

CITY OF HOUSTON HOUSTON PUBLIC WORKS CAPITAL PROJECTS

Construction in Harris County Flood Control District Right-of-Way requires:

Site plans must be approved prior to obtaining the required HCFC Right-of-Way Notification. Be advised that the HCFC Right-of-Way Notification is separate from the site development permit package

- 1.) HCFC Right-of-Way Notification (permit)
- 2.) HCFC 48-hr Pre-Construction Notice

Both are required prior to entering or working within Harris County Flood Control District right-of-way. The HCFC Right-of-Way Notification and 48-hour notice must be provided to HCFC at dcid@hcfcd.hctx.net.

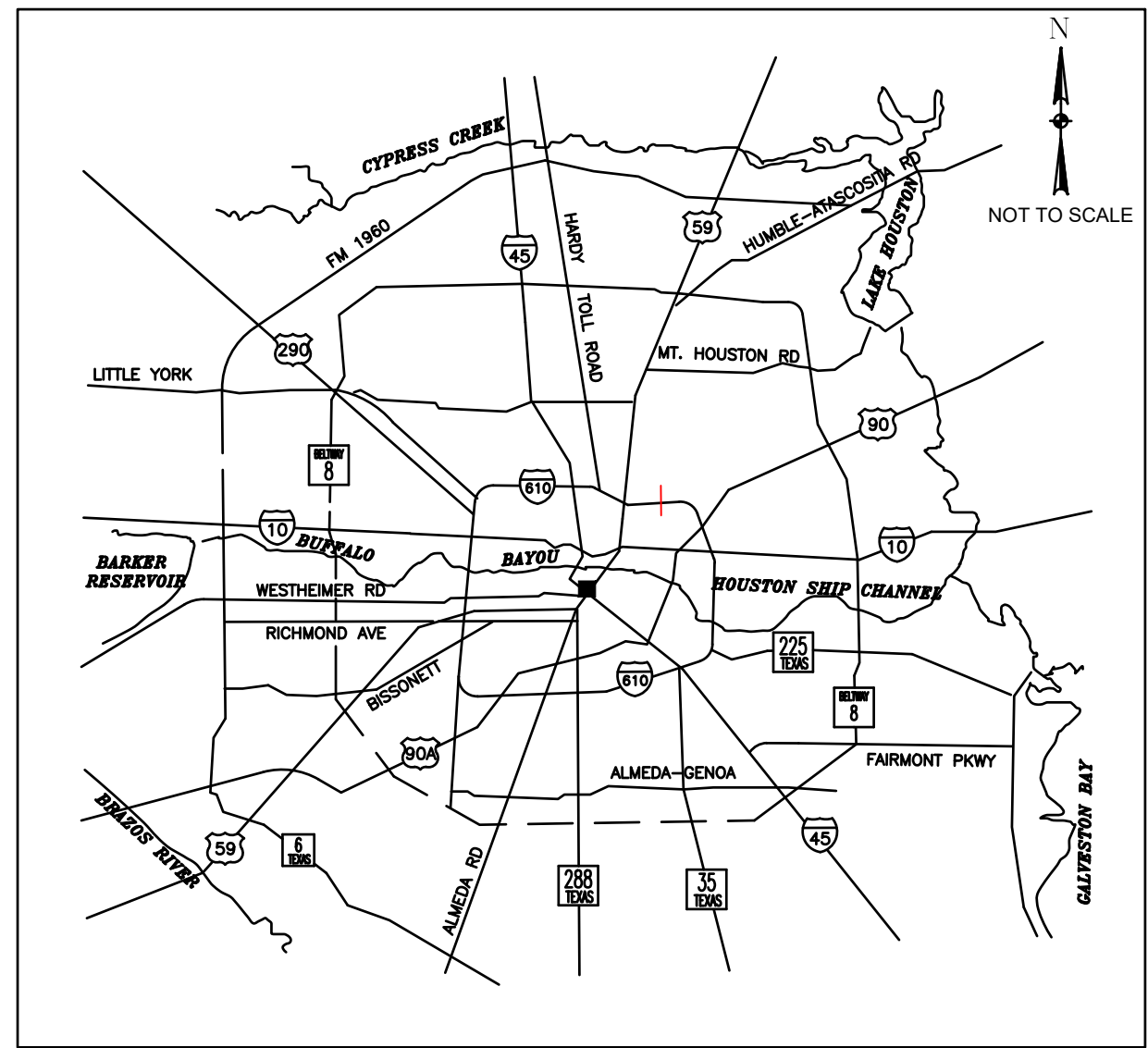
To apply for the HCFC Right-of-Way Notification please go to <http://apps.harriscountytexas.gov/EPermits> and apply for the HCFC ROW under ROW Notification. Failure to provide both items could result in project delays.

COMPLIES WITH:
2021 IBC WITH CITY OF HOUSTON AMENDMENTS AS PER SEC 101.2.
2023 NEC - NATIONAL ELECTRICAL CODE

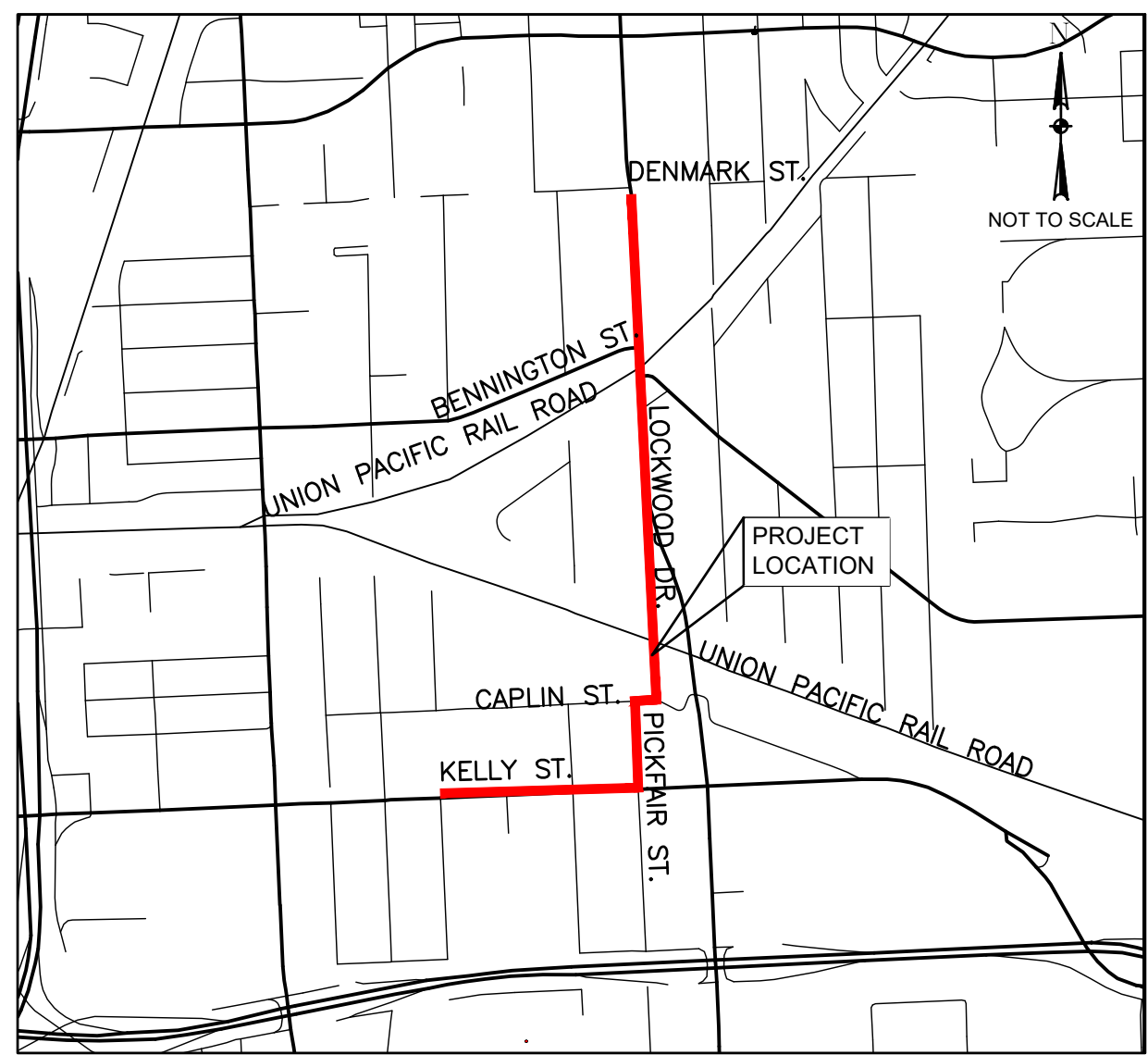
Harris County may have existing underground / overhead utilities within the proposed project limits. Please contact the call center at 713-881-3210, or submit a work order requests through <https://www.eng.hctx.net/SignalOut> to obtain field locates.

48 Hour Notice: Contractor shall notify Harris County prior to commencing construction and/or backfilling any utilities. Contractor(s) to contact Public Review Department @ (713-274-3931) or Public.review@hcpid.org.

CRMP PACKAGE 8 AREA 1 BASIN IB043 WBS NO. R-001000-0033-3



LOCATION MAP



VICINITY MAP
KEY MAP NO 454L, 454Q, & 454U
GIMS MAP NO ### X



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 | |

TDLR EABPR _____

 Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S, Houston, TX 77042		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: GREGORY S. HENRY 11/11/2025 Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614	
SURVEYED BY: FB NO. #####			
_____ PARKS-FORESTRY DEPT.			
_____ METRO			
_____ HOUSTON WATER			
_____ TRANSPORTATION & DRAINAGE OPERATIONS			
_____ CAPITAL PROJECTS		_____ SURVEY	
_____ CITY ENGINEER		_____ DATE	
_____ DIRECTOR OF HOUSTON PUBLIC WORKS		_____ DATE	
SHEET NO 01 OF 106 SHEETS		FOR CITY OF HOUSTON USE ONLY	

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 C.O.H. Field Book P-XXXX

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GREGORY J. HENRY
 91826
 06/05/2026
 Lockwood, Andrews & Newnam, Inc.
 Texas Registered Engineering Firm F-2014

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

 DRAWING INDEX

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 02 OF 106	

GENERAL CONSTRUCTION NOTES

- 1. CONSTRUCT WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING IN ACCORDANCE WITH THE LATEST EDITION OF THE PUBLICATIONS STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING, AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING PUBLISHED BY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING.
2. THE GEOTECHNICAL INVESTIGATION FOR THIS PROJECT WAS CONDUCTED IN ACCORDANCE WITH CHAPTER 11 OF THE LATEST EDITION OF THE PUBLICATION INFRASTRUCTURE DESIGN MANUAL, PUBLISHED BY THE CITY OF HOUSTON, DEPARTMENT OF THE PUBLIC WORKS AND ENGINEERING. SOILS REPORT WAS PREPARED BY GEOTEST ENGINEERING, INC. REPORT NO. 1140223001, DATED SEPTEMBER 14, 2017.
3. UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 713-223-4567/811 OR 800-344-8377 AND LONE STAR NOTIFICATION CENTER AT 800-669-8344 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION. UTILITIES MARKED WITHIN THE PUBLIC RIGHT OF WAY OR IN EASEMENTS SHALL COMPLY WITH TAC TITLE 16, PART 1, CHAPTER 18, RULE §18.6 AND THE AMERICAN PUBLIC WORKS ADMINISTRATION (APWA) UNIFORM COLOR CODE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE CITY OF HOUSTON, HOUSTON PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, AND STREET PAVING AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING, REFERENCED ABOVE, AT NO ADDITIONAL COST.
5. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, HOUSTON PUBLIC WORKS @ 832-394-9098 OR VIA FAX AT 832-395-4424 FOR INSPECTION AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
6. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.
7. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
8. CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
9. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD AS-BUILT CONDITIONS DURING CONSTRUCTION. THESE REDLINE MARKED UP DRAWINGS SHALL BE VERIFIED BY THE CONSTRUCTION INSPECTOR PRIOR TO SUBMISSION TO THE DESIGN CONSULTANT WHO WILL MAKE THE CHANGES ON THE ORIGINAL TRACINGS, LABEL EACH SHEET IN THE SET AS "RECORD DRAWINGS", AND RETURN IT TO THE OFFICE OF THE CITY ENGINEER.
10. FOR ANY AREAS WHERE CONSTRUCTION ACTIVITIES MAY CONFLICT WITH STREET LIGHTING POLES OR UNDERGROUND CABLES, CONTRACTOR SHALL CONTACT DAVID DIGGS WITH CENTERPOINT ENERGY AT 713-945-3202 A MINIMUM OF ONE WEEK PRIOR TO SCHEDULED CONSTRUCTION ACTIVITIES.
11. CONTRACTOR SHALL PROTECT AND MAINTAIN SERVICE IN ALL EXISTING SEWER LINES DURING CONSTRUCTION AND ONLY TRANSFER SERVICE ONCE PROPOSED SEWER IS INSTALLED AND OPERATIONAL.
12. PRIOR TO ABANDONMENT, ALL EXISTING SANITARY SEWERS INCLUDING 30" SHALL BE TV'ED. ALL EXISTING CONNECTIONS SHALL BE REROUTED TO THE PROPOSED LINE.
13. CONTRACTOR SHALL SCHEDULE WORK AS TO MINIMIZE NOISE DISTURBANCES TO RESIDENTS AND BUSINESSES. WORKING HOURS SHALL CONFORM TO ALL STANDARD CITY OF HOUSTON ORDINANCES. 7AM-7PM MON-SATURDAY SPECIAL REQUEST FOR HOLIDAYS AND AFTER HOURS.
14. CONTRACTOR SHALL REMOVE/REPLACE INLET PROTECTION BEFORE/AFTER SEVERE RAIN EVENT AS REQUESTED BY THE CITY OF HOUSTON. COSTS SHALL BE INCIDENTAL TO CONTRACT
15. ALL PAVEMENT RESTORATION SHALL COMPLY WITH THE STREET CUT DETAILS 02951-02 OR 02951-01, 02951-03, AS APPLICABLE DEPENDING ON THE TYPE OF PAVEMENT).
16. CONTRACTOR SHALL SECURE SHAFTS WITH FENCING, LOW PROFILE BARRIERS, AND PLATES.
17. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM CITY OF HOUSTON PROJECT MANAGER PRIOR TO STORING ANY MATERIAL OR EQUIPMENT ON MEDIANS.

STANDARD HCFCD NOTES FOR CONSTRUCTION DRAWINGS

- 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 DEVELOPMENT COORDINATION AND INSPECTION 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 OR COMPLIANCE WITH NATIONWIDE PERMIT, IF APPLICABLE, TO HCFCD, 9900 NORTHWEST FREEWAY, HOUSTON, TEXAS 77092, ATTN: DEVELOPMENT COORDINATION AND INSPECTION DEPT. BY HAND DELIVERY, BY EMAIL DCID@HCFCD.ORG, 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 DEVELOPMENT COORDINATION AND INSPECTION SECTION 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. PERFORM ALL ACTIVITIES WITHIN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT-OF-WAY IN ACCORDANCE WITH THE MOST RECENT HARRIS COUNTY FLOOD CONTROL DISTRICT STANDARD SPECIFICATIONS BOOK.
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.

HARRIS COUNTY TOLL ROAD AUTHORITY (HCTRA)

- 1. FIBER OPTIC DUCT BANKS OWNED BY TXDOT, HARRIS COUNTY, AND HCTRA MAY ALSO EXIST WITHIN THE PROJECT LIMITS. THESE FIBER DUCT BANKS ARE NOT PART OF THE TEXAS ONE CALL SYSTEM. THE CONTRACTOR SHALL CONTACT TXDOT, HARRIS COUNTY TRAFFIC AND HCTRA TO OBTAIN FIBER OPTIC DUCT BANK LOCATES AT THE FOLLOWING CONTACTS: TXDOT - 713.802.5662, HARRIS COUNTY TRAFFIC SIGNAL HOTLINE - 713.881.3210 AND HCTRA VIA E-MAIL AT ITSMINT@HCTRA.ORG.
2. THE CONTRACTOR SHALL CONTACT HCTRA MAINTENANCE DEPARTMENT AT 832.590.6936 48 HOURS PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL RESTORE THE PROJECT SITE BACK TO ORIGINAL CONDITIONS OR BETTER.

TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)

- 1. THE TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) IS NOT A MEMBER OF 811. AT LEAST 72 HOURS BEFORE STARTING WORK, MAKE ARRANGEMENTS FOR LOCATING EXISTING TXDOT-OWNED ABOVE GROUND AND UNDERGROUND FIBER OPTIC, COMMUNICATIONS, POWER ILLUMINATION, AND TRAFFIC SIGNAL CABLING AND CONDUIT. DO THIS BY CALLING TXDOT'S HOUSTON DISTRICT TRAFFIC SIGNAL OPERATIONS OFFICE AT 713-802-5668 TO SCHEDULE MARKING OF UNDERGROUND LINES ON THE GROUND. USE CAUTION IF WORKING IN THESE AREAS TO AVOID DAMAGING OR INTERFERING WITH EXISTING FACILITIES.
2. CONTRACTOR OR SUB-CONTRACTOR IS REQUIRED TO CONTACT THE TXDOT MAINTENANCE SUPERVISOR A MINIMUM OF 72 HOURS PRIOR TO COMMENCING ANY WORK.

TXDOT MAINTENANCE SUPERVISORS OFFICE PHONE

- HARRIS COUNTY, INSIDE IH 610 LOOP (713) 636-7400
HARRIS COUNTY, NORTH (281) 319-6400
HARRIS COUNTY, SOUTHEAST (281) 464-5500
HARRIS COUNTY, WEST (713) 934-5900
TRAFFIC SIGNAL OPERATIONS (713) 866-7101

DETAILS:

CITY OF HOUSTON STANDARD DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATERLINES, STORM DRAINAGE, AND STREET PAVING ARE INCORPORATED IN PLANS BY REFERENCE AS IF COPIED VERBATIM. STANDARD DETAILS ARE AVAILABLE FOR DOWNLOAD AT THE FOLLOWING WEB ADDRESS: HTTP://EDOCS.PUBLICWORKS.HOUSTONTX.GOV/ENGINEERING-AND-CONSTRUCTION/DRAWINGS/STANDARD-DETAILS.HTML DETAILS INCLUDED IN PLAN SET SUPERSEDE RELATED COH STANDARD DETAILS.

GRADING CONSTRUCTION NOTES

- 1. GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE STARTING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
2. BEFORE STARTING CONSTRUCTION, CONTRACTOR SHALL VERIFY BENCHMARK ELEVATION AND NOTIFY ENGINEER IF ANY DISCREPANCY AND/OR CONFLICT IS FOUND.
3. CONTRACTOR SHALL ENSURE THERE IS POSITIVE DRAINAGE FROM THE PROPOSED BUILDINGS AND NO PONDING IN PAVED AREAS, AND SHALL NOTIFY ENGINEER IF ANY GRADING DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR UTILITIES.
4. CONTRACTOR SHALL PROTECT ALL MANHOLE COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES THAT ARE TO REMAIN IN PLACE AND UNDISTURBED DURING CONSTRUCTION.
5. ALL EXISTING CONCRETE PAVING, SIDEWALK, AND CURB DEMOLITION SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR. DISPOSAL SHALL BE AT AN APPROVED OFF-SITE, LAWFUL LOCATION, UNLESS DIRECTED OTHERWISE BY THE OWNER.

METRO

- 1. THE CONTRACTOR SHALL CONTACT METRO BUS OPERATIONS BY EMAIL 10 BUSINESS DAYS IN ADVANCE OF WORK SCHEDULED THAT WOULD IMPACT A METRO BUS OR RAIL LINE. EMAIL SHALL BE SENT TO ZELMA.RIDLEY@RIDEMETRO.ORG, TANGEE.MOBLEY@RIDEMETRO.ORG AND CARL.TAYLOR@RIDEMETRO.ORG AND COPY TO COH PROJECT MANAGER, CALL METRO AT 713-635-4000 WITH QUESTIONS

HARRIS COUNTY

RECORD DRAWINGS TO BE SUBMITTED TO THE HARRIS COUNTY ENGINEERING DEPARTMENT PERMITS OFFICE. THESE DRAWINGS CAN BE SUBMITTED TO ACCEPTANCE@ENG.HCTX.NET

APPENDIX D - CONSTRUCTION NOTES TO BE ON ALL PROJECTS

- 1. WATER LINES, WASTEWATER COLLECTION SYSTEMS, AND STORM DRAINAGE SYSTEMS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON'S, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "DESIGN MANUAL, STANDARD CONSTRUCTION SPECIFICATIONS, AND DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING".
2. ALL STORM SEWER WILL BE REINFORCED CONCRETE (C76 CLASS III) AND SHALL BE INSTALLED, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE CITY OF HOUSTON'S DRAWINGS 02317-02, 02317-03, 02317-05, 02317-06 AND 02317-07 AS APPLICABLE.
3. ALL STORM SEWERS CONSTRUCTED INSIDE LOT EASEMENTS SHALL BE R.C.P., MINIMUM TWENTY (20) FOOT WIDE EASEMENTS SHALL BE PROVIDED.
4. AN ALTERNATIVE TO CEMENT STABILIZED SAND MAY BE USED AS BACKFILL FOR PIPES FIFTY FOUR (54) INCH AND LARGER, FROM 1-FOOT ABOVE THE TOP OF THE PIPE TO THE BOTTOM OF THE SUBGRADE. CONTRACTOR MAY BACKFILL WITH SUITABLE MATERIAL, PROVIDED THE BACKFILL MATERIAL IS PLACED IN EIGHT (8) INCH LIFTS AND MECHANICALLY COMPACTED TO NINETY-FIVE (95)% STANDARD PROCTOR DENSITY. TESTS SHALL BE TAKEN AT ONE HUNDRED (100) FOOT INTERVALS ON EACH LIFT. BEDDING AND BACKFILL TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE CEMENT-STABILIZED SAND.
5. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH EIGHT (8) INCH BRICK WALLS UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR(S) SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT - PERMIT OFFICE TWENTY-FOUR (24) HOURS IN ADVANCE OF COMMENCING UTILITY AND/OR PAVING CONSTRUCTION AT (713) 274-3823 AND WRITTEN NOTIFICATION FORTY EIGHT (48) HOURS IN ADVANCE OF COMMENCING CONSTRUCTION AT 10555 NORTHWEST FREEWAY, SUITE 144, HOUSTON, TX 77092.
7. PAVING SHALL BE IN ACCORDANCE WITH THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR THE APPROVAL AND ACCEPTANCE OF INFRASTRUCTURE" AND/OR AMENDMENTS OF THE SAME.
8. GUIDELINES SET FORTH IN THE LATEST EDITION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, TMUCD WITH REVISIONS" SHALL BE OBSERVED.
9. OWNER OR OWNER'S AGENT TO OBTAIN ALL PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOODPLAIN MANAGEMENT" PRIOR TO STARTING CONSTRUCTION.
10. OWNER OR OWNER'S AGENT TO OBTAIN ALL NOTIFICATIONS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN HARRIS COUNTY AND HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHTS-OF-WAY.

APPENDIX E - CONSTRUCTION NOTES INVOLVING UTILITIES AND PAVING WORK LOCATED WITHIN A PUBLIC RIGHT-OF-WAY

- 1. NOTE: "NOTIFICATIONS ISSUED BY HARRIS COUNTY ENGINEERING DEPARTMENT - PERMITS OFFICE - IS REQUIRED FOR PROPOSED WORK WITHIN HARRIS COUNTY RIGHT-OF-WAY. THE PROJECT MUST BE APPROVED PRIOR TO OBTAINING THE REQUIRED NOTIFICATION. BE ADVISED THAT A NOTIFICATION MUST BE OBTAINED SEPARATELY FROM SITE DEVELOPMENT PERMIT PACKAGE. FOR ADDITIONAL INFORMATION, PLEASE VISIT HTTP://WWW.ENG.HCTX.NET/PERMITS/PUBLIC-REVIEW-CODE/PUBLIC-PLAN-REVIEW/NOTIFICATION-OF-CONSTRUCTION-IN-THE-ROW OR CONTACT PUBLIC REVIEW INSPECTIONS DEPARTMENT @ (713-274-3931)"

Lockwood, Andrews & Newnam, Inc. logo and contact information. Includes address: 3700 W Sam Houston Pkwy S Houston, TX 77042. Surveyed by: GREGORY J. HENRY, dated 06/05/2026.

CITY OF HOUSTON HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8

GENERAL NOTES - SHEET 1 OF 3

Table with 2 columns: WBS NUMBER (R-001000-0033-3), DRAWING SCALE, CITY OF HOUSTON PM (NEIL BARNSDALE, P.E.), SHEET NO. (03 OF 106). Includes a note: FOR CITY OF HOUSTON USE ONLY.

SANITARY SEWER CONSTRUCTION NOTES

1. ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON "STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, STREET PAVING, AND TRAFFIC" AND ALL CURRENT AMENDMENTS THERETO AND BE SUBJECT TO A STANDARD EXFILTRATION TEST. TESTS ARE TO BE PERFORMED ON THE TOTAL FOOTAGE OF SEWER LINE INCLUDED IN THE PROJECT. REQUIREMENTS OF TEXAS ADMINISTRATIVE CODE, TITLE 30 CHAPTER 217, "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS" SHALL GOVERN WHERE CONFLICTS EXIST EXCEPT WHERE CITY REQUIREMENTS ARE MORE STRINGENT.
2. ALL MANHOLES ARE TO BE PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBERS 02082-01, 02082-02, 02082N-02, 02082-03, AND 02082N-03 UNLESS OTHERWISE NOTED. USE 2019 VERSION AS APPLICABLE.
3. SANITARY SEWER MANHOLES WILL HAVE BEDDING AND BACKFILL PER CITY OF HOUSTON STANDARD DETAILS DRAWING NO. 02317-08 UNLESS OTHERWISE NOTED.
4. THE SANITARY SEWER PVC PIPE SHALL BE ASTM D 3034 TYPE PSM SDR 26 GRAVITY SEWER PIPE, ASTM D2241 SDR 26 PRESSURE RATED SEWER PIPE OR AWWA C-900 DR-18 GREEN PVC PRESSURE RATED SEWER PIPE BASED ON CONSTRUCTION CONDITION REQUIREMENT AND CONFORMING TO ASTM D1784 AND CITY OF HOUSTON STANDARD SPECIFICATION SECTION 02506 POLYVINYL CHLORIDE PIPE.
5. WHEN SS PRESSURE RATED PVC PIPE IS USED ON WATERLINE (WL) CROSSING UNDER CONDITION 1 OF COH IDM TABLE 7.3, THE SAME TYPE OF D2241 SDR 26 PVC PIPE OR C-900 GREEN DR-18 PVC GREEN PRESSURED TO BE UTILIZING IN-BETWEEN TWO SS MH'S. OR TO UTILIZE A DI TRANSITION ADAPTER FOR THE CONNECTING OF ASTM D-3034 PVC GRAVITY PIPE TO DI-OD AWWA C-900 PVC PIPE CENTERED AT WL WHEN CONNECTING TWO DIFFERENT TYPES OF PVC PIPES FOR SEWER CONSTRUCTION.
6. AWWA C-900 DR-18 PVC PIPE USES EITHER AWWA C900 DR-18 PVC FITTINGS OR DIP FITTINGS.
7. ALL SANITARY SEWER LINES UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL HAVE BEDDING PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBERS 02317-01, 02317-02, OR 02317-03 AS APPLICABLE, WITH 1 ½ SACK CEMENT/CY STABILIZED SAND BACKFILL UP TO THE BOTTOM OF THE PAVEMENT SUBGRADE. 100 PSI PERFORMANCE RESULTS ARE STILL REQUIRED.
8. ALL SANITARY SEWERS CROSSING WATER LINES WITH A CLEARANCE BETWEEN 12 INCHES AND 9 FEET SHALL HAVE A MINIMUM OF ONE 18' JOINT OF 150 PSI DUCTILE IRON OR (GREEN) C900 PVC PIPE MEETING ASTM SPECIFICATION D2241 CENTERED ON WATER LINE. WHEN WATER LINE IS BELOW SANITARY SEWER, PROVIDE MINIMUM 2 FOOT SEPARATION.
9. CONTRACTOR SHALL PROVIDE A MINIMUM HORIZONTAL CLEARANCE OF 9' FEET BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.
10. SANITARY SEWER MANHOLE RIMS OUTSIDE OF PROPOSED PAVING WILL BE SET 3" - 6" ABOVE THE SURROUNDING LEVEL FINISHED GRADE AFTER PAVING WITH SLOPED BACKFILL ADDED FOR STORM WATER TO DRAIN AWAY FROM MANHOLE RIM.
11. IN WET STABLE TRENCH AREAS USE BEDDING PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBER 02317-02.
12. DEFLECTION TEST: DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID SEWER PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5% IF THE DEFLECTION TEST IS TO BE RUN USING A RIGID MANDREL, IT SHALL HAVE A DIAMETER EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE. THE TEST SHALL BE PERFORMED AS PER 30 TAC 217.57 LATEST AMENDMENT AND WITHOUT MECHANICAL PULLING DEVICES. NO BALL-TYPE MANDREL IS ALLOWED.
13. INFILTRATION, EXFILTRATION OR LOW-PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC, TITLE 30 217.57 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.

A. INFILTRATION OR EXFILTRATION TEST: TOTAL LEAKAGE AS DETERMINED BY A HYDROSTATIC HEAD TEST SHALL NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO (2) FEET.

B. LOW-PRESSURE AIR TEST: PERFORM TEST ACCORDING TO UNI-B-6-90 OR OTHER APPROPRIATE PROCEDURES. FOR SECTIONS OF PIPE LESS THAN 36" (INCH) AVERAGE INSIDE DIAMETER, THE MINIMUM ALLOWABLE TIME FOR PRESSURE DROP FROM 3.5 P.S.I.G. TO 2.5 P.S.I.G. SHALL BE AS FOLLOWS:

6" 340 SECONDS OR 0.855(L) FOR TEST LENGTHS GREATER THAN 398'

8" 454 SECONDS OR 1.520(L) FOR TEST LENGTHS GREATER THAN 298'

10" 567 SECONDS OR 2.374(L) FOR TEST LENGTHS GREATER THAN 239'

12" 680 SECONDS OR 3.419(L) FOR TEST LENGTHS GREATER THAN 199'

15" 850 SECONDS OR 5.342(L) FOR TEST LENGTHS GREATER THAN 159'

18" 1020 SECONDS OR 7.693(L) FOR TEST LENGTHS GREATER THAN 133'


WHERE L = LENGTH OF LINE OF SAME PIPE SIZE IN FEET.
14. "SAN. S. E." INDICATES "SANITARY SEWER EASEMENT"
15. FOR SANITARY MANHOLE (MH) RIMS SET INSIDE OF OR @ CURB & GUTTER PAVEMENT AND/OR BELOW T.C., MH RIMS WILL BE SET FLUSHED WITH AN ABUTTING PAVED SURFACE. THE (VALCUN, NEENAH OR EQUAL) HEAVY DUTY BOLTED SOLID MH COVER SHALL BE PROPERLY (AND SECURELY) ATTACHED AND SEALED TO ITS COMPATIBLE GASKETED FRAME BY USING BOTH A NEOPRENE GASKET AND (AT LEAST) 4 COUNTER-SUNK HEX-HEAD COARSE THREADED ½"-13 UNC STAINLESS STEEL BOLTS. THE HEAVY DUTY FRAME MH COVER SHALL BE SOLID (NO AIR HOLES). SAID FRAME SHALL BE BOTH EMBEDDED INTO THE MH'S TOP ALSO SECURELY ANCHORED TO THE UNDERLYING MH STRUCTURE WITH EITHER SECURELY ATTACHED EMBEDDED ANCHOR BOLTS OR THE CONCRETE MH'S EXPOSED REBARS WELDED TO THE FRAME OR OTHER EQUALLY SECURED METHODS TO PREVENT MH COVER/FRAME BLOW-OFFS/EJECTIONS.

WATER LINE CONSTRUCTION NOTES

- 1) WATER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF HOUSTON INFRASTRUCTURE DESIGN MANUAL, STANDARD SPECIFICATION, AND CONSTRUCTION DETAILS.
- 2) ALL 4" THROUGH 12" WATER LINE TO BE AWWA C-900 PVC DR-18 BLUE PRESSURE RATED WATER MAIN WITH 2" AND SMALLER WATER SERVICE LINE TO BE CONTINUOUS TYPE K COPPER TUBING PER COH STANDARD SPECIFICATION SECTION 02503. ALL 4" THRU 54" DI PIPE WATER LINES SHALL BE AWWA C151 WITH INSIDE LINING WITH AWWA C104 AND DOUBLE WRAPPED WITH 8-MIL POLYETHYLENE SHEETS.
- 3) CONCRETE THRUST BLOCKS SHALL BE PROVIDED AS NECESSARY TO PREVENT PIPE MOVEMENT. USE RESTRAINED JOINTS WHERE PREVENTING MOVEMENT OF 16" OR GREATER PIPE IS NECESSARY DUE TO THRUST.
- 4) ALL WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT OF ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" OVER PIPE AND BACKFILLED WITH CEMENT STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE.
- 5) ALL WATER LINE AND SEWER LINE CROSSINGS SHALL BE CONSTRUCTED PER CITY OF HOUSTON AND TCEQ REGULATIONS.
- 6) ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C-500 AND SHALL BE OF THE RESILIENT SEAT TYPE.
- 7) ALL WATER LINES TO BE DISINFECTED IN CONFORMANCE WITH AWWA C-651 AND THE TEXAS STATE DEPARTMENT OF HEALTH. AT LEAST ONE BACTERIOLOGICAL SAMPLE SHALL BE COLLECTED FOR EVERY 1,000 LINEAR FEET OF WATER LINE AND SHALL BE REPEATED IF CONTAMINATION PERSISTS.
- 8) ALL BELOW GRADE VALVES SHALL BE GASKETED, HUB-END GATE VALVES WITH A CAST IRON BOX, EXCEPT WHERE FLANGES ARE CALLED OUT ON THE PLANS.
- 9) 4" THRU 12" FITTINGS SHALL BE CEMENT MORTAR LINED COMPACT DUCTILE IRON PRESSURE FITTINGS PER ANSI A21.53, OR PUSH ON FITTINGS PER ANSI A21.10 PRESSURE RATED AT 250 PSIG.
- 10) HYDROSTATIC TESTING: ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH THE LATEST CITY OF HOUSTON STANDARD CONSTRUCTION SPECIFICATIONS. TESTS ARE TO BE PERFORMED ON THE ENTIRE FOOTAGE OF WATER PIPE LINE INCLUDED IN THE PROJECT.
- 11) ALL WATER LINES TO HAVE 4' MINIMUM COVER TO FINISHED GRADE AND MINIMUM 12" CLEARANCE TO OTHER UTILITIES AT CROSSING UNLESS OTHERWISE NOTED ON PLANS. ALL WATER LINE INSTALLED OVER 8' DEEP SHALL UTILIZE RESTRAINED JOINT FITTINGS.
- 12) CONTRACTOR SHALL KEEP WATER PIPE CLEAN AND CAPPED (OR OTHERWISE EFFECTIVELY COVERED) OPEN PIPE ENDS TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPE LINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.

STREET AND BRIDGE NOTES

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

 Lockwood, Andrews & Newnam, Inc. <small>3700 W Sam Houston Pkwy S Houston, TX 77042</small>	<p style="text-align: center; margin: 0;">INTERIM REVIEW ONLY</p> <p style="font-size: 8px; margin: 0;">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</p> <p style="text-align: center; margin: 0;">GREGORY J. HENRY <small>91826 06/05/2026</small></p> <p style="font-size: 8px; margin: 0; text-align: right;">Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</p>								
<h2 style="margin: 0;">CITY OF HOUSTON</h2> <p style="margin: 0;">HOUSTON PUBLIC WORKS</p> <h3 style="margin: 0;">CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8</h3>									
<p style="margin: 0;">GENERAL NOTES - SHEET 2 OF 3</p>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">WBS NUMBER</td> <td rowspan="4" style="padding: 2px; text-align: center; vertical-align: middle;">FOR CITY OF HOUSTON USE ONLY</td> </tr> <tr> <td style="padding: 2px;">R-001000-0033-3</td> </tr> <tr> <td style="padding: 2px;">DRAWING SCALE</td> </tr> <tr> <td style="padding: 2px;"> </td> </tr> <tr> <td style="padding: 2px;">CITY OF HOUSTON PM</td> <td rowspan="2" style="padding: 2px; text-align: center; vertical-align: middle;">NEIL BARNSDALE, P.E.</td> </tr> <tr> <td style="padding: 2px;">SHEET NO. 04 OF 106</td> </tr> </table>	WBS NUMBER	FOR CITY OF HOUSTON USE ONLY	R-001000-0033-3	DRAWING SCALE		CITY OF HOUSTON PM	NEIL BARNSDALE, P.E.	SHEET NO. 04 OF 106	
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SHEET NO. 04 OF 106									

TRAFFIC SIGNAL NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING, RESTORING, REPLACING ALL INFRASTRUCTURES AND EXISTING DETECTION CURRENTLY IN PLACE FOR ALL APPROACHES IF DAMAGED DURING CONSTRUCTION.

THE CONTRACTORS SHALL ALSO MAINTAIN EXISTING COMMUNICATION. THE CONTRACTORS SHALL ALSO MAINTAIN PEDESTRIAN ACCESSIBILITY TO PUSH BUTTONS AND PROPER SIGNAL ALIGNMENT THROUGHOUT TCP STAGES, OTHERWISE BAG PEDESTRIAN SIGNAL HEADS AND INSTALL CROSSWALK CLOSED SIGNS AND PROVIDE PEDESTRIAN DETOUR.

CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON TRAFFIC OPERATIONS FOR ANY SIGNAL TIMING MODIFICATIONS AT LEAST 72 HOURS PRIOR TO IMPLEMENTING THE TCP STAGES. THIS NOTE APPLY'S TO ALL CONSTRUCTION PHASES AND STAGES.

IF NORMAL OPERATION OF TRAFFIC SIGNALS AT ANY INTERSECTION IS AFFECTED BY LANE CLOSURE OR TRAFFIC DIVERSION AS A RESULT OF THE PROPOSED IMPROVEMENTS, THE EOR SHALL SUBMIT TRAFFIC CONTROL PLANS THAT INCLUDES TEMPORARY TRAFFIC SIGNALS TO ACCOMMODATE THE NEW TRAFFIC OPERATION AT THE INTERSECTION.

STORM CONSTRUCTION NOTES

1. STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (C-76, CLASS III), AND SHALL BE INSTALLED, BEDDED, AND BACK FILLED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS. 2317-02, 02317-3, 02317-05, 02317-06, AND 02317-07 (OCT. 2002) AS APPLICABLE UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
2. ALL STORM SEWER CONSTRUCTED IN SIDELOT EASMENT SHALL BE R.C.P (C-76, CLASSIII) AND SHALL BE EMBEDDED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS. 02317-02, 02317-03, 02317-05, 02317-06, AND 02317-07 AS APPLICABLE.
3. ALL SEWER UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1-1/2 SACK CEMENT/C.Y. STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL.
4. ALL TRENCH BACKFILL SHALL BE IN 8" LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS IN EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMACTION TEST (ASTM D-698/AASHTO 199).
5. CIRCULAR AND ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINT CONFORMING TO ASTM C443 AND ASTM C877 RESPECTIVELY.
6. ALL STORM SEWER PIPES AND INLET LEADS SHALL BE 24" AND LARGER R.C.P. (C-76, CLASSIII).
7. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES AND INLET LEADS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
8. MINIMUM HORIZONTAL CLEARANCE BETWEEN ANY STORM PIPE AND BOX SHALL BE AT LEAST 48-INCHES FROM EXTERIOR OF THE STORM PIPE OR BOX TO THE EXTERIOR OF THE EXISTING OR PROPOSED PUBLIC OR PRIVATE UTILITY AND OTHER APPURTENANCES. MINIMUM VERTICAL CLEARANCE BETWEEN ANY STORM PIPE AND BOX SHALL BE AT LEAST 18-INCHES FROM EXTERIOR OF THE STORM PIPE OR BOX TO THE EXTERIOR OF THE EXISTING OR PROPOSED PUBLIC OR PRIVATE UTILITY AND OTHER APPURTENANCES.
9. ADJUST MANHOLE COVERS TO GRADE CONFORMING TO REQUIREMENTS OF SECTION 02086-ADJUSTING MANHOLES, INLETS, AND VALVE BOXES TO GRADE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING, AND RESTORING ANY BACK SLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF THIS WORK.
11. ALL DITCHES SHALL BE GRADED TO PROPOSED ELEVATIONS TO INSURE PROPER DRAINAGE. ALL OUTFALLS SHALL BE PROPERLY BACKFILLED AND COMPACTED. ALL DISTURBED AREA SHALL BE REGRADED, SEEDED, AND FERTILIZED.
12. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

SWPPP CONSTRUCTION NOTES

1. CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG ROAD AND SIDE DITCHES AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION (SWPP) PLANS TO KEEP SILT AND OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS AND DITCHES EVENTUALLY POLLUTING THE RECEIVING STORM.
2. DURING THE EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATION MATERIAL CAN BE QUICKLY HAULED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT. ANY LOOSE EXCAVATED MATERIAL WHICH FALLS ON PAVEMENTS OR DRIVEWAYS SHALL BE SWEEPED BACK INTO THE EXCAVATED AREA.
3. CONTRACTOR SHALL CLEAN UP THE EXISTING STREET INTERSECTIONS AND DRIVEWAYS DAILY, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT OR ROCK TRACKED FORM THE EXCAVATED AREA.

4. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.
5. CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.
 - DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
 - AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
 - STRUCTURAL CONTROL MEASURES.
 - LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.
6. CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING DITCHES AND OR CULVERTS FOR UNOBSTRUCTED DRAINAGE AT ALL TIMES. WHERE SODDING IS DISTURBED BY EXCAVATION ON BACKFILLING OPERATIONS, SUCH AREAS SHALL BE REPLACED BY SEEDING OR SODDING. SLOPES 4:1 OR STEEPER SHALL BE REPLACED BY BLOCK SODDING.
7. CONTRACTOR SHALL REMOVE/REPLACE INLET PROTECTION BARRIER BEFORE/AFTER A SEVERE WEATHER EVENT AT THE REQUEST OF THE CITY OF HOUSTON. PAY ITEM FOR SEVER WEATHER EVENT ONLY.

CENTERPOINT ENERGY HOUSTON LIGHTING AND POWER

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

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

- WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
- WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
- FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200.

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

WARNING: OVERHEAD ELECTRICAL LINES

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 PERSON OR THINGS MAY COME WITHIN SIX(6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
- OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

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


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

<p>TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713-207-2222</p> <p style="text-align: center;">NOTICE:</p> <p>For your safety, you are required by Texas Law to call 811 at least 48 hours before you dig so that underground line can be marked. This Verification does not fulfill your obligation to call 811.</p>
<p>VERIFICATION OF PRIVATE UTILITY LINES</p>
<p>Date</p>
<p>CenterPoint Energy/Natural Gas Facilities Verification ONLY. (This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification.) (Gas service lines are not shown.) Signature Valid for six months.</p>
<p>Date</p>
<p>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.</p>

AT&T TEXAS/SWBT FACILITIES

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWIN 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 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 ACILITIES.
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 DAMAGE PREVENTION MANAGER KEVIN RAY (713) 614-1983 OR E-MAIL HIM © KR7896@ATT.COM IF CABLE LOCATE REQUESTS ARE NOT COMPLETED FOR OUR AT&T TEXAS/SWBT FACILITIES.
7. NOTE:
AT&T SHALL NOT REGARD CONTRACTIBILITY ISSUES AS CONFLICTS. THE EXCAVATING CONTRACTOR SHALL SUPPORT AT&T FACILITIES EXPOSED WITHIN THEIR TRENCH, WHICH ARE NOT IN DIRECT CONFLICT WITH ROADWAY OR OTHER IMPROVEMENTS

COH Capacity Remedial Measures Plan Area 1 Package 8 - CONTACT LIST				
11/7/2025				
Owner	Contact Person	Utility Type	Address	Phone
Communication				
AT&T Texas	Marc F Johnson	Fiber Optic	9051 Park West Dr. RM 1216 Houston, Texas 77063	713-213-4868
Comcast	Cory Thomas	Fiber Optic	7033 Airport Blvd. Houston, Texas 77061	832-317-2849
PS LIGHTWAVE	Emmanuel Maldonado	Fiber Optic	5959 Corporate Dr. Suite 3300 Houston, Texas 77036	832-615-8000
Phonoscope Enterprises Group	Dean McKenna	Fiber Optic	10555 Westoffice Dr. Houston, Texas 77042	713-272-4600
Verizon Wireline Network	Michael Mabe	Fiber Optic	14503 Luth Rd. Houston, Texas 77039	281-901-3348
Zayo Group	Dean Lippe	Fiber Optic	6630 Roxburgh Dr., Suite 150 Houston, Texas 77041	713-344-2171
Logix Fiber Networks	Gregory Hoss	Fiber Optic	2950 N. Loop W. 10th Floor Houston, Texas 77092	713-865-8128
Crown Castle	Terry Walker	Fiber Optic	8020 Katy Freeway Houston, Texas 77024	209-484-7078
Lumen / CenturyLink	Josue Romero	Fiber Optic	7060 Empire Central Dr. Houston, Texas 77040	281-618-3992
Verizon Wireless	Willis W. Wilcox, Jr	Fiber Optic	14123 Cicero Road Houston, Texas 77095	251-300-7109
Transtar, City of Houston	Eldridge R Medina	Fiber Optic	6922 Katy Rd. Houston, Texas 77024	713-881-3175
Gas				
CenterPoint Energy	Gas Engineering Support	Gas	1111 Louisiana St. Suite 2258C Houston, Texas 77002	713-207-4624 713-207-4601
Energy Transfer	Electric	Gas	1300 Main Street Houston, Texas 77002	713-503-9063 C
Kinder Morgan	Oscar Zapata	Gas	1001 Louisiana St. Houston, Texas 77002	713-420-4654
Sunoco Pipeline L.P.	Eric Lucas	Gas		832-331-7481 eric.lucas@energytransfer.com
Magellan/ONEOK	Brian Nieto	Gas/Petroleum	100 W. Fifth Street Tulsa, OK 74103	631-401-2489
Electric				
CenterPoint Energy	Cynthia Martinez	Electric	1111 Louisiana - 943A Houston, Texas 77002	713-207-6555
CenterPoint Energy	Randy Morehead	Street Lighting	4700 S. Shaver Bldg. I Houston, Texas 77034	713-945-6282

 <p>Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042</p>	<p>INTERIM REVIEW ONLY</p> <p><small>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</small></p> <p style="text-align: center;">_____ GREGORY J. HENRY _____ 91826 06/05/2026 _____ Date</p>
	<p><small>SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX</small></p> <p style="text-align: right;"><small>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</small></p>

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8

GENERAL NOTES - SHEET 3 OF 3

<p>WBS NUMBER</p> <p>R-001000-0033-3</p> <p>DRAWING SCALE</p> <p>CITY OF HOUSTON PM</p> <p>NEIL BARNSDALE, P.E.</p> <p>SHEET NO. 05 OF 106</p>	<p>FOR CITY OF HOUSTON USE ONLY</p>
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Date

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Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

**CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8**

HARRIS COUNTY FLOOD CONTROL
DISTRICT REVIEW SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 06 OF 106	



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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

HARRIS COUNTY ENGINEERING
DEPARTMENT REVIEW SHEET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 07 OF 106	

EXISTING PLAN LEGEND

	ASPHALT SYMBOL
	B OR BB INLET
	BUSH
	C INLET
	CLEANOUT
	COLUMN
	DOWN GUY
	E INLET
	ELEC MANHOLE
	FIRE HYDRANT
	GAS METER
	GAS VALVE
	GATE
	GRATE INLET
	GRATE INLET
	IRRIGATION CONTROL VALVE
	MAIL BOX
	MANHOLE
	PLANTER
	POWER POLE
	POWER POLE W/LT.
	REFERENCE INFORMATION (FROM RECORD DRAWING)
	SBC MANHOLE
	SIGN
	SIGNAL POLE
	SPRINKER VALVE
	SPRINKLER HEAD
	STREET LIGHT/FLOOD LIGHT
	STREET LIGHT/PARKING LIGHT
	TREE
	TREE STUMP
	TREE-CREPE MYRTLE
	TREE-PINE
	UTILITY MARK
	UTILITY PIN FLAG
	WATER METER
	WATER VALVE
	TEST HOLES
	BRUSH ROW
	DITCH/SWALE CENTER LINE
	EASEMENT OR BUILDING LINE
	FENCE
	GAS LINE
	R.O.W. LINE S & W

EXISTING PLAN LEGEND (CONT.)

	GUARD RAIL
	HEDGE ROW OR TREE LINE
	HIGH BANK
	OVERHEAD POWER LINE
	TELEPHONE LINE
	UG STREET LIGHT CABLE
	SAN SEWER LINE 24" DIA. & SMALLER
	SAN SEWER LINE 30" DIA. & LARGER
	STM SEWER LINE 24" DIA. & SMALLER
	STM SEWER LINE 30" DIA & LARGER
	WATER LINE 24" DIA. & SMALLER
	WATER LINE 30" DIA & LARGER

EXISTING PROFILE LEGEND

	BASELINE, CENTER LINE OF RIGHT-OF-WAY
	R.O.W. LINE N & E
	R.O.W. LINE S & W
	DITCH OR CURB LINE N & E
	DITCH OR CURB LINE S & W
	GAS LINE
	TELEPHONE CONDUIT
	SAN SEWER LINE 24" DIA. & SMALLER
	SAN SEWER LINE 30" DIA. & LARGER
	STM SEWER LINE 24" DIA. & SMALLER
	STM SEWER LINE 30" DIA & LARGER
	WATER LINE 24" DIA. & SMALLER
	WATER LINE 30" DIA & LARGER
	PIPELINE MARKER
	INFORMATION OBTAINED FROM RECORD DRAWINGS, NOT FIELD VERIFIED.

PROPOSED PLAN LEGEND

	SANITARY SEWER MANHOLE
	BORING AND RECEIVING SHAFT
	=<24" SANITARY SEWER LINE
	>24" FRP SANITARY SEWER LINE
	DEMOLITION OF EXISTING

PROPOSED PROFILE LEGEND

	8" & 24" SANITARY SEWER LINE
	36 & 42" FRP SANITARY SEWER LINE
	BORE AND RECEIVING SHAFT
	SANITARY SEWER MANHOLE

STANDARD ABBREVIATIONS

AT	AIR RELEASE/VACUUM RELEASE	D.I.C.L.	DUCTILE IRON CEMENT LINED	H.P.	HIGH PRESSURE	PL	PROPERTY LINE	S.S.E.	SANITARY SEWER EASEMENT
AI/VR	AIR RELEASE/VACUUM RELEASE	D.I.P.	DUCTILE IRON PIPE	I.P.	INTERMEDIATE PRESSURE	P.R.C.	POINT OF REVERSE CURVE	SAN.	SANITARY
B.L.	BUILDING LINE	DIA.	DIAMETER	I.R.	IRON ROD	PRV	PRESSURE REDUCING/RELIEF VALVE	SB/BH	SOIL BORING/BORE HOLE
B/F	BLIND FLANGE	D/W	DRIVEWAY	INFL.	INFLUENT	P.T.	POINT OF TANGENCY	SWBT	AT&T TEXAS/SWBT
B.F.V.	BUTTERFLY VALVE	E.	EAST	INV. EL.	INVERT ELEVATION	PT.	POINT	STA.	STATION
BL.	BASELINE	E.P.	EDGE OF PAVEMENT	L.F.	LINEAR FEET	PROP.	PROPOSED	STL	STEEL
B/S	BACKSLOPE	EL.	ELEVATION	L.U.S.T.	LEAKING UNDERGROUND STORAGE TANK	PVI	POINT OF VERTICAL INTERSECTION	STM.	STORM
CAV	COMBINATION AIR VALVE	ENT.	ENTERGY	LT.	LEFT	PVMT.	PAVEMENT	SWR.	SEWER
C.L.	CENTER LINE	ESMT	EASEMENT	M.A.	MAINTENANCE ACCESS	R.	RADIUS	T.C.	TOP OF CURB
CLR.	CLEARANCE	EXIST.	EXISTING	M.C.D.	MULTI CONDUIT DUCT	R.C.P.	REINFORCED CONCRETE PIPE	T.C.E.	TEMPORARY CONSTRUCTION EASEMENT
C-C	CENTER TO CENTER	F.H.	FIRE HYDRANT	M.H.	MANHOLE	R.O.W.	RIGHT-OF-WAY	TP	TOP OF PAVEMENT
C.O.	CLEAN OUT	F.L.	FLOOD LIGHT	MAX.	MAXIMUM	R.P.	RADIUS POINT	TYP.	TYPICAL
CONC.	CONCRETE	F.M.	FORCE MAIN OR FLOW METER	MIN.	MINIMUM	RED.	REDUCER	U.E.	UTILITY EASEMENT
CP	CATHODIC PROTECTION	FPVC	FUSIBLE PVC	N.	NORTH	(R)	RECORD DRAWING NOT FIELD VERIFIED	VPI.	VERTICAL POINT INTERSECTION
CPP	CORRUGATED PLASTIC PIPE	F.V.	FLUSH VALVE	N.G.	NATURAL GROUND	RT.	RIGHT	W.	WEST
C.G.M.P.	CORRUGATED GALVANIZED METAL PIPE	FL.	FLOW LINE	N.F.V.	NOT FIELD VERIFIED	S	SLOPE	WL	WATERLINE
C.M.P.	CORRUGATED METAL PIPE	G.V.	GATE VALVE	P.C.	POINT OF CURVATURE	S.	SOUTH	W.L.E.	WATER LINE EASEMENT
D.E.	DRAINAGE EASEMENT	GRP	GROUNDWATER REDUCTION PROGRAM	P.O.C.	POINT ON CURVE	SJRA	SAN JACINTO RIVER AUTHORITY	W/	WITH
DESC.	DESCRIPTION	H.M.A.C.	HOT MIX ASPHALTIC CONCRETE	PI.	POINT OF INTERSECTION	S.S.	SIDE SLOPE		

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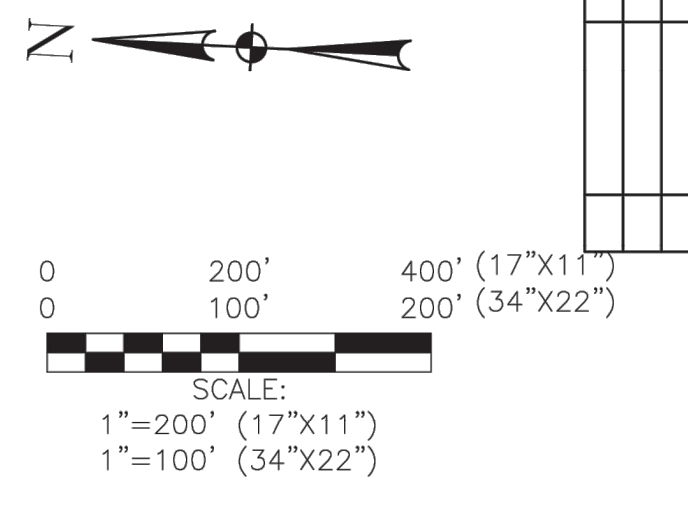
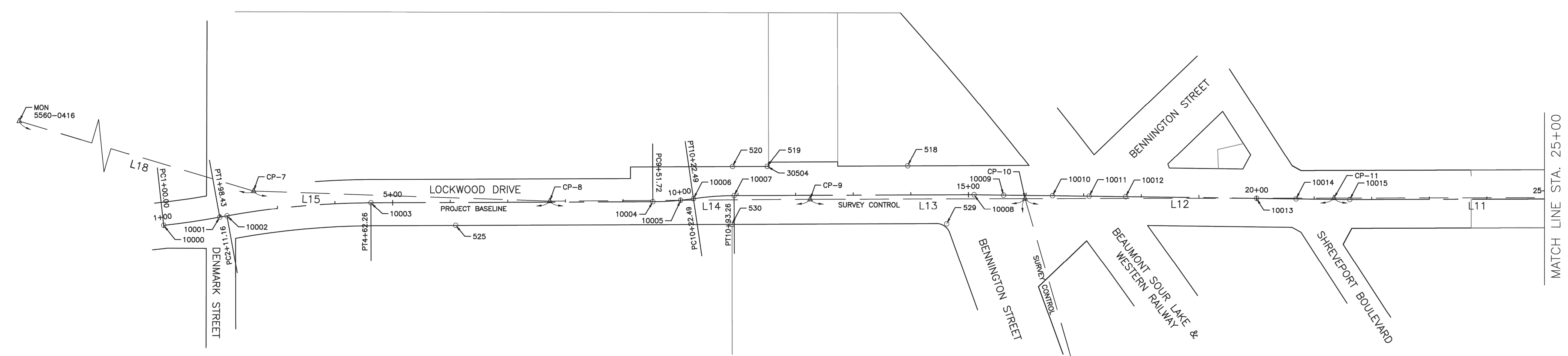
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

**CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8**

SYMBOLS & ABBREVIATIONS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 08 OF 106	

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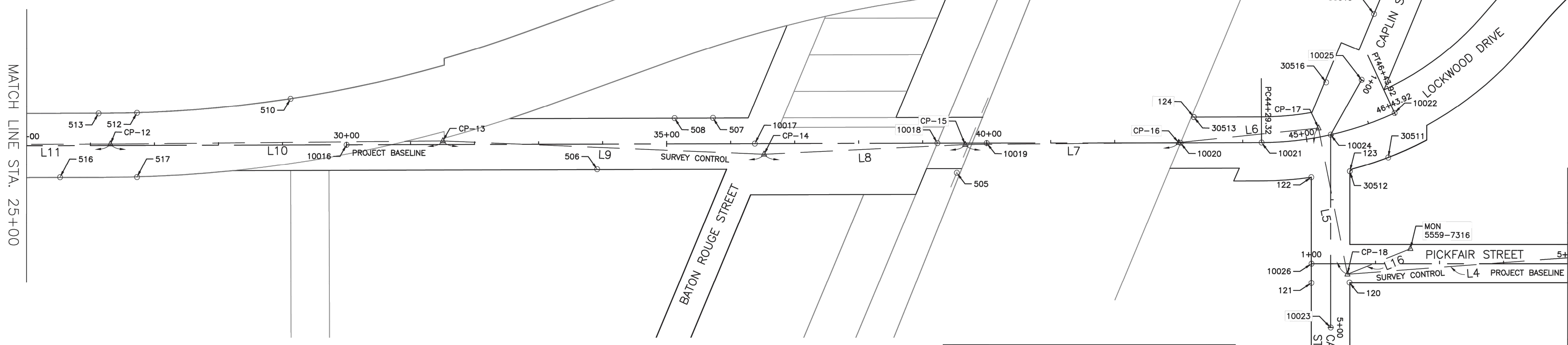
NO.	DATE	REVISION	APP.

Point#	Station	Offset	Description
124	43+23.65	40.08	LT FOUND 5/8" IR. TEAM SURV
505	39+53.13	46.65	RT FOUND 5/8" IR. (BENT)
506	33+91.17	39.38	RT FOUND 5/8" IR.
507	35+72.51	40.16	LT FOUND 5/8" IR.
508	35+12.51	40.01	LT FOUND 5/8" IR.
510	29+12.61	72.03	LT FOUND 5/8" IR.
512	26+72.72	50.62	LT FOUND 5/8" IR.
513	26+12.79	49.88	LT FOUND 5/8" IR.
516	25+52.33	49.57	RT FOUND 5/8" IR.
517	26+72.55	49.69	RT FOUND 1/2" IR.
518	13+94.67	50.23	LT FOUND 1/2" IR.
519	11+50.83	50.17	LT FOUND 1/2" IR.
520	10+90.98	50.24	LT FOUND 1/2" IR.
525	6+09.40	39.78	RT FOUND 1/2" IR.
529	14+61.97	50.59	RT FOUND 5/8" IR.
530	10+88.78	50.09	RT FOUND "X" ON CONC
30504	11+50.87	50.20	LT FOUND 1/2" IR.
30513	43+23.60	39.91	LT FOUND 5/8" IR. TEAM 281-401-2525

Point#	Station	Northing	Easting	Grid Northing	Grid Easting	Description
10000	1+00.00	13,868,274.27	3,135,823.73	13,866,885.37	3,135,509.68	SET "X" ON CONC
10001	1+98.43	13,868,177.61	3,135,842.23	13,866,788.72	3,135,528.17	SET "X" ON CONC
10002	2+11.16	13,868,165.19	3,135,845.05	13,866,776.30	3,135,531.00	SET "X" ON CONC
10003	4+62.26	13,867,916.73	3,135,878.99	13,866,527.86	3,135,564.94	SET 3/8" IR. W/ LANDTECH CAP
10004	9+51.72	13,867,427.83	3,135,902.55	13,866,039.01	3,135,588.49	SET 3/8" IR. W/ LANDTECH CAP
10005	10+00.00	13,867,379.80	3,135,907.19	13,865,990.98	3,135,593.13	SET 3/8" IR. W/ LANDTECH CAP
10006	10+22.49	13,867,357.62	3,135,910.94	13,865,968.81	3,135,596.88	SET 3/8" IR. W/ LANDTECH CAP
10007	10+93.26	13,867,287.41	3,135,919.32	13,865,898.60	3,135,605.26	SET 3/8" IR. W/ LANDTECH CAP
10008	15+09.62	13,866,871.54	3,135,939.36	13,865,482.77	3,135,625.30	SET 3/8" IR. W/ LANDTECH CAP
10009	15+60.78	13,866,820.40	3,135,940.97	13,865,431.64	3,135,626.91	SET "X" ON CONC
10010	16+45.93	13,866,735.29	3,135,943.66	13,865,346.54	3,135,629.60	SET 3/8" IR. W/ LANDTECH CAP
10011	17+09.62	13,866,671.63	3,135,945.67	13,865,282.89	3,135,631.61	SET MAG NAIL
10012	17+72.96	13,866,608.32	3,135,947.67	13,865,219.59	3,135,633.61	SET 3/8" IR. W/ LANDTECH CAP
10013	20+00.00	13,866,381.40	3,135,954.83	13,864,992.68	3,135,640.77	SET "X" ON CONC
10014	20+68.65	13,866,312.78	3,135,957.00	13,864,924.08	3,135,642.94	SET "X" ON CONC
10015	21+61.90	13,866,219.57	3,135,959.94	13,864,830.88	3,135,645.88	SET 3/8" IR. W/ LANDTECH CAP
10016	30+00.00	13,865,382.41	3,135,999.48	13,863,993.80	3,135,685.42	SET "X" ON CONC
10017	36+37.70	13,864,745.42	3,136,029.57	13,863,356.87	3,135,715.50	SET MAG NAIL
10018	39+22.84	13,864,460.60	3,136,043.02	13,863,072.08	3,135,728.95	SET MAG NAIL
10019	40+00.00	13,864,383.52	3,136,046.52	13,862,995.01	3,135,732.45	UNABLE TO SET/ NO ACCESS/ FALLS IN RAIL YARD
10020	43+02.87	13,864,080.96	3,136,060.27	13,862,692.48	3,135,746.19	SET 3/8" IR. W/ LANDTECH CAP
10021	44+29.32	13,863,954.66	3,136,066.31	13,862,566.19	3,135,752.24	SET MAG NAIL
10022	46+43.92	13,863,749.01	3,136,121.57	13,862,360.56	3,135,807.49	SET "X" ON CONC

Point#	Station	Offset	Northing	Easting	Grid Northing	Grid Easting	Elevation	Description
7	2+63.07	35.23	13,868,120.94	3,135,890.24	13,866,732.05	3,135,576.18	54.29	CUT "X" IN CONC
8	7+72.88	1.71	13,867,606.55	3,135,895.65	13,866,217.71	3,135,581.59	53.55	SET 5/8" IR. W/ LANDTECH CAP
9	12+25.16	6.86	13,867,155.34	3,135,918.82	13,865,766.55	3,135,604.76	52.41	SET 5/8" IR. W/ LANDTECH CAP
10	15+98.34	5.64	13,866,782.68	3,135,936.53	13,865,393.93	3,135,622.46	54.32	CUT "X" IN CONC
11	21+34.32	2.21	13,866,247.22	3,135,961.28	13,864,858.52	3,135,647.22	51.83	SET 5/8" IR. W/ LANDTECH CAP
12	26+31.10	2.15	13,865,751.00	3,135,984.23	13,864,362.35	3,135,670.16	50.49	SET 5/8" IR. W/ LANDTECH CAP
13	31+50.47	5.59	13,865,232.37	3,136,012.17	13,863,843.77	3,135,698.10	49.23	SET 5/8" IR. W/ LANDTECH CAP
14	36+52.12	16.50	13,864,730.24	3,136,013.76	13,863,341.69	3,135,699.69	47.54	SET 5/8" IR. W/ LANDTECH CAP
15	39+66.38	2.25	13,864,417.00	3,136,042.76	13,863,028.49	3,135,728.67	49.80	SET COTTON SPINDLE
16	42+99.88	0.41	13,864,083.96	3,136,060.54	13,862,695.48	3,135,746.47	46.59	SET 5/8" IR. W/ LANDTECH CAP
MON 5560-0416	-	-	13,871,809.08	3,136,808.42	13,870,419.83	3,136,494.27	57.61	FOUND CoH MON
MON 5560-7105	-	-	13,866,237.98	3,134,325.45	13,864,849.28	3,134,011.55	51.21	FOUND CoH MON

LINE	BEARING	DISTANCE
L4	N6°47'22"W	354.00'
L5	N76°14'41"E	232.42'
L6	N8°27'29"W	219.58'
L7	N3°03'30"W	333.51'
L8	N5°17'11"W	314.57'
L9	N0°10'56"W	502.13'
L10	N3°05'00"W	519.39'
L11	N2°38'53"W	496.74'
L12	N2°38'49"W	536.04'
L13	N2°43'12"W	373.07'
L14	N2°56'22"W	451.81'
L15	N0°36'11"W	514.42'
L16	N24°29'10"W	106.07'
L17	N71°19'10"E	1,700.67'
L18	S13°58'48"W	3,800.72'



Point#	Station	Offset	Description
121	4+30.13	30.05	RT FOUND 5/8" IR.
122	2+65.23	30.26	RT FOUND 1/2" IP.
123	2+55.89	29.84	LT FOUND 5/8" IR. TEAM SURV
30511	2+34.11	89.91	LT FOUND 5/8" IR. TEAM 281-401-2525
30512	2+55.79	29.83	LT FOUND 5/8" IR. TEAM 281-401-2525
30515	0+00.81	33.63	RT FOUND "X" IN CONC
30516	1+30.67	46.40	RT FOUND "X" IN CONC

Point#	Station	Offset	Northing	Easting	Grid Northing	Grid Easting	Elevation	Description
17	1+98.71	21.68	13,863,866.77	3,136,092.84	13,862,478.31	3,135,778.76	46.51	SET COTTON SPINDLE
18	4+16.24	26.20	13,863,811.51	3,135,867.08	13,862,423.06	3,135,553.02	45.45	SET 5/8" IR. W/ LANDTECH CAP

Point#	Station	Northing	Easting	Grid Northing	Grid Easting	Description
10023	5+00.00	13,863,833.97	3,135,782.24	13,862,445.52	3,135,468.20	SET MAG NAIL
10024	1+98.71	13,863,847.34	3,136,083.24	13,862,458.88	3,135,769.16	SET "X" ON CONC
10025	1+00.00	13,863,802.83	3,136,171.34	13,862,414.38	3,135,857.26	SET MAG NAIL

Point#	Station	Offset	Description
120	1+59.39	29.54	RT FOUND 1/2" IR.

Point#	Station	Northing	Easting	Grid Northing	Grid Easting	Description
10026	1+00.00	13,863,868.38	3,135,880.81	13,862,479.92	3,135,566.78	SET MAG NAIL

Point#	Station	Offset	Northing	Easting	Grid Northing	Grid Easting	Elevation	Description
18	1+56.20	16.24	13,863,811.51	3,135,867.08	13,862,423.06	3,135,553.02	45.45	SET 5/8" IR. W/ LANDTECH CAP
MON 5559-7316	2+54.59	23.40	13,863,714.98	3,135,911.04	13,862,326.53	3,135,596.98	44.77	SET CoH MON

LANDTECH
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STE 100
HOUSTON, TEXAS 77043
T: 713-861-7088 F: 713-861-4131
TBPELS REGISTRATION NO. 10019100

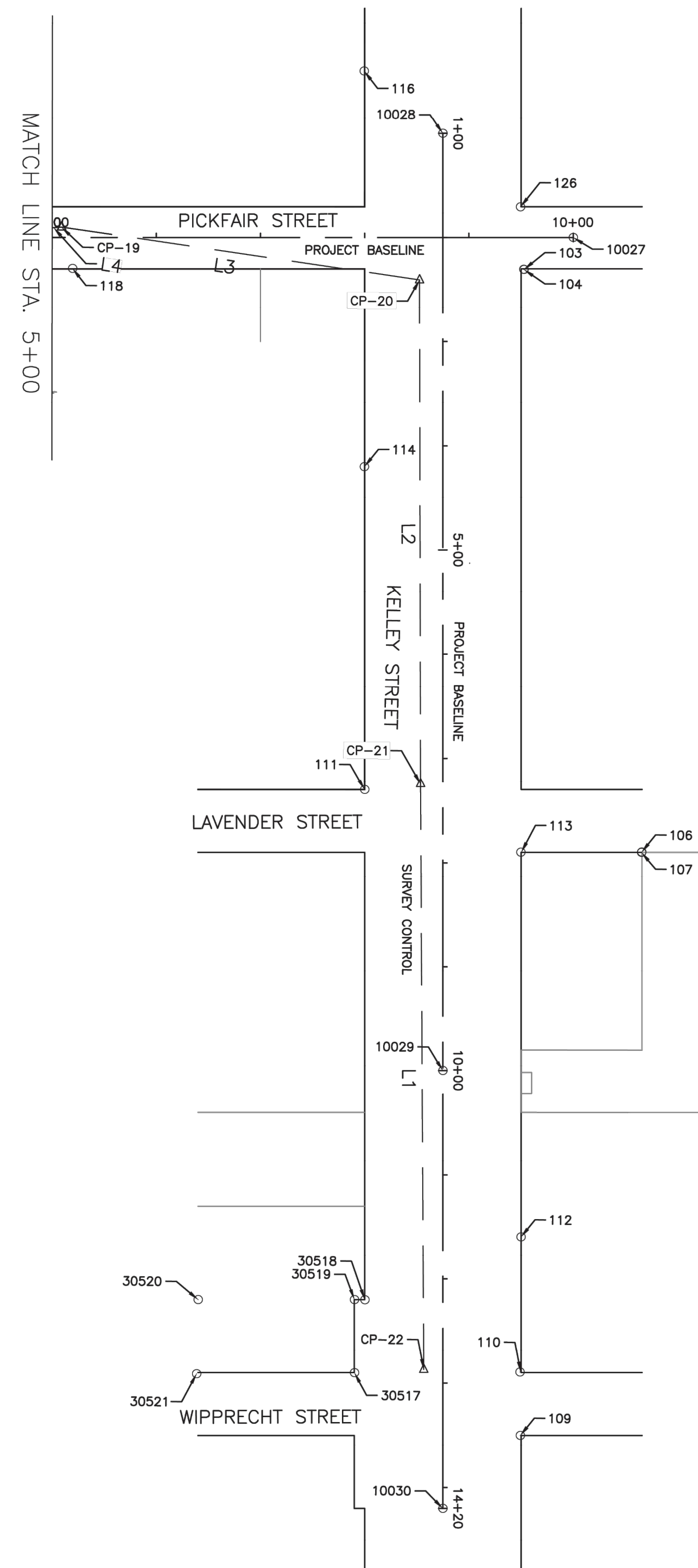
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

SURVEY CONTROL MAP
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 9	OF 106



PICKFAIR CONTROL								
Point#	Station	Offset	Northing	Easting	Grid Northing	Grid Easting	Elevation	Description
19	5+09.23	9.98 LT	13,863,460.00	3,135,908.93	13,862,071.58	3,135,594.87	44.77	SET 5/8" IR. W/ LANDTECH CAP
20	8+52.57	40.68 RT	13,863,114.74	3,135,873.54	13,861,726.36	3,135,559.49	43.51	SET 5/8" IR. W/ LANDTECH CAP

PICKFAIR BASELINE						
Point#	Station	Northing	Easting	Grid Northing	Grid Easting	Description
10027	10+00.00	13,862,969.27	3,135,920.73	13,861,580.89	3,135,606.66	SET MAG NAIL

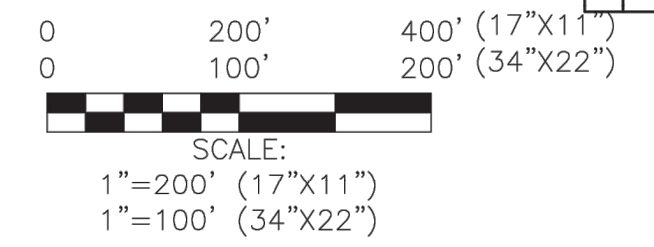
PICKFAIR FOUND CORNERS				
Point#	Station	Offset	Description	
103	9+52.73	30.75 RT	FOUND 1/2" IR. (BENT)	
104	9+52.53	30.57 RT	FOUND 1/2" IR.	
118	5+19.64	29.68 RT	FOUND 1/2" IR. (BENT)	
126	9+49.41	29.80 LT	FOUND 5/8" IR. (BENT)	

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N87°08'55"E	562.52'
L2	N87°20'27"E	483.70'
L3	N5°51'07"E	347.06'

KELLEY CONTROL								
Point#	Station	Offset	Northing	Easting	Grid Northing	Grid Easting	Elevation	Description
20	2+40.68	22.43 RT	13,863,114.74	3,135,873.54	13,861,726.36	3,135,559.49	43.51	SET 5/8" IR. W/ LANDTECH CAP
21	7+24.39	21.44 RT	13,863,092.30	3,135,390.36	13,861,703.92	3,135,076.35	44.34	SET 5/8" IR. W/ LANDTECH CAP
22	12+86.90	18.40 RT	13,863,064.32	3,134,828.53	13,861,675.94	3,134,514.58	44.48	SET 5/8" IR. W/ LANDTECH CAP

KELLEY BASELINE						
Point#	Station	Northing	Easting	Grid Northing	Grid Easting	Description
10028	1+00.00	13,863,098.58	3,136,015.08	13,861,710.19	3,135,701.01	SET 3/8" IR. W/ LANDTECH CAP
10029	10+00.00	13,863,058.67	3,135,115.97	13,861,670.29	3,134,801.99	SET 3/8" IR. W/ LANDTECH CAP
10030	14+20.00	13,863,040.04	3,134,696.38	13,861,651.68	3,134,382.44	SET 3/8" IR. W/ LANDTECH CAP

KELLEY FOUND CORNERS				
Point#	Station	Offset	Description	
106	7+59.78	190.75 LT	FOUND 3/8" IR. (BENT)	
107	7+90.01	190.54 LT	FOUND 1/2" IR.	
109	13+49.98	74.25 LT	FOUND 1/2" IR.	
110	12+89.32	74.58 LT	FOUND CONC STAMPED R.O.W.	
111	7+29.75	75.20 RT	FOUND CONC STAMPED R.O.W.	
112	11+59.65	74.94 LT	FOUND 1/2" IR.	
113	7+89.73	75.28 LT	FOUND CONC STAMPED R.O.W.	
114	4+19.89	75.31 RT	FOUND 1/2" IR.	
116	0+40.22	75.59 RT	FOUND 1/2" IR.	
30517	12+90.05	84.90 RT	FOUND ALUM DISK IR.	
30518	12+20.04	74.88 RT	FOUND ALUM DISK IR.	
30519	12+19.95	84.92 RT	FOUND ALUM DISK IR.	
30520	12+19.95	234.85 RT	FOUND 1/2" IR.	
30521	12+91.01	236.32 RT	FOUND 1/2" IR.	



NO.	DATE	REVISION	APP.

