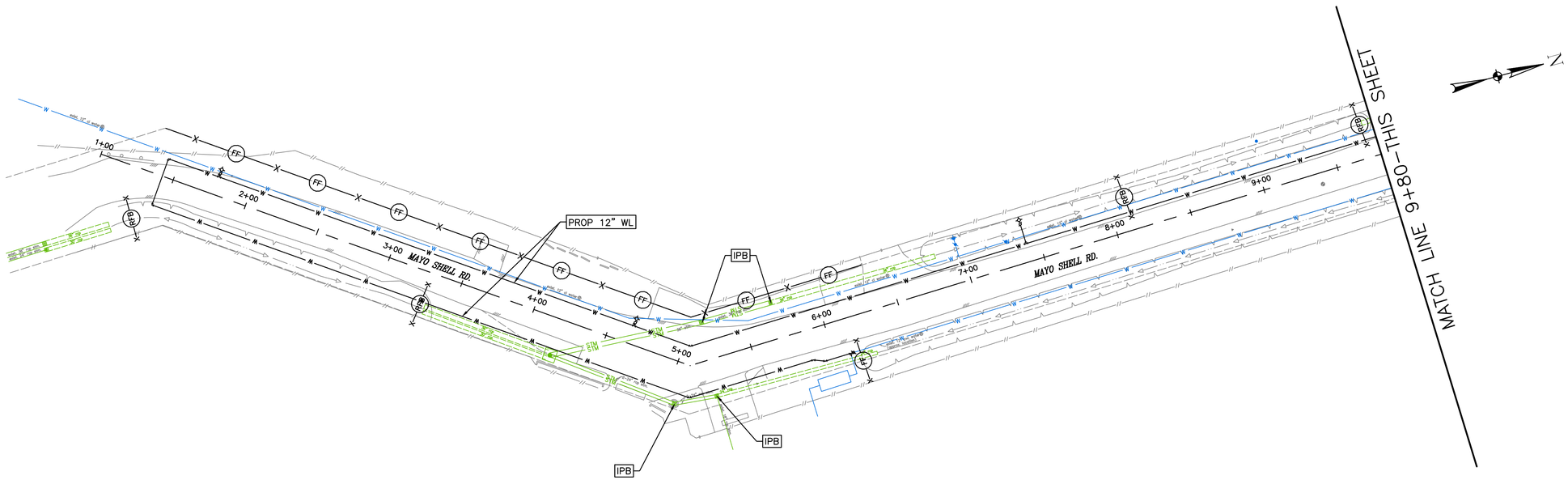
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

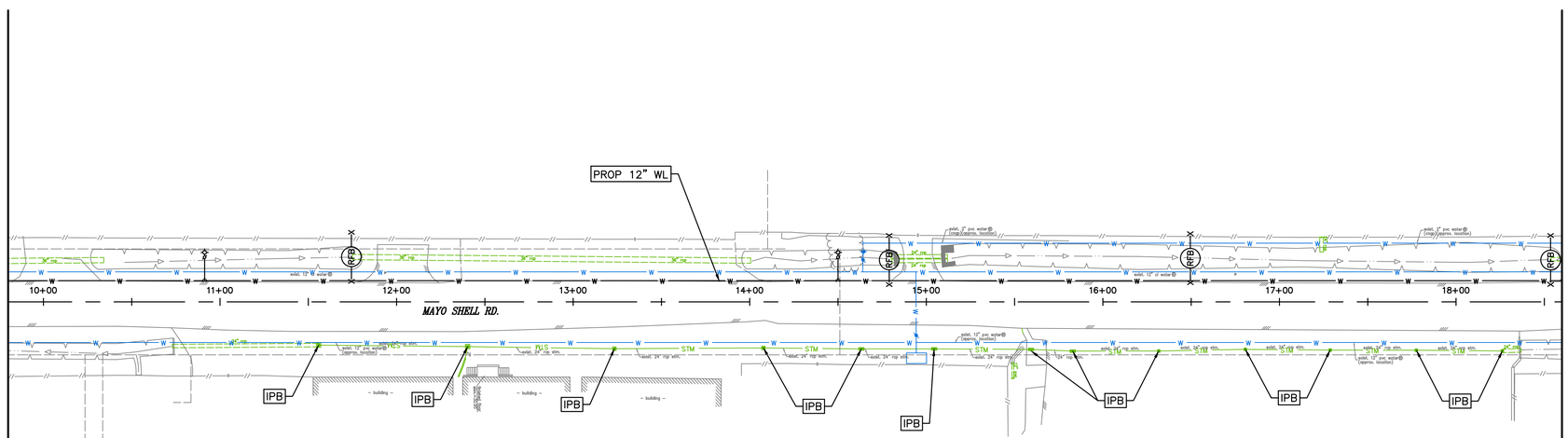
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (8 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 190 OF 204	

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0' 20' 40' 80'
SCALE: 1"=40'

NO.	DATE	REVISION	APP.

LEGEND:

- RFB — REINFORCED FILTER FABRIC BARRIER
- FF — FILTER FABRIC BARRIER
- IPB — INLET PROTECTION BARRIER

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

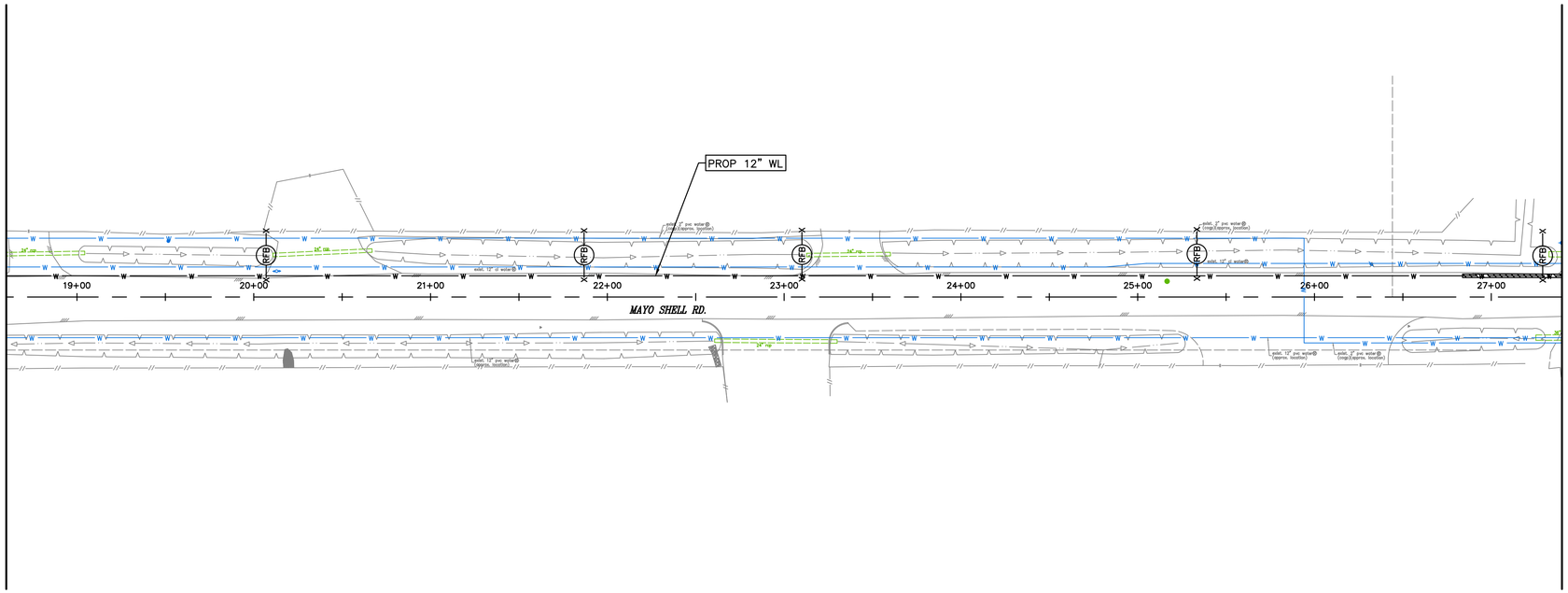
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (9 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
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1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 191 OF 204	

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MATCH LINE 18+60–SEE SHEET 9 OF 12



MATCH LINE 27+40–THIS SHEET

0' 20' 40' 80'
SCALE: 1"=40'