LANDTECH
 1315 W SAM HOUSTON PKWY N
 STE 100
 HOUSTON, TEXAS 77043
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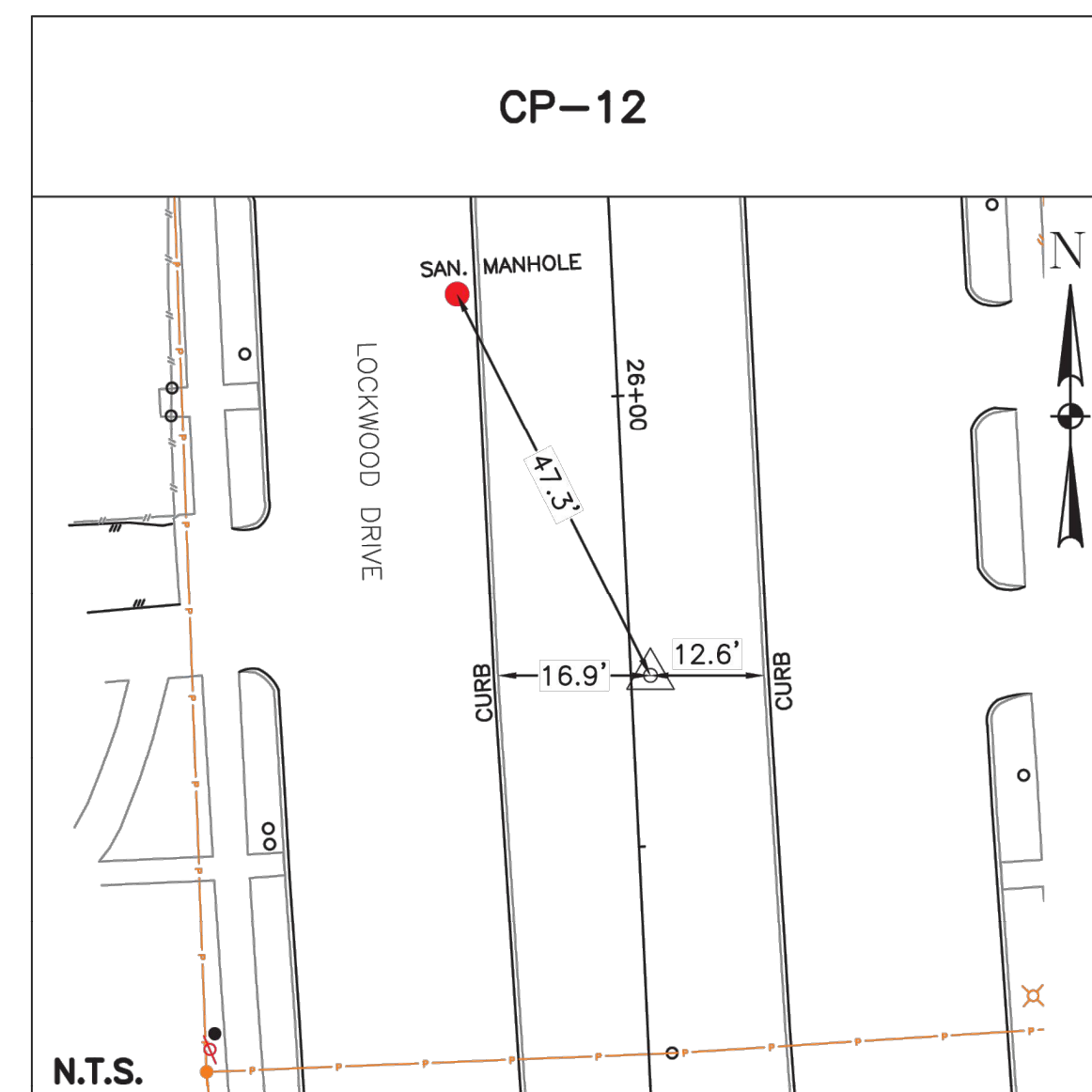
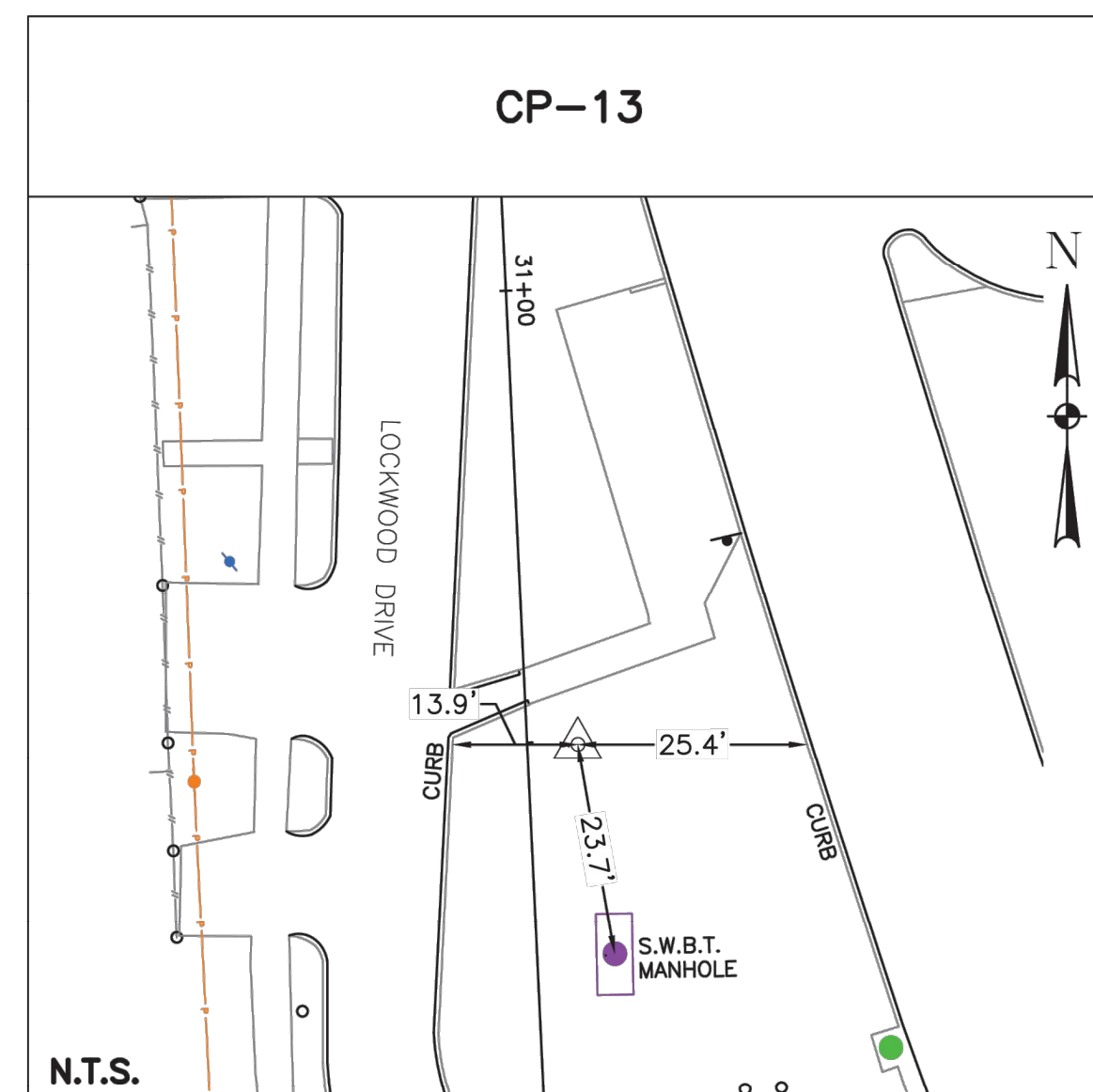
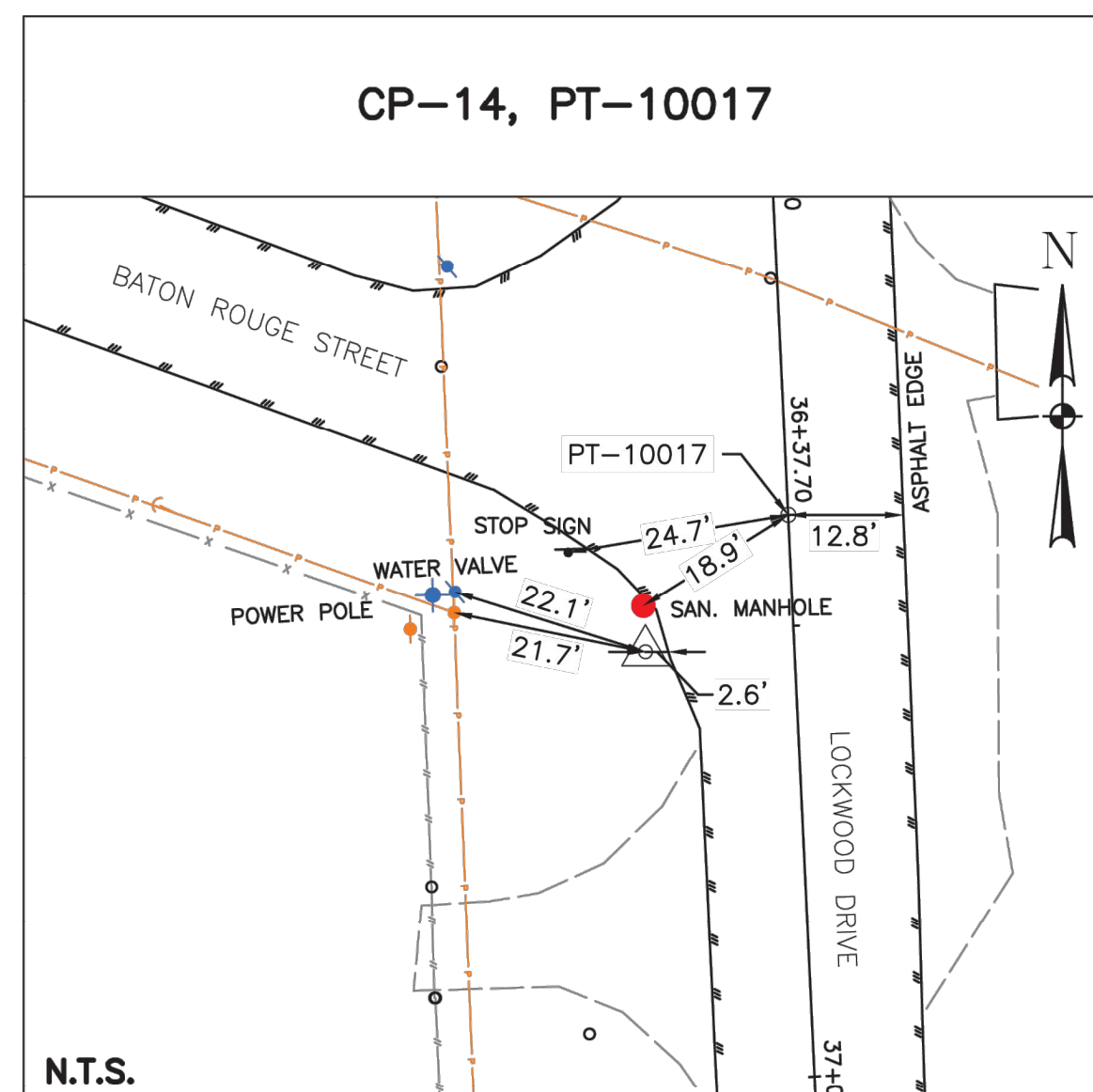
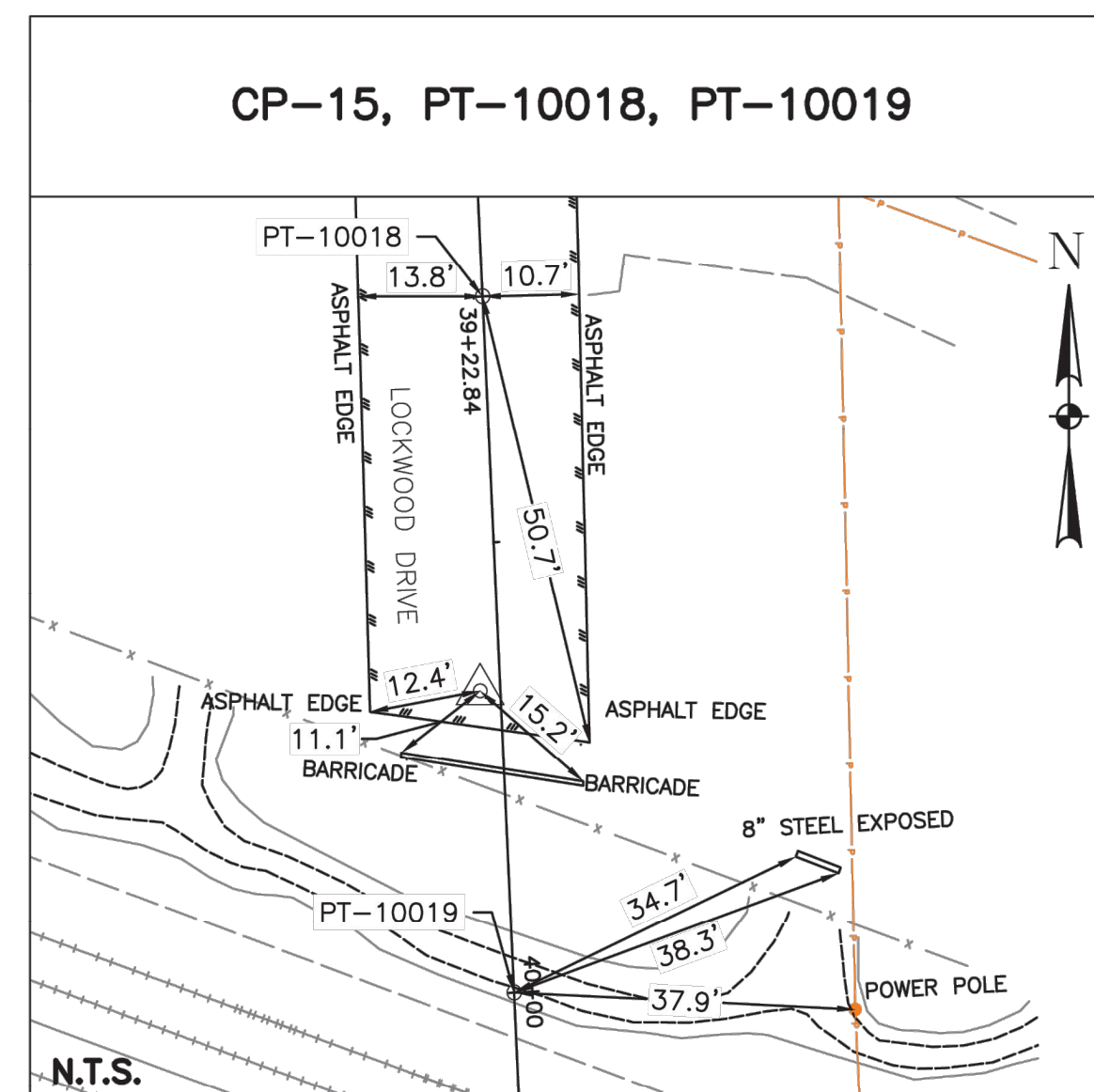
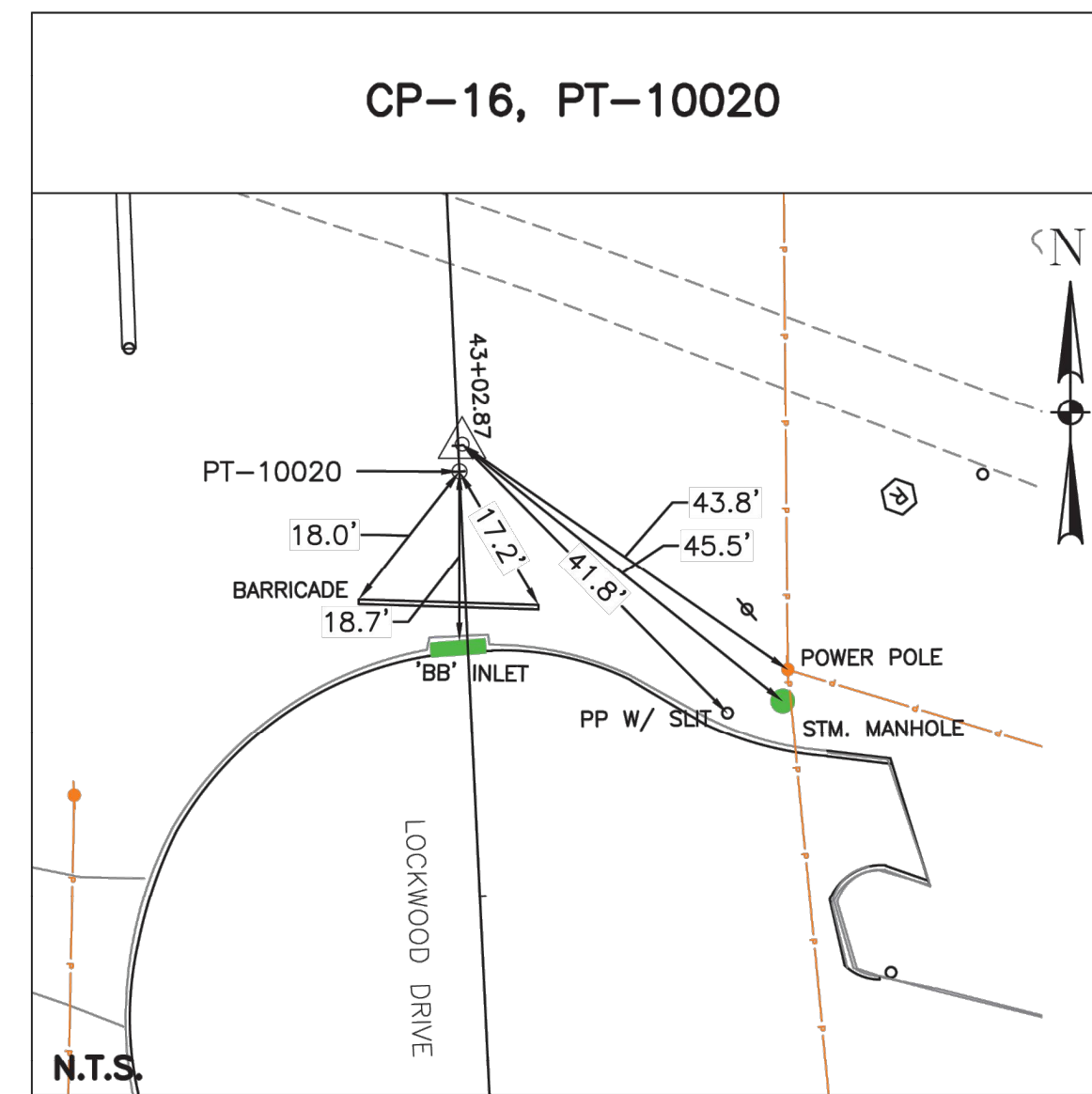
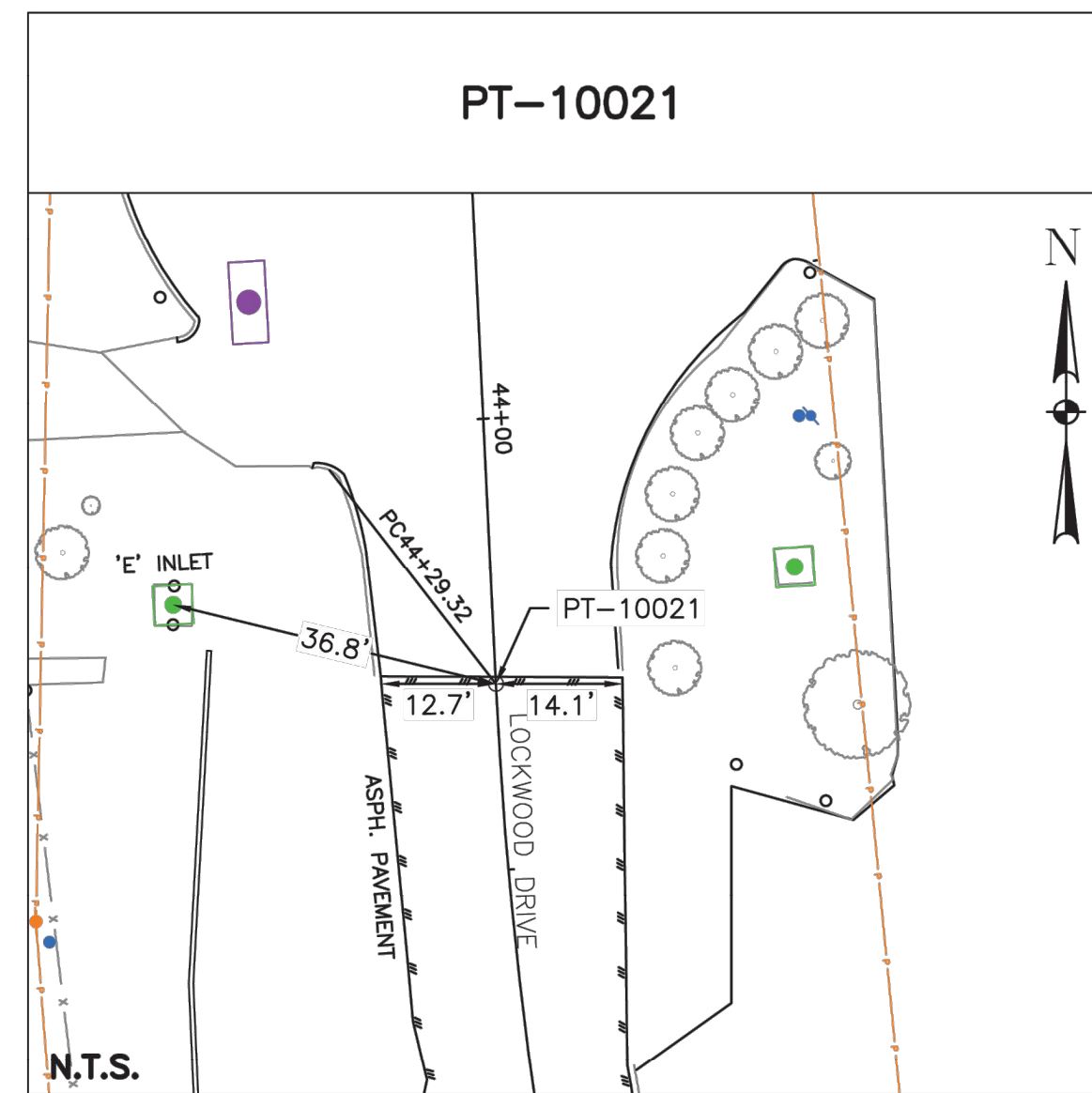
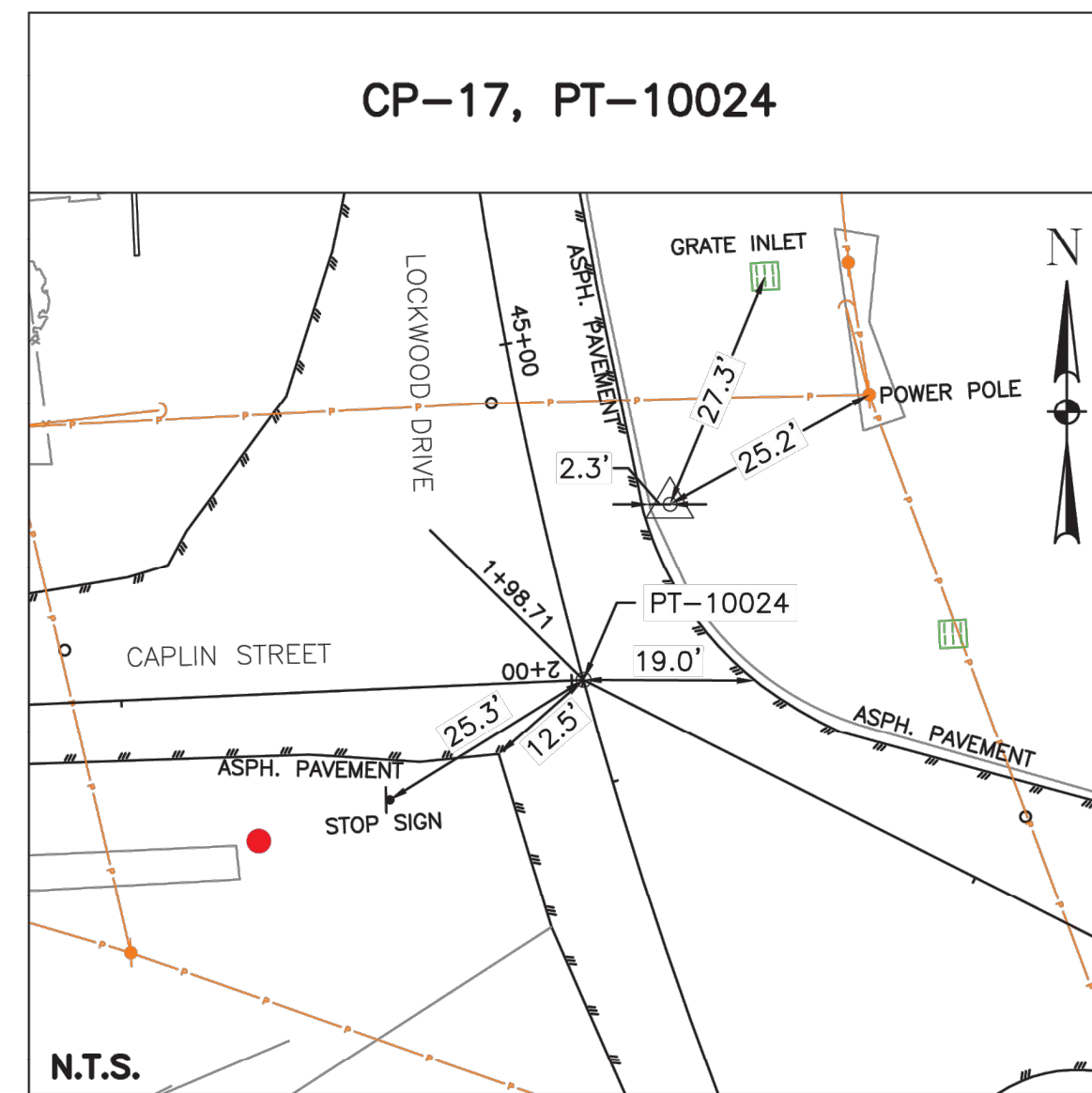
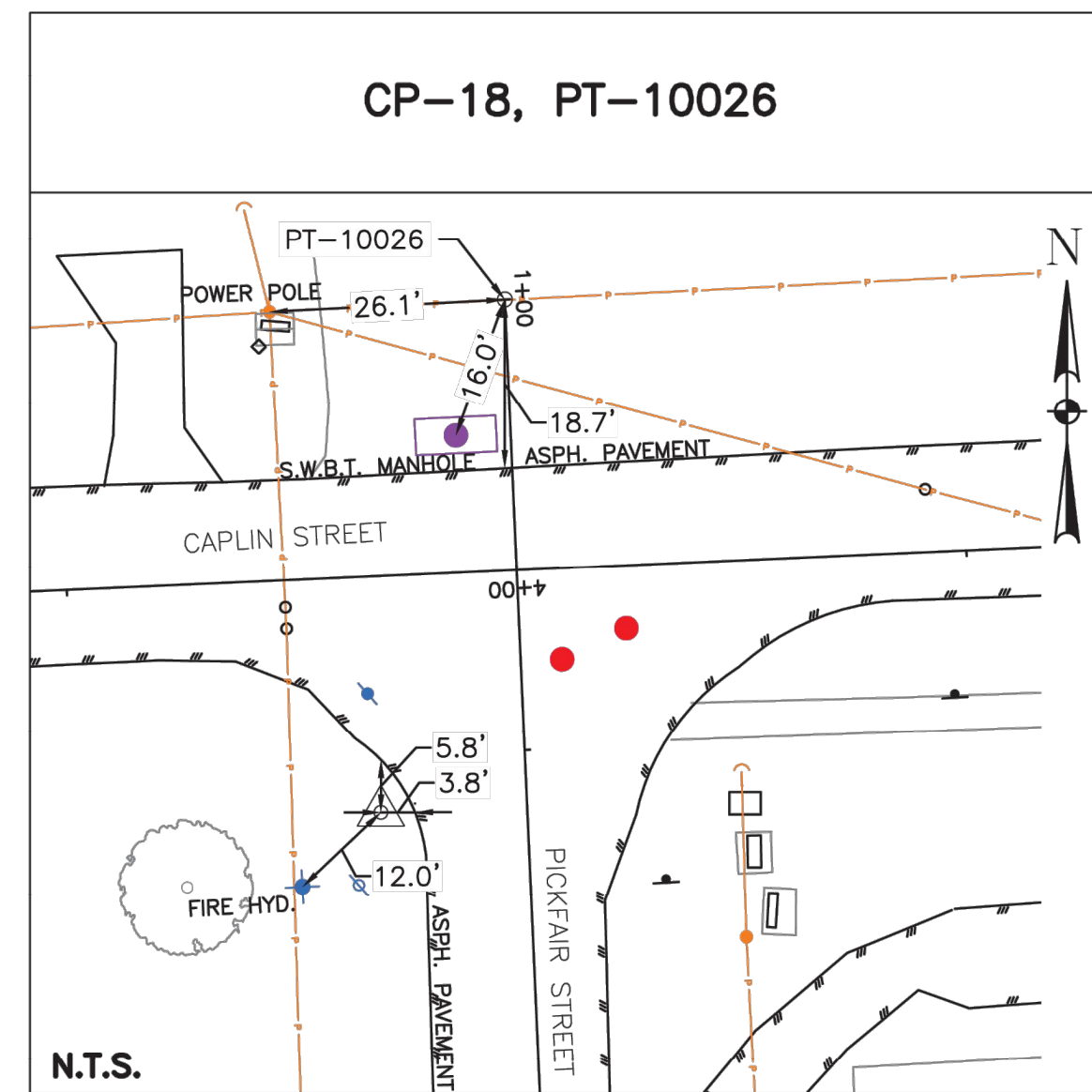
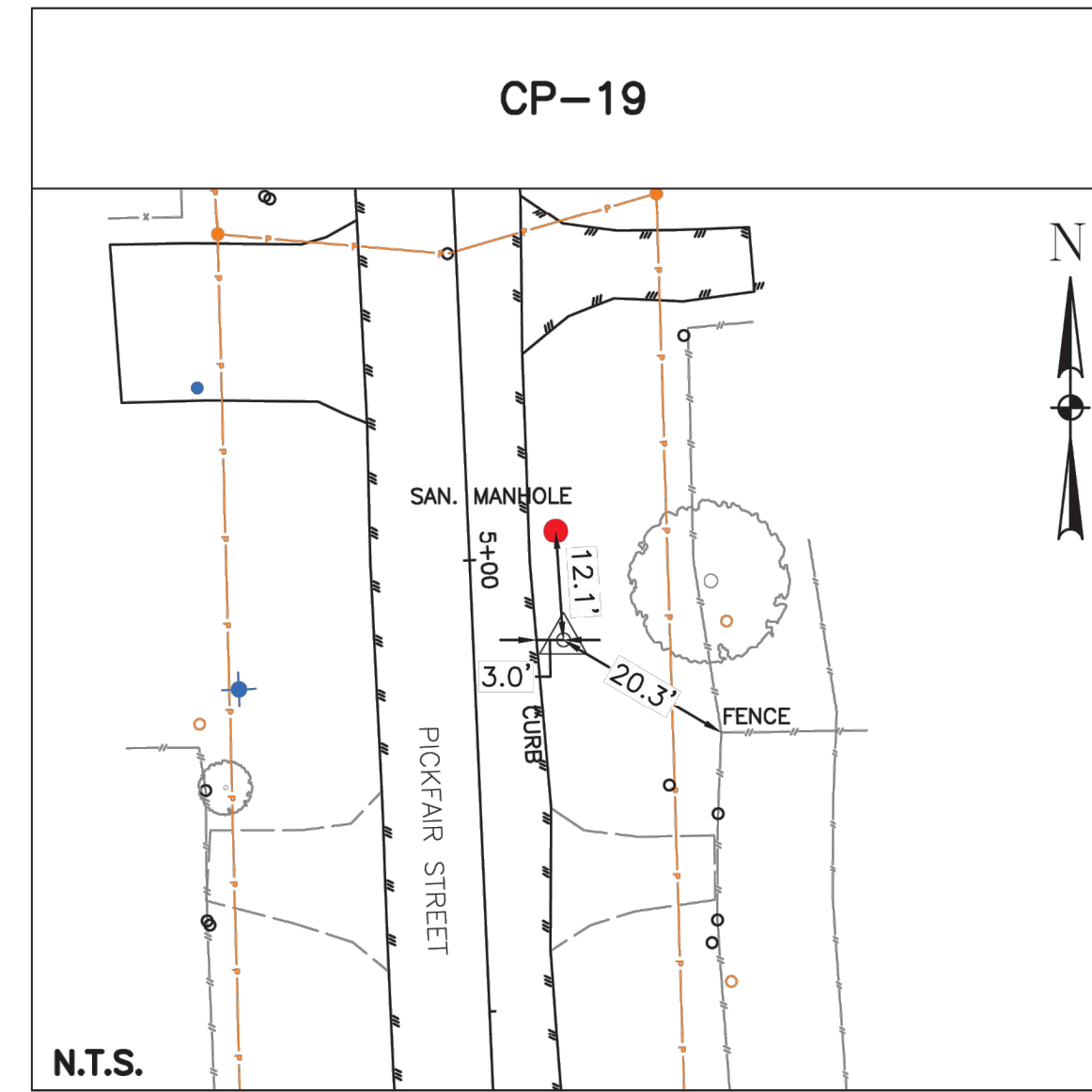
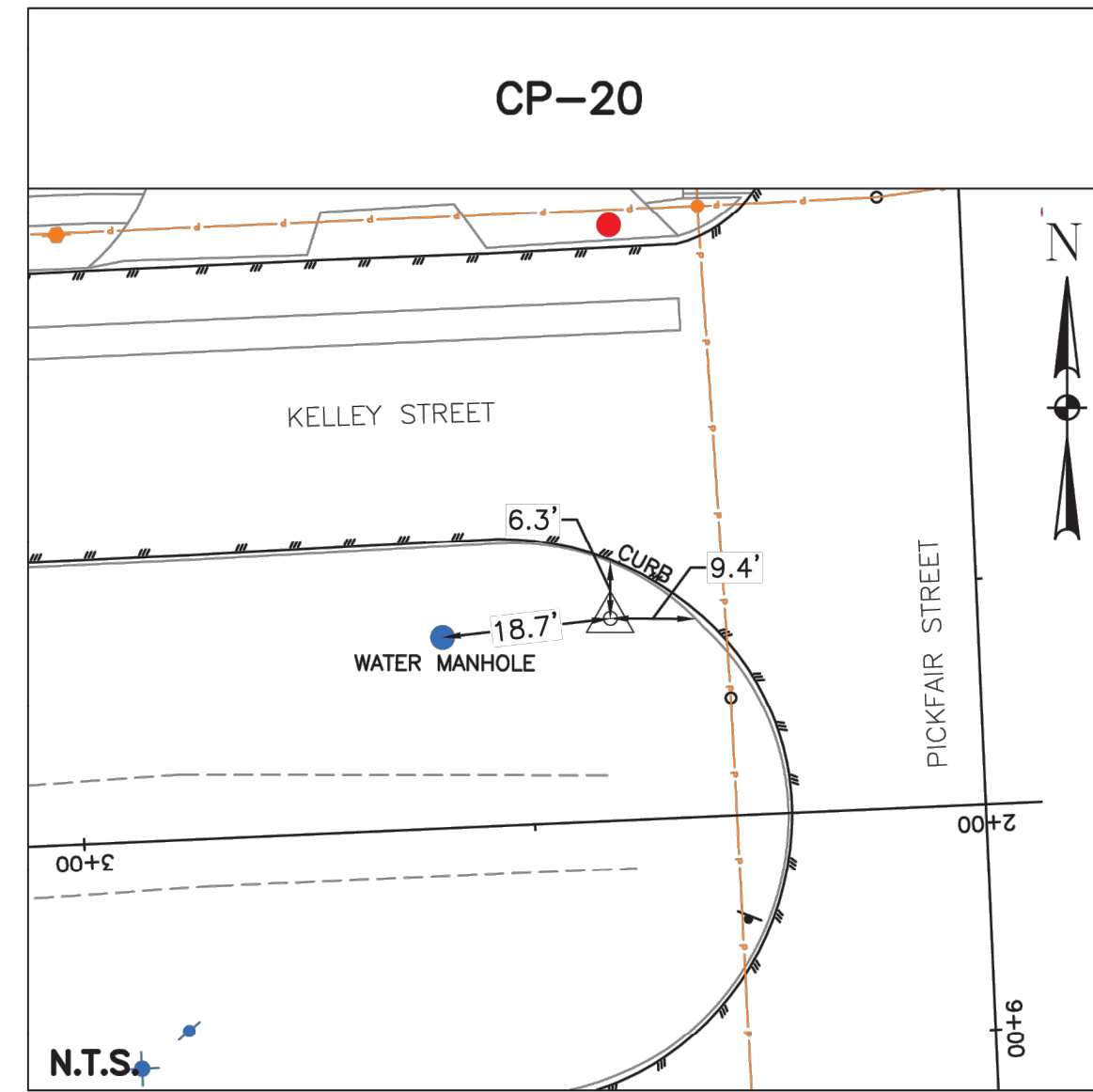
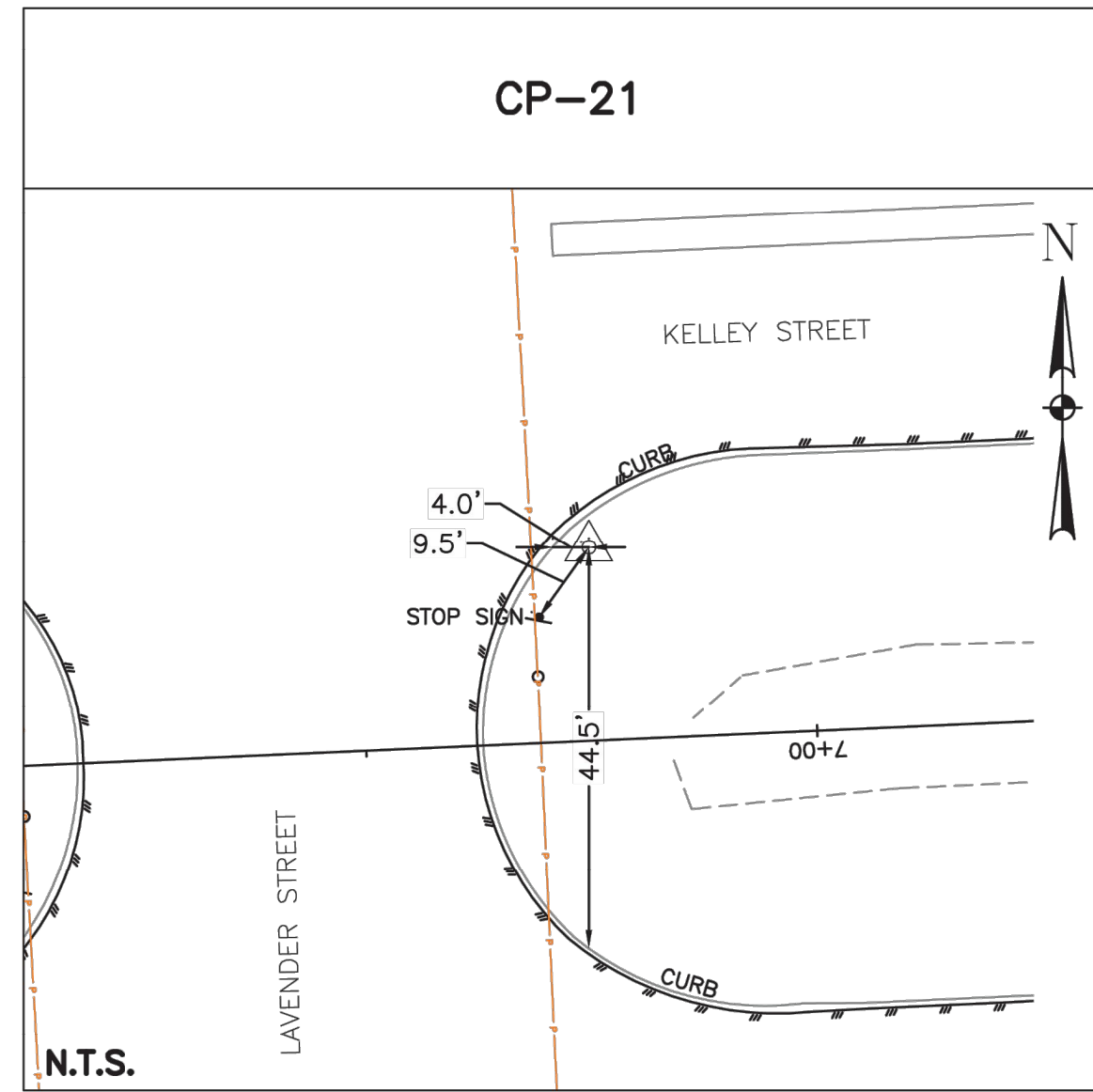
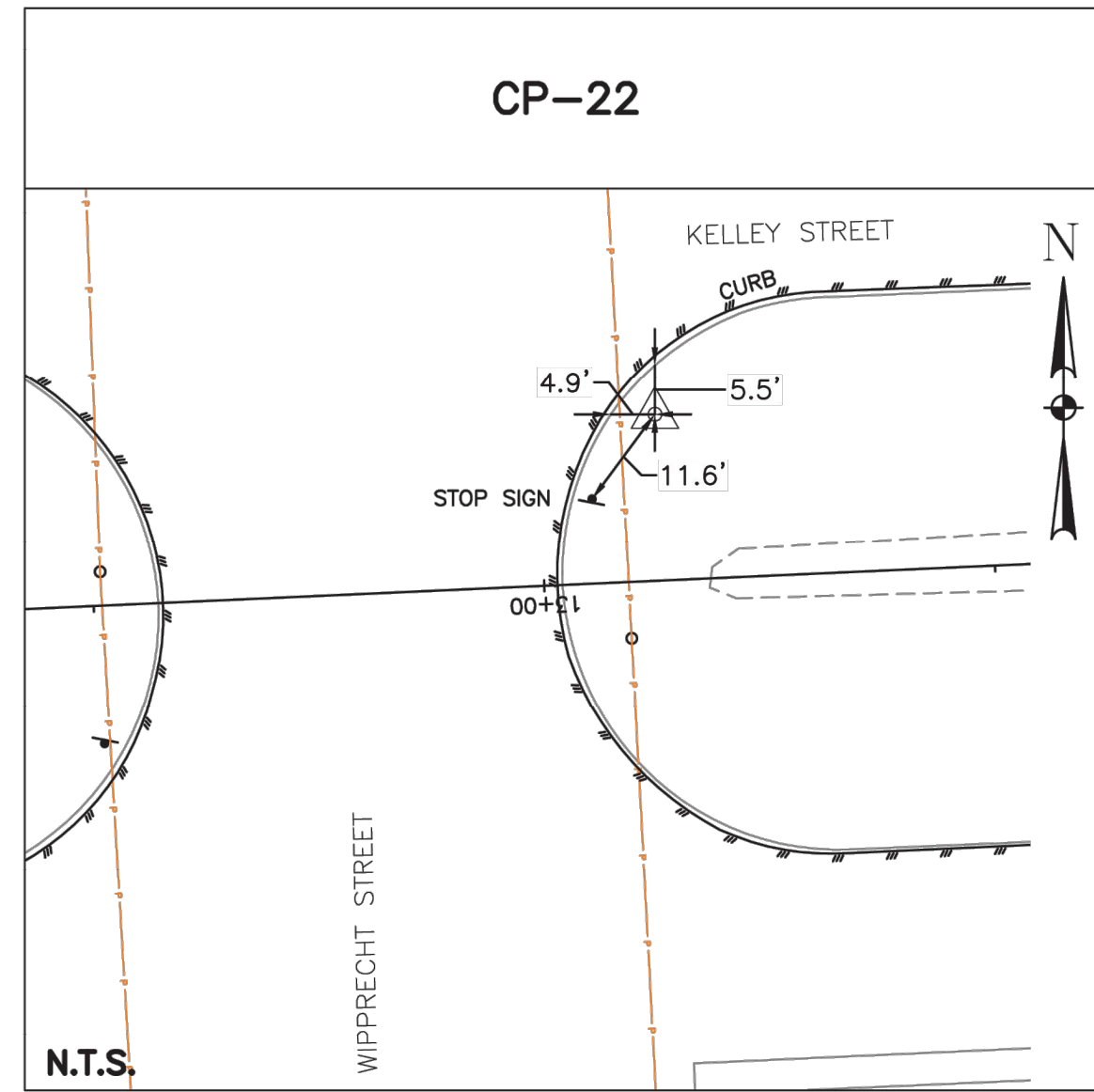
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

SURVEY CONTROL MAP
 SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 10 OF 106	

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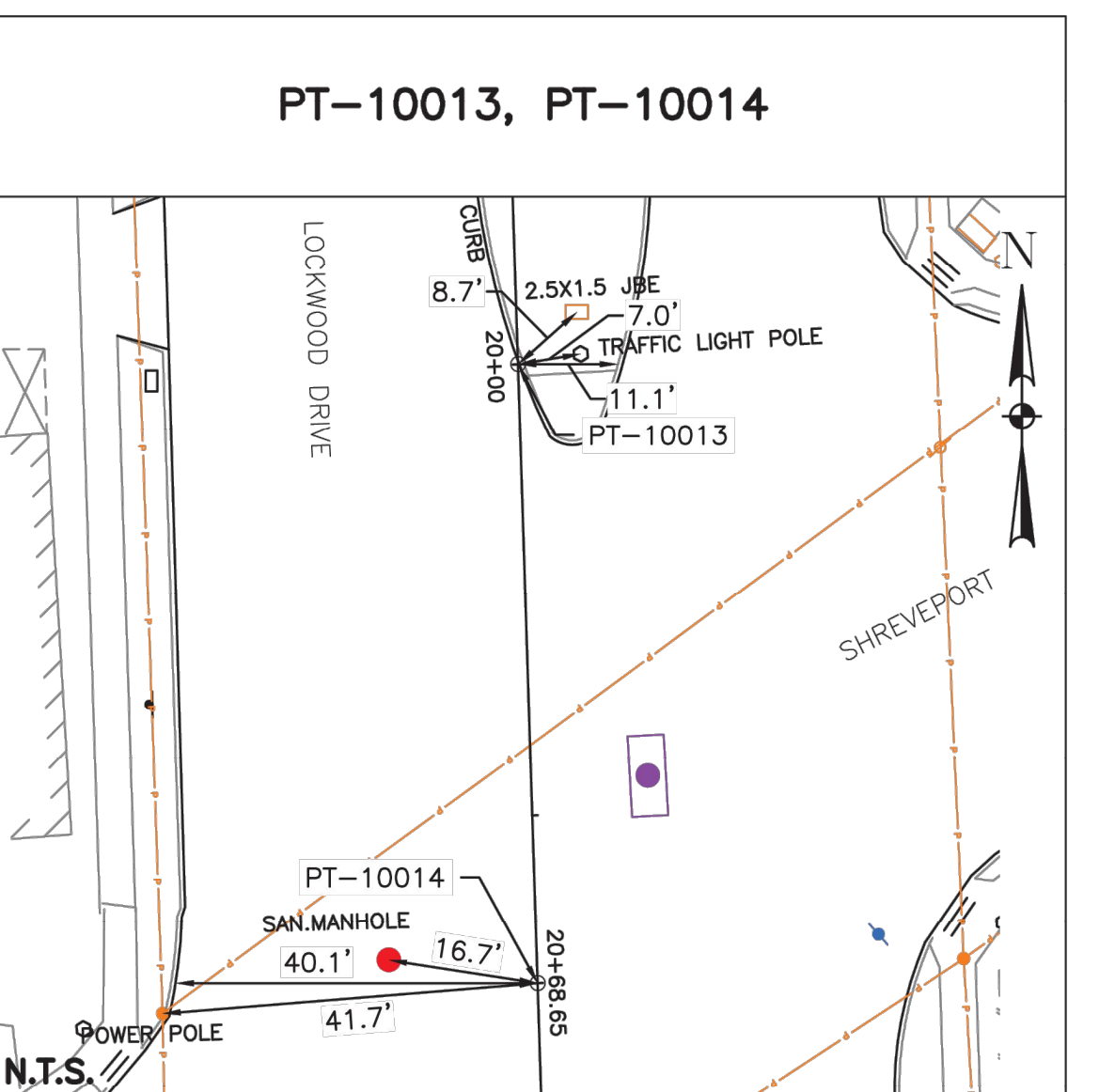
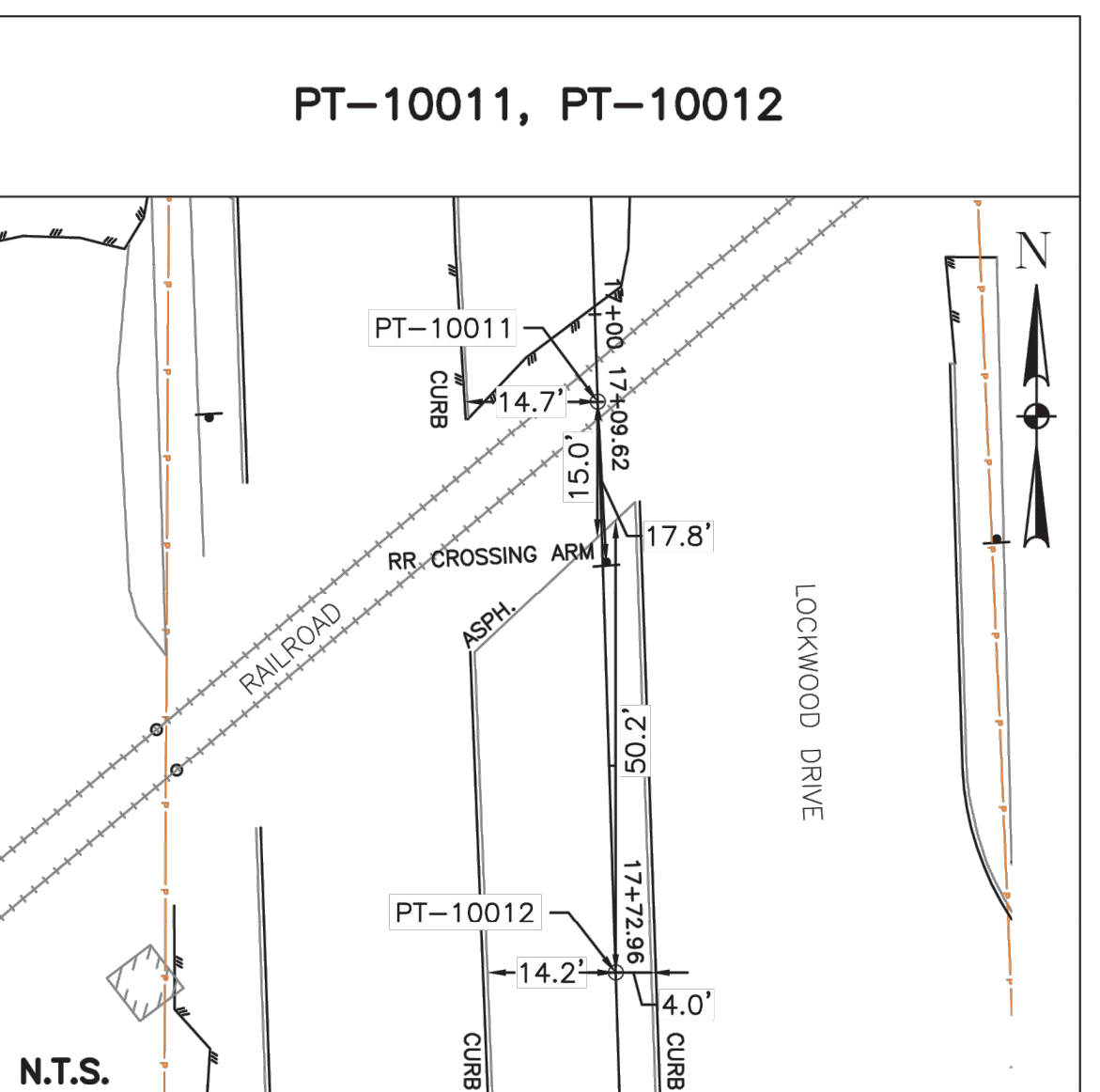
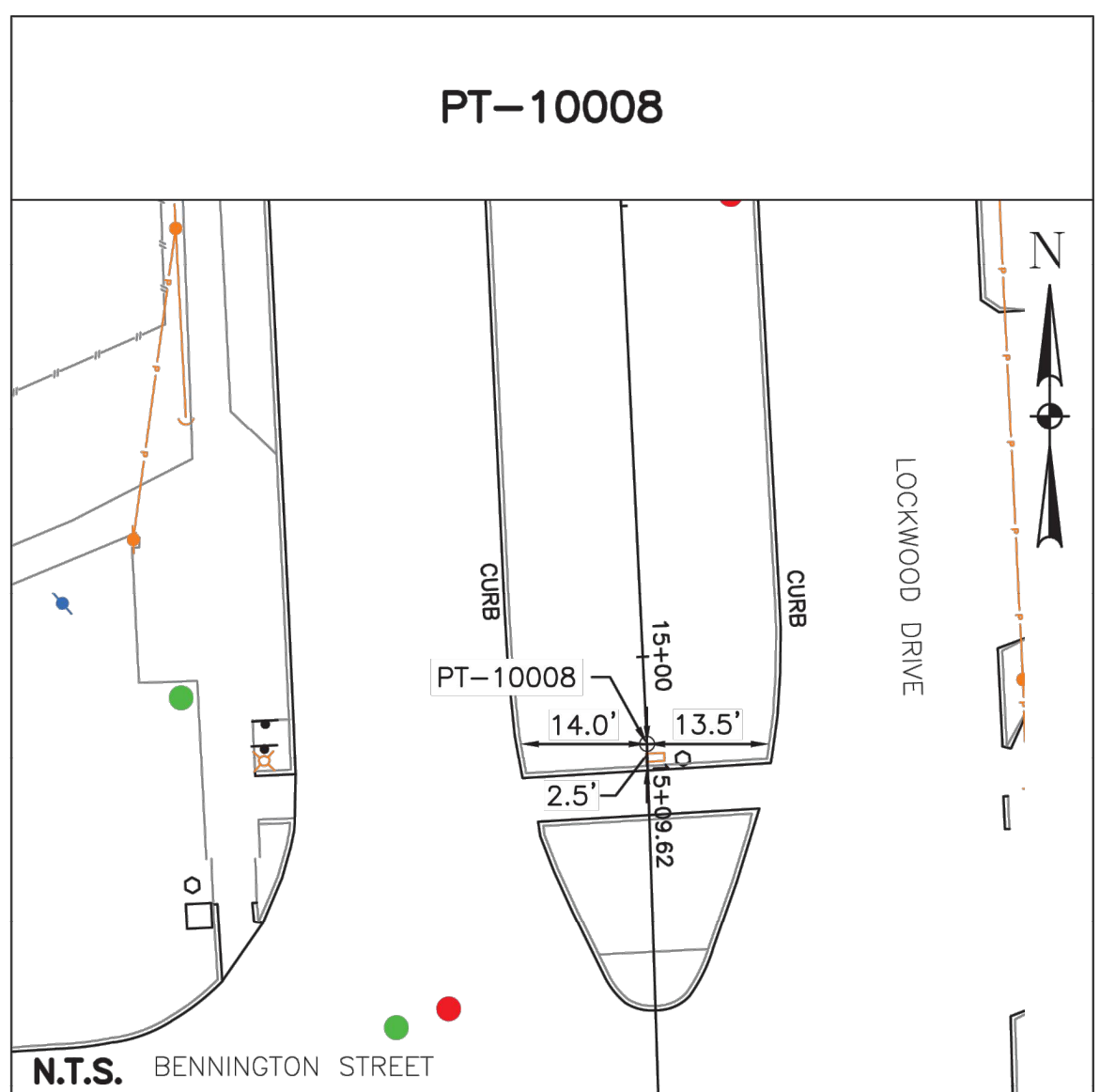
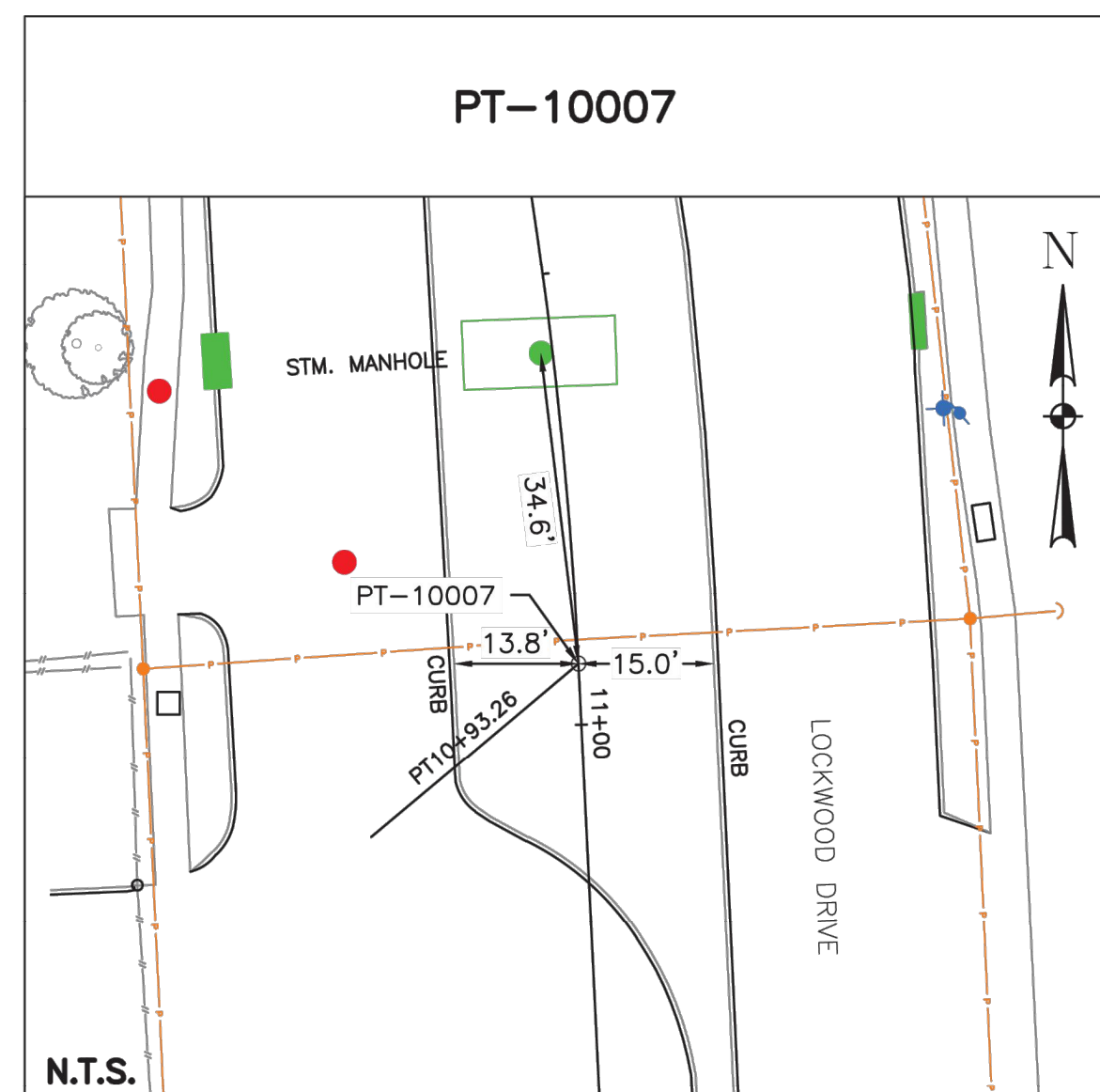
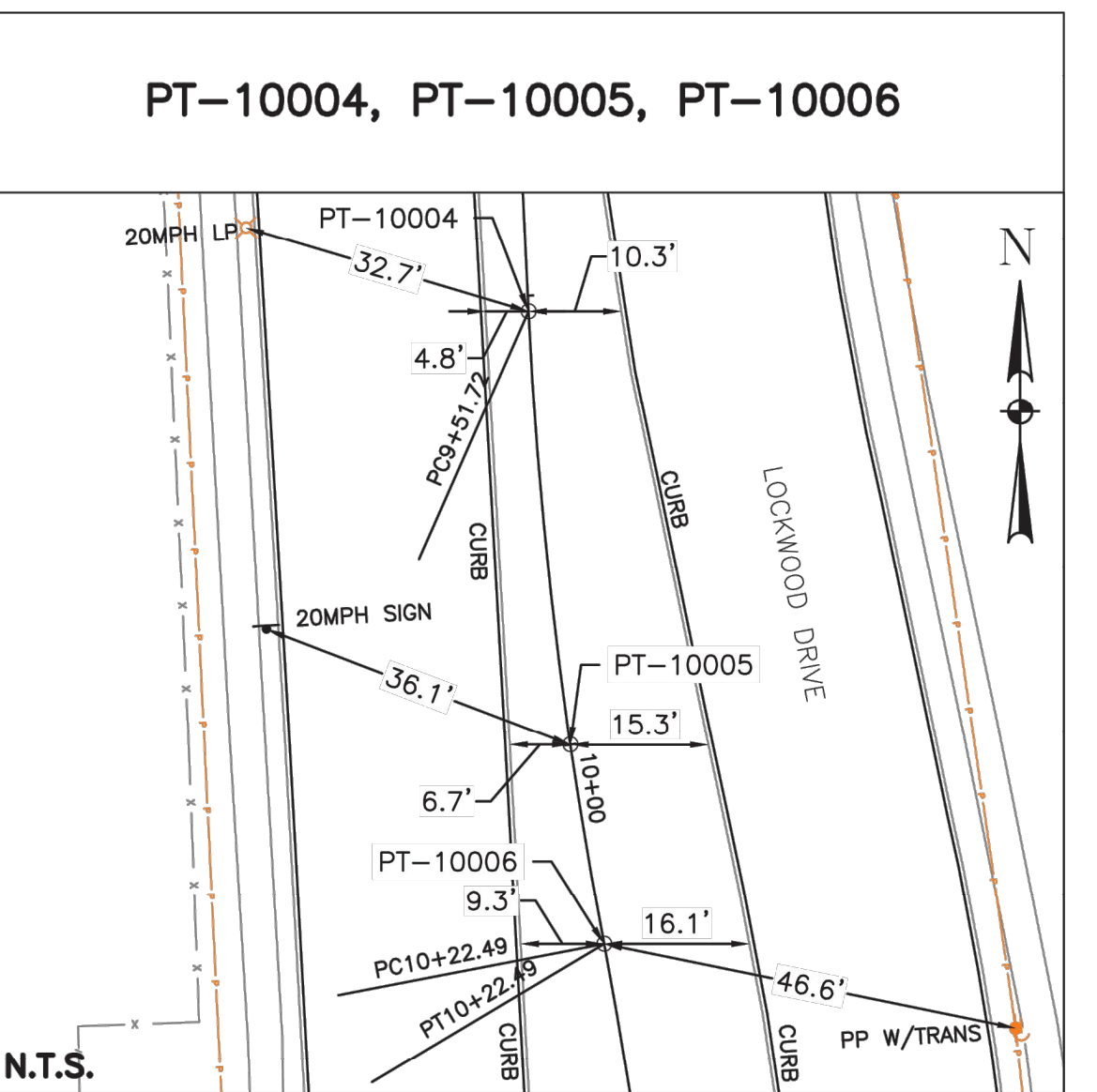
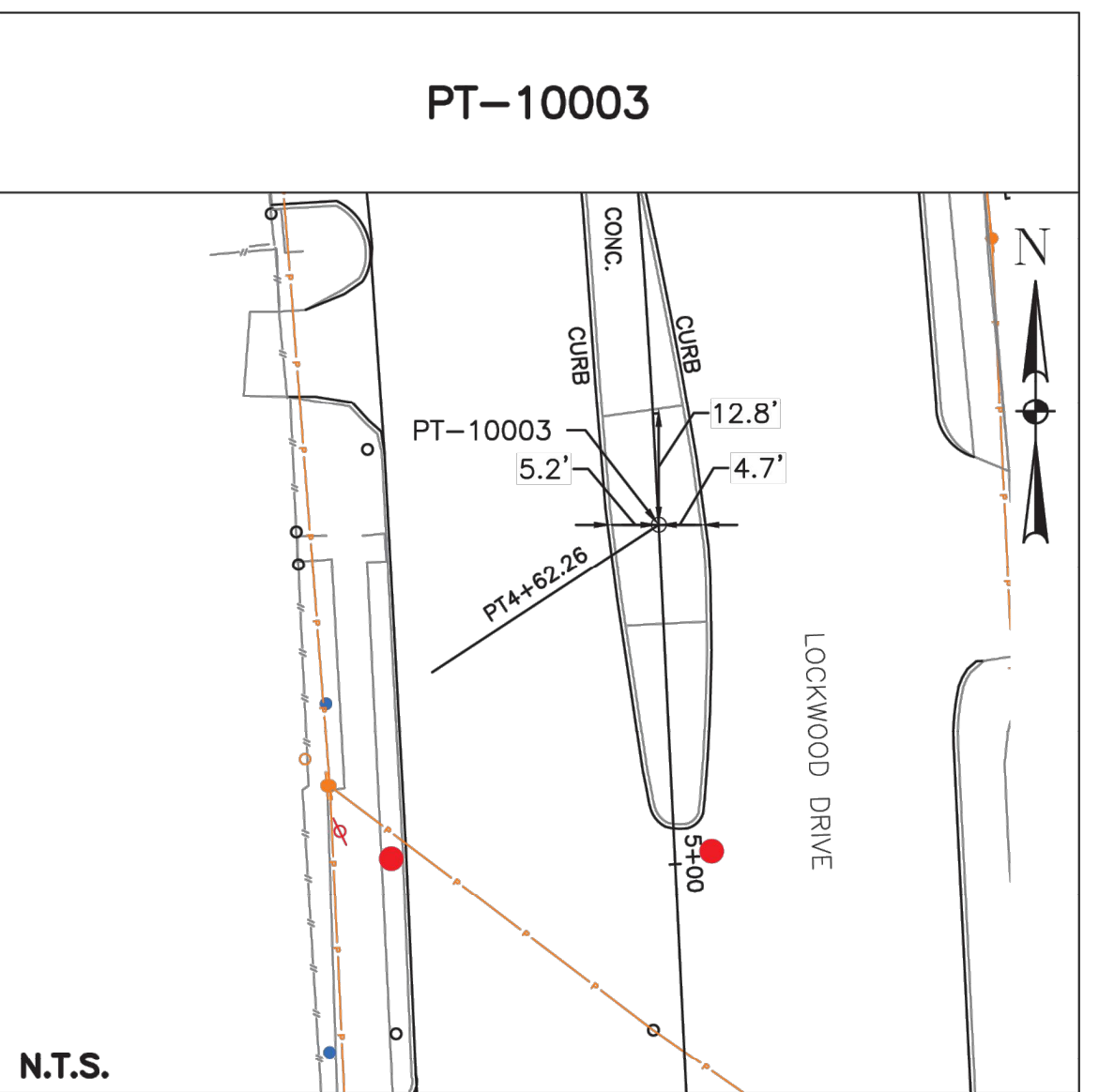
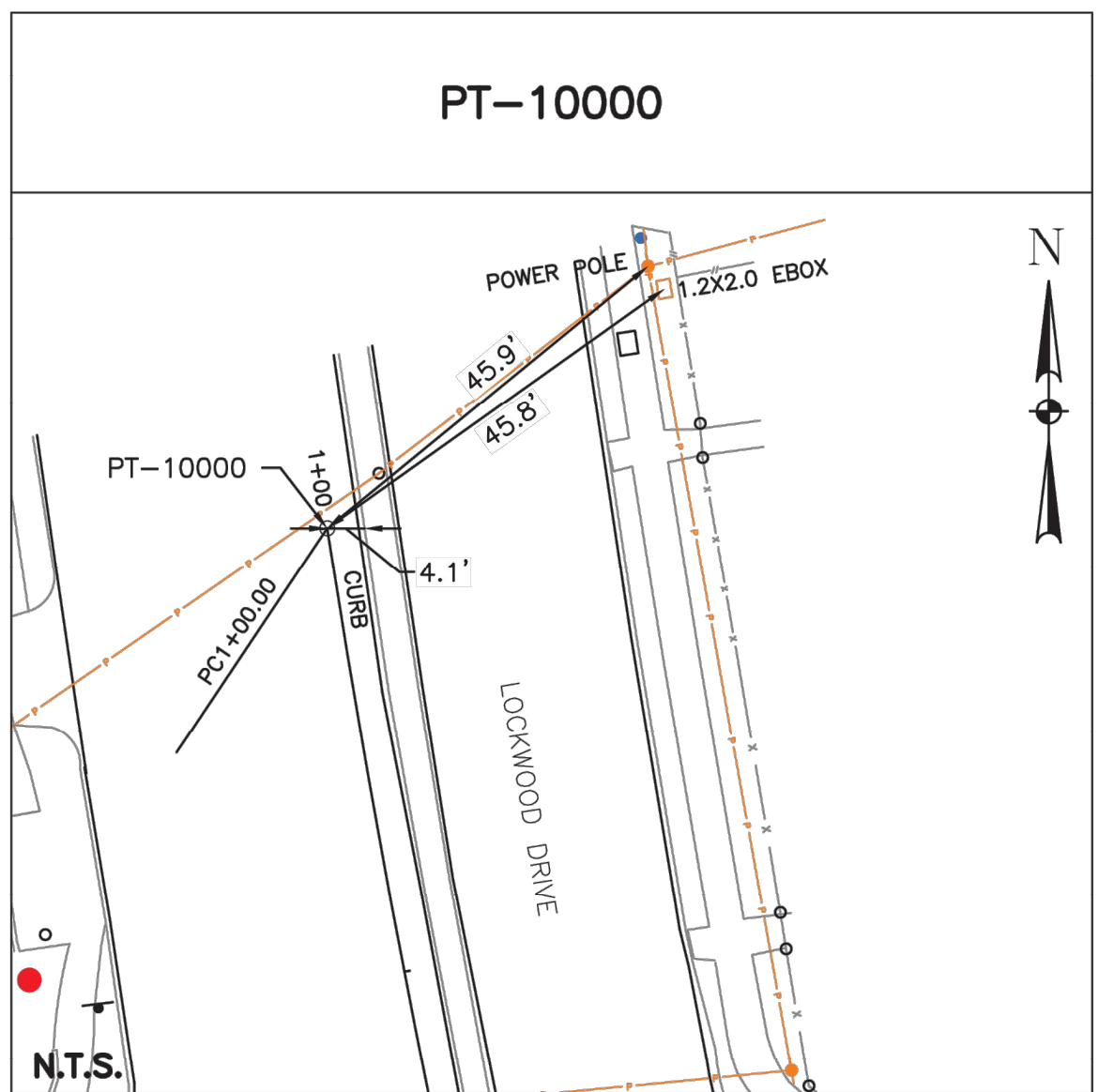
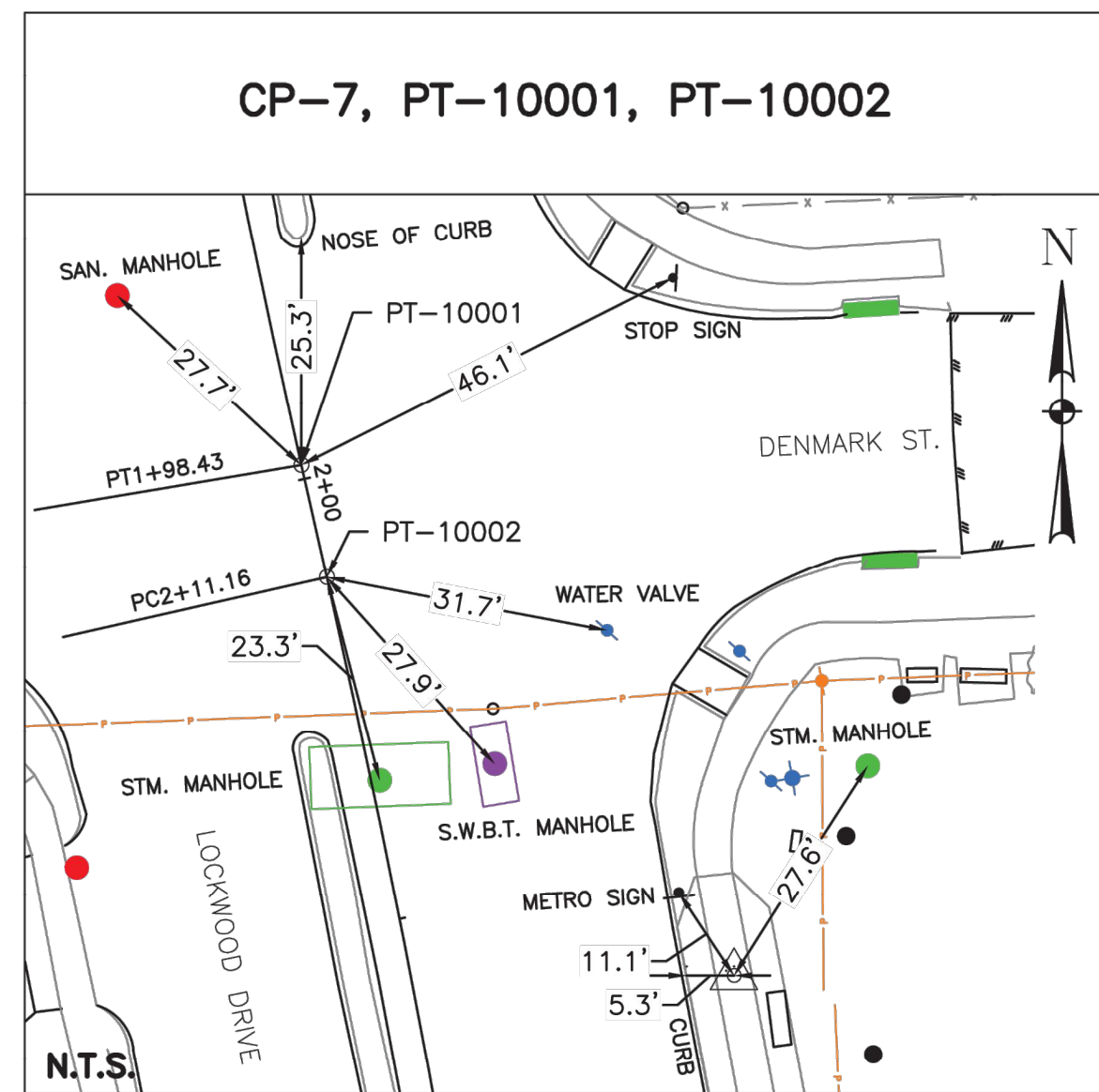
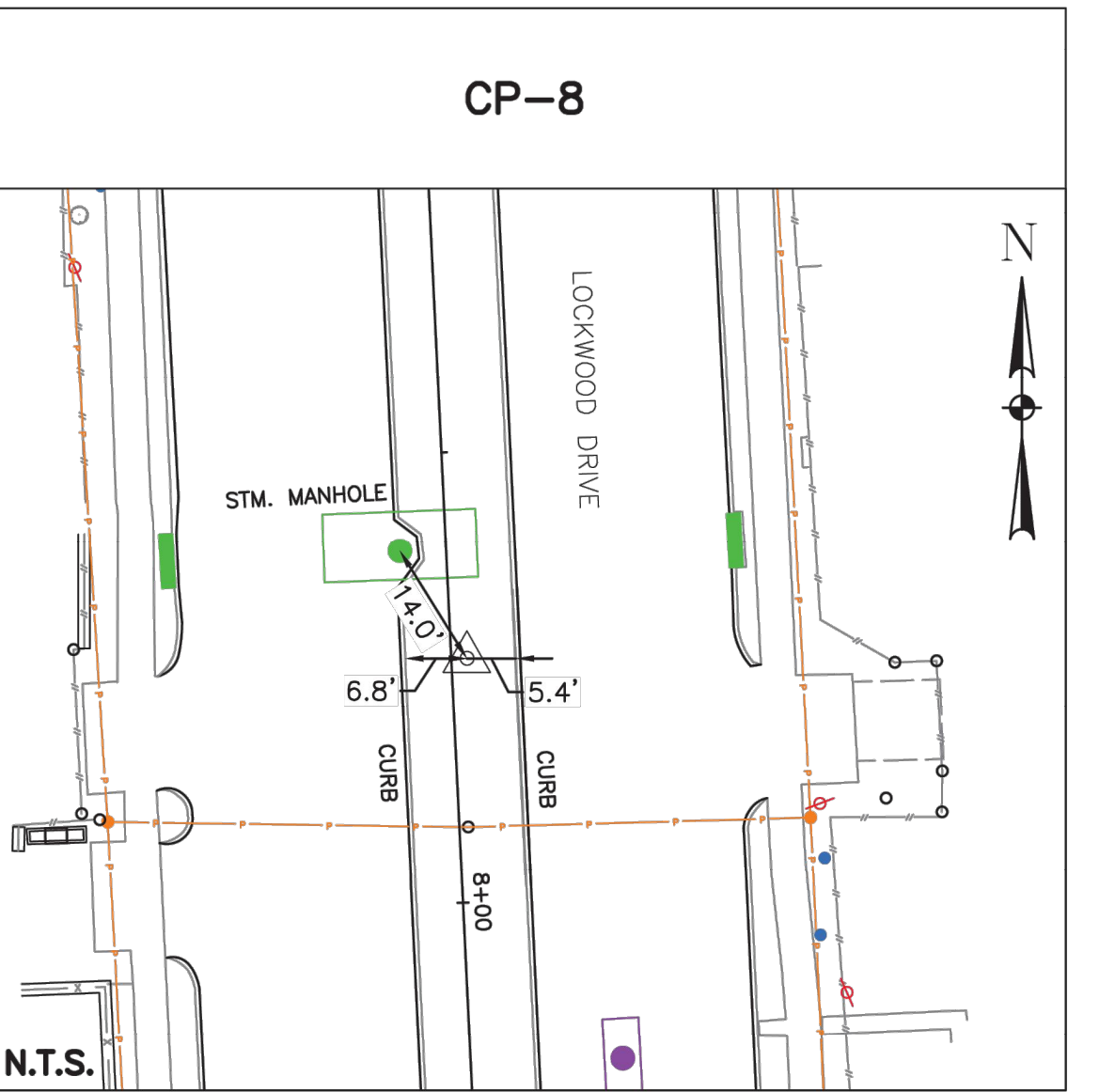
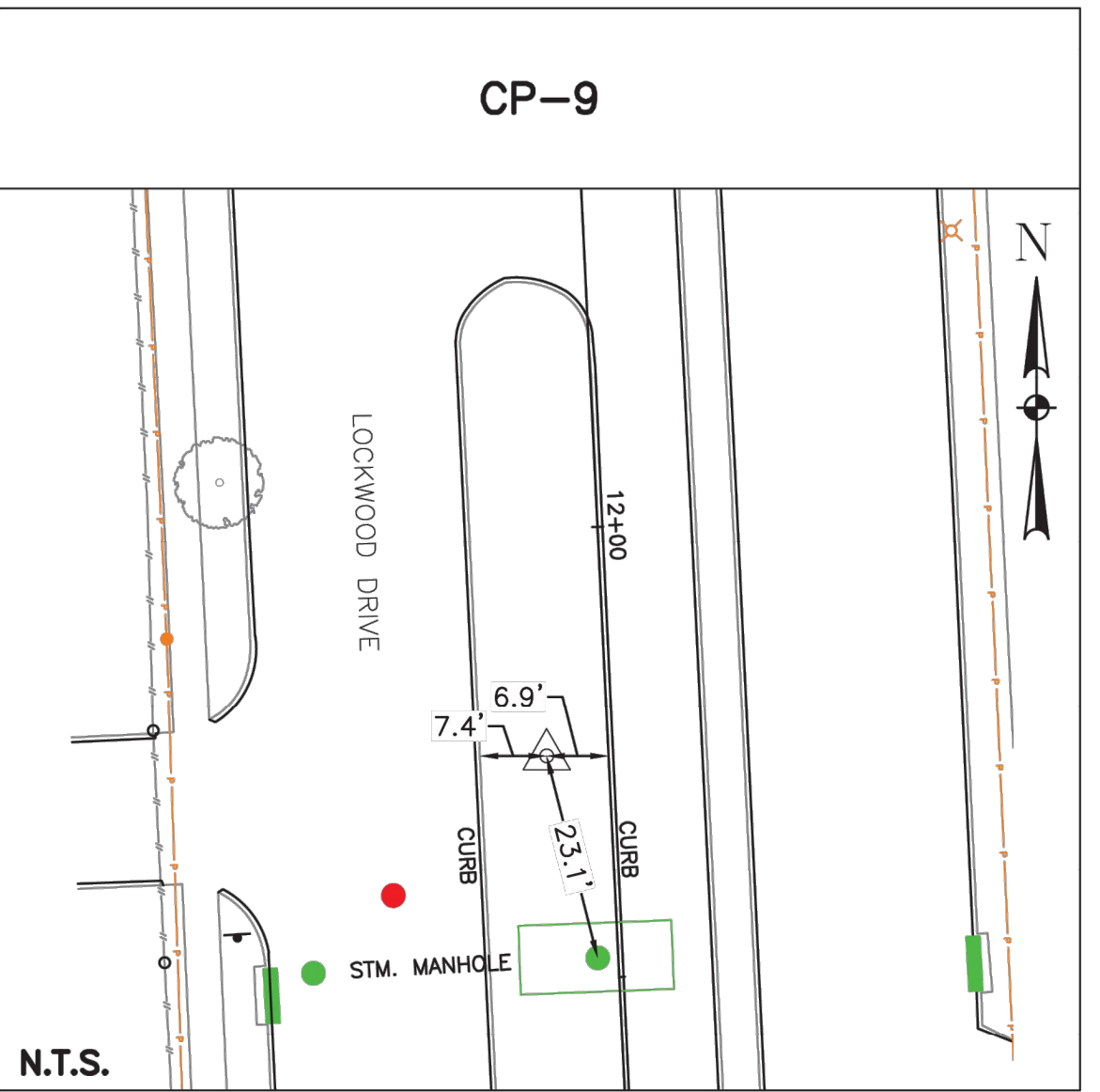
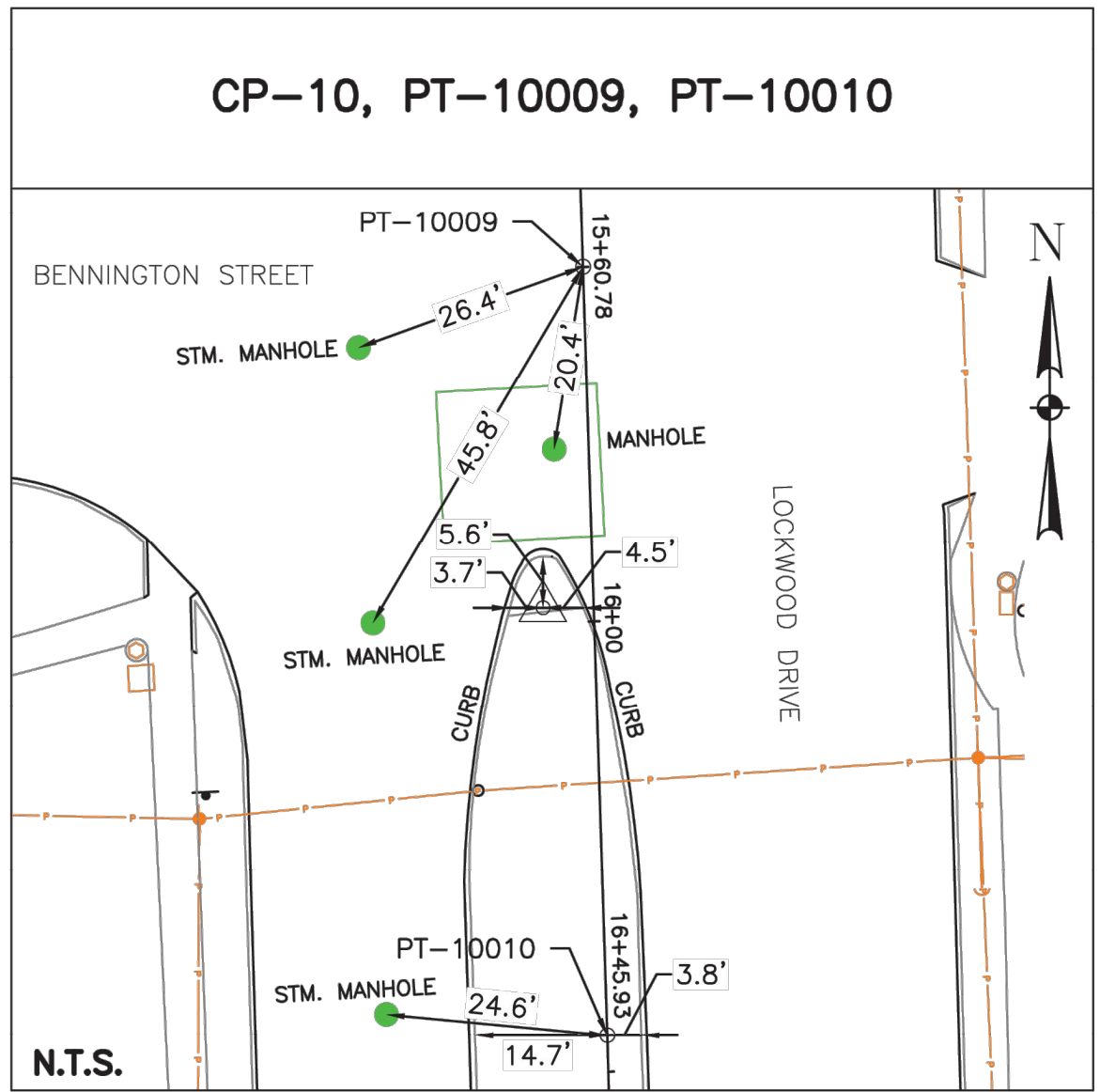
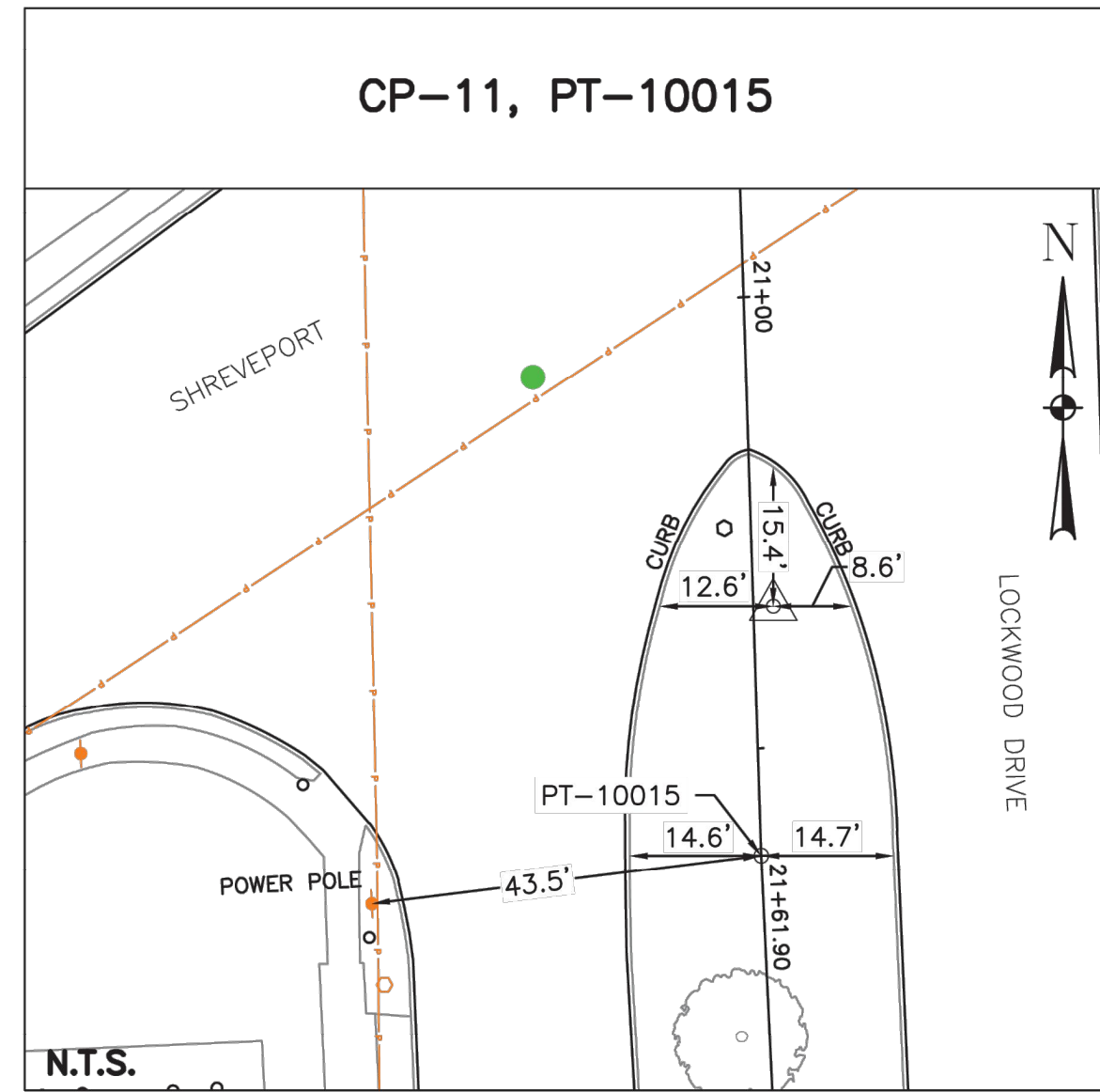
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<p>LANDTECH 1315 W SAM HOUSTON PKWY N STE 100 HOUSTON, TEXAS 77043 T: 713-861-7088 F: 713-861-4131 TBPELS REGISTRATION NO. 10019100</p>		<p>Released by: Nhuy Nguyen, TX RPLS #6409 Date: November 12, 2025</p> <p>FOR INTERIM REVIEW ONLY</p> <p>PRELIMINARY. THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE AND SHALL NOT BE USED OR VIEWED OR RELIED UPON AS A FINAL SURVEY DOCUMENT</p>
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<p>WBS NUMBER R-001000-0033-3</p>	<p>FOR CITY OF HOUSTON USE ONLY</p>	
<p>DRAWING SCALE</p>		
<p>CITY OF HOUSTON PM NEIL BARNSDALE, P.E.</p>		
<p>SHEET NO. 11 OF 106</p>		

NO.	DATE	REVISION	APP.

NO.	DATE	REVISION	APP.



LANDTECH
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 HOUSTON, TEXAS 77043
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 TBPELS REGISTRATION NO. 10019100

Released by: Nhuy Nguyen, TX RPLS #6409
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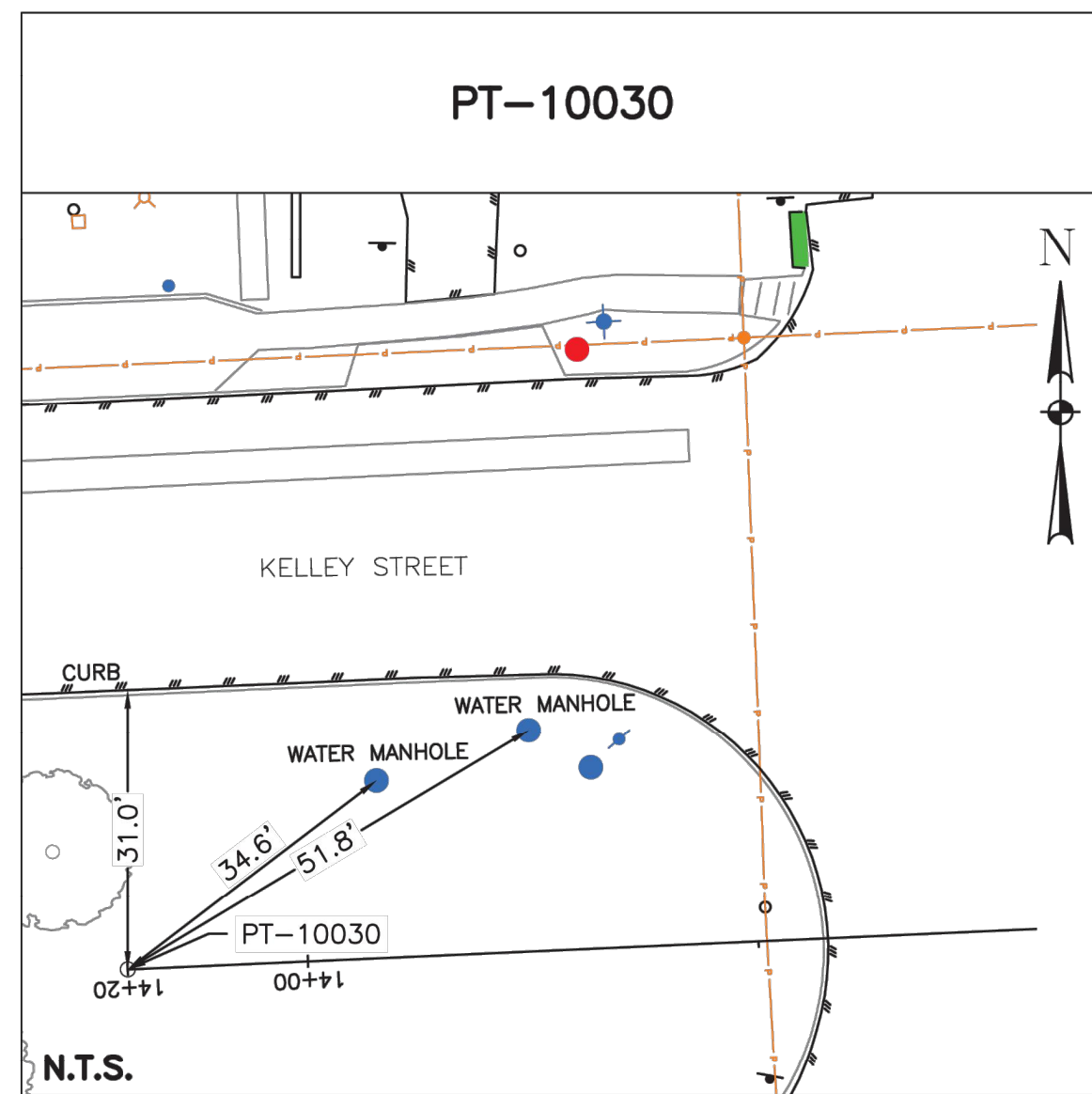
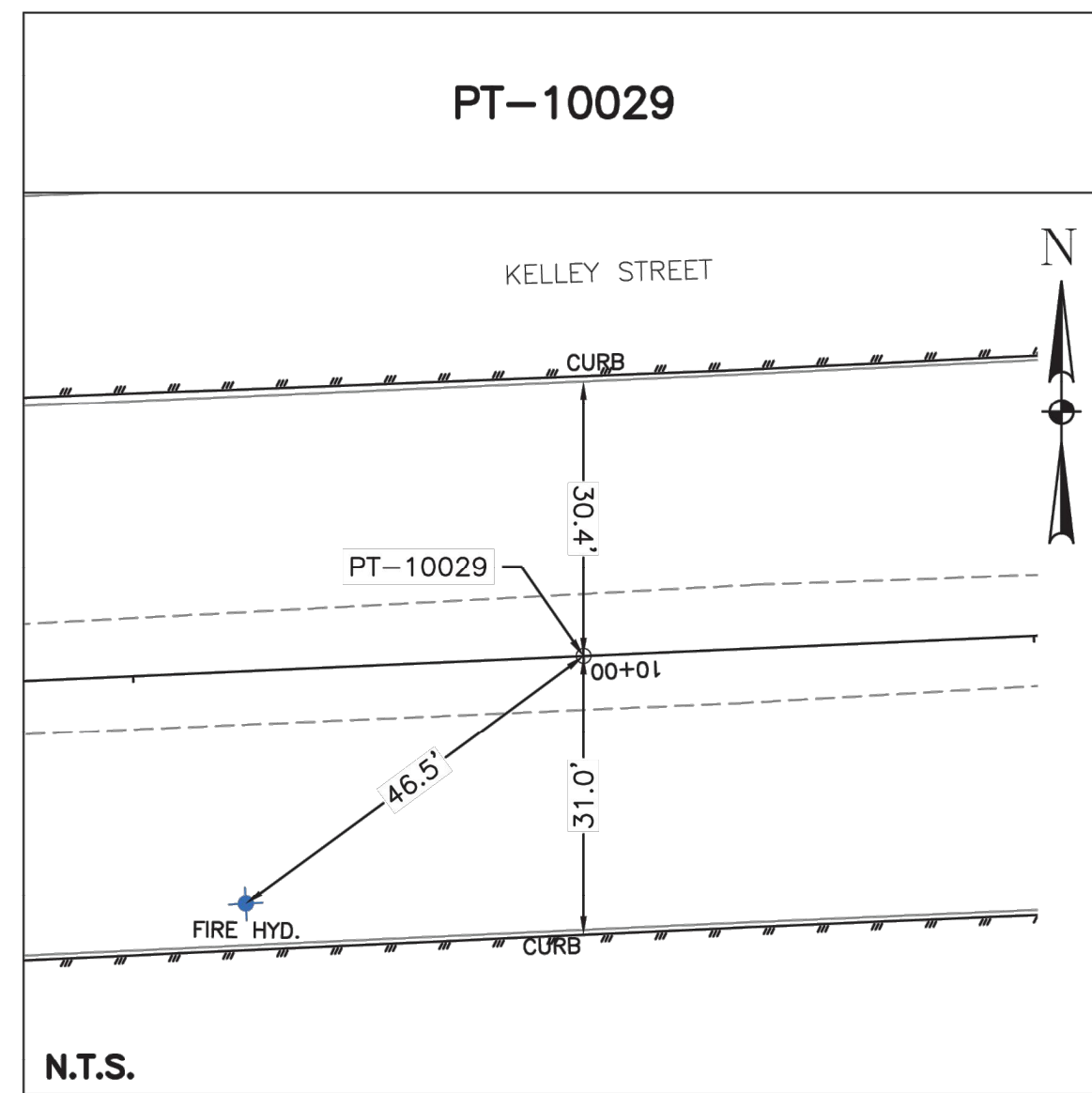
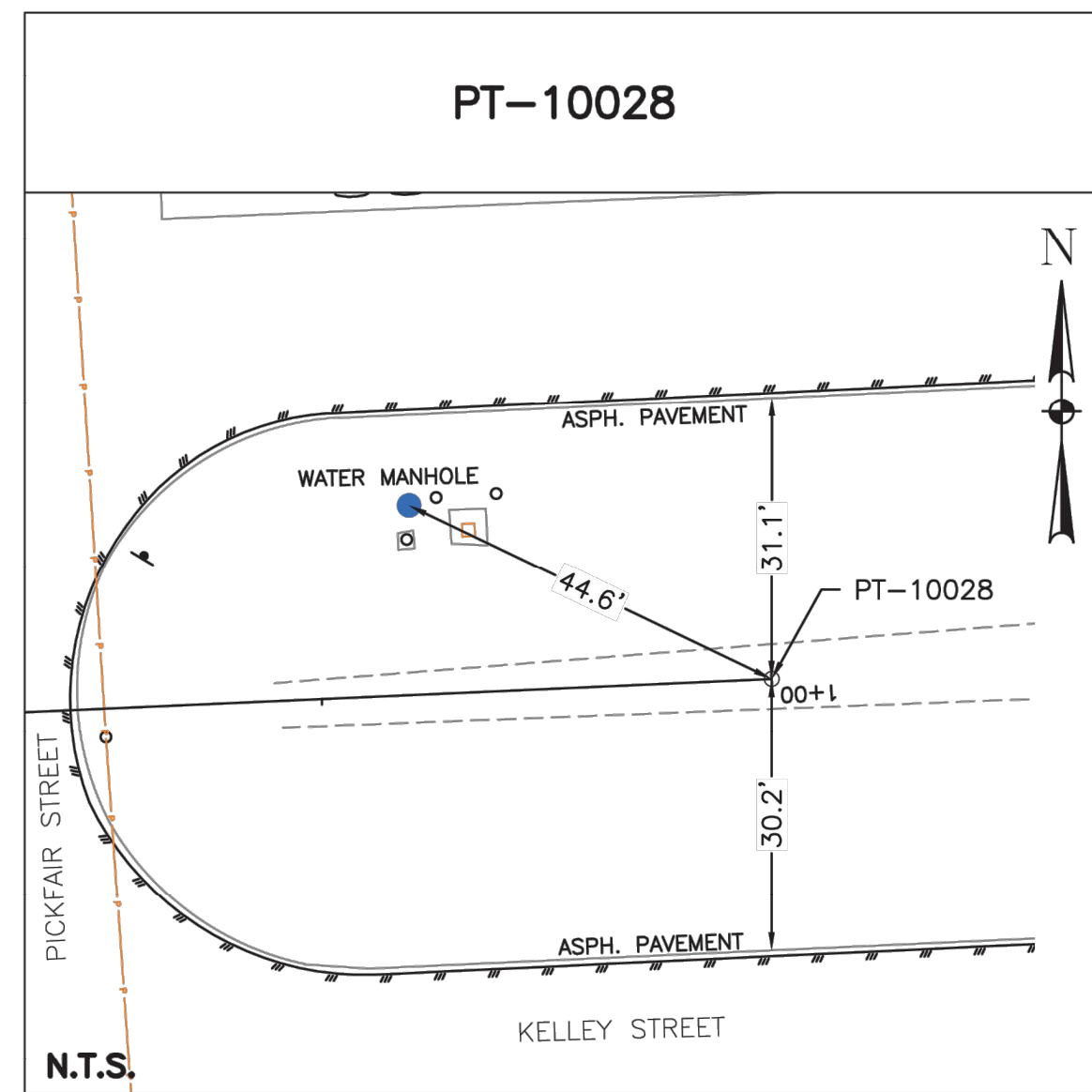
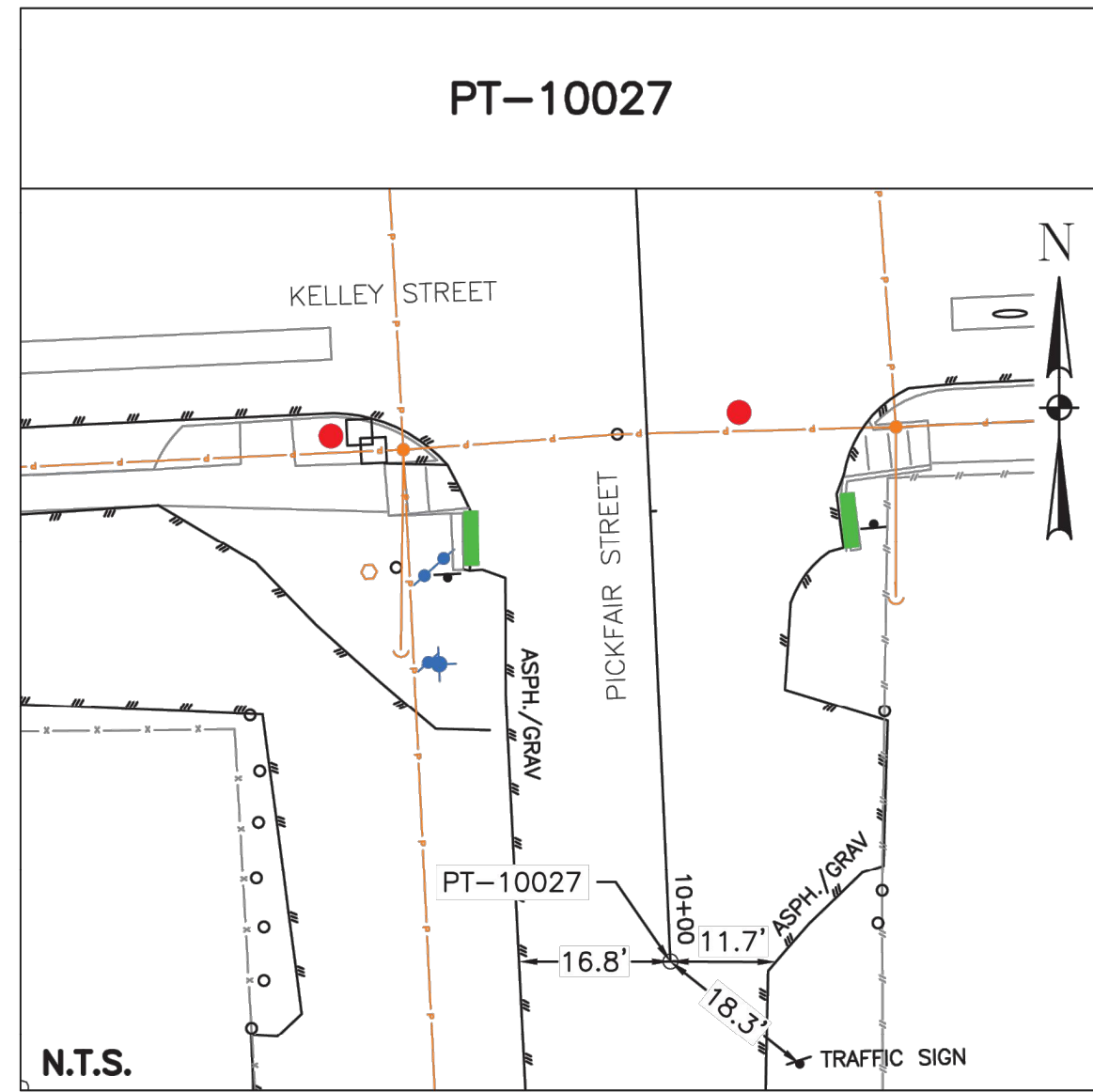
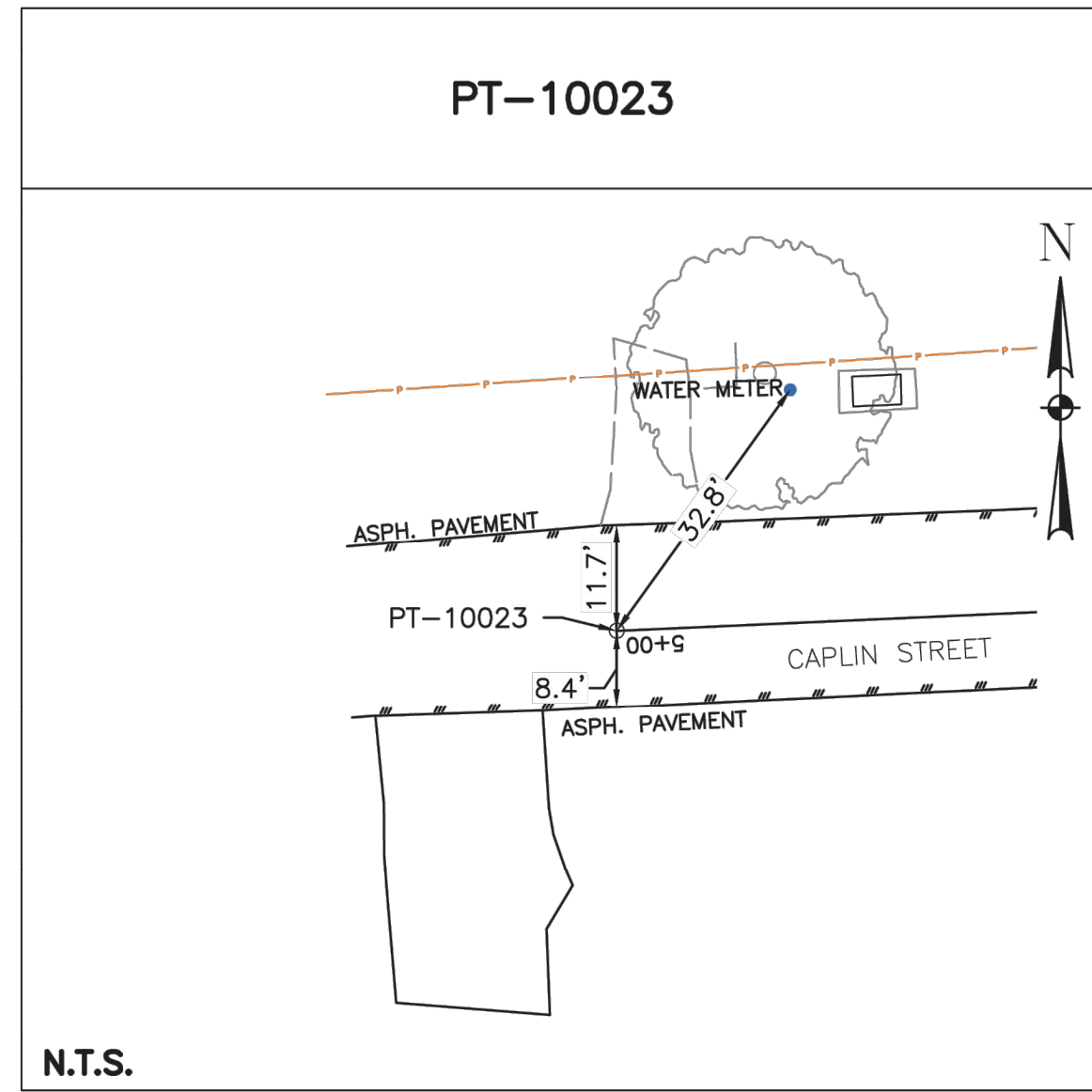
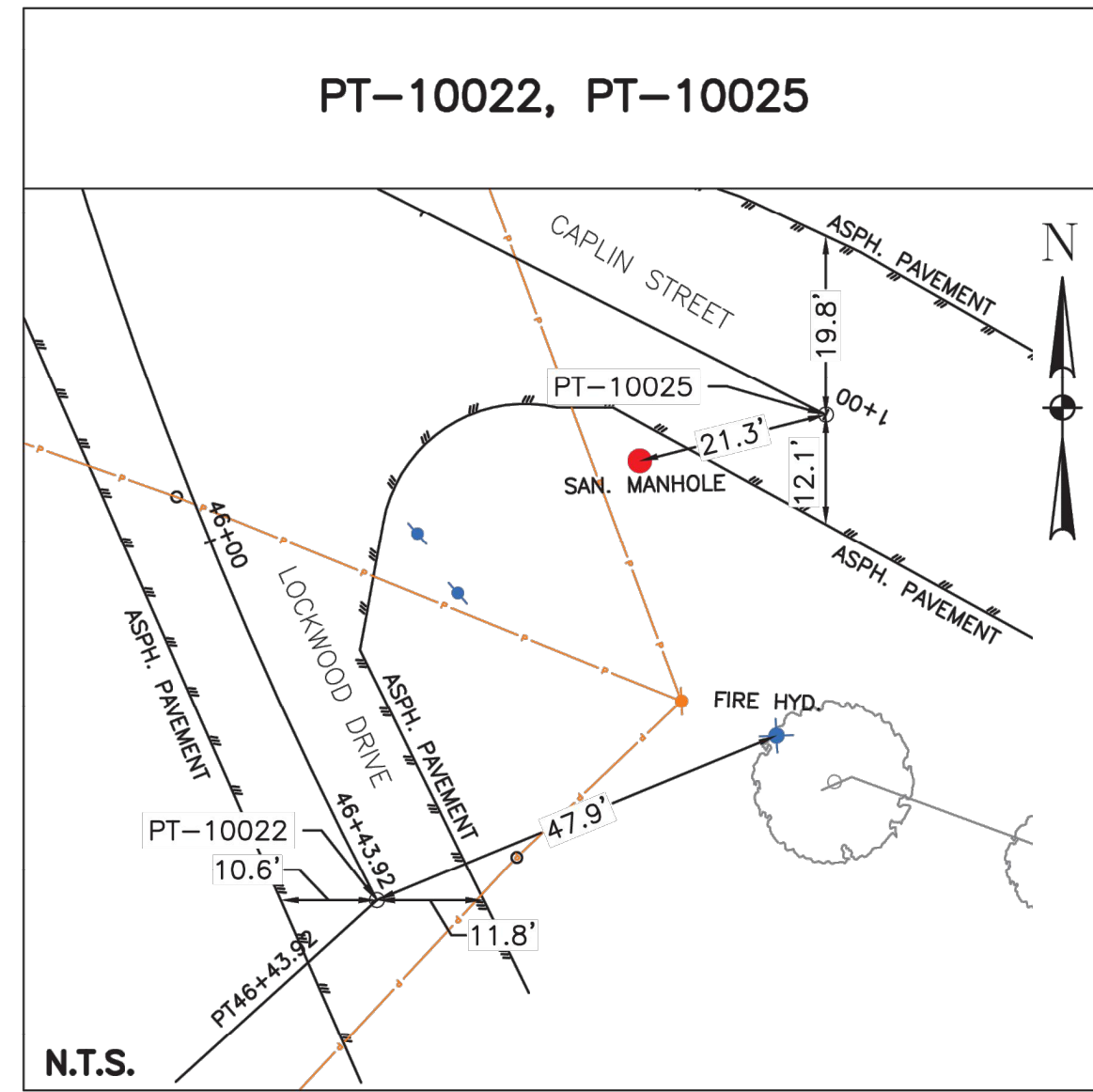
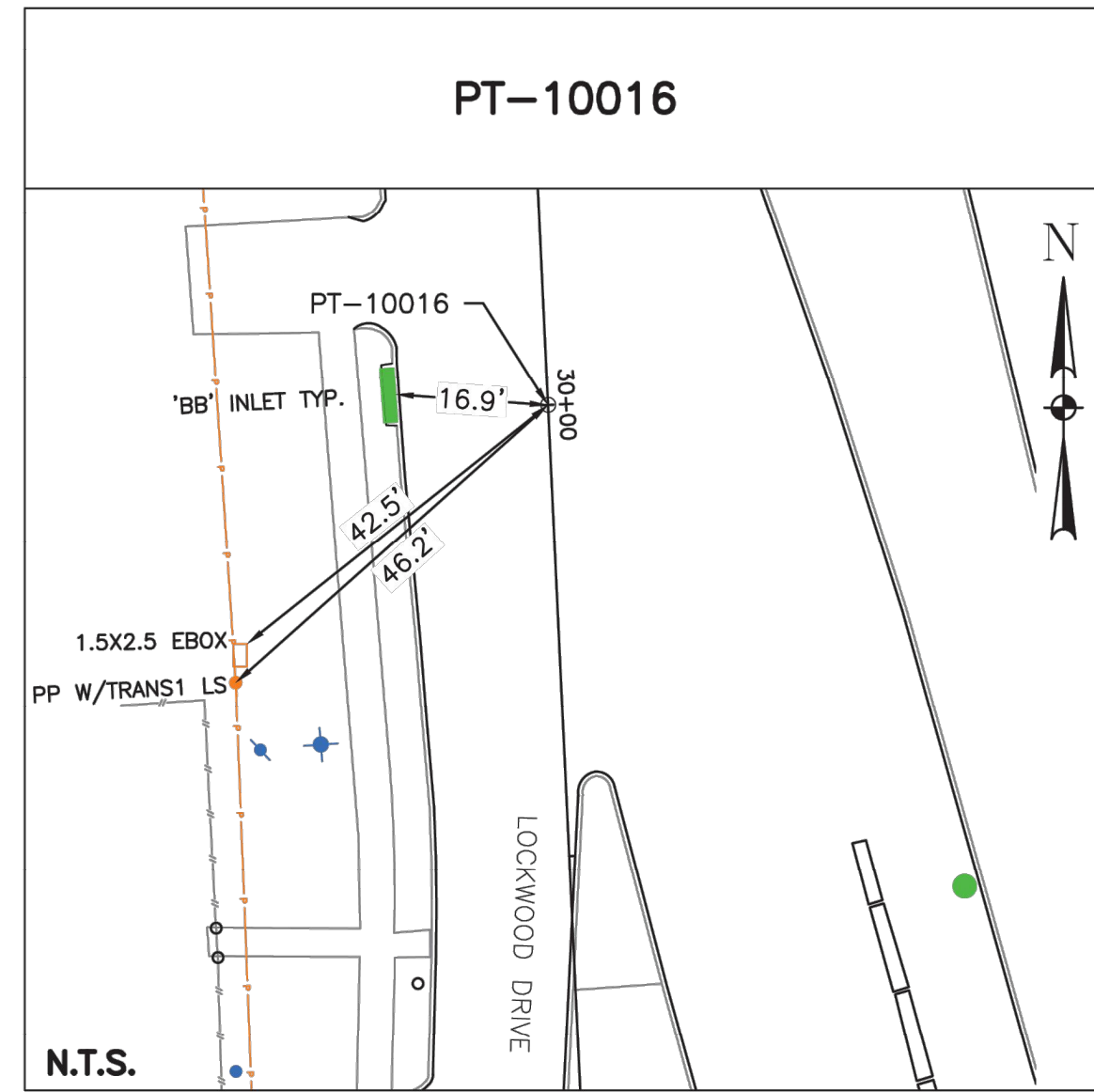
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

SWING TIES
 SHEET 2 OF 4

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 12 OF 106	



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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

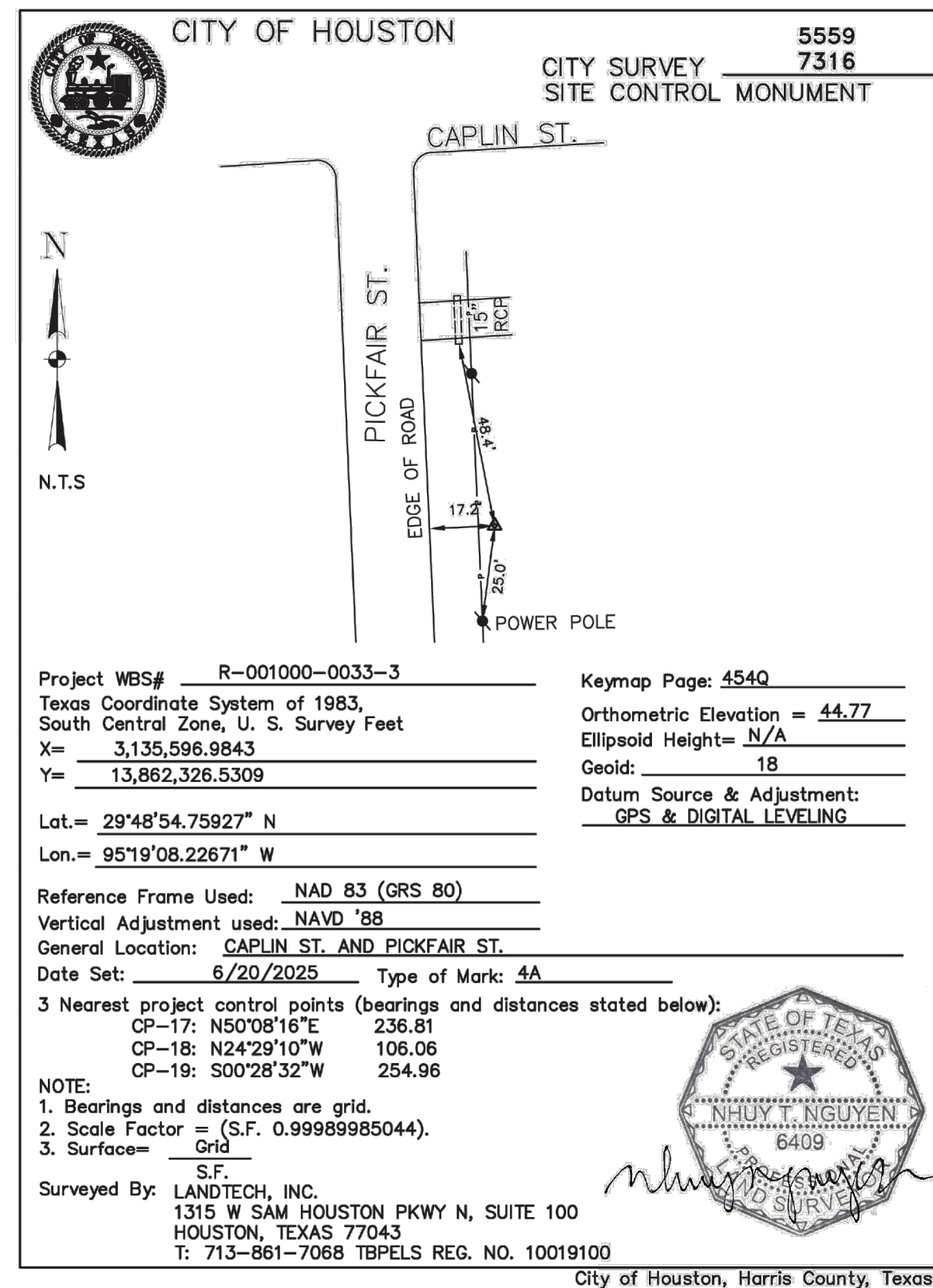
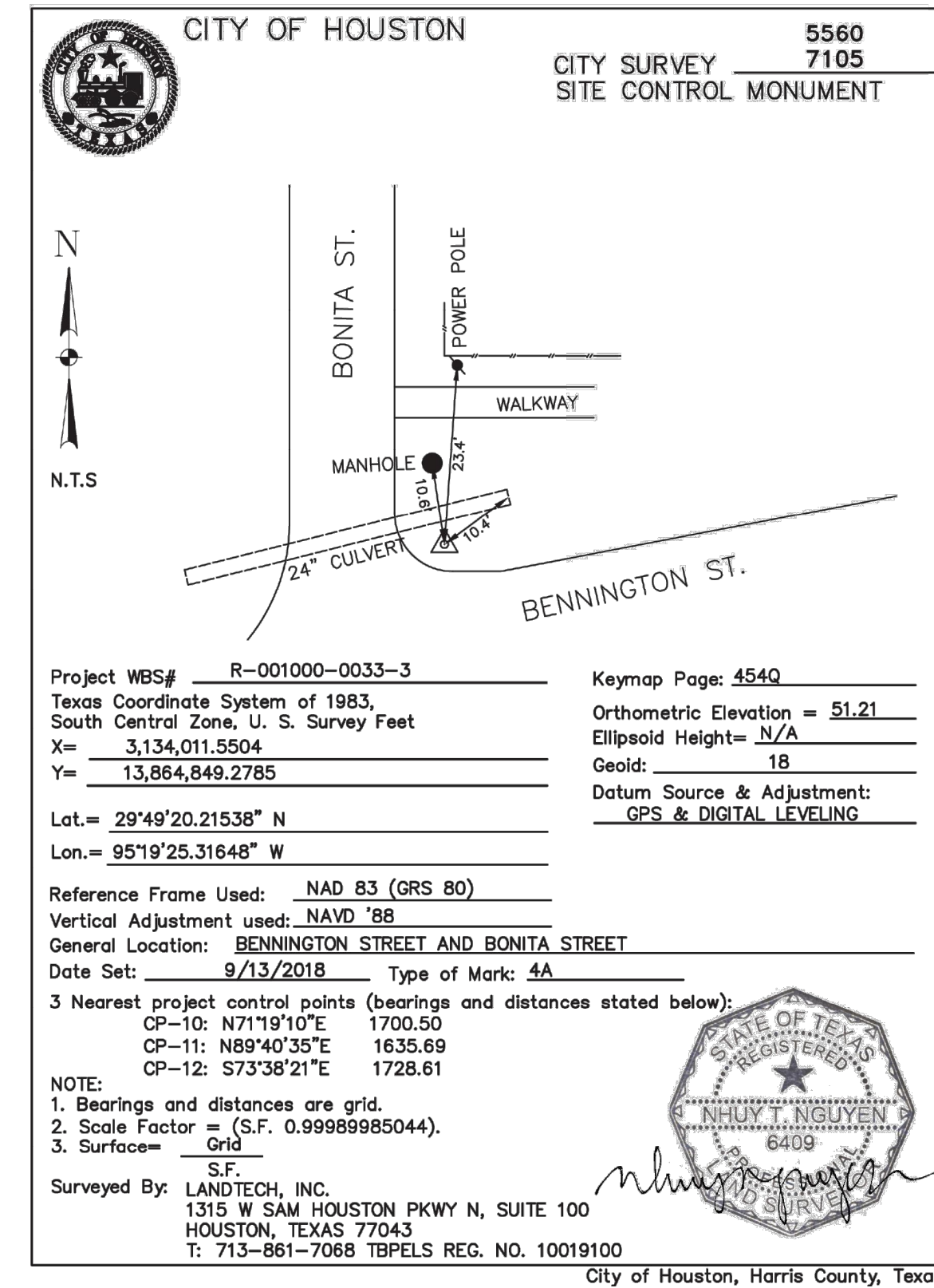
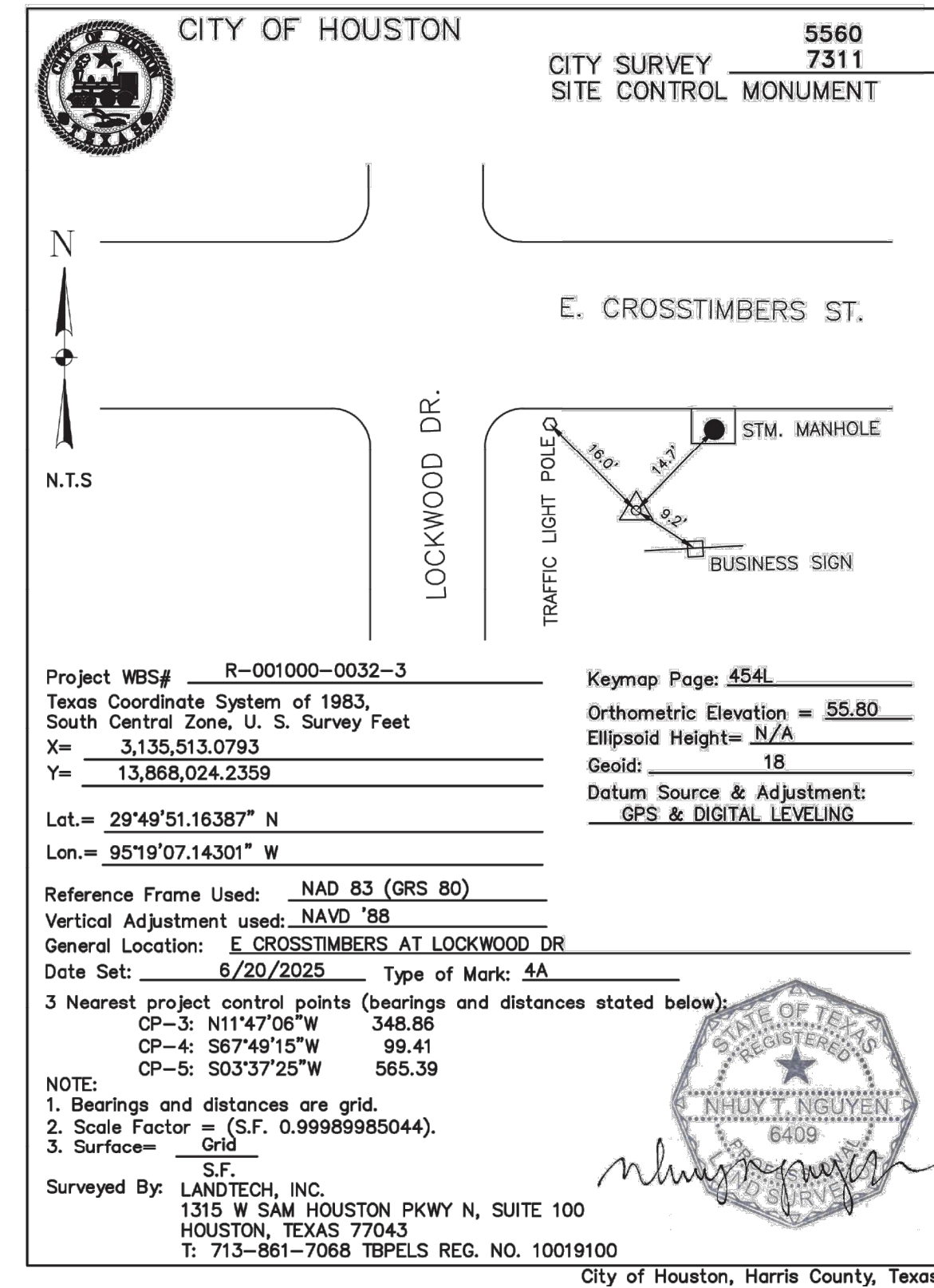
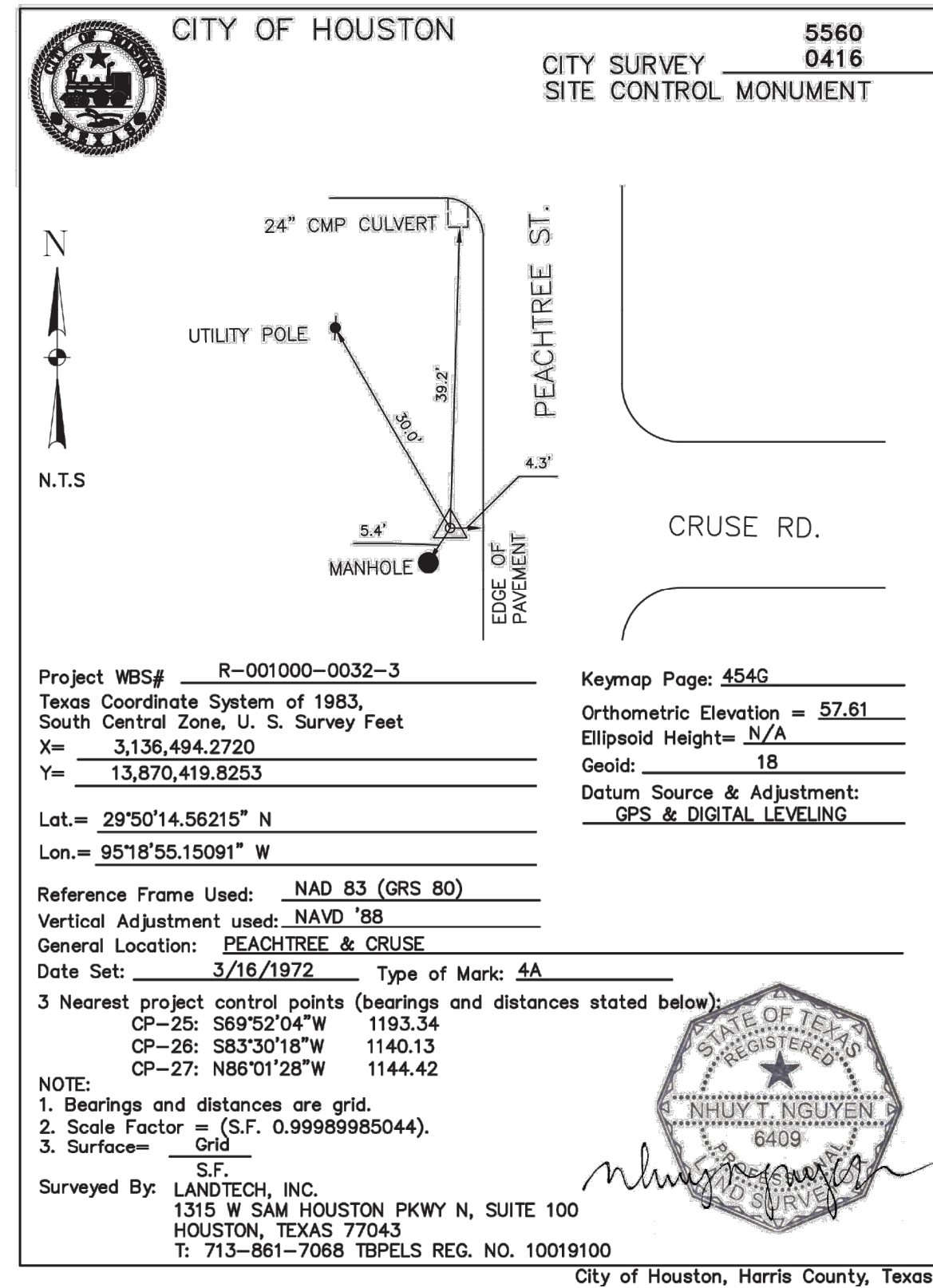
**CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8**

**SWING TIES
 SHEET 3 OF 4**

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 13 OF 106	

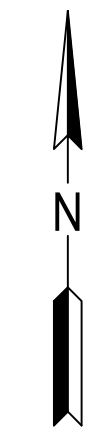
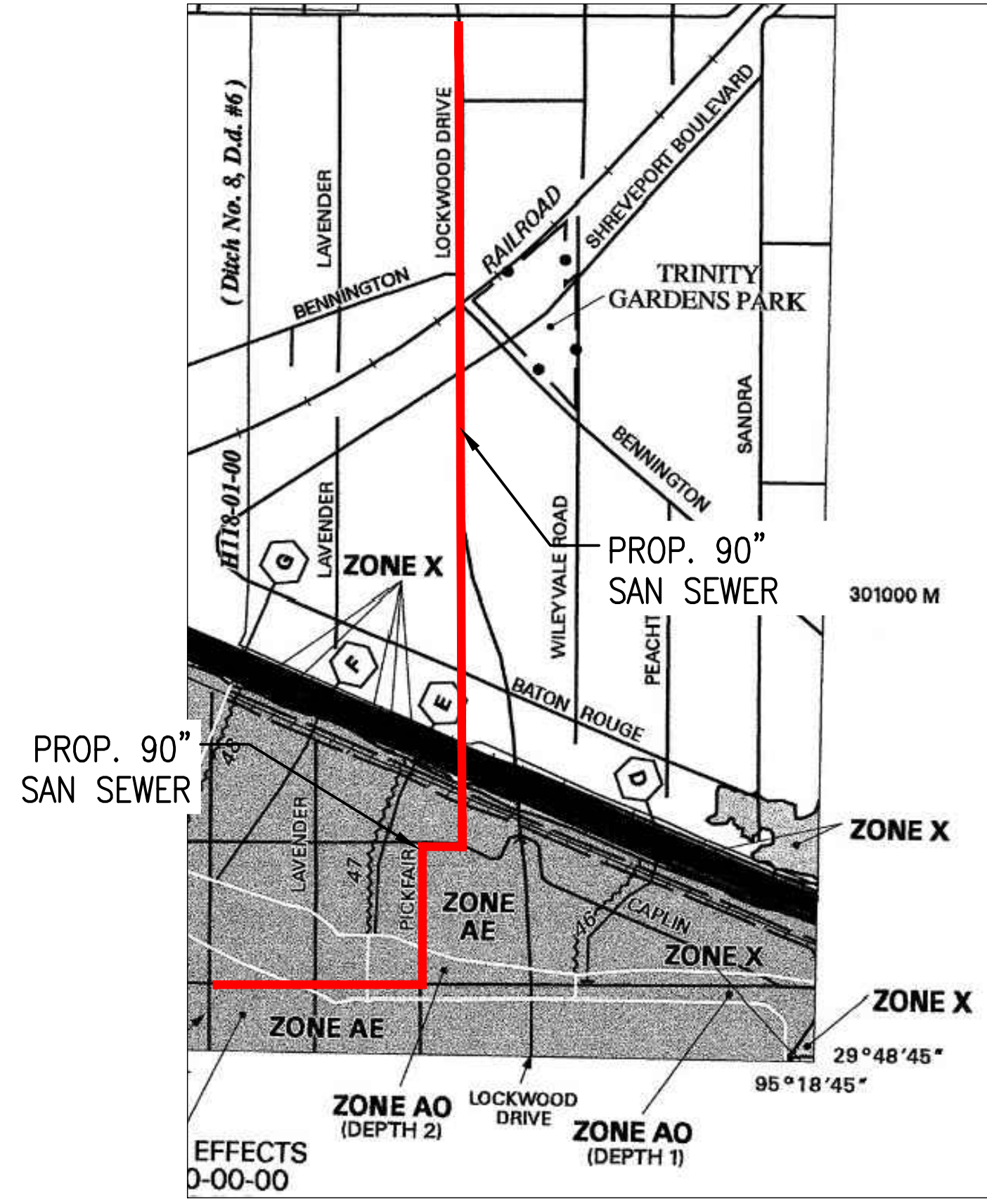
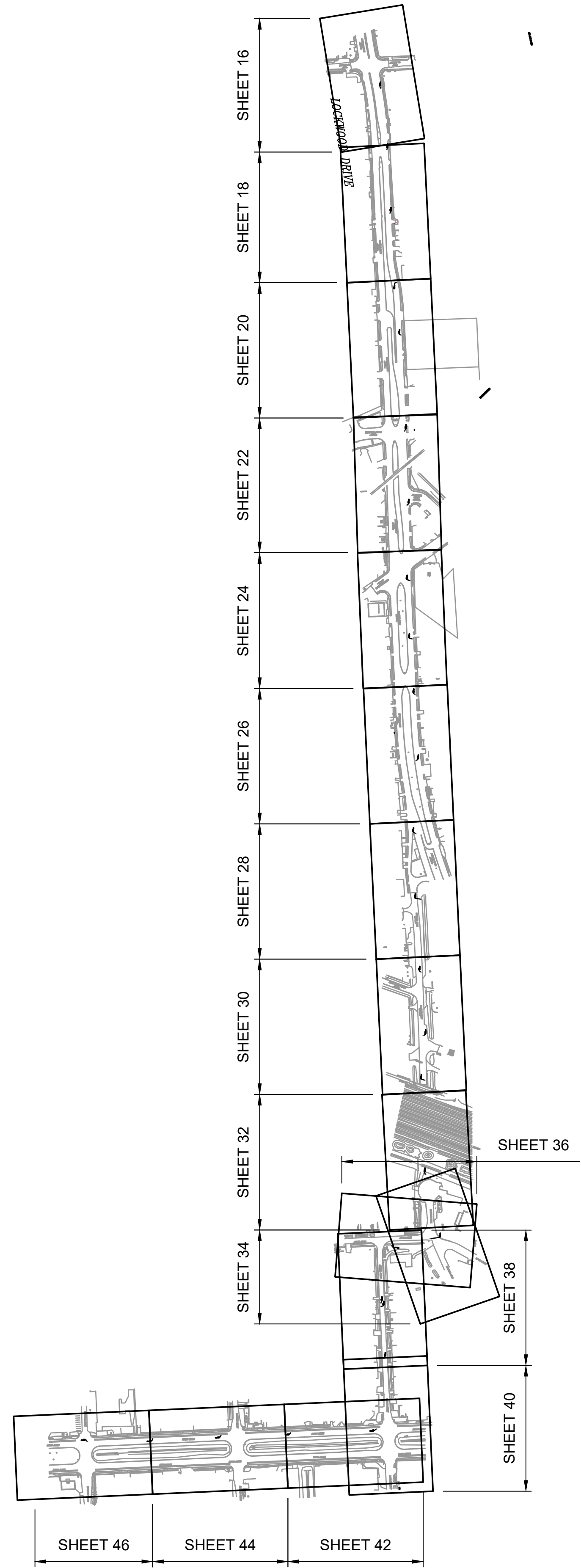
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<p>SWING TIES MONUMENT SHEET 4 OF 4</p>		
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3		
DRAWING SCALE		
CITY OF HOUSTON PM		
NEIL BARNSDALE, P.E.		
SHEET NO. 14 OF 106		

NO.	DATE	REVISION	APP.



NOTICE:
 FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS SIGNATURE DOES NOT FULFILL YOUR OBLIGATION TO CALL 811

VERIFICATION OF PRIVATE UTILITY LINES

Date _____
 CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not be used for conflict verification.
 Signature valid for six months.

Date _____
 CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This signature verifies existing underground facilities - not to be used for conflict verification)
 Signature valid for six months.

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

 Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042	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 _____ GREGORY J. HENRY _____ 91826 _____ 06/05/2026 Date
	SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8
 OVERALL PLAN SHEET LAYOUT

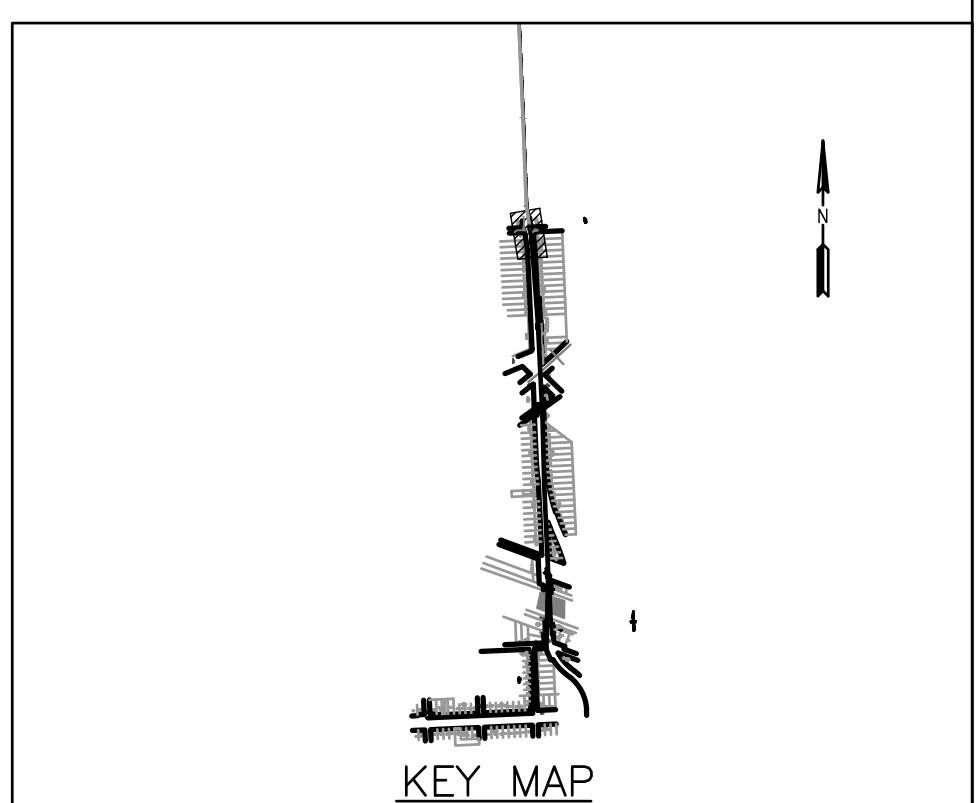
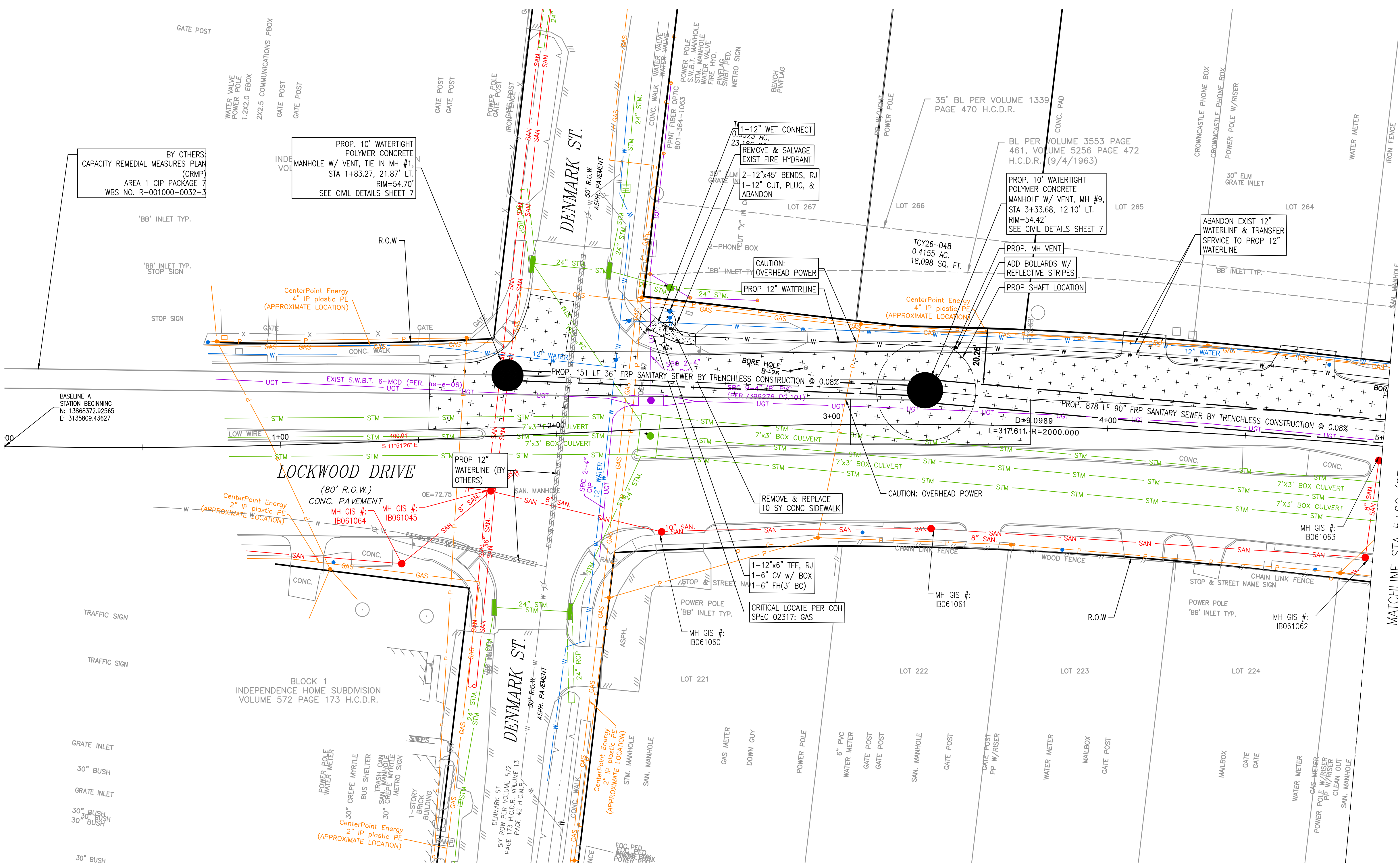
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 15 OF 106	

CONSTRUCTION NOTES

1. LOCATE VENT PIPE AT LEAST 3' FROM BACK OF CURB REFER TO DETAIL 02082-06, SHEET
2. ADD BOLLARD AS DETAILED ON SHEET 64 , DETAIL 6.

NOTES:

1. XX' SHAFT LOCATION AND GEOMETRY SHOWN ARE REPRESENTATIVE ONLY. ACTUAL LOCATION AND GEOMETRY TO BE AS DETERMINED BY CONTRACTOR.
2. CONTRACTOR SHALL TAKE CARE TO MAINTAIN EXISTING SERVICE CONNECTIONS THROUGHOUT CONSTRUCTION.
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4. CONTRACTOR TO INSTALL THE 12" WL AFTER THE COMPLETION OF 84-INCH SAN SWR WORK.



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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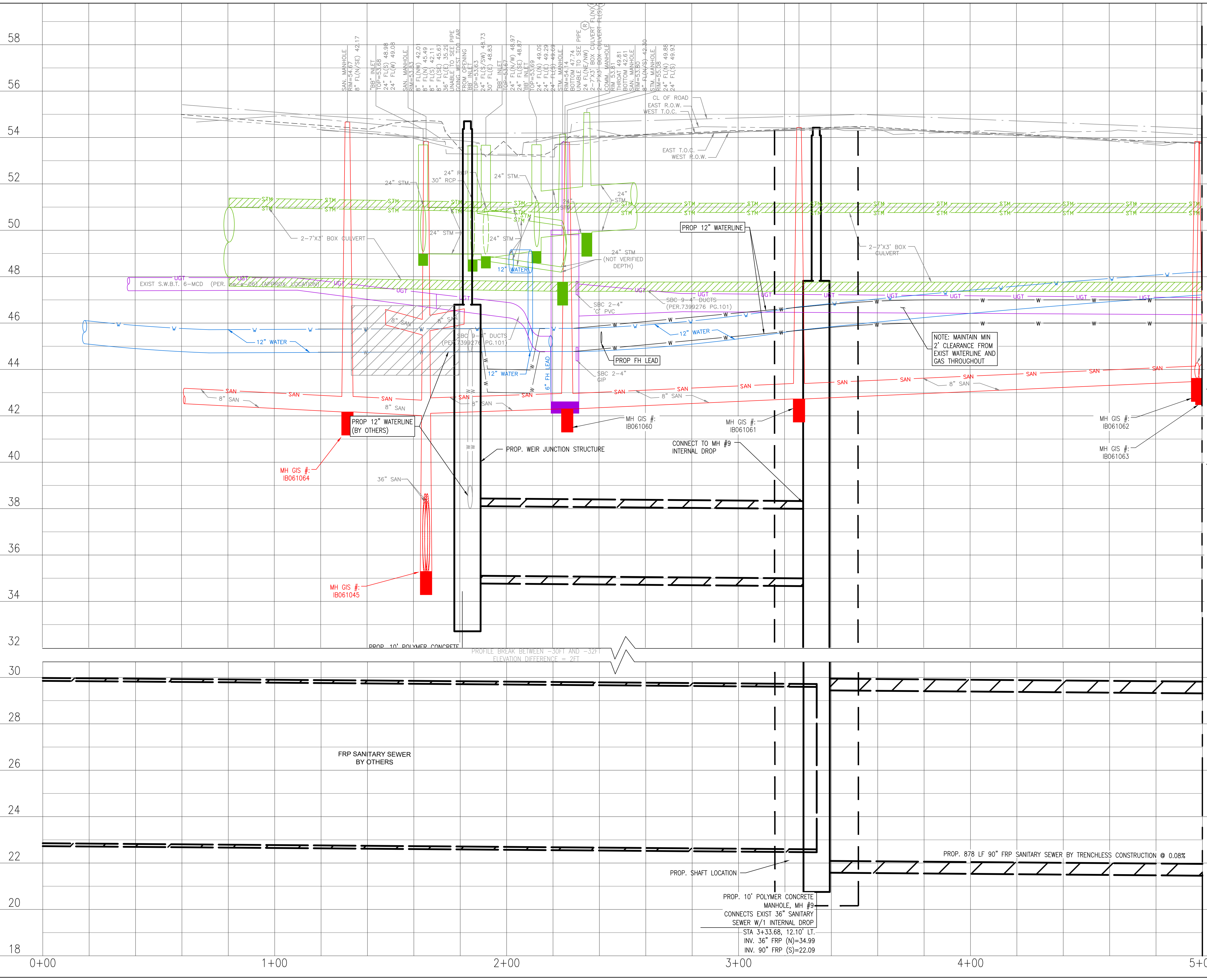
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE - STA. 0+00.00 TO 5+00.00 - PLAN	
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 16 OF 106	

MATCHLINE STA 5+00 (SEE SHEET 18)



LEGEND

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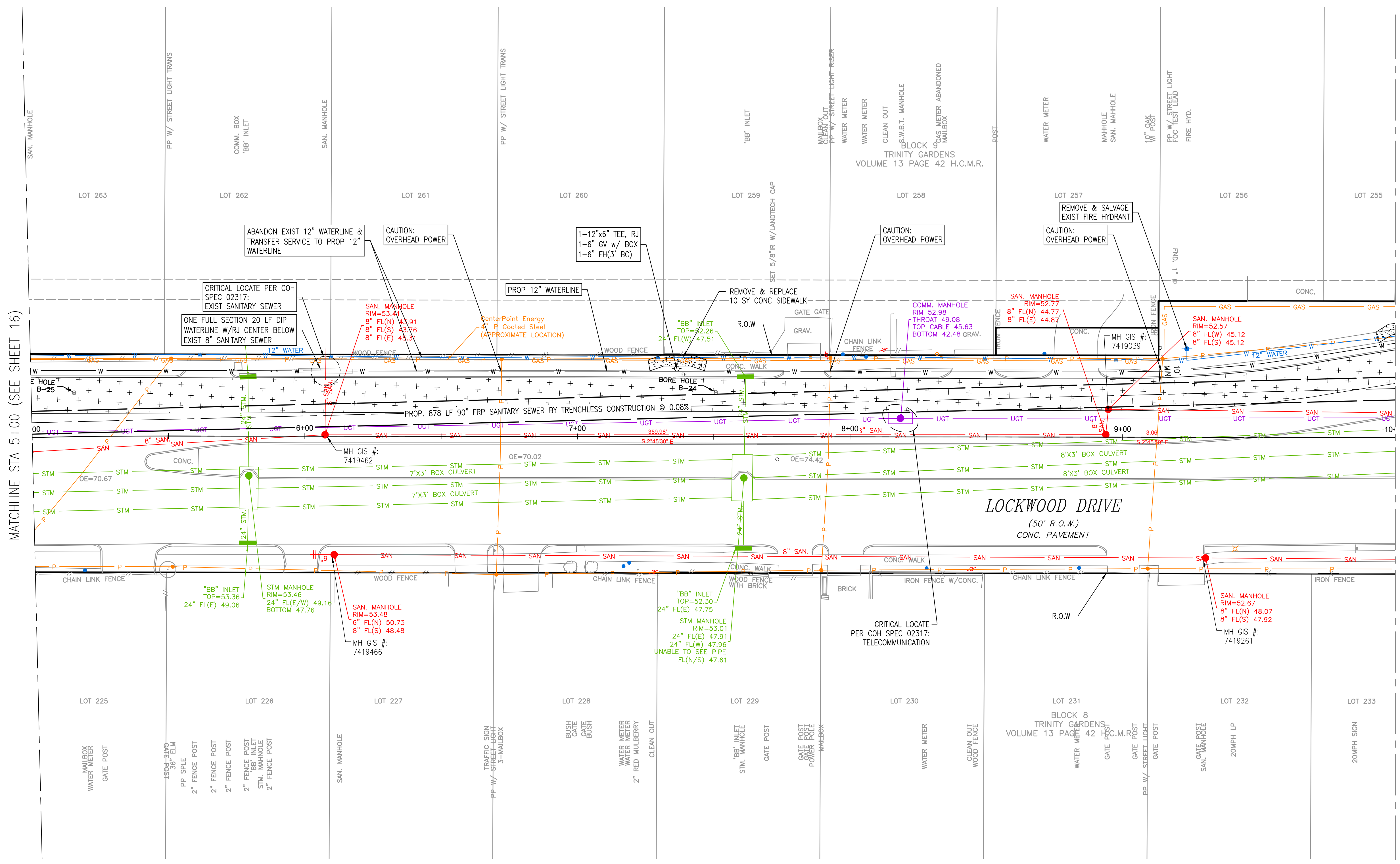
 Lockwood, Andrews & Newnam, Inc. <small>3700 W Sam Houston Pkwy S Houston, TX 77042</small>	<p>INTERIM REVIEW ONLY</p> <p><small>Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of</small></p> <p style="text-align: center;"><u>GREGORY J. HENRY</u> <small>91826 06/05/2026</small></p> <p><small>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</small></p>
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
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WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	17 OF 106



MATCHLINE STA 5+00 (SEE SHEET 16)

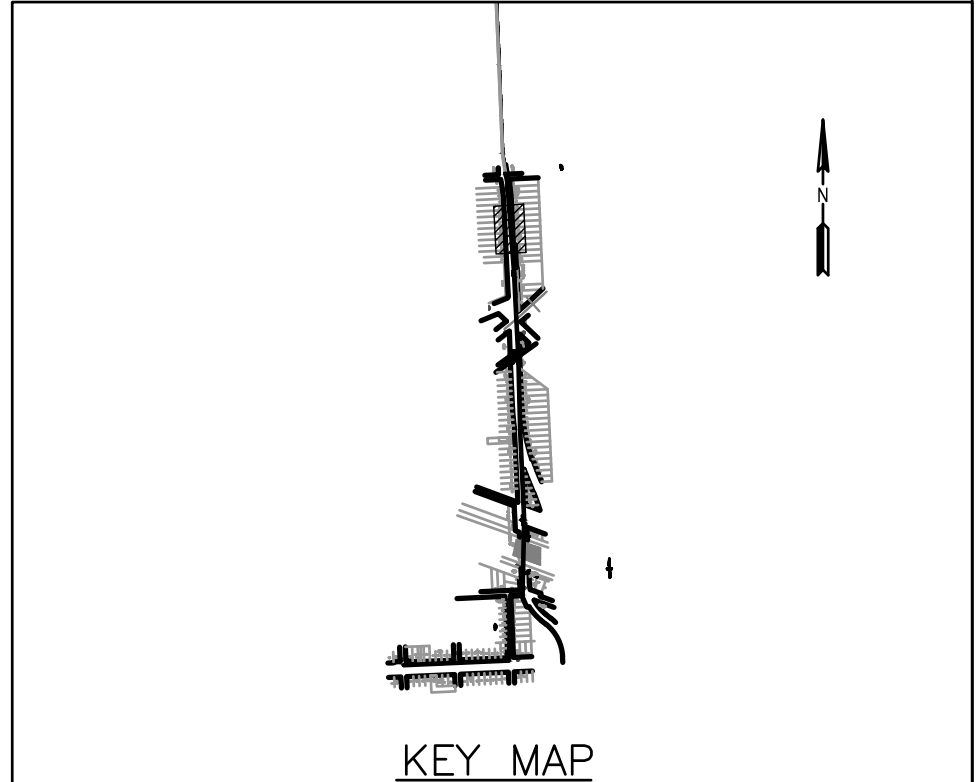
MATCHLINE STA 10+00 (SEE SHEET 20)

NOTES CONTINUE:

- 5. CONTRACTOR TO INSTALL THE 12" WL AFTER THE COMPLETION OF 84-INCH SAN SWR WORK.

NOTES:

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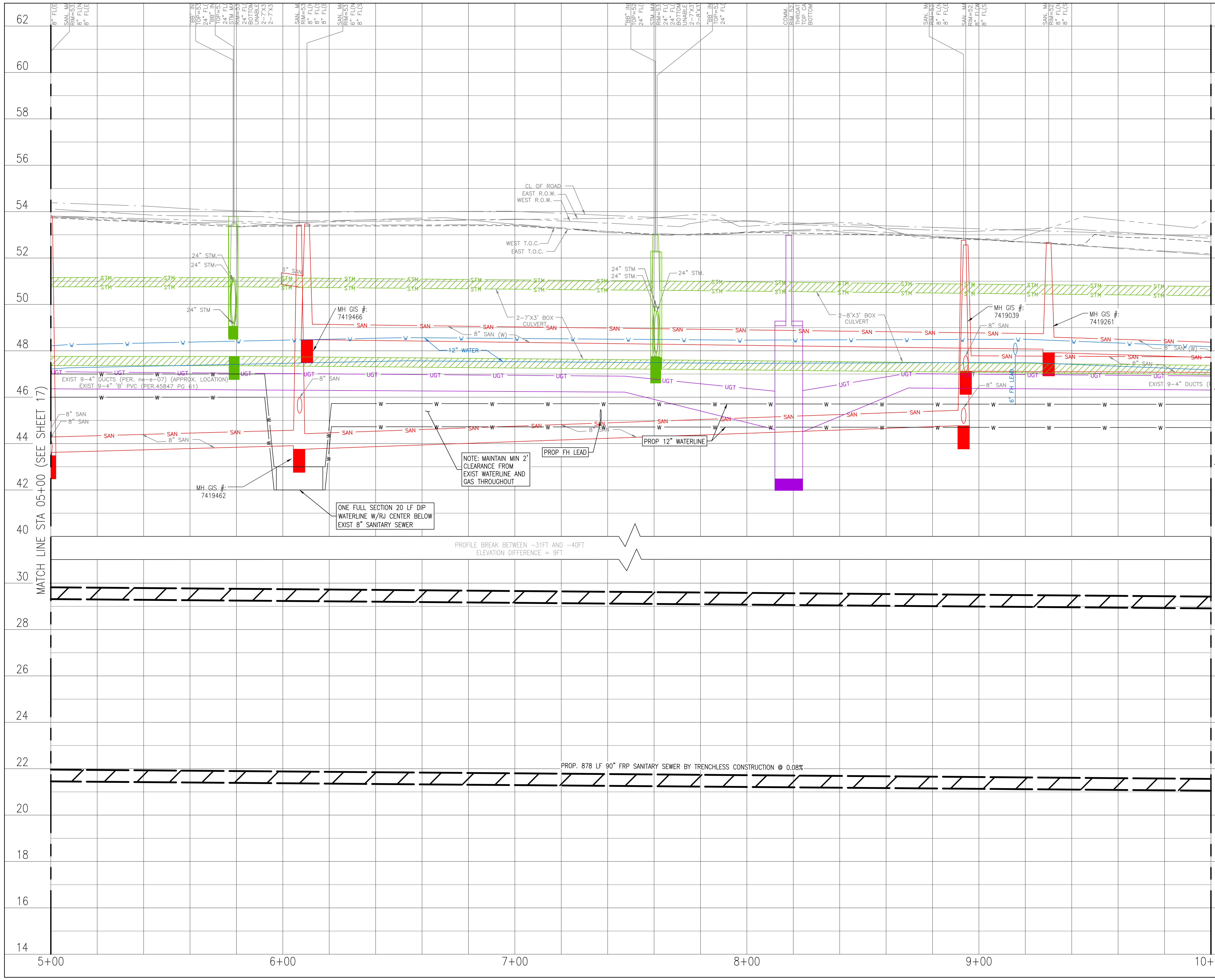
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CITY OF HOUSTON
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CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE - STA. 5+00.00 TO 10+00.00 - PLAN	
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R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 18 OF 106	



<p>LEGEND</p> <table border="0"> <tr> <td></td> <td>CLAYEY SILTY SAND, CL-ML</td> <td></td> <td>CONCRETE</td> </tr> <tr> <td></td> <td>CLAYEY SAND, SC</td> <td></td> <td>BASE</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY LEAN CLAY, CL</td> <td></td> <td>FAT CLAY, CH</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY CLAY, CL</td> <td></td> <td>SILT, ML</td> </tr> <tr> <td></td> <td>SILTY CLAYEY SAND, SC-SM</td> <td></td> <td>FILL CL/CH</td> </tr> </table>			CLAYEY SILTY SAND, CL-ML		CONCRETE		CLAYEY SAND, SC		BASE		LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH		LOW PLASTICITY SANDY CLAY, CL		SILT, ML		SILTY CLAYEY SAND, SC-SM		FILL CL/CH
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<p>SHEET NO. 19 OF 106</p>																					

CONSTRUCTION NOTES

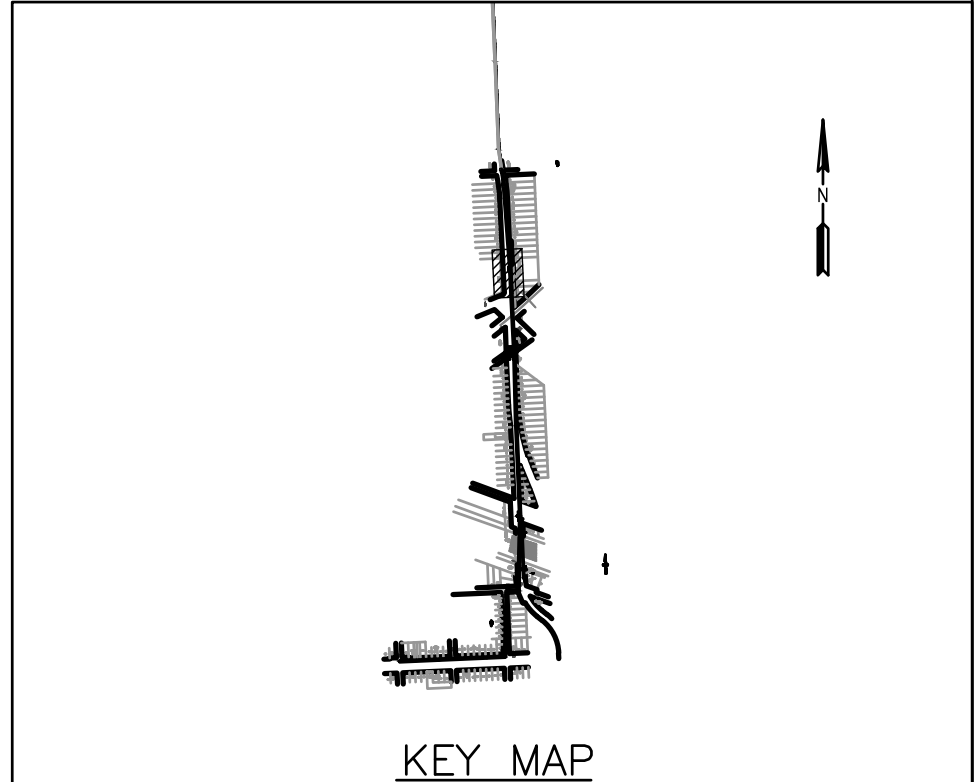
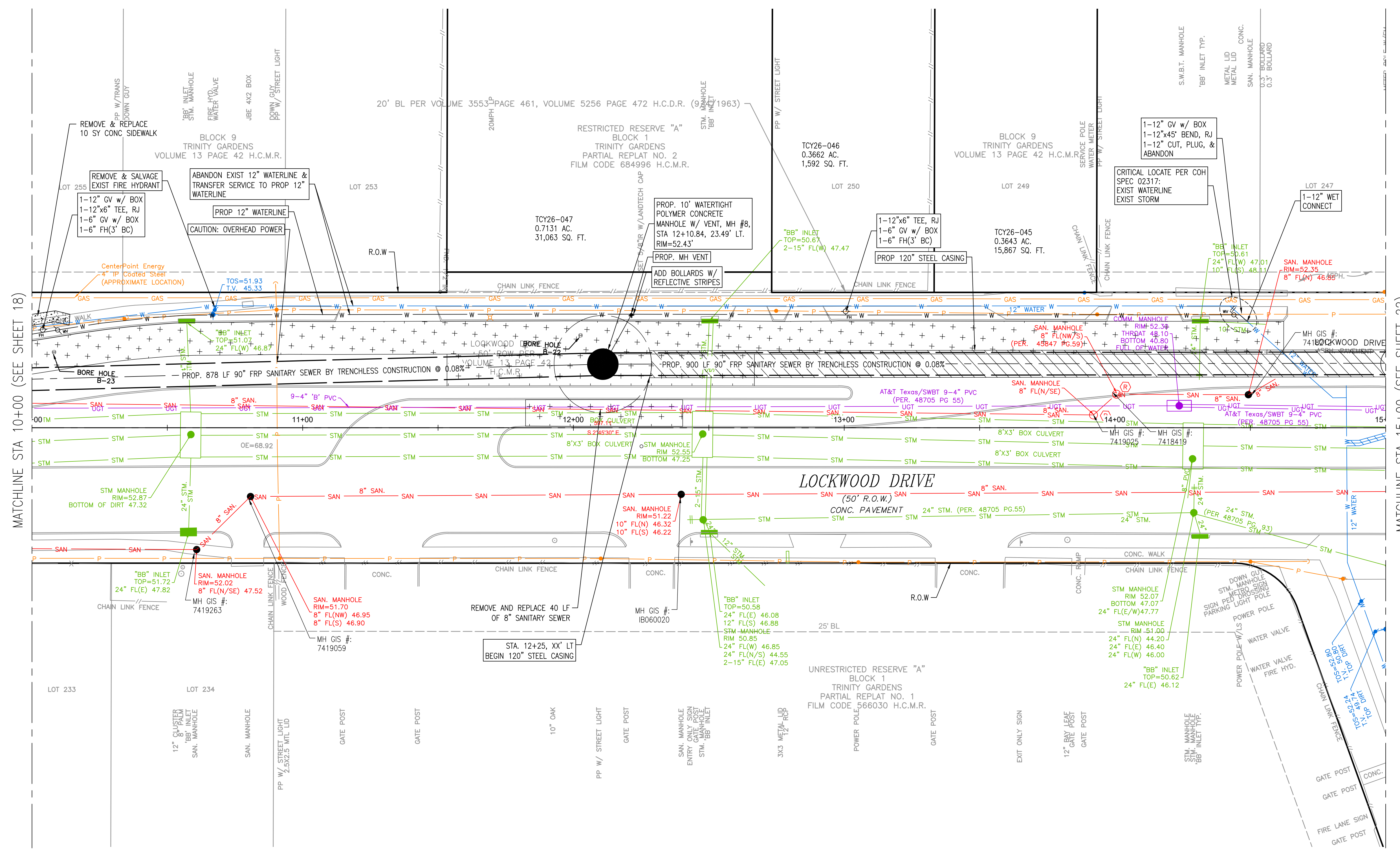
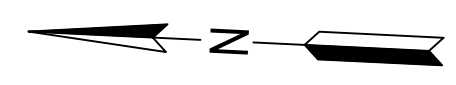
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NOTES CONTINUE:

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91826

06/05/2026

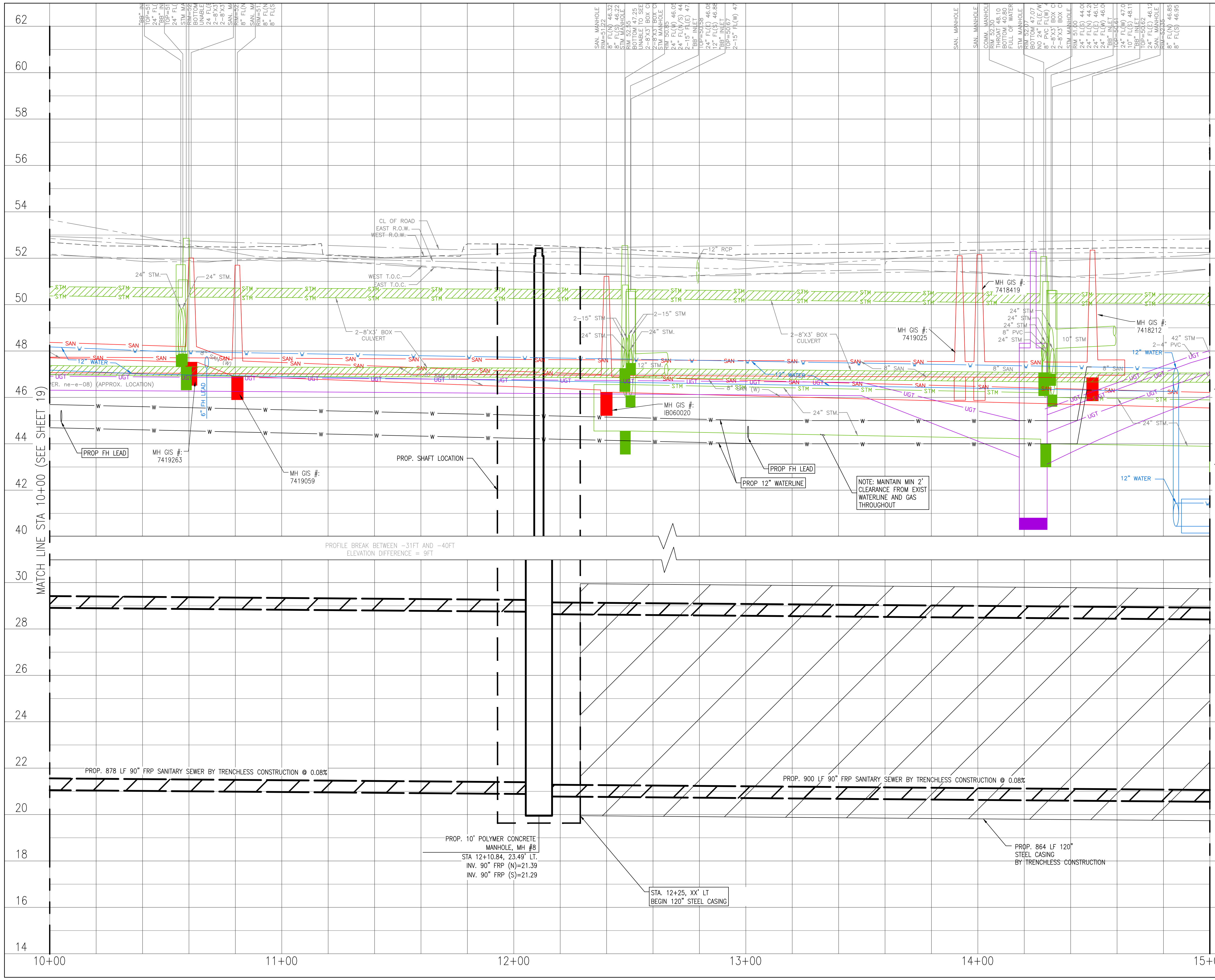
Date

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

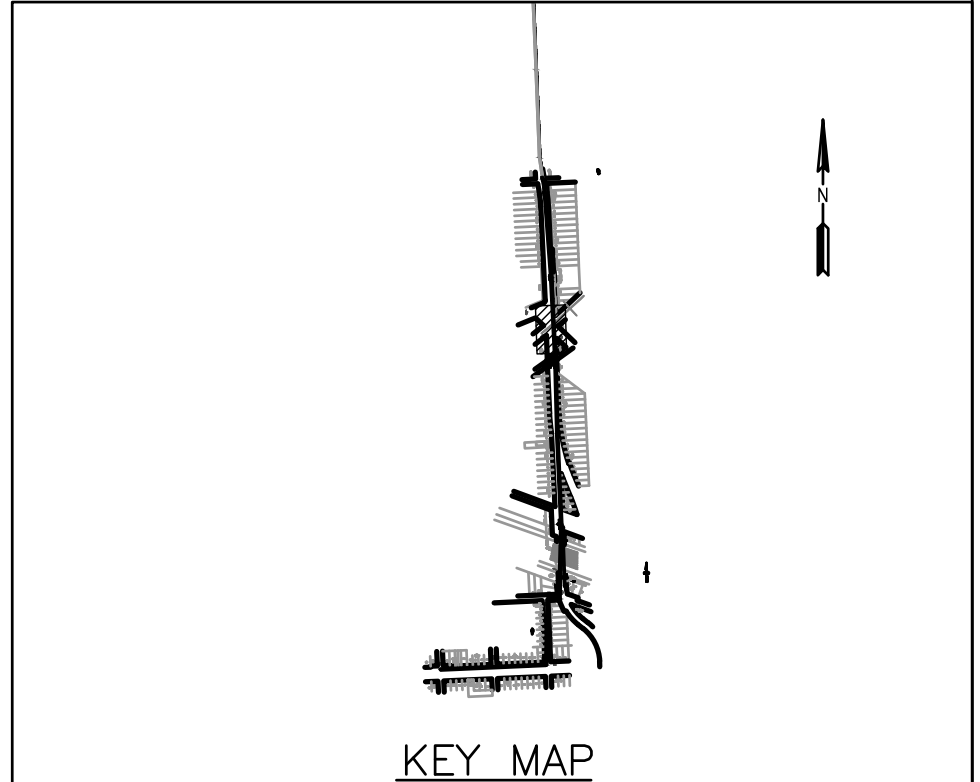
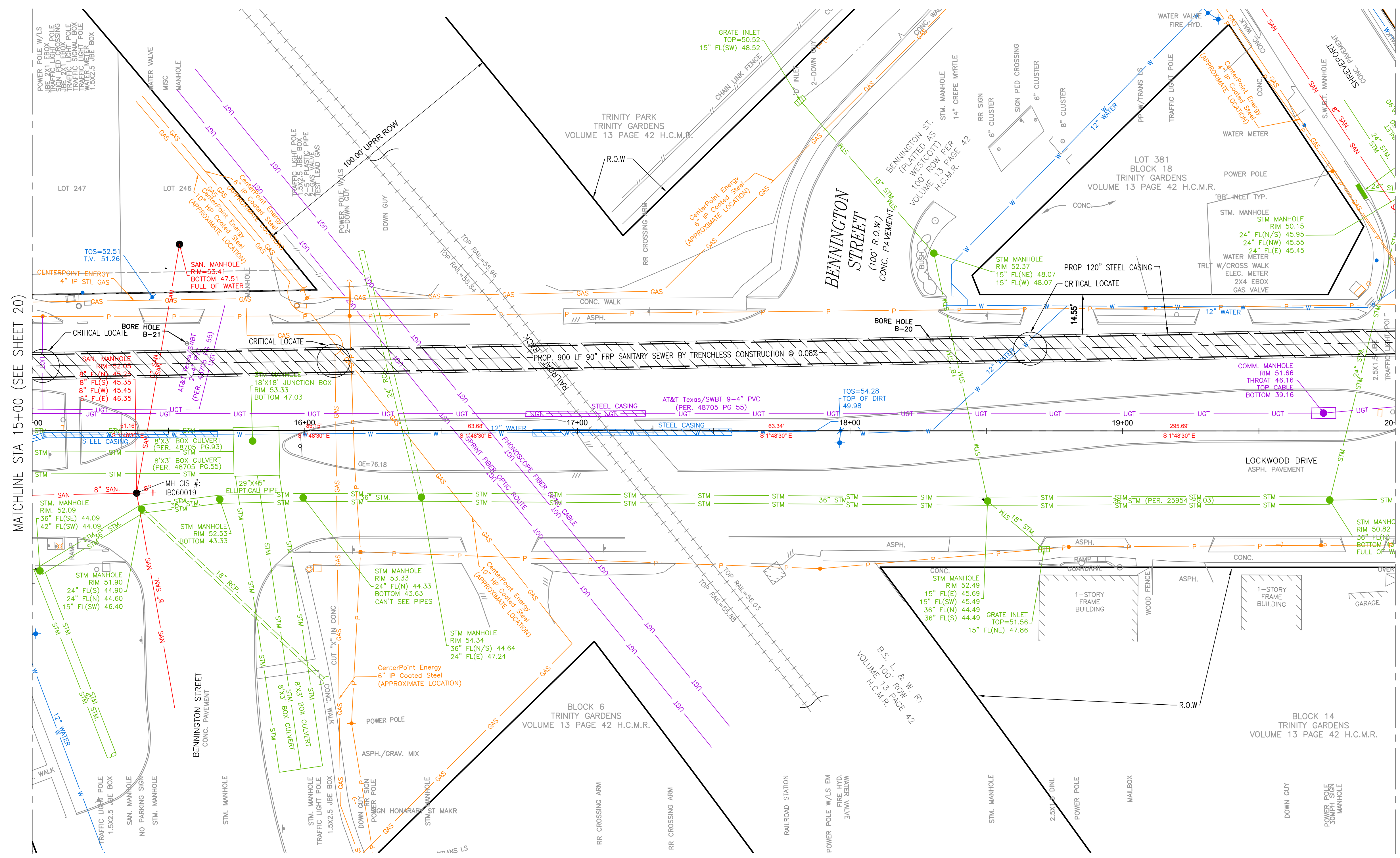
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DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 20 OF 106	



<p>LEGEND</p> <table border="0"> <tr> <td></td> <td>CLAYEY SILTY SAND, CL-ML</td> <td></td> <td>CONCRETE</td> </tr> <tr> <td></td> <td>CLAYEY SAND, SC</td> <td></td> <td>BASE</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY LEAN CLAY, CL</td> <td></td> <td>FAT CLAY, CH</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY CLAY, CL</td> <td></td> <td>SILT, ML</td> </tr> <tr> <td></td> <td>SILTY CLAYEY SAND, SC-SM</td> <td></td> <td>FILL CL/CH</td> </tr> </table>			CLAYEY SILTY SAND, CL-ML		CONCRETE		CLAYEY SAND, SC		BASE		LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH		LOW PLASTICITY SANDY CLAY, CL		SILT, ML		SILTY CLAYEY SAND, SC-SM		FILL CL/CH
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CONSTRUCTION NOTES
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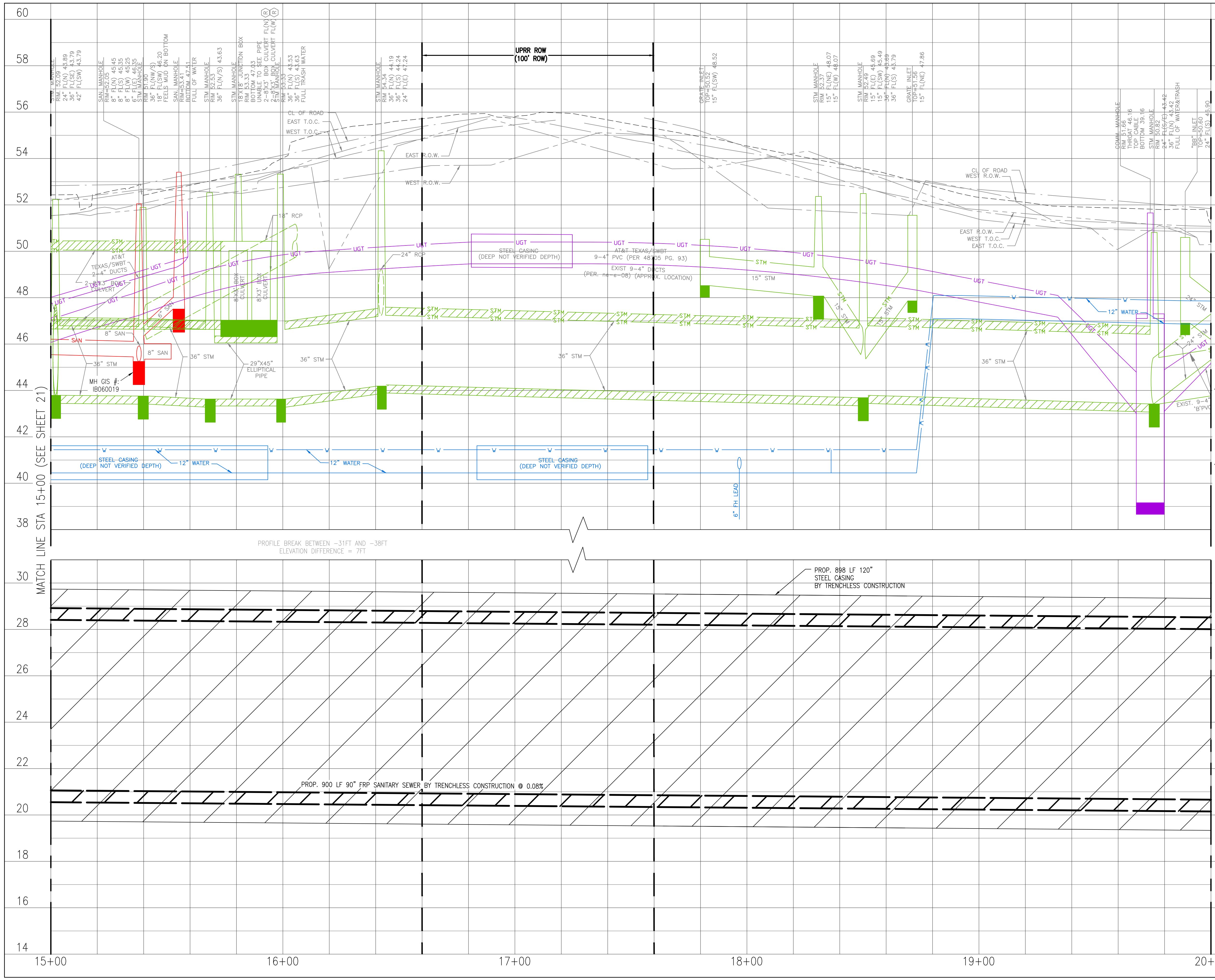
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SHEET NO. 22 OF 106	

FILE PATH: C:\Users\Agaivan\DC\ACCDocs\Lee A. Doty\132-10021-000\Project Files\4-0-Production-Working\4-1-BIM-CAD\Civil\Sheets\BASELINE A - LOCKWOOD DRIVE - PROF.dwg PLOT STYLE: Coh.ctb_230809.ctb PLOTTED: 6/5/2026 4:20 PM



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LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
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HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

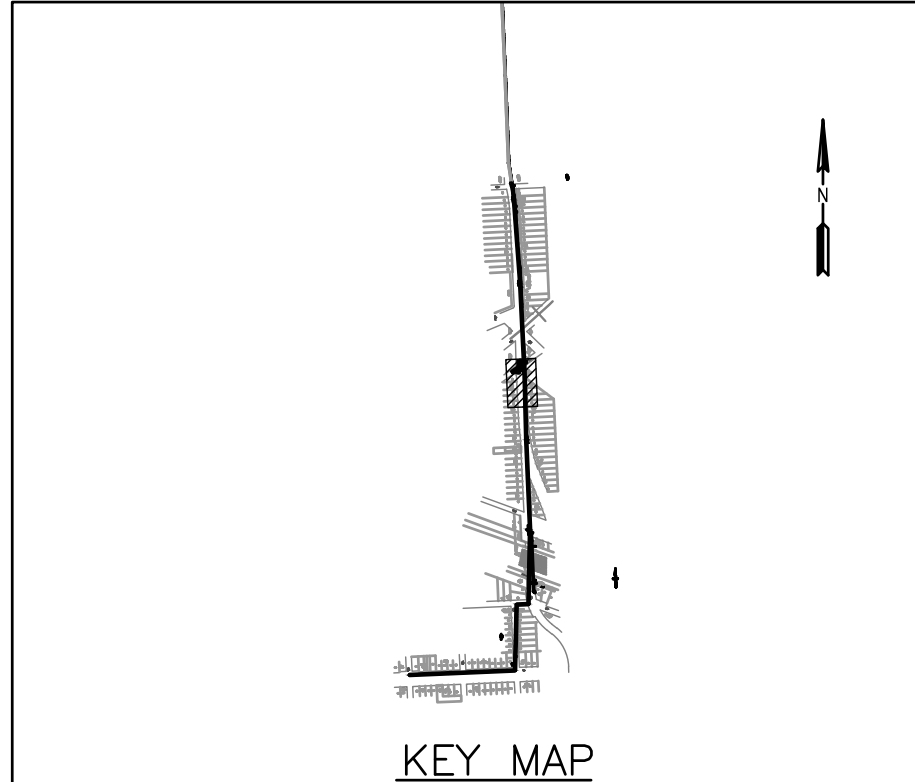
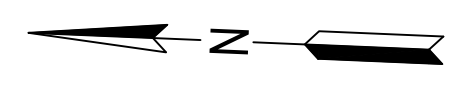
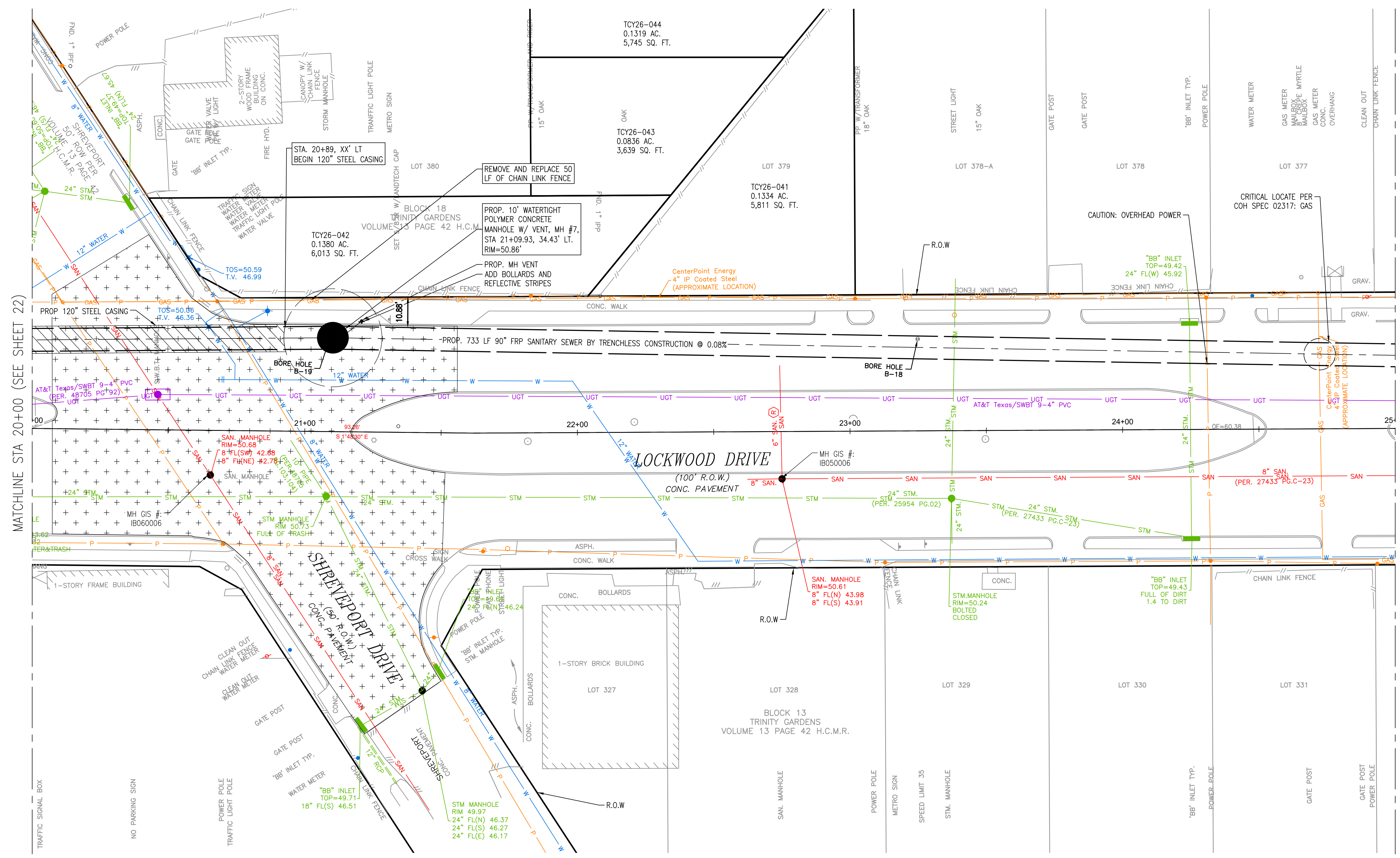
BASELINE A - LOCKWOOD DRIVE -
STA. 15+00.00 TO 20+00.00 - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 23 OF 106	

FILE PATH: C:\Users\A\Galvan\DC\ACCDocs\Lee A. Doly\132-10021-000\Project Files\4-0-Production-Working\4-1-BIM-CAD\Civil\Sheets\BASELINE A - LOCKWOOD DRIVE - PLAN.dwg PLOT STYLE: Coh.ctb_230809.ctb PLOTTED: 6/5/2026 4:21 PM

- CONSTRUCTION NOTES**
- LOCATE VENT PIPE AT LEAST 3' FROM BACK OF CURB REFER TO DETAIL 02082-06, SHEET
 - INCLUDE BOLLARD AS DETAILED ON SHEET 64, DETAIL 6.

- NOTES:**
- XX' SHAFT LOCATION AND GEOMETRY SHOWN ARE REPRESENTATIVE ONLY. ACTUAL LOCATION AND GEOMETRY TO BE AS DETERMINED BY CONTRACTOR.
 - CONTRACTOR SHALL TAKE CARE TO MAINTAIN EXISTING SERVICE CONNECTIONS THROUGHOUT CONSTRUCTION.
 - PAVEMENT & CURB REPLACEMENT LIMITS SHOWN AT SHAFT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF ANY PAVEMENT REMOVED IN THE COURSE OF SHAFT EXCAVATION, AND ANY PAVEMENT DAMAGE BY CONTRACTORS OPERATIONS. REPLACEMENT OF PAVEMENT SHALL IN ACCORDANCE WITH THE CITY OF HOUSTON STANDARDS, IN THICKNESS AND STRENGTH MATCHING THE EXISTING PAVEMENT, AND INCLUDING CURBS THAT ARE REMOVED OR DAMAGED. NO SEPARATE PAYMENT, COSTS ARE SUBSIDIARY TO SHAFT EXCAVATION.
 - CAUTION EXISTING OVERHEAD CABLES ARE WITHIN CLOSE PROXIMITY OF CONSTRUCTION ALONG PROJECT LIMITS. CONTRACTOR TO COORDINATE WITH CENTERPOINT ENERGY ELECTRIC AS REQUIRED TO RAISE OR RELOCATED THEM FOR CONSTRUCTION ACTIVITIES.



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 to be used for conflict verification.
Signature valid for six months.

Date _____
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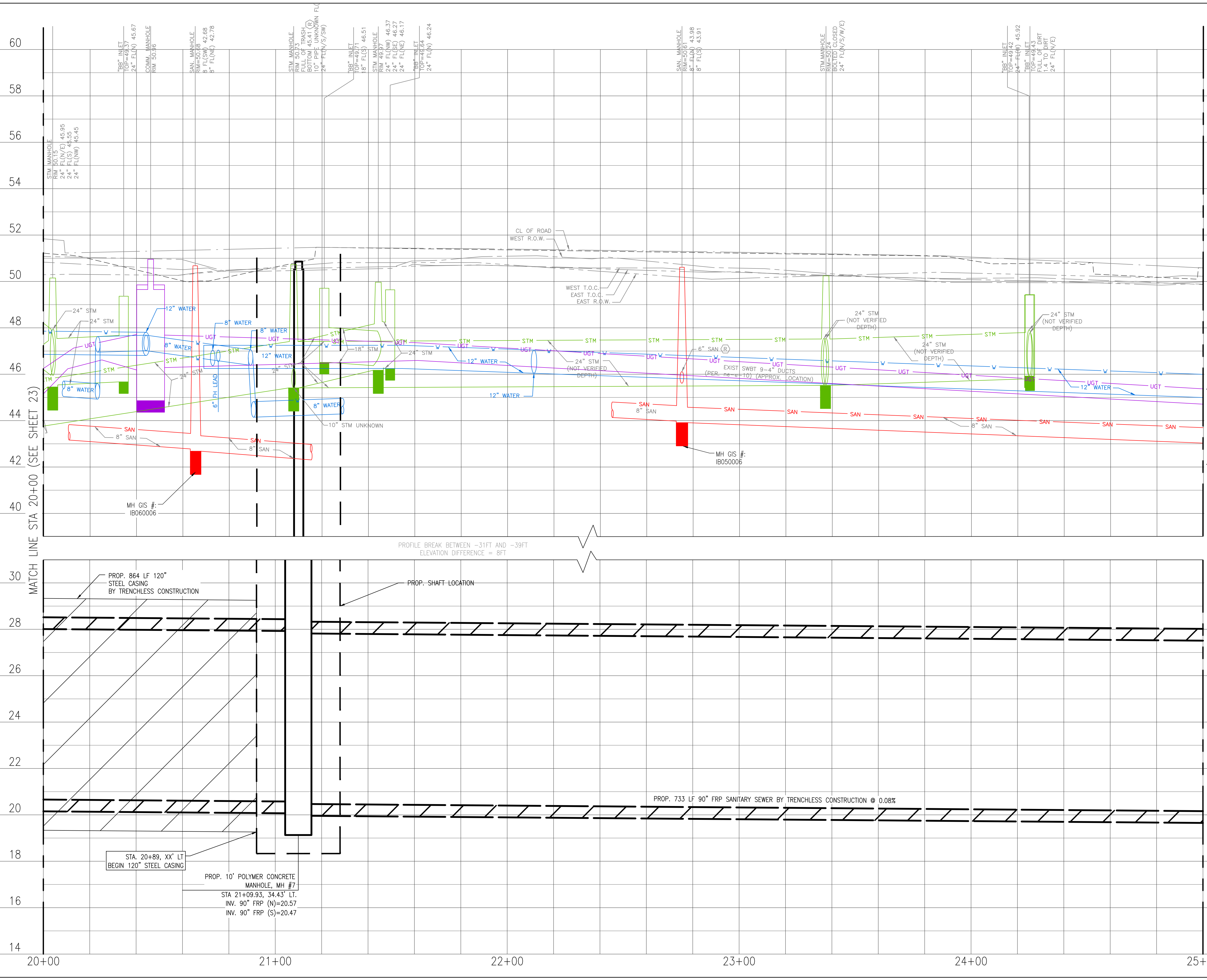
 Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042	INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of GREGORY J. HENRY 91826 06/05/2026 Date
	SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
STA. 20+00.00 TO 25+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	24 OF 106

FILE PATH: C:\Users\A\Galvan\DC\ACCDocs\Lee A. Doty\132-10021-000\Project Files\4-0-Production-Working\4-1-BIM-CAD\Civil\Sheets\BASELINE A - LOCKWOOD DRIVE - PROF.dwg PLOT STYLE: Coh.ctb_230809.ctb PLOTTED: 6/5/2026 4:23 PM



LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
	CLAYEY SAND, SC		BASE
	LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH
	LOW PLASTICITY SANDY CLAY, CL		SILT, ML
	SILTY CLAYEY SAND, SC-SM		FILL CL/CH

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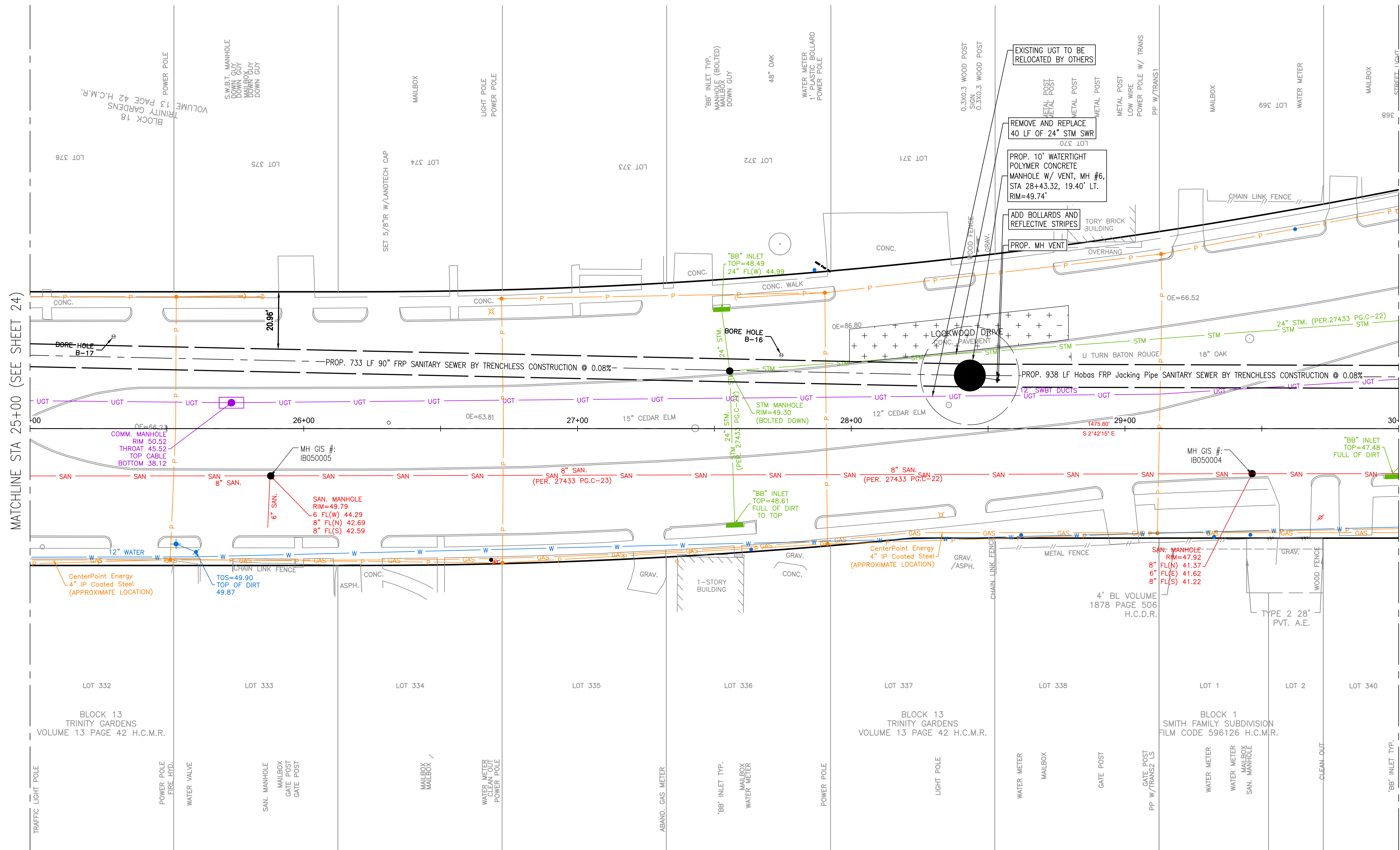
Date _____
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INTERIM REVIEW ONLY
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GREGORY J. HENRY
91826
06/05/2026
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
STA. 20+00.00 TO 25+00.00 - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 25 OF 106	

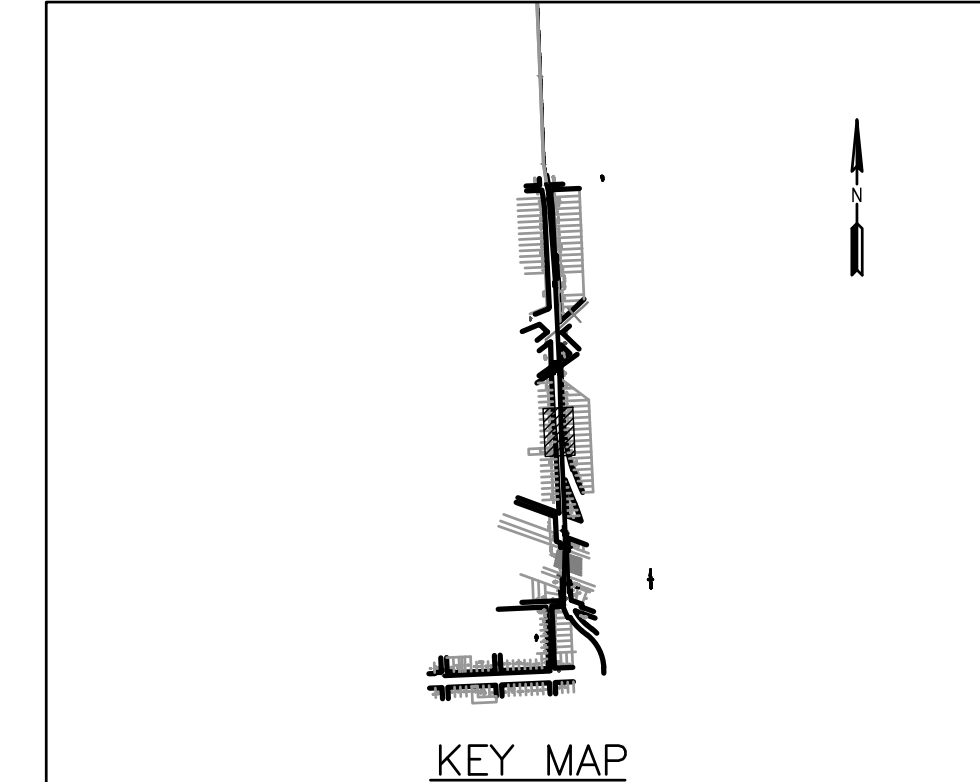


MATCHLINE STA 25+00 (SEE SHEET 24)

MATCHLINE STA 30+00 (SEE SHEET 28)

NOTES:

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 Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042	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 <u>GREGORY J. HENRY</u> 91826 06/05/2026 Date
	SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2014

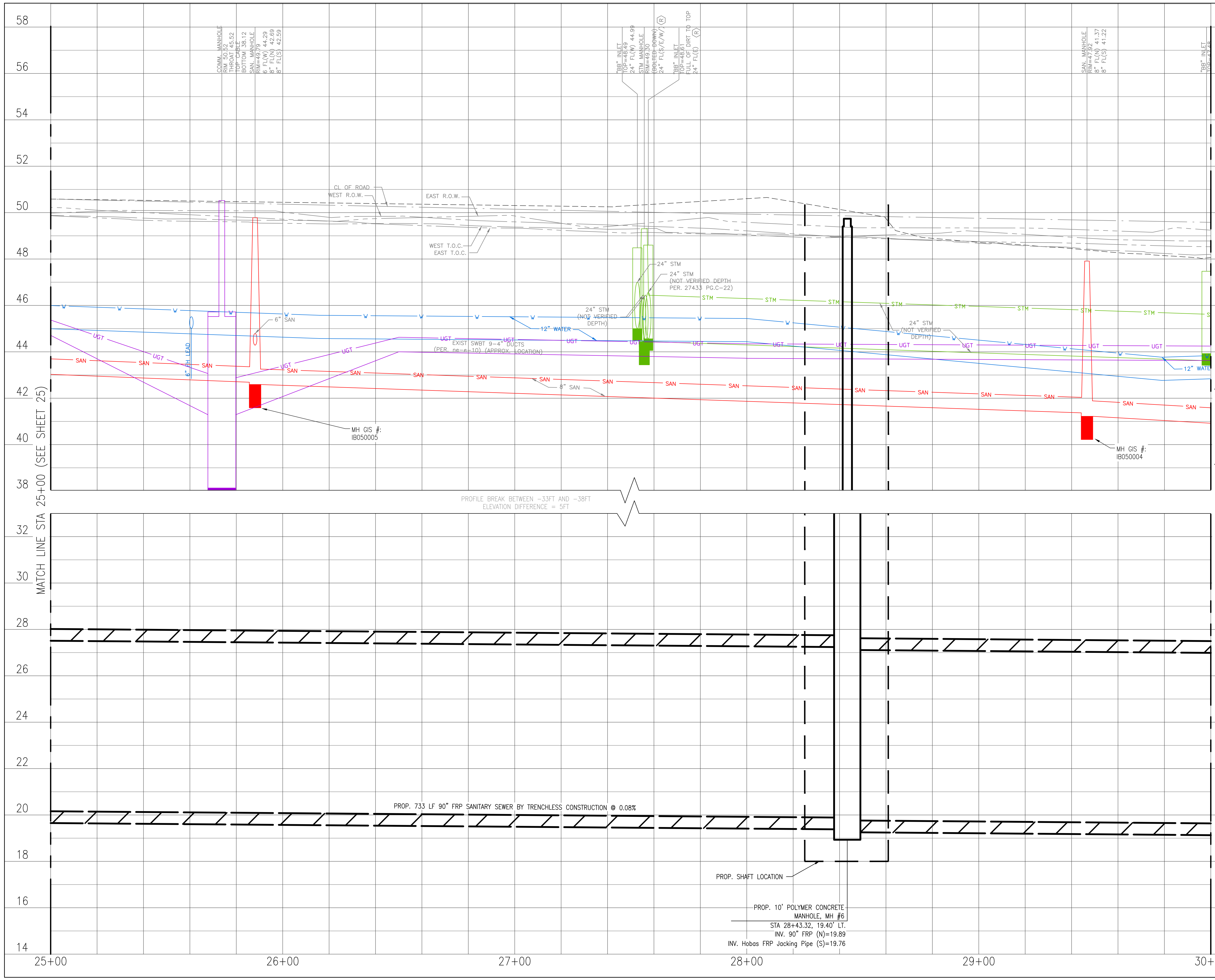
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
STA. 25+00.00 TO 30+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 26 OF 106	

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LEGEND	
	CLAYEY SILTY SAND, CL-ML
	CLAYEY SAND, SC
	LOW PLASTICITY SANDY LEAN CLAY, CL
	LOW PLASTICITY SANDY CLAY, CL
	SILTY CLAYEY SAND, SC-SM
	CONCRETE
	BASE
	FAT CLAY, CH
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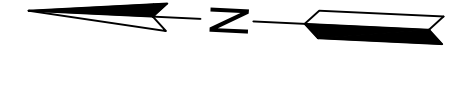
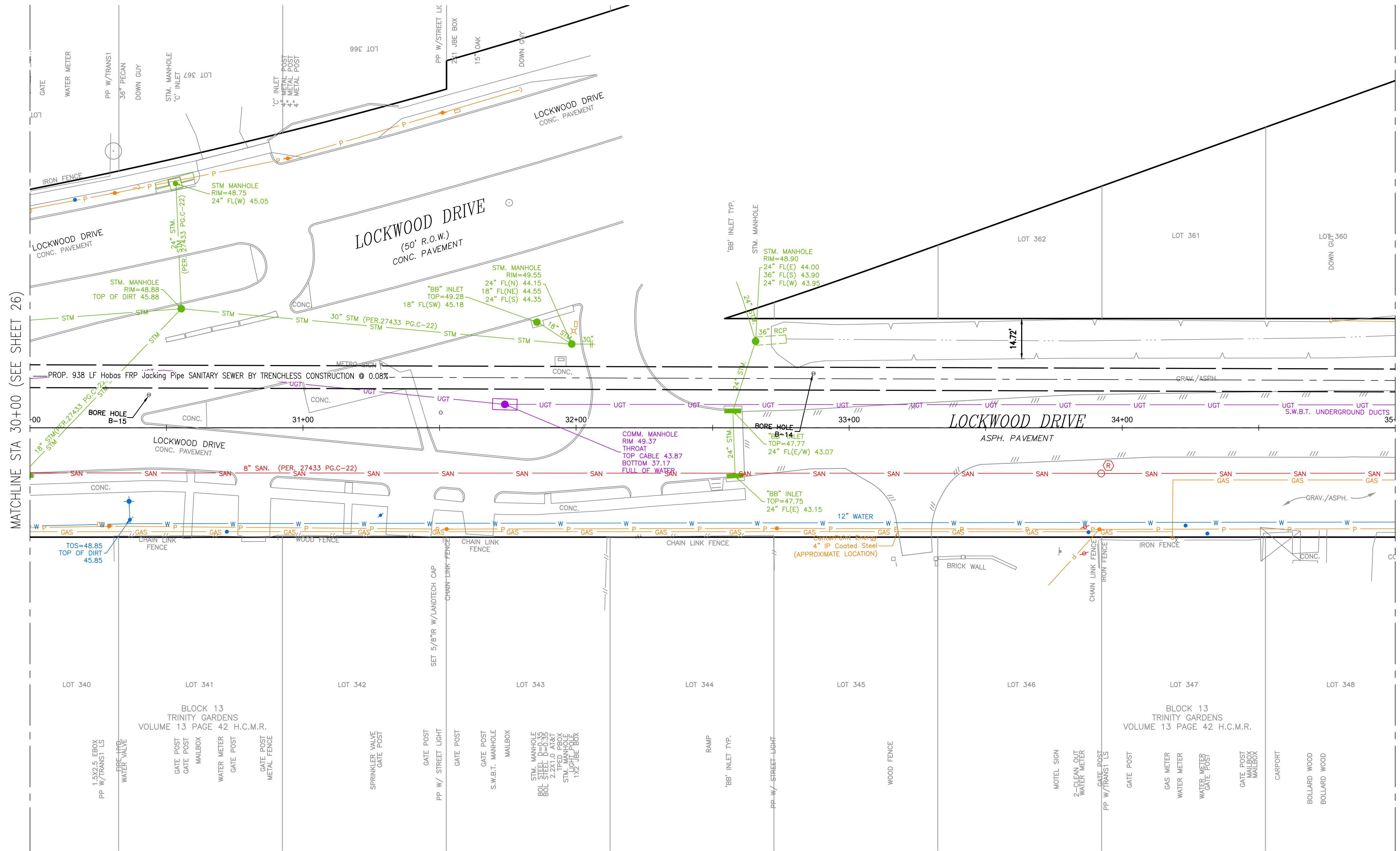
VERIFICATION OF PRIVATE UTILITY LINES	
Date	
CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not be used for conflict verification.	Signature valid for six months.
Date	
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Date	
Approved for AT&T underground conduit facilities only. Signature valid for one year.	