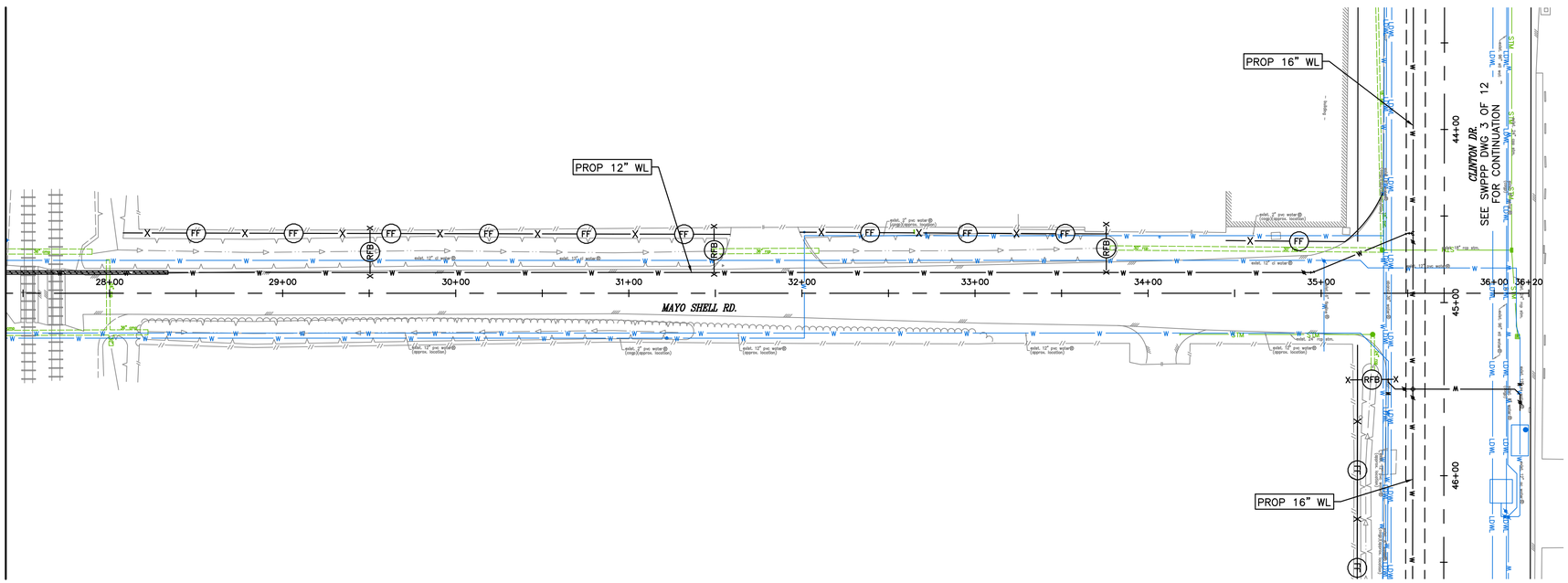
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NO.	DATE	REVISION	APP.

LEGEND:

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- X—FF—X FILTER FABRIC BARRIER
- IPB INLET PROTECTION BARRIER

MATCH LINE 27+40–THIS SHEET



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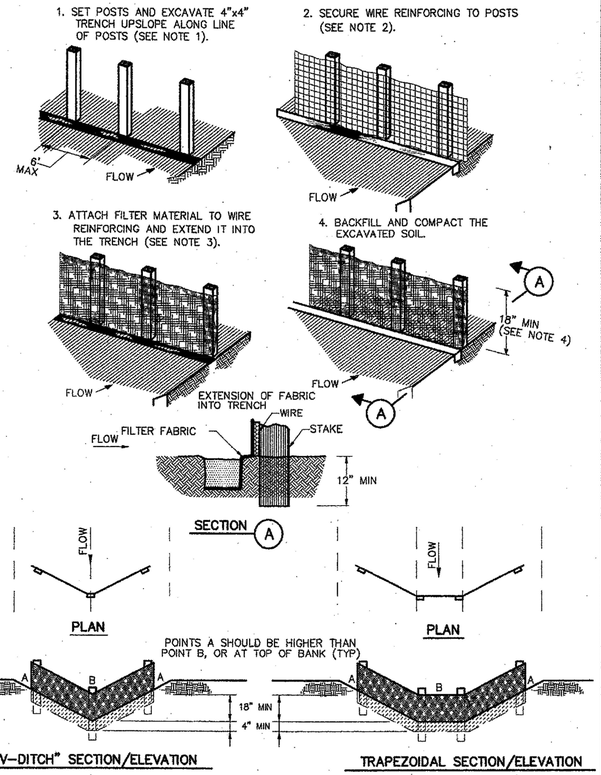
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN (10 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 192 OF 204	

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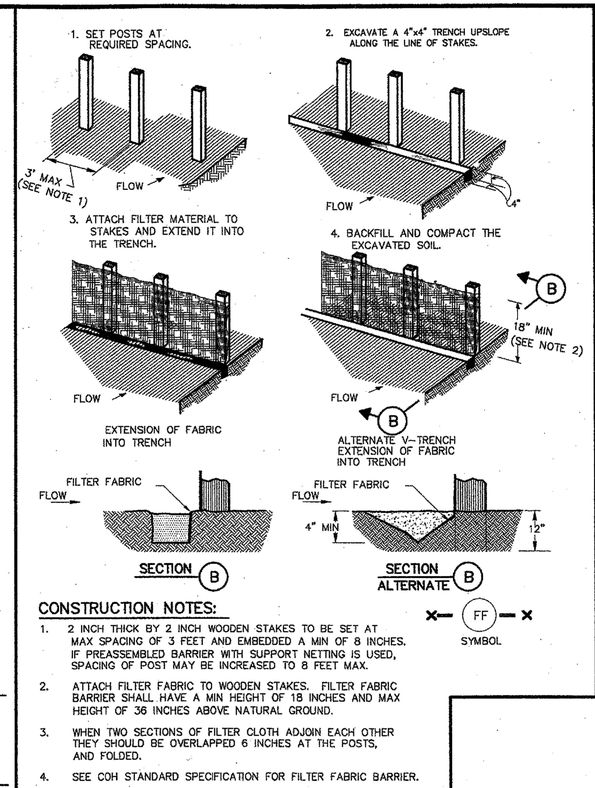


CONSTRUCTION NOTES:

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.

RFB
SYMBOL

REINFORCED FILTER FABRIC BARRIER

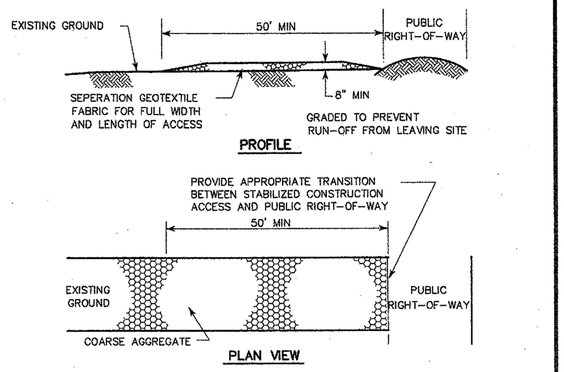


CONSTRUCTION NOTES:

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.

FF
SYMBOL

FILTER FABRIC BARRIER

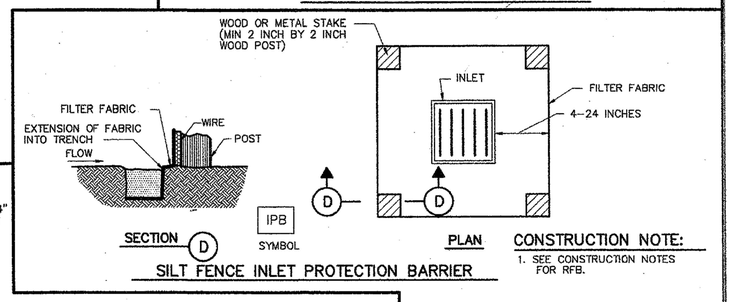


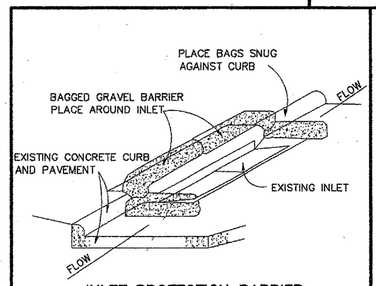
CONSTRUCTION NOTES:

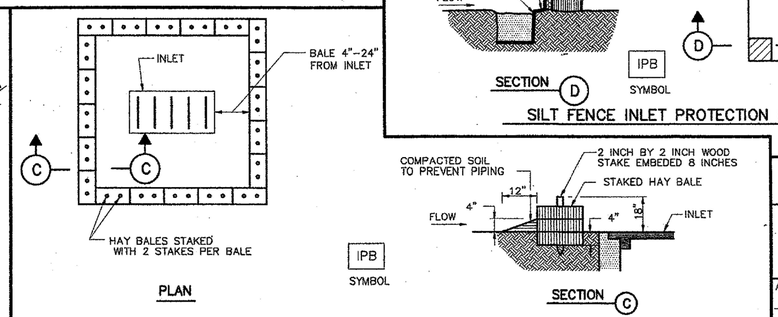
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS 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







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

NO.	DATE	REVISION	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

InduSri Consulting
8815 WEST ROAD, SUITE 302
HOUSTON, TEXAS 77064
832-865-4462
TBPE FIRM NO. F-21781

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

FOR INTERIM REVIEW ONLY

ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT - PACKAGE 3

STORM WATER POLLUTION PREVENTION PLAN DETAILS (11 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
NTS	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 193 OF 204	

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STORM WATER POLLUTION PREVENTION PLAN

PROJECT NAME: _____

LOCATION & LIMITS: _____

See plan cover sheet for vicinity map.