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	SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614

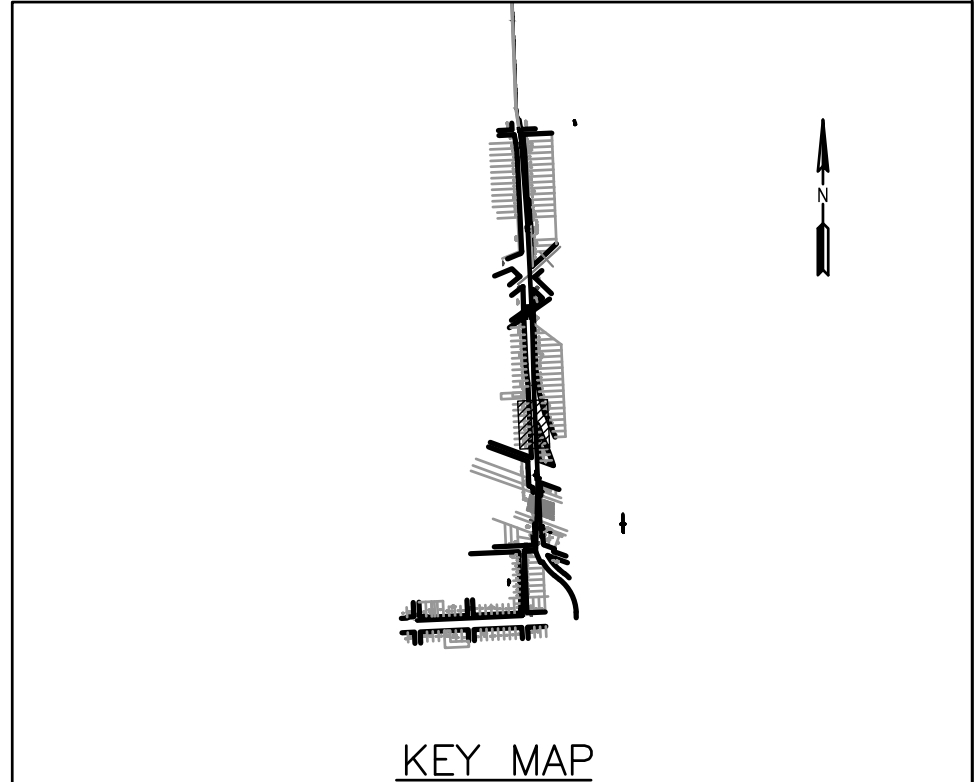
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
 STA. 25+00.00 TO 30+00.00 - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 27 OF 106	



- NOTES:**
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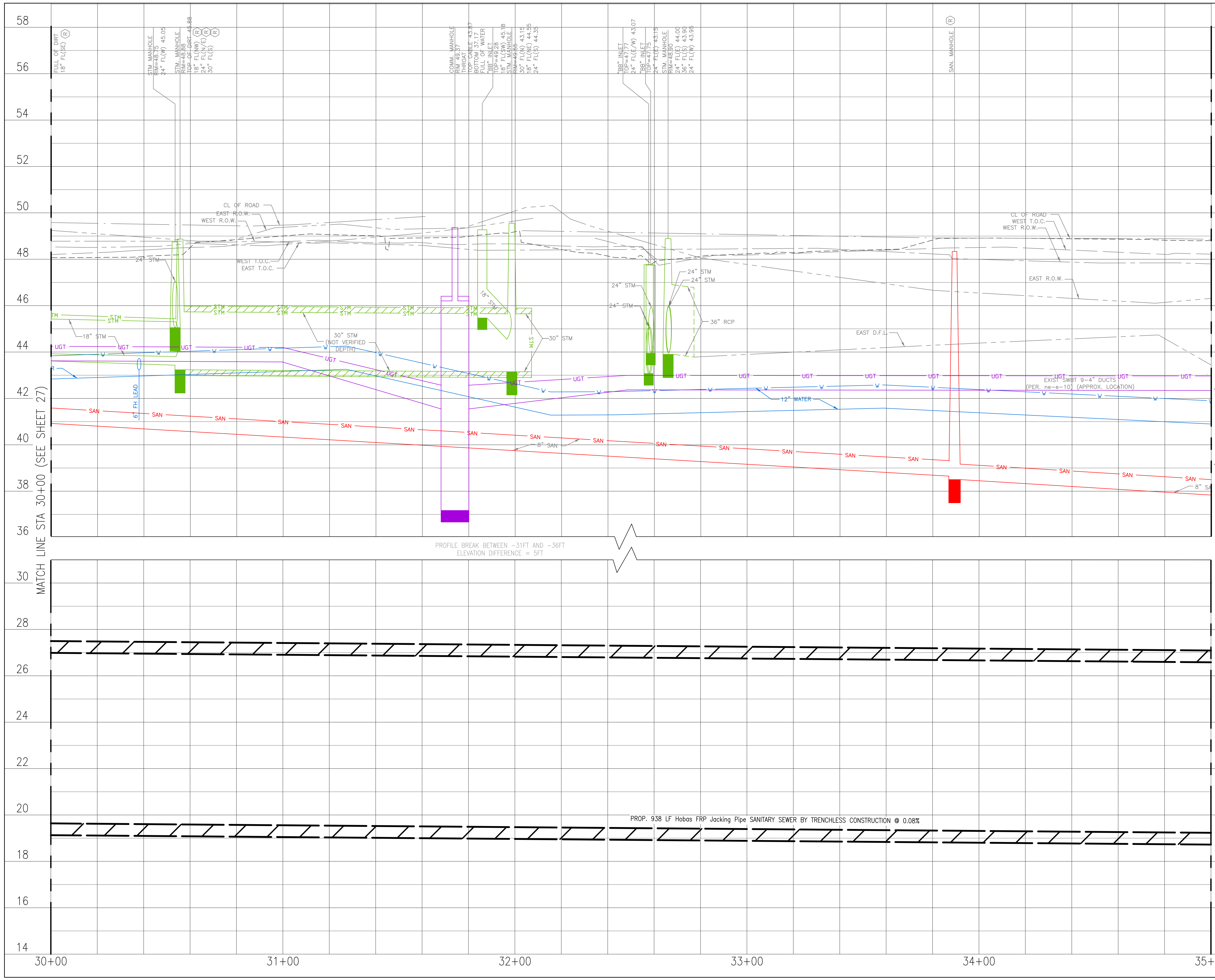
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

**CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8**

BASELINE A - LOCKWOOD DRIVE -
STA. 30+00.00 TO 35+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	28 OF 106

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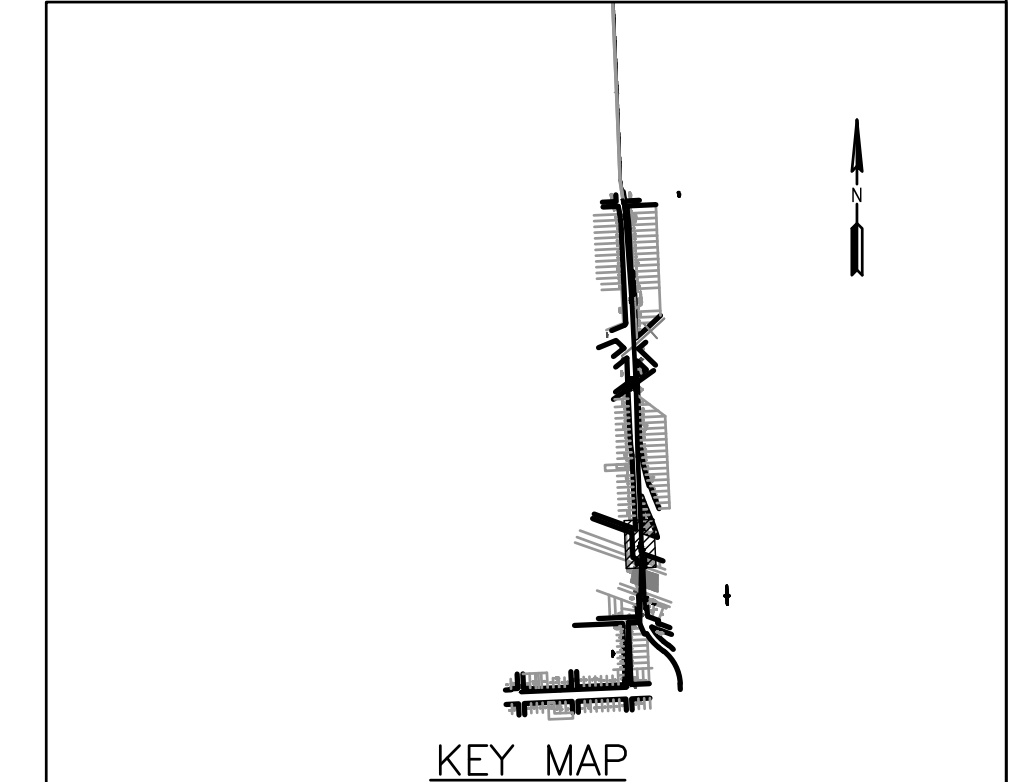
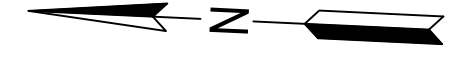
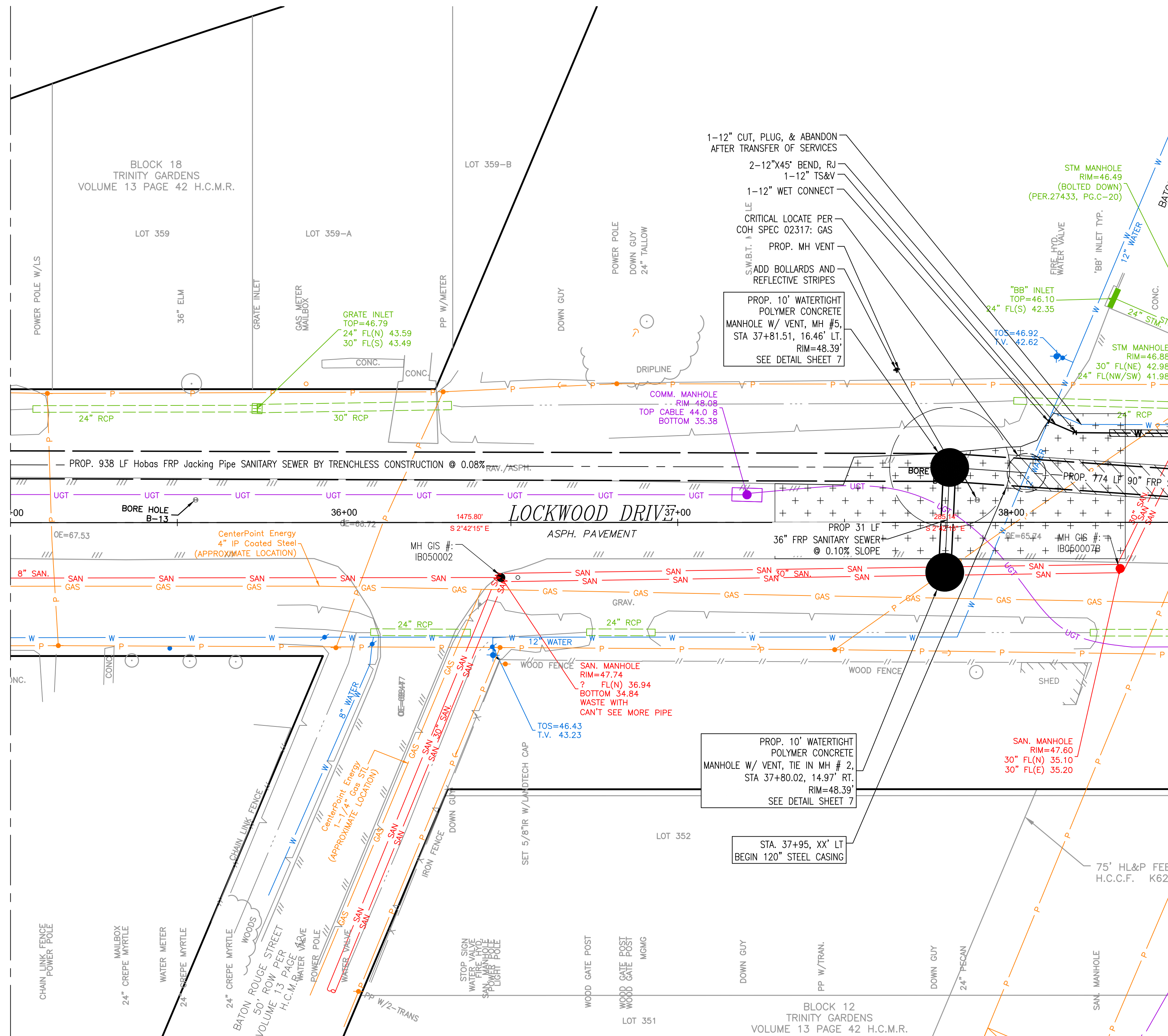
<p>LEGEND</p> <table border="0"> <tr> <td></td> <td>CLAYEY SILTY SAND, CL-ML</td> <td></td> <td>CONCRETE</td> </tr> <tr> <td></td> <td>CLAYEY SAND, SC</td> <td></td> <td>BASE</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY LEAN CLAY, CL</td> <td></td> <td>FAT CLAY, CH</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY CLAY, CL</td> <td></td> <td>SILT, ML</td> </tr> <tr> <td></td> <td>SILTY CLAYEY SAND, SC-SM</td> <td></td> <td>FILL CL/CH</td> </tr> </table>			CLAYEY SILTY SAND, CL-ML		CONCRETE		CLAYEY SAND, SC		BASE		LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH		LOW PLASTICITY SANDY CLAY, CL		SILT, ML		SILTY CLAYEY SAND, SC-SM		FILL CL/CH
	CLAYEY SILTY SAND, CL-ML		CONCRETE																		
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<p>Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042</p>	<p>INTERIM REVIEW ONLY</p> <p>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</p> <p><u>GREGORY J. HENRY</u> 91826 06/05/2026</p> <p>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</p>																				
<p>SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX</p>																					
<p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> <p>CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8</p> <p>BASELINE A - LOCKWOOD DRIVE - STA. 30+00.00 TO 35+00.00 - PROF</p>																					
<p>WBS NUMBER</p> <p>R-001000-0033-3</p>	<p>FOR CITY OF HOUSTON USE ONLY</p>																				
<p>DRAWING SCALE</p> <p>H: 1"=20' V: 1"=2'</p>																					
<p>CITY OF HOUSTON PM</p> <p>NEIL BARNSDALE, P.E.</p>																					
<p>SHEET NO. 29 OF 106</p>																					

CONSTRUCTION NOTES

1. LOCATE VENT PIPE AT LEAST 3' FROM BACK OF CURB REFER TO DETAIL 02082-06, SHEET 45.
2. INCLUDE BOLLARD AS DETAILED ON SHEET 64, DETAIL 6.
3. TUNNEL SHAFTS AND ASSOCIATED WORK AREAS SHALL BE ENTIRELY OUTSIDE OF UPRR ROW. REFER TO SPEC SECTION 01110 FOR MORE REQUIREMENTS

NOTES:

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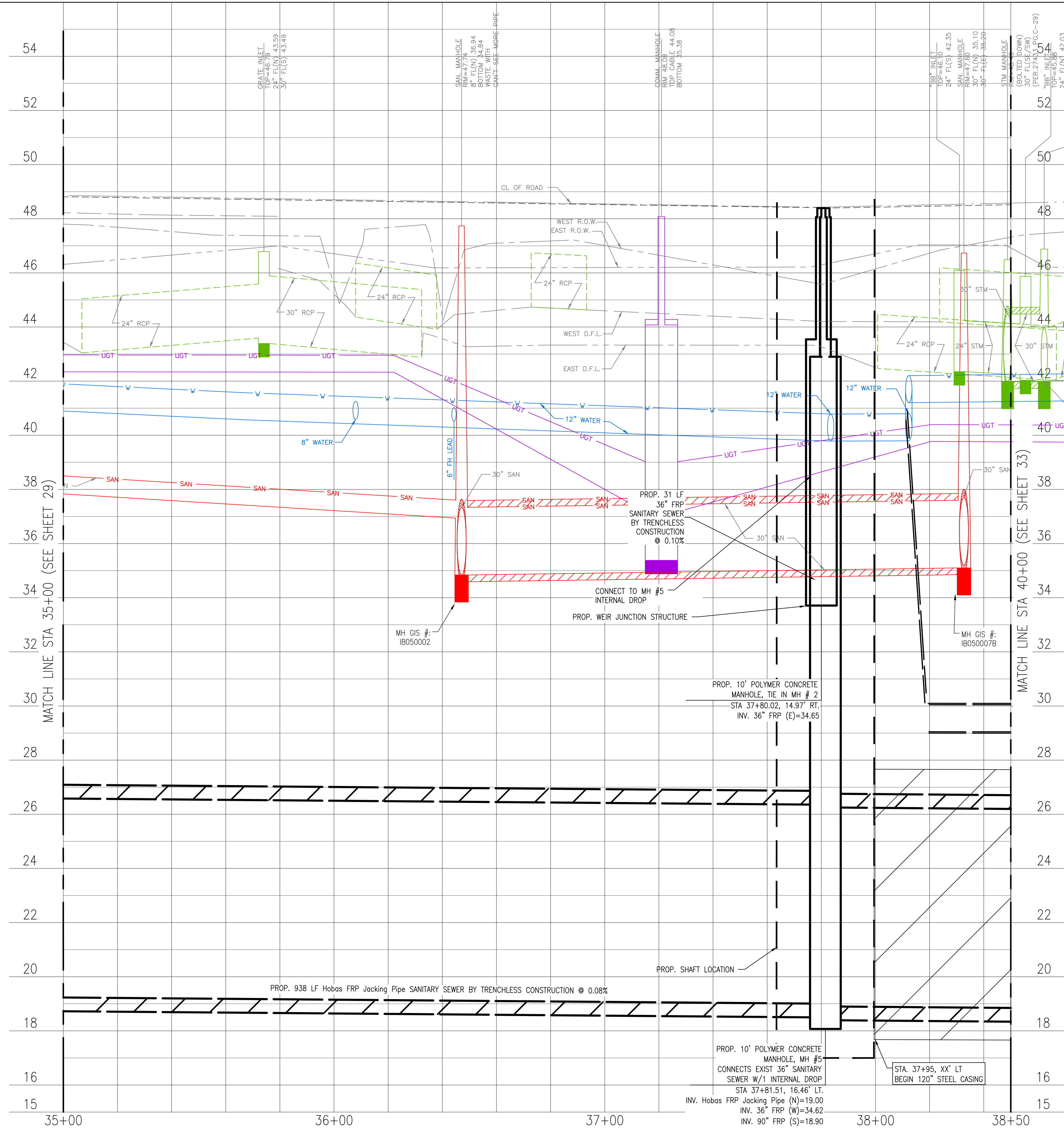
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
STA. 35+00.00 TO 38+50.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 30 OF 106	

MATCHLINE STA 35+00 (SEE SHEET 28)

MATCHLINE STA 38+50 (SEE SHEET 32)



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LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
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	LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH
	LOW PLASTICITY SANDY CLAY, CL		SILT, ML
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

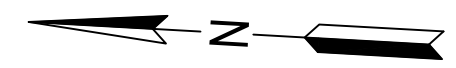
BASELINE A - LOCKWOOD DRIVE -
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DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	31 OF 106

CONSTRUCTION NOTES

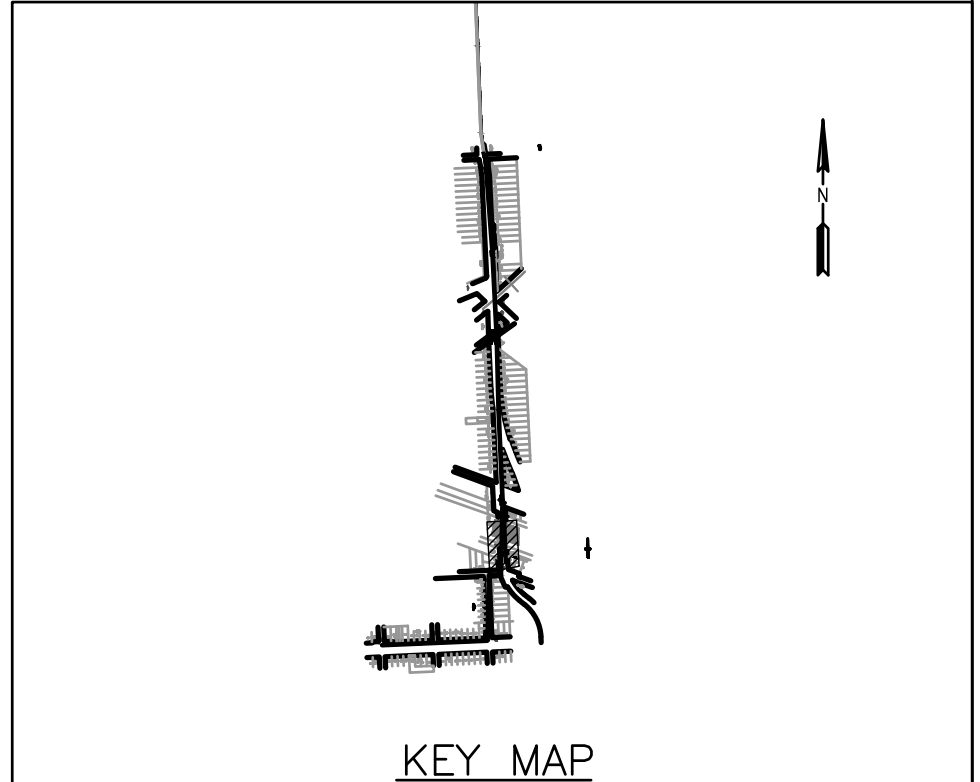
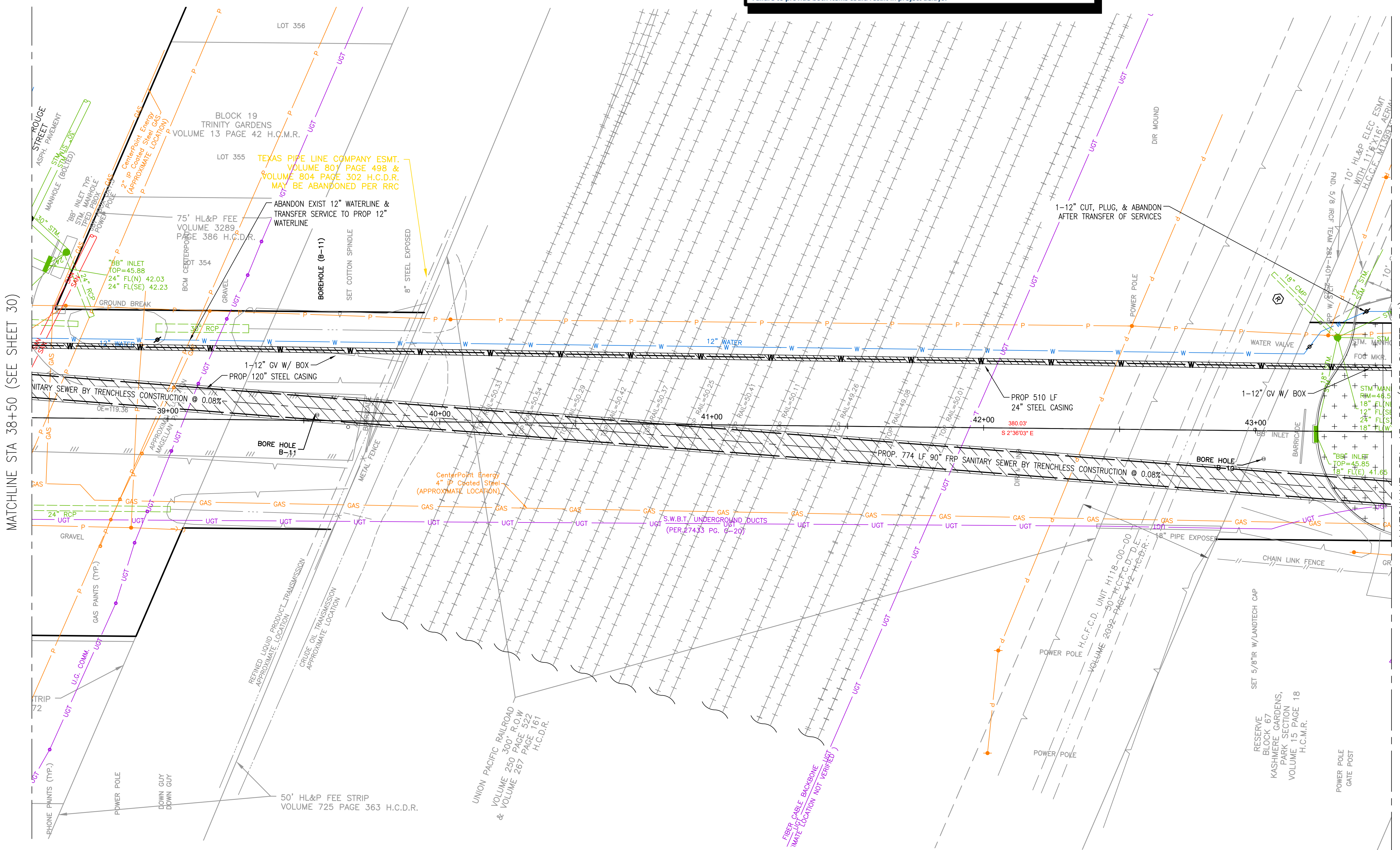
- 1. TUNNEL SHAFTS AND ASSOCIATED WORK AREAS SHALL BE ENTIRELY OUTSIDE OF UPRR ROW. REFER TO SPEC SECTION 01110 FOR MORE REQUIREMENTS

***Construction in Harris County Flood Control District Right-of-Way requires:**
 Site plans must be approved prior to obtaining the required HCFCR Right-of-Way Notification. Be advised that the HCFCR Right-of-Way Notification is separate from the site development permit package
 1.) HCFCR Right-of-Way Notification (permit)
 2.) HCFCR 48-hr Pre-Construction Notice
 Both are required prior to entering or working within Harris County Flood Control District right-of-way. The HCFCR Right-of-Way Notification and 48-hour notice must be provided to HCFCR at dcid@hcfcd.hctx.net.
 To apply for the HCFCR Right-of-Way Notification please go to <http://apps.harriscountytexas.gov/EPermits> and apply for the HCFCR ROW under ROW Notification. Failure to provide both items could result in project delays.



NOTES:

- 1. XX' SHAFT LOCATION AND GEOMETRY SHOWN ARE REPRESENTATIVE ONLY. ACTUAL LOCATION AND GEOMETRY TO BE AS DETERMINED BY CONTRACTOR.
- 2. CONTRACTOR SHALL TAKE CARE TO MAINTAIN EXISTING SERVICE CONNECTIONS THROUGHOUT CONSTRUCTION.
- 3. PAVEMENT & CURB REPLACEMENT LIMITS SHOWN AT SHAFT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF ANY PAVEMENT REMOVED IN THE COURSE OF SHAFT EXCAVATION, AND ANY PAVEMENT DAMAGE BY CONTRACTORS OPERATIONS. REPLACEMENT OF PAVEMENT SHALL IN ACCORDANCE WITH THE CITY OF HOUSTON STANDARDS, IN THICKNESS AND STRENGTH MATCHING THE EXISTING PAVEMENT, AND INCLUDING CURBS THAT ARE REMOVED OR DAMAGED. NO SEPARATE PAYMENT, COSTS ARE SUBSIDIARY TO SHAFT EXCAVATION.



NOTICE:
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VERIFICATION OF PRIVATE UTILITY LINES

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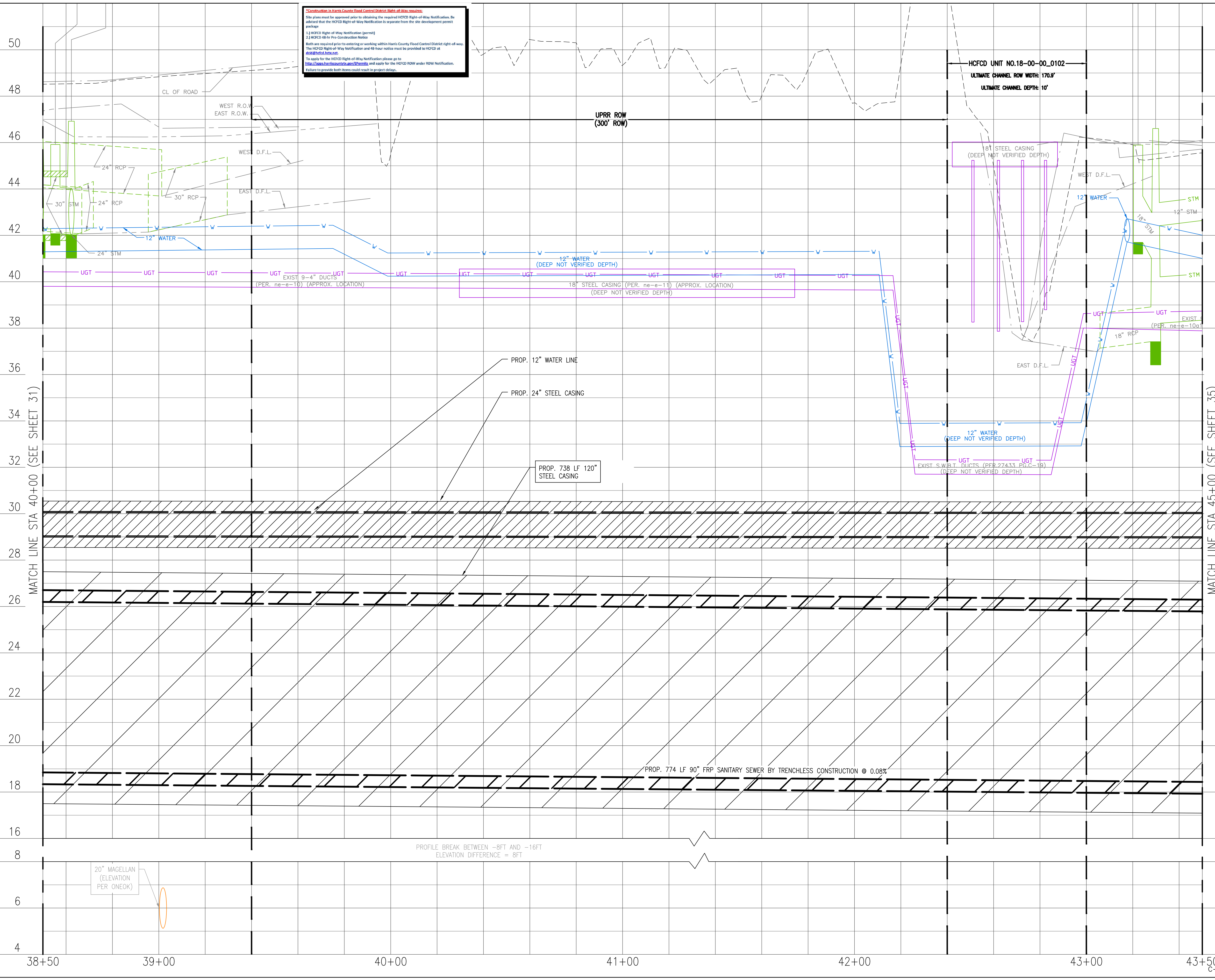
 Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042 SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX	INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of GREGORY J. HENRY 91826 06/05/2026 Date
	Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
 STA. 38+50.00 TO 43+50.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 32 OF 106	

FILE PATH: C:\Users\Agaivan\DC\ACCDocs\Lee A. Doly\132-10021-000\Project Files\4-0-Production-Working\4-1-BIM-CAD\Civil\Sheets\BASELINE A - LOCKWOOD DRIVE - PROF.dwg PLOT STYLE: Coh.ctb_230809.ctb PLOTTED: 6/5/2026 4:33 PM



***Construction in Harris County Flood Control District Right-of-Way requires:**
 Site plans must be approved prior to obtaining the required HCFCO Right-of-Way Notification. Be advised that the HCFCO Right-of-Way Notification is separate from the site development permit package.
 1. HCFCO Right-of-Way Notification (permit)
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LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
	CLAYEY SAND, SC		BASE
	LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH
	LOW PLASTICITY SANDY CLAY, CL		SILT, ML
	SILTY CLAYEY SAND, SC-SM		FILL CL/CH

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 91826
 06/05/2026
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 Texas Registered Engineering Firm F-2614

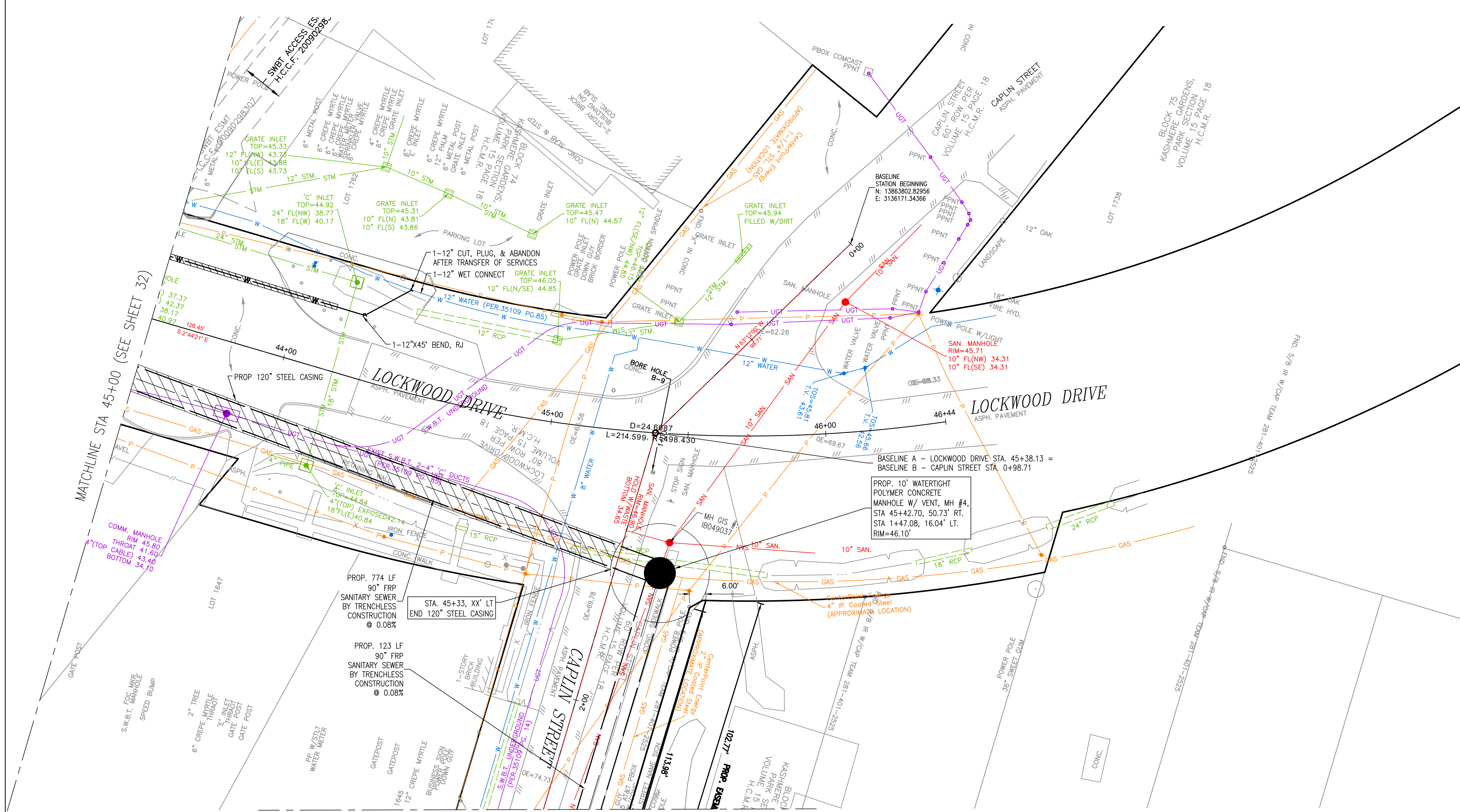
LOCKWOOD, ANDREWS & NEWNAM, INC.
 3700 W Sam Houston Pkwy S Houston, TX 77042

SURVEYED BY:
 LAND-TECH, INC.
 C.O.H. Field Book P-XXXX

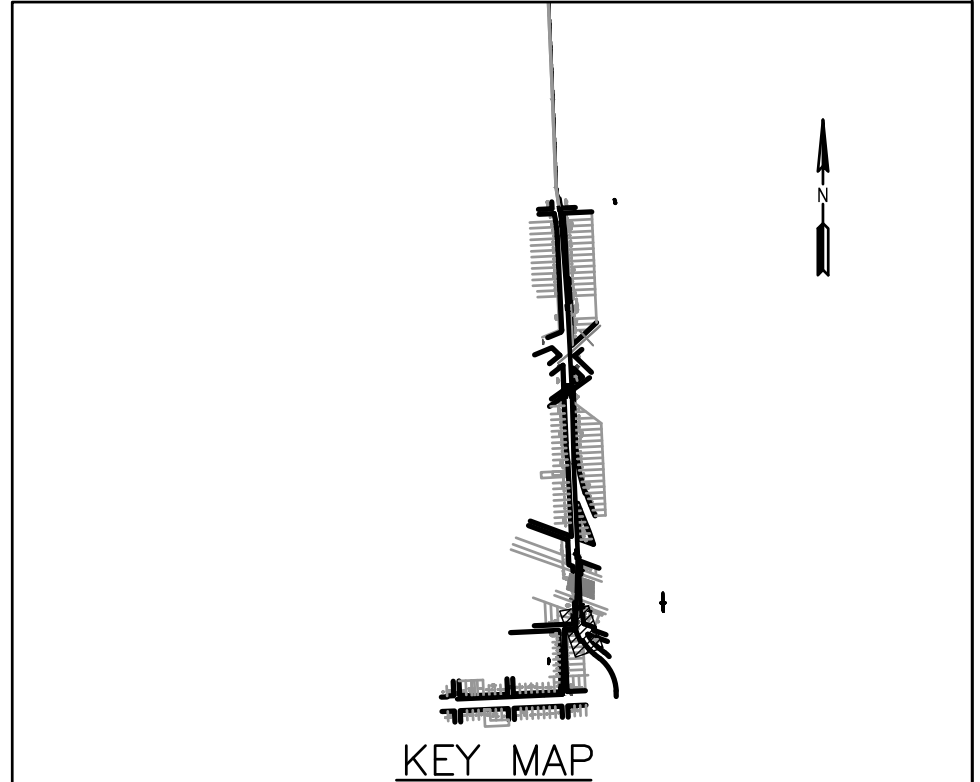
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
 STA. 38+50.00 TO 43+50.00 - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	33 OF 106



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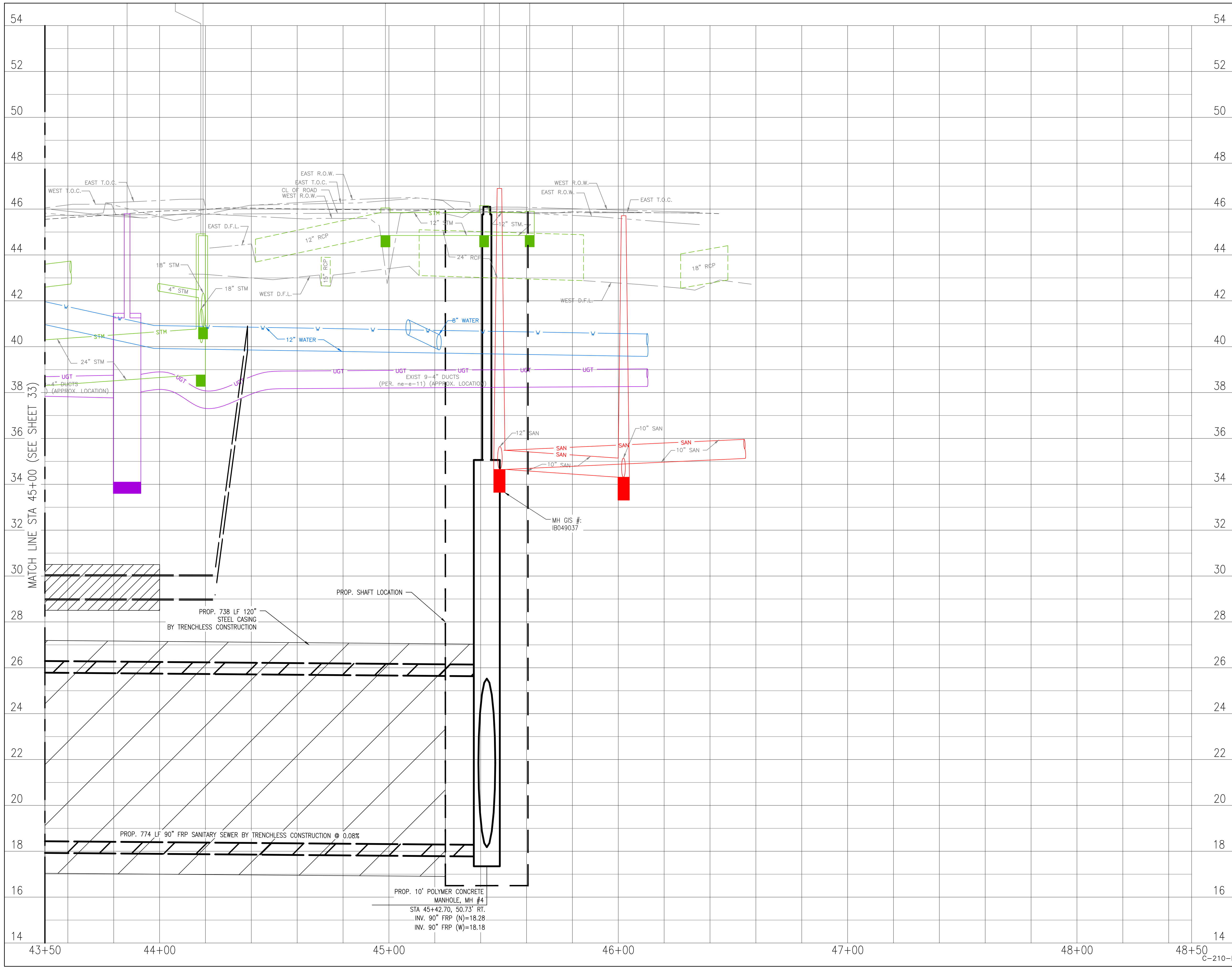
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
STA. 43+50.00 TO END - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	34 OF 106

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LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
	CLAYEY SAND, SC		BASE
	LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH
	LOW PLASTICITY SANDY CLAY, CL		SILT, ML
	SILTY CLAYEY SAND, SC-SM		FILL CL/CH

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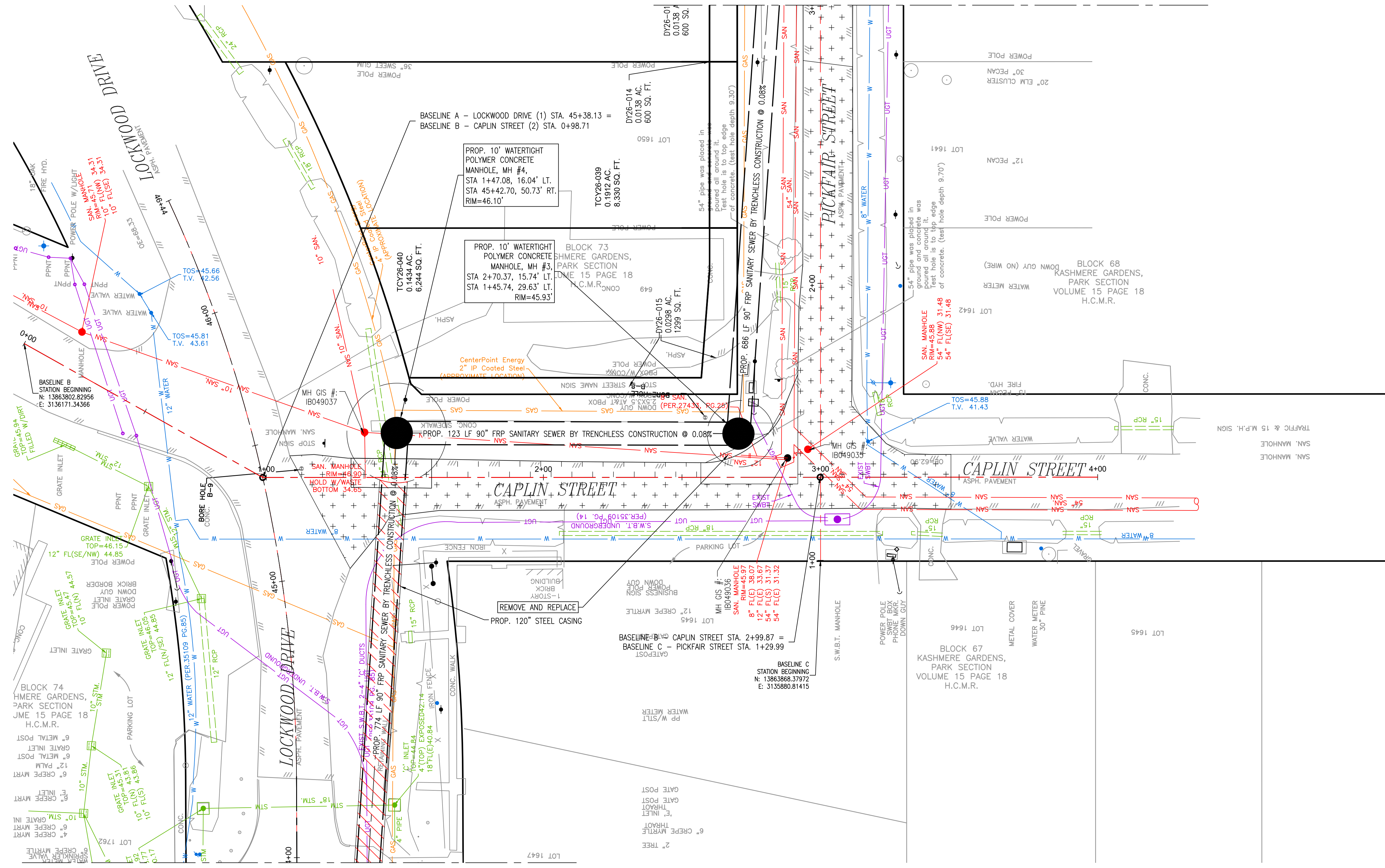
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

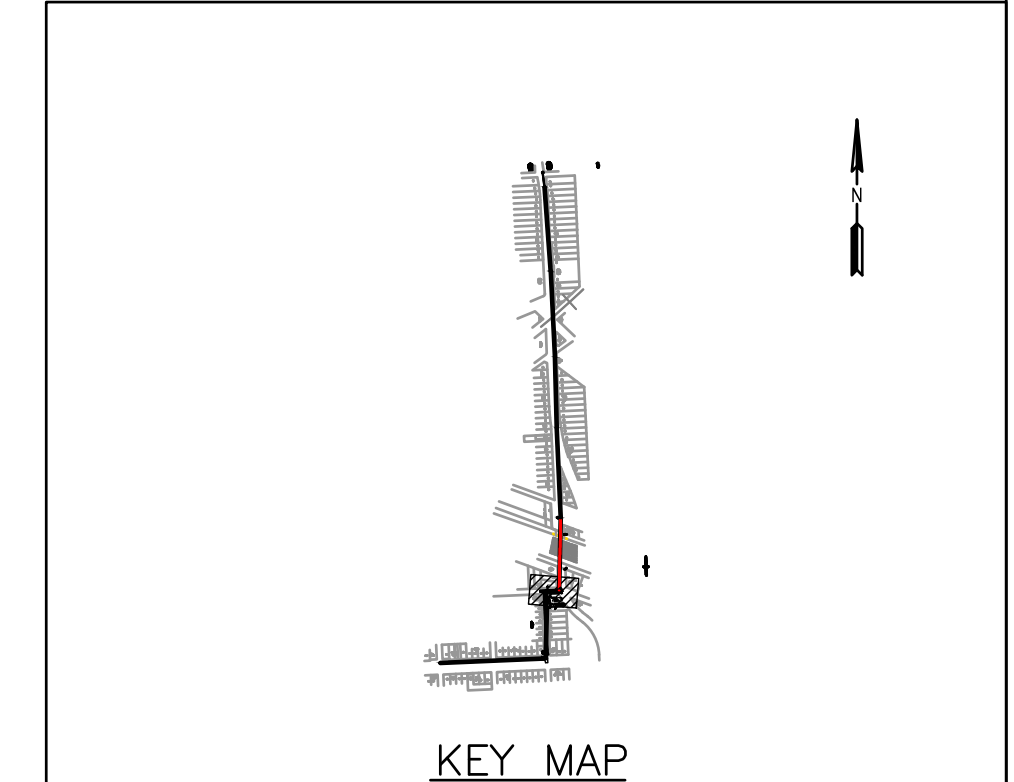
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE A - LOCKWOOD DRIVE -
STA. 43+50.00 TO END - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	35 OF 106



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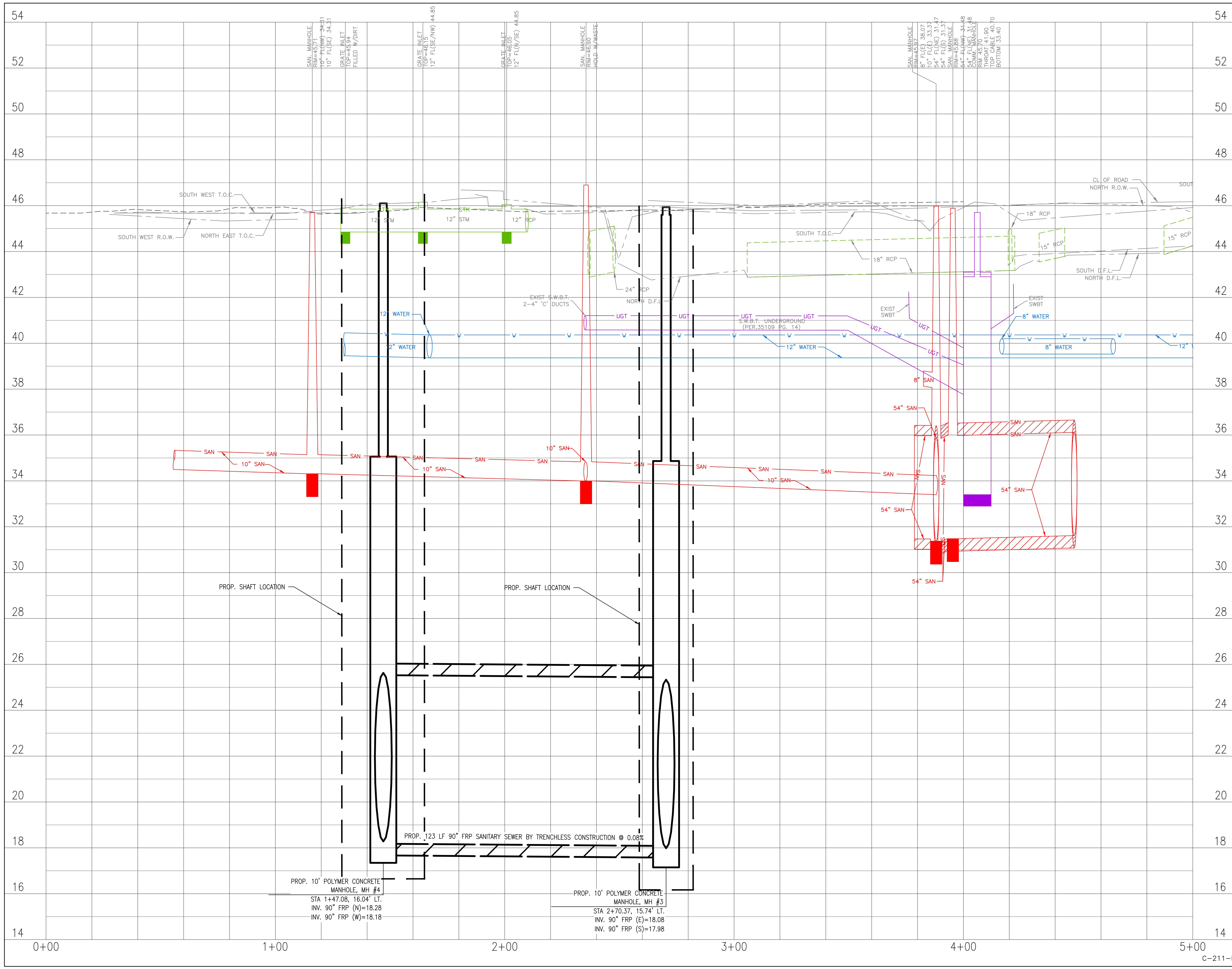
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

**CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8**

BASELINE B - CAPLIN STREET -
STA. 0+00.00 TO 5+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	36 OF 106

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LEGEND	
	CLAYEY SILTY SAND, CL-ML
	CLAYEY SAND, SC
	LOW PLASTICITY SANDY LEAN CLAY, CL
	LOW PLASTICITY SANDY CLAY, CL
	SILTY CLAYEY SAND, SC-SM
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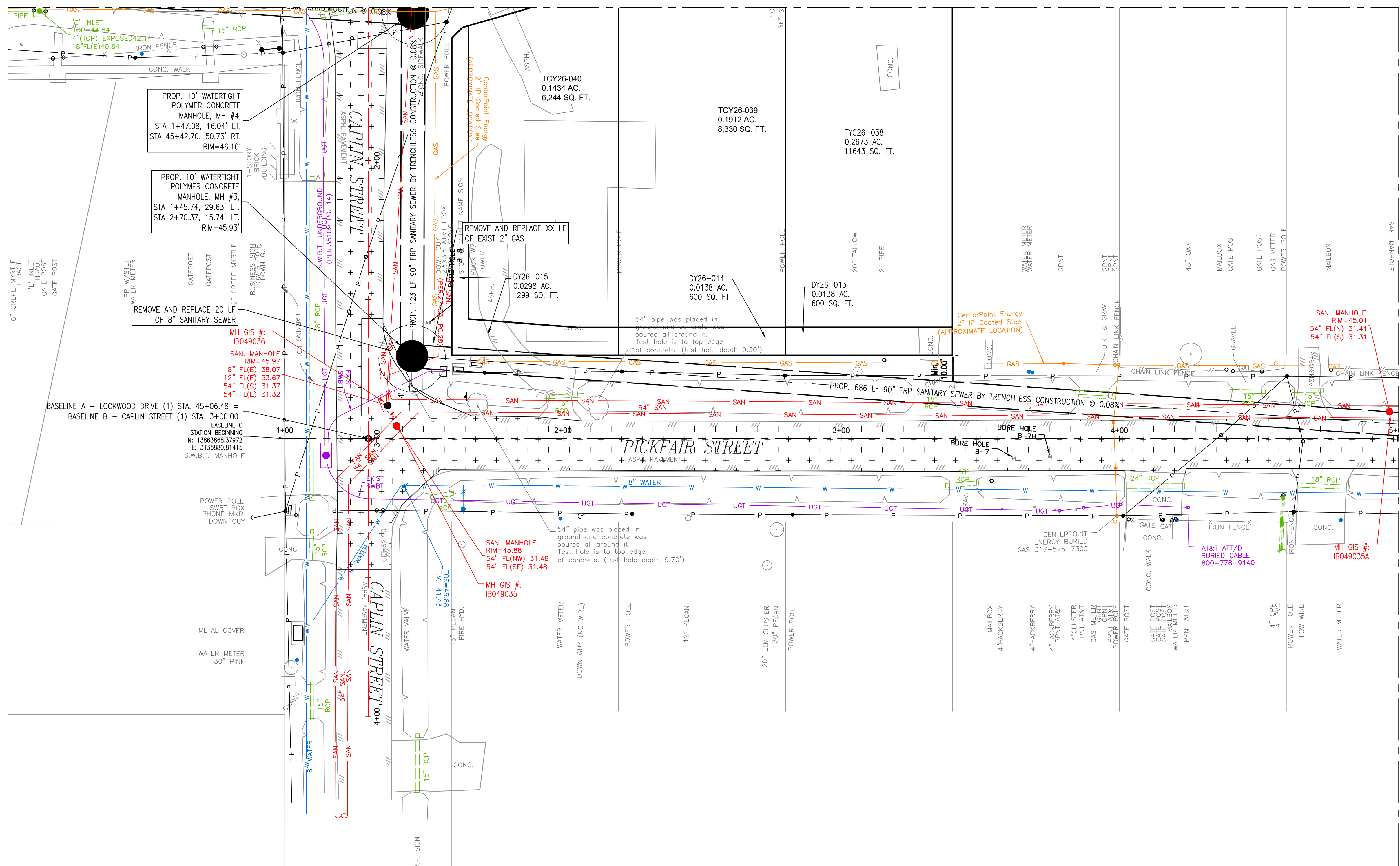
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

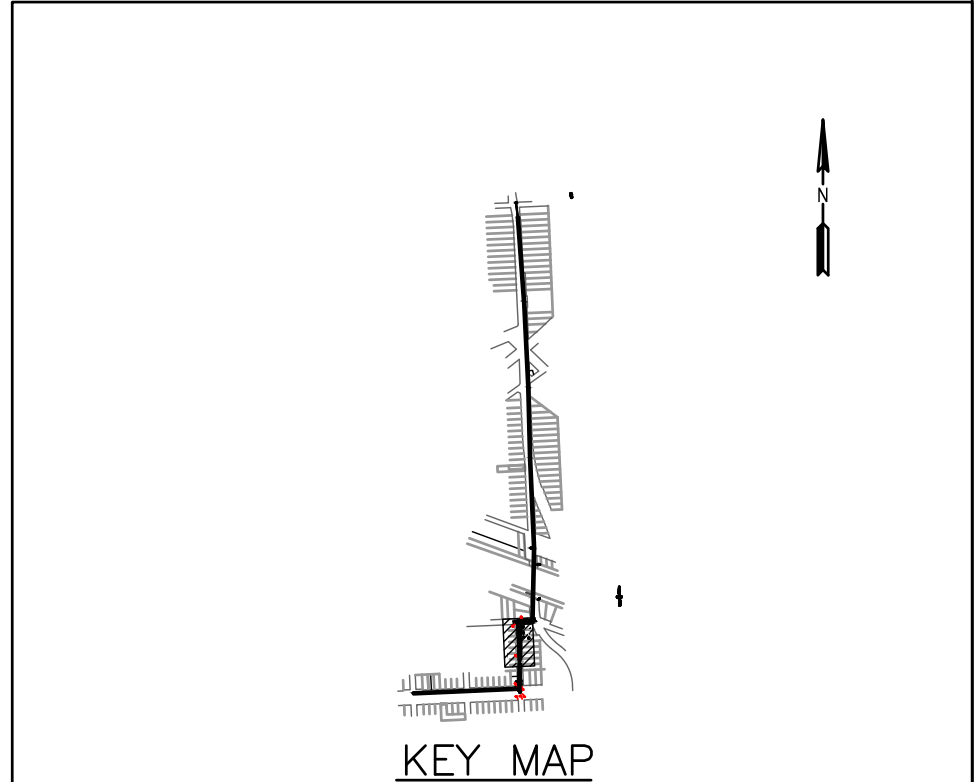
**CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8**

BASELINE B - CAPLIN STREET -
STA. 0+00.00 TO 5+00.00 - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 37 OF 106	



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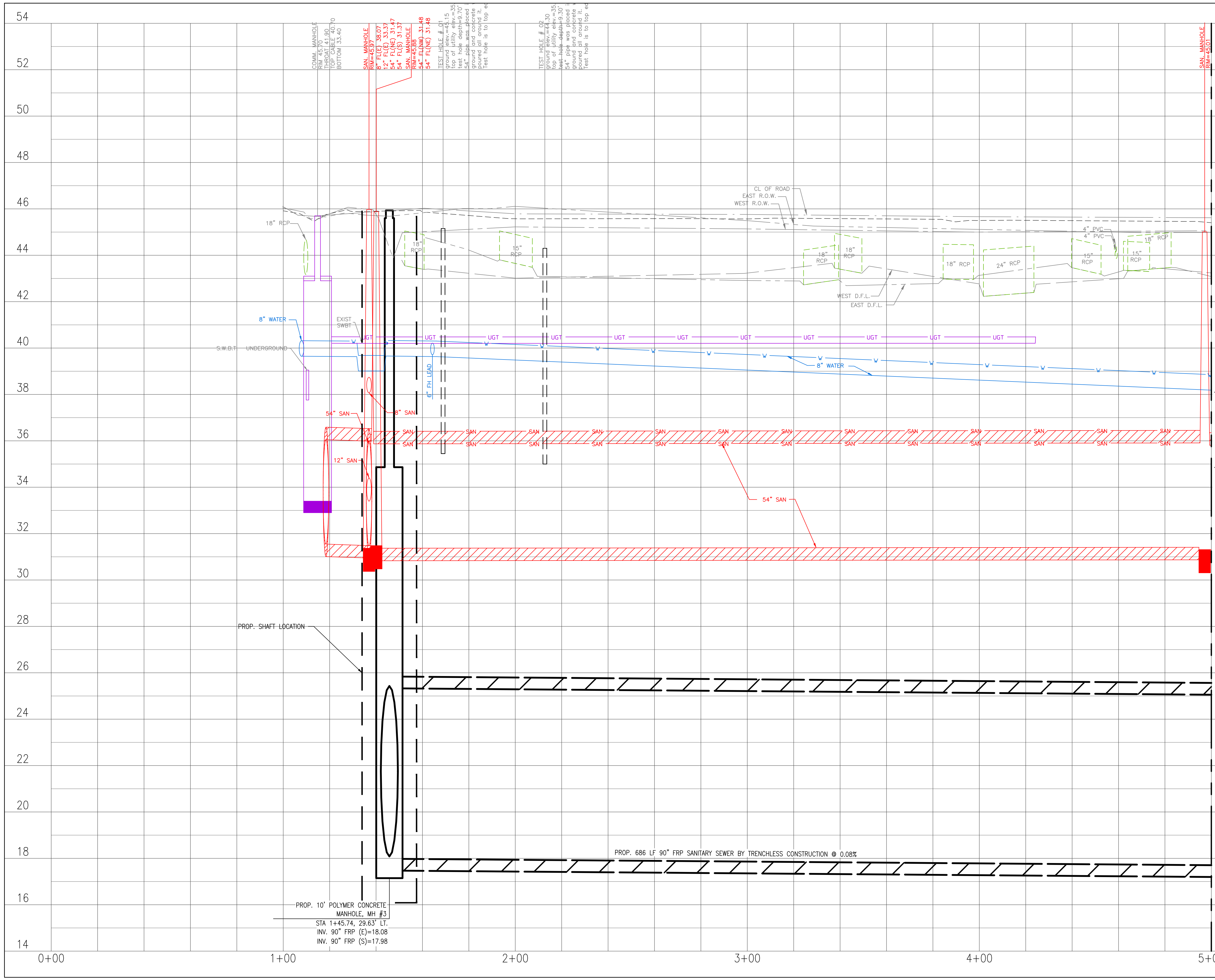
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

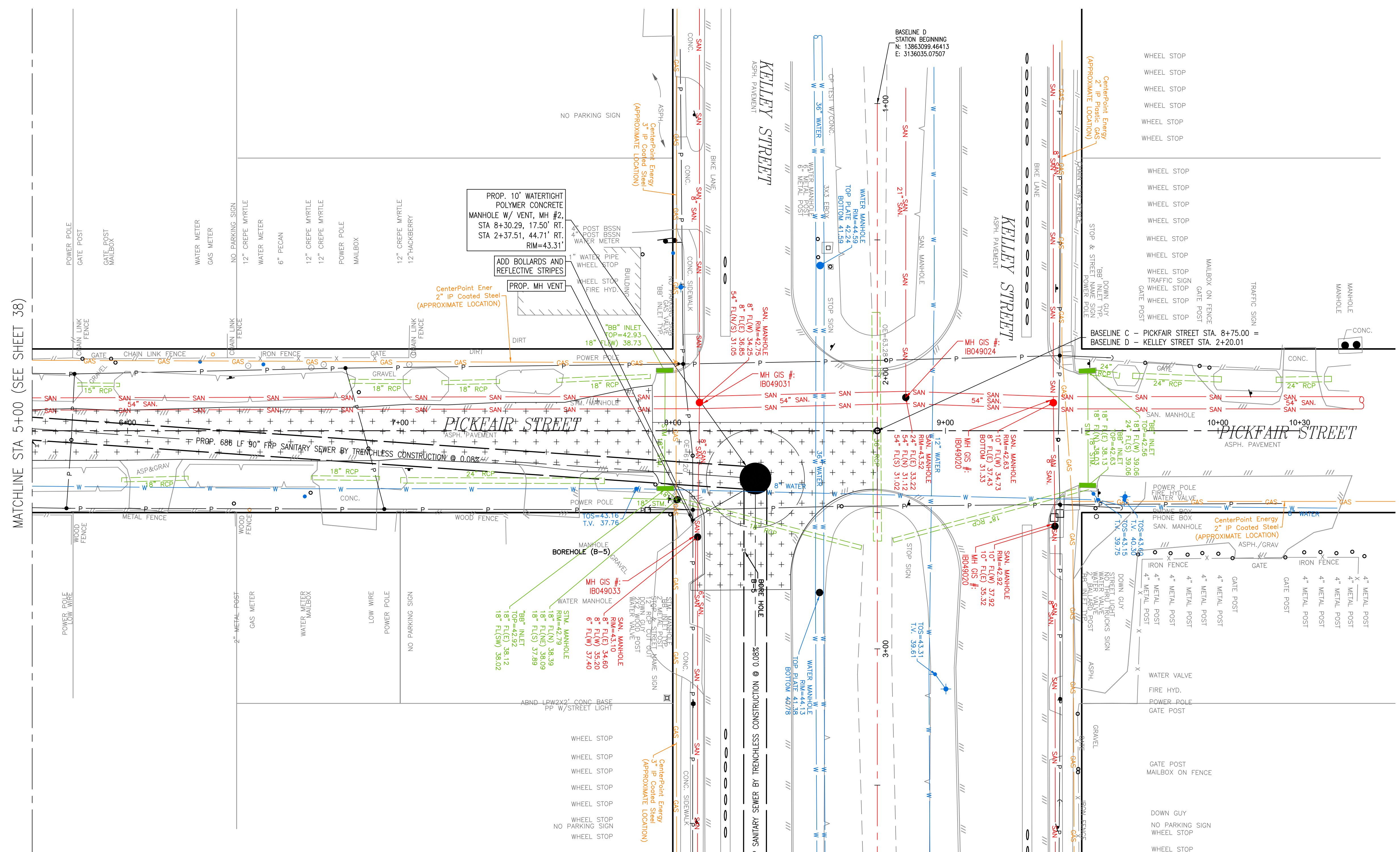
BASELINE C - PICKFAIR STREET-
 STA. 0+00.00 TO 5+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	38 OF 106

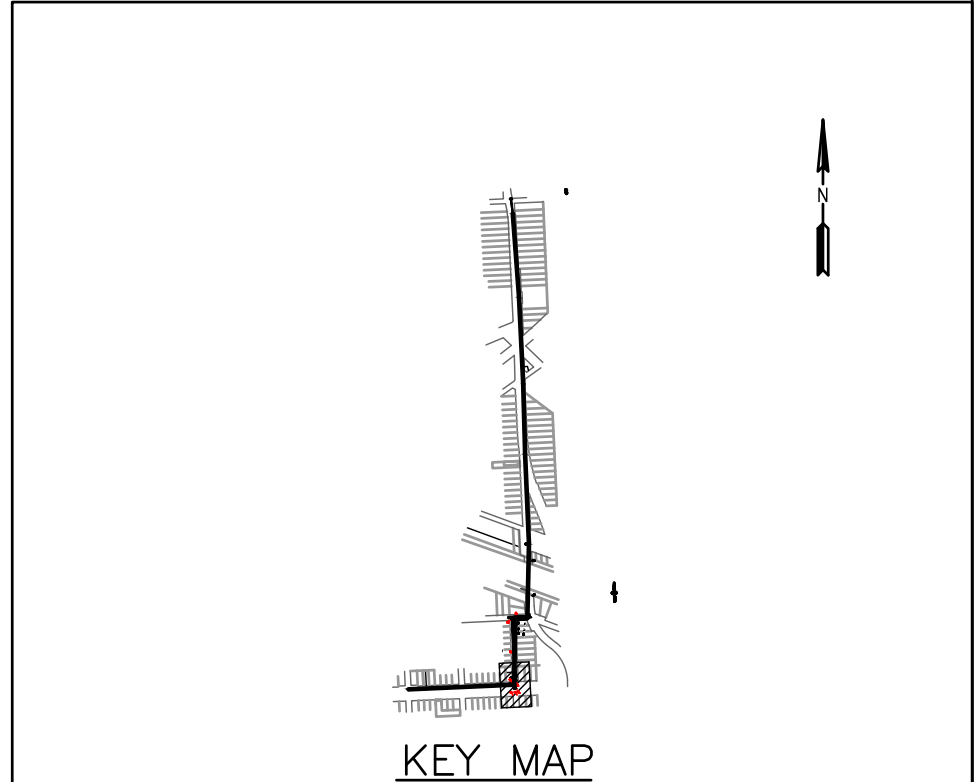
MATCHLINE STA 5+00 (SEE SHEET 40)



<p>LEGEND</p> <table border="0"> <tr> <td></td> <td>CLAYEY SILTY SAND, CL-ML</td> <td></td> <td>CONCRETE</td> </tr> <tr> <td></td> <td>CLAYEY SAND, SC</td> <td></td> <td>BASE</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY LEAN CLAY, CL</td> <td></td> <td>FAT CLAY, CH</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY CLAY, CL</td> <td></td> <td>SILT, ML</td> </tr> <tr> <td></td> <td>SILTY CLAYEY SAND, SC-SM</td> <td></td> <td>FILL CL/CH</td> </tr> </table>			CLAYEY SILTY SAND, CL-ML		CONCRETE		CLAYEY SAND, SC		BASE		LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH		LOW PLASTICITY SANDY CLAY, CL		SILT, ML		SILTY CLAYEY SAND, SC-SM		FILL CL/CH
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<p>CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8</p>																					
<p>BASELINE C - PICKFAIR STREET- STA. 0+00.00 TO 5+00.00 - PROF</p>																					
<table border="1"> <tr> <th>WBS NUMBER</th> <th>FOR CITY OF HOUSTON USE ONLY</th> </tr> <tr> <td>R-001000-0033-3</td> <td></td> </tr> <tr> <th>DRAWING SCALE</th> <td></td> </tr> <tr> <td>H: 1"=20' V: 1"= 2'</td> <td></td> </tr> <tr> <th>CITY OF HOUSTON PM</th> <td></td> </tr> <tr> <td>NEIL BARNSDALE, P.E.</td> <td></td> </tr> <tr> <th>SHEET NO.</th> <td>39 OF 106</td> </tr> </table>	WBS NUMBER	FOR CITY OF HOUSTON USE ONLY	R-001000-0033-3		DRAWING SCALE		H: 1"=20' V: 1"= 2'		CITY OF HOUSTON PM		NEIL BARNSDALE, P.E.		SHEET NO.	39 OF 106	<p>C-212-PR</p>						
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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.

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

Lockwood, Andrews & Newnam, Inc.
3700 W Sam Houston Pkwy S Houston, TX 77042

INTERIM REVIEW ONLY
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GREGORY J. HENRY
91826
06/05/2026

SURVEYED BY:
LAND-TECH, INC.
C.O.H. Field Book P-XXXX

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

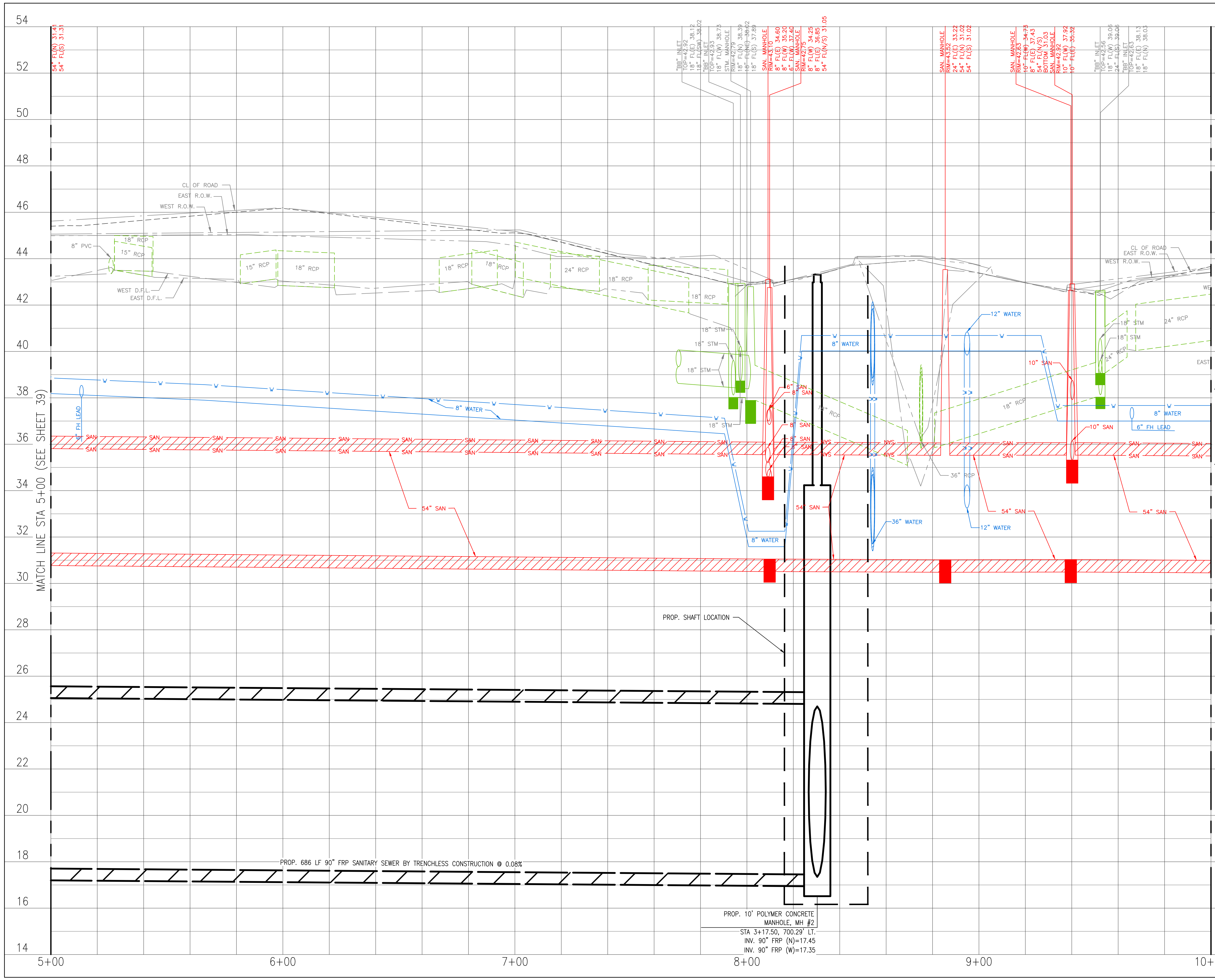
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE C - PICKFAIR STREET-
STA. 5+00.00 TO 10+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 40 OF 106	

SEE BASELINE D SHEET 42 FOR CONTINUATION

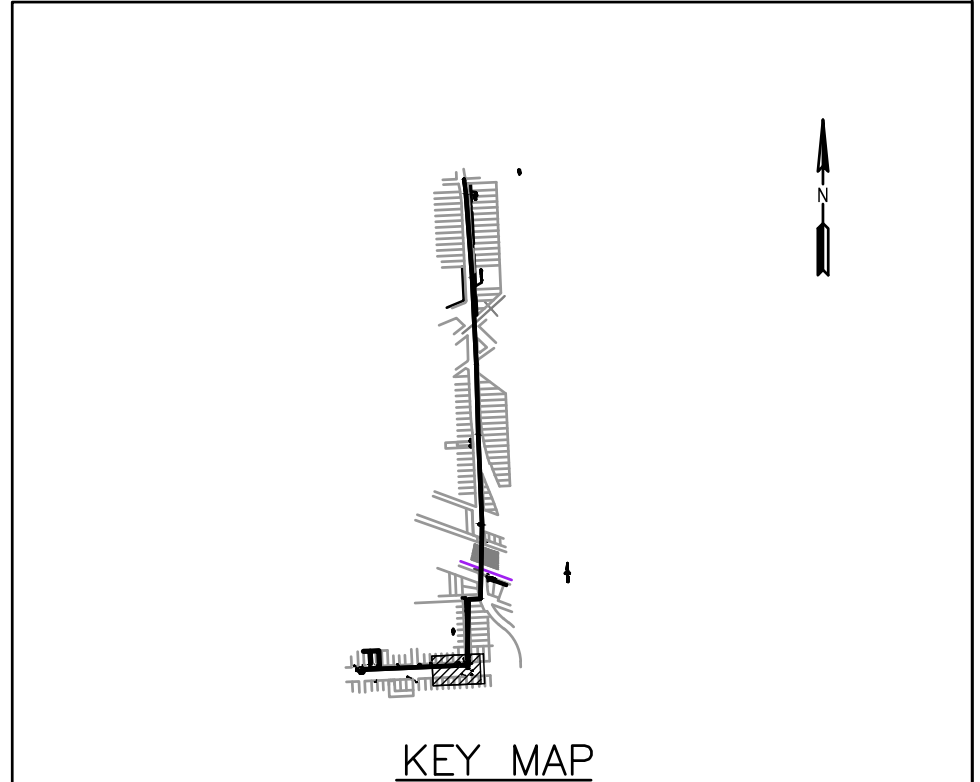
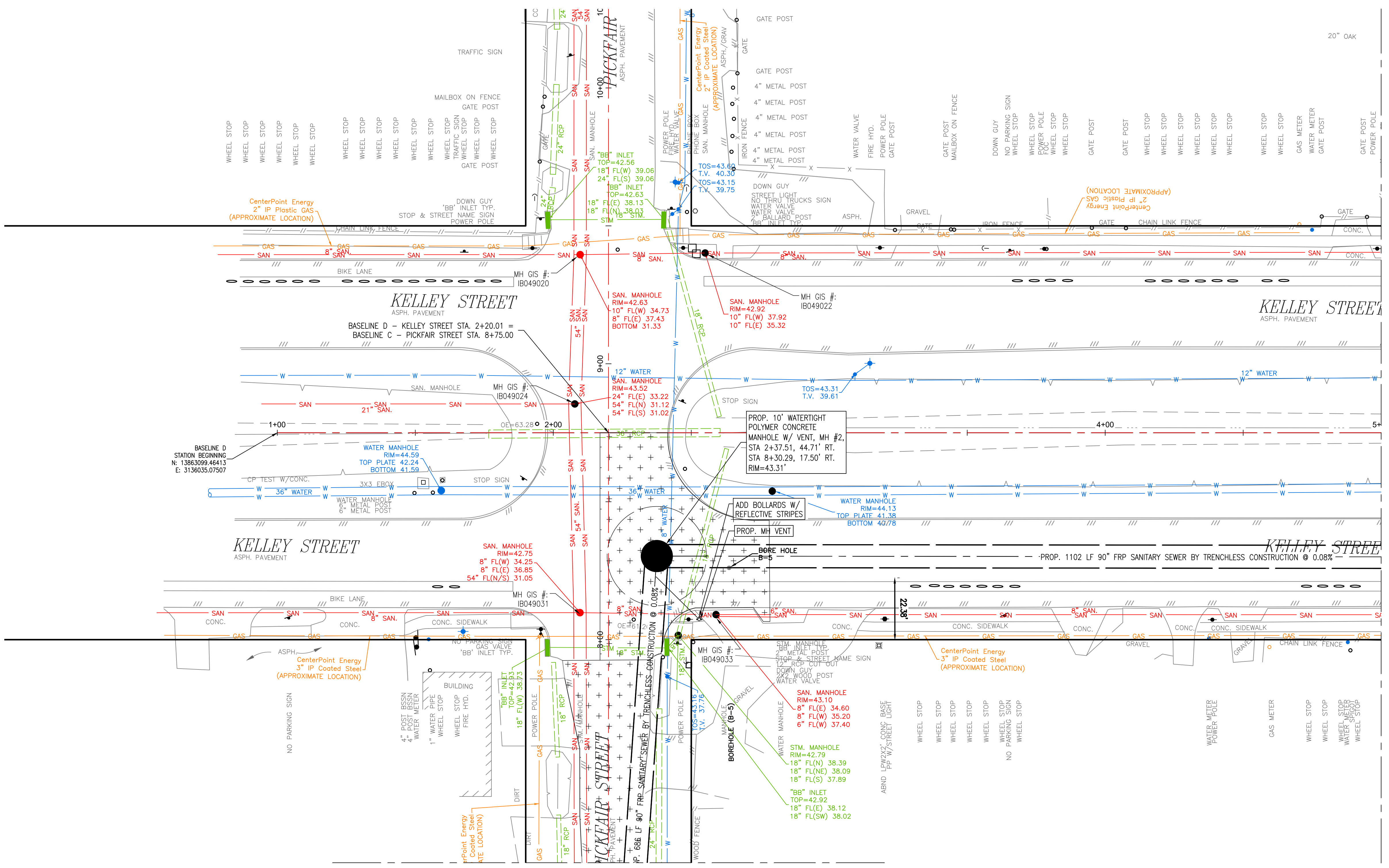
MATCHLINE STA 5+00 (SEE SHEET 38)



<p>LEGEND</p> <table border="0"> <tr> <td></td> <td>CLAYEY SILTY SAND, CL-ML</td> <td></td> <td>CONCRETE</td> </tr> <tr> <td></td> <td>CLAYEY SAND, SC</td> <td></td> <td>BASE</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY LEAN CLAY, CL</td> <td></td> <td>FAT CLAY, CH</td> </tr> <tr> <td></td> <td>LOW PLASTICITY SANDY CLAY, CL</td> <td></td> <td>SILT, ML</td> </tr> <tr> <td></td> <td>SILTY CLAYEY SAND, SC-SM</td> <td></td> <td>FILL CL/CH</td> </tr> </table>			CLAYEY SILTY SAND, CL-ML		CONCRETE		CLAYEY SAND, SC		BASE		LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH		LOW PLASTICITY SANDY CLAY, CL		SILT, ML		SILTY CLAYEY SAND, SC-SM		FILL CL/CH
	CLAYEY SILTY SAND, CL-ML		CONCRETE																		
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<p>Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042</p>	<p>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 <u>GREGORY J. HENRY</u> 91826 06/05/2026 Date</p> <p>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</p>																				
<p>CITY OF HOUSTON HOUSTON PUBLIC WORKS CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8</p>																					
<p>BASELINE C - PICKFAIR STREET - STA. 5+00.00 TO 10+00.00 - PROF</p>																					
<table border="1"> <tr> <th>WBS NUMBER</th> <th>FOR CITY OF HOUSTON USE ONLY</th> </tr> <tr> <td>R-001000-0033-3</td> <td></td> </tr> <tr> <th>DRAWING SCALE</th> <td></td> </tr> <tr> <td>H: 1"=20' V: 1"= 2'</td> <td></td> </tr> <tr> <th>CITY OF HOUSTON PM</th> <td></td> </tr> <tr> <td>NEIL BARNSDALE, P.E.</td> <td></td> </tr> <tr> <th>SHEET NO.</th> <td>41 OF 106</td> </tr> </table>	WBS NUMBER	FOR CITY OF HOUSTON USE ONLY	R-001000-0033-3		DRAWING SCALE		H: 1"=20' V: 1"= 2'		CITY OF HOUSTON PM		NEIL BARNSDALE, P.E.		SHEET NO.	41 OF 106							
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CITY OF HOUSTON PM																					
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SHEET NO.	41 OF 106																				

CONSTRUCTION NOTES:
 1. LOCATE VENT PIPE AT LEAST 3' FROM BACK OF CURB REFER TO DETAIL 02082-06, SHEET

NOTES:
 1. 26" SHAFT LOCATION AND GEOMETRY SHOWN ARE REPRESENTATIVE ONLY. ACTUAL LOCATION AND GEOMETRY TO BE AS DETERMINED BY CONTRACTOR.
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VERIFICATION OF PRIVATE UTILITY LINES
 Date
 CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.
 Signature valid for six months.

Date
 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.

Lockwood, Andrews & Newnam, Inc.
 3700 W Sam Houston Pkwy S Houston, TX 77042
 SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX

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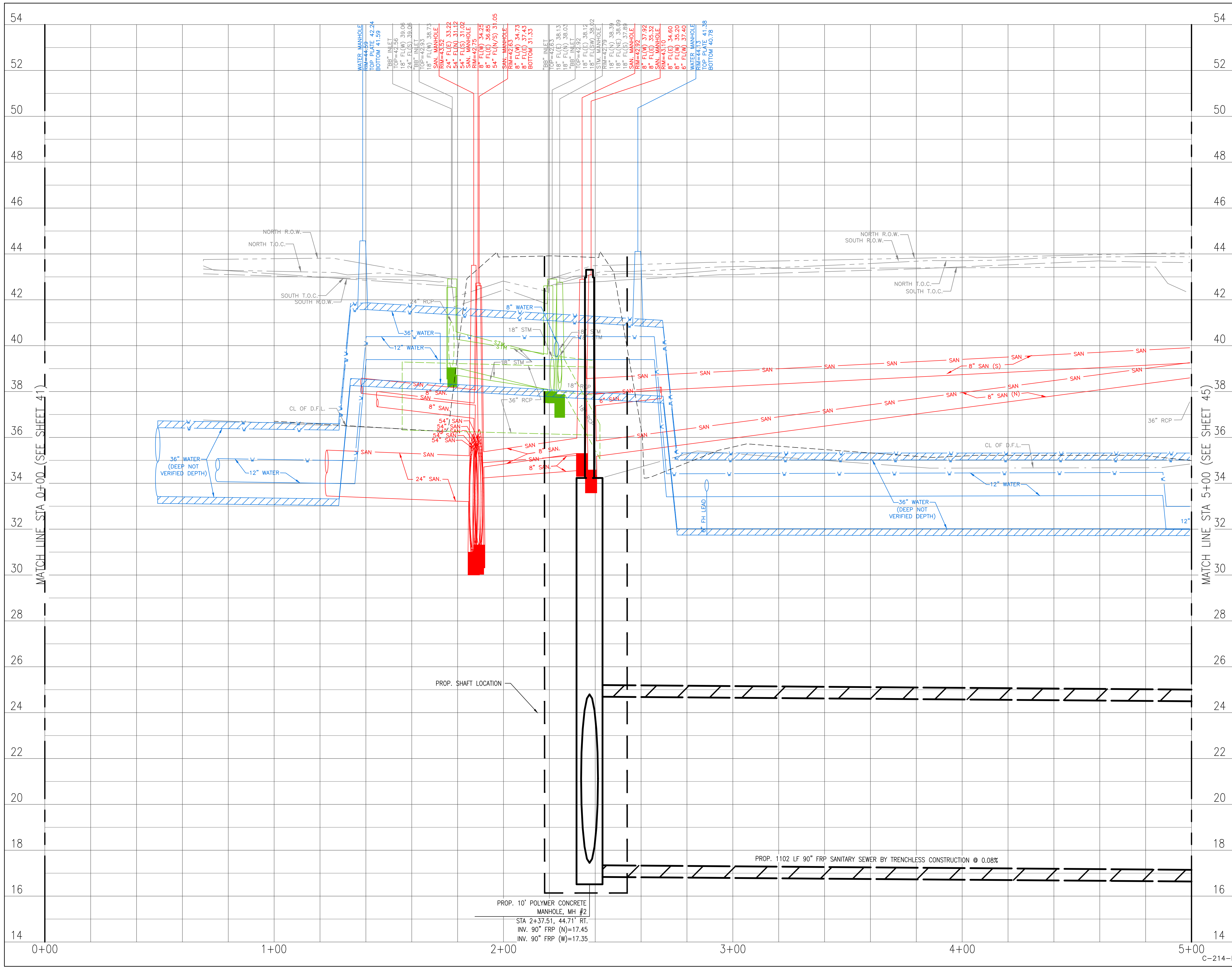
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE D - KELLEY STREET - STA. 0+00.00 TO 5+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 42 OF 106	

SEE BASELINE C SHEET 40 FOR CONTINUATION

MATCHLINE STA 5+00 (SEE SHEET 44)



LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
	CLAYEY SAND, SC		BASE
	LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH
	LOW PLASTICITY SANDY CLAY, CL		SILT, ML
	SILTY CLAYEY SAND, SC-SM		FILL CL/CH

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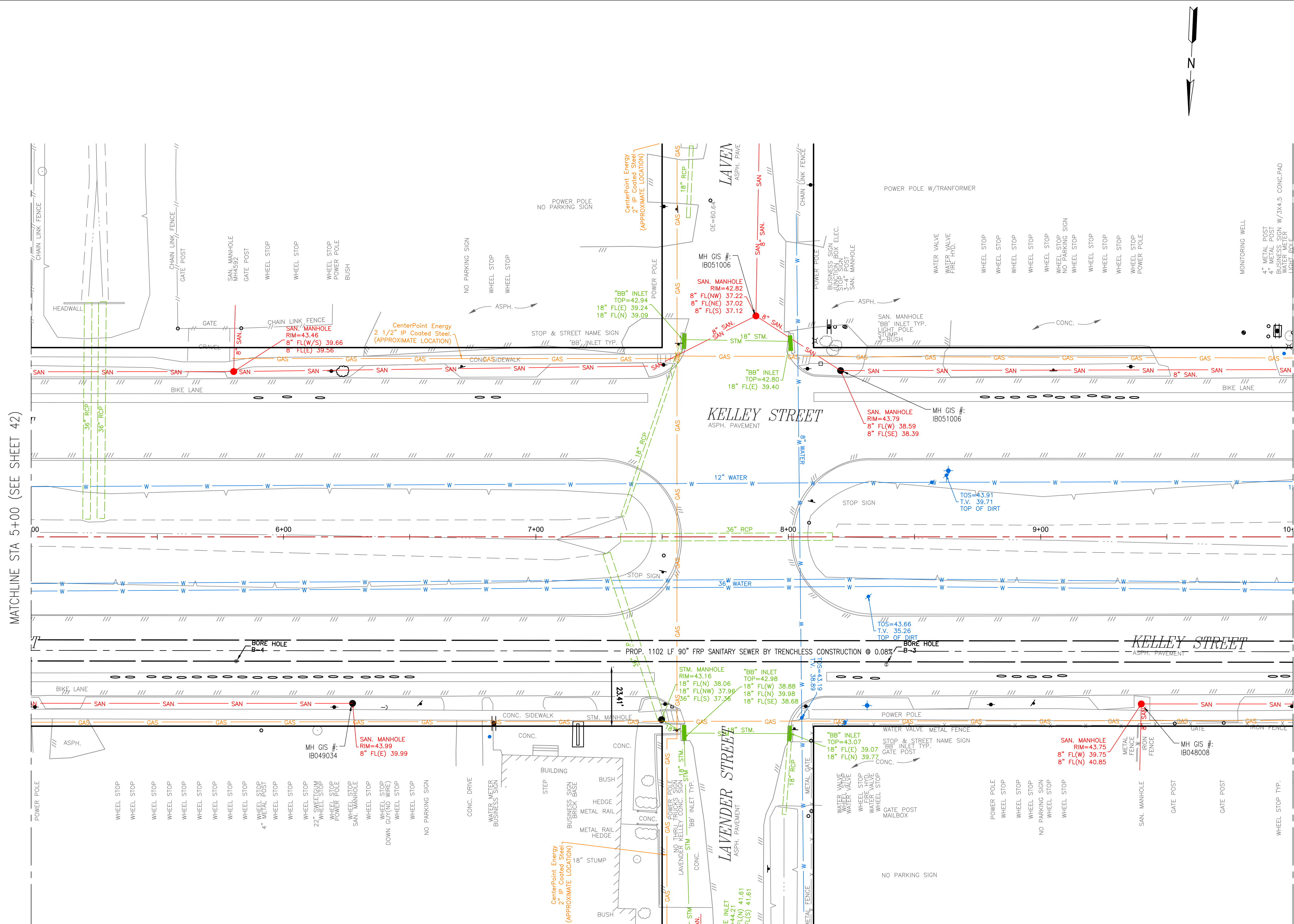
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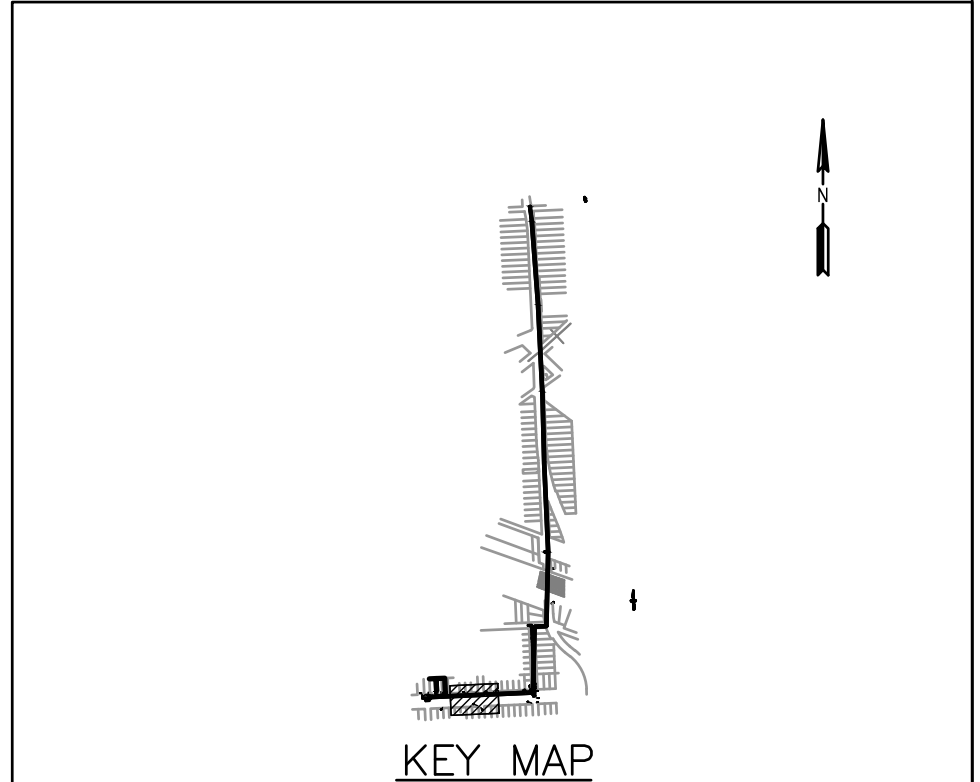
CITY OF HOUSTON
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CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE D - KELLEY STREET -
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DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 43 OF 106	



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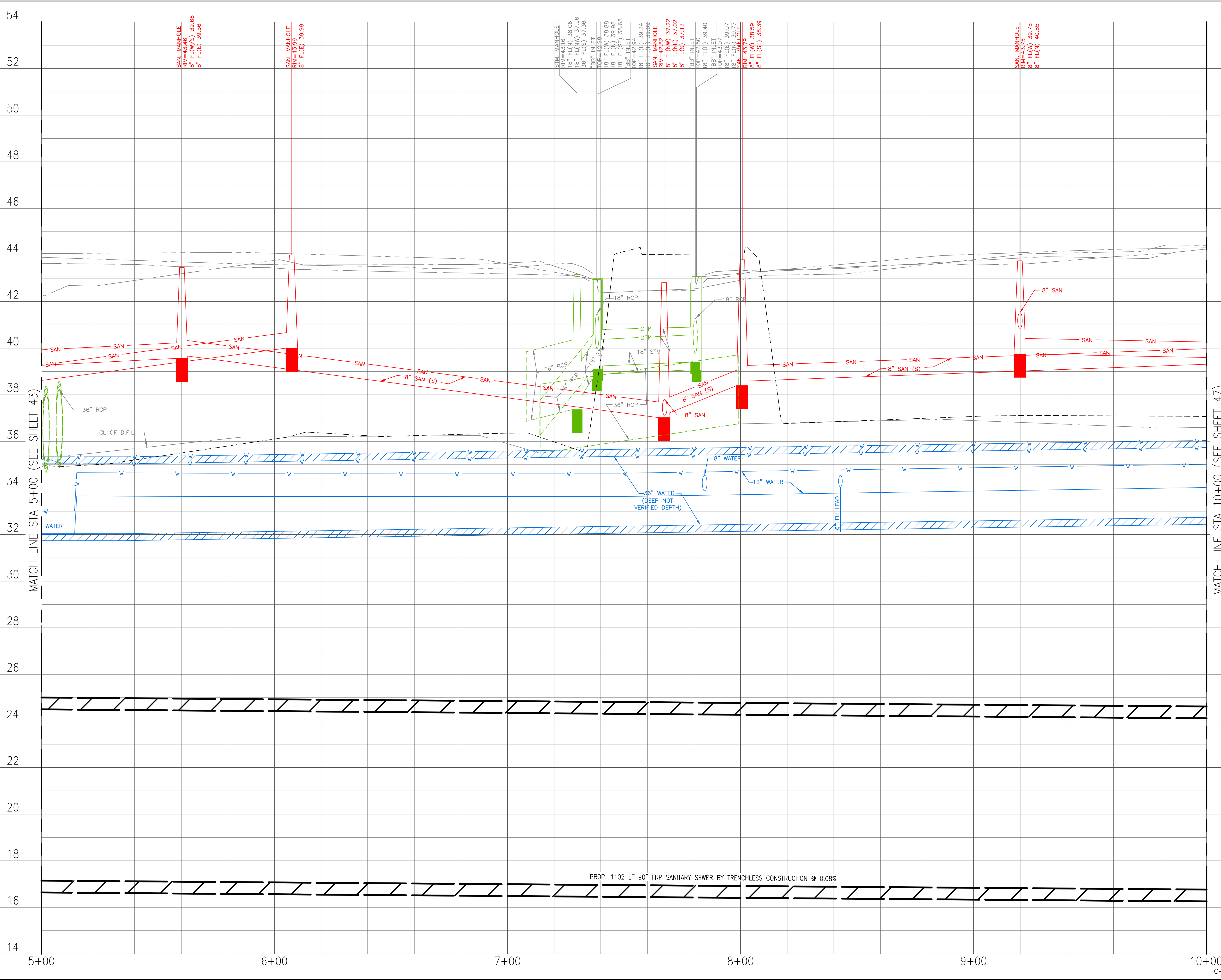
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

BASELINE D - KELLEY STREET-
STA. 5+00.00 TO 10+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 44 OF 106	



LEGEND

	CLAYEY SILTY SAND, CL-ML		CONCRETE
	CLAYEY SAND, SC		BASE
	LOW PLASTICITY SANDY LEAN CLAY, CL		FAT CLAY, CH
	LOW PLASTICITY SANDY CLAY, CL		SILT, ML
	SILTY CLAYEY SAND, SC-SM		FILL CL/CH

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	SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE D - KELLEY STREET - STA.
 5+00.00 TO 10+00.00 - PROF

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"= 2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 45 OF 106	

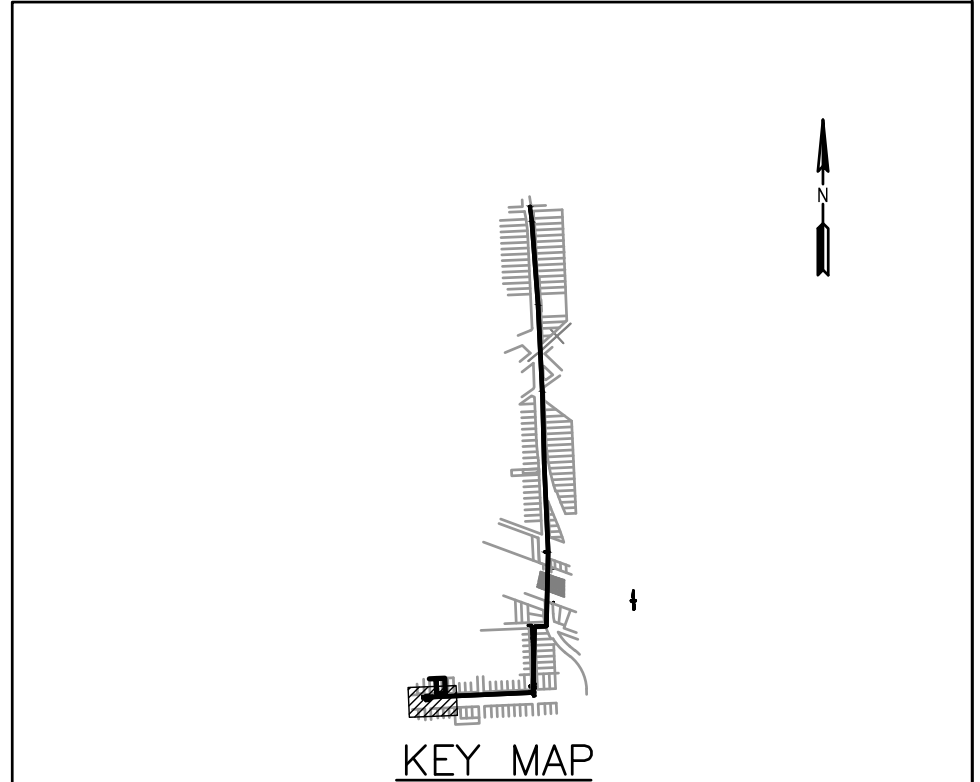
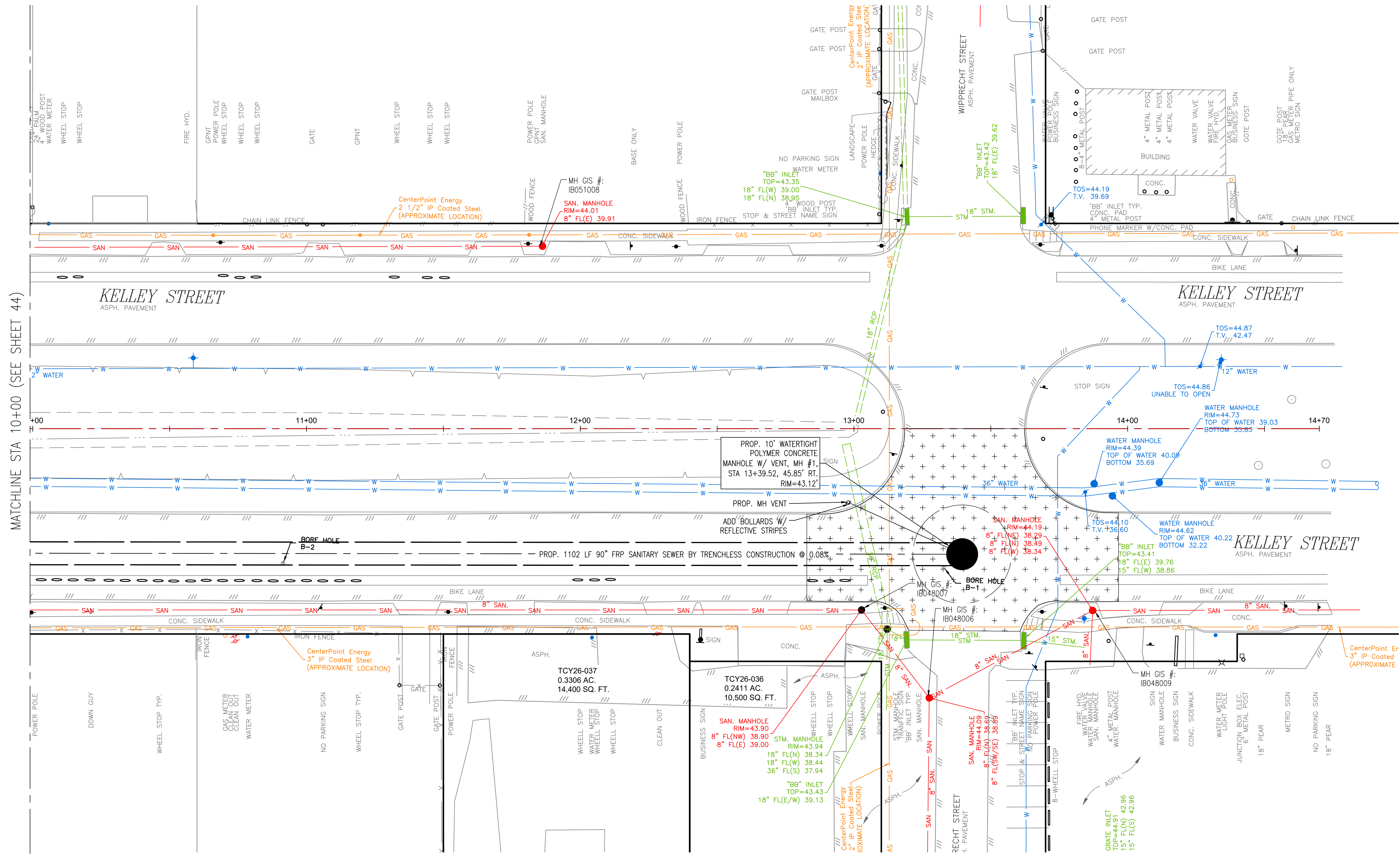
CONSTRUCTION NOTES
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PLOT STYLE: Coh_ctb_230809.ctb

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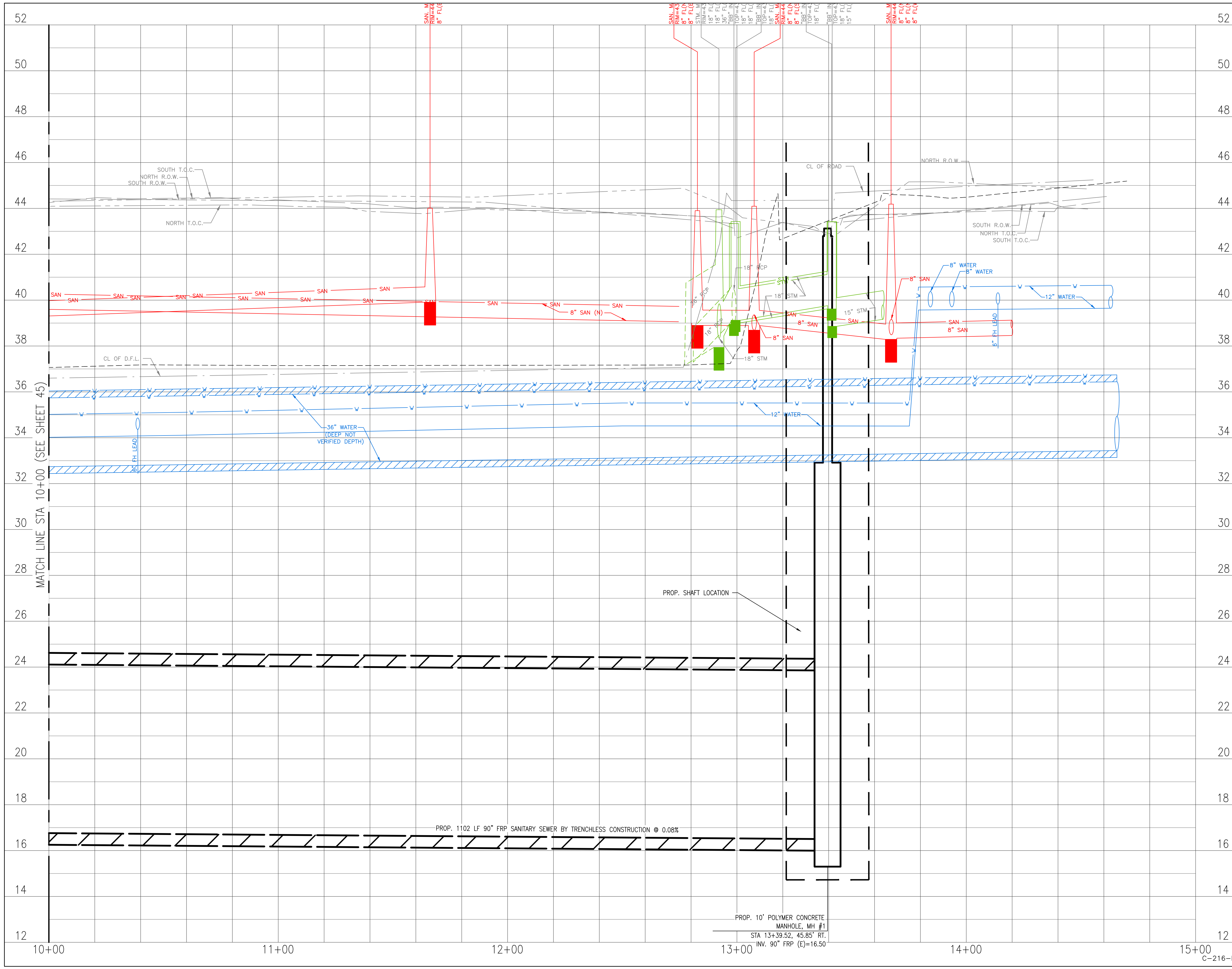
SURVEYED BY:
 LAND-TECH, INC.
 C.O.H. Field Book P-XXXX

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

BASELINE D - KELLEY STREET- STA. 10+00.00 TO 15+00.00 - PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
1" = 20'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 46 OF 106	

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LEGEND	
	CLAYEY SILTY SAND, CL-ML
	CLAYEY SAND, SC
	LOW PLASTICITY SANDY LEAN CLAY, CL
	LOW PLASTICITY SANDY CLAY, CL
	SILTY CLAYEY SAND, SC-SM
	CONCRETE
	BASE
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

**CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8**

BASELINE D - KELLEY STREET - STA.
 10+00.00 TO 15+00.00 - PROF

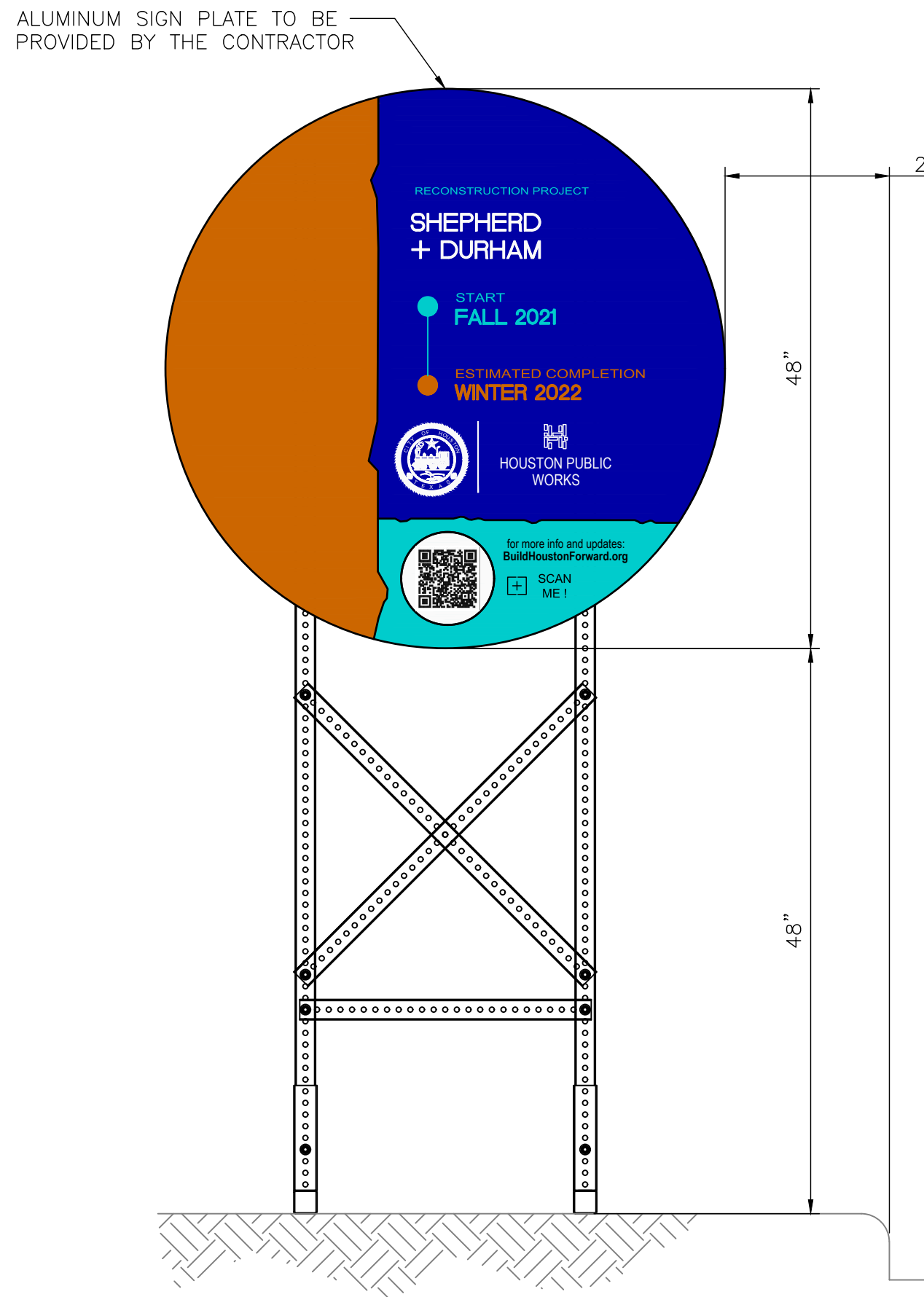
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
H: 1"=20' V: 1"=2'	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 47 OF 106	

PROP. 10' POLYMER CONCRETE MANHOLE, MH #1
 STA 13+39.52, 45.85' RT.
 INV. 90" FRP (E)=16.50

PROP. 1102 LF 90" FRP SANITARY SEWER BY TRENCHLESS CONSTRUCTION @ 0.08%

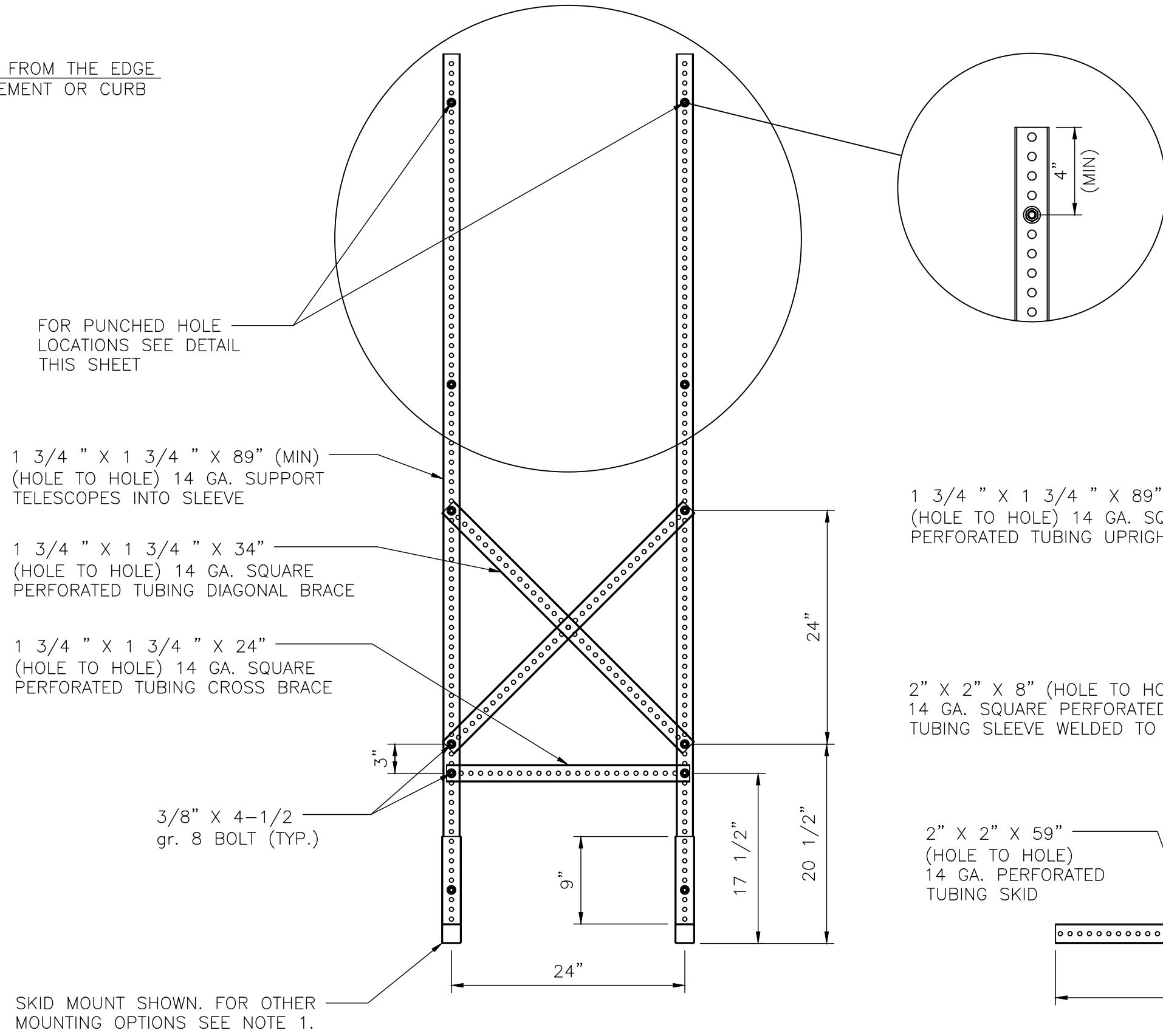
PROP. SHAFT LOCATION

MATCH LINE STA 10+00 (SEE SHEET 45)



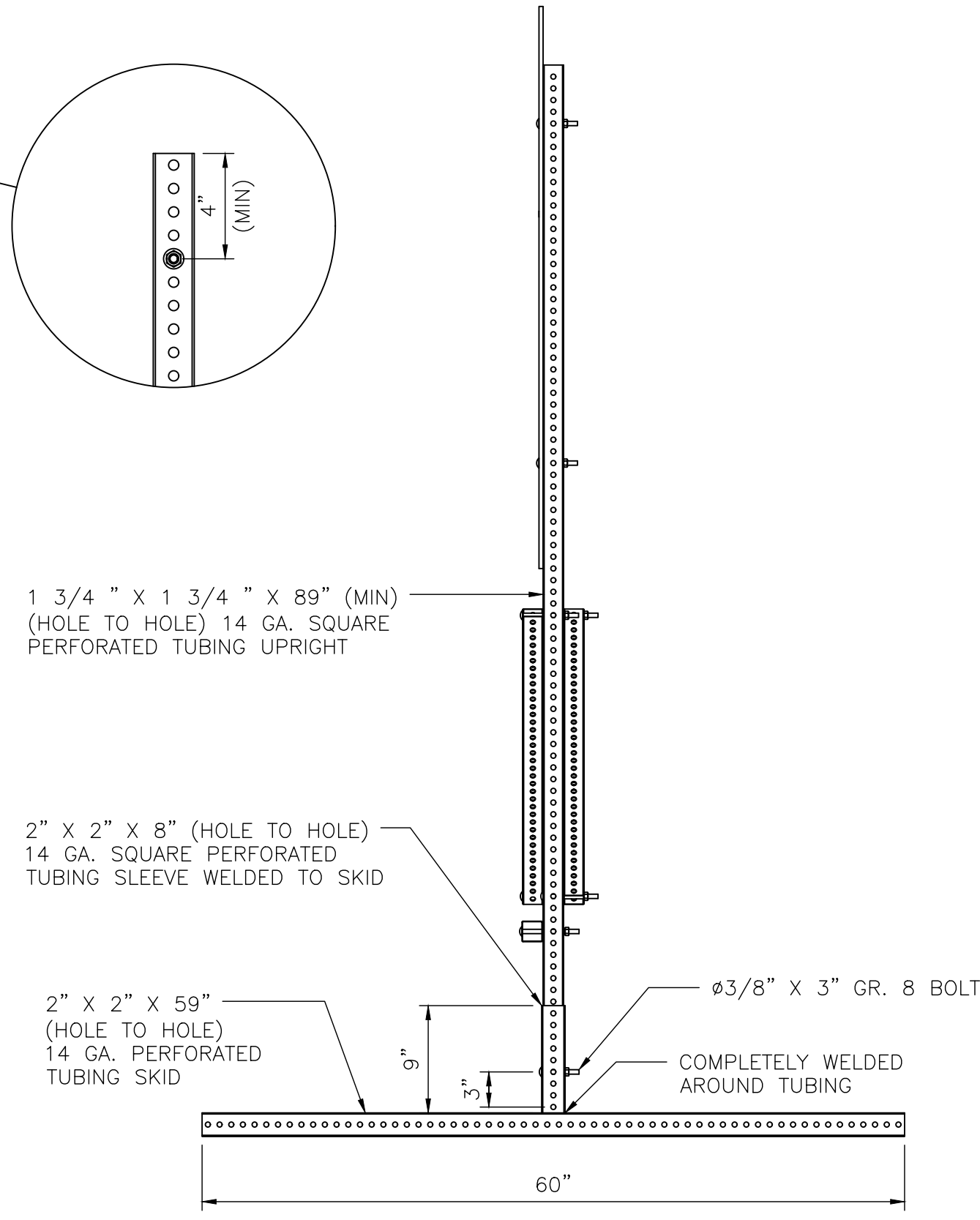
FRONT VIEW

PROJECT SIGN - 48"

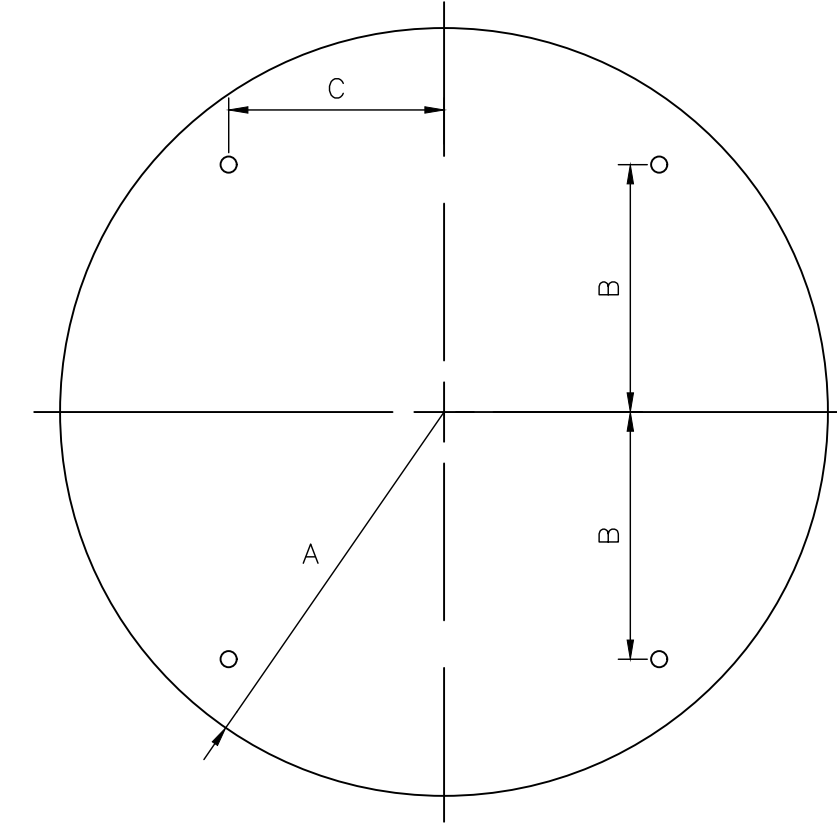


FRONT VIEW

SKID MOUNTED SUPPORTS FOR 48" PROJECT SIGN



SIDE VIEW



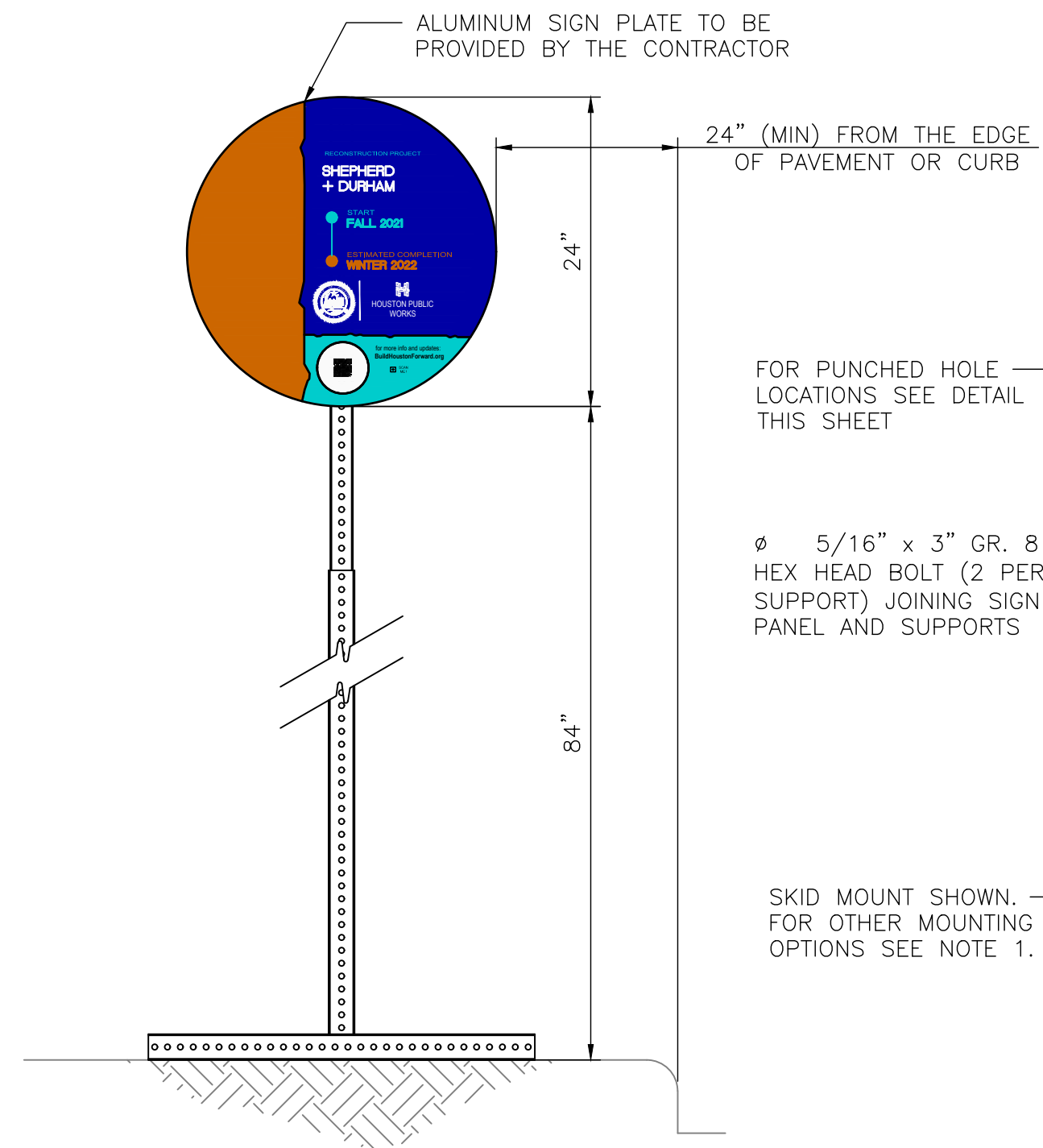
CIRCLE

A	B	C	T
24"	15"	12"	0.080"

48" SIGN PLATE HOLE DETAIL

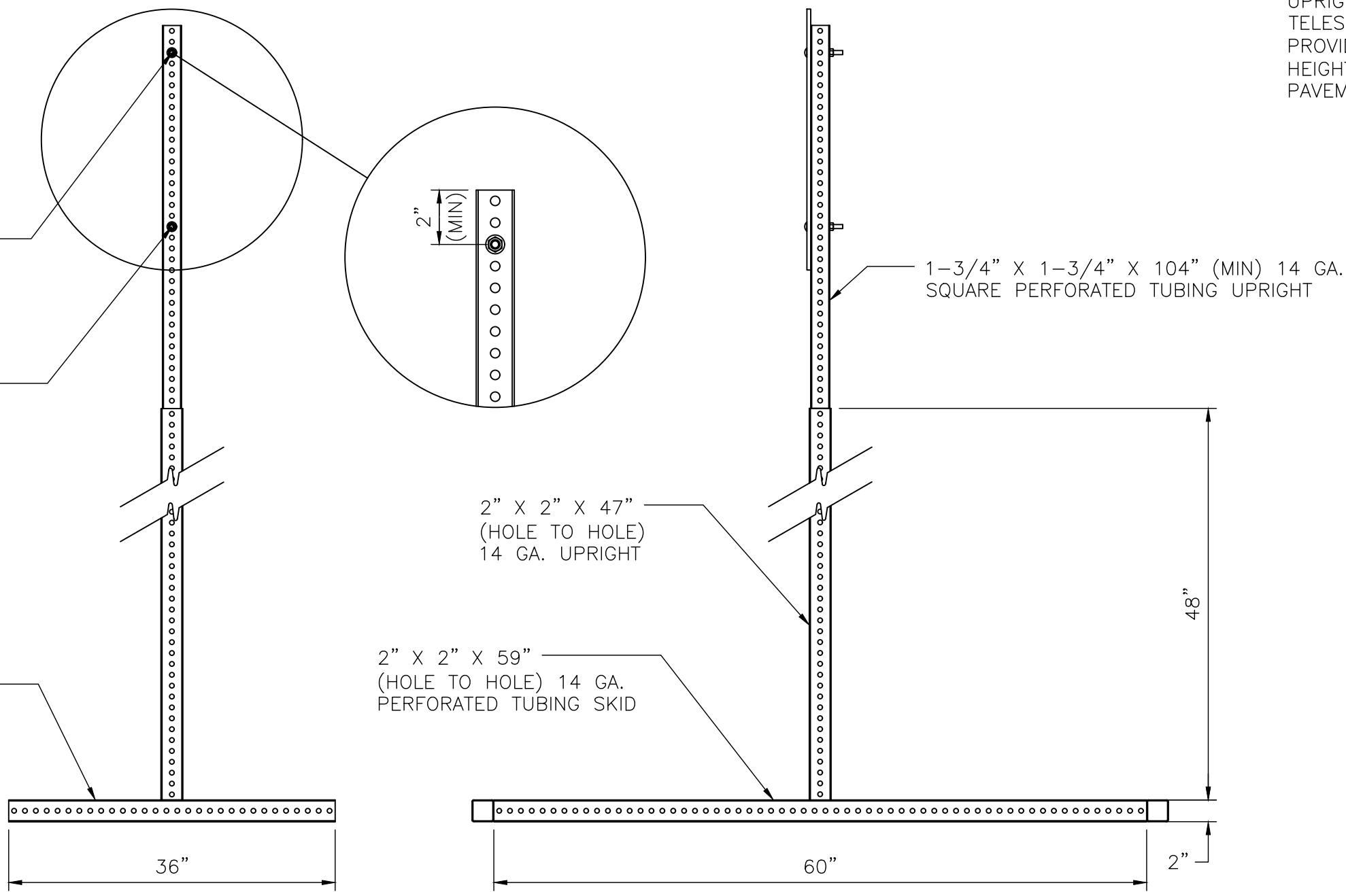
NOTES:

1. ALLOWABLE POST INSTALLATION METHODS ARE: CONCRETE FOOTING, SURFACE MOUNTING, SKID MOUNTING AND PILE DRIVEN POSTS.
2. FOR POST INSTALLATION WITH CONCRETE FOOTING, REFER TO DETAIL 01554-01.
3. FOR SURFACE MOUNTED POST INSTALLATION, REFER TO DETAIL 01554-02.
4. FOR SKID MOUNTING REQUIREMENTS REFER TO SPECIFICATION 01582.
5. PILE DRIVEN POSTS MUST BE DRIVEN TO A MINIMUM DEPTH OF 4- FEET INTO EXISTING GROUND.
6. LAYOUT, TEXT SIZE, AND OVERALL DESIGN OF THE SIGN WILL BE THE RESPONSIBILITY OF THE BUILD HOUSTON COORDINATOR.
7. ALL SIGN POSTS, SIGN TUBING, AND SIGN FASTENERS SHALL BE GALVANIZED STEEL PER SPECIFICATION 01582.



FRONT VIEW

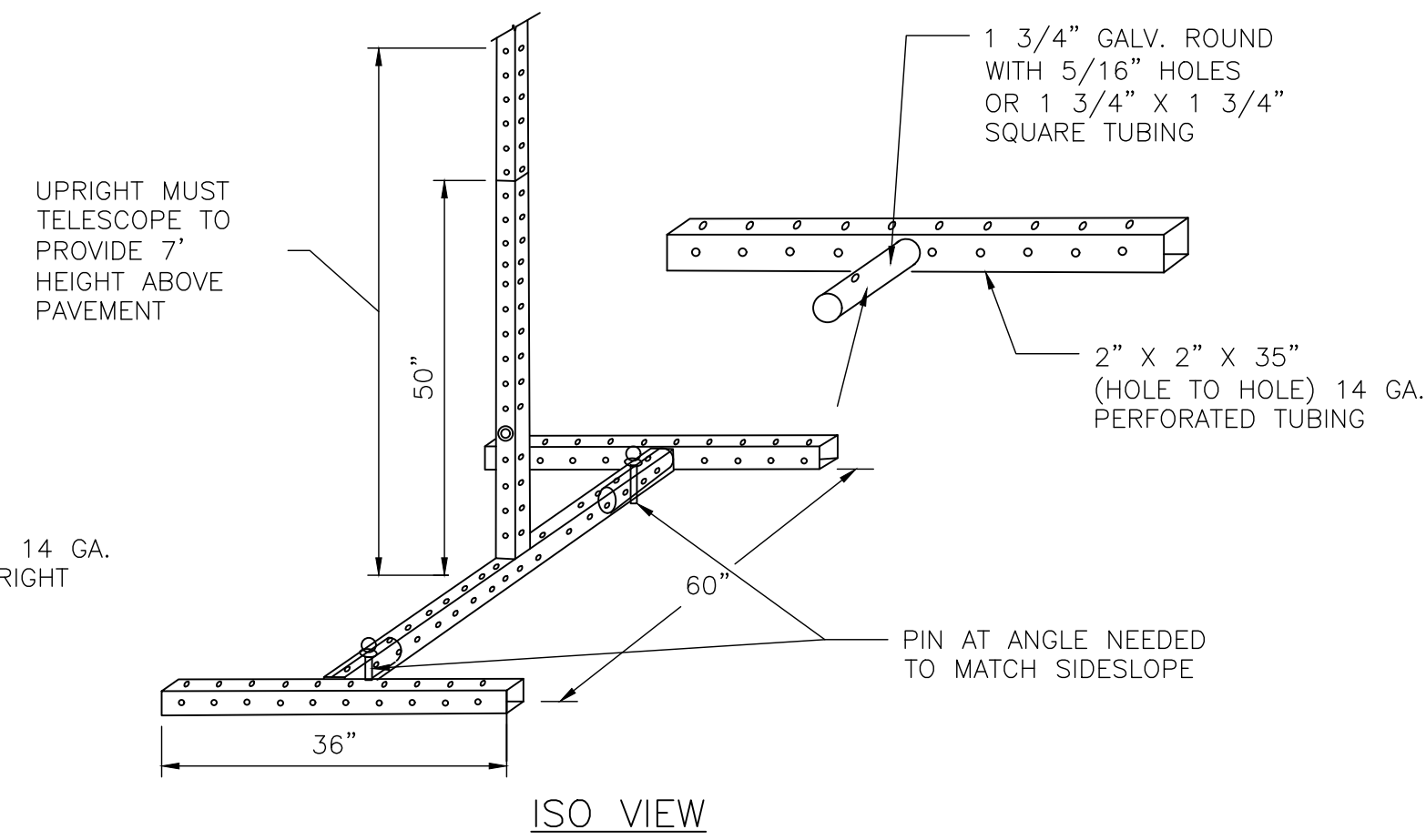
PROJECT SIGN - 24"



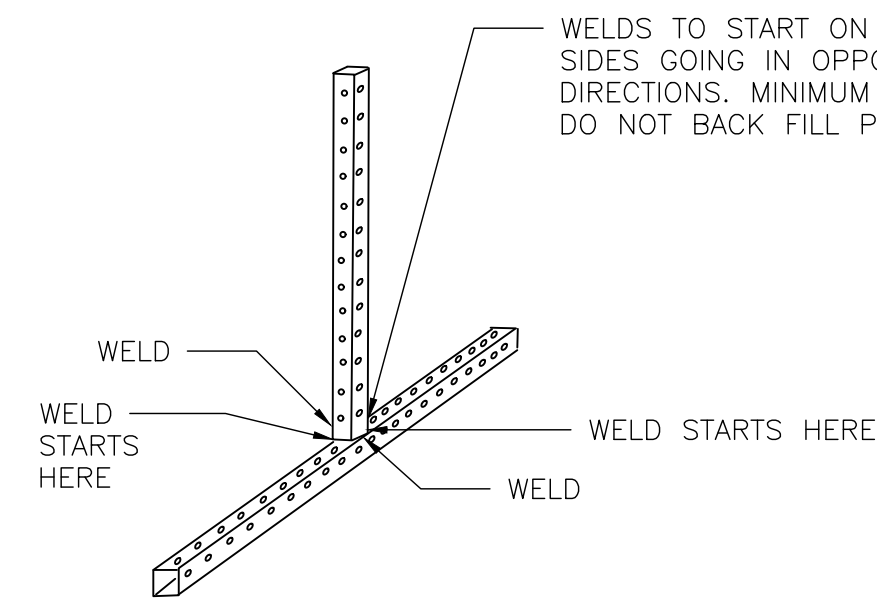
FRONT VIEW

SIDE VIEW

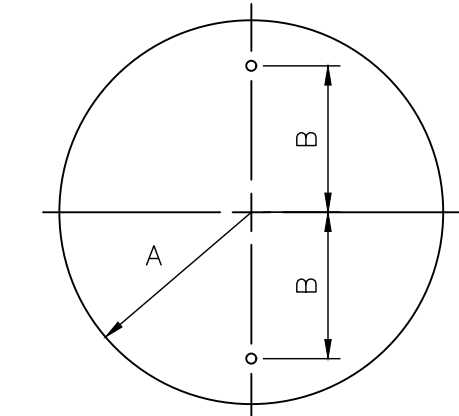
SKID MOUNTED SUPPORTS FOR 24" PROJECT SIGN



ISO VIEW



ISO VIEW



A	B	C
12"	8"	0.080"

24" SIGN PLATE HOLE DETAIL

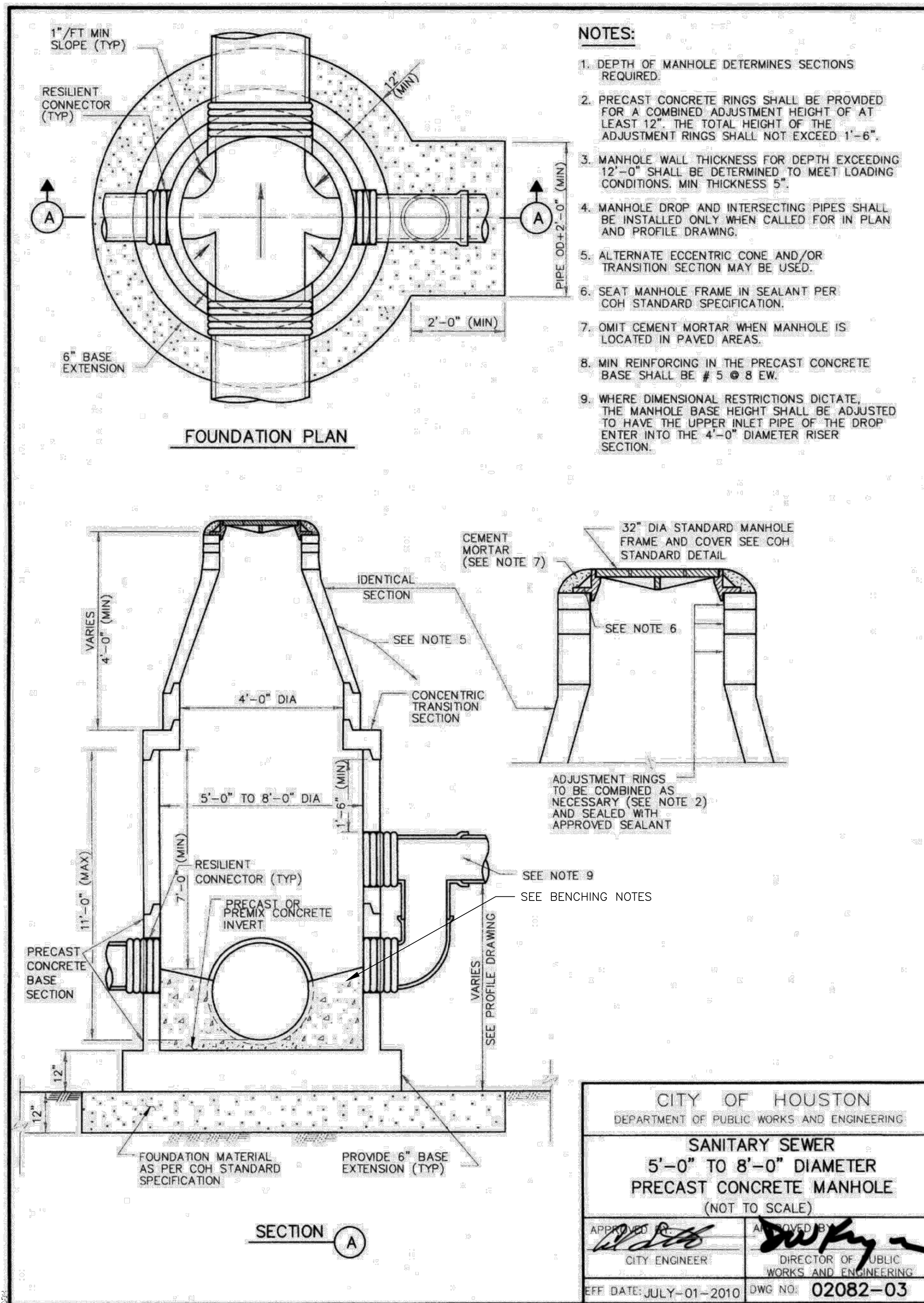
<p>Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042</p>	<p>INTERIM REVIEW ONLY</p> <p>Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of</p> <p>GREGORY J. HENRY</p> <p>91826</p> <p>06/05/2026</p>
	<p>SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX</p>

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

PROJECT CONSTRUCTION SIGN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 48 OF 106	



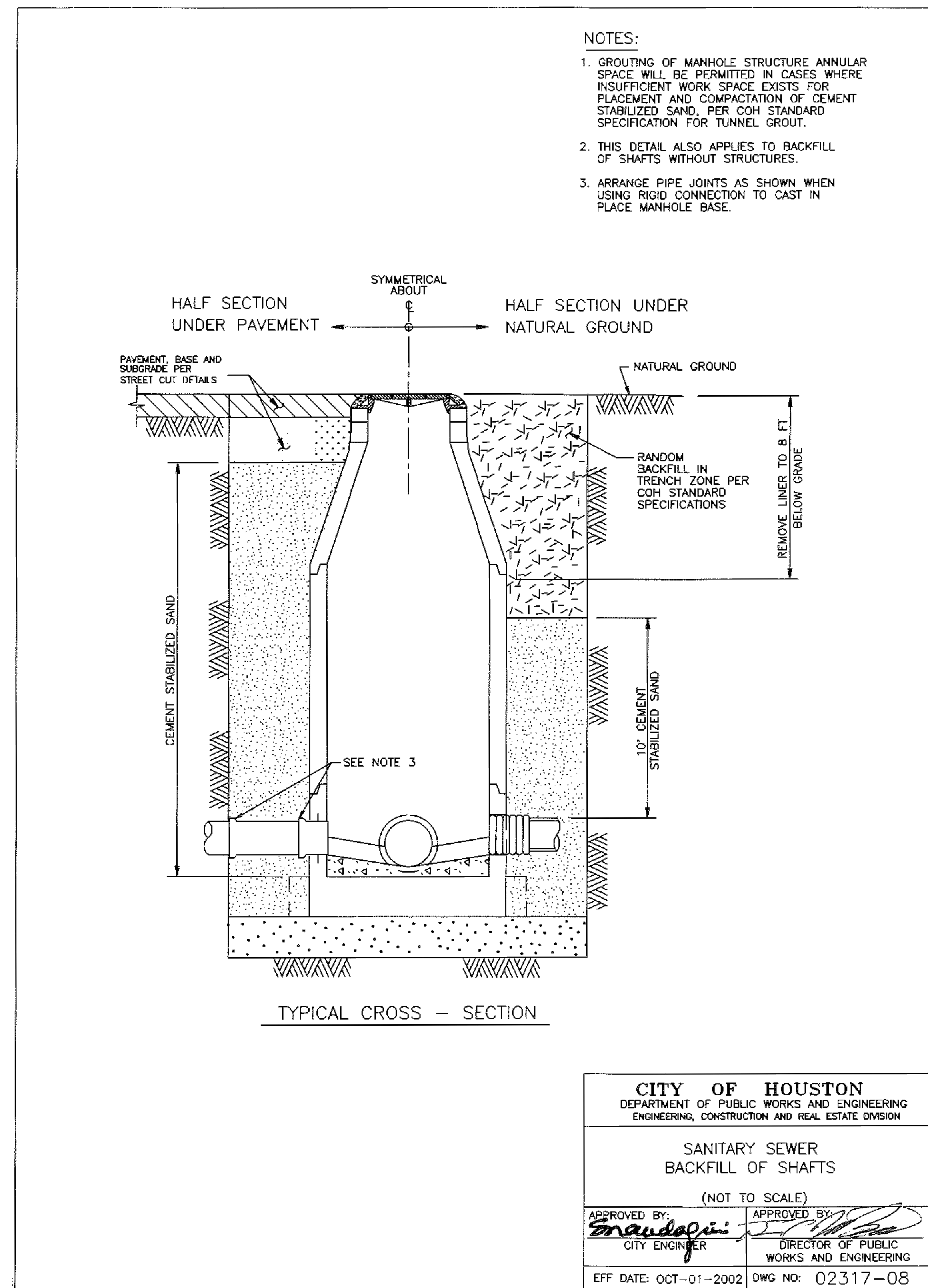
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER
5'-0" TO 8'-0" DIAMETER
PRECAST CONCRETE MANHOLE
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 02082-03



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY SEWER
BACKFILL OF SHAFTS
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2002 DWG NO: 02317-08

- NOTES:**
- A MANHOLE LOCATED WITHIN A 100-YEAR FLOOD PLAIN MUST BE GASKETED AND BOLTED DOWN TO PREVENT INFLOW.
 - A MANHOLE COVER THAT IS LOCATED IN A ROADWAY MUST MEET OR EXCEED THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS STANDARD M-306 FOR LOAD BEARING.
 - A MANHOLE CONNECTED TO PIPES LESS THAN 15 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST HALF THE LARGEST PIPE'S DIAMETER.
 - A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
 - A MANHOLE CONNECTED TO A PIPE THAT IS GREATER THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THE LARGEST PIPE'S DIAMETER.
 - IN A MANHOLE WITH PIPES OF DIFFERENT SIZES, THE TOPS OF ALL THE PIPES MUST BE AT THE SAME ELEVATION AND FLOW CHANNELS IN THE INVERT MUST BE SLOPED EVENLY FROM PIPE TO PIPE TO PREVENT BACKPRESSURE.
 - A COLLECTION SYSTEM PIPE ENTERING A MANHOLE MORE THAN 24 INCHES ABOVE AN INVERT MUST HAVE A DROP PIPE.
 - A MANHOLE-PIPE CONNECTION MUST USE WATERTIGHT, SIZE-ON-SIZE RESILIENT CONNECTORS THAT ALLOW FOR DIFFERENTIAL SETTLEMENT AND MUST CONFORM TO AMERICAN SOCIETY FOR TESTING AND MATERIALS C923.
- BENCHING NOTES:**
- A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
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91826
06/05/2026

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Texas Registered Engineering Firm F-2614

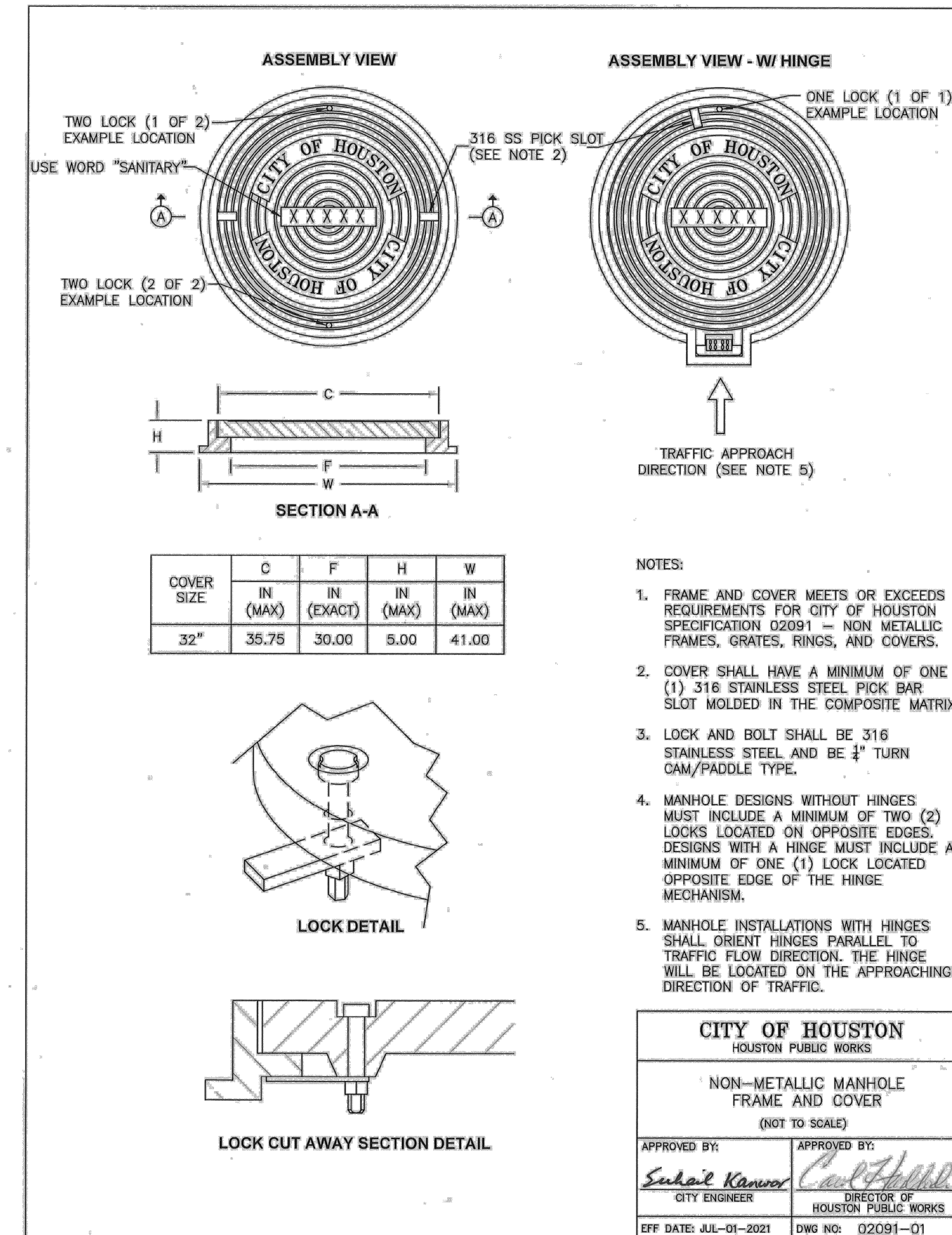
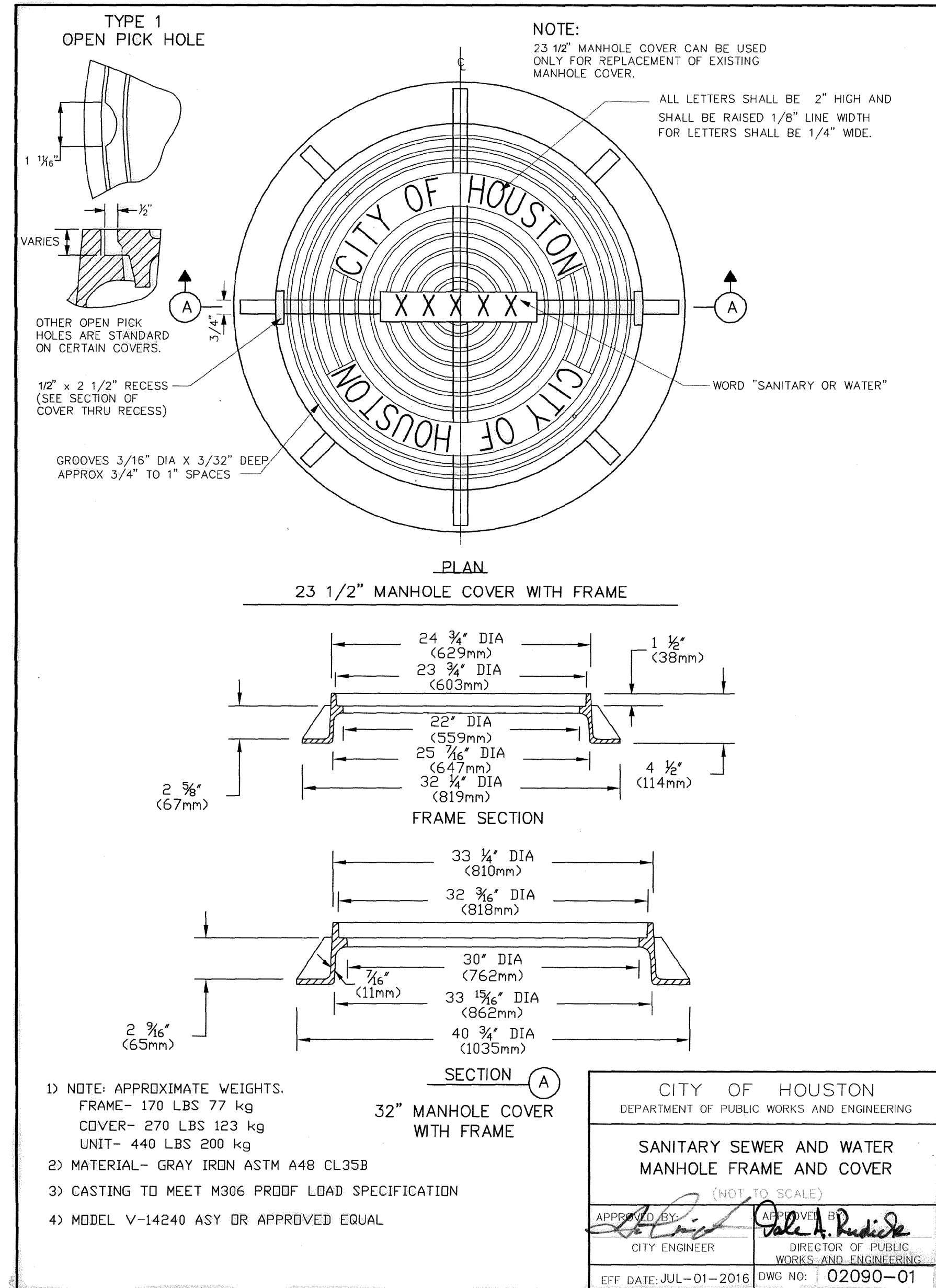
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 1 OF 16

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 49 OF 106	

CITY TO PROVIDE UPDATED DETAIL



NOTES:

- A MANHOLE LOCATED WITHIN A 100-YEAR FLOOD PLAIN MUST BE GASKETED AND BOLTED DOWN TO PREVENT INFLOW.
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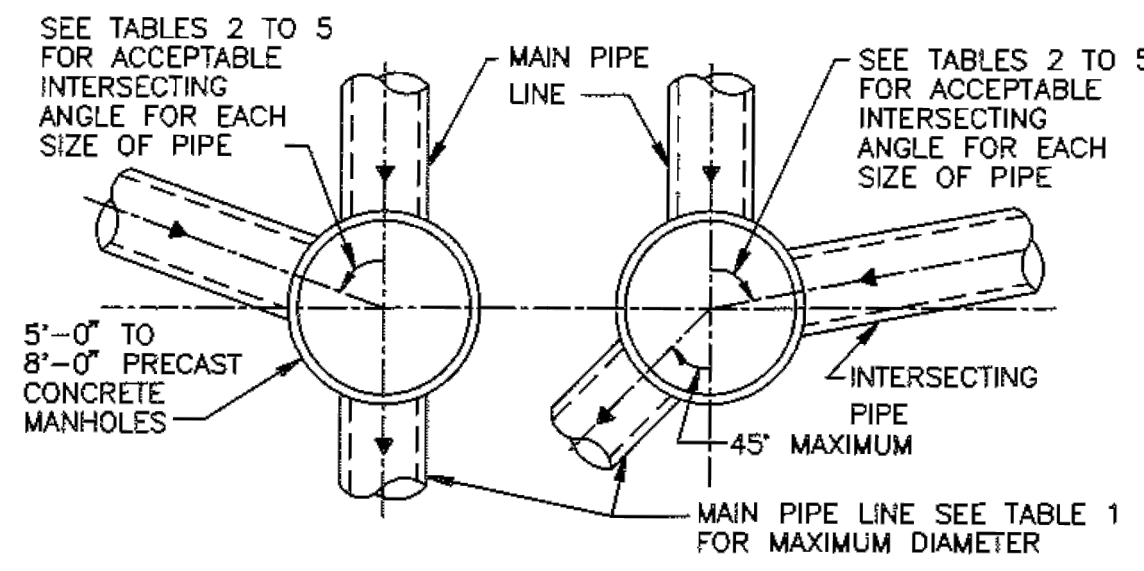
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	<p>SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX</p> <p>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2014</p>

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

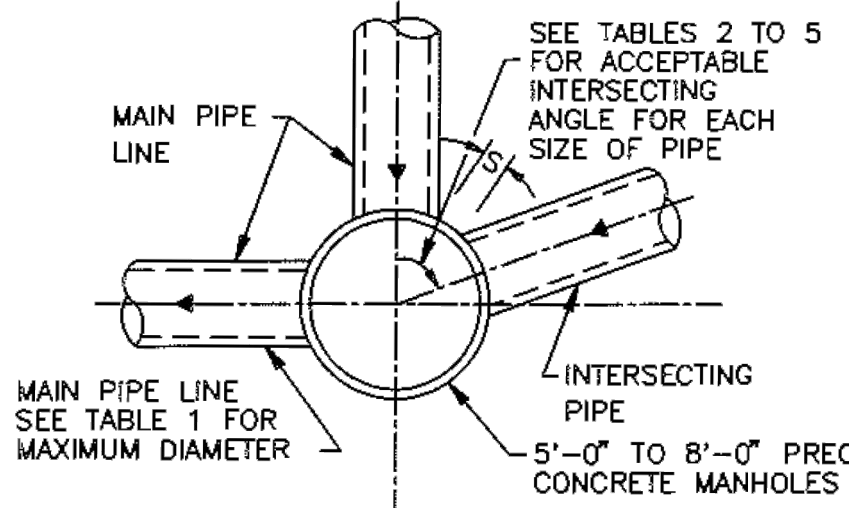
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 2 OF 16

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 50 OF 106	



FOR MAIN PIPES FROM STRAIGHT THROUGH TO 45° DEFLECTION



FOR MAIN PIPE WITH 45° TO 90° DEFLECTION

NOTES ON USE OF STANDARD DETAIL 02082-03

TABLE 3
MINIMUM ANGLE AND INTERSECTING PIPE ID SIZES FOR 6'-0" DIA MANHOLE

INTERSECTING PIPE ID SIZES (INCHES)	MINIMUM INTERSECTING ANGLE IN DEGREES FOR VARIOUS MAIN PIPE ID SIZES IN INCHES											
	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	42"
8	40											
10		42										
12			44									
15				47								
18					50							
21						53						
24							56					
27								59				
30									62			
33										65		
36											68	
42												78

TABLE 4
MINIMUM ANGLE AND INTERSECTING PIPE ID SIZES FOR 7'-0" DIA MANHOLE

INTERSECTING PIPE ID SIZES (INCHES)	MINIMUM INTERSECTING ANGLE IN DEGREES FOR VARIOUS MAIN PIPE ID SIZES IN INCHES													
	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	42"	48"	
8	35													
10		36												
12			38											
15				40										
18					43									
21						46								
24							48							
27								50						
30									53					
33										55				
36											58			
42												61		
48													63	

TABLE 5
MINIMUM ANGLE AND INTERSECTING PIPE ID SIZES FOR 8'-0" DIA MANHOLE

INTERSECTING PIPE ID SIZES (INCHES)	MINIMUM INTERSECTING ANGLE IN DEGREES FOR VARIOUS MAIN PIPE ID SIZES IN INCHES															
	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	42"	48"	54"	60"	
8	30															
10		32														
12			33													
15				35												
18					38											
21						40										
24							42									
27								44								
30									46							
33										48						
36											51					
42												53				
48													55			
54														57		
60															59	

TABLE 1
MAXIMUM MAIN PIPE DIAMETER (I D) IN INCHES

MANHOLE DIAMETER (FT)	STRAIGHT THROUGH TO 45° DEFLECTION	WITH 90° DEFLECTION	TABLE TO BE USED
5	36	27	2
6	42	33	3
7	48	36	4
8	60	42	5

TABLE 2
MINIMUM ANGLE AND INTERSECTING PIPE ID SIZES FOR 5'-0" DIA MANHOLE

INTERSECTING PIPE ID SIZES (INCHES)	MINIMUM INTERSECTING ANGLE IN DEGREES FOR VARIOUS MAIN PIPE ID SIZES IN INCHES											
	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	
8	49											
10		53										
12			57									
15				61								
18					65							
21						68						
24							71					
27								76				
30									79			
33										84		
36											88	

NOTES TO SPECIFIER:

1. "-" INDICATES THAT A SPECIAL DESIGN OR THE NEXT LARGER MANHOLE SIZE SHALL BE USED.
2. TABLES 2 TO 5 ARE BASED ON A MIN SEPARATION DISTANCE "S" OF 15.5" OR INTERSECTION PIPE OD/2, WHICHEVER IS GREATER, BETWEEN MAIN AND INTERSECTING PIPES ALONG THE MANHOLE INSIDE WALL ARC.
3. PIPE WALL THICKNESS USED IN TABLES 2 TO 5 ARE BASED ON RCP. THE DESIGN ENGINEER MAY CALCULATE TO SEE IF THINNER WALL PIPES CAN MEET THE SEPARATION CRITERIA FOR ANGLES SMALLER THAN THE TABLES ALLOW.
4. LIMITATIONS TO BASE HEIGHT ARE BASED ON RESISTING BUOYANT UPLIFT FORCES BASED ON WATER AT GROUND SURFACE AND A SAFETY FACTOR OF 1.20.
5. A SPECIAL DESIGN IS REQUIRED IF MANHOLE ID IS GREATER THAN 8 FT.

NOTES:

1. A MANHOLE LOCATED WITHIN A 100-YEAR FLOOD PLAIN MUST BE GASKETED AND BOLTED DOWN TO PREVENT INFLOW.
2. A MANHOLE COVER THAT IS LOCATED IN A ROADWAY MUST MEET OR EXCEED THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS STANDARD M-306 FOR LOAD BEARING.
3. A MANHOLE CONNECTED TO PIPES LESS THAN 15 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST HALF THE LARGEST PIPE'S DIAMETER.
4. A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
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7. A COLLECTION SYSTEM PIPE ENTERING A MANHOLE MORE THAN 24 INCHES ABOVE AN INVERT MUST HAVE A DROP PIPE.
8. A MANHOLE-PIPE CONNECTION MUST USE WATERTIGHT, SIZE-ON-SIZE RESILIENT CONNECTORS THAT ALLOW FOR DIFFERENTIAL SETTLEMENT AND MUST CONFORM TO AMERICAN SOCIETY FOR TESTING AND MATERIALS C923.

* NOT APPLICABLE (INTERSECTING PIPE GREATER THAN MAIN PIPE)

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

SANITARY SEWER
5'-0" TO 8'-0" DIAMETER
PRECAST CONCRETE MANHOLE NOTES
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2002 DWG NO: 02082N-03

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91826
06/05/2026

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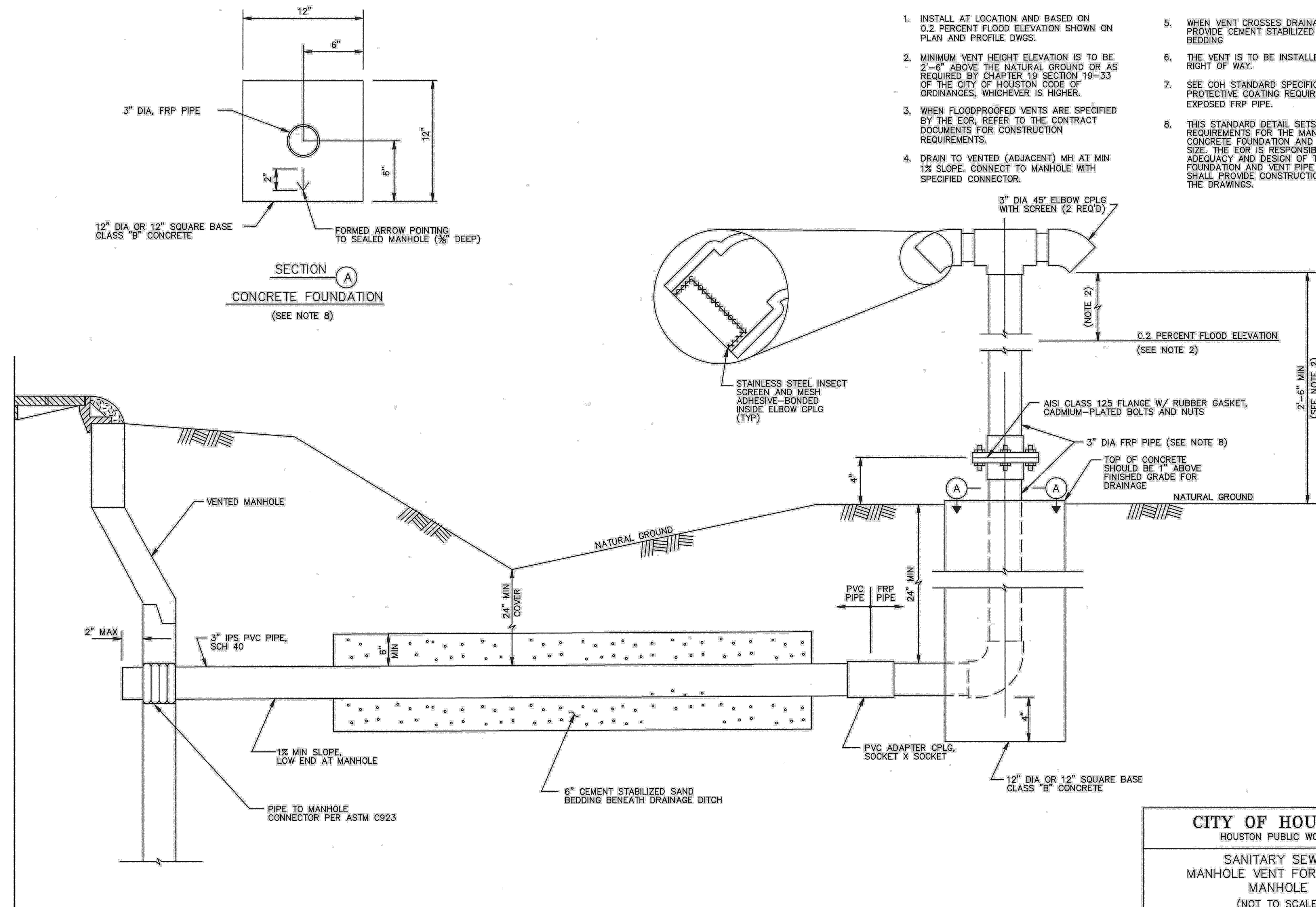
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Texas Registered Engineering Firm F-2014

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 3 OF 16

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	51 OF 106



- NOTES:**
1. INSTALL AT LOCATION AND BASED ON 0.2 PERCENT FLOOD ELEVATION SHOWN ON PLAN AND PROFILE DWGS.
 2. MINIMUM VENT HEIGHT ELEVATION IS TO BE 2'-6" ABOVE THE NATURAL GROUND OR AS REQUIRED BY CHAPTER 19 SECTION 19-33 OF THE CITY OF HOUSTON CODE OF ORDINANCES, WHICHEVER IS HIGHER.
 3. WHEN FLOODPROOFED VENTS ARE SPECIFIED BY THE EOR, REFER TO THE CONTRACT DOCUMENTS FOR CONSTRUCTION REQUIREMENTS.
 4. DRAIN TO VENTED (ADJACENT) MH AT MIN 1% SLOPE. CONNECT TO MANHOLE WITH SPECIFIED CONNECTOR.
 5. WHEN VENT CROSSES DRAINAGE DITCH, PROVIDE CEMENT STABILIZED SAND BEDDING
 6. THE VENT IS TO BE INSTALLED WITHIN THE RIGHT OF WAY.
 7. SEE COH STANDARD SPECIFICATIONS FOR PROTECTIVE COATING REQUIREMENTS FOR EXPOSED FRP PIPE.
 8. THIS STANDARD DETAIL SETS THE MINIMUM REQUIREMENTS FOR THE MANHOLE VENT'S CONCRETE FOUNDATION AND VENT PIPE SIZE. THE EOR IS RESPONSIBLE FOR THE ADEQUACY AND DESIGN OF THE CONCRETE FOUNDATION AND VENT PIPE SIZE AND SHALL PROVIDE CONSTRUCTION DETAILS IN THE DRAWINGS.

SECTION A
CONCRETE FOUNDATION
 (SEE NOTE 8)

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
SANITARY SEWER MANHOLE VENT FOR SEALED MANHOLE (NOT TO SCALE)	
APPROVED BY: <i>Subal Kanwar</i> CITY ENGINEER	APPROVED BY: <i>Gregory J. Henry</i> DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2021	DWG NO: 02082-06

CITY TO PROVIDE UPDATED DETAIL

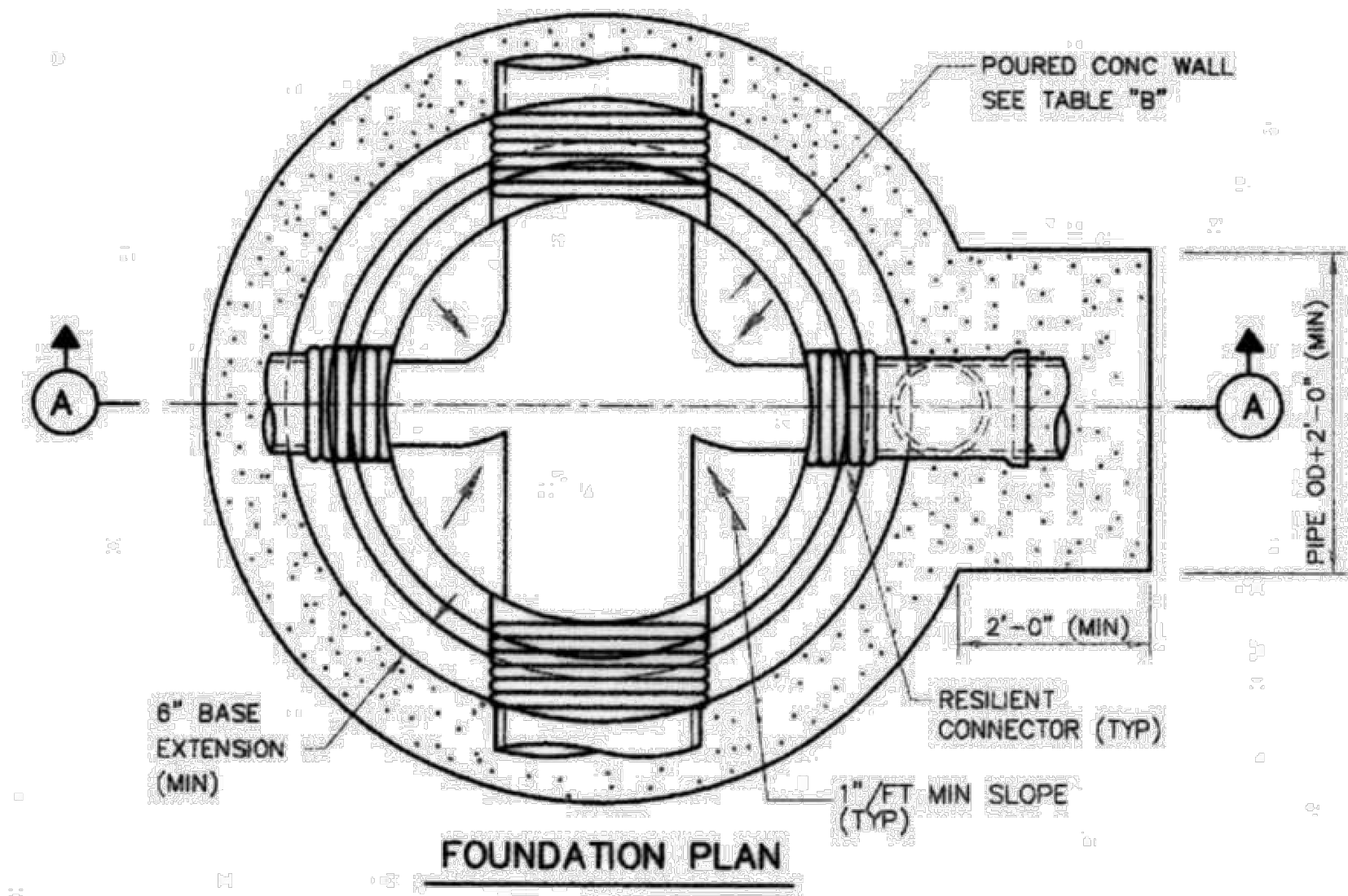
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 3700 W Sam Houston Pkwy S Houston, TX 77042

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 91826
 06/05/2026

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 Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 52 OF 106	



NOTES:

1. SEAT MANHOLE FRAME IN SEALANT PER COH STANDARD SPECIFICATION.
2. OMIT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREAS.
3. MANHOLE DROP AND INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWING.