PROJECT SCOPE:

Activity (check all that apply)	
Roadway Expansion	
Roadway New Construction	
Underground Storm Sewer	
Detention Pond	
Bridge Expansion	
Bridge New Construction	

TOTAL PROJECT AREA: _____ Acres _____ Linear Feet

TOTAL AREA DISTURBED*: _____ Acres

(*Note: Include estimated need for project trailer and laydown yards.)

EXISTING CONDITIONS OF SOIL, VEGETATION, AND DRAINAGE:

PHASED CONSTRUCTION ACTIVITIES:

DESCRIPTION OF DRAINAGE AREAS AND OUTFALLS:

All outfall structures will be constructed in accordance to Harris County Specification 460 and any applicable specification referenced by it. Drainage pathways will shown on plan sheets stored with other attachments to this SWPPP.

Is Receiving Waters listed on the current TCEQ 303(d) list?

☐ No ☐ Yes, if yes list impairment _____.

RECEIVING WATERS/CONVEYANCE:

Include name(s) of MS4 Operator(s) as applicable.

MAJOR SOIL DISTURBING ACTIVITIES:

ACTIVITY (CHECK ALL THAT APPLY)	
SPEC 100 – Preparing Right-of-Way	
SPEC 104/110/400 – Excavating	
SPEC 400 – Fill	
Leveling/Grading	

NOTES:

See Site Plan for detailed planning drawings.

SOIL STABILIZATION AND SEDIMENT CONTROL MEASURE:

MEASURES	TEMPORARY	PERMANENT
SPEC 162 – Sodding		
SPEC 164 – Seeding		
SPEC 164 – Erosion Control Mat/Mesh		
SPEC 164 – Hydro-mulch		
SPEC 591 – Watering for Dust Control		
SPEC 591 – Rock Filter Dam		
SPEC 591 – Construction Exit		
SPEC 591 – Inlet Protection Barrier, Stage I		
SPEC 591 – Inlet Protection Barrier, Stage II		
SPEC 591 – Sediment-Control Fence		
SPEC 591 – Concrete Truck Washout Structures		

NOTES:

If sediment escapes off site, these accumulations will be removed to minimize impact. Rock filter dams will be cleared before the reach 1/3 the height of the dam, other control measures will be cleared before their capacity has been reduced by 50%. As required in CGP TXR 150000, soil stabilization measures will be initiated in portions of the site where activities have ceased for a period exceeding 14 days. This stabilization will commence no later than the day following completion of work in these areas. If prompt repair or replacement is not feasible, the reason will be documented in the SWPPP. Records of dates for major grading activities, and initiation of stabilization measures will be maintained in the SWPPP. Daily work logs related to this section will be kept in CAPTRAC. The Harris County SWPPP detail sheet will be used when implementing BMP's and included with this document.

Current construction specification documents can be found at:
http://www.eng.hctx.net/Consultants/Standards-Specifications/Standard-Engineering-Design-Specifications

INSPECTION & MAINTENANCE:

Inspection and Maintenance will be performed according to SPEC 591. Inspections will be conducted at least every 7 calendar days. Inspection forms will be filed with SWPPP supporting documents. If repair or replacement of stabilization or erosion control features is necessary, it must be completed at the earliest date possible. Amendments will be tracked on the SWPPP Amendment Log. Daily work logs related to this section will be kept in current construction management system.

POTENTIAL POLLUTION SOURCES:

Concrete	√	Cleaning Solvents	√
Fertilizer	√	Curing Compounds	√
Pesticides	√	Hydraulic Fluid	√
Asphalt	√	Motor Oil	√
Paint	√		
Gasoline	√		
Diesel Fuel	√		
Sanitary Toilets	√		

POLLUTION PREVENTION BMPS

Whenever possible all materials will be stored in their original containers in secure areas where spillage is protected from runoff. Stockpiles and work areas will be constructed in such a way to minimize the amount of sediment that enters receiving waters and wetlands. Spill prevention and control measures are included on attached site maps. Records of spills will be maintained with SWPPP supporting documents. Additional required BMPs can be found in SPEC 591. Temporary materials and structures will be removed from waterways as soon as feasible once they are no longer required.

WASTE MATERIAL:

All solid waste materials will be collected and stored in secure metal dumpsters, then transported to appropriate disposal facilities. Collection will be completed often enough to ensure that no waste materials will be lost due to overfilling of collection containers. Liquid wastes will be stored in sealed containers in designated areas and disposed of according to all applicable regulations. All wasted containers should meet all state and local requirements.

RESPONSIBLE PARTY/CONTRACTOR

Name	
Title	
Company	
Signature	

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

HARRIS COUNTY
ENGINEERING DEPARTMENT

FOR INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE
NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES
ENGINEER NAME
P.E. SERIAL No. NUMBER
DATE: / /

PROJECT TITLE:

SHEET DESCRIPTION: STORM WATER POLLUTION PREVENTION PLAN WORK FORM

CIVIL STANDARD: SW3P-WF

DRAWN BY: JDZ
CK'D BY: DR
SCALE: NONE
DATE: 10/10/23
SHEET NO: /

NO.	DATE	REVISION	APP.

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ENGINEER: SRIKANTH PUNUKULA
P.E. LICENSE No. 88614
DATE: 8/12/2025

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

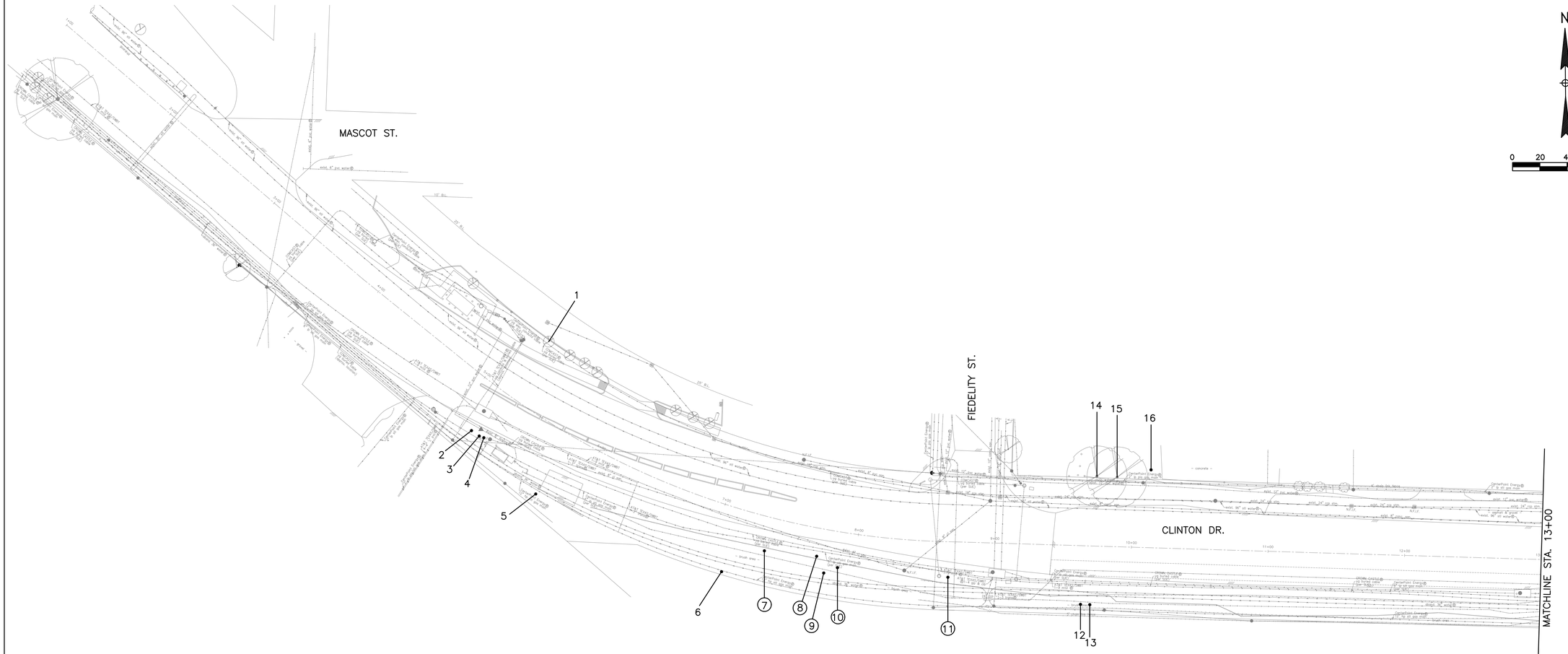
HC SWPPP WORK FORM

(12 OF 12)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
NTS	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 194 OF 204	

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NO.	DATE	REVISION	APP.