NOTES ON USE OF STANDARD DETAIL

TABLE "A"

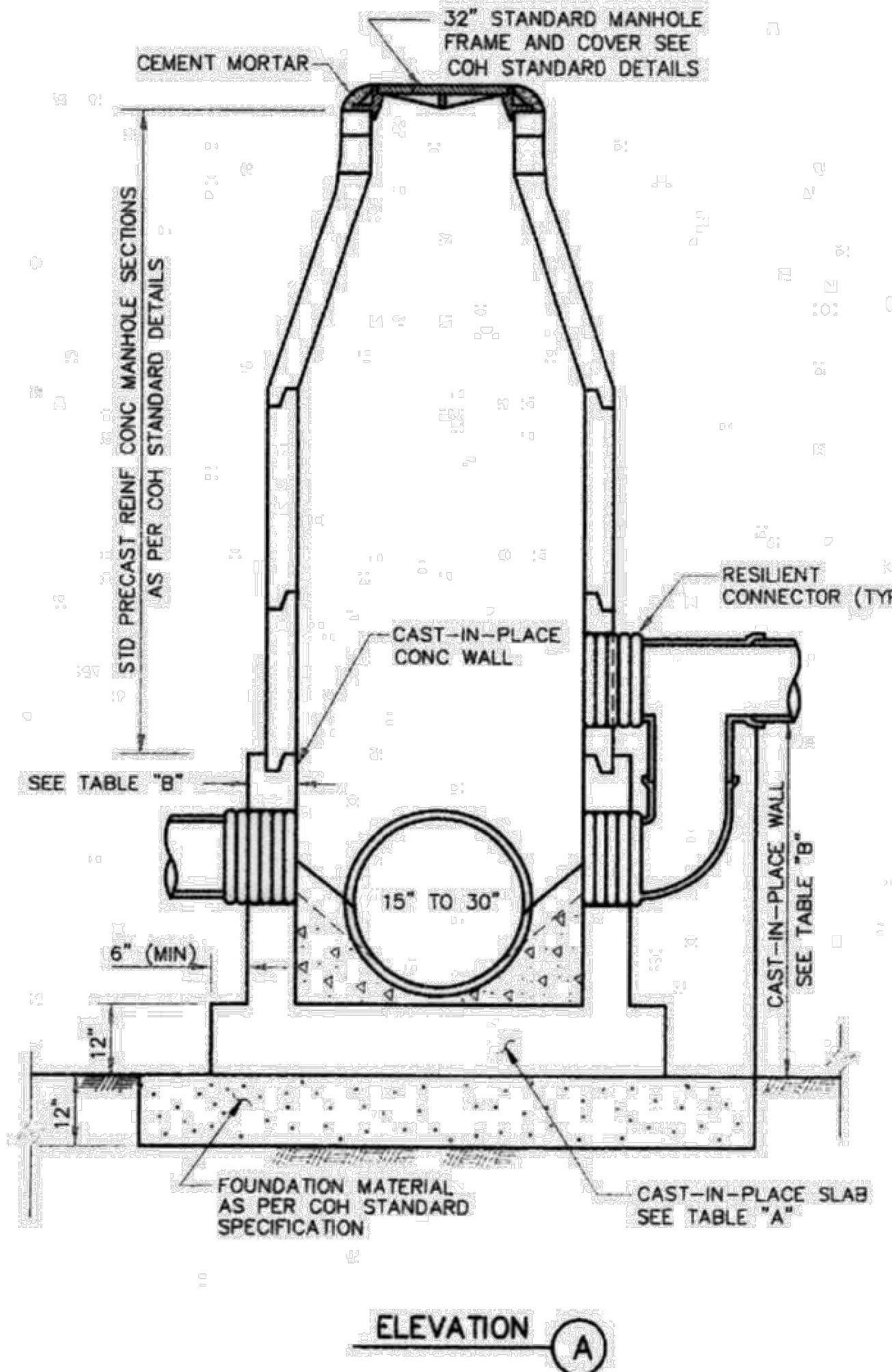
BASE SLAB REINFORCING AND THICKNESS			
MH INSIDE DIA (FT)	DEPTH TO INV (FT)	BASE THICKNESS	REINFORCING (E, W, T & B)
8	≤ 20	1'-0"	# 6 @ 10"
	≤ 25	1'-2"	# 6 @ 8"
	≤ 30	1'-4"	# 6 @ 7"
	≤ 40	1'-6"	# 6 @ 6"
	≤ 50	1'-8"	# 6 @ 6"
6	≤ 20	1'-0"	# 5 @ 8"
	≤ 25	1'-2"	# 5 @ 7"
	≤ 30	1'-2"	# 5 @ 6"
	≤ 40	1'-2"	# 6 @ 8"
	≤ 50	1'-4"	# 6 @ 8"
5	≤ 15	1'-0"	# 5 @ 8"
	≤ 20	1'-0"	# 5 @ 7"
	≤ 25	1'-0"	# 5 @ 6"
	≤ 30	1'-0"	# 6 @ 10"
	≤ 40	1'-2"	# 6 @ 10"
4	≤ 20	1'-0"	# 5 @ 8"
	≤ 25	1'-0"	# 5 @ 8"
	≤ 30	1'-0"	# 5 @ 7"
	≤ 30	1'-0"	# 5 @ 7"
	≤ 40	1'-0"	# 6 @ 10"

NOTE TO SPECIFIER:

1. TABLES "A" AND "B" WILL BE USED TO DESIGN THE CAST-IN-PLACE BASE AND WALL FOR VARIOUS MANHOLE DIAMETER AND DEPTH.

TABLE "B"

WALL REINFORCING AND THICKNESS					
MH INSIDE DIA (FT)	DEPTH TO PIPE TO INV (FT)	MAXIMUM CAST-IN-PLACE WALL HEIGHT	WALL THICKNESS	REINFORCING AT EACH FACE	
				VERTICAL	HORIZONTAL
8	≤ 20	6'-0"	0'-10"	# 6 @ 12"	# 6 @ 12"
	≤ 25	6'-6"	0'-10"	# 6 @ 10"	
	≤ 30	7'-0"	0'-10"	# 6 @ 8"	
	≤ 40	8'-0"	1'-0"	# 6 @ 8"	
	≤ 50	9'-0"	1'-2"	# 6 @ 6"	
6	≤ 15	5'-0"	0'-8"	# 5 @ 12"	# 5 @ 12"
	≤ 20	5'-6"	0'-8"	# 5 @ 8"	
	≤ 25	6'-0"	0'-9"	# 5 @ 8"	
	≤ 30	6'-0"	0'-9"	# 5 @ 6"	
	≤ 40	7'-0"	0'-10"	# 5 @ 8"	
5	≤ 15	5'-0"	0'-8"	# 5 @ 12"	# 4 @ 12"
	≤ 20	5'-4"	0'-8"	# 5 @ 7"	
	≤ 25	5'-8"	0'-10"	# 5 @ 6"	
	≤ 30	6'-0"	0'-10"	# 6 @ 10"	
	≤ 40	6'-4"	0'-10"	# 6 @ 10"	
4	≤ 20	4'-6"	0'-8"	# 5 @ 12"	# 4 @ 12"
	≤ 25	5'-0"	0'-8"	# 5 @ 10"	
	≤ 30	5'-6"	0'-10"	# 6 @ 12"	
	≤ 30	5'-6"	0'-10"	# 6 @ 12"	
	≤ 40	6'-0"	0'-10"	# 6 @ 12"	



NOTES:

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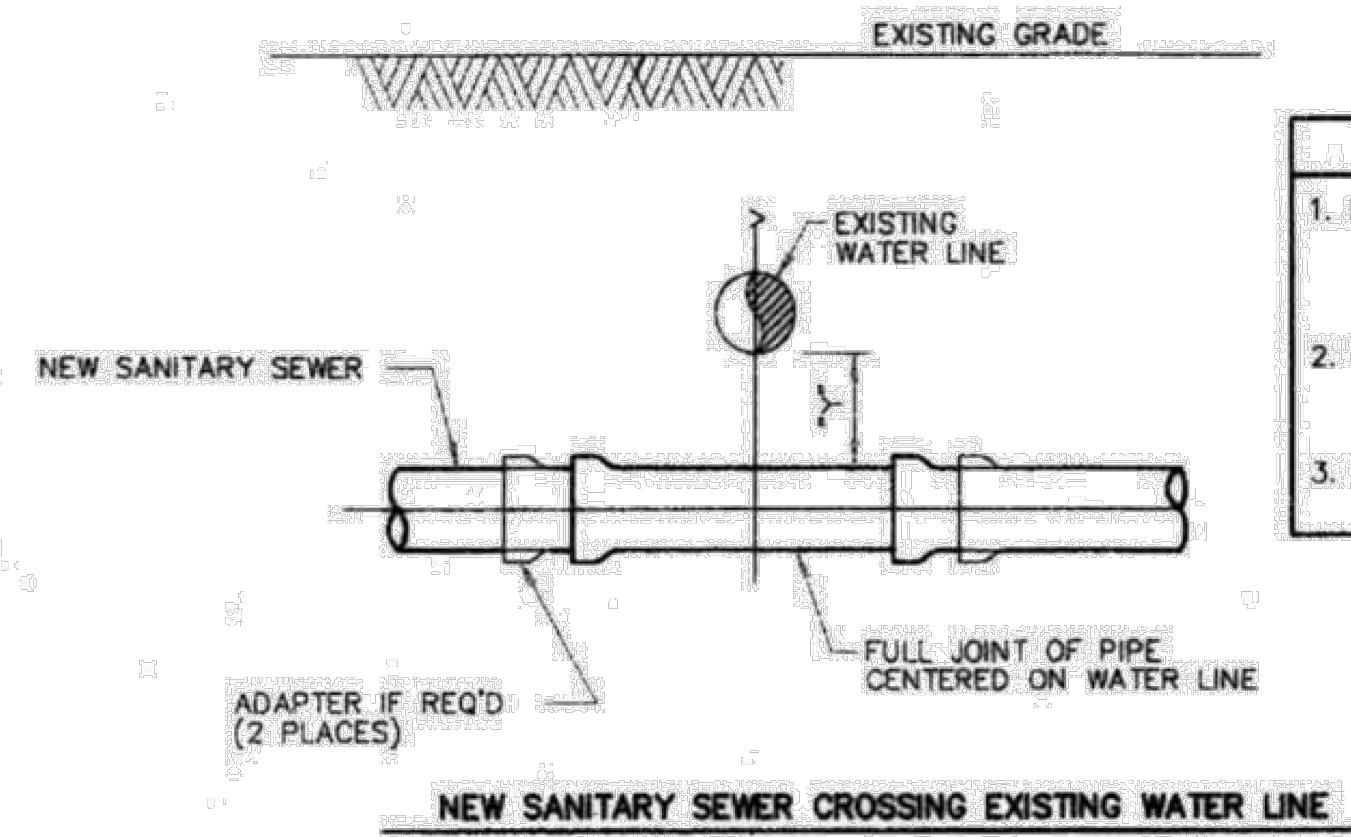
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
**SANITARY SEWER
PRECAST CONCRETE MANHOLE
WITH CAST-IN-PLACE BASE**
(NOT TO SCALE)
APPROVED BY: [Signature]
CITY ENGINEER DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 DWG NO: 02082-08

CIVIL DETAILS SHEET 5 OF 16

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 53 OF 106	

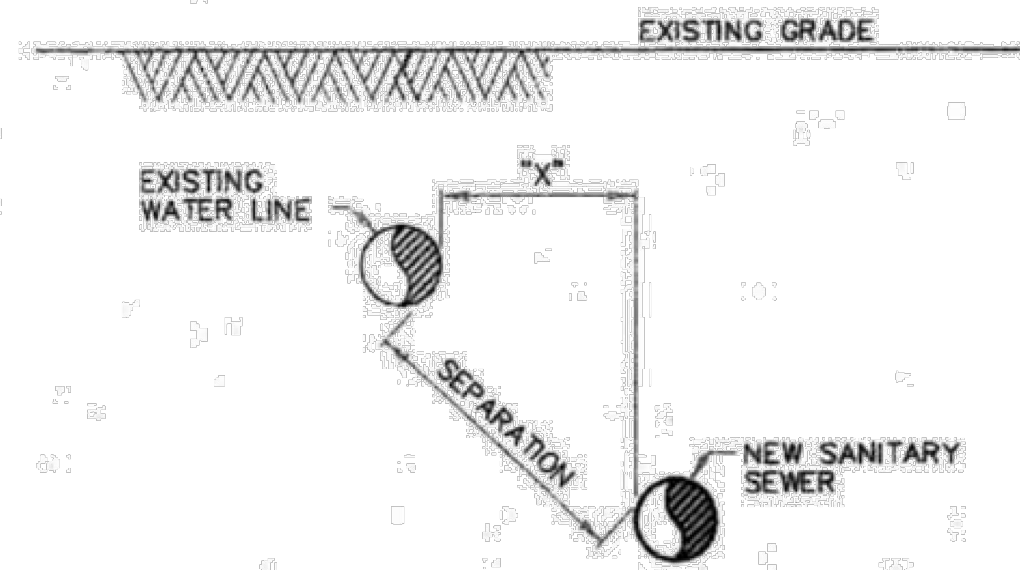
CITY TO PROVIDE UPDATED DETAIL



INSTALLATION REQUIREMENTS

1. IF "Y" IS GREATER THAN 1' AND "Y" IS LESS THAN 2', USE MINIMUM 18 FT JOINT OF PRESSURE-RATED PIPE PER COH STANDARD DRAWING.
2. IF "Y" IS GREATER THAN 2' AND "Y" IS LESS THAN 9', USE GRAVITY SEWER PIPE IN CEMENT-STABILIZED SAND EMBEDMENT.
3. IF "Y" IS GREATER THAN 9', USE STANDARD EMBEDMENT AND NORMAL JOINT SPACING.

NEW SANITARY SEWER CROSSING EXISTING WATER LINE



INSTALLATION REQUIREMENTS

1. IF SEPARATION IS LESS THAN 9', USE PRESSURE-RATED PIPE MH TO MH. "X" MUST BE AT LEAST 4 FT. VERTICAL SEPARATION MUST BE AT LEAST 2 FT.
2. IF SEPARATION IS 9' OR GREATER, USE STANDARD PIPE AND EMBEDMENT.

NEW SANITARY SEWER PARALLEL TO EXISTING WATER LINE

INSTALLING SANITARY SEWERS CROSSING OR PARALLEL TO WATER LINES

NOTES:

1. SANITARY SEWER MUST BE BELOW WATER LINE WHEREVER POSSIBLE. WHEN WATERLINE IS BELOW THE SANITARY SEWER PROVIDE MINIMUM 2 FT SEPARATION AND INSTALL PIPE IN ACCORDANCE TO CHAPTER 7 TABLE 7.3 OF COH DESIGN MANUAL.
2. WHEN PRESSURE-RATED PIPE IS REQUIRED, PROVIDE PIPE WITH MINIMUM 150 psi PRESSURE RATING.
3. ADAPTERS MUST BE FACTORY MOLDED OR FABRICATED, WITH RING STIFFNESS AT LEAST EQUAL TO THE ADJOINING SANITARY SEWER PIPE, AND USING RESILIENT GASKET OR SEAL MATERIAL. FLEXIBLE RUBBER "BOOT" TYPE ADAPTERS WILL NOT BE ACCEPTED.
4. INSTALL FORCE MAINS SAME AS FOR GRAVITY SEWER, USING SPECIFIED PRESSURE PIPE.
5. "Y" MUST ALWAYS BE GREATER THAN OR EQUAL TO 1 FT FOR PRESSURE RATED SS AND 2 FT FOR NON-PRESSURE RATED SS.
6. "X" MUST BE GREATER THAN OR EQUAL TO 4 FT.
7. ALTERNATIVES MAY BE SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.
8. SEPARATION REQUIREMENTS SHOWN HERE DO NOT APPLY TO SERVICE CONNECTIONS - REFER TO PLUMBING CODE FOR APPLICABLE REQUIREMENTS.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

**SANITARY SEWER
INSTALLING SANITARY SEWERS
CROSSING OR PARALLEL TO WATER LINES
(NOT TO SCALE)**

APPROVED: [Signature] CITY ENGINEER
[Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JUL-01-2010 DWG NO: 02531-05

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3700 W Sam Houston Pkwy S Houston, TX 77042

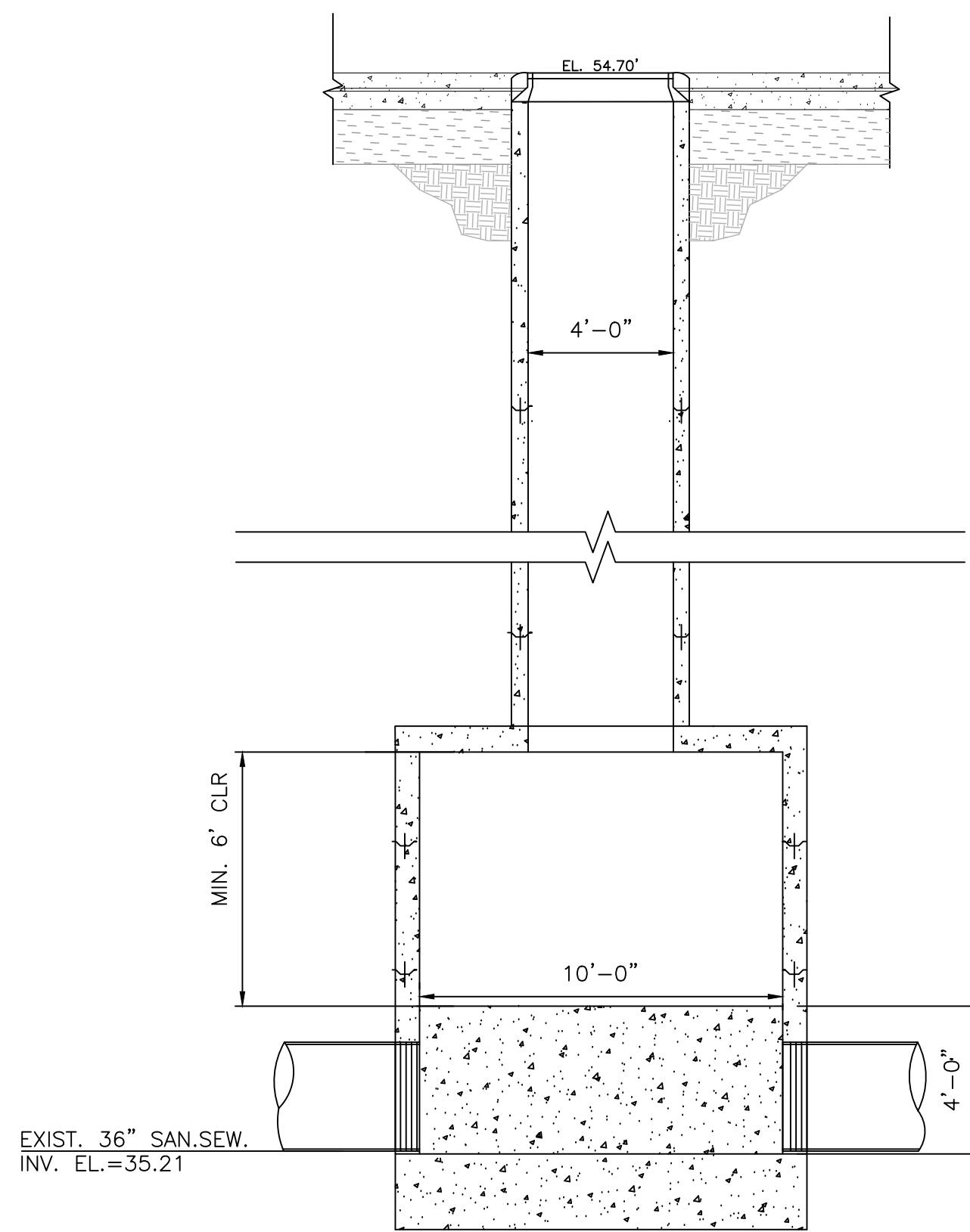
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LAND-TECH, INC.
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133023
06/05/2026
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2014

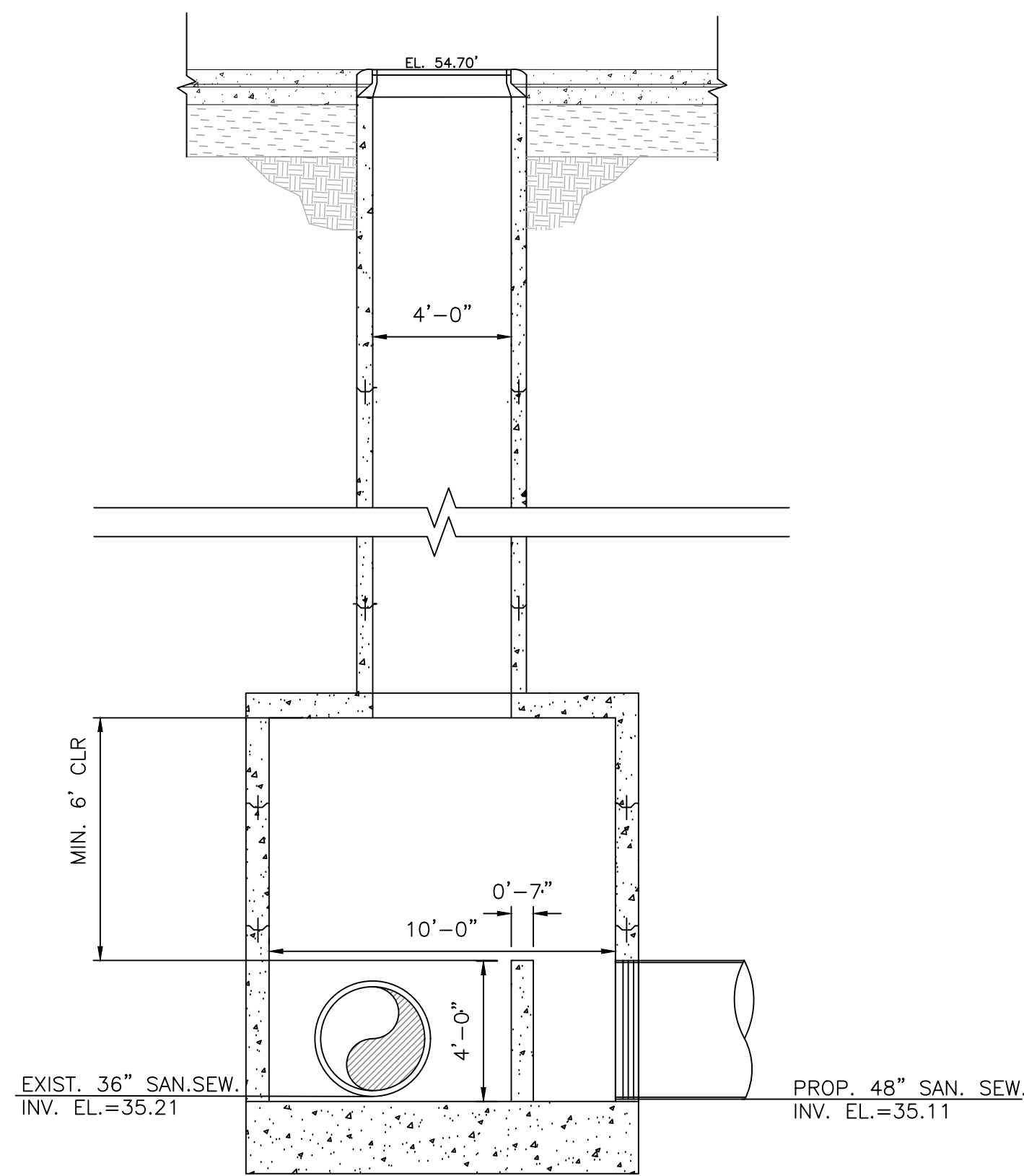
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 6 OF 16

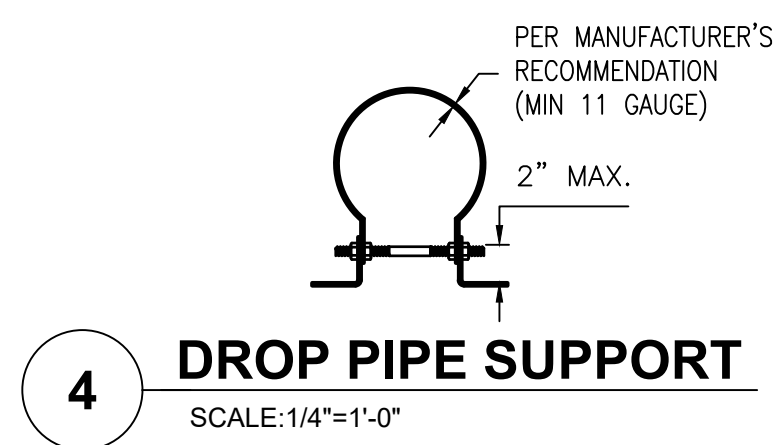
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NEIL BARNSDALE, P.E.	
SHEET NO. 54 OF 106	



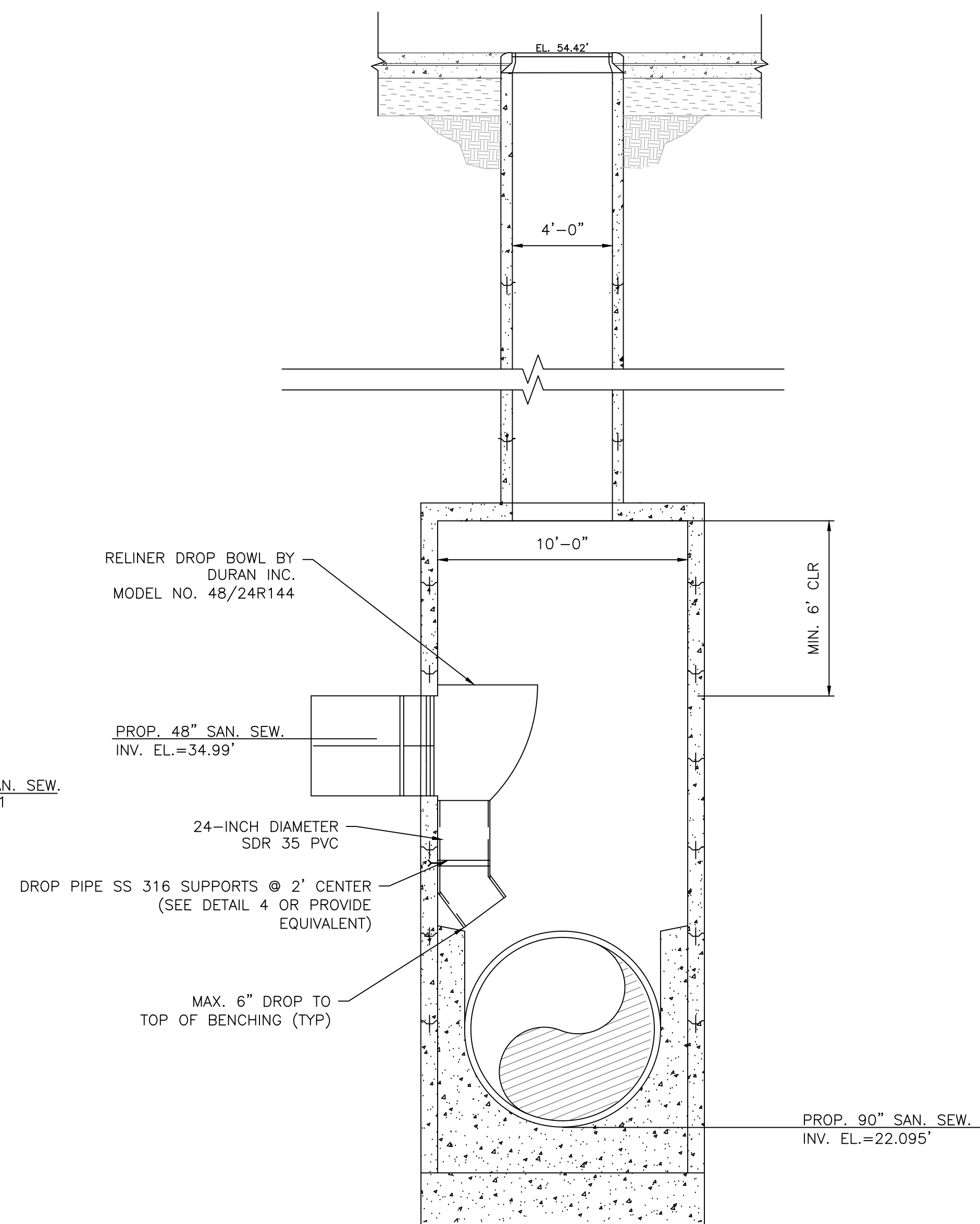
1 MANHOLE @ LOCKWOOD DR. & DENMARK ST. TIE IN MH #1
SCALE:1/4"=1'-0"



2 MANHOLE @ LOCKWOOD DR. & DENMARK ST. TIE IN MH #1
SCALE:1/4"=1'-0"



4 DROP PIPE SUPPORT
SCALE:1/4"=1'-0"



3 MANHOLE @ LOCKWOOD DR. MH #9 WITH INTERNAL DROP
SCALE:1/4"=1'-0"

NOTES:

1. A MANHOLE LOCATED WITHIN A 100-YEAR FLOOD PLAIN MUST BE GASKETED AND BOLTED DOWN TO PREVENT INFLOW.
2. A MANHOLE COVER THAT IS LOCATED IN A ROADWAY MUST MEET OR EXCEED THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS STANDARD M-306 FOR LOAD BEARING.
3. A MANHOLE CONNECTED TO PIPES LESS THAN 15 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST HALF THE LARGEST PIPE'S DIAMETER.
4. A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
5. A MANHOLE CONNECTED TO A PIPE THAT IS GREATER THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THE LARGEST PIPE'S DIAMETER.
6. IN A MANHOLE WITH PIPES OF DIFFERENT SIZES, THE TOPS OF ALL THE PIPES MUST BE AT THE SAME ELEVATION AND FLOW CHANNELS IN THE INVERT MUST BE SLOPED EVENLY FROM PIPE TO PIPE TO PREVENT BACKPRESSURE.
7. A COLLECTION SYSTEM PIPE ENTERING A MANHOLE MORE THAN 24 INCHES ABOVE AN INVERT MUST HAVE A DROP PIPE.
8. A MANHOLE-PIPE CONNECTION MUST USE WATERTIGHT, SIZE-ON-SIZE RESILIENT CONNECTORS THAT ALLOW FOR DIFFERENTIAL SETTLEMENT AND MUST CONFORM TO AMERICAN SOCIETY FOR TESTING AND MATERIALS C923.

BENCHING NOTES:

1. A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
2. A MANHOLE CONNECTED TO A PIPE THAT IS GREATER THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THE LARGEST PIPE'S DIAMETER.

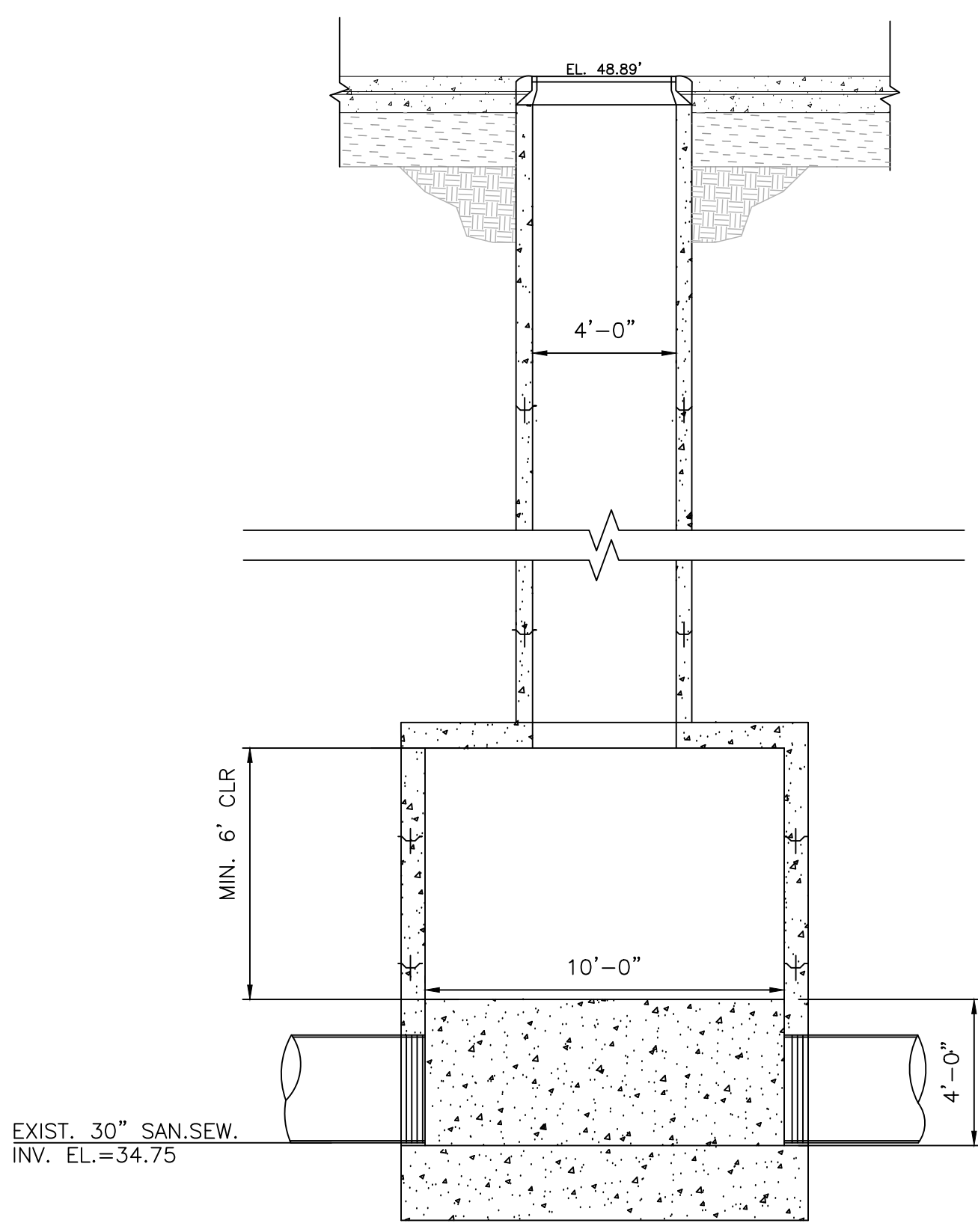
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HOUSTON PUBLIC WORKS

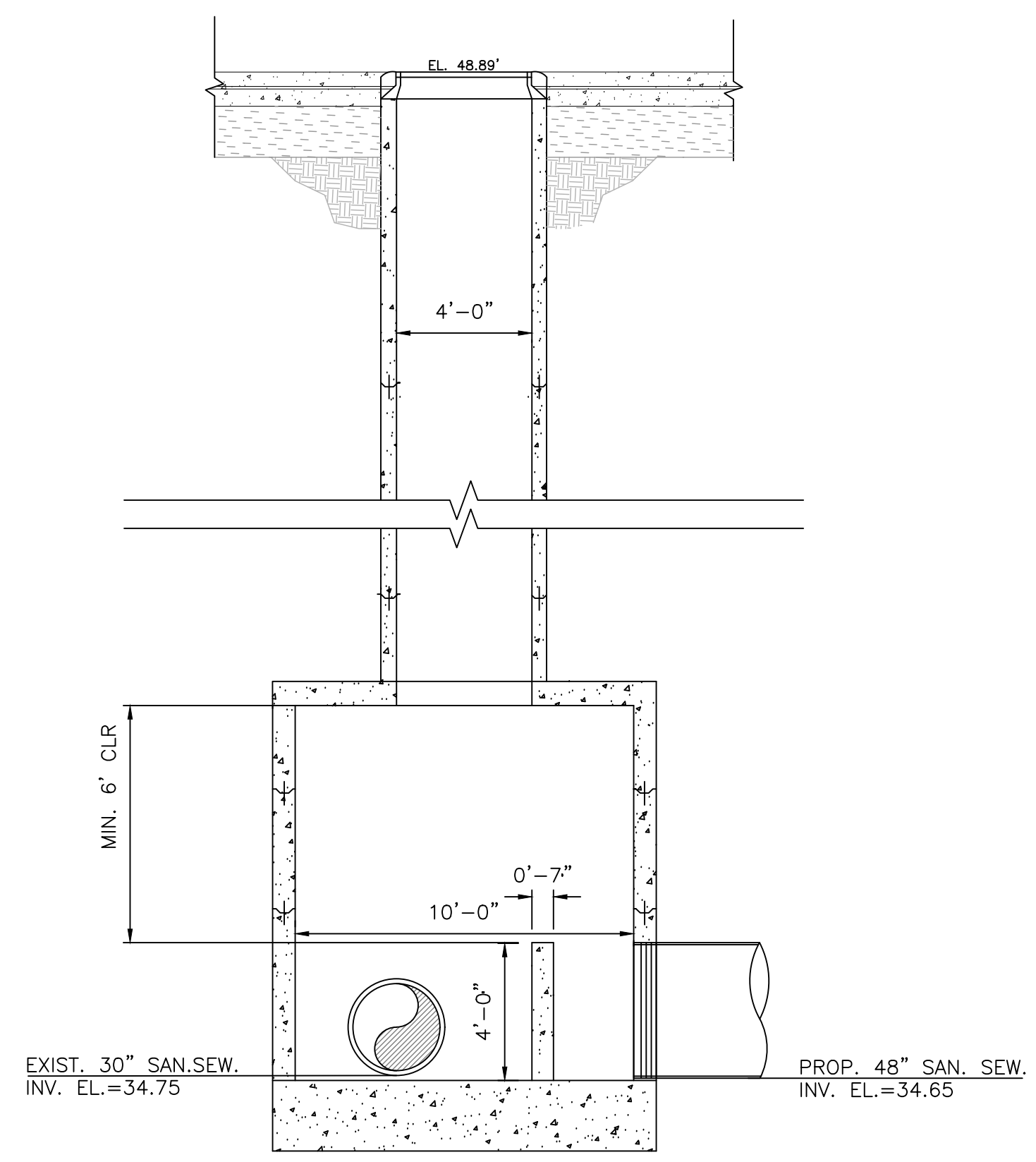
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 7 OF 16

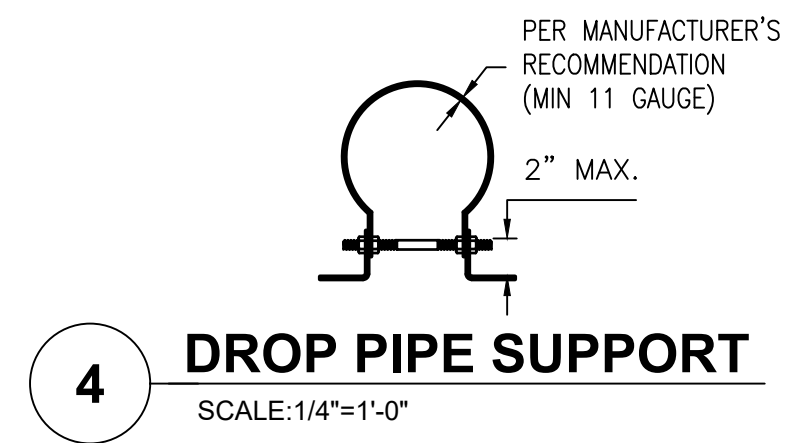
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NEIL BARNSDALE, P.E.	
SHEET NO. 55 OF 106	



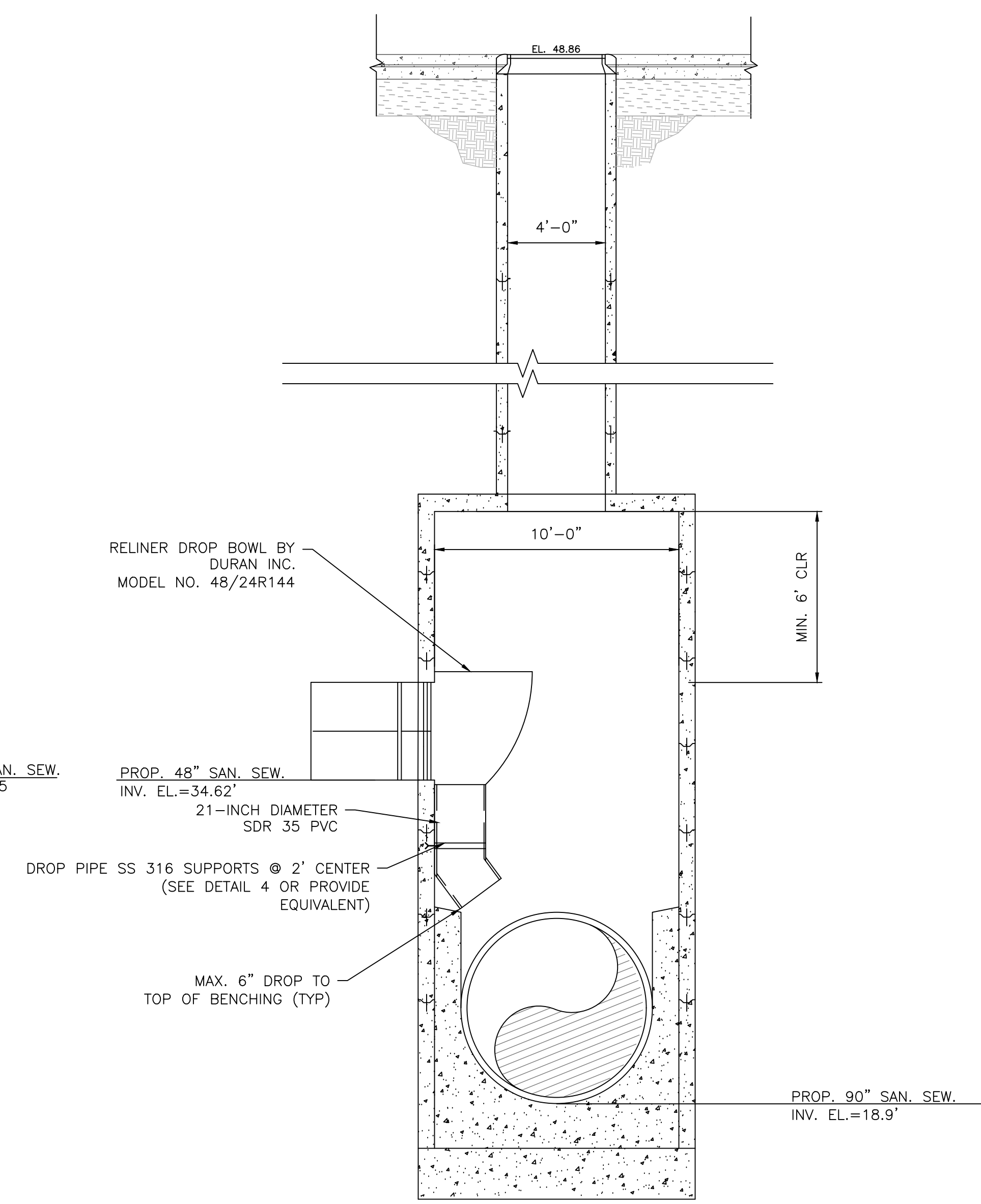
1 **MANHOLE @ LOCKWOOD DR. TIE IN MH #2**
SCALE: 1/4"=1'-0"



2 **MANHOLE @ LOCKWOOD DR. TIE IN MH #2**
SCALE: 1/4"=1'-0"



4 **DROP PIPE SUPPORT**
SCALE: 1/4"=1'-0"



3 **MANHOLE @ LOCKWOOD DR. MH #5 WITH INTERNAL DROP**
SCALE: 1/4"=1'-0"

- NOTES:**
1. A MANHOLE LOCATED WITHIN A 100-YEAR FLOOD PLAIN MUST BE GASKETED AND BOLTED DOWN TO PREVENT INFLOW.
 2. A MANHOLE COVER THAT IS LOCATED IN A ROADWAY MUST MEET OR EXCEED THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS STANDARD M-306 FOR LOAD BEARING.
 3. A MANHOLE CONNECTED TO PIPES LESS THAN 15 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST HALF THE LARGEST PIPE'S DIAMETER.
 4. A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
 5. A MANHOLE CONNECTED TO A PIPE THAT IS GREATER THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THE LARGEST PIPE'S DIAMETER.
 6. IN A MANHOLE WITH PIPES OF DIFFERENT SIZES, THE TOPS OF ALL THE PIPES MUST BE AT THE SAME ELEVATION AND FLOW CHANNELS IN THE INVERT MUST BE SLOPED EVENLY FROM PIPE TO PIPE TO PREVENT BACKPRESSURE.
 7. A COLLECTION SYSTEM PIPE ENTERING A MANHOLE MORE THAN 24 INCHES ABOVE AN INVERT MUST HAVE A DROP PIPE.
 8. A MANHOLE-PIPE CONNECTION MUST USE WATERTIGHT, SIZE-ON-SIZE RESILIENT CONNECTORS THAT ALLOW FOR DIFFERENTIAL SETTLEMENT AND MUST CONFORM TO AMERICAN SOCIETY FOR TESTING AND MATERIALS C923.

- BENCHING NOTES:**
1. A MANHOLE CONNECTED TO A PIPE THAT IS AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
 2. A MANHOLE CONNECTED TO A PIPE THAT IS GREATER THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THE LARGEST PIPE'S DIAMETER.

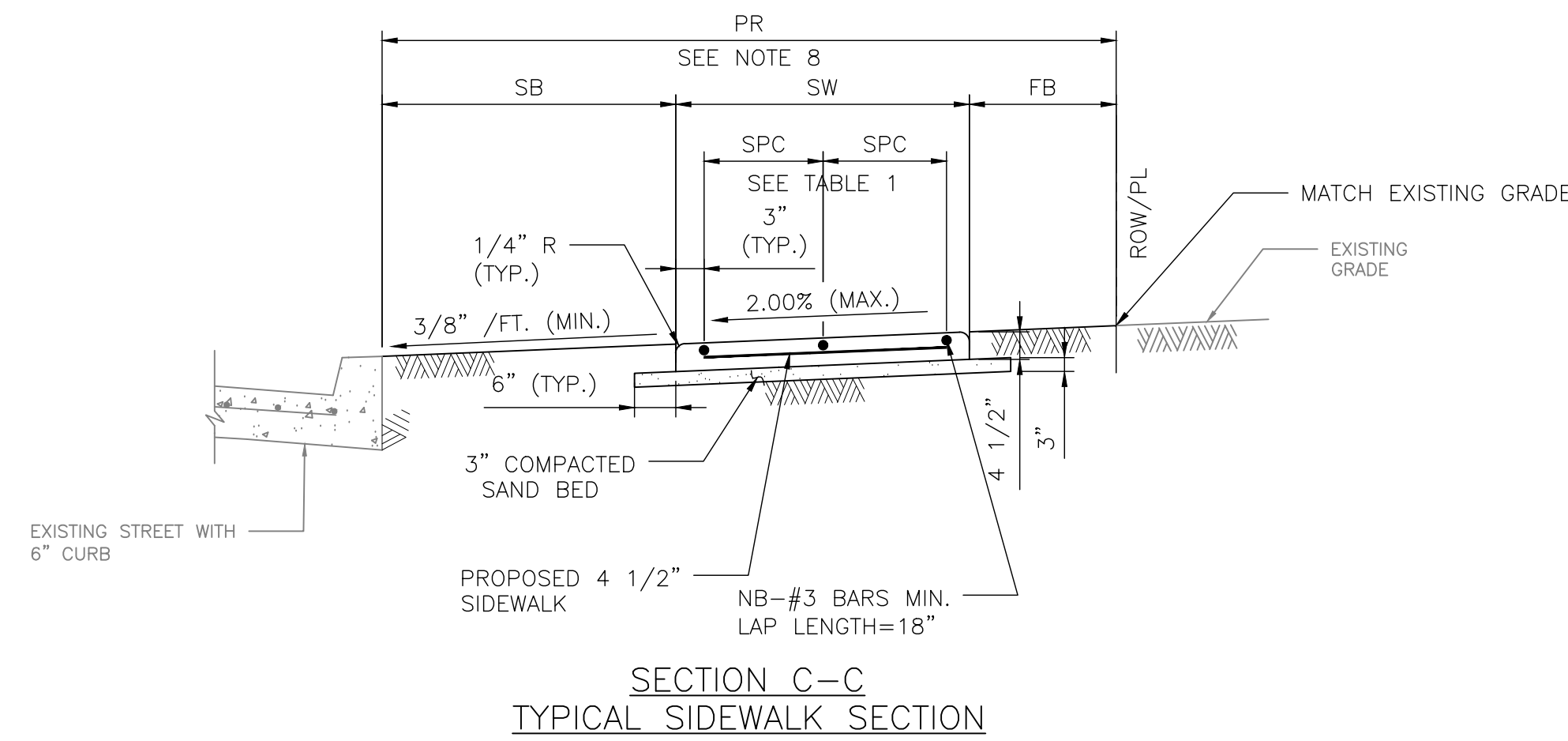
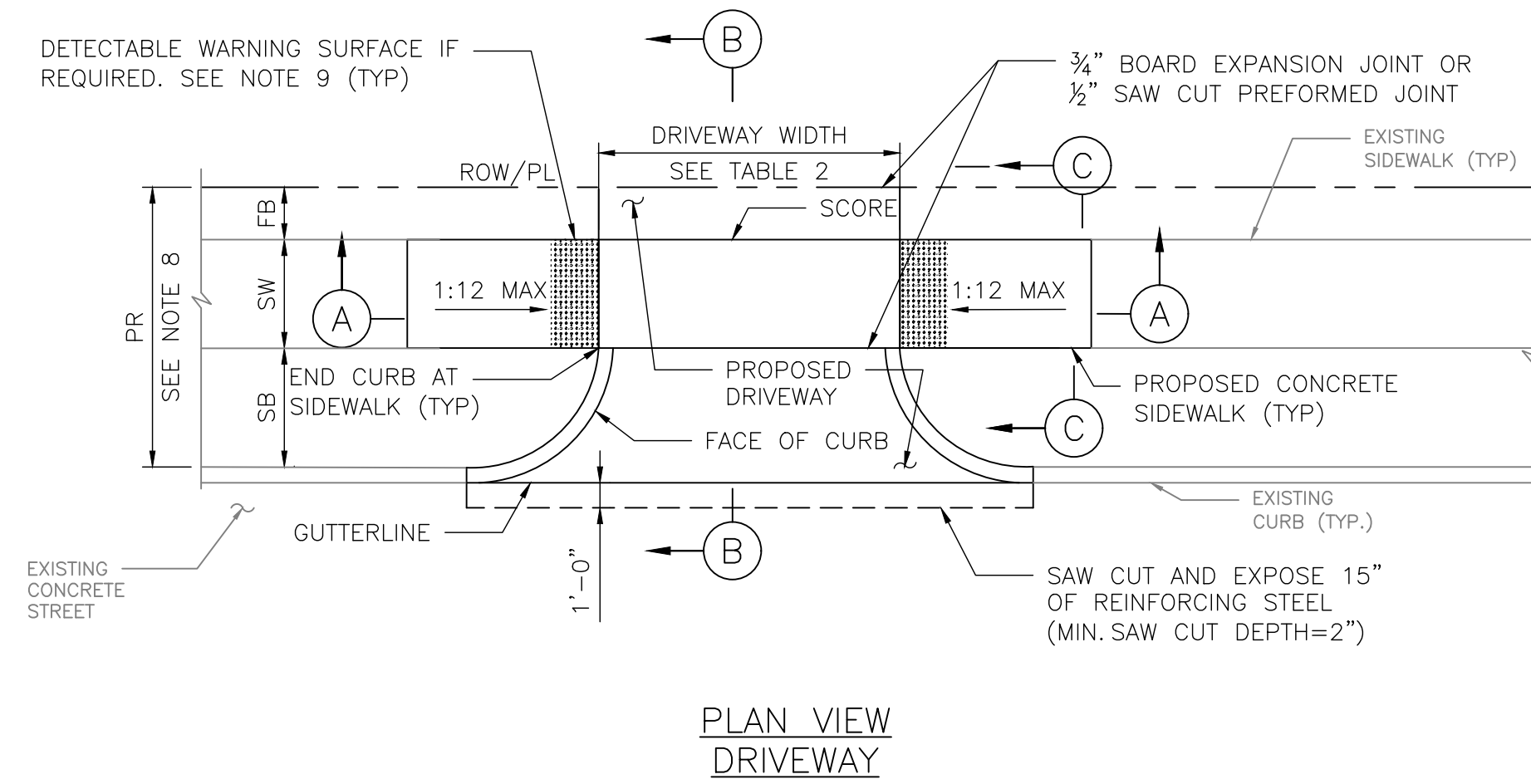
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 8 OF 17

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DRAWING SCALE	
NONE	
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SHEET NO. 56 OF 106	



NOTES:

- REPAIR, RECONSTRUCTION OR REPLACEMENT OF SIDEWALKS SHALL MEET PERMITTING REQUIREMENTS OF CODE OF ORDINANCES SECTION 40-552.
- FOR REPAIR, RECONSTRUCTION, OR REPLACEMENT OF EXISTING SIDEWALKS:
 - EXISTING SIDEWALKS LESS THAN OR EQUAL TO 20 FEET IN TOTAL LENGTH:
 - THE PROPOSED SIDEWALK WIDTH WILL BE ALLOWED TO MATCH THE EXISTING SIDEWALK.
 - EXISTING SIDEWALKS GREATER THAN 20 FEET IN TOTAL LENGTH:
 - THE SIDEWALK WIDTH FOR THE ENTIRE PROPERTY WIDTH SHALL BE IMPROVED TO MEET WIDTH REQUIREMENTS ACCORDING TO THE LATEST INFRASTRUCTURE DESIGN MANUAL.
- 20 FOOT TOTAL LENGTH IS DEFINED AS:
 - UP TO 10 FEET ON BOTH SIDES OF THE DRIVEWAY; OR
 - UP TO 20 FEET WHEN SIDEWALK AFFECTED IS LOCATED ONLY ON ONE SIDE OF THE DRIVEWAY.
- ALL JOINTS ALONG THE SIDEWALK SHALL BE CONSTRUCTED ACCORDING TO DRAWING 02752-02 AND SPECIFICATION 02752.
- DRIVEWAYS SHALL BE MINIMUM 6" THICK FOR SINGLE FAMILY AND DUPLEXES. DRIVEWAYS SHALL BE MINIMUM 7" THICK FOR ALL OTHERS (I.E. COMMERCIAL, INDUSTRIAL, ETC.)
- DRIVEWAYS AND SIDEWALKS SHALL BE CONSTRUCTED WITH PORTLAND CEMENT CONCRETE AND INCLUDE 5 1/2 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
- ALL RAMPS AND SIDEWALKS/WALKWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH HOUSTON PUBLIC WORKS STANDARDS, TEXAS ACCESSIBILITY STANDARDS (TAS) AND AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS. IF THERE IS A CONFLICT IN THE REQUIREMENTS, THE STRICTEST REQUIREMENTS SHALL GOVERN.
- CURB RAMP THAT ARE STEEPER THAN A 1:12 MAX SLOPE WILL NOT BE ACCEPTED BY THE CITY OF HOUSTON.
- REFER TO CONTRACT DRAWINGS FOR PEDESTRIAN REALM (PR), SIDEWALK (SW), FRONTAGE BUFFER (FB), AND SAFETY BUFFER (SB) WIDTHS.
- DETECTABLE WARNING SURFACES:
 - SIDEWALK SHALL HAVE A DETECTABLE WARNING SURFACE WHERE:
 - SIDEWALK INTERSECTS TYPE C DRIVEWAYS (COMMERCIAL DRIVEWAYS) THAT ARE STOP, YIELD, OR TRAFFIC SIGNAL CONTROLLED; OR
 - SIDEWALK SLOPE IS GREATER THAN 1:20 AND INTERSECTS A TYPE C DRIVEWAY (COMMERCIAL DRIVEWAY)
 - DETECTABLE WARNING SURFACES ARE OPTIONAL WHERE SIDEWALKS INTERSECT TYPE A DRIVEWAYS (SINGLE FAMILY RESIDENTIAL HOUSES OR DUPLEXES) OR TYPE B DRIVEWAYS (SHARED ACCESS/SHARED DRIVEWAYS).
 - REFER TO STANDARD DETAILS 02775-06 TO 02775-07 FOR DETECTABLE WARNING SURFACE STANDARDS.

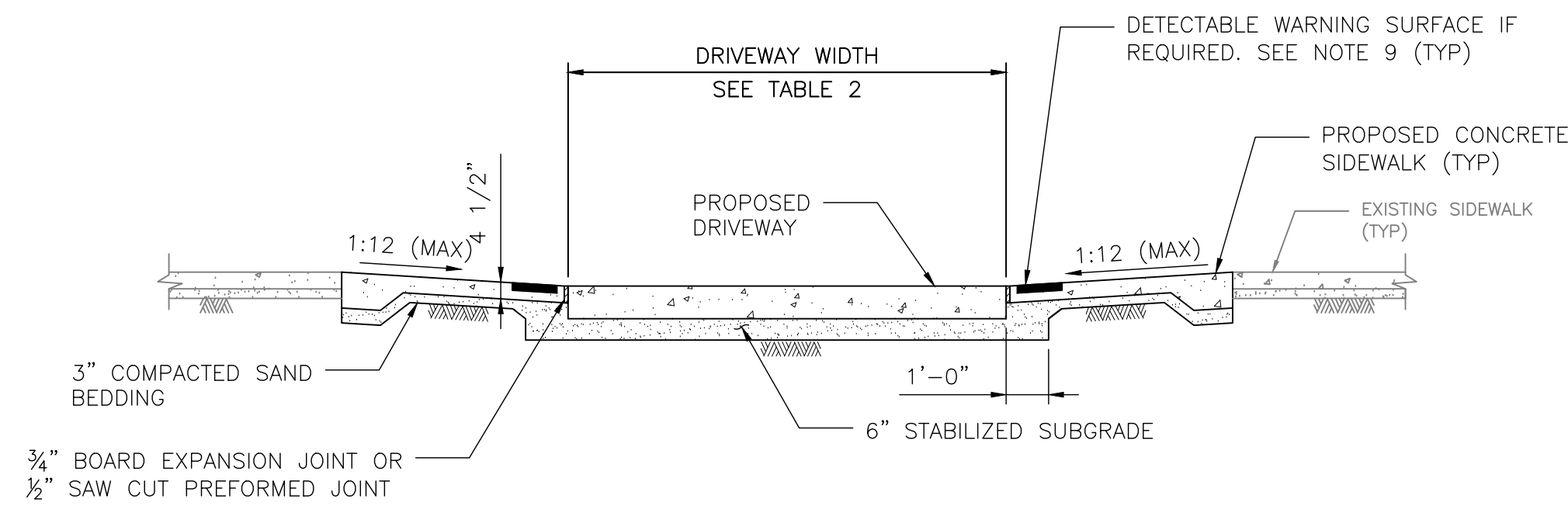


TABLE 1

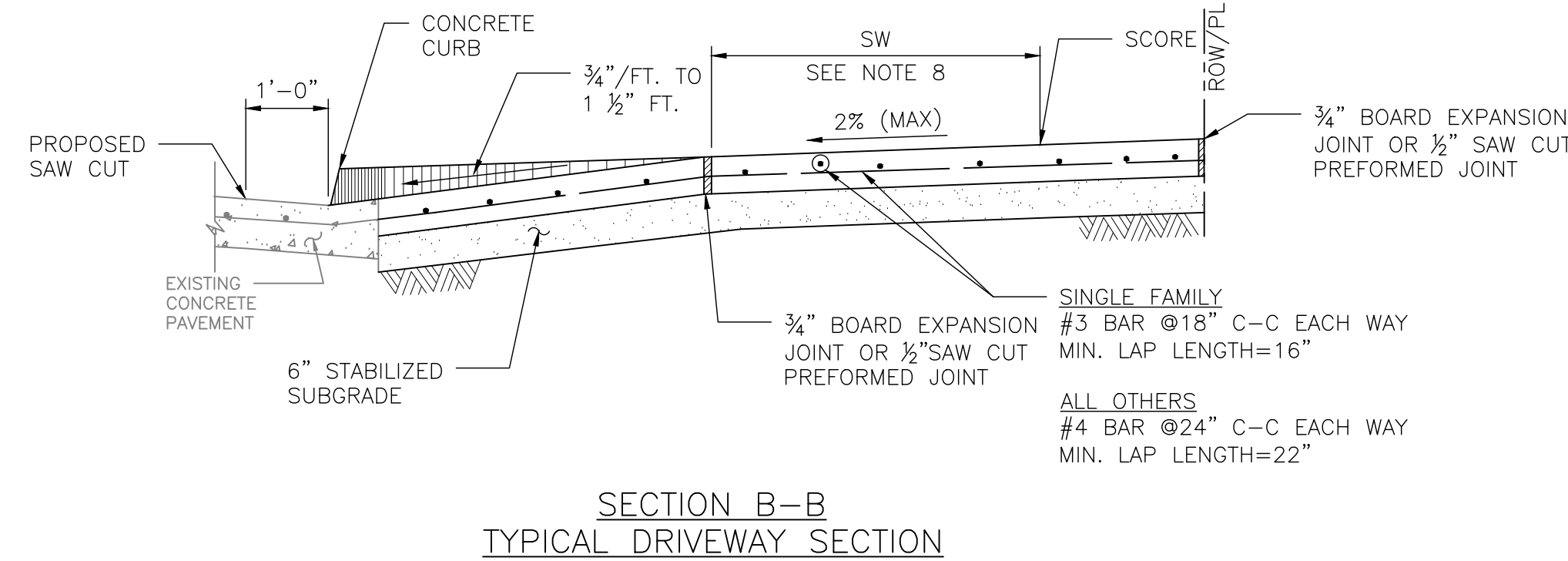
REINFORCING STEEL INFORMATION FOR 4 1/2" THICK SIDEWALKS
 EXPANSION JOINT SPACING = 40 FT
 f_c' = 3,500 PSI AND f_y = 60,000 PSI
 REFER TO CONTRACT DRAWINGS FOR SIDEWALKS WIDER THAN 6 FEET.

SIDEWALK THICKNESS (IN)	SIDEWALK WIDTH (FT)	LONGITUDINAL STEEL #3 BARS			TRANSVERSE STEEL #3 BARS SPACING (IN)
		NO. OF BARS "NB"	SPACING "SPC" (IN)	END BAR SPACING (IN)	
4.5	5	3	27	3	48
4.5	6	4	22	3	48

TABLE 2

TRAFFIC TYPE	DRIVEWAY DESIGN CRITERIA (1)(2)											
	TYPE A DRIVEWAY (FOR SINGLE FAMILY RESIDENTIAL HOUSES OR DUPLEXES)				TYPE B DRIVEWAY (SHARED ACCESS/SHARED DRIVEWAY)				TYPE C DRIVEWAY (COMMERCIAL DRIVEWAY)			
	WIDTH (FT)		RADIUS (FT)		WIDTH (FT)		RADIUS (FT)		WIDTH (FT)		RADIUS (FT)	
ONE-WAY	10	12	4	10	12 ⁽⁵⁾	16 ⁽⁵⁾	4 ⁽⁵⁾	10 ⁽⁵⁾	15	20	10	20
TWO-WAY	10 ⁽³⁾	24 ⁽⁴⁾	4	10	16 ⁽⁶⁾	24	4	10	24	35	10	20

(1) REFER TO INFRASTRUCTURE DESIGN MANUAL ARTICLE 15.2.07.C.1.F FOR DRIVEWAYS THAT REQUIRE A VEHICLE SWEEP PATH ANALYSIS.
 (2) REFER TO INFRASTRUCTURE DESIGN MANUAL ARTICLES 15.2.07.C.1.G.(1) AND 15.2.07.C.1.G.(2) FOR TYPE 1 PAE AND TYPE 2 PAE REQUIREMENTS.
 (3) THE MINIMUM WIDTH FOR JOINT ACCESS DRIVEWAY IS 12 FT.
 (4) REFER TO CHAPTER 42 OF THE CODE OF ORDINANCES FOR DRIVEWAY WIDTHS FOR NARROW LOTS.
 (5) ONLY MURS AND COURTYARD STYLE DEVELOPMENTS ON CORNER LOTS CAN HAVE ONE-WAY DRIVEWAYS.
 (6) REFER TO CHAPTER 42, SECTION 42-146 OF THE CODE OF ORDINANCES FOR EXCEPTIONS TO THE MINIMUM DRIVEWAY WIDTH FOR SHARED DRIVEWAYS.



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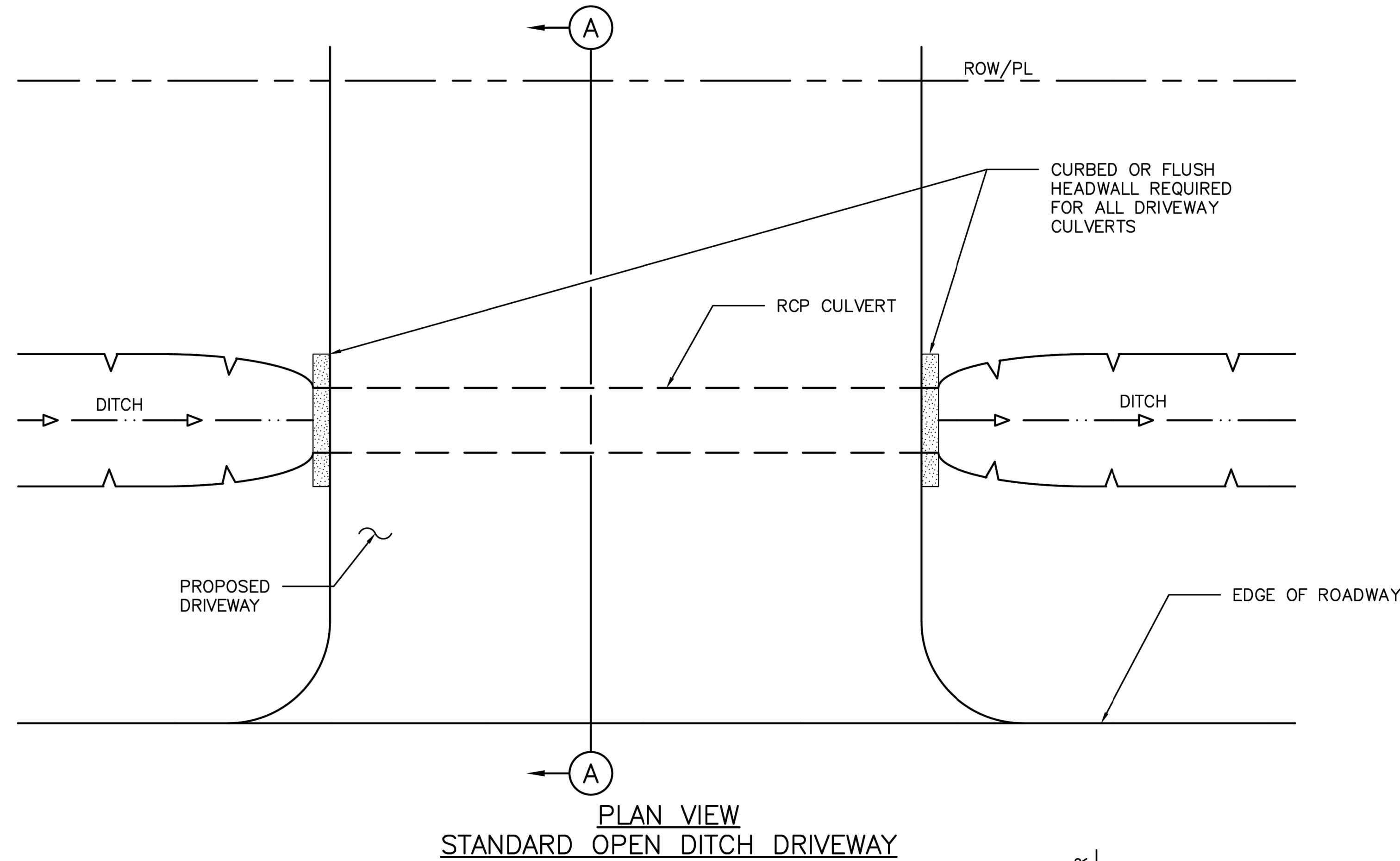
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 9 OF 16

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CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 57 OF 106	

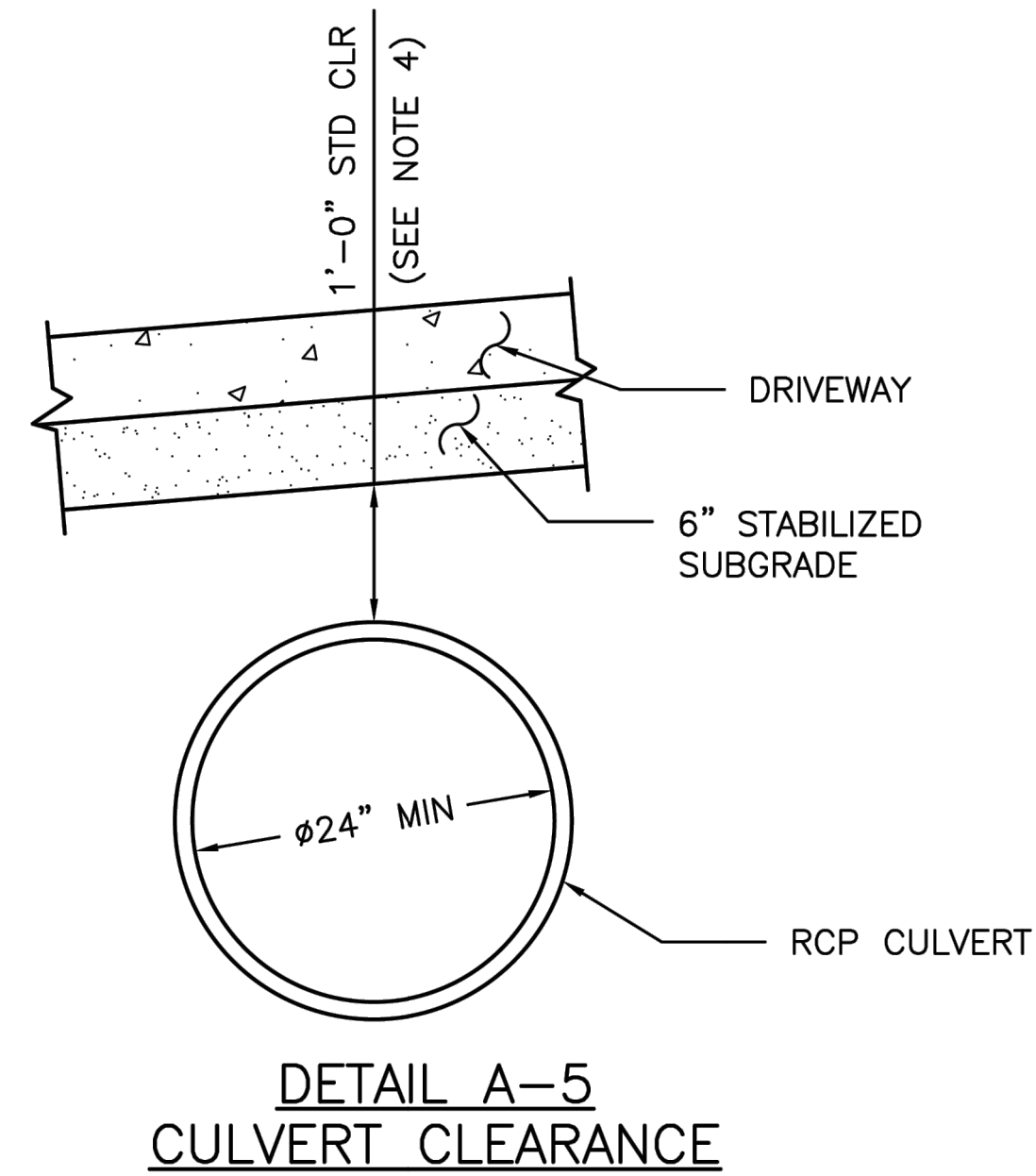
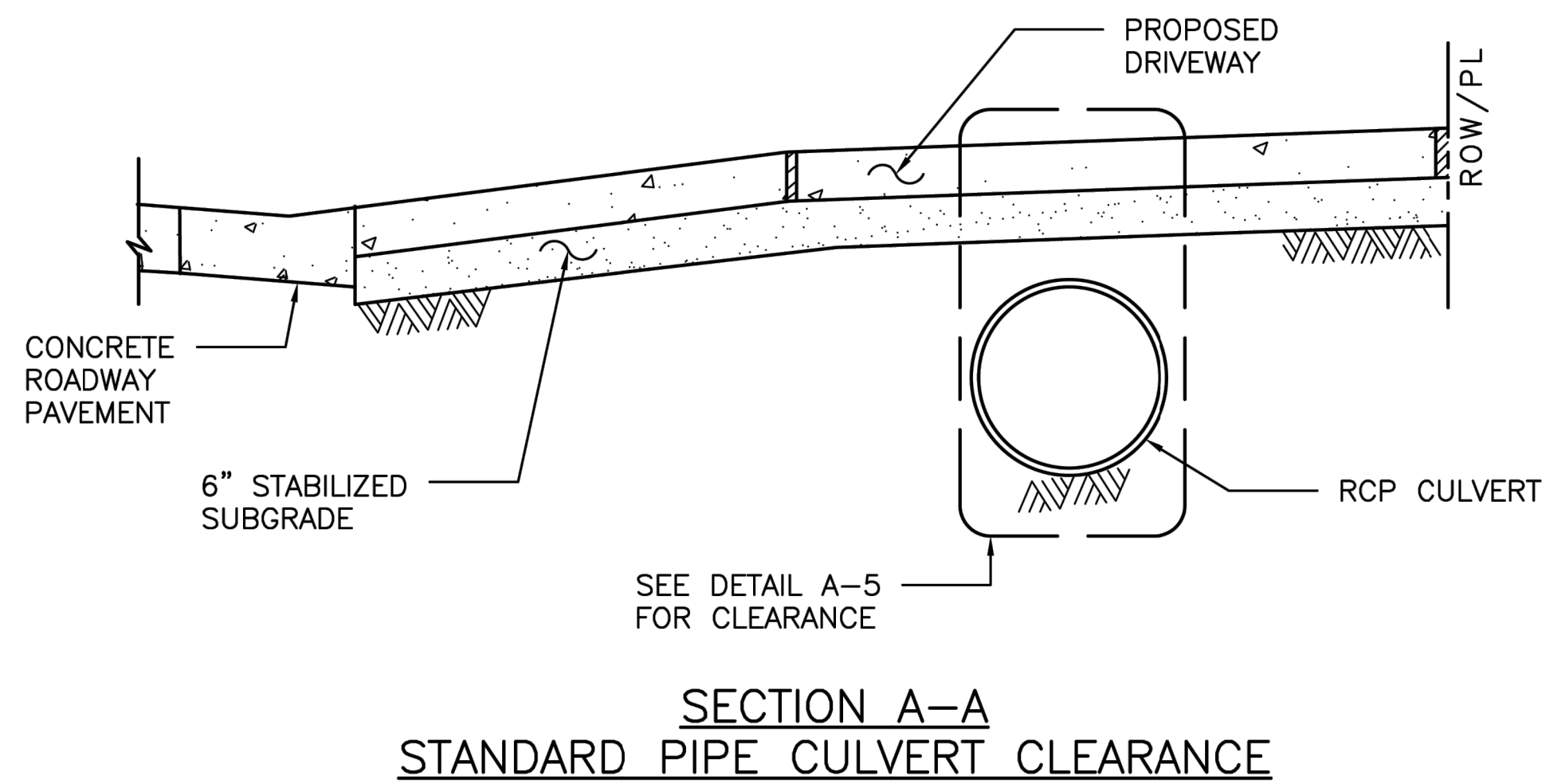
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DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW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



NOTES:

1. PIPE CULVERTS SHALL CONFORM TO CHAPTER 9 DESIGN REQUIREMENTS OF THE INFRASTRUCTURE DESIGN MANUAL AND MATERIAL REQUIREMENTS OF STANDARD CONSTRUCTION SPECIFICATION SECTION 02631.
2. RCP CULVERT SIZE WILL BE APPROVED BY CITY ENGINEER WITH 24" DIAMETER MINIMUM.
3. DRIVEWAY MATERIAL WITHIN THE RIGHT OF WAY SHALL BE CONCRETE OR ASPHALT.
4. WHERE STANDARD 1'-0" CLEARANCE IS NOT FEASIBLE, MINIMUM CLEARANCE OF 6" IS ALLOWED WHEN APPROVED BY THE OFFICE OF THE CITY ENGINEER (OCE).
5. DITCH FLOW LINE DIRECTION DEPICTED IS SHOWN AS AN EXAMPLE AND MAY NOT MATCH SITE SPECIFIC CONDITIONS. REFER TO CONTRACT DRAWINGS FOR FLOW LINE DIRECTION AND ELEVATIONS.



CITY OF HOUSTON HOUSTON PUBLIC WORKS STANDARD	
DRIVEWAYS WITH CULVERTS ON OPEN DITCH TYPE STREETS	
(SCALE: NOT TO SCALE)	
APPROVED BY:	
DocuSigned by: <i>Sulail Kanwar</i> <small>9EF8B0C641F5478...</small> CITY ENGINEER DocuSigned by: <i>KARINE NGUYEN</i> <small>95A29EFD7A75B4CD...</small> CITY TRAFFIC ENGINEER	DocuSigned by: <i>Carol Haddock</i> <small>A93C410B72B3453...</small> DIRECTOR OF HPW
EFF DATE: NOV-27-2023	DWG NO: 02754-02

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HOUSTON PUBLIC WORKS

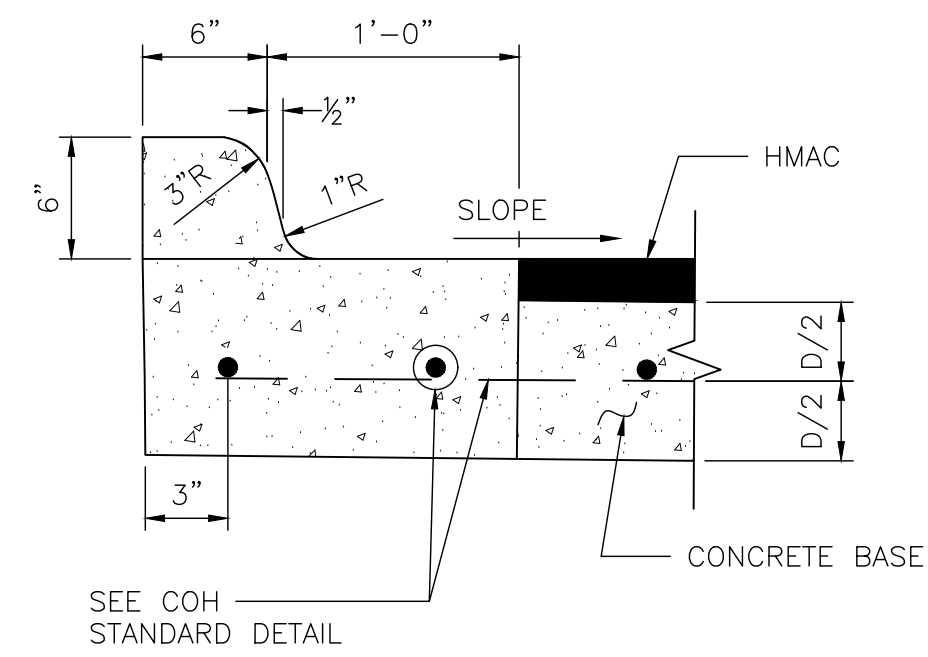
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 10 OF 17

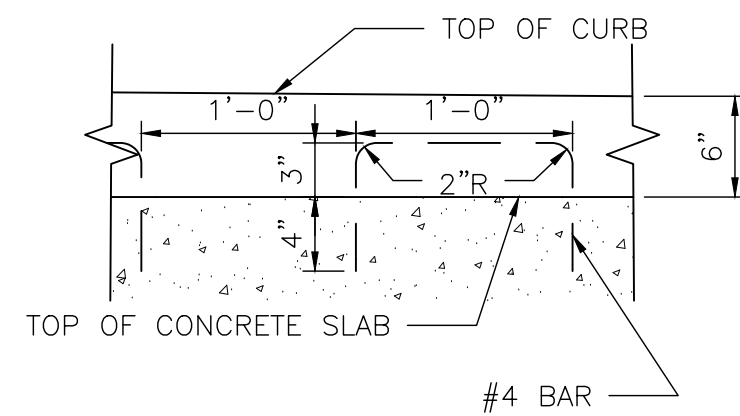
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NEIL BARNSDALE, P.E.	
SHEET NO. 58 OF 106	

4"x12" MONOLITHIC AND TRANSITION CURB NOTES:

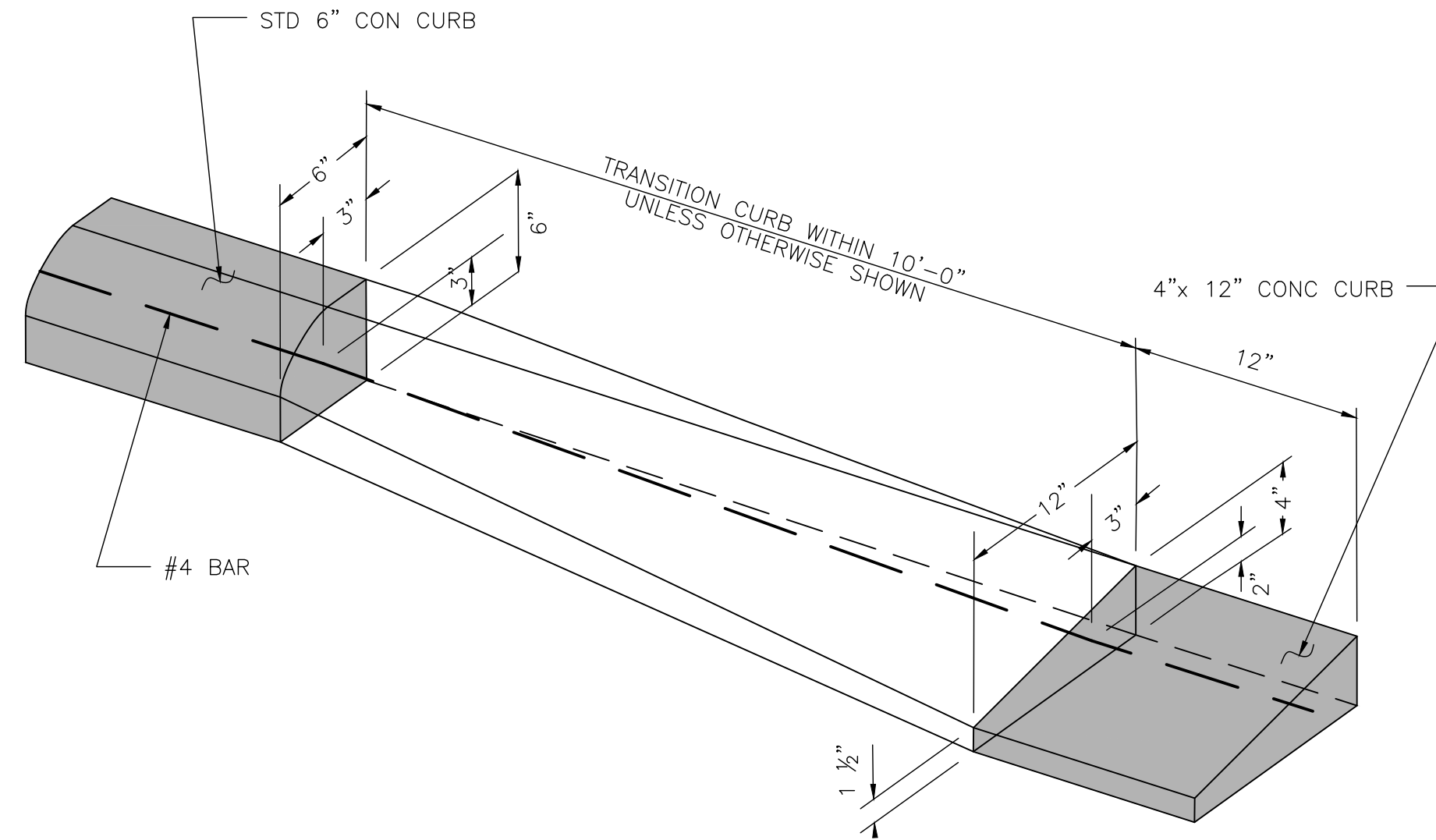
- 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS, NON-RESIDENTIAL STREETS, AND RESIDENTIAL STREETS.
- TRANSITIONS FROM 6-INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10-FEET TRANSITION CURB IS NOT POURED MONOLITHICALLY WITH THE PAVEMENT, THEN REINFORCING STEEL AS SHOWN IN "4-INCH x 12-INCH TRANSITION CURB" IS TO BE INSTALLED.



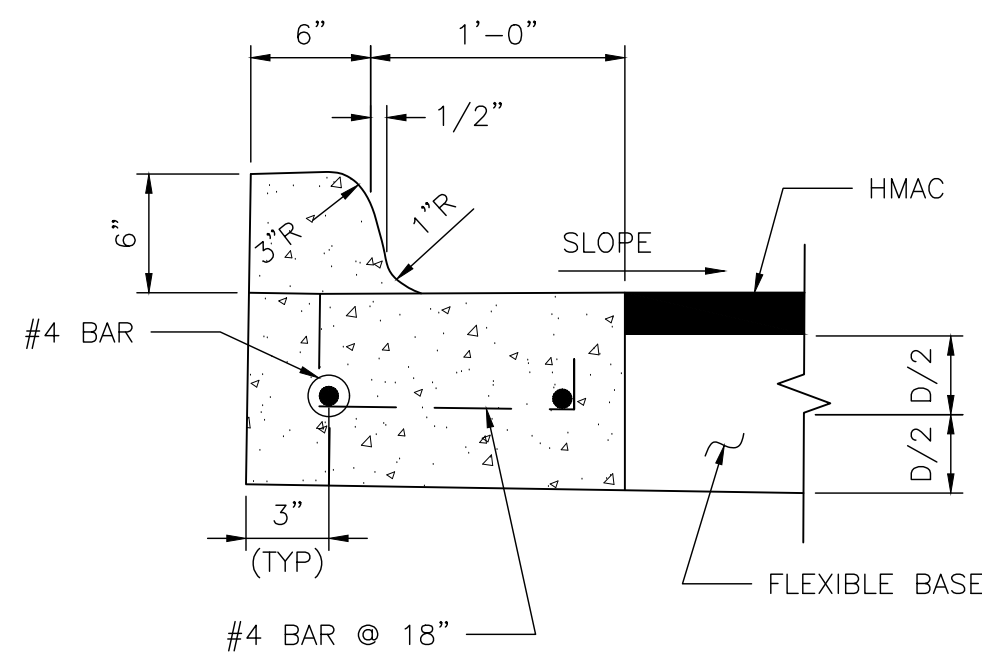
ESPLANADE CURB CONNECTED TO CONCRETE BASE



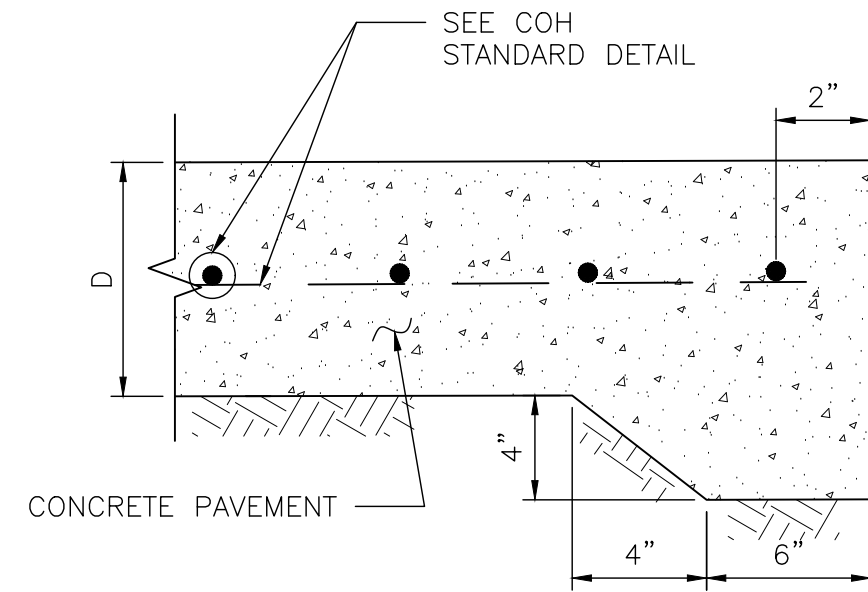
ALTERNATE CONCRETE CURB REINFORCEMENT



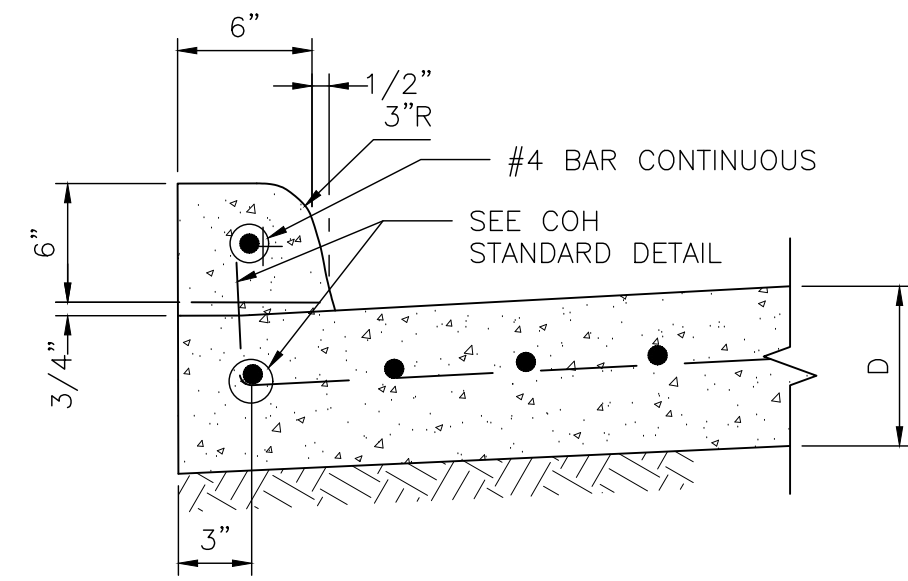
CURB TRANSITION (SEE NOTES)



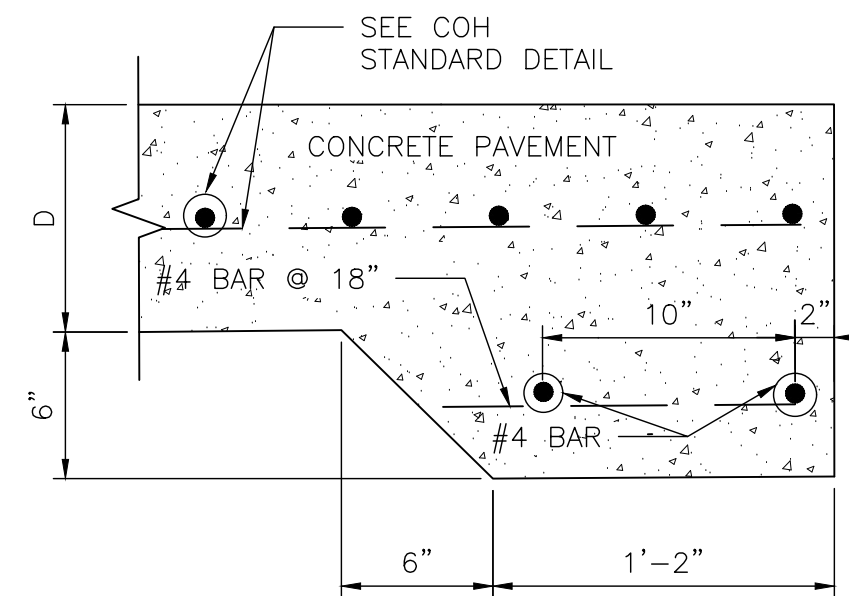
ESPLANADE CURB CONNECTED TO FLEXIBLE BASE



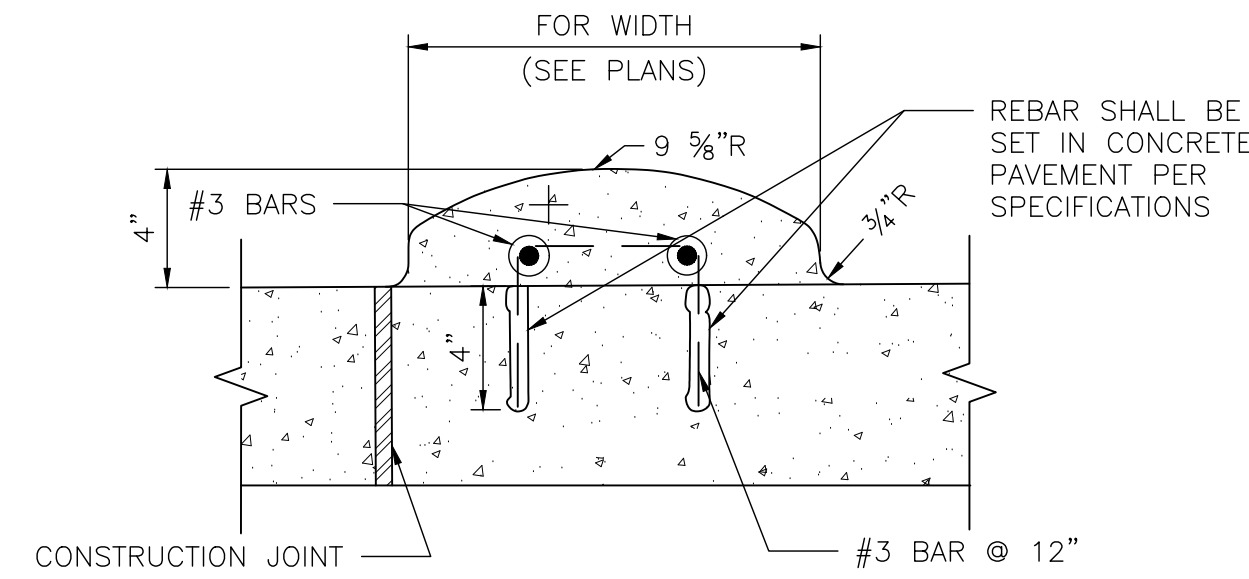
STANDARD CONCRETE PAVING HEADER



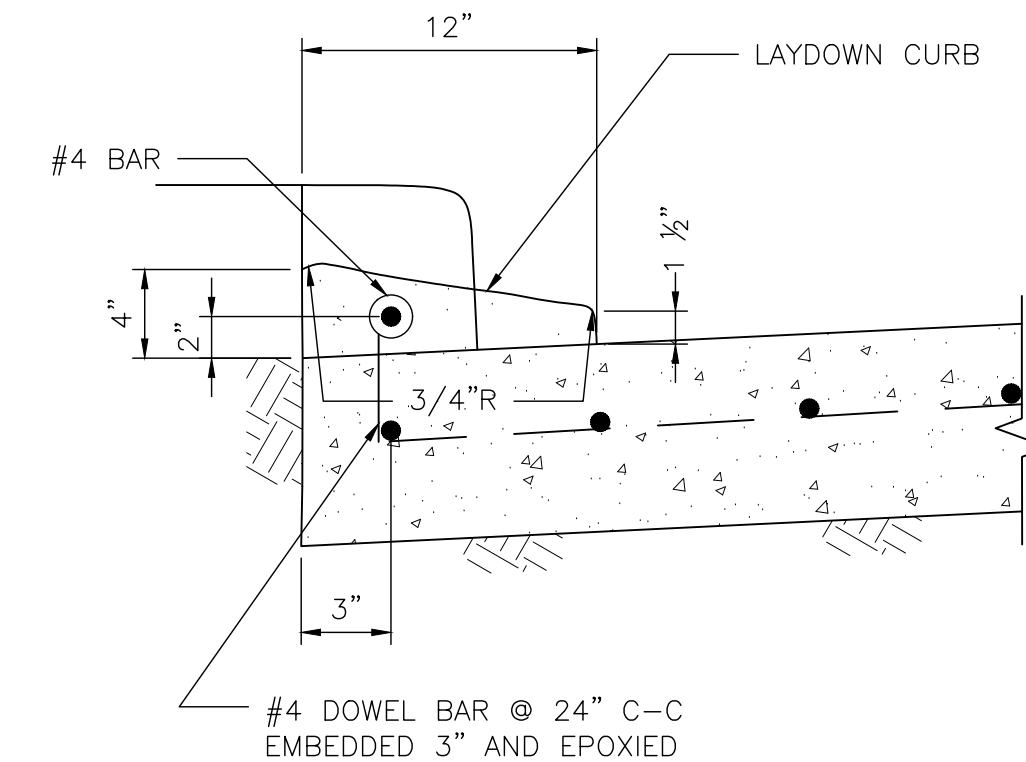
CONCRETE CURB



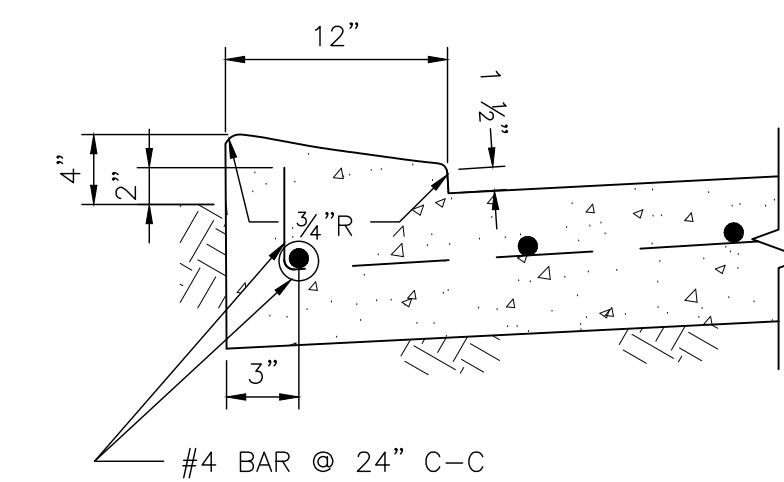
STANDARD RAILROAD HEADER



MOUNTABLE CURB

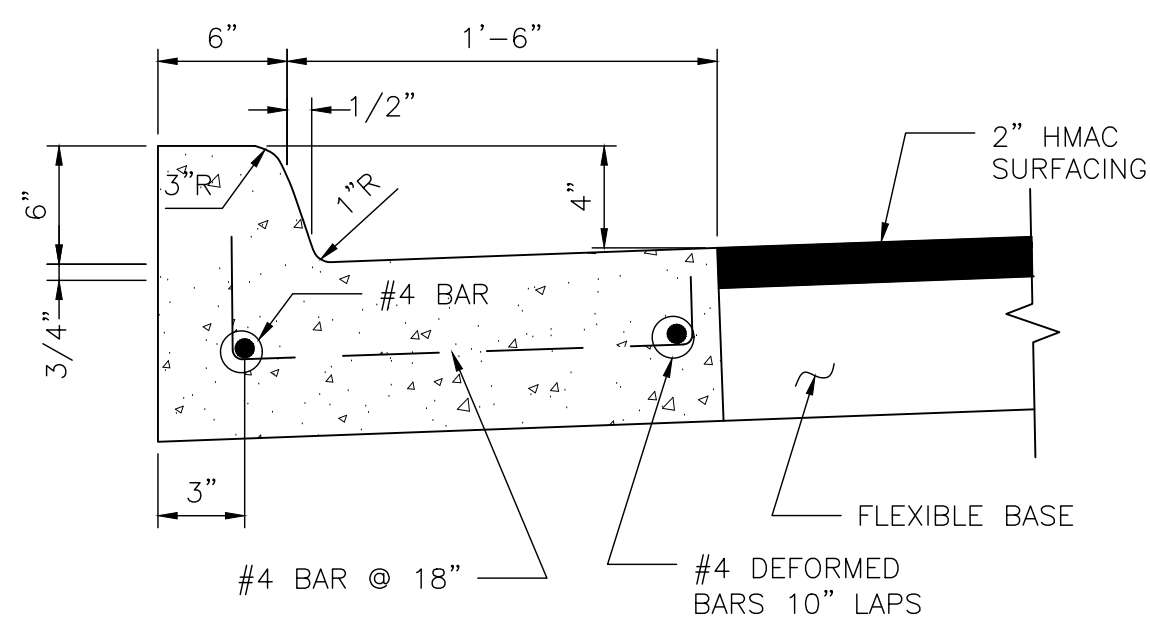


4-INCH x 12-INCH TRANSITION CURB (SEE NOTES)

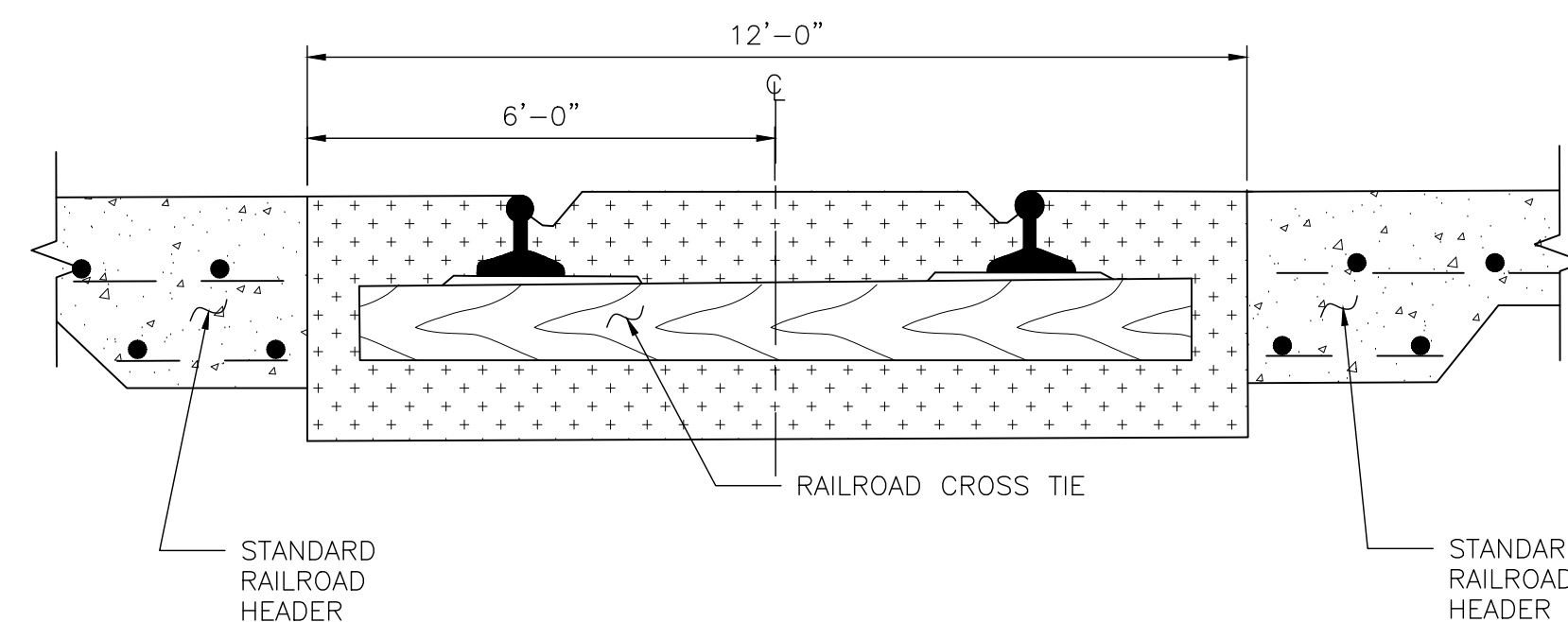


4-INCH x 12-INCH MONOLITHIC CURB (SEE NOTES)

WHEN CONCRETE CURB IS TO BE PLACED EXISTING CONCRETE USE BASE #4 BAR @ 18x10" LONG, DOWELED AND SET IN EPOXY GROUT. SET #4 DOWEL BARS, 25" LONG AT 12" C-C WHEN PAVEMENT SECTION POURED.



MONOLITHIC CURB AND GUTTER



STANDARD RAILROAD CROSSING - SINGLE TRACK

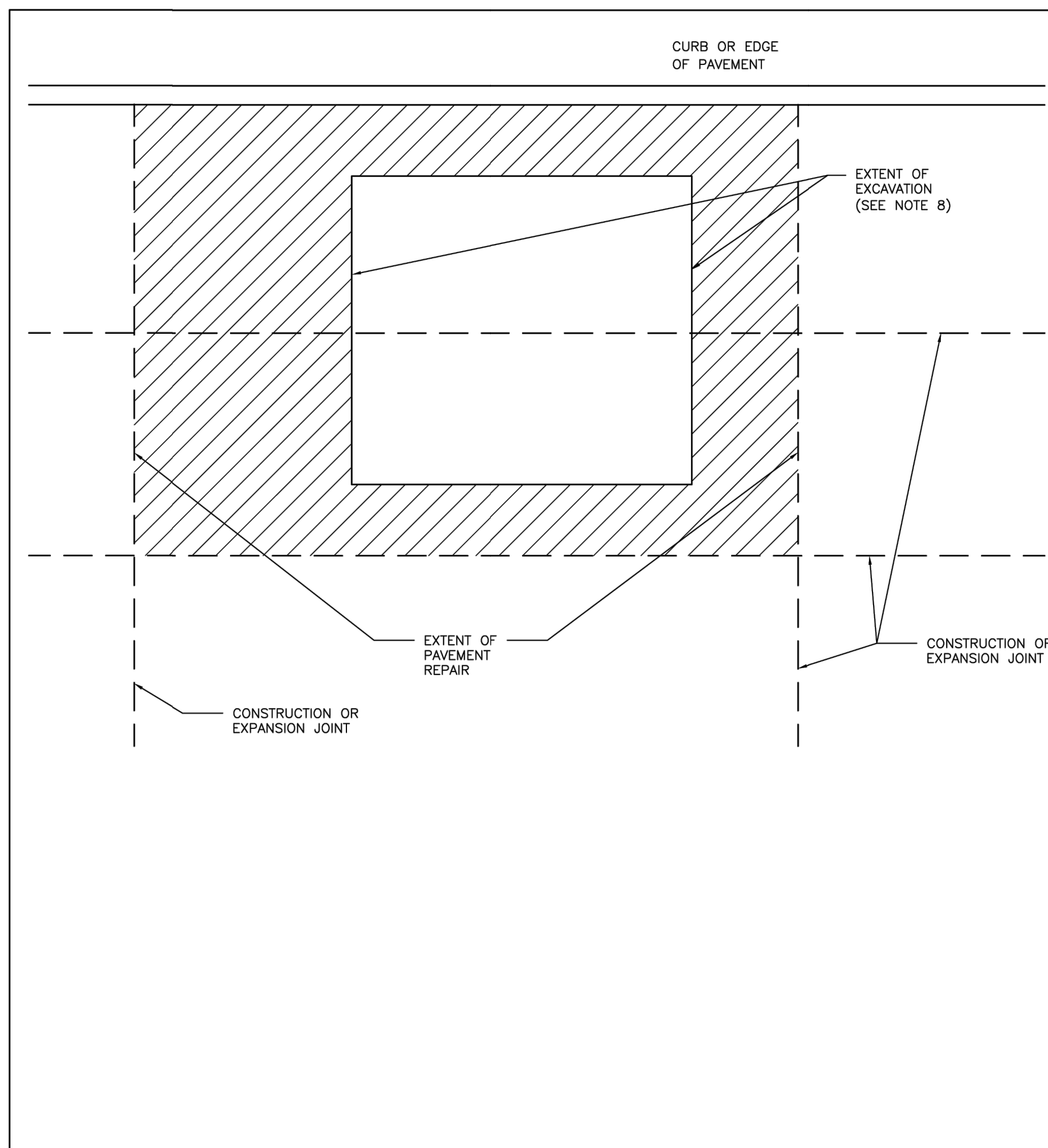
<p>Lockwood, Andrews & Newnam, Inc. 3700 W Sam Houston Pkwy S Houston, TX 77042</p>	<p>INTERIM REVIEW ONLY</p> <p>Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of</p> <p>GREGORY J. HENRY Professional Engineer 91826 06/05/2026</p>
	<p>SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX</p> <p>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</p>

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 11 OF 17

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 59 OF 106	



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).

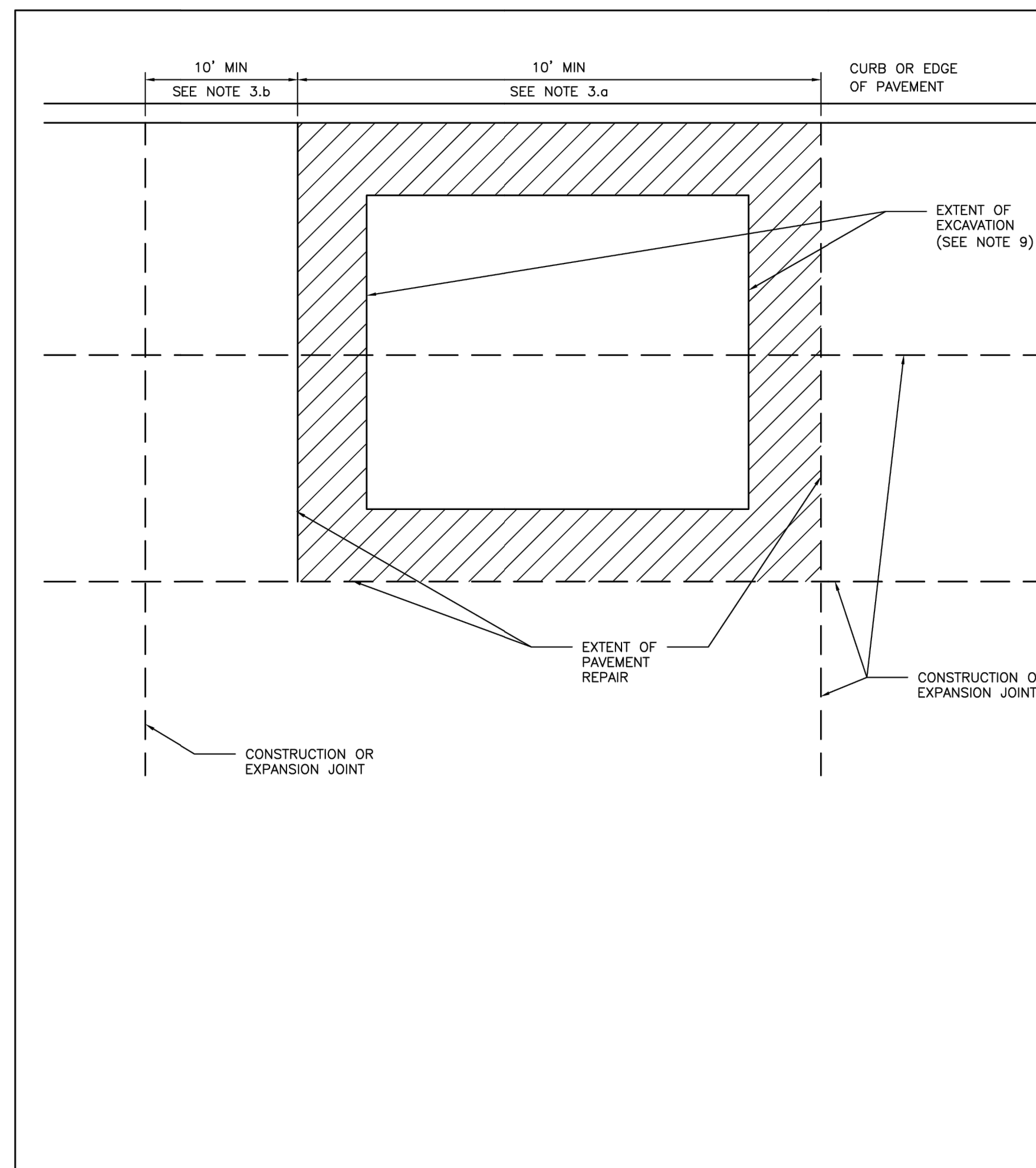
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET CUT FOR CONCRETE PAVEMENT
REPLACEMENT/RESTORATION AGE OF PAVEMENT ≤ 5YRS
(SCALE: NOT TO SCALE)

APPROVED BY:

Designed by: <i>Sulal KANWAR</i> <small>REF:8803415478</small> CITY ENGINEER Checked by: <i>LEANN NGUYEN</i> <small>04-026704758303</small> CITY TRAFFIC ENGINEER	Designed by: <i>Carl Stallock</i> <small>04-0118272483</small> DIRECTOR OF HPW
--	---

EFF DATE: NOV-27-2023 DWG NO: 02951-01



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).

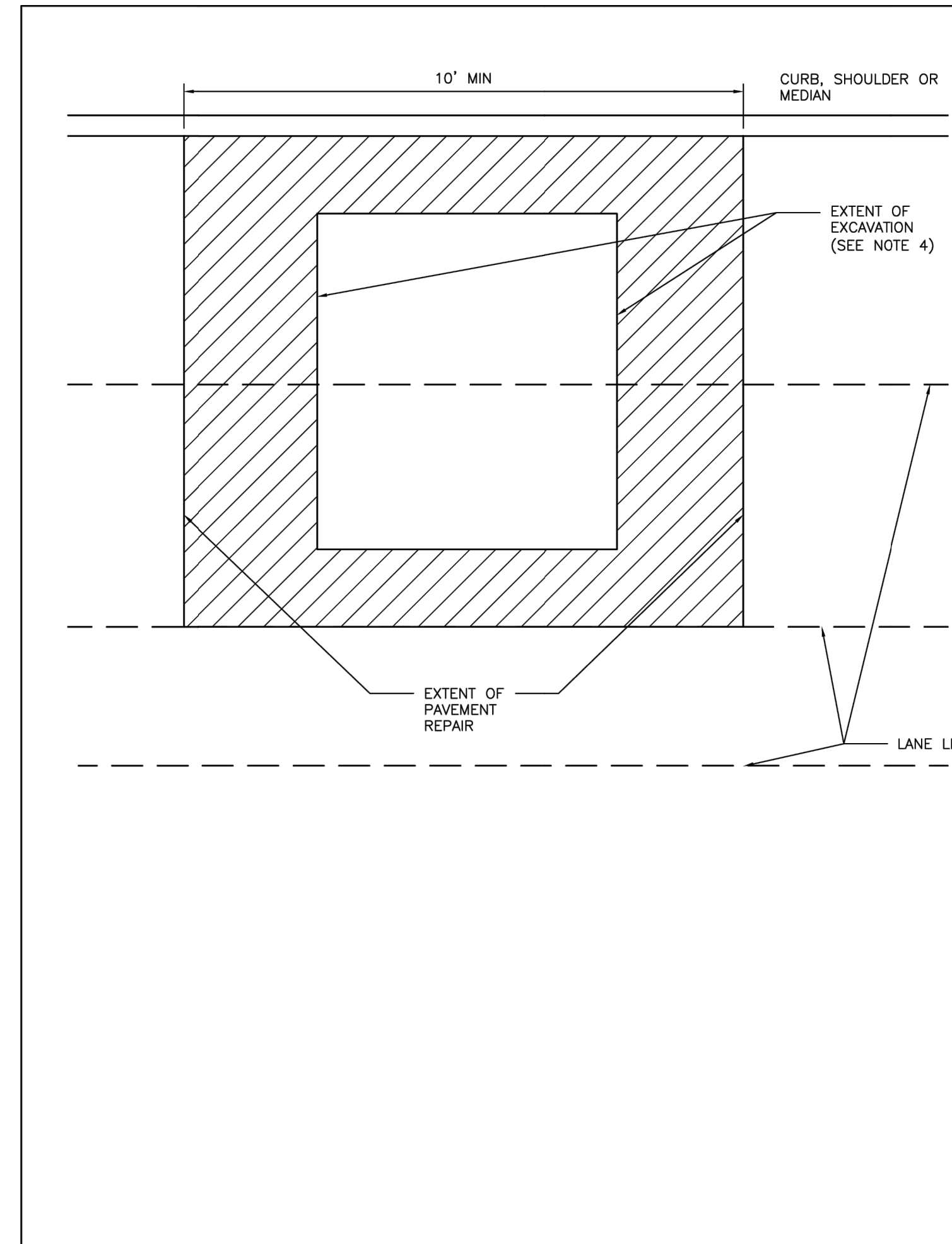
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET CUT FOR CONCRETE PAVEMENT
REPLACEMENT/RESTORATION AGE OF PAVEMENT > 5YRS
(SCALE: NOT TO SCALE)

APPROVED BY:

Designed by: <i>Sulal KANWAR</i> <small>REF:8803415478</small> CITY ENGINEER Checked by: <i>LEANN NGUYEN</i> <small>04-026704758303</small> CITY TRAFFIC ENGINEER	Designed by: <i>Carl Stallock</i> <small>04-0118272483</small> DIRECTOR OF HPW
--	---

EFF DATE: NOV-27-2023 DWG NO: 02951-02



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 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:

Designed by: <i>Sulal KANWAR</i> <small>REF:8803415478</small> CITY ENGINEER Checked by: <i>LEANN NGUYEN</i> <small>04-026704758303</small> CITY TRAFFIC ENGINEER	Designed by: <i>Carl Stallock</i> <small>04-0118272483</small> DIRECTOR OF HPW
--	---

EFF DATE: NOV-27-2023 DWG NO: 02951-03

Lockwood, Andrews & Newnam, Inc.
3700 W Sam Houston Pkwy S Houston, TX 77042

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 GREGORY J. HENRY

 91826
 06/05/2026

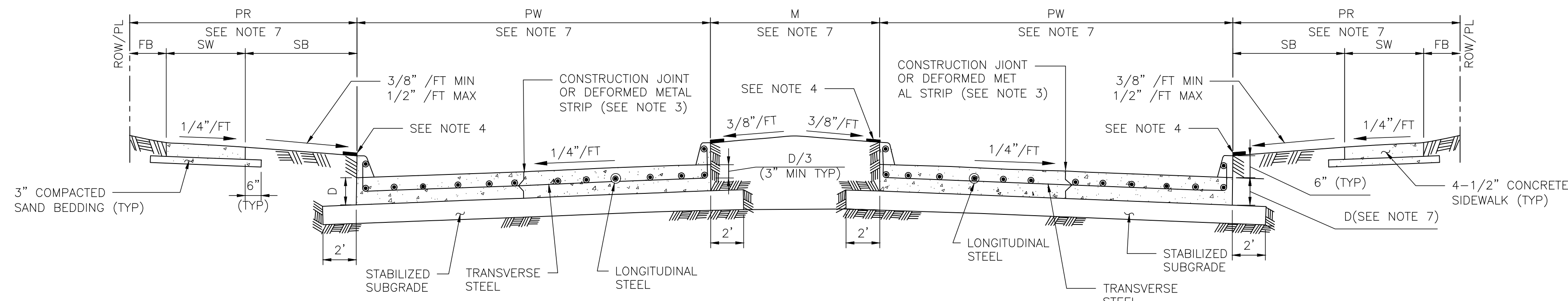
 Lockwood, Andrews & Newnam, Inc.
 Texas Registered Engineering Firm F-2614

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

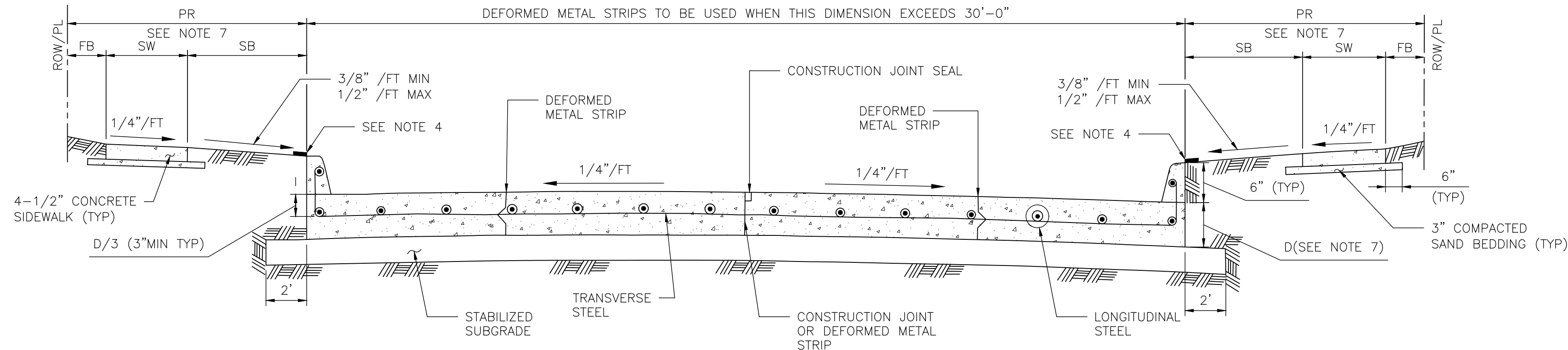
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 12 OF 17

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 60 OF 106	



TYPICAL DOUBLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS



TYPICAL SINGLE 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.
7. REFER TO CONTRACT DRAWINGS FOR PAVEMENT WIDTH (PW) AND PAVEMENT THICKNESS (D), MEDIAN (M), PEDESTRIAN REALM (PR), SIDEWALK (SW), FRONTAGE BUFFER (FB), AND SAFETY BUFFER (SB) WIDTHS.

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"
 $f_c' = 4,000 \text{ PSI}/28 \text{ DAYS}$ AND $F_Y = 60,000 \text{ PSI}$

PAVEMENT THICKNESS 'D' (IN)	PAVEMENT WIDTH 'PW' (FT)	LONGITUDINAL STEEL									TRAVERSE STEEL		
		#4 BARS			#5 BARS			#6 BARS			#4 BARS	#5 BARS	#6 BARS
		NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	SPACING (IN)	SPACING (IN)	SPACING (IN)
6	28	17	20.50	4.00	-	-	-	-	-	-	36	-	-
7	25	17	18.25	4.00	-	-	-	-	-	-	36	-	-
7	35	24	18.00	3.00	-	-	-	-	-	-	36	-	-
7	36	25	17.75	3.00	-	-	-	-	-	-	36	-	-
7	37	25	18.25	3.00	-	-	-	-	-	-	36	-	-
7	41	28	18.00	3.00	-	-	-	-	-	-	36	-	-
7	45	31	17.75	3.75	-	-	-	-	-	-	36	-	-
8	25	20	15.50	2.75	13	24.50	3.0	-	-	-	36	36	-
8	34	27	15.50	2.50	17	25.00	4.0	-	-	-	36	36	-
8	35	27	16.00	2.00	18	24.25	4.0	-	-	-	36	36	-
8	36	28	15.75	3.25	18	25.00	3.0	-	-	-	30	36	-
8	44	24	15.75	4.00	22	24.75	4.0	-	-	-	30	36	-
8	45	35	15.75	2.25	23	24.25	3.0	-	-	-	30	36	-
9	25	22	14.00	3.00	14	22.50	4.0	-	-	-	36	36	-
9	34	31	13.50	2.00	19	22.25	3.5	-	-	-	30	36	-
9	35	31	13.75	3.75	20	21.75	3.5	-	-	-	30	36	-
9	36	32	13.75	3.00	21	21.25	3.5	-	-	-	30	36	-
9	44	39	13.75	2.75	25	21.75	3.0	-	-	-	24	36	-
9	45	39	14.00	4.00	26	21.25	4.5	-	-	-	24	36	-
10	25	24	12.75	3.50	17	18.25	4.0	-	-	-	36	36	36
10	34	33	12.50	4.00	21	20.00	4.0	-	-	-	30	36	36
10	35	34	12.50	3.75	23	18.75	4.0	-	-	-	30	36	36
10	36	35	12.50	3.50	24	18.50	3.0	-	-	-	30	36	36
10	44	44	12.00	4.00	29	18.50	4.5	-	-	-	24	36	36
10	45	44	12.50	3.00	29	19.00	3.0	-	-	-	24	36	36
11	25	27	11.25	3.00	17	18.25	4.0	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	3.00	24	18.00	3.0	17	25.75	4	24	36	36
11	36	40	11.00	2.00	25	17.75	3.0	17	26.50	4	24	36	36
11	44	48	11.125	2.50	30	18.00	3.0	21	26.00	4	24	36	36
11	45	49	11.125	3.00	31	17.75	4.0	22	25.50	3	24	36	36
12	25	-	-	-	19	16.25	4.0	13	24.50	3	36	36	36
12	34	-	-	-	26	16.00	4.0	18	23.50	4	24	36	36
12	35	-	-	-	26	16.50	4.0	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	4.0	24	22.50	5	24	30	36
12	45	-	-	-	35	15.75	3.0	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

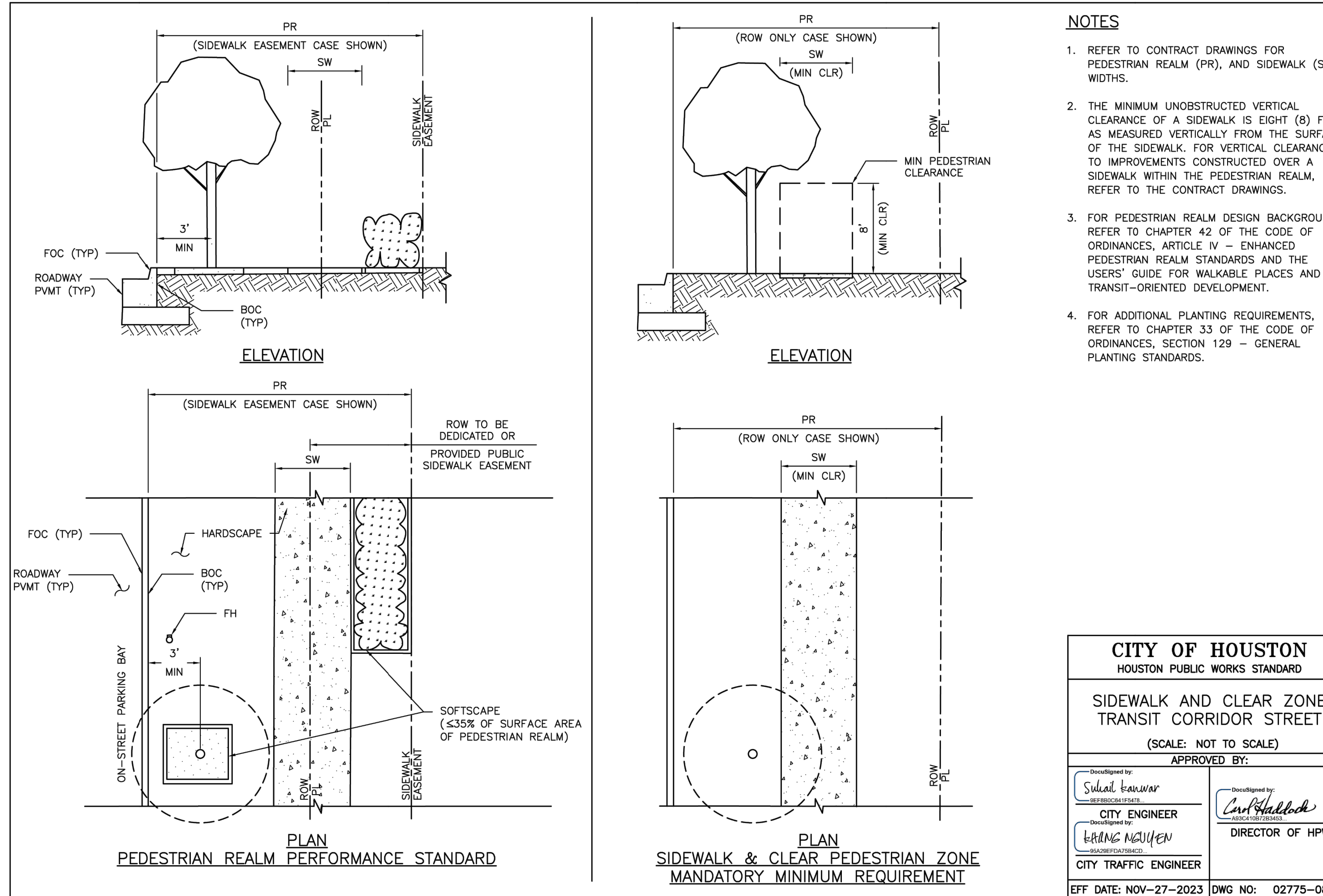
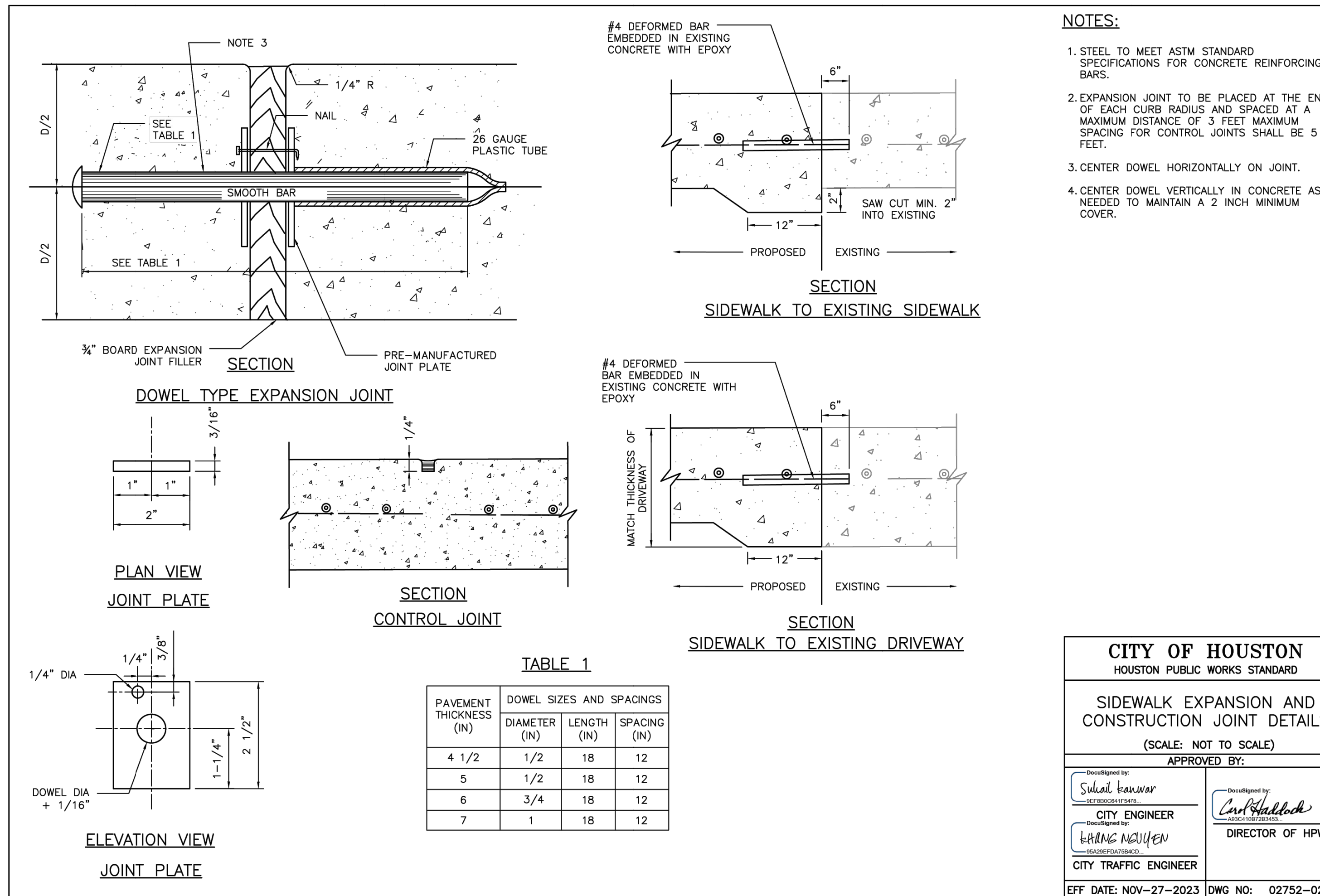
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 3700 W Sam Houston Pkwy S Houston, TX 77042
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 13 OF 17

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 61 OF 106	



CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

SIDEWALK EXPANSION AND CONSTRUCTION JOINT DETAILS
(SCALE: NOT TO SCALE)

APPROVED BY:

Disciplined by: *Sulad Banwar*
CITY ENGINEER

Disciplined by: *Leahng Nuiyen*
CITY TRAFFIC ENGINEER

Disciplined by: *Carl Hubbard*
DIRECTOR OF HPW

EFF DATE: NOV-27-2023 DWG NO: 02752-02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

SIDEWALK AND CLEAR ZONE TRANSIT CORRIDOR STREET
(SCALE: NOT TO SCALE)

APPROVED BY:

Disciplined by: *Sulad Banwar*
CITY ENGINEER

Disciplined by: *Leahng Nuiyen*
CITY TRAFFIC ENGINEER

Disciplined by: *Carl Hubbard*
DIRECTOR OF HPW

EFF DATE: NOV-27-2023 DWG NO: 02775-08

Lockwood, Andrews & Newnam, Inc.
3700 W Sam Houston Pkwy S Houston, TX 77042

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91826
06/05/2026
Date

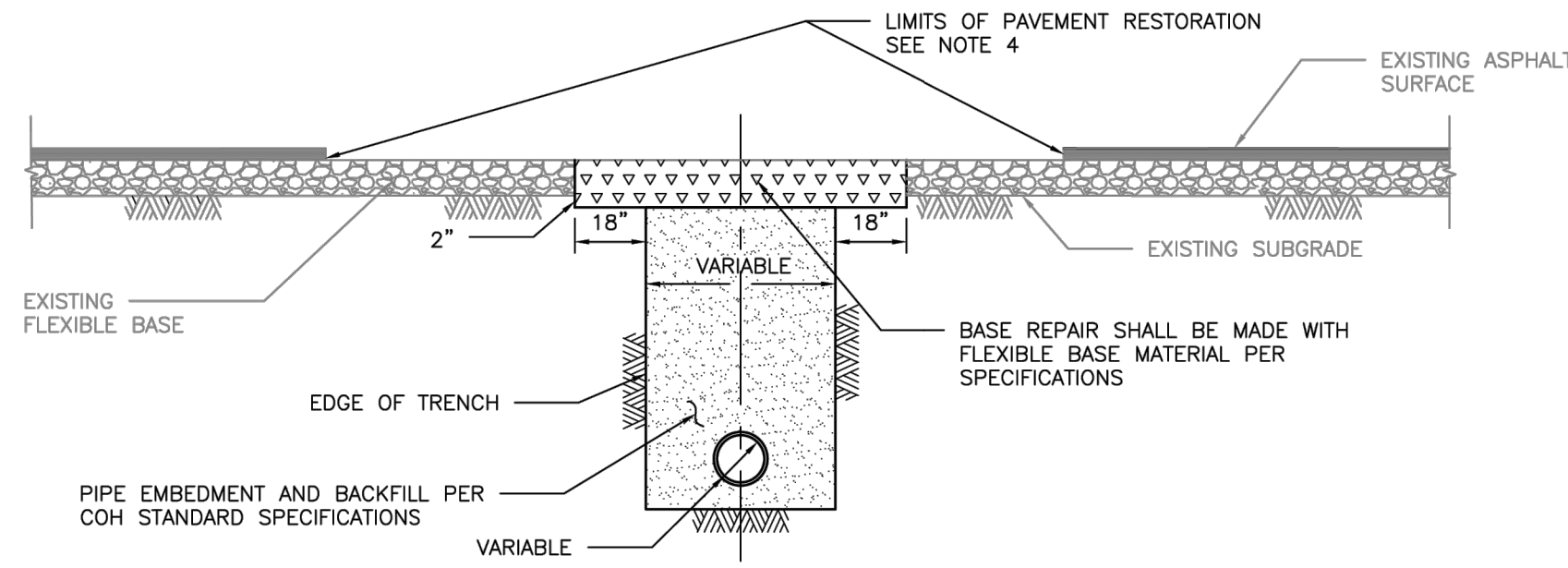
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2014

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

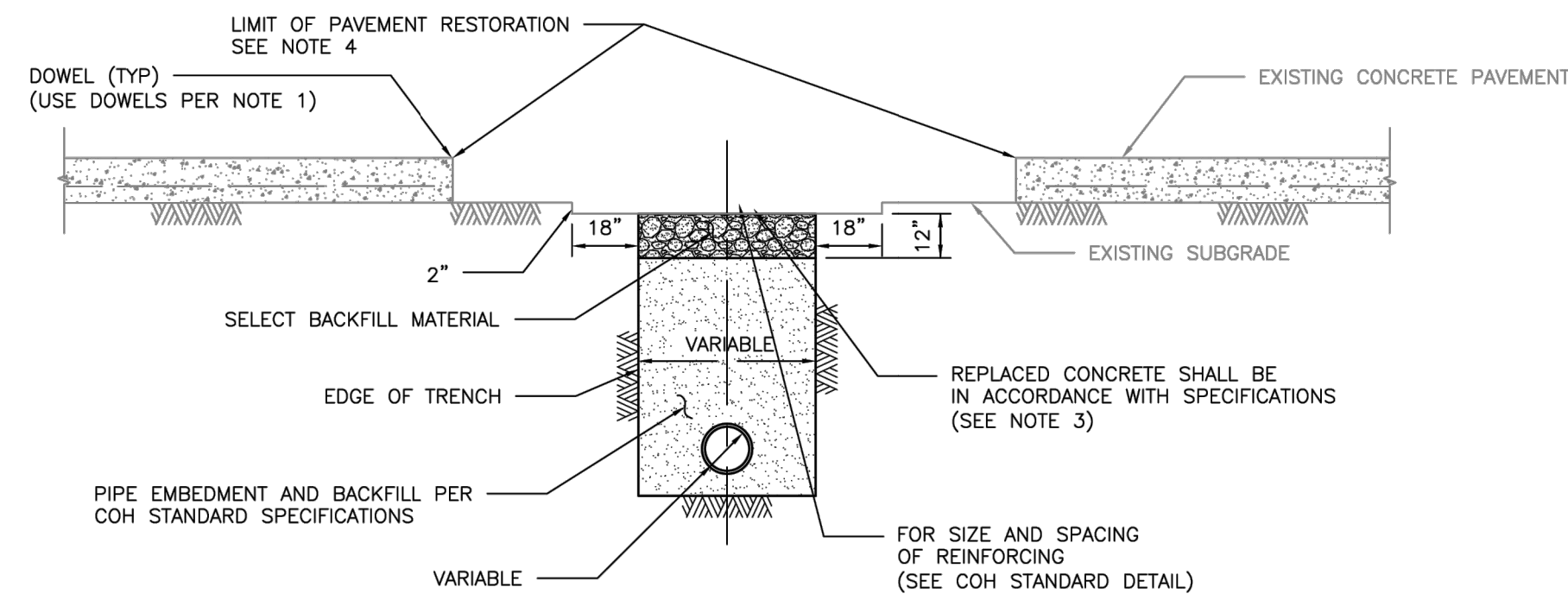
CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 14 OF 17

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 62 OF 106	



ELEVATION A
REPAIR OF FLEXIBLE BASE PAVEMENT

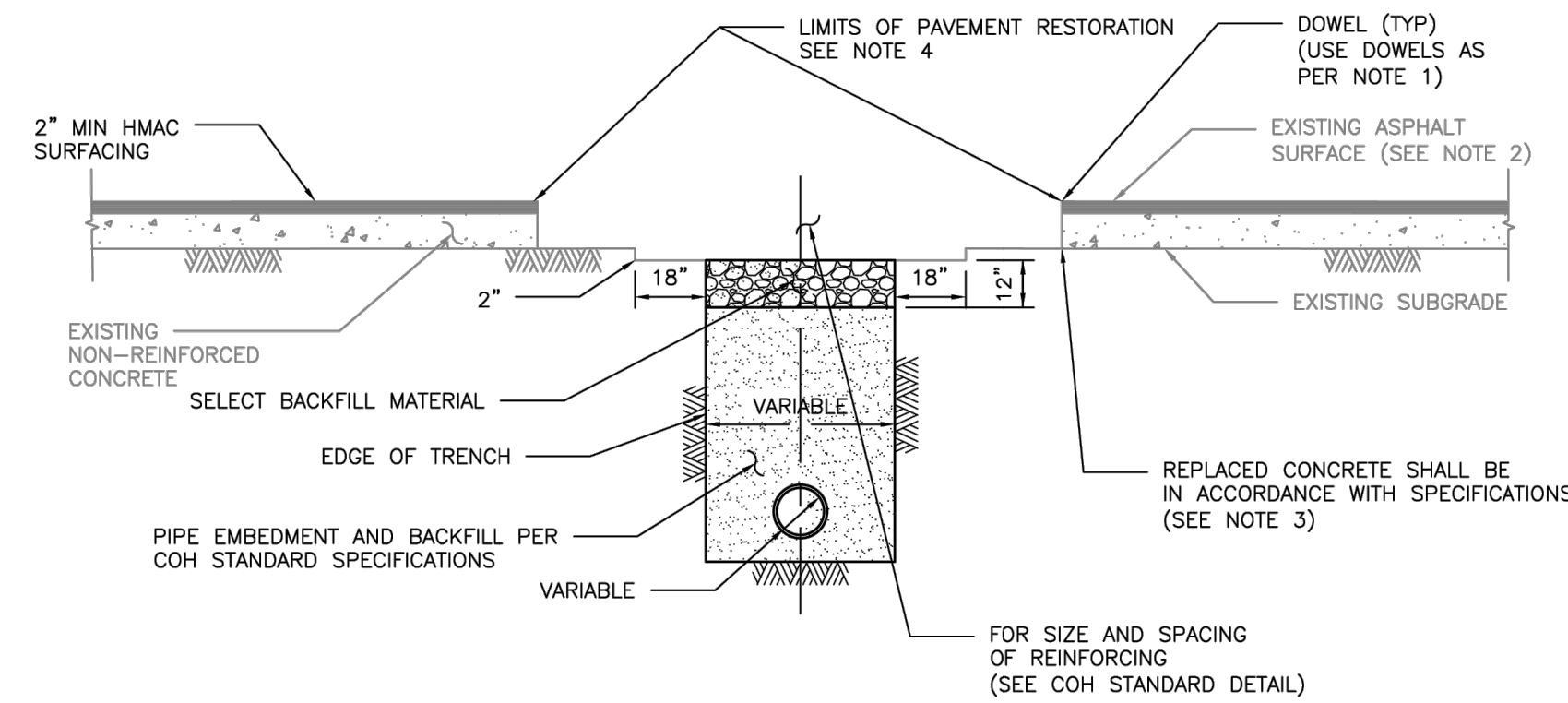


ELEVATION B
REPAIR OF REINFORCED CONCRETE PAVEMENT

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.

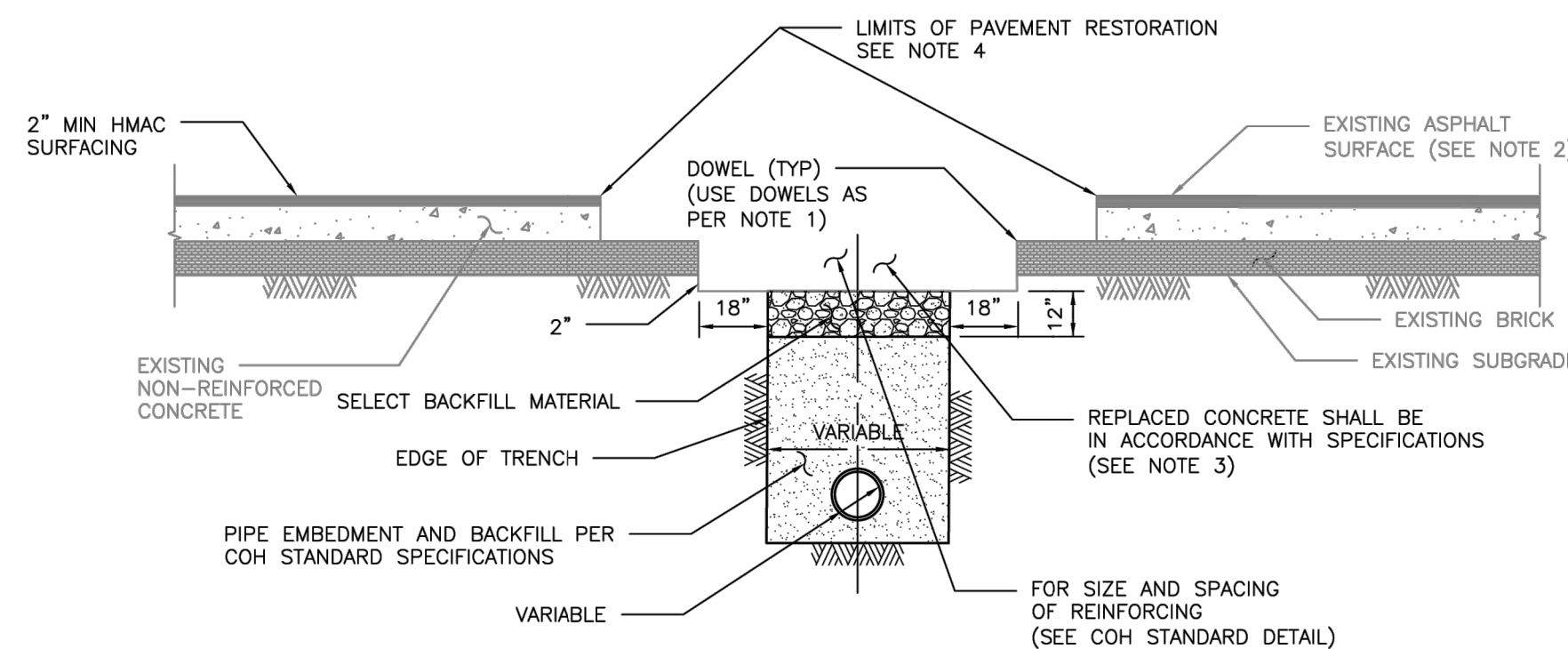
CITY OF HOUSTON HOUSTON PUBLIC WORKS STANDARD	
PAVEMENT REPAIR DETAIL FOR STREET CUTS (FLEX-BASE PAVEMENT & CONCRETE PAVEMENT) (SCALE: NOT TO SCALE)	
APPROVED BY:	
Designed by: SUBAL KANWAR CITY ENGINEER	Designed by: CARL P. HALLACK DIRECTOR OF HPW
Designed by: BRIAN NGUYEN CITY TRAFFIC ENGINEER	
EFF DATE: NOV-27-2023 DWG NO: 02951-04	



ELEVATION C
REPAIR OF NON-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 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.



ELEVATION D
REPAIR OF NON-REINFORCED CONCRETE PAVEMENT WITH BRICK

CITY OF HOUSTON HOUSTON PUBLIC WORKS STANDARD	
PAVEMENT REPAIR DETAIL FOR STREET CUTS (NON-REINFORCED CONCRETE & BRICK PAVEMENT) (SCALE: NOT TO SCALE)	
APPROVED BY:	
Designed by: SUBAL KANWAR CITY ENGINEER	Designed by: CARL P. HALLACK DIRECTOR OF HPW
Designed by: BRIAN NGUYEN CITY TRAFFIC ENGINEER	
EFF DATE: NOV-27-2023 DWG NO: 02951-05	

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	SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2014

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 15 OF 17

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 63 OF 106	

OPTIONAL HOOD FOR "B" SERIES
HOOD ATTACHES WITH 4 STAINLESS STEEL BOLTS. FITS B8 & B10

RELINER STAINLESS STEEL ANCHOR BOLT ASSEMBLY

MODEL #

B8DB - 18" DROP BOWL WITH 8" OUTLET - USE FOR 4' - 5' DIA MH
 B8DBR84 - 18" DROP BOWL WITH 8" OUTLET - USE FOR 8' - 8' DIA MH
 B8DBR144 - 18" DROP BOWL WITH 8" OUTLET - USE FOR 9' - 12' DIA MH
 B10DB - 18" DROP BOWL WITH 10" OUTLET - USE FOR 4' - 5' DIA MH
 B10R96 - 18" DROP BOWL WITH 10" OUTLET - USE FOR 6' - 8' DIA MH
 B10R144 - 18" DROP BOWL WITH 10" OUTLET - USE FOR 9' - 12' DIA MH

THE "B-8" BOWL WILL SERVICE UP THROUGH FULL 10" INLETS. THE "B-10" BOWL WILL SERVICE UP THROUGH FULL 12" INLETS. CAN BE USED FOR 15" AND 16" INLET MODERATE FLOWS. ALL SIZES ARE FOR RETROFIT OR NEW CONSTRUCTION. FABRICATED IN MARINE GRADE FIBERGLASS AND FINISHED IN BRIGHT WHITE GEL COAT.

USE 4 RELINER ANCHOR ASSEMBLIES TO ATTACH DROP BOWL TO MANHOLE WALL. USE RELINER STAINLESS STEEL PIPE BRACKETS TO SUPPORT DOWN PIPE. EXTERNAL PIPE COUPLER REQUIRED. PROVIDE SWEEP AT DOWN PIPE OUTLET.

MADE IN U.S.A.
 U.S. PAT. # 6074130
 CANADIAN PAT. # 2269565

RELINER / DURAN, INC.
 53 MT. ARCHER ROAD, LYME, CT. 06371
 (800) 508-6001 FAX: (877)434-3191
 WWW.RELINER.COM

DESCRIPTION	DATE	SCALE
B8 & B10 DROP BOWLS FOR ROUND WALLS	11/28/16	NONE
DRAWING NUMBER	B8DB B10DB	

OPTIONAL FORCE LINE HOOD
24/12, 24/15 L=13.5" M=9.5"

MODEL # AND DIMENSIONS

MODEL #	24/12R60	24/12R96	24/12R144
A	24.0"	24.0"	24.0"
B	27.5"	27.5"	27.5"
C	12.3"	12.3"	12.3"
D	15.0"	15.0"	15.0"
E	1.8"	1.8"	1.8"
F	16.5"	16.5"	16.5"
G	15.0"	15.0"	15.0"
H	2.8"	2.8"	2.8"
I	1.5"	1.5"	1.5"
J	2.5"	1.5"	1.0"
K	12.4"	12.4"	12.4"

MODEL #	24/15R60	24/15R96	24/15R144
A	24.0"	24.0"	24.0"
B	28.0"	28.0"	28.0"
C	12.3"	12.3"	12.3"
D	15.8"	15.8"	15.8"
E	2.0"	2.0"	2.0"
F	19.3"	19.3"	19.3"
G	18.0"	18.0"	18.0"
H	3.5"	3.5"	3.5"
I	1.8"	1.8"	1.8"
J	2.5"	1.5"	1.0"
K	14.8"	14.8"	14.8"

THE "24/12" BOWL WILL SERVICE UP THROUGH FULL 16" INLETS. THE "24/15" BOWL WILL SERVICE UP THROUGH FULL 18" INLETS. CAN BE USED FOR 21" MODERATE FLOW INLETS. ALL SIZES ARE FOR RETROFIT OR NEW CONSTRUCTION. FABRICATED IN MARINE GRADE FIBERGLASS AND FINISHED IN BRIGHT WHITE GEL COAT.

USE 6 RELINER ANCHOR ASSEMBLIES TO ATTACH DROP BOWL TO MANHOLE WALL. USE RELINER STAINLESS STEEL PIPE BRACKETS TO SUPPORT DOWN PIPE. EXTERNAL PIPE COUPLER REQUIRED. PROVIDE SWEEP AT DOWN PIPE OUTLET.

MADE IN U.S.A.
 U.S. PAT. # 6074130
 CANADIAN PAT. # 2269565

RELINER / DURAN, INC.
 53 MT. ARCHER ROAD, LYME, CT. 06371
 (800) 508-6001 FAX: (877)434-3191
 WWW.RELINER.COM

DESCRIPTION	DATE	SCALE
24/12R DROP BOWLS 24/15R DROP BOWLS FOR ROUND WALLS	11/28/16	NONE
DRAWING NUMBER	24/12R 24/15R	

OPTIONAL FORCE LINE HOOD
36/21 L=18.8" M=14.0"
48/24 L=20.0" M=17.0"

MODEL # AND DIMENSIONS

MODEL #	36/21R60	36/21R144
A	35.3"	36.0"
B	38.8"	39.3"
C	18.0"	18.0"
D	23.0"	22.8"
E	1.8"	1.6"
F	31.6"	31.0"
G	29.9"	29.0"
H	5.0"	4.8"
I	2.0"	2.8"
J	6.0"	2.3"
K	21.1"	21.1"

MODEL #	48/24R72	48/24R96	48/24R144
A	48.0"	48.0"	48.0"
B	51.0"	51.4"	51.4"
C	24.0"	24.0"	24.0"
D	30.0"	30.0"	30.0"
E	1.5"	1.7"	1.7"
F	30.5"	30.5"	30.5"
G	28.6"	28.6"	28.6"
H	6.0"	6.0"	6.0"
I	2.0"	2.0"	2.0"
J	9.2"	6.4"	4.1"
K	25.1"	25.1"	25.1"

THE "36/21" BOWL WILL SERVICE UP THROUGH FULL 24" INLETS AND CAN BE USED FOR 27" AND 30" MODERATE FLOW INLETS. THE "48/24" BOWL WILL SERVICE UP THROUGH FULL 36" INLETS. CAN BE USED FOR 42" MODERATE FLOW INLETS. ALL SIZES ARE FOR RETROFIT OR NEW CONSTRUCTION. FABRICATED IN MARINE GRADE FIBERGLASS AND FINISHED IN BRIGHT WHITE GEL COAT.

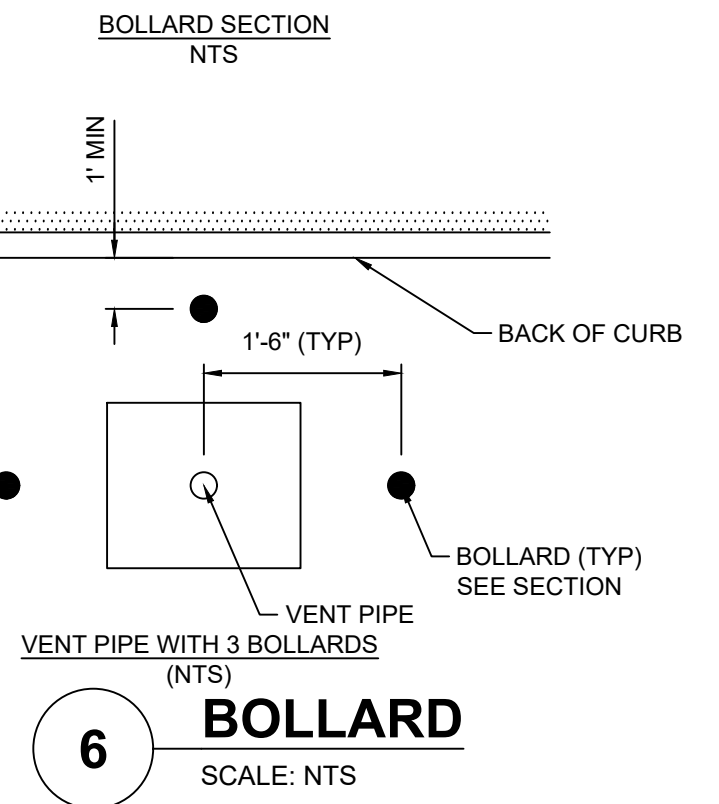
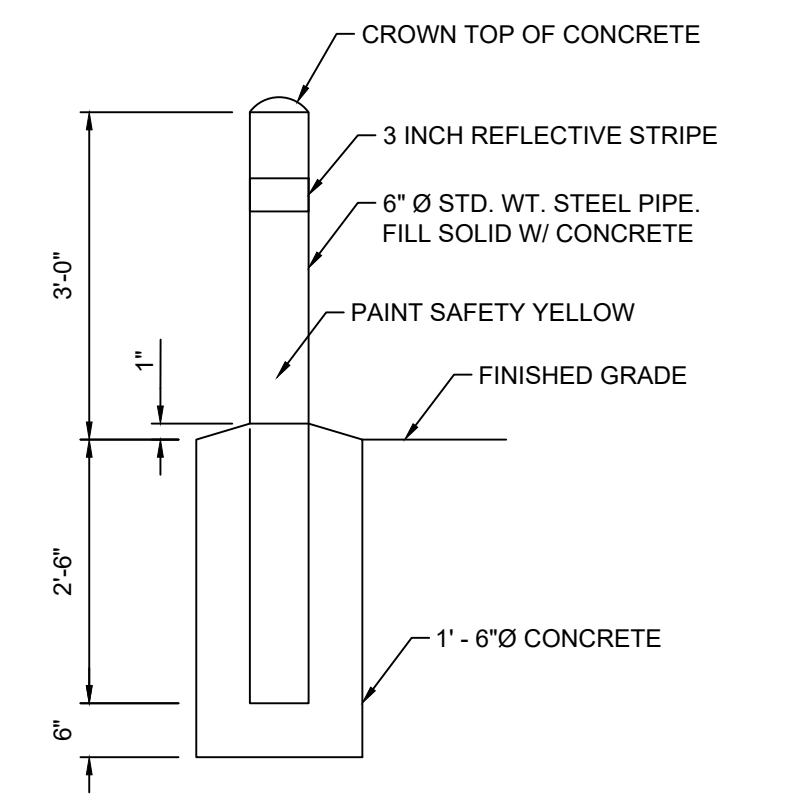
USE 8 - 3" RELINER WEDGE ANCHORS FOR "36/21" BOWLS AND 10 - 3" WEDGE ANCHORS FOR "48/24" BOWLS TO ATTACH DROP BOWL TO MANHOLE WALL. USE RELINER STAINLESS STEEL PIPE BRACKETS TO SUPPORT DOWN PIPE. EXTERNAL PIPE COUPLER REQUIRED. PROVIDE SWEEP AT DOWN PIPE OUTLET.

MADE IN U.S.A.
 U.S. PAT. # 6074130
 CANADIAN PAT. # 2269565

RELINER / DURAN, INC.
 9 MATTHEWS DRIVE, UNIT A1/A2
 EAST HADDAM, CT 06423
 (800) 508-6001 FAX: (877)434-3191
 WWW.RELINER.COM

DESCRIPTION	DATE	SCALE
36/21R DROP BOWLS 48/24R DROP BOWLS FOR ROUND WALLS	2/23/21	NONE
DRAWING NUMBER	36/21R 48/24R	

5 DROP BOWL
SCALE: NTS



Lockwood, Andrews & Newnam, Inc.
 3700 W Sam Houston Pkwy S Houston, TX 77042

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 GREGORY J. HENRY
 91826
 06/05/2026
 Date

SURVEYED BY:
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 C.O.H. Field Book P-XXXX

Lockwood, Andrews & Newnam, Inc.
 Texas Registered Engineering Firm F-2014

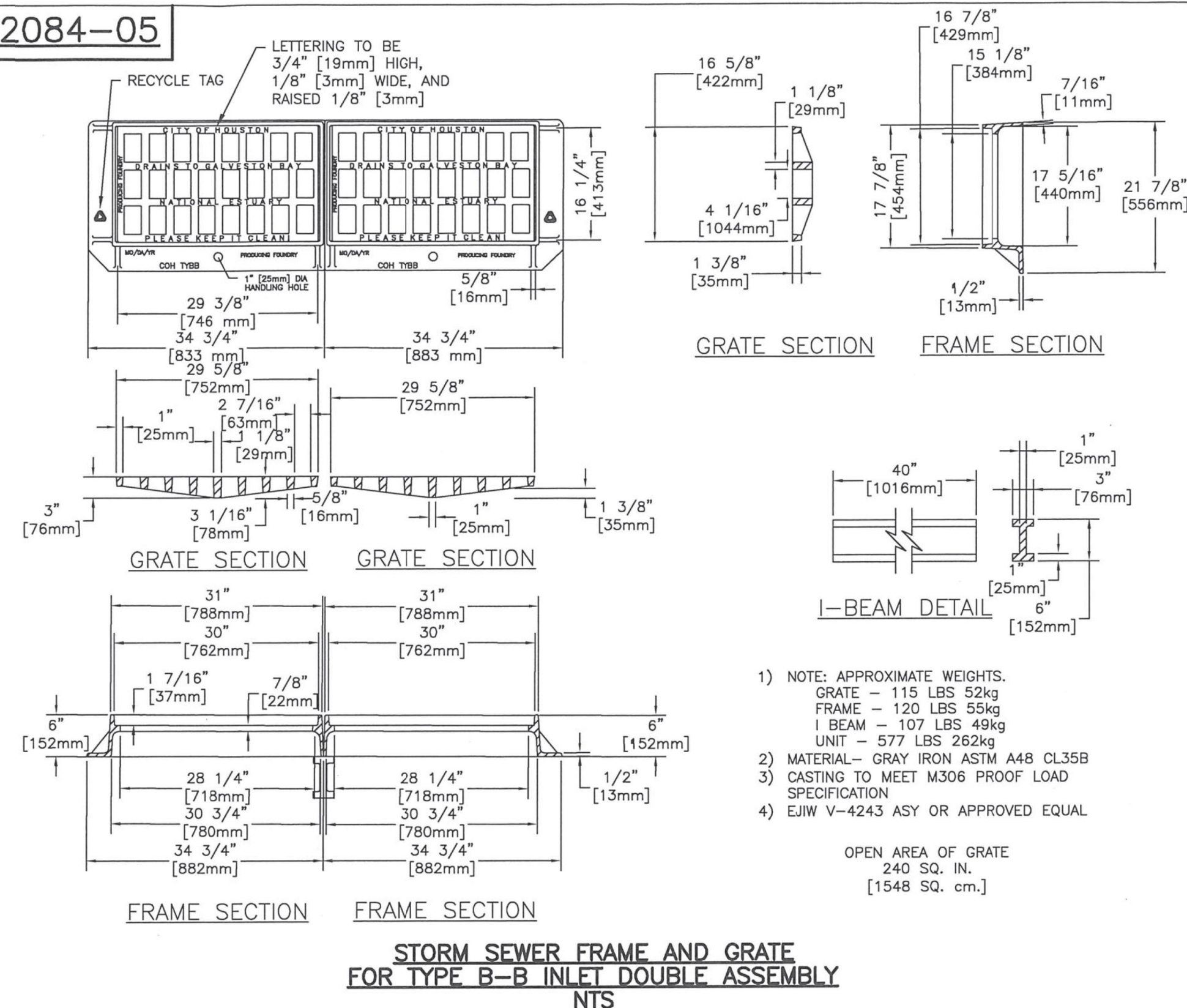
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 16 OF 17

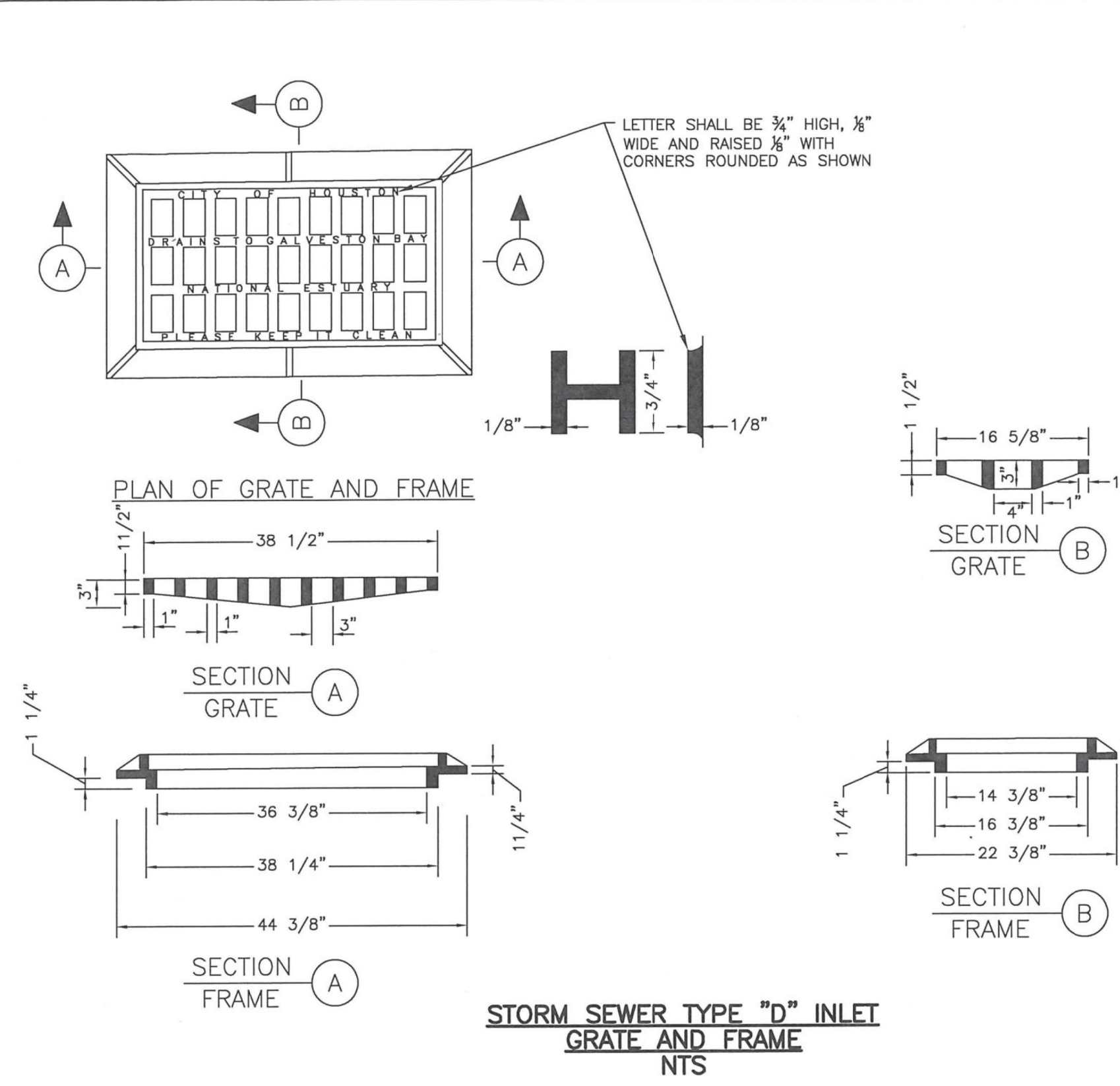
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R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 64 OF 106	

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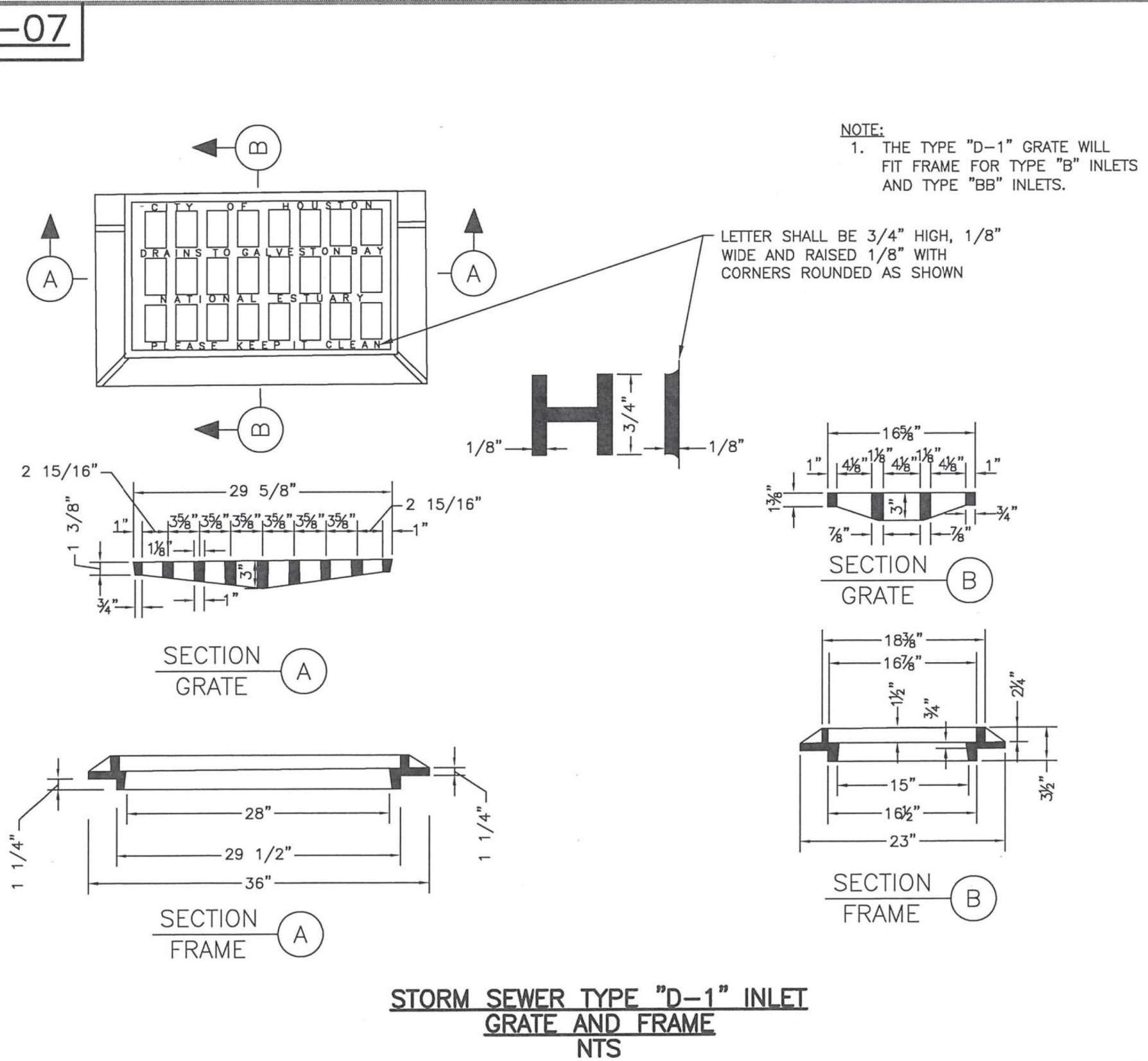
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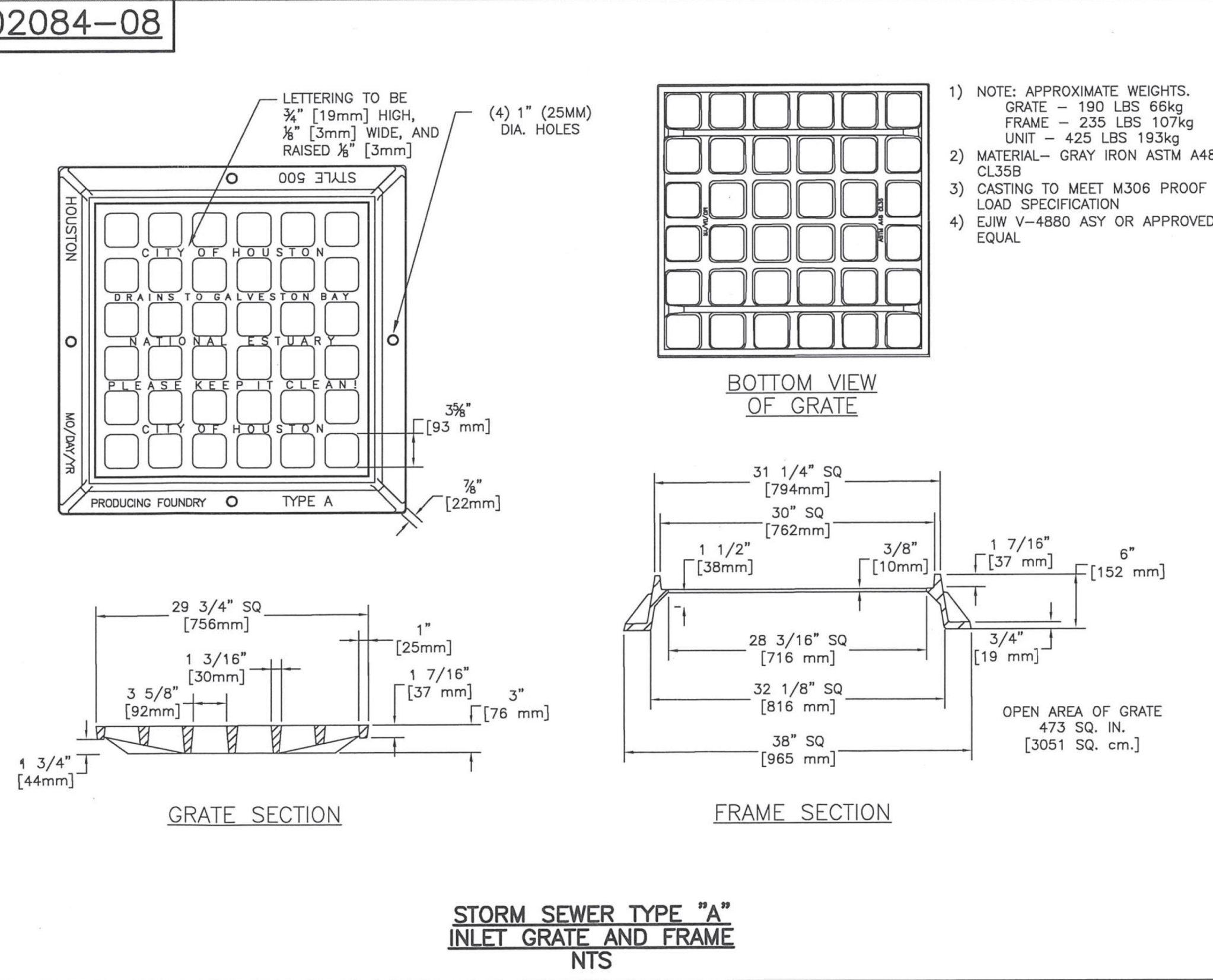
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02084-07



02084-08



FIRM INFORMATION		ENGINEER'S SEAL	
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
STORM SEWER 02084-05 THROUGH 08			
APPROVED BY: CITY ENGINEER	APPROVED BY: DEPUTY DIRECTOR		
APPROVED BY: DIRECTOR			
EFFECTIVE DATE: JUL-01-2019 FOR CITY OF HOUSTON USE ONLY			
SHEET NO.			

Lockwood, Andrews & Newnam, Inc.
 3700 W Sam Houston Pkwy S Houston, TX 77042
 C.O.H. Field Book P-XXXX

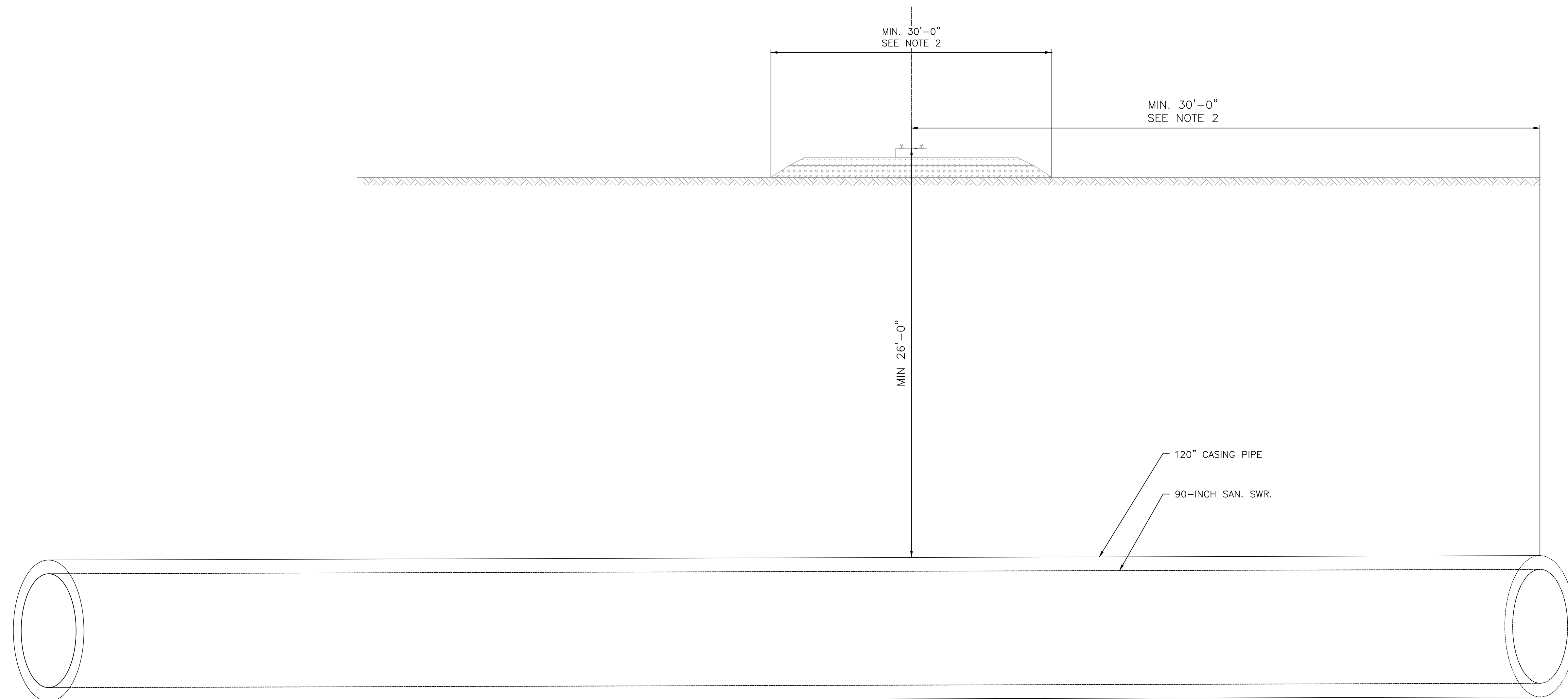
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 91826
 06/05/2026
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 Texas Registered Engineering Firm F-2014

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

CIVIL DETAILS SHEET 17 OF 17

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO.	65 OF 106




1. SEAL NOT REQUIRED IF CASING ENDS ABOVE GROUND WHERE DRAINAGE IS AVAILABLE.
2. CASING TO END AT LEAST 30 FT, FROM CENTERLINE OF TRACK, WHERE RAILROAD TIMETABLE SPEEDS ARE GREATER THAN 25 M.P.H. 20+20 FT, IF GREATER WILL APPLY.
3. ALL HORIZONTAL DISTANCES TO BE MEASURED AT RIGHT ANGLES FROM CENTER LINE OF TRACK.

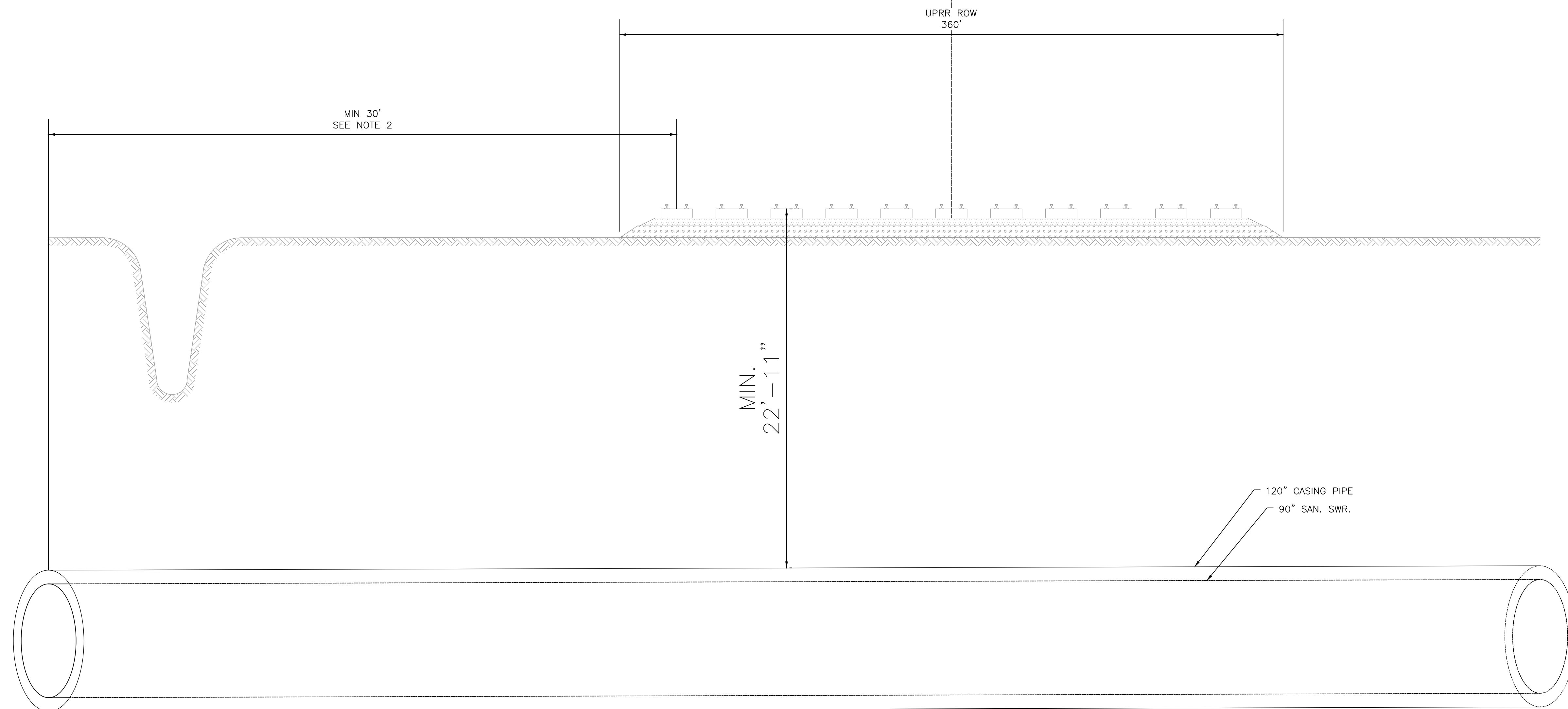
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UPRR CROSSING AT LOCKWOOD DRIVE

N.T.S

 Lockwood, Andrews & Newnam, Inc. <small>3700 W Sam Houston Pkwy S Houston, TX 77042</small>	INTERIM REVIEW ONLY <small>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</small> <u>GREGORY J. HENRY</u> <small>91826</small> <small>06/05/2026</small>														
<small>SURVEYED BY: LAND-TECH, INC. C.O.H. Field Book P-XXXX</small>	<small>Lockwood, Andrews & Newnam, Inc. Texas Registered Engineering Firm F-2614</small>														
CITY OF HOUSTON HOUSTON PUBLIC WORKS															
CAPACITY REMEDIAL MEASURES PLAN AREA 1, PACKAGE 8															
UPRR CROSSING DETAIL															
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WBS NUMBER	FOR CITY OF HOUSTON USE ONLY														
R-001000-0033-3															
DRAWING SCALE															
NONE															
CITY OF HOUSTON PM															
NEIL BARNSDALE, P.E.															
SHEET NO. 66 OF 106															

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1. SEAL NOT REQUIRED IF CASING ENDS ABOVE GROUND WHERE DRAINAGE IS AVAILABLE.
2. CASING TO END AT LEAST 30 FT. FROM CENTERLINE OF TRACK, WHERE RAILROAD TIMETABLE SPEEDS ARE GREATER THAN 25 M.P.H. 2D+20 FT, IF GREATER WILL APPLY.
3. ALL HORIZONTAL DISTANCES TO BE MEASURED AT RIGHT ANGLES FROM CENTER LINE OF TRACK.

2

RAIL YARD CROSSING AT LOCKWOOD DRIVE

N.T.S

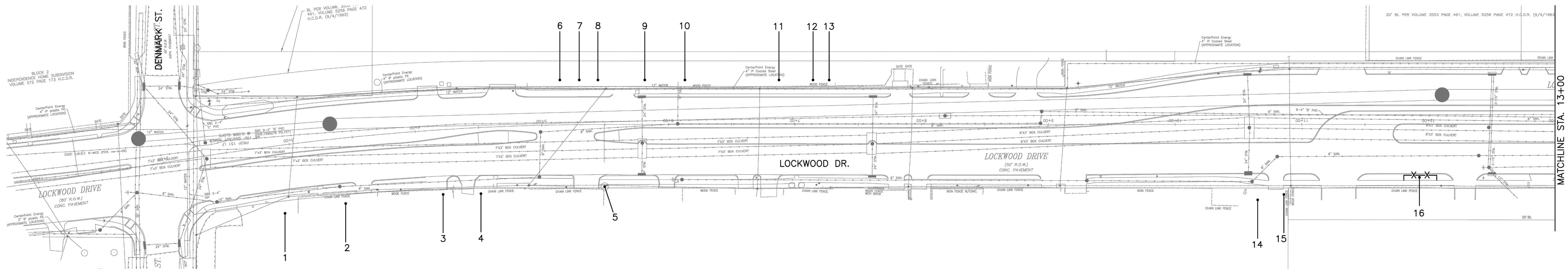
 Lockwood, Andrews & Newnam, Inc. <small>3700 W Sam Houston Pkwy S Houston, TX 77042</small>	INTERIM REVIEW ONLY <small>Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of</small>
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

UPRR RAIL YARD DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NONE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 67 OF 106	

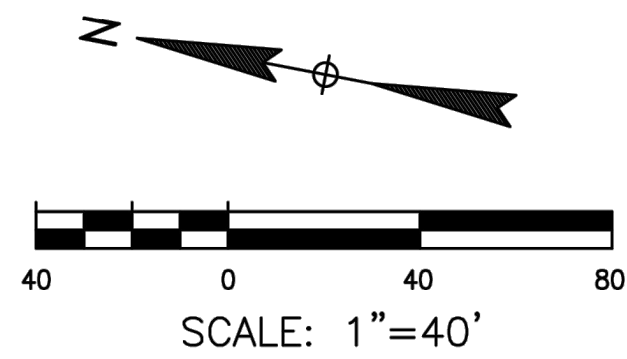


TREE PRESERVATION PLAN LEGEND	
	TREE NUMBER/LOCATION
	TREE TO BE REMOVED
	TREE PROTECTION FENCE
	ROOT PRUNING TRENCH

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Lockwood Drive					
1	Not available	41" Green Ash	Protected	Corridor tree, Trunk cavity, Not impacted	
2	7419 Lockwood	24" Magnolia	Protected	Corridor tree, Pruned by CPE	Clearance prune
3	7415 Lockwood	17" Arborvitae	Not Protected	Private tree, Not impacted	
4	7405 Lockwood	16" Crepe Myrtle	Not Protected	Private tree, Not impacted	
5	Not available	22" American Elm	Protected	Growing around power pole, 50% dieback, not impacted	
6	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
7	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
8	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
9	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
10	7318 Lockwood	14" Mulberry	Not Protected	Private tree, 90% dieback, Dead, Not impacted	
11	Not available	11" Box Elder	Not Protected	Private tree, Not impacted, Topped by CPE	
12	Not available	11" Box Elder	Not Protected	Private tree, Not impacted, Topped by CPE	
13	Not available	11" Tallow	Not Protected	Private tree, Not impacted, Topped by CPE	
14	7115 Lockwood	4' Sago	Not Protected	Private tree, Not impacted	
15	7115 Lockwood	11" Mulberry	Not Protected	Private tree, Not impacted	
16	7115 Lockwood	10" Green Ash	Protected		Clearance prune, Fence

NOTE:

- THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED APRIL 2026. 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.
- 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.
- 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.