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
1	9709 Clinton	1" Live Oak	City of Galena Park-Not protected	In ROW, Not impacted, Stump sprouts, Poor	
2	NA	5" Mulberry	City of Galena Park-Not protected	In ROW, Not impacted	
3	NA	9" Tallow	City of Galena Park-Not protected	In ROW, Not impacted	
4	NA	9" Tallow	City of Galena Park-Not protected	In ROW, Not impacted	
5	NA	4" Tallow	City of Galena Park-Not protected	In ROW, Not impacted	
6	NA	12" American Elm	City of Galena Park-Not protected	Pruned by CPE, In ROW, Not impacted	
7	NA	9" Green Ash	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
8	NA	11" Tallow	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
9	NA	11" Tallow	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
10	NA	11" Tallow	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
11	NA	7" Mulberry	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
12	NA	10" Tallow	City of Galena Park-Not protected		
13	NA	10" Tallow	City of Galena Park-Not protected		
14	9807 Clinton	23" Sycamore	City of Galena Park-Not protected	Private tree, Topped by CPE, Hypoxylon, Poor, Not impacted	
15	9807 Clinton	21" Sycamore	City of Galena Park-Not protected	Private tree, Topped by CPE, Hollow, Not impacted	
16	9807 Clinton	18" Sycamore	City of Galena Park-Not protected	Private tree, Topped by CPE, Poor	

TREE PRESERVATION PLAN LEGEND

1 — TREE NUMBER/LOCATION

(1) — TREE TO BE REMOVED

NOTE:

1. THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JULY 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.

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TX FIRM NO.: F-4578

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210 Stone Bush Ct • Katy, Texas 77493
281-391-0022 ckoehl@koehlurbanforestry.com

APPROVED:

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

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

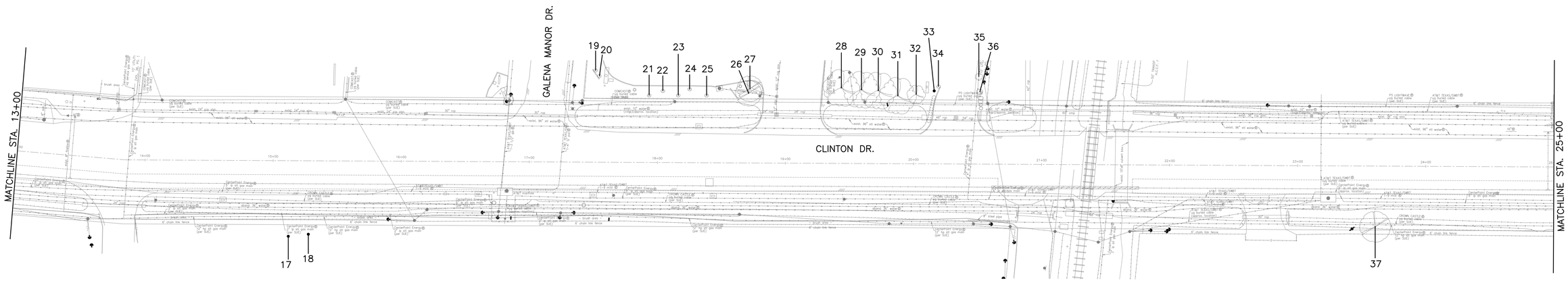
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 1 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 195 OF 204	

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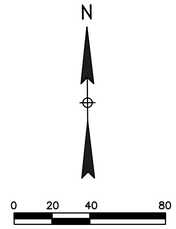


Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
17	NA	8" Sycamore	City of Galena Park-Not protected	Private tree, Not impacted	
18	NA	7" Sycamore	City of Galena Park-Not protected	Topped, Poor, Private tree, Not impacted	
19	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
20	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
21	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
22	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
23	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
24	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
25	2507 Clinton	2" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
26	2507 Clinton	9" Raintree	City of Galena Park-Not protected	Private tree, Dead	
27	2507 Clinton	9" Raintree	City of Galena Park-Not protected	Private tree, Dead	
28	2503 Clinton	6" Crepe Myrtle	City of Galena Park-Not protected	Topped, Poor, Private tree, Not impacted	
29	2503 Clinton	6" Crepe Myrtle	City of Galena Park-Not protected	Topped, Poor, Private tree, Not impacted	
30	2503 Clinton	6" Crepe Myrtle	City of Galena Park-Not protected	Topped, Poor, Private tree, Not impacted	
31	2503 Clinton	6" Crepe Myrtle	City of Galena Park-Not protected	Topped, Poor, Private tree, Not impacted	
32	2509 Clinton	6" Crepe Myrtle	City of Galena Park-Not protected	Topped, Poor, Private tree, Not impacted	
33	2509 Clinton	4" Arborvitae	City of Galena Park-Not protected	Private tree, Not impacted	
34	2509 Clinton	4" Arborvitae	City of Galena Park-Not protected	Private tree, Not impacted	
35	2509 Clinton	4" Arborvitae	City of Galena Park-Not protected	Private tree, Not impacted	
36	2509 Clinton	4" Arborvitae	City of Galena Park-Not protected	Private tree, Not impacted	
37	NA	12" Mulberry	City of Galena Park-Not protected	In ROW, Not impacted	

TREE PRESERVATION PLAN LEGEND	
1	TREE NUMBER/LOCATION
①	TREE TO BE REMOVED

NOTE:

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NO.	DATE	REVISION	APP.

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713-975-8769
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APPROVED:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

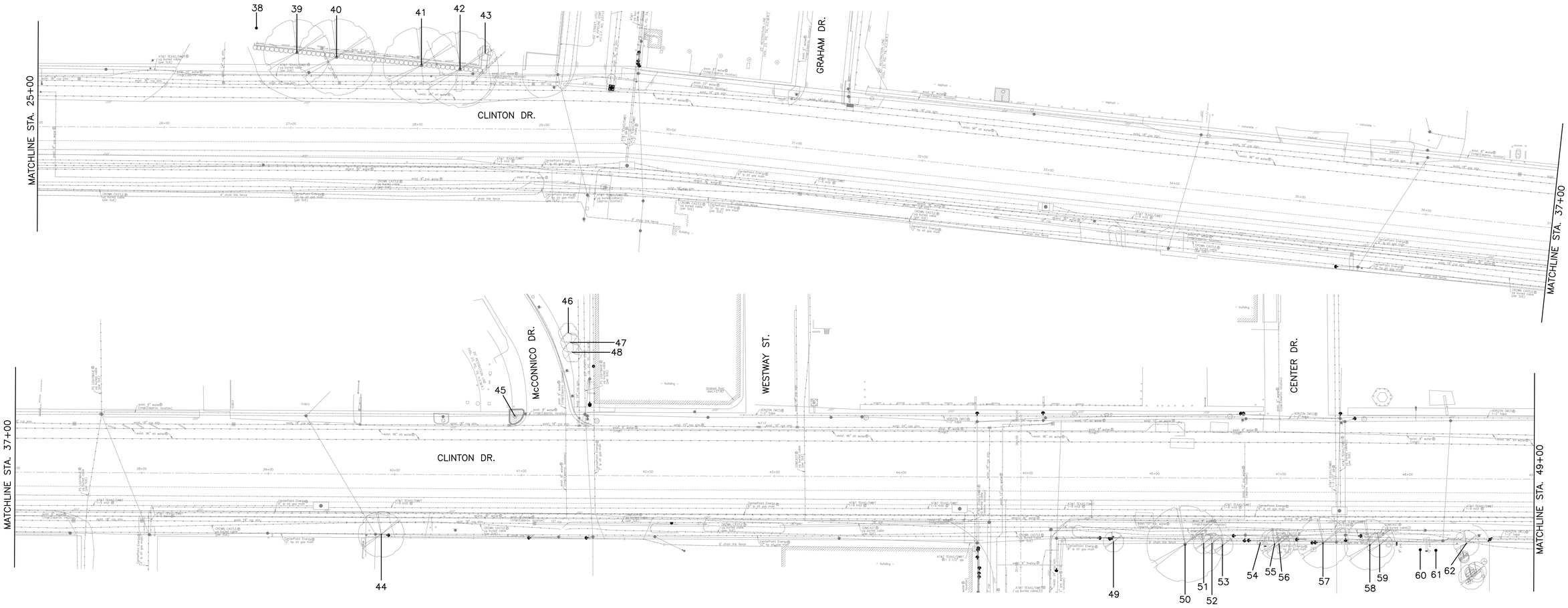
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 2 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 196 OF 204	

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Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
38	2333 Clinton	26" Live Oak	City of Galena Park-Not protected	Private tree, 25% dieback	
39	2333 Clinton	22" Live Oak	City of Galena Park-Not protected	Private tree, 25% dieback	
40	2333 Clinton	25" Live Oak	City of Galena Park-Not protected	Private tree, 30% dieback	
41	2333 Clinton	26" Live Oak	City of Galena Park-Not protected	In ROW, Topped by CPE, Not impacted	
42	2333 Clinton	18" Live Oak	City of Galena Park-Not protected	In ROW, Topped by CPE, Not impacted	
43	2333 Clinton	7" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
44	2210 Clinton	18" Arizona Ash	City of Galena Park-Not protected	In ROW, Topped by CPE	Clearance prune
45	2201 Clinton	3' Sago	City of Galena Park-Not protected	Not impacted	
46	2129 McConnico	11" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
47	2129 McConnico	14" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
48	2129 McConnico	14" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
49	2011 Clinton	4" Lacebark Elm	City of Galena Park-Not protected	Private tree, Not impacted	
50	2011 Clinton	10" Mulberry	City of Galena Park-Not protected	70% dieback, Private tree, Not impacted	
51	2011 Clinton	3" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
52	2011 Clinton	3" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
53	2011 Clinton	4" Lacebark Elm	City of Galena Park-Not protected	Private tree, Not impacted	
54	2011 Clinton	3" Lacebark Elm	City of Galena Park-Not protected	Hedged, Private, Not impacted	
55	2011 Clinton	3" Lacebark Elm	City of Galena Park-Not protected	Hedged, Private, Not impacted	
56	2011 Clinton	3" Lacebark Elm	City of Galena Park-Not protected	Hedged, Private, Not impacted	
57	2011 Clinton	12" Mulberry	City of Galena Park-Not protected	Private tree	Clearance prune
58	2011 Clinton	11" Mulberry	City of Galena Park-Not protected	Private tree	Clearance prune
59	2011 Clinton	7" Mulberry	City of Galena Park-Not protected	Private tree	Clearance prune
60	2011 Clinton	16" Lacebark Elm	City of Galena Park-Not protected	Pruned by CPE, Private, Not impacted	
61	2011 Clinton	16" Lacebark Elm	City of Galena Park-Not protected	Pruned by CPE, Private, Not impacted	
62	2011 Clinton	12" American Elm	City of Galena Park-Not protected	Topped by CPE, Private, Not impacted	

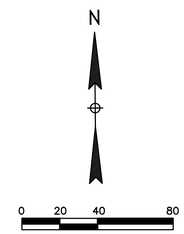
TREE PRESERVATION PLAN LEGEND

1 — TREE NUMBER/LOCATION

① — TREE TO BE REMOVED

NOTE:

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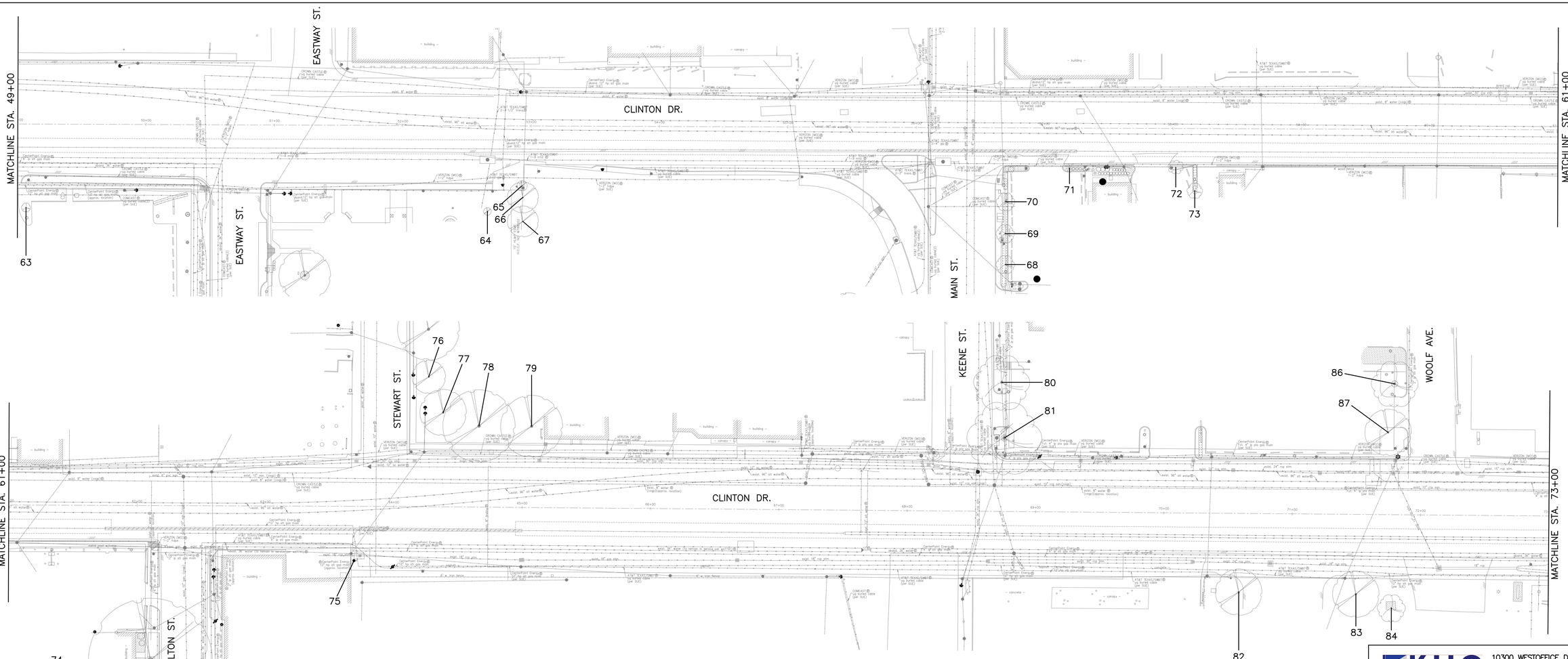
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 3 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 197 OF 204	

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Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
63	2001 Clinton	5" Crepe Myrtle	City of Galena Park-Not protected	Topped, Private, Not impacted	
64	2000 Clinton	5" Cedar Elm	City of Galena Park-Not protected	Private tree, Not impacted	
65	2000 Clinton	6" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
66	2000 Clinton	10" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
67	2000 Clinton	10" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
68	1812 Clinton	4" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
69	1812 Clinton	4" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
70	1812 Clinton	4" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
71	1812 Clinton	8' Windmill Palm	City of Galena Park-Not protected	Private tree, Not impacted	
72	1812 Clinton	4' Windmill Palm	City of Galena Park-Not protected	Not impacted	
73	1804 Clinton	7" Crepe Myrtle	City of Galena Park-Not protected	Topped, Private, Not impacted	
74	1700 Clinton	38" Live Oak	City of Galena Park-Not protected	Not impacted	
75	1610 Clinton	14" Mulberry	City of Galena Park-Not protected	Not impacted	
76	1611 Clinton	15" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
77	1611 Clinton	20" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
78	1611 Clinton	25" Live Oak	City of Galena Park-Not protected	Pruned by CPE, Private, Not impacted	
79	1611 Clinton	24" Live Oak	City of Galena Park-Not protected	Pruned by CPE, Private, Not impacted	
80	1515 Clinton	15" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
81	1515 Clinton	15" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
82	1500 Clinton	22" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
83	1500 Clinton	20" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
84	1500 Clinton	13" Crepe Myrtle	City of Galena Park-Not protected	Private tree, Not impacted	
86	1515 Clinton	15" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
87	1515 Clinton	17" Tallow	City of Galena Park-Not protected	Private tree, 30% dieback, Not impacted	

N

0 20 40 80

TREE PRESERVATION PLAN LEGEND

1 TREE NUMBER/LOCATION

① TREE TO BE REMOVED

NOTE:

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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

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281-391-0022 ckoehl@koehlurbanforestry.com

APPROVED:

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

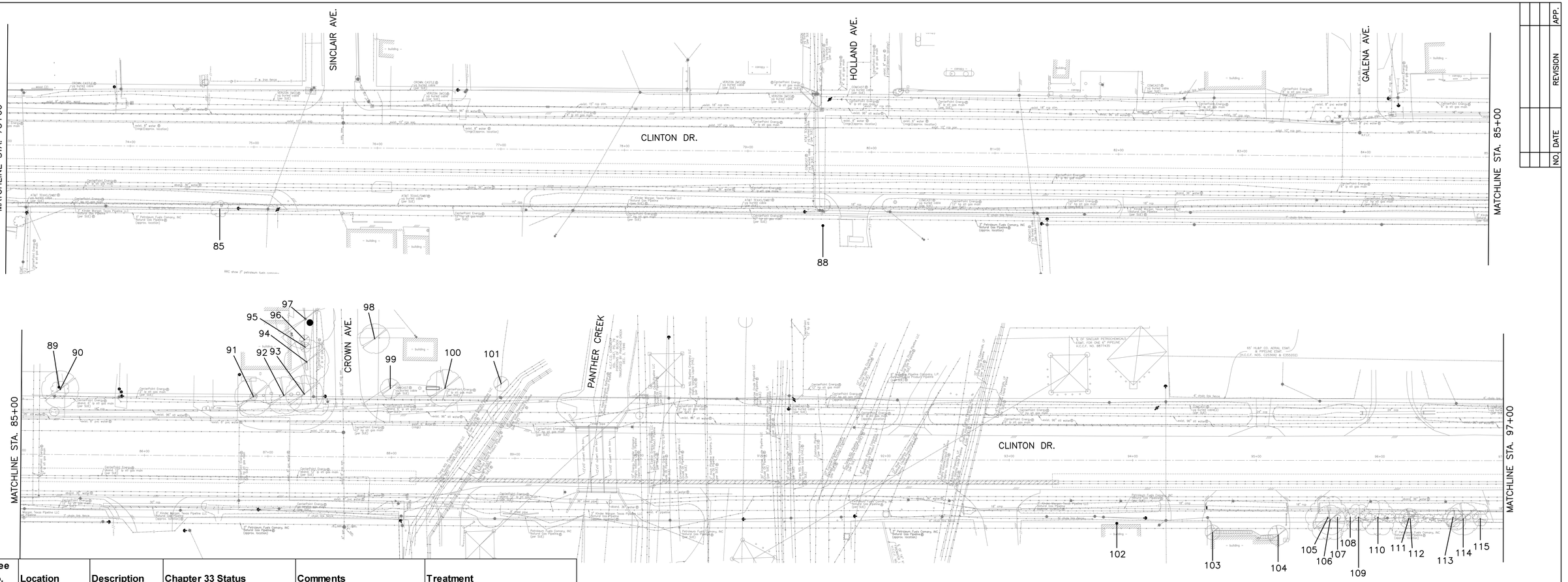
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 4 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 198 OF 204	

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Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
85	1216 Clinton	7" Mulberry	City of Galena Park-Not protected	Not impacted	
88	1216 Clinton	26" Sugarberry	City of Galena Park-Not protected	Private tree, Not impacted	
89	1109 Clinton	9" Sugarberry	City of Galena Park-Not protected	Pruned by CPE, Private, Not impacted	
90	1109 Clinton	13" Sugarberry	City of Galena Park-Not protected	Pruned by CPE, Private, Not impacted	
91	1101 Clinton	17" Sycamore	City of Galena Park-Not protected	Topped by CPE, Not impacted	
92	1101 Clinton	16" Sycamore	City of Galena Park-Not protected	Topped by CPE, Not impacted	
93	1101 Clinton	18" Sycamore	City of Galena Park-Not protected	Topped by CPE, Not impacted	
94	1101 Clinton	23" Catalpa	City of Galena Park-Not protected	Topped by CPE, Not impacted	
95	1101 Clinton	1' Agave	City of Galena Park-Not protected	Not impacted	
96	1101 Clinton	3" Pecan	City of Galena Park-Not protected	Not impacted	
97	1101 Clinton	26" Sycamore	City of Galena Park-Not protected	Topped by CPE, Not impacted	
98	1011 Clinton	8" Arborvitae	City of Galena Park-Not protected	Not impacted	
99	1011 Clinton	10" Live Oak	City of Galena Park-Not protected	Topped by CPE, Private, Not impacted	
100	1011 Clinton	17" Live Oak	City of Galena Park-Not protected	Topped by CPE, Private, Not impacted	
101	1011 Clinton	4" Sugarberry	City of Galena Park-Not protected	Private tree, Not impacted	
102	900 Clinton	16" Black Willow	City of Galena Park-Not protected	Not impacted	
103	900 Clinton	10" Water Oak	City of Galena Park-Not protected	Private tree, Not impacted	
104	900 Clinton	7" Juniper	City of Galena Park-Not protected	70% dieback, Private tree, Not impacted	
105	900 Clinton	15" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
106	900 Clinton	9" Mulberry	City of Galena Park-Not protected	Not impacted	
107	900 Clinton	4" Oleander	City of Galena Park-Not protected	Not impacted	
108	900 Clinton	4" Oleander	City of Galena Park-Not protected	Not impacted	
109	900 Clinton	5" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
110	900 Clinton	7" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
111	900 Clinton	5" Mulberry	City of Galena Park-Not protected	Not impacted	
112	900 Clinton	5" Mulberry	City of Galena Park-Not protected	Not impacted	
113	900 Clinton	4" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
114	900 Clinton	5" Sugarberry	City of Galena Park-Not protected	Not impacted	
115	900 Clinton	4" Sugarberry	City of Galena Park-Not protected	Not impacted	

TREE PRESERVATION PLAN LEGEND	
1	TREE NUMBER/LOCATION
(1)	TREE TO BE REMOVED

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NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
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TX FIRM NO.: F–4578

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281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

SURVEYED BY:
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FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

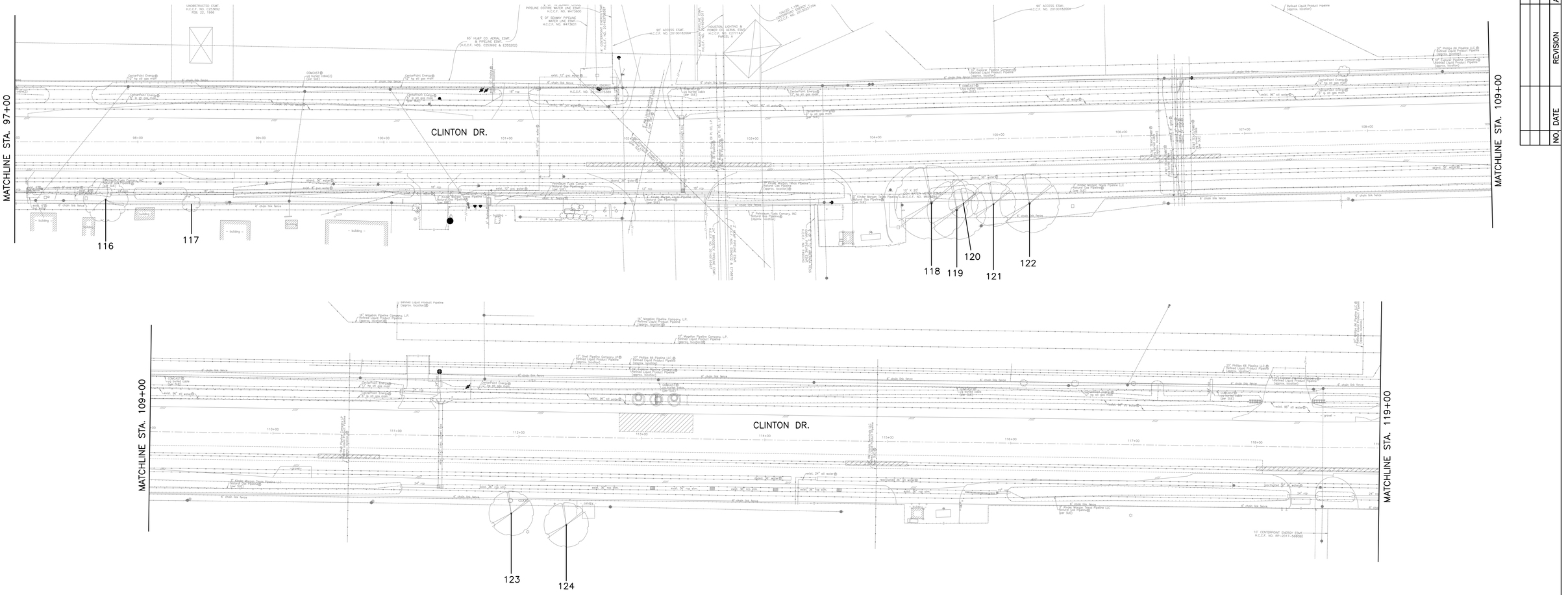
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 5 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 199 OF 204	

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Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
116	900 Clinton	13" Crepe Myrtle	City of Galena Park-Not protected	Dead, Not impacted	
117	900 Clinton	13" Mulberry	City of Galena Park-Not protected	Not impacted	
118	780 Clinton	27" Live Oak	City of Galena Park-Not protected	Private tree, 25% dieback	Clearance prune
119	780 Clinton	22" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
120	780 Clinton	12" Live Oak	City of Galena Park-Not protected	Private tree, Suppressed	Clearance prune
121	780 Clinton	15" Live Oak	City of Galena Park-Not protected	Private tree	Clearance prune
122	780 Clinton	19" Live Oak	City of Galena Park-Not protected	Private tree	Clearance prune
123	780 Clinton	23" Bradford Pear	City of Galena Park-Not protected	Private tree, Pruned by CPE, Fire Blight, Not impacted	
124	780 Clinton	18" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	

TREE PRESERVATION PLAN LEGEND

1 — TREE NUMBER/LOCATION

① — TREE TO BE REMOVED

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NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
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713-975-8769
TX FIRM NO.: F-4578

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APPROVED:

SURVEYED BY:
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FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

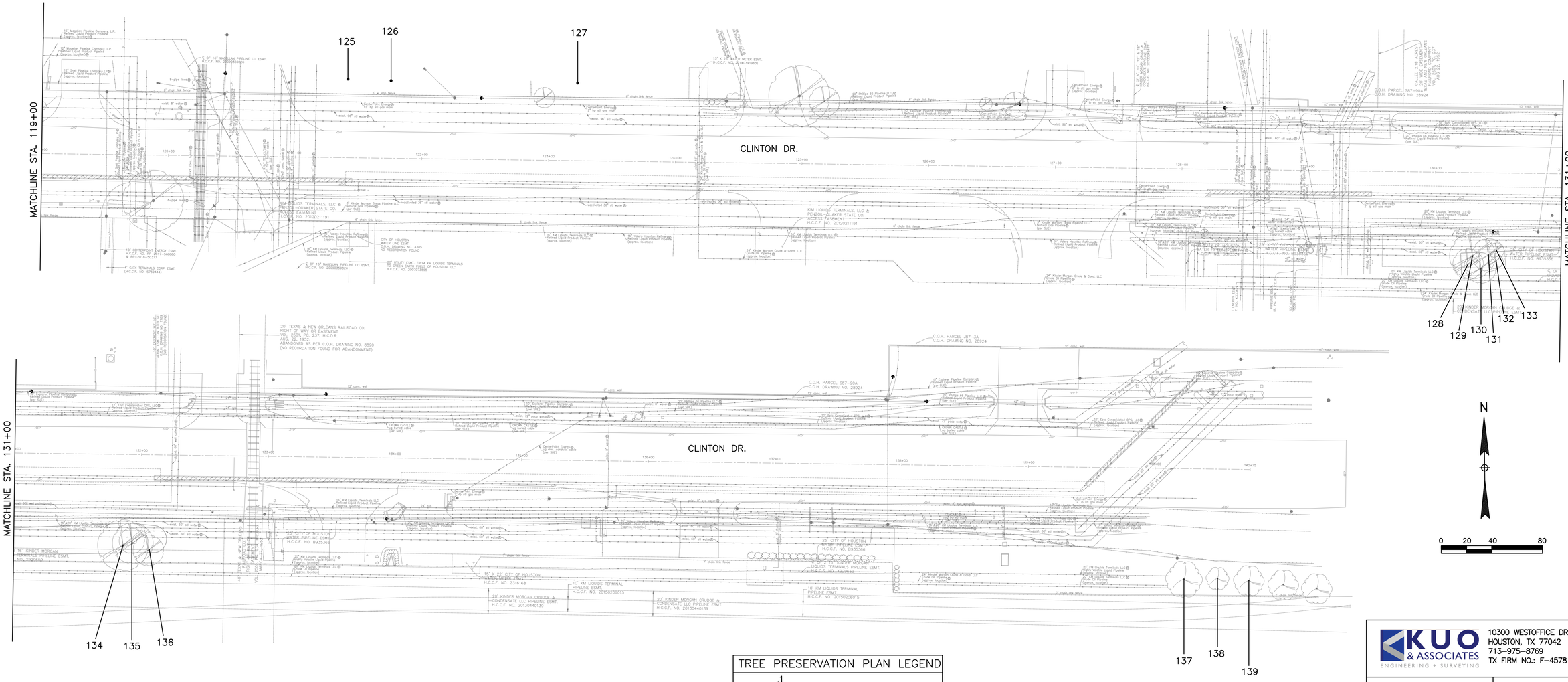
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 6 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 200 OF 204	

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Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Clinton Drive					
125	407 Clinton	21" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
126	407 Clinton	18" Live Oak	City of Galena Park-Not protected	Private tree, Not impacted	
127	407 Clinton	34" Tallow	City of Galena Park-Not protected	Private tree, Poor, Pruned by CPE, Not impacted	
128	NA	13" Sugarberry	City of Galena Park-Not protected	Private tree, Dead	
129	NA	17" American Elm	City of Galena Park-Not protected	Private tree, Not impacted	
130	NA	15" Sugarberry	City of Galena Park-Not protected	Private tree, Not impacted	
131	NA	16" Green Ash	City of Galena Park-Not protected	Private tree, 80% dieback, Not impacted	
132	NA	7" American Elm	City of Galena Park-Not protected	Private tree, Not impacted	
133	NA	7" American Elm	City of Galena Park-Not protected	Private tree, Not impacted	
134	NA	18" Sugarberry	City of Galena Park-Not protected	Private tree, Dead, Not impacted	
135	NA	15" Green Ash	City of Galena Park-Not protected	Private tree, 70% dieback, Not impacted	
136	NA	17" Cottonwood	City of Galena Park-Not protected	Private tree, Not impacted	
137	NA	10" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
138	NA	10" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	
139	NA	10" Crepe Myrtle	City of Galena Park-Not protected	Not impacted	

TREE PRESERVATION PLAN LEGEND

1 — TREE NUMBER/LOCATION

① — TREE TO BE REMOVED

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NO.	DATE	REVISION	APP.

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HOUSTON, TX 77042
713-975-8769
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281-391-0022 ckoehl@koehlurbanforestry.com

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FB NO. 000000

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

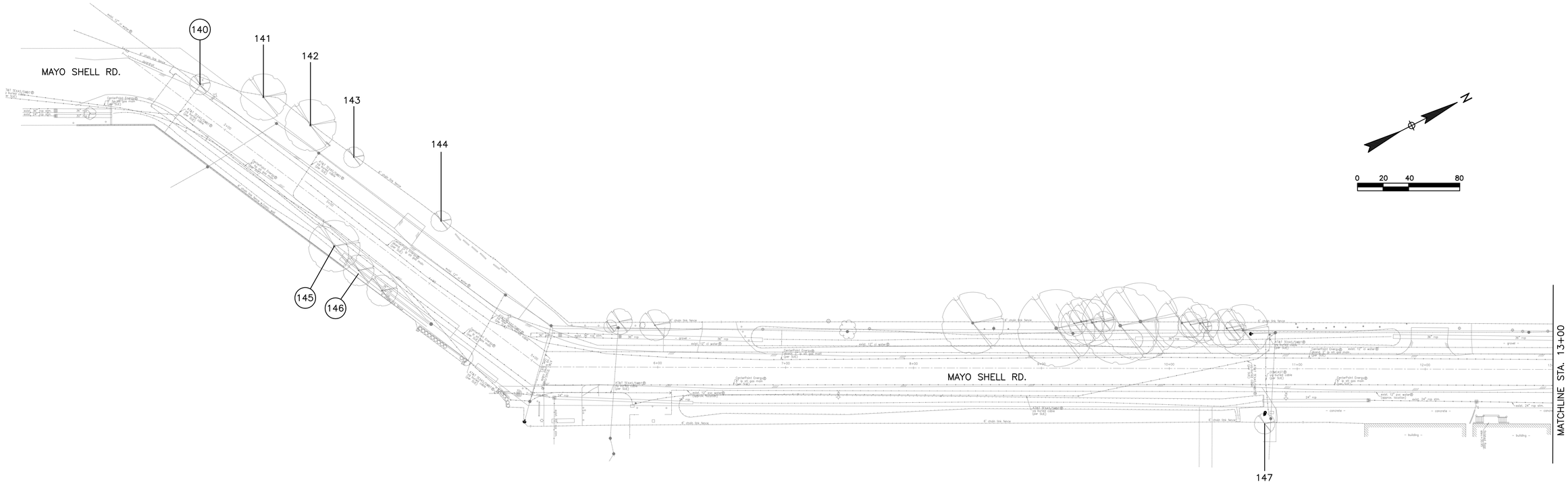
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 7 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 201 OF 204	

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NO.	DATE	REVISION	APP.

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Mayo Shell Road					
140	922 Mayo Shell	7" Mulberry	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
141	922 Mayo Shell	11" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
142	922 Mayo Shell	11" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
143	922 Mayo Shell	6" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
144	922 Mayo Shell	6" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	
145	1201 Mayo Shell	10" Crepe Myrtle	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
146	1201 Mayo Shell	12" Crepe Myrtle	City of Galena Park-Not protected	Remove for open cut	Remove tree, No replacement required
147	903 Mayo Shell	7" Sugarberry	City of Galena Park-Not protected	Private tree, Topped by CPE, In chainlink fence, not impacted	

TREE PRESERVATION PLAN LEGEND

1 — TREE NUMBER/LOCATION

(1) — TREE TO BE REMOVED

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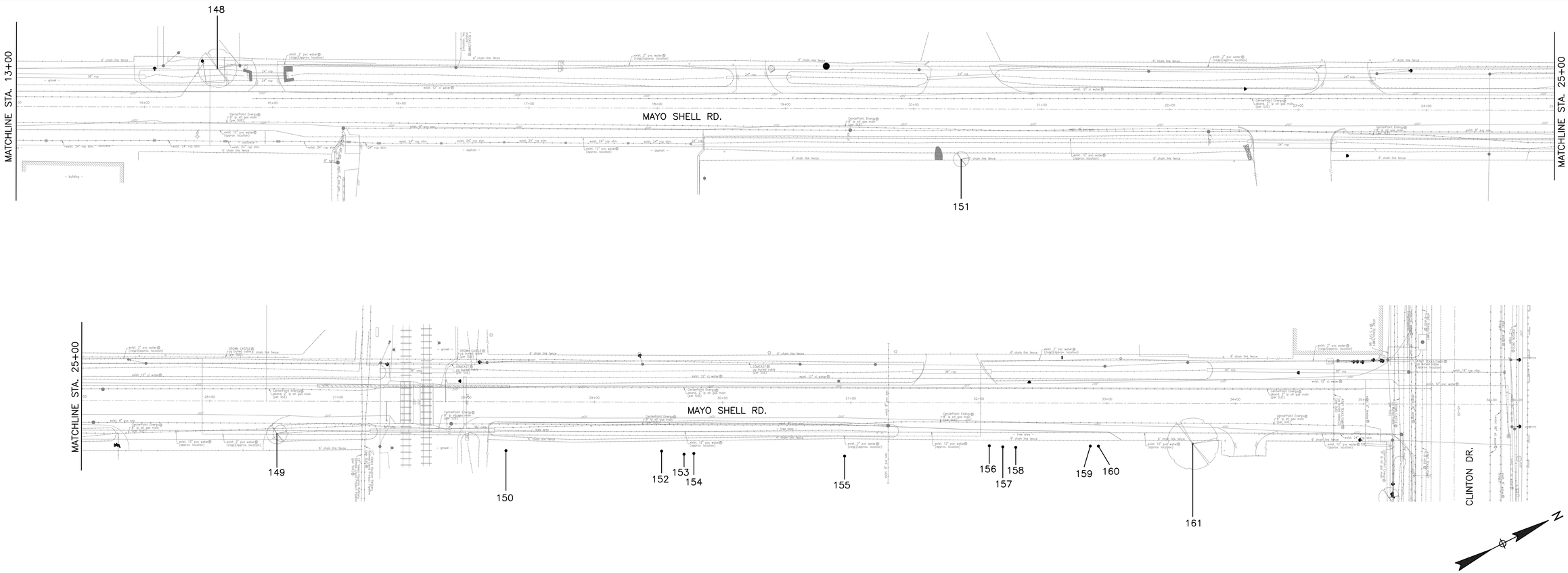
LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 8 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 202 OF 204	

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Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Mayo Shell Road					
148	500 Mayo Shell	11" Mulberry	City of Galena Park-Not protected	Not impacted	
149	NA	7" Mulberry	City of Galena Park-Not protected	Not impacted	
150	NA	17" Sugarberry	City of Galena Park-Not protected	Private tree	Clearance prune
151	NA	3" Sugarberry	City of Galena Park-Not protected	Not impacted	
152	NA	10" Sugarberry	City of Galena Park-Not protected	Private tree, Not impacted	
153	NA	9" Mulberry	City of Galena Park-Not protected	Private tree	Clearance prune
154	NA	8" Mulberry	City of Galena Park-Not protected	Private tree	Clearance prune
155	NA	13" Sugarberry	City of Galena Park-Not protected	Private tree, vines, poor	Clearance prune
156	NA	8" Mulberry	City of Galena Park-Not protected	Private tree	Clearance prune
157	NA	9" Sugarberry	City of Galena Park-Not protected	Private tree, Not impacted	
158	NA	15" Tallow	City of Galena Park-Not protected	Private tree	Clearance prune
159	NA	9" Lacebark Elm	City of Galena Park-Not protected	Private tree, Not impacted	
160	NA	9" Lacebark Elm	City of Galena Park-Not protected	Private tree, Not impacted	
161	2011 Clinton	13" Mulberry	City of Galena Park-Not protected	Private tree, Not impacted	

TREE PRESERVATION PLAN LEGEND	
1	TREE NUMBER/LOCATION
①	TREE TO BE REMOVED

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NO.	DATE	REVISION	APP.

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281–391–0022 ckoehl@koehlurbanforestry.com

APPROVED:

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 9 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S–000701–0038–3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 203 OF 204	

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Tree Removal List

Tree No.	Location	Description	Replacement requirement
7	Not available	9" Green Ash	0
8	Not available	11" Tallow	0
9	Not available	11" Tallow	0
10	Not available	11" Tallow	0
11	NA	7" Mulberry	0
140	922 Mayo Shell	7" Mulberry	0
145	1201 Mayo Shell	10" Crepe Myrtle	0
146	1201 Mayo Shell	12" Crepe Myrtle	0
		TOTAL REPLACEMENT INCHES REQUIRED	**0**

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"		496.64	$ -
12" +		662.19	$ -
		TOTAL REQUIRED MITIGATION FEE	**$ -**

Arboriculturally Significant Tree List

Tree No.	Location	Description
38	2333 Clinton	26" Live Oak
40	2333 Clinton	25" Live Oak
41	2333 Clinton	26" Live Oak
74	1700 Clinton	38" Live Oak
78	1611 Clinton	25" Live Oak
79	1611 Clinton	24" Live Oak
88	1216 Clinton	26" Sugarberry
97	1101 Clinton	26" Sycamore
118	780 Clinton	27" Live Oak
127	407 Clinton	34" Tallow

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.

NO.	DATE	REVISION	APP.

KUO & ASSOCIATES
ENGINEERING + SURVEYING
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HOUSTON, TX 77042
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APPROVED:

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

LARGE DIAMETER WATER LINE & VALVE REPLACEMENT – PACKAGE 3

TREE PROTECTION PLAN

SHEET 10 OF 10

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
S-000701-0038-3	
DRAWING SCALE	
H: 1"=20' V: N/A	
CITY OF HOUSTON PM	
SHAN HANG LEI, P.E.	
SHEET NO. 204 OF 204	

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