C.N. Koehl
 Urban Forestry, Inc.
 210 Stone Bush Ct. • Katy, Texas 77493
 281-391-0023 ckoehl@ckoehlurbanforestry.com

APPROVED:

Lockwood, Andrews & Newnam, Inc.
 3700 W Sam Houston Pkwy S Houston, TX 77042

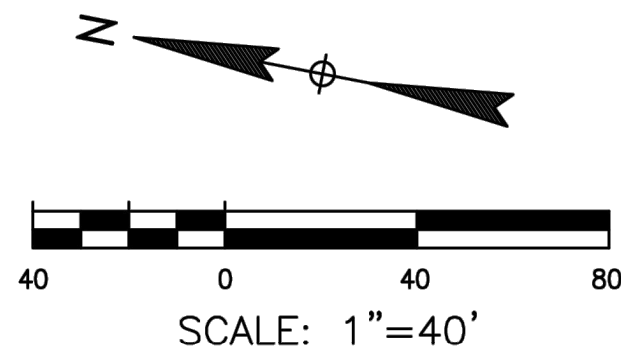
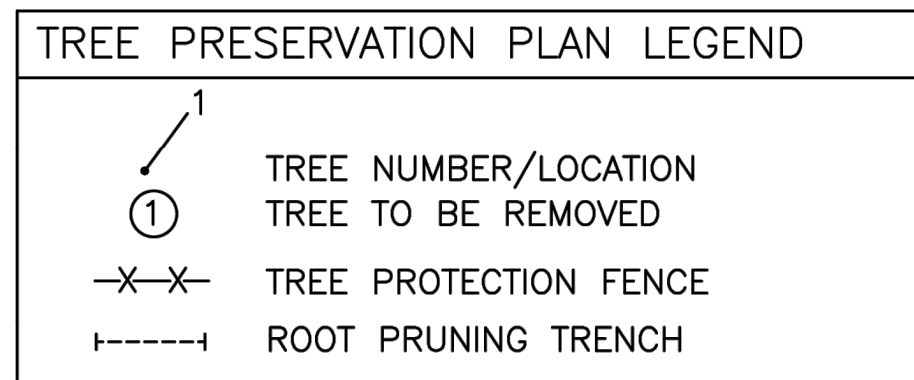
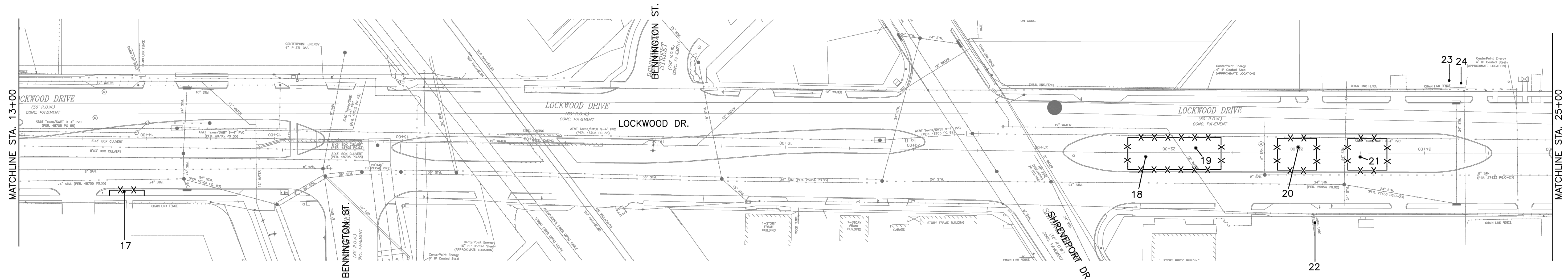
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8

TREE PROTECTION PLAN

SHEET 1 OF 7	
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 68	OF 106



Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Lockwood Drive					
17	7115 Lockwood	11" Green Ash	Protected		Clearance prune, Fence
18	Median	12" Cedar Elm	Protected	50% dieback, Storm damage	Fence
19	Median	14" Cedar Elm	Protected	Storm damage, Split trunk	Fence
20	Median	16" Cedar Elm	Protected	40% dieback, Storm damage	Fence
21	Median	15" Cedar Elm	Protected		Fence
22	6729 Lockwood	19" American Elm	Not Protected	Private tree, Pruned by CPE	Clearance prune
23	6718 Lockwood	22" China Berry	Not Protected	Pruned by CPE, Private tree, Not impacted	
24	6718 Lockwood	33" American Elm	Protected	Corridor tree, Pruned by CPE, 70% dieback, Not impacted	

NOTE:

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C.N. Koehl
 Urban Forestry, Inc.
 210 Stone Bush Ct. • Katy, Texas 77493
 281-391-0022 ckoehl@ckoehlurbanforestry.com

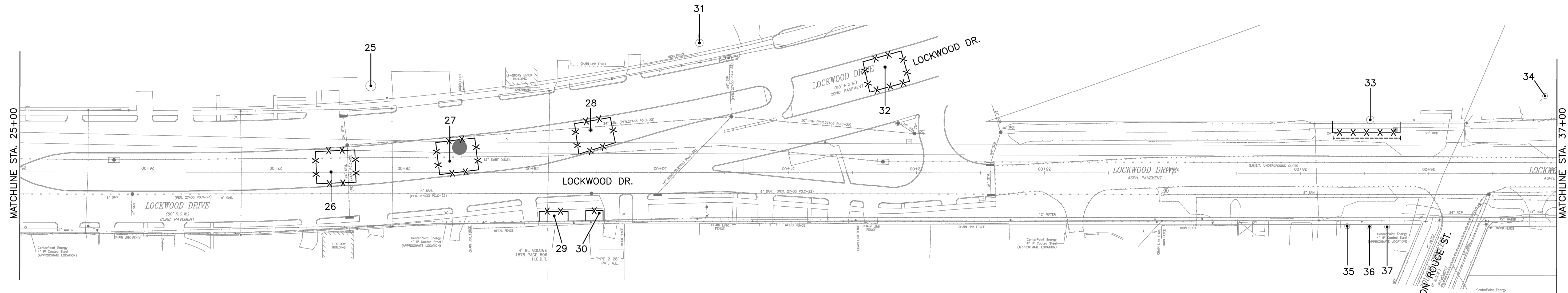
LAN
 Lockwood, Andrews & Newnam, Inc.
 3700 W Sam Houston Pkwy S Houston, TX 77042

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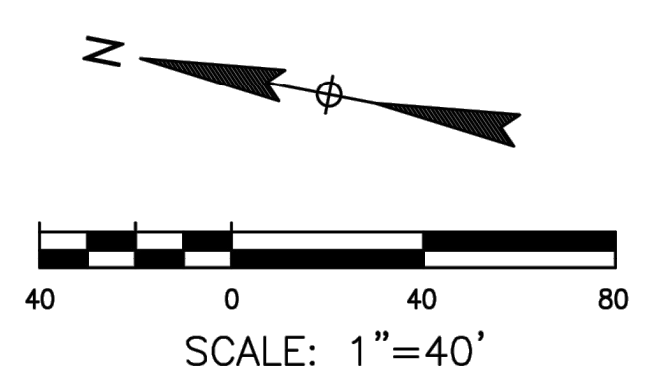
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8
 TREE PROTECTION PLAN

SHEET 2 OF 7

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 69 OF 106	



TREE PRESERVATION PLAN LEGEND	
	TREE NUMBER/LOCATION TREE TO BE REMOVED
	TREE PROTECTION FENCE
	ROOT PRUNING TRENCH



Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Lockwood Drive					
25	6612 Lockwood	38" Arizona Ash	Not Protected	Private tree, Topped, Not impacted	
26	Median	14" Cedar Elm	Protected	Trunk scars	Fence
27	Median	14" Cedar Elm	Protected		Fence
28	Median	16" Cedar Elm	Protected		Fence
29	6603 Lockwood	10" Pecan	Protected	Topped by CPE	Fence
30	6603 Lockwood	5" Live Oak	Protected		Fence
31	6520 Lockwood	28" Pecan	Protected	Corridor, Pruned by CPE, Not impacted	
32	Median	13" Cedar Elm	Protected	Storm damage	Fence
33	6406 Lockwood	27" American Elm	Protected	Corridor tree, Pruned by CPE	Fence, Root prune, Clearance prune
34	6406 Lockwood	16" Tallow	Not Protected	Private tree	
35	6409 Lockwood	15" Crepe Myrtle	Not Protected	Private tree	
36	6409 Lockwood	10" Crepe Myrtle	Not Protected	Private tree	
37	6409 Lockwood	12" Crepe Myrtle	Not Protected	Private tree	

NOTE:

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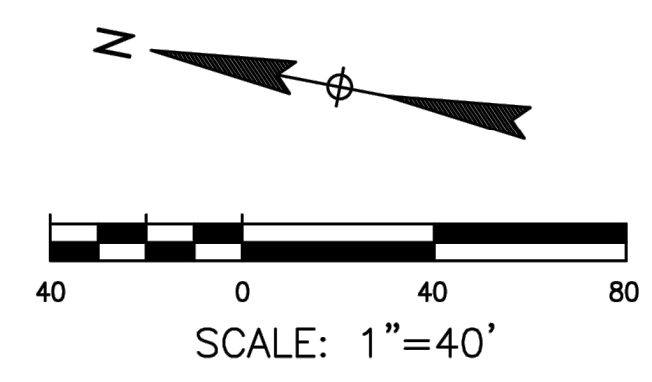
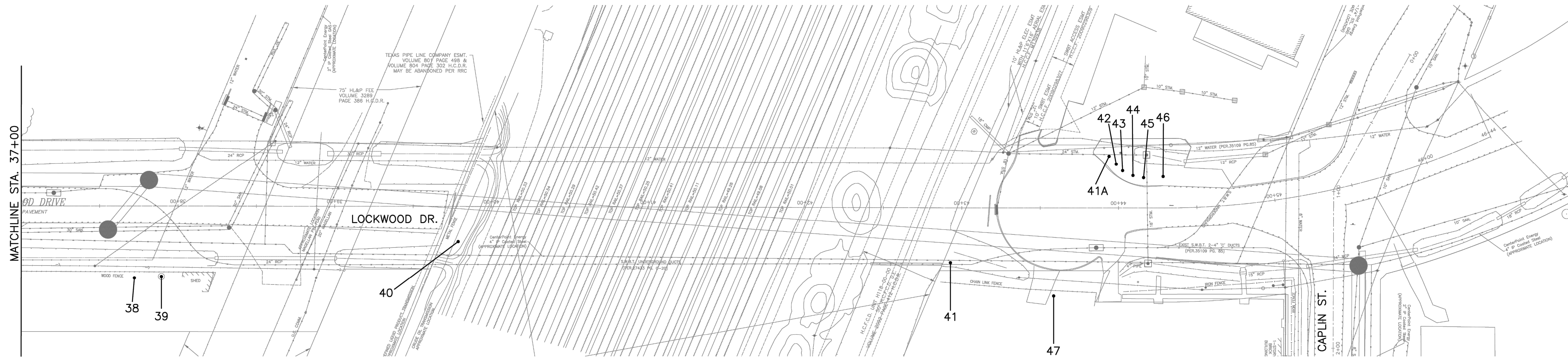
C.N. Koehl
 Urban Forestry, Inc.
 210 Stone Bush Ct. • Katy, Texas 77493
 281-391-0022 ckoehl@koehlorbustree.com

LAN
 Lockwood, Andrews & Newnam, Inc.
 3700 W Sam Houston Pkwy S Houston, TX 77042

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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1, PACKAGE 8
 TREE PROTECTION PLAN

SHEET 3 OF 7	
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 70 OF 106	



TREE PRESERVATION PLAN LEGEND	
	TREE NUMBER/LOCATION
	TREE TO BE REMOVED
	TREE PROTECTION FENCE
	ROOT PRUNING TRENCH

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Lockwood Drive					
38	4832 Baton Rouge	14" Pine	Protected	Private tree, Not impacted	
39	4832 Baton Rouge	16" Pecan	Protected	Private tree	
40	6702 Los Angeles	11" American Elm	Protected	Not impacted, Trenchless construction	
41	6702 Los Angeles	24" American Elm	Protected	Not impacted, Trenchless construction	
41A	6202 Lockwood	5" Crepe Myrtle	Not Protected	Topped	
42	6202 Lockwood	5" Crepe Myrtle	Not Protected	Topped	
43	6202 Lockwood	5" Crepe Myrtle	Not Protected	Topped	
44	6202 Lockwood	5" Crepe Myrtle	Not Protected	Topped	
45	6202 Lockwood	5" Crepe Myrtle	Not Protected	Topped	
46	6202 Lockwood	5" Crepe Myrtle	Not Protected	Topped	
47	5313 Caplin	25" Pecan	Protected	Corridor tree, Pruned by CPE, Not impacted, Trenchless construction	

NOTE:

- THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED APRIL 2026. 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.
- 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.
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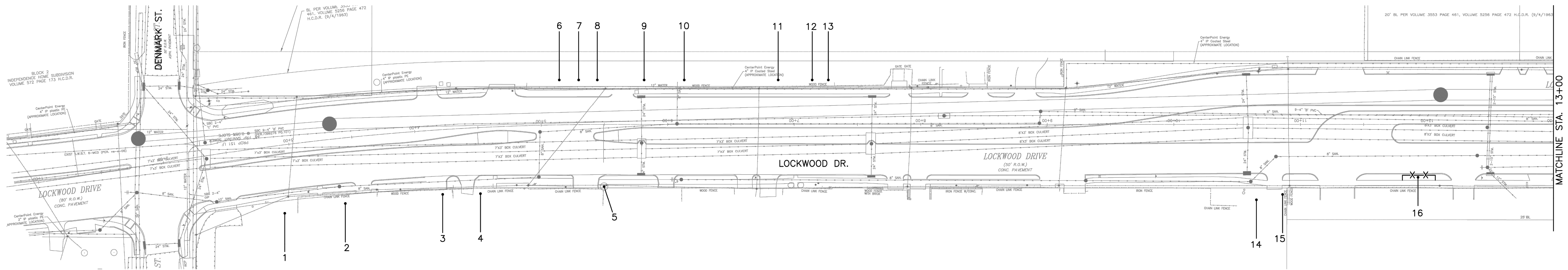
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SHEET 4 OF 7	
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 71 OF 106	



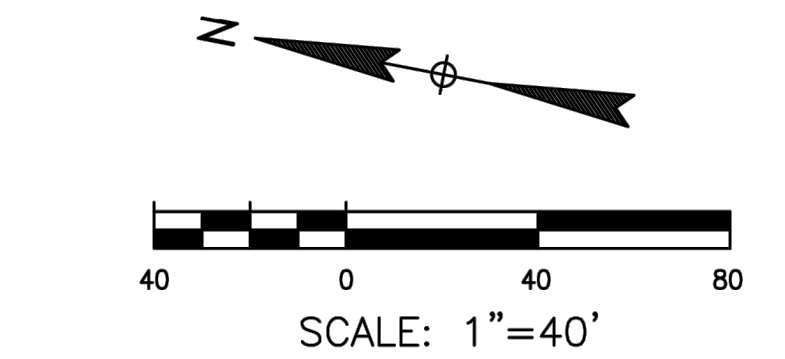
TREE PRESERVATION PLAN LEGEND

	TREE NUMBER/LOCATION TREE TO BE REMOVED
	TREE PROTECTION FENCE
	ROOT PRUNING TRENCH

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Lockwood Drive					
1	Not available	41" Green Ash	Protected	Corridor tree, Trunk cavity, Not impacted	
2	7419 Lockwood	24" Magnolia	Protected	Corridor tree, Pruned by CPE	Clearance prune
3	7415 Lockwood	17" Arborvitae	Not Protected	Private tree, Not impacted	
4	7405 Lockwood	16" Crepe Myrtle	Not Protected	Private tree, Not impacted	
5	Not available	22" American Elm	Protected	Growing around power pole, 50% dieback, not impacted	
6	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
7	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
8	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
9	7318 Lockwood	11" Box Elder	Not Protected	Private tree, Topped, Topped by CPE Not impacted	
10	7318 Lockwood	14" Mulberry	Not Protected	Private tree, 90% dieback, Dead, Not impacted	
11	Not available	11" Box Elder	Not Protected	Private tree, Not impacted, Topped by CPE	
12	Not available	11" Box Elder	Not Protected	Private tree, Not impacted, Topped by CPE	
13	Not available	11" Tallow	Not Protected	Private tree, Not impacted, Topped by CPE	
14	7115 Lockwood	4' Sago	Not Protected	Private tree, Not impacted	
15	7115 Lockwood	11" Mulberry	Not Protected	Private tree, Not impacted	
16	7115 Lockwood	10" Green Ash	Protected		Clearance prune, Fence

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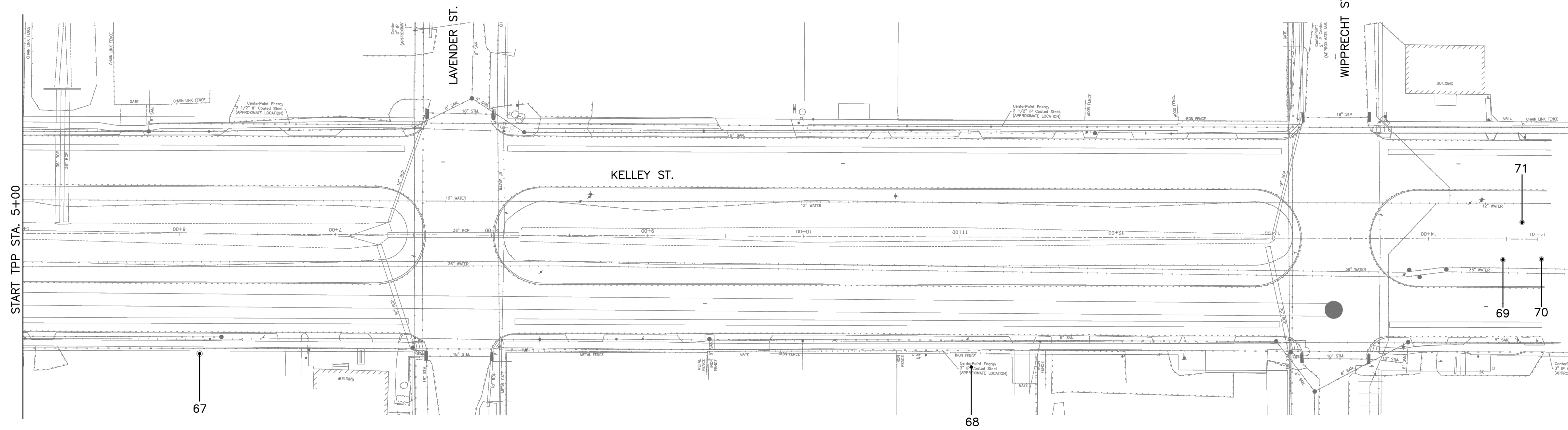
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HOUSTON PUBLIC WORKS
CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8
TREE PROTECTION PLAN

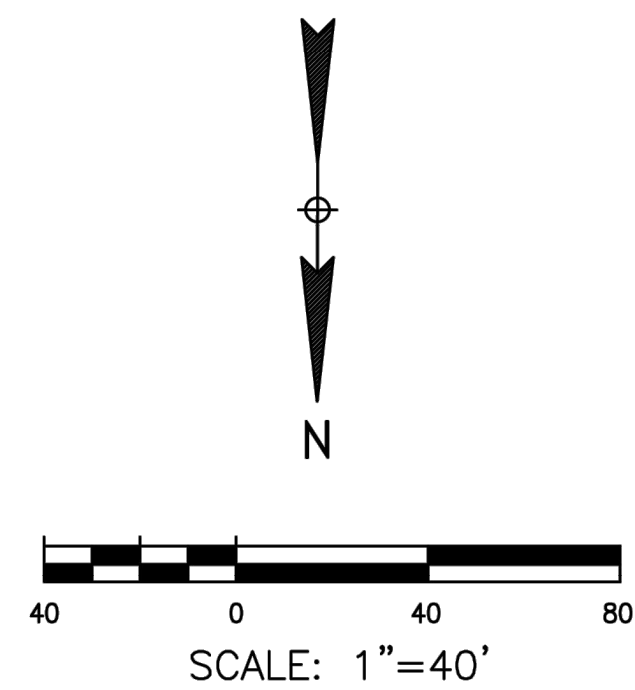
SHEET 1 OF 7	
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 72 OF 106	



TREE PRESERVATION PLAN LEGEND	
①	TREE NUMBER/LOCATION TREE TO BE REMOVED
-X-X-	TREE PROTECTION FENCE
- - - - -	ROOT PRUNING TRENCH

Tree No.	Location	Description	Chapter 33 Status	Comments	Treatment
Trees on Kelley Street					
67	4916 Kelley	25" Sweetgum	Protected	Corridor tree, 40% dieback, Topped by CPE, Not impacted	
68	4813 Kelley	23" Water Oak	Protected	Corridor tree, Pruned by CPE, Not impacted	
69	Median	18" Bradford Pear	Not Protected	Fire blight	
70	Median	19" Bradford Pear	Not Protected	60% dieback	
71	Median	13" Bradford Pear	Not Protected	Fire blight	

- NOTE:**
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 281-391-0022 ckoehl@koehlorbunforestry.com

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 Lockwood, Andrews & Newnam, Inc.
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 PLAN AREA 1, PACKAGE 8
 TREE PROTECTION PLAN

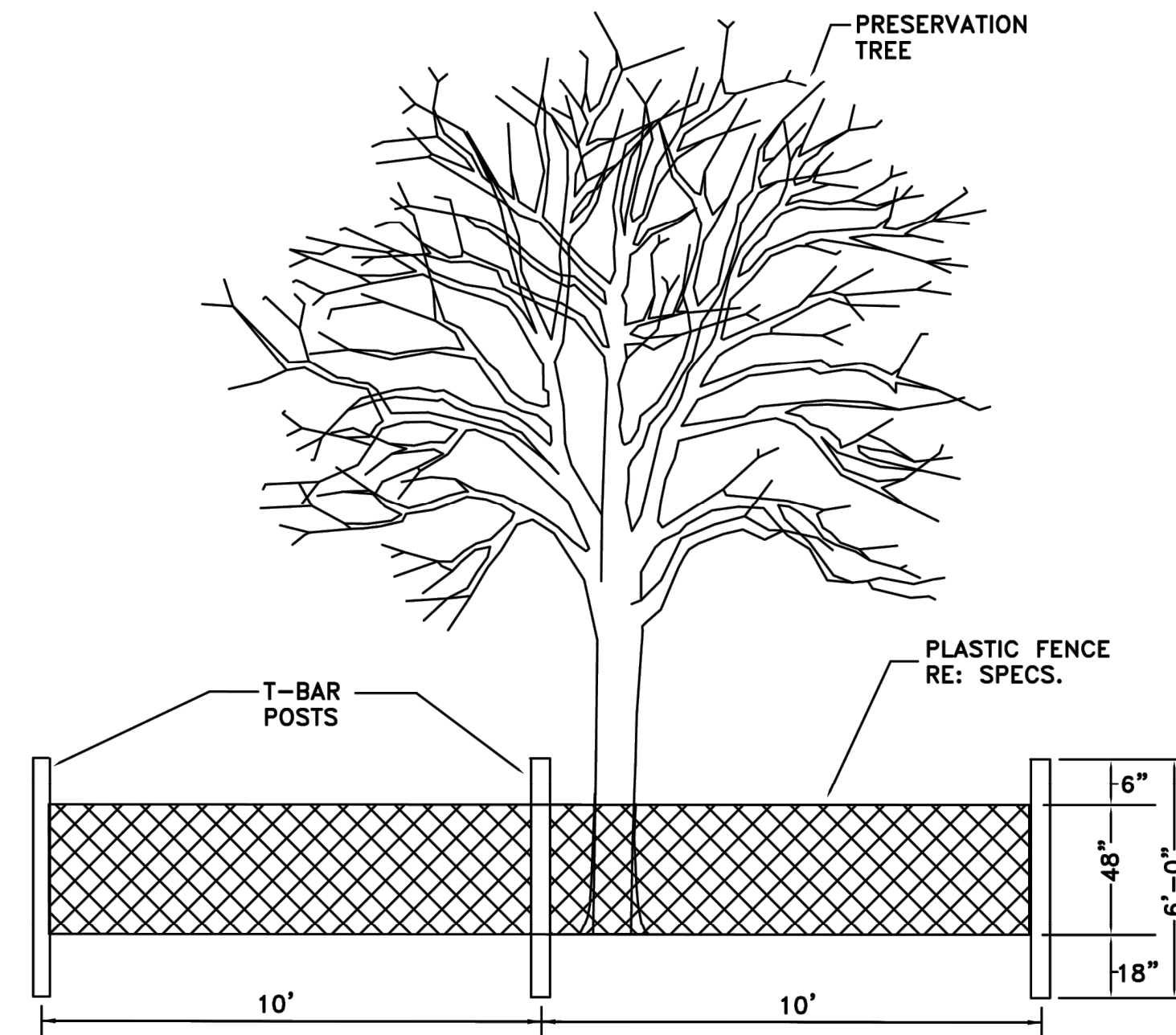
SHEET 6 OF 7

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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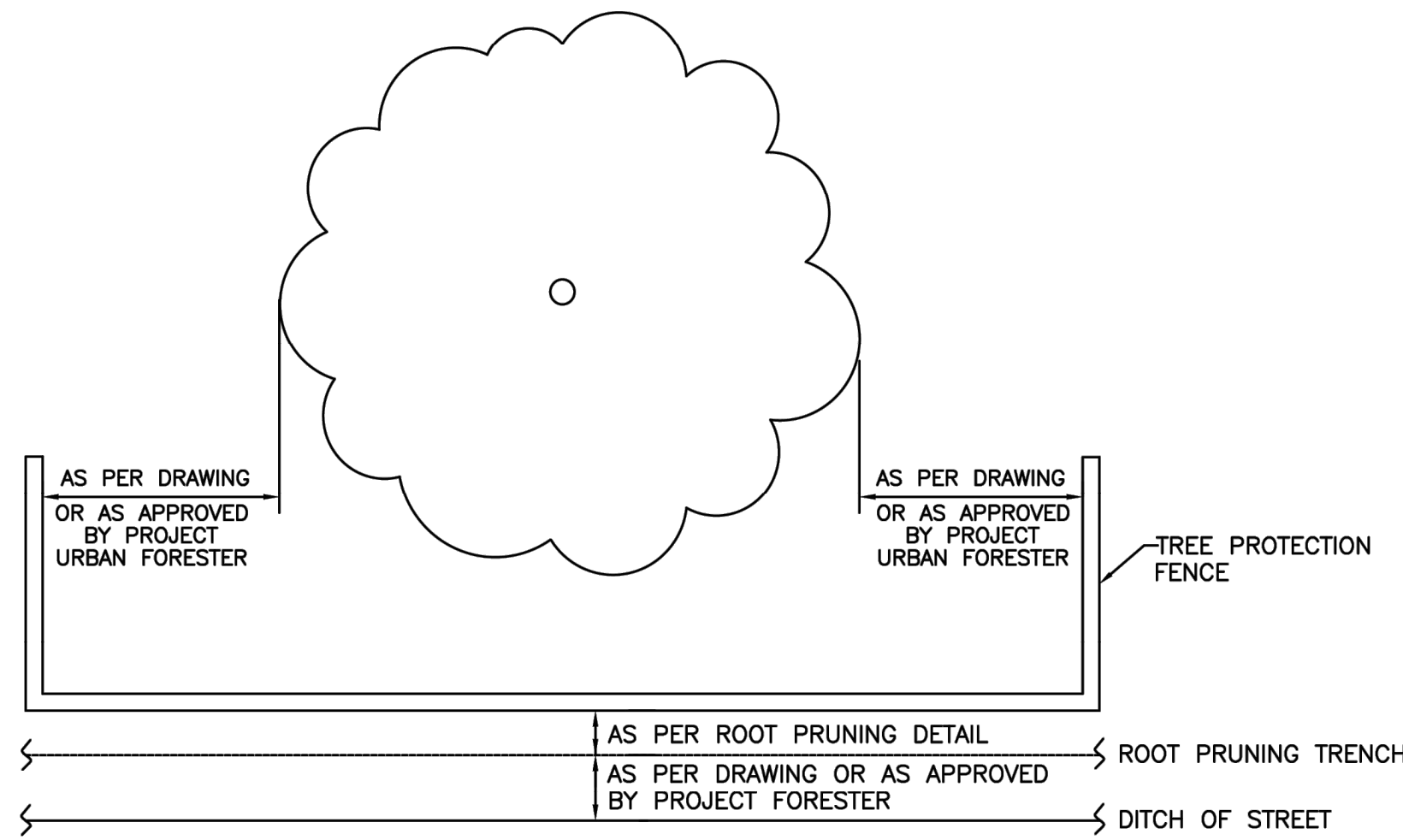
Arboriculturally Significant Tree List

Tree No.	Location	Description
1	Not available	41" Green Ash
2	7419 Lockwood	24" Magnolia
5	Not available	22" Arizona Ash
24	6718 Lockwood	33" American Elm
25	6612 Lockwood	38" Arizona Ash
31	6520 Lockwood	28" Pecan
33	6406 Lockwood	27" American Elm
41	6702 Los Angeles	24" American Elm
47	5313 Caplin	25" Pecan
51	6111 Pickfair	23" Black Walnut
58	6017 Pickfair	22" Pine
59	6014 Pickfair	29" Live Oak
67	4916 Kelley	25" Sweetgum
68	4813 Kelley	23" Water Oak

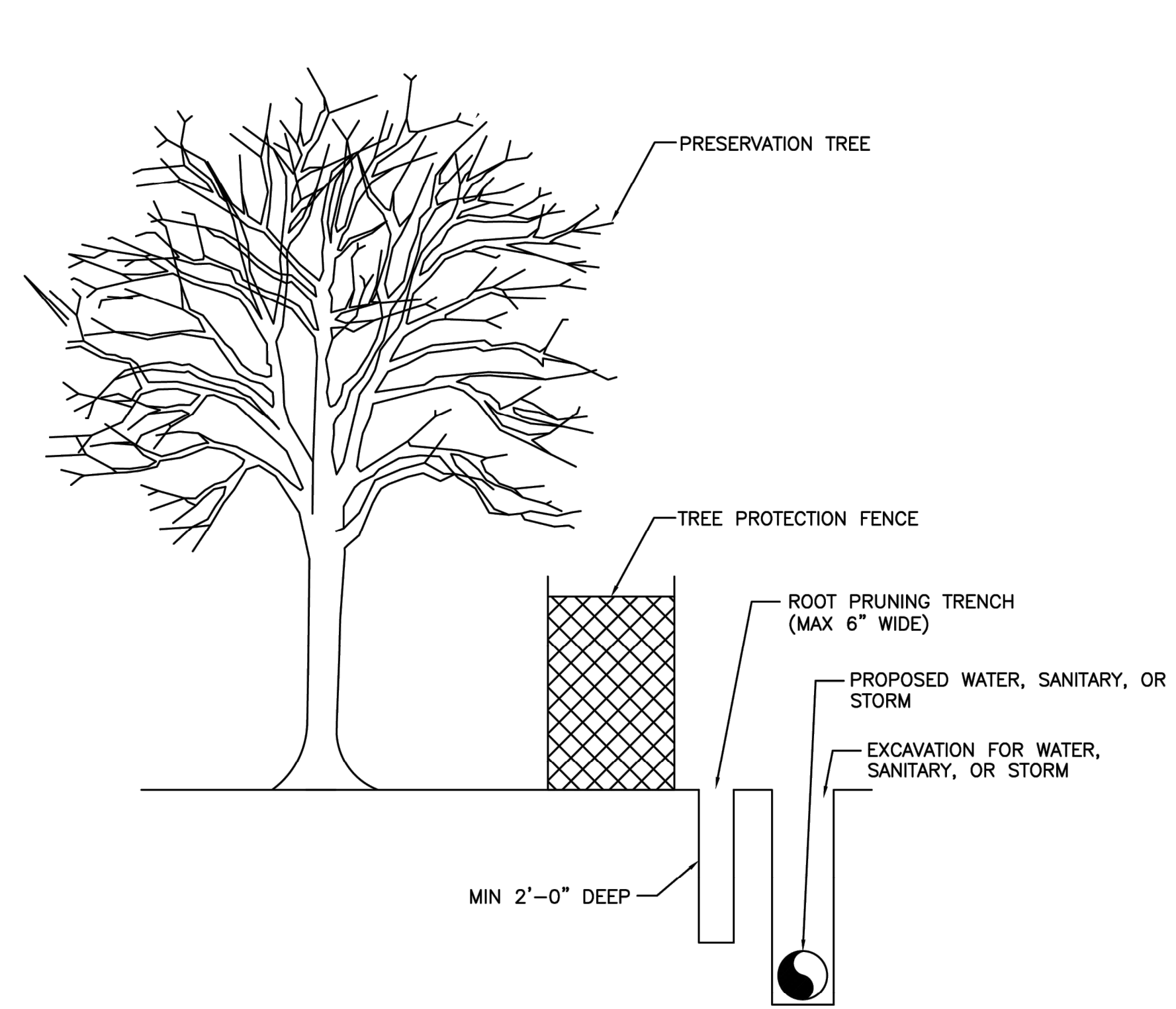
Trees Identified by City of Houston Forestry/Parks & Recreation Department as Arboriculturally Significant are identified here and/or in treatment schedule included on TPP sheets. Arboriculturally Significant trees are to be pruned under direct supervision of City of Houston Forestry. Minimal pruning will be allowed for construction equipment access, and in some cases no pruning will be allowed. Contractor must review conditions around and/or under the canopy of Arboriculturally Significant trees and consider restrictions when preparing cost estimate and planning construction equipment that will be necessary to accomplish design installation with minimal to no tree pruning.



TREE PROTECTION FENCING DETAIL A
NOT TO SCALE



TREE PROTECTION FENCING DETAIL B
NOT TO SCALE



ROOT PRUNE FOR WATER, SANITARY, OR STORM LINE
NOT TO SCALE

C.N. Koehl
Urban Forestry, Inc.
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1, PACKAGE 8

TREE PROTECTION PLAN

SHEET 7 OF 7

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R-001000-0033-3	
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CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
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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.houston.tx.gov>) BEFORE IMPLEMENTING THE TRAFFIC CONTROL PLAN. THE APPLICATION MUST BE SUBMITTED AT LEAST TEN DAYS PRIOR TO THE IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN AND/OR BEGINNING CONSTRUCTION WORK. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLANS, CONSTRUCTION SEQUENCING, AND CONSTRUCTION SCHEDULE WITH THE APPLICATION.
10. CONTRACTOR SHALL HAVE APPROVED TRAFFIC CONTROL PLAN AND PERMIT AT THE JOB SITE FOR INSPECTION AT ALL TIMES.
11. DURING PAVEMENT SURFACE RESTORATION PROJECTS; THE CONTRACTOR SHALL NOT OPEN CLOSED LANES UNTIL THE PAVEMENT SURFACE HAS CURED ENOUGH TO ALLOW VEHICULAR TRAFFIC ACCORDING TO CITY OF HOUSTON STANDARD SPECIFICATIONS.
12. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING AND COORDINATING ALL CONSTRUCTION ACTIVITIES WITH STAKE HOLDERS IN THE VICINITY INCLUDING EMERGENCY RESPONSE AGENCIES SUCH AS HOUSTON POLICE DEPARTMENT, HOUSTON FIRE DEPARTMENT, AND METROPOLITAN TRANSIT AUTHORITY.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ISSUING ALL WORK DIRECTIVES TO ALL SUB-CONTRACTORS, UTILITY COMPANIES, AND ALL OTHER ENTITIES PERFORMING CONSTRUCTION WORK ASSOCIATED WITH THE PROJECT.
14. NOTHING IN THESE NOTES OR PLANS SHALL RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT; INCLUDING SAFETY OF ALL MODES OF TRANSPORTATION, PERSONS, AND PROPERTY, AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO WORKING HOURS.
15. THE OFFICE OF CITY ENGINEER (MOBILITY PERMITS GROUP) PER THE DIRECTION OF THE CITY TRAFFIC ENGINEER HAVE THE RIGHT TO DEMAND THE INSTALLATION OF ADDITIONAL TRAFFIC CONTROL DEVICES OR MODIFICATIONS OF THESE PLANS AND NOTES, AS DEEMED NECESSARY TO PROMOTE THE SAFE AND ORDERLY FLOW OF TRAFFIC, INCLUDING PEDESTRIANS AND BICYCLES, THROUGH THE CONSTRUCTION WORK ZONE. THE CONTRACTOR SHALL COMPLY WITH THESE ADDITIONAL REQUESTS OR MODIFICATIONS WITH DUE DILIGENCE.
16. ALL EXISTING TRAFFIC CONTROL SIGNS AND PAVEMENT MARKINGS SHALL BE MAINTAINED IN VISIBLE LOCATIONS DURING CONSTRUCTION UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM CITY OF HOUSTON PROJECT MANAGER. THE CONTRACTOR SHALL RESTORE OR REPLACE (AT THE DISCRETION OF THE CITY TRAFFIC ENGINEER) ANY PAVEMENT MARKING OR SIGNING DAMAGE DURING CONSTRUCTION OPERATIONS, INCLUDING RAISED PAVEMENT MARKERS (RPMs).
17. WHEN ENTERING OR LEAVING ROADWAYS CARRYING PUBLIC TRAFFIC, THE CONTRACTOR'S EQUIPMENT, WHETHER EMPTY OR LOADED SHALL IN ALL CASES YIELD TO PUBLIC TRAFFIC WITH THE ASSISTANCE OF CONTRACTOR PROVIDED CERTIFIED FLAGGER/PEACE OFFICER.
18. ACCESS TO DRIVEWAYS ADJACENT TO THE CONSTRUCTION WORK ZONE SHALL BE MAINTAINED AT ALL TIMES AS MUCH AS POSSIBLE. ADDITIONAL CONES AND/OR DELINEATORS MAY BE REQUIRED TO DELINEATE THE DRIVEWAY ACCESS ROUTE THROUGH THE CONSTRUCTION WORK ZONE. A MINIMUM OF ONE TRAVEL LANE SHALL BE MAINTAINED ACROSS THE DRIVEWAYS, UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM CITY OF HOUSTON PROJECT MANAGER.
19. SPILLAGE RESULTING FROM HAULING OPERATIONS ALONG OR ACROSS ANY PUBLIC TRAVELED WAY SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
20. THE CONTRACTOR SHALL SUBMIT AN APPLICATION FOR TEMPORARY PARKING RESTRICTIONS IF THERE ARE PARKING METERS LOCATED AT THE PROPOSED LANE CLOSURES FROM PARKING MANAGEMENT DIVISION (832-393-8690) AT LEAST TEN BUSINESS DAYS BEFORE IMPLEMENTATION OF LANE CLOSURES. IN ADDITION, TEMPORARY NO PARKING SIGNS SHALL BE POSTED 24 HOURS PRIOR TO COMMENCEMENT OF WORK.
21. ADDITIONAL OFF DUTY OFFICERS/FLAGGERS MAY BE REQUESTED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED AT THE DISCRETION OF THE CITY PROJECT MANAGER EVEN IF THEY ARE NOT SPECIFICALLY IDENTIFIED ON THE PROJECT PLANS.
22. THE CONTRACTOR SHALL REPLACE WITHIN 72 HOURS, ALL TRAFFIC SIGNAL LOOP DETECTORS DAMAGED DURING CONSTRUCTION.
23. IN GENERAL, A SOLAR POWERED FLASHING ARROW BOARD SHALL BE REQUIRED ON ALL MAJOR THOROUGHFARE LANES CLOSURES. EXCEPTIONS TO FLASHING ARROW BOARDS AND/OR IMPLEMENTATION ON RESIDENTIAL LANE CLOSURES SHALL BE APPROVED BY CITY TRAFFIC ENGINEER.
24. APPROVED TRAFFIC CONTROL PLAN SHALL BE IN PLACE BEFORE STARTING ANY EXCAVATION.
25. WATER FILLED BARRIERS CAN BE USED AS INSTRUCTED BY THE ENGINEER AND APPROVED BY THE CITY FOR PROJECTS WHERE SPACE IS LIMITED AND HEAVY EQUIPMENT TO PLACE CONCRETE BARRIERS IS NOT FEASIBLE. WATER FILLED BARRIERS SHALL NOT BE USED ON ROADWAYS WITH A POSTED SPEED LIMIT MORE THAN 45 MPH.
26. WATER FILLED BARRIERS MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S REQUIREMENTS AND ROUTINELY INSPECTED FOR DEFECTS.
27. IF WATER FILLED BARRIER IS PROVIDED, USE ENVIRONMENTALLY SAFE ANTI-FREEZING AGENT IN THE WATER WHEN IT IS APPLICABLE PER MANUFACTURER SPECIFICATIONS AND RECOVER AGENT WHEN THE BARRIER IS DRAINED.

28. DISPOSE OF WATER AND AGENT PROPERLY. DO NOT DRAIN WATER FILLED BARRIER INTO OR ACROSS AN EXISTING TRAVEL LANE.
29. PROVIDE BARRIER UNITS THAT ARE CAPABLE OF BEING LIFTED AND MOVED WHEN FILLED IF DRAINING IS NOT POSSIBLE.
30. PROVIDE WATER FILLED BARRIER THAT ACTS AS ITS OWN FREE STANDING, NON-REDIRECTIVE END TREATMENT.
31. WHEN WATER FILLED BARRIERS ARE USED TO CHANNELIZE PEDESTRIANS, THEY MUST HAVE A CONTINUOUS DETECTABLE BOTTOM FOR USERS OF LONG CANES AND THE TOP OF THE UNIT SHALL NOT BE LESS THAN 32 INCHES IN HEIGHT.
32. ANY CLOSURE OF A PEDESTRIAN OR BICYCLE FACILITY SHALL REQUIRE THE SHORTEST DETOUR THAT MAINTAINS THE SAFETY OF PEDESTRIAN AND/OR BICYCLISTS.

SPACING FOR CHANNELIZING DEVICES

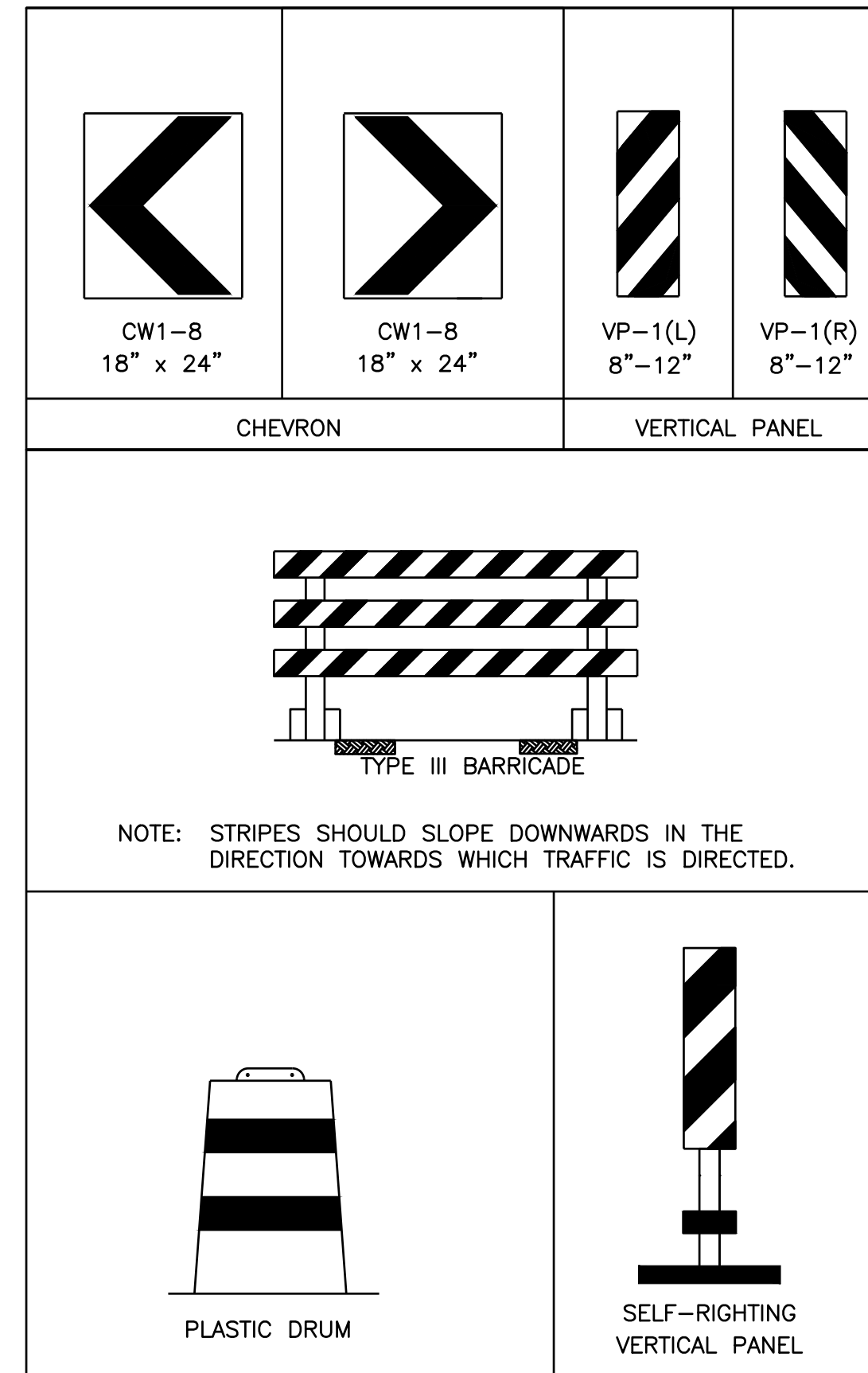
- A. PLASTIC DRUMS ON MERGING TAPER @ 30' C - C WITH CHEVRON SIGN @ 60' C - C AND WARNING LIGHTS FOR OVERNIGHT CLOSURE.
- B. PLASTIC DRUMS ON DOWNSTREAM TAPER @ 30' C - C (RETURN TAPER AND BARRICADE ARE OPTIONAL AND DIVIDED ROADWAY SECTION)
- C. PLASTIC DRUMS ON RADII @ 35' C - C.
- D. PLASTIC DRUMS ON TANGENT @ 35' C - C WITH VERTICAL PANEL AT 70' C - C AND APPROVED WARNING LIGHT @ 70' C - C (FOR OVERNIGHT CLOSURE).
- E. PLASTIC DRUMS IN FRONT OF CONSTRUCTION ZONE @ 20' C - C WITH VERTICAL PANEL AT 40' C - C AND APPROVED WARNING LIGHT @ 40' C - C (FOR OVERNIGHT CLOSURE).
- F. CONCRETE TRAFFIC BARRIER (CTB) OR LOW PROFILE CONCRETE TRAFFIC BARRIER (LPCTB) WITH APPROVED REFLECTORS @ 10' C - C IF PAVEMENT DROP IS GREATER THAN 1 FOOT.
- G. PLASTIC DRUMS W/GUARD RAIL MOUNTED.
- H. SELF- RIGHTING VERTICAL PANEL SPACING.
 - 4 LANES TO 2 LANES UNDIVIDED ROADWAY SECTION @ 20' C - C.
 - 4 LANES DIVIDED ROADWAY TO ONE SIDE TWO WAY ROADWAY @ 20' C - C.
 - LEFT LANE AND RIGHT LANE STORAGE BAYS @ 15' C - C.
- I. SPACING SHOWN ON TRAFFIC CONTROL SHALL SUPERSEDE THE ABOVE SPACING.
- J. SPACING MAY BE ADJUSTED TO PROVIDE DRIVEWAYS, INTERSECTIONS AND /OR MEDIAN OPENINGS.

TABLE C3 - TYPICAL SIGN SPACING, TAPER LENGTHS, AND SUGGESTED SPACING OF CHANNELIZATION DEVICES

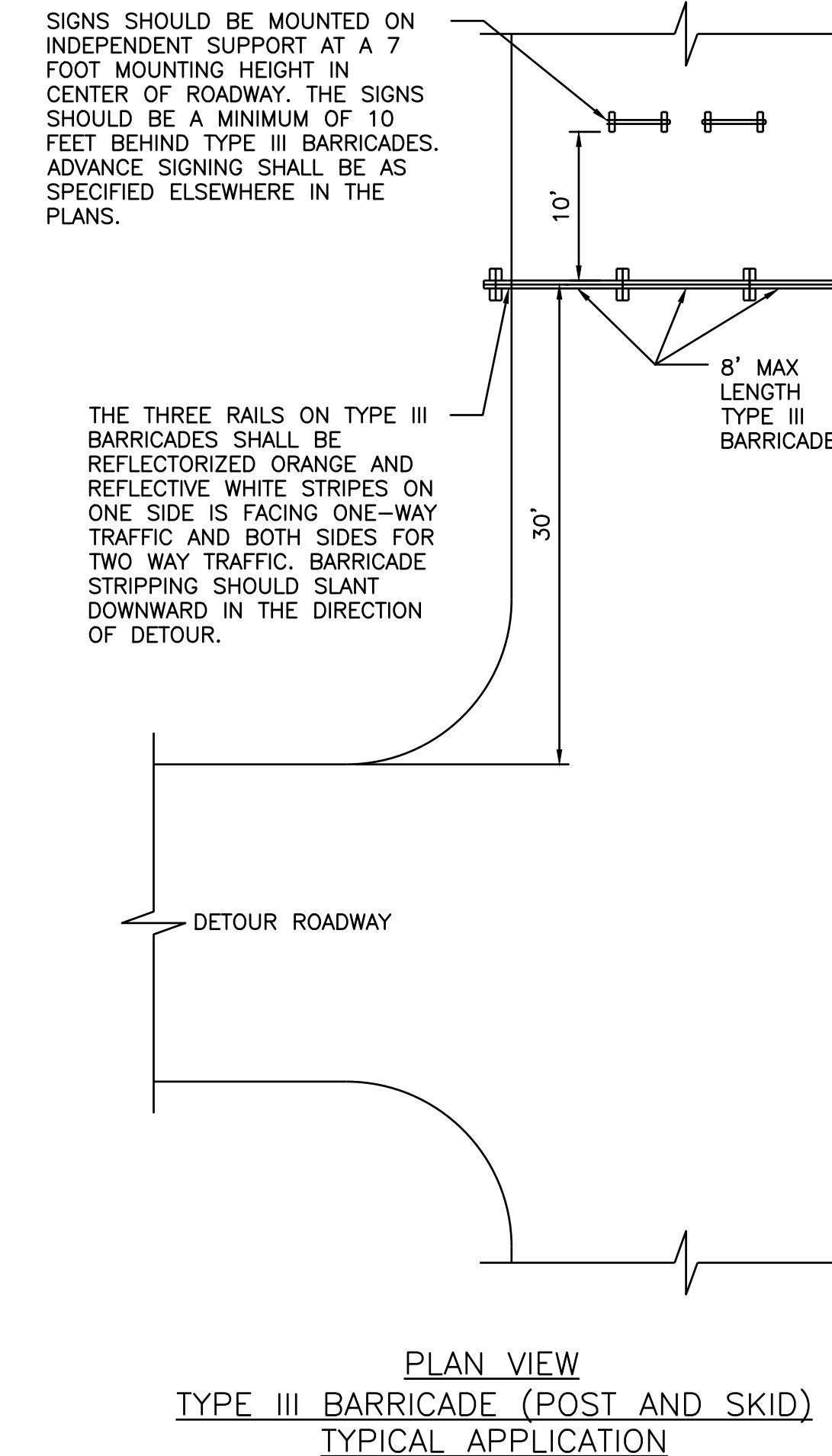
POSTED SPEED (MPH)	SIGN SPACING "X" (FEET)	MIN. DESIRABLE TAPER LENGTH "L"			SUGGESTED MAXIMUM SPACING OF DEVICE	
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER	ON A TANGENT
30	120'	150'	165'	180'	30'	60'-75'
35	160'	205'	225'	245'	35'	70'-90'
40	240'	265'	295'	320'	40'	80'-100'
45	320'	450'	495'	540'	45'	90'-110'
50	400'	500'	550'	600'	50'	100'-125'
55	500'	550'	605'	660'	55'	110'-140'

TABLE C4 - STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

POSTED SPEED (MPH)	DISTANCE "D" (FEET)
30	200
35	250
40	305
45	360
50	425
55	495



CHANNELIZATION AND BARRICADES



NO.	DATE	REVISION	APP.
EFF DATE: XXXX-XX-2027		DWG NO:	
		THESE DOCUMENTS ARE ISSUED FOR INTERIM REVIEW ONLY AND ARE NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.	
SURVEYED BY: FB NO. -		JUNE 2026 GRISELDA GONZALES, P.E. TX PE NO. 115678	
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TRAFFIC CONTROL PLAN NOTES (1 OF 2)			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3			
DRAWING SCALE			
CITY OF HOUSTON PM			
NEIL BARNSDALE, P.E.			
SHEET NO. 75 OF 106			

GENERAL PROJECT NOTES

- THIS PROJECT CONSISTS OF INSTALLATION OF A NEW 12-INCH AND A NEW 8-INCH WATERLINE BY AUGERING/TRENCHLESS METHODS WITH OPEN PITS AT VERTICAL AND HORIZONTAL FITTINGS AND SERVICE TRANSFERS (PHASE 1).
- FOLLOWING RESOLUTION OF UTILITY CONFLICTS CONSTRUCTION WILL COMMENCE OF THE TRENCHLESS INSTALLATION OF AN 84-INCH SANITARY SEWER WITH MULTIPLE TUNNEL SHAFT WORK AREAS ALONG LOCKWOOD DR., CAPLIN ST., PICKFAIR ST., AND KELLEY ST. (PHASE 2).
- THE CONTRACTOR SHALL COMPLETE INSTALLATION OF THE NEW 8-INCH AND 12-INCH WATERLINE AND TRANSFER SERVICES PRIOR TO STARTING TUNNEL SHAFT EXCAVATION AND INSTALLATION OF THE 84-INCH WASTEWATER LINE. TRAFFIC CONTROL SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE APPROVED TCP SHEETS AND CITY OF HOUSTON (COH) MOBILITY PERMIT REQUIREMENTS.

THROUGH TRAFFIC OPERATIONS

- THROUGH TRAFFIC SHALL BE MAINTAINED DURING BOTH PHASES OF CONSTRUCTION USING TEMPORARY LANE SHIFTS, MERGE TAPERS, AND CHANNELIZATION TO ROUTE VEHICLES SAFELY AROUND ACTIVE WORK AREAS. DURING PHASE 1, TRAFFIC CONTROL SHALL BE CONFIGURED TO ACCOMMODATE DISCRETE OPEN PIT WORK AREAS AT WATERLINE FITTINGS AND SERVICE TRANSFER LOCATIONS. DURING PHASE 2, TRAFFIC CONTROL SHALL BE CONFIGURED TO ROUTE VEHICLES AROUND ACTIVE TUNNEL SHAFT WORK ZONES. TRAFFIC SHALL BE RETURNED TO NORMAL ALIGNMENT AT THE END OF EACH ACTIVE WORK SEGMENT AS SHOWN ON THE TCP SHEETS

TCP APPROACH

- CONSTRUCTION IS ANTICIPATED TO PROGRESS USING A ROLLING/SEGMENTED TRAFFIC CONTROL APPROACH. ACTIVE WORK LIMITS SHALL BE ESTABLISHED ONLY WHERE WORK IS OCCURRING AND SHALL BE CLEARLY DELINEATED WITH APPROVED DEVICES AND SIGNING. DURING PHASE 1, THE CONTRACTOR SHALL IMPLEMENT SITE-SPECIFIC SETUPS FOR EACH ACTIVE WATERLINE OPEN PIT/FITTING LOCATION CONSISTENT WITH THE TCP TYPICALS. DURING PHASE 2, THE CONTRACTOR SHALL PROVIDE SITE-SPECIFIC SETUPS CONSISTENT WITH TCP SHEETS FOR EACH ACTIVE SHAFT OR GROUP OF SHAFTS.

WORK ZONE SAFETY

- DURING PHASE 1, EACH WATERLINE OPEN PIT/FITTING LOCATION SHALL BE TREATED AS AN ACTIVE WORK ZONE WITH APPROPRIATE BUFFER SPACE AND TRAFFIC EXCLUSION/CLOSED AREAS AS SHOWN ON THE PLANS. DURING PHASE 2, EACH SHAFT LOCATION SHALL BE TREATED AS AN ACTIVE WORK ZONE WITH APPROPRIATE BUFFER SPACE AND TRAFFIC EXCLUSION/CLOSED AREAS AS SHOWN ON THE PLANS. CLOSED AREAS SHALL NOT BE ACCESSIBLE TO PUBLIC TRAFFIC AND MAY BE USED FOR CONTRACTOR OPERATIONS/STAGING WHERE INDICATED. POSITIVE PROTECTION (BARRIERS/FENCING) SHALL BE PROVIDED AS REQUIRED FOR PUBLIC SAFETY.

LOCAL TRAFFIC ACCESS

- ACCESS TO ADJACENT PROPERTIES SHALL BE MAINTAINED TO THE MAXIMUM EXTENT PRACTICAL. WHERE "LOCAL TRAFFIC ONLY" OR TEMPORARY RESTRICTIONS ARE SHOWN, THE CONTRACTOR SHALL MAINTAIN SAFE ACCESS AND COORDINATE ANY TEMPORARY DRIVEWAY CLOSURES WITH PROPERTY OWNERS IN ADVANCE. MAINTAIN AT LEAST ONE ACCESS POINT TO COMMERCIAL PROPERTIES WHEN FEASIBLE.

PEDESTRIAN ACCESS

- PEDESTRIAN ROUTES AND ADA ACCESS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. WHERE PEDESTRIAN ACCESS TO PUSH BUTTONS, CROSSWALKS, OR SIDEWALKS CANNOT BE MAINTAINED SAFELY, THE CONTRACTOR SHALL IMPLEMENT THE APPROVED PEDESTRIAN DETOUR AND POST REQUIRED CLOSURE/DETOUR SIGNING AS SHOWN ON THE TCP SHEETS.

TRAFFIC SIGNAL OPERATIONS

- EXISTING TRAFFIC SIGNAL OPERATIONS MAY REQUIRE TEMPORARY ADJUSTMENTS (TIMING/PHASING/DETECTION) TO MATCH TEMPORARY LANE CONFIGURATIONS AND MAINTAIN SAFE OPERATIONS. CONTRACTOR SHALL COORDINATE WITH COH TRAFFIC OPERATIONS PRIOR TO IMPLEMENTATION AND SHALL RESTORE SIGNAL OPERATIONS TO ORIGINAL CONDITIONS UPON COMPLETION (OR AS DIRECTED BY COH). METRO BUS STOPS

TRAFFIC OPERATION DEVICES

- ADVANCE WARNING SIGNING, CHANNELIZING DEVICES (DRUMS/DELINATORS), BARRICADES, WARNING LIGHTS, ARROW BOARDS (AS REQUIRED), AND TEMPORARY PAVEMENT MARKINGS (INCLUDING DOTTED PAVEMENT MARKING "CAT TRACKS" WHERE SHOWN) SHALL BE INSTALLED AND MAINTAINED AS DEPICTED ON THE TCP DEVICES SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE DRIVEWAYS, INTERSECTIONS, AND MEDIAN OPENINGS WHILE MAINTAINING SAFETY.

TCP MAINTENANCE AND RESTORATION

- CONTRACTOR SHALL MAINTAIN ALL TRAFFIC CONTROL DEVICES IN PROPER POSITION AND CONDITION AT ALL TIMES. REMOVE SPILLAGE FROM HAULING OPERATIONS IMMEDIATELY, AND REPAIR/REPLACE ANY DAMAGED SIGNS, MARKINGS, OR TRAFFIC SIGNAL COMPONENTS. UPON COMPLETION OF EACH STAGE, TEMPORARY DEVICES/MARKINGS SHALL BE REMOVED AS REQUIRED AND FINAL CONDITIONS RESTORED PER PROJECT REQUIREMENTS AND COH STANDARDS.

GENERAL SCHOOL ZONE CLOSURES

- COOK ELEMENTARY GENERALLY BEGINS CLASSES IN MID AUGUST AND DISMISSES IN EARLY JUNE. LANE CLOSURES DURING SCHOOL ARRIVAL AND DISMISSAL PERIODS TO BE APPROVED BY THE SCHOOL AND LOCAL AGENCY. TYPICAL RESTRICTED HOURS MAY INCLUDE: (NIGHT OR WEEKEND WORK MAY BE REQUIRED IN SCHOOL ZONES)

- MORNING ARRIVAL: 6:30 AM - 8:15 AM
- AFTERNOON DISMISSAL: 4:00 PM - 5:00 PM

- COORDINATE ALL WORK ACTIVITIES WITH THE LOCAL SCHOOL DISTRICT AND SCHOOL ADMINISTRATION BEFORE STARTING CONSTRUCTION.

- PROVIDE ADVANCE NOTICE TO THE SCHOOL AND PUBLIC OF LANE CLOSURES, DETOURS, OR TRAFFIC PATTERN CHANGES. COORDINATE WITH SCHOOL TRANSPORTATION STAFF REGARDING BUS ROUTES AND STOP RELOCATIONS.

- MAINTAIN ACCESS TO ALL SCHOOL ENTRANCES, BUS LOADING ZONES, PARENT PICK-UP/DROP-OFF AREAS, AND EMERGENCY ACCESS ROUTES AT ALL TIMES. ANY TEMPORARY BUS STOPS OR RELOCATIONS MUST BE APPROVED BY THE SCHOOL DISTRICT.

- USE CERTIFIED FLAGGERS WHEN REQUIRED BY SIGHT DISTANCE LIMITATIONS OR REDUCED ROADWAY WIDTH.

- PROVIDE FLAGGERS OR CROSSING GUARDS WHEN PEDESTRIAN TRAFFIC CONFLICTS WITH CONSTRUCTION ACTIVITIES.

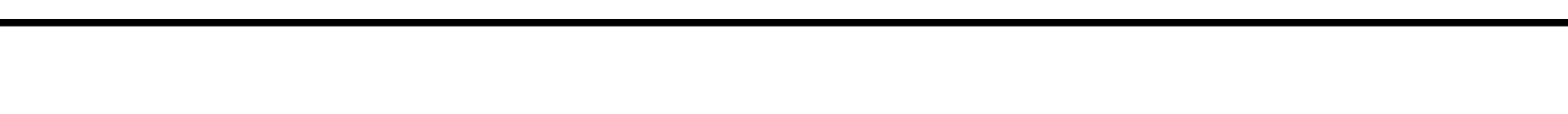
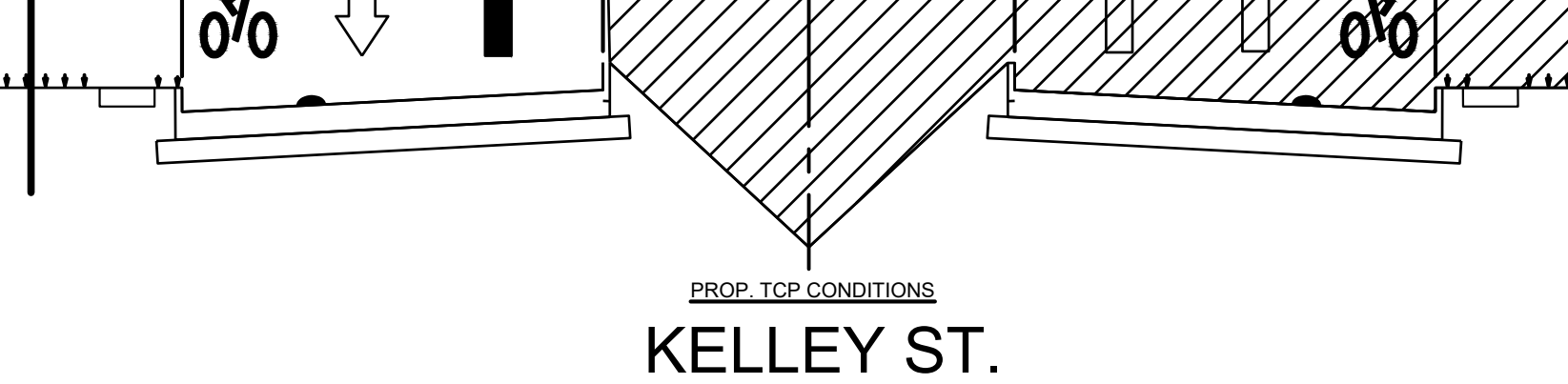
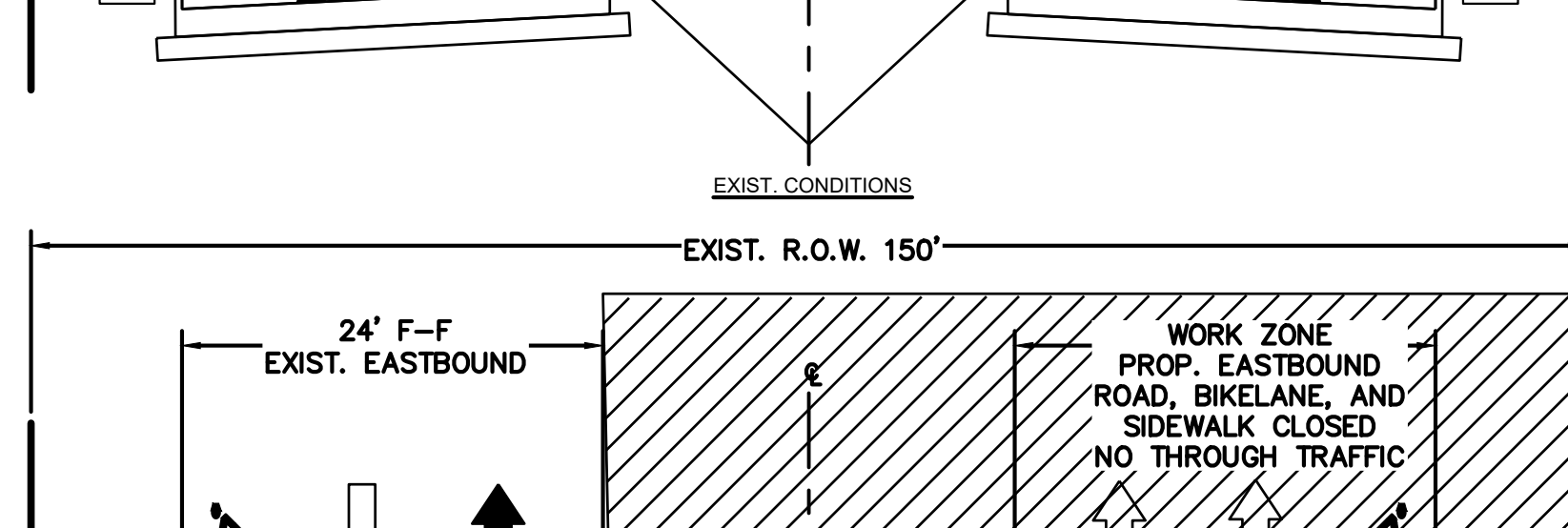
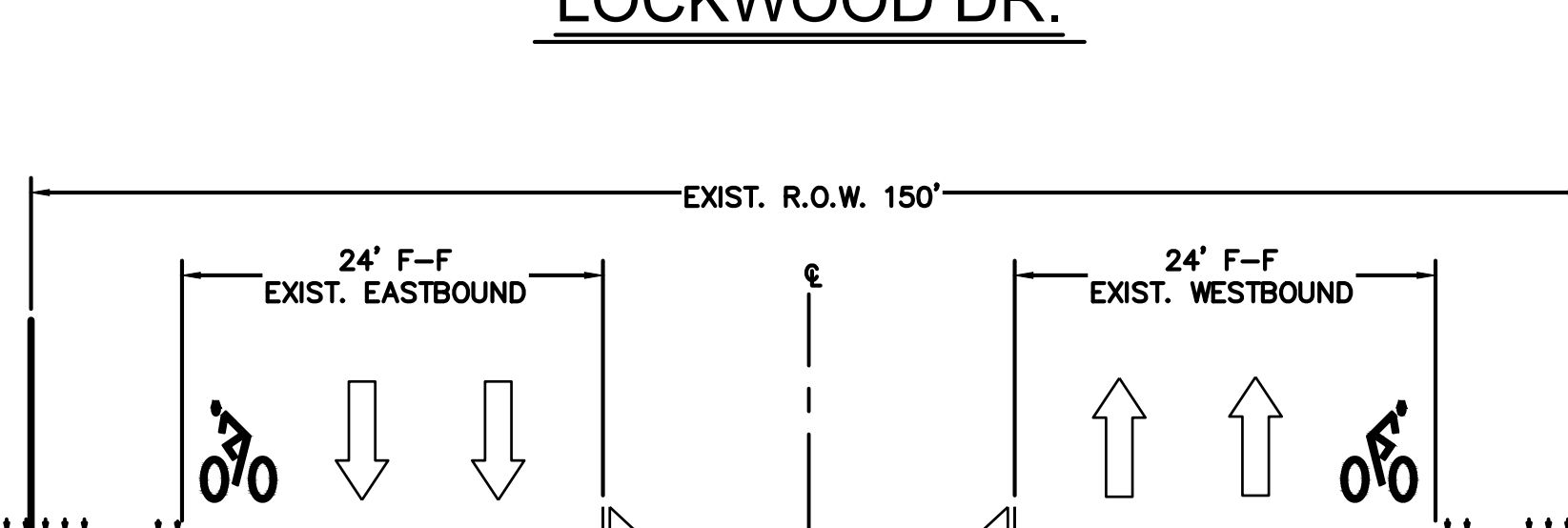
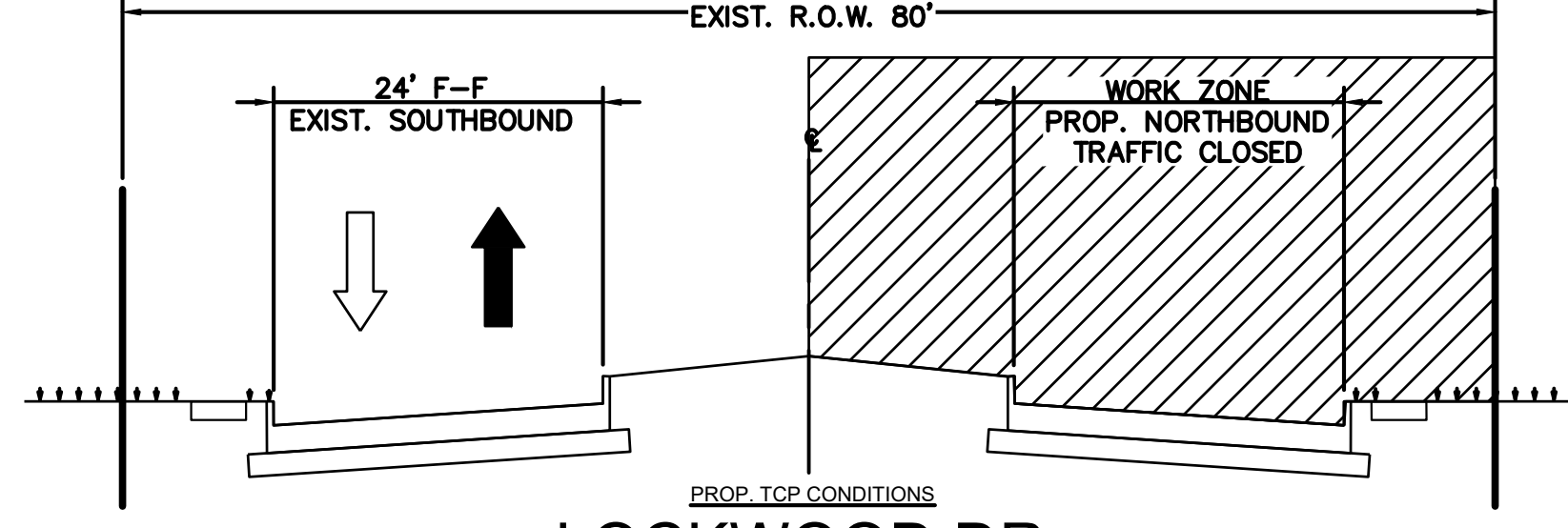
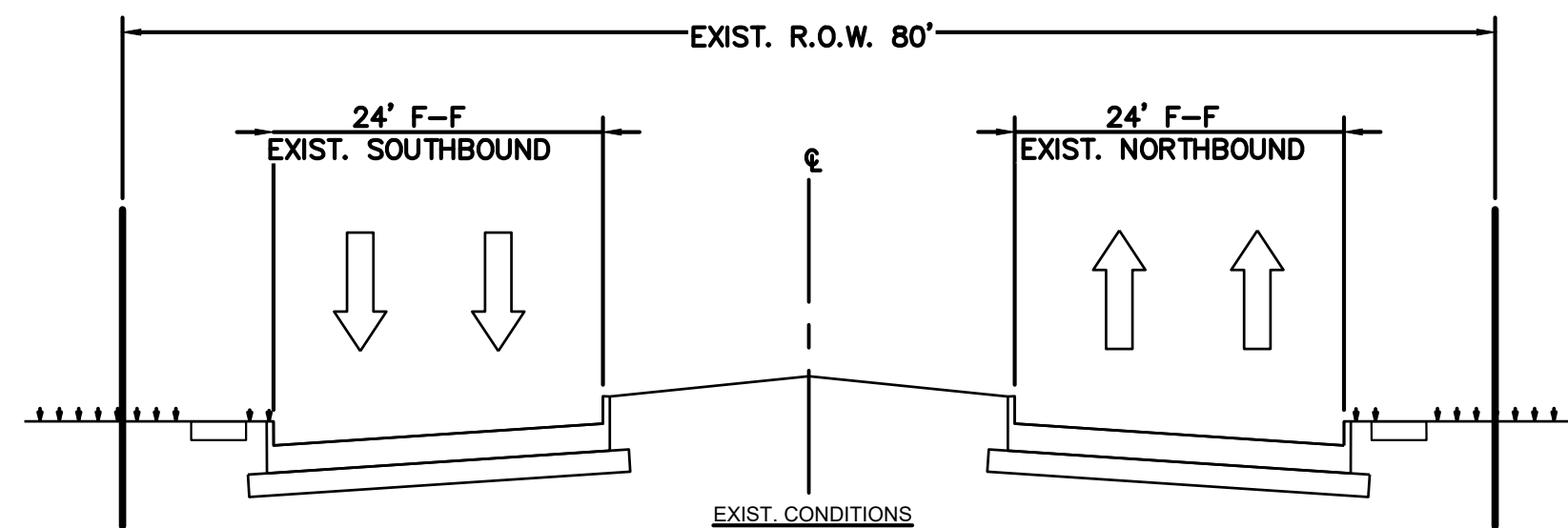
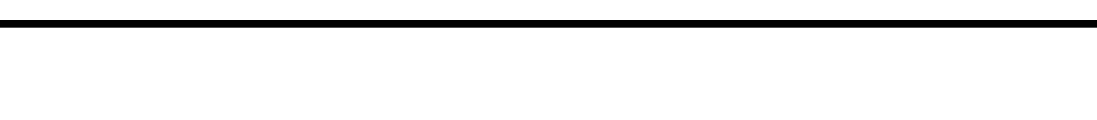
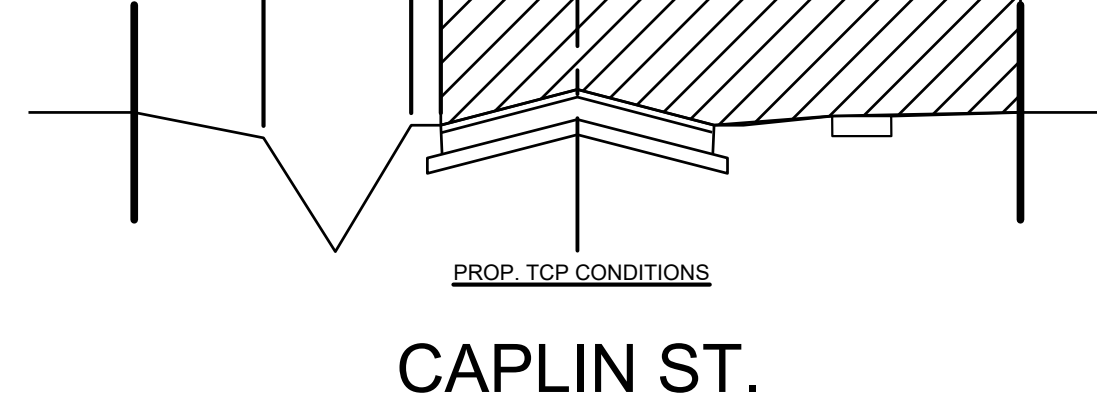
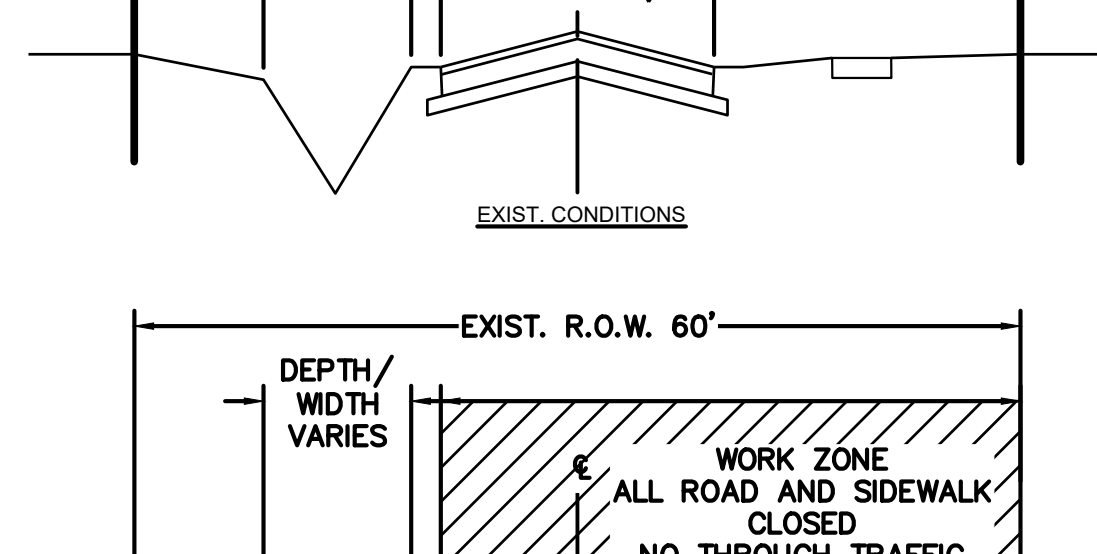
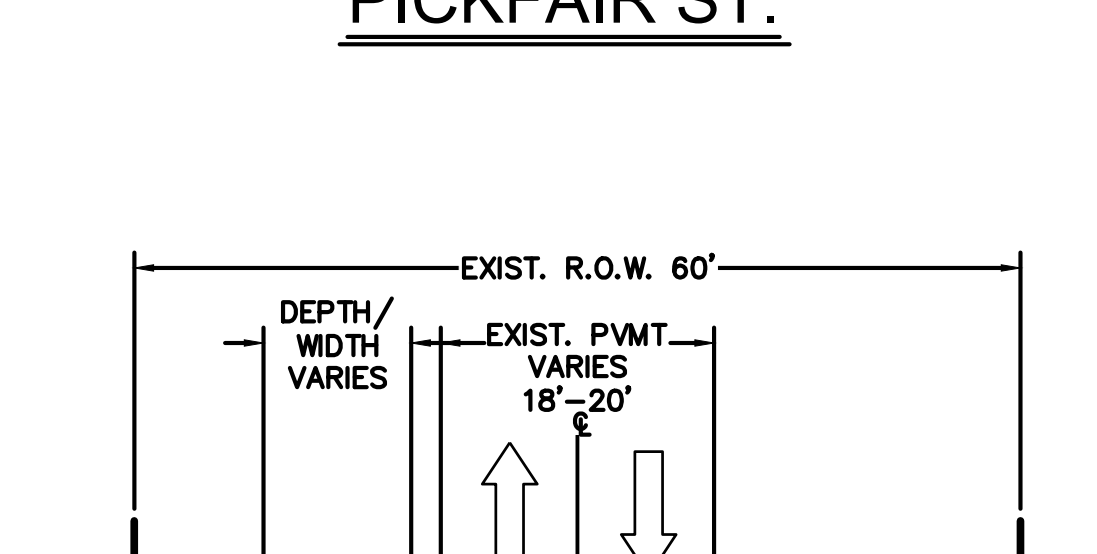
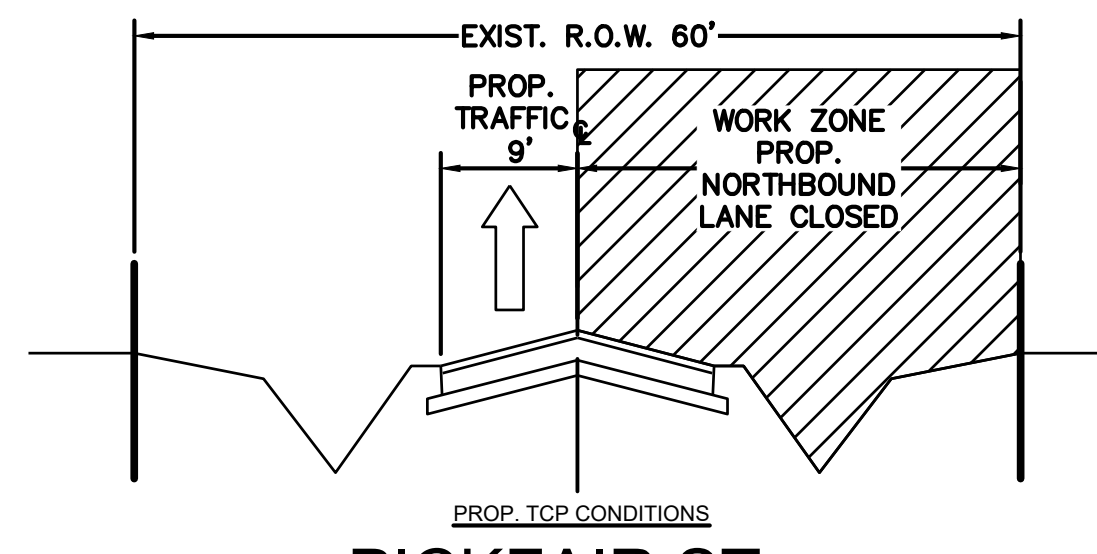
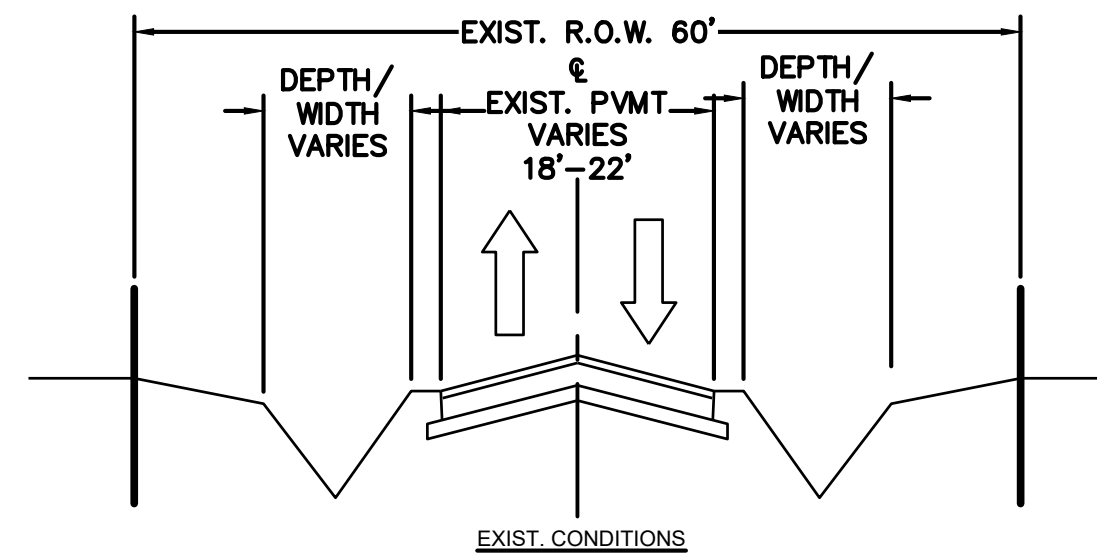
- FLAGGERS SHALL NOT STOP TRAFFIC ACROSS ACTIVE SCHOOL CROSSWALKS DURING PEAK PEDESTRIAN PERIODS UNLESS DIRECTED BY LAW ENFORCEMENT.

PROJECT CONDITIONS

ROADWAY	SPEED LIMIT	Minimum Desirable Taper Lengths "L"			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
LOCKWOOD DR	35	150'	165'	180'	30'	60'	120'	90'
KELLEY ST.	35	205'	225'	245'	35'	70'	160'	120'
DENMARK ST	25	150'	165'	180'	30'	60'	120'	90'
BENNINGTON	30	205'	225'	245'	35'	70'	160'	120'
PICKFAIR ST	25	150'	165'	180'	30'	60'	120'	90'
WIPPRECHT ST	25	265'	295'	320'	40'	80'	240'	155'

PROPOSED TRAFFIC SIGNAL MODIFICATIONS

LOCATION	APPROX. STATION	APPROACH	MODIFICATION
LOCKWOOD DR. AT BENNINGTON ST.	15+50	SOUTHBOUND, NORTHBOUND, EASTBOUND, & WESTBOUND	RE-ALIGN AND RELOCATE SIGNAL HEAD TO ALIGN WITH CONTRA-FLOW CONDITIONS AND TRAFFIC ROUTING
LOCKWOOD DR. AT SHREVEPORT ST.	21+50	SOUTHBOUND, NORTHBOUND, EASTBOUND, & WESTBOUND	RE-ALIGN AND RELOCATE SIGNAL HEAD TO ALIGN WITH CONTRA-FLOW CONDITIONS AND TRAFFIC ROUTING
LOCKWOOD DR. AT KELLEY ST.		SOUTHBOUND, NORTHBOUND, EASTBOUND, & WESTBOUND	RE-ALIGN AND RELOCATE SIGNAL HEAD TO ALIGN WITH CONTRA-FLOW CONDITIONS AND TRAFFIC ROUTING.



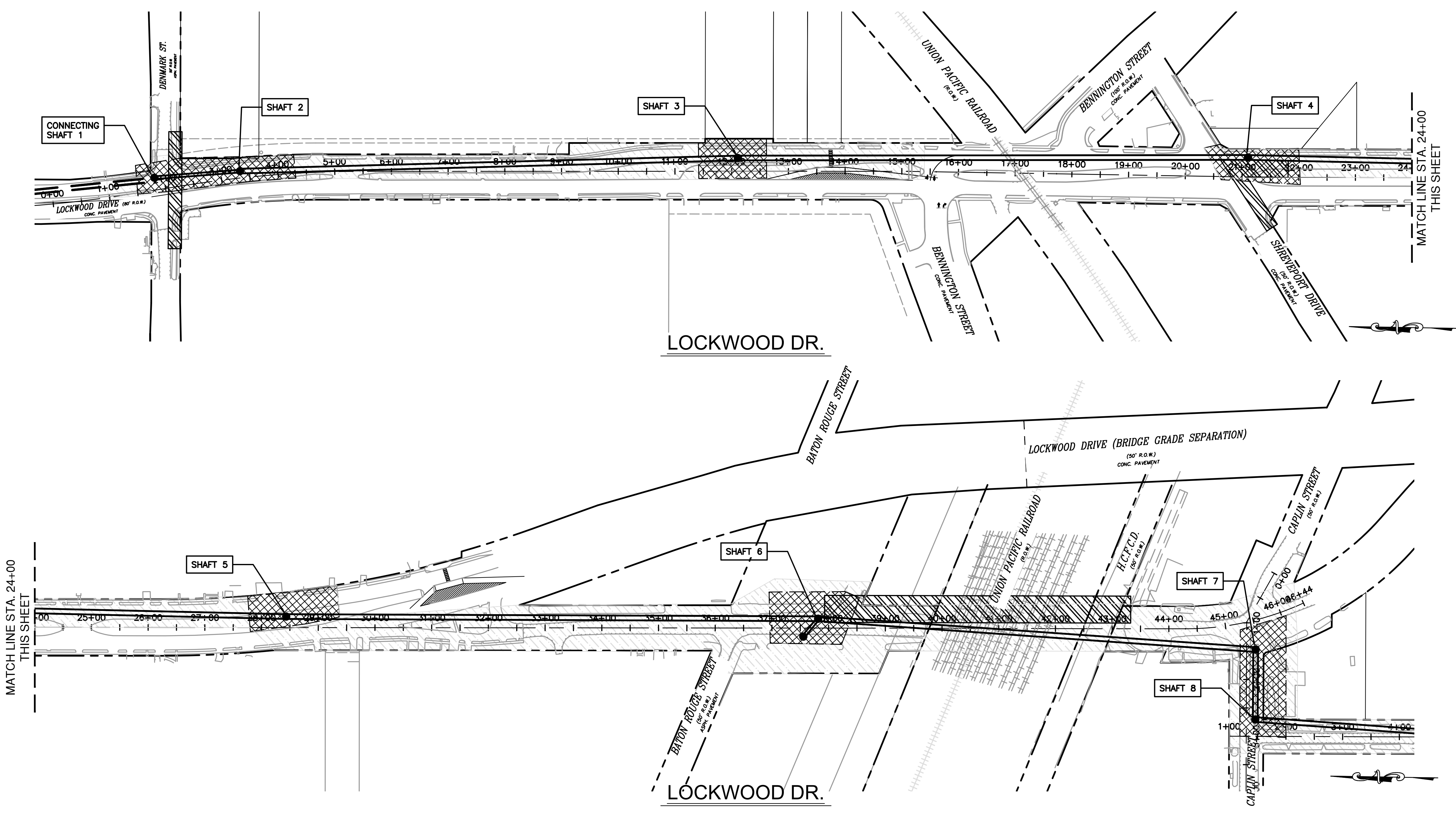
NOTES

- CHANNELIZING DEVICES SHALL BE USED FOR SHORT-TERM OR MOBILE OPERATIONS. FOR LONG-TERM TRAFFIC CONTROL INSTALLATIONS, DURABLE PAVEMENT MARKINGS AND STABLE DELINEATION CONSISTENT WITH MUTCD REQUIREMENTS FOR POSITIVE GUIDANCE SHALL BE PROVIDED
- MARKINGS MUST BE MAINTAINED AND RESTORED PROMPTLY IN WORK ZONES.
- CONTRACTOR SHALL RELOCATE/ADJUST TRAFFIC SIGNAL HEADS AND OVERHEAD SIGNS TO ALIGN WITH TEMPORARY TRAFFIC LANES DURING ALL CONSTRUCTION PHASES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING TRAFFIC SIGNAL AND INTERSECTION INFRASTRUCTURE. ANY DAMAGE TO SIGNAL EQUIPMENT, DETECTION, WIRING, CONDUITS, CABINETS, PEDESTRIAN FACILITIES, OR ASSOCIATED APPURTENANCES RESULTING FROM CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED, AND THE INTERSECTION AND SIGNAL SYSTEM RESTORED TO PRE-CONSTRUCTION CONDITION.
- A 10-FT LANE SHALL BE MAINTAINED AT ALL TIMES FOR EMERGENCY CONDITIONS.
- SECURITY FENCING/BARRIERS SHALL BE MAINTAINED AT SHAFT WORK ZONES FOR PER COH AND OSHA.
- CONTRACTOR TO MAINTAIN PEDESTRIAN ACCESS TO CROSSWALKS AND PUSH BUTTONS AT SIGNALS OR PROVIDE DETOUR.
- CONTRACTOR TO COORDINATE AND PROVIDE ADVANCE NOTICE OF ANY NECESSARY DRIVEWAY CLOSURES.
- CONTRACTOR TO UPDATE TCP AS NECESSARY TO MAINTAIN SAFE ACCESS AND TRAVEL THROUGH THE WORK ZONE TO PEDESTRIANS AND TRAFFIC.

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SURVEYED BY: FB NO. -		JUNE 2026 GRISELDA GONZALES, P.E. TX PE NO. 115678	
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TRAFFIC CONTROL PLAN NOTES (2 OF 2)			FOR CITY OF HOUSTON USE ONLY
WBS NUMBER		R-001000-0033-3	
DRAWING SCALE			
CITY OF HOUSTON PM		NEIL BARNSDALE, P.E.	
SHEET NO. 76 OF 106			

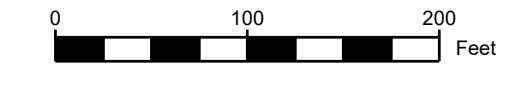
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 GRIS Engineering

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LEGEND:

- SHAFT WORK ZONE
- PHASE 1 CONSTRUCTION
- PHASE 2 CONSTRUCTION



GENERAL TCP PHASING

PHASE 1 – GENERAL NARRATIVE

1. CONTRACTOR TO COORDINATE WITH ANY LAW ENFORCEMENT AND OTHER LOCAL ENTITIES SUCH AS BUSINESSES, SCHOOLS, HOSPITALS PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO COORDINATE WITH HOUSTON METROPOLITAN TRANSIT AUTHORITY (METRO) FOR BUS OPERATION SCHEDULES AND ANY RE-ROUTING REQUIRED DUE TO TO DETOURS DURING CONSTRUCTION BY CALLING 713-635-4000.
3. CONTRACTOR TO PREPARE ANY TEMPORARY PAVEMENTS
4. CONTRACTOR TO PERFORM UTILITY LOCATES AND POTHOLES TO VERIFY EXISTING UTILITY CONFLICTS.
5. INSTALL PROJECT SIGNS AND TRAFFIC CONTROL DEVICES
6. INSTALL STORM WATER POLLUTION PREVENTION MEASURES
7. PERFORM SURVEY CONTROL AND CONSTRUCTION STAKING
8. REMOVE AND RELOCATE ANY EXISTING UTILITY CONFLICTS

PHASE 2 – SHAFT CONSTRUCTION NARRATIVE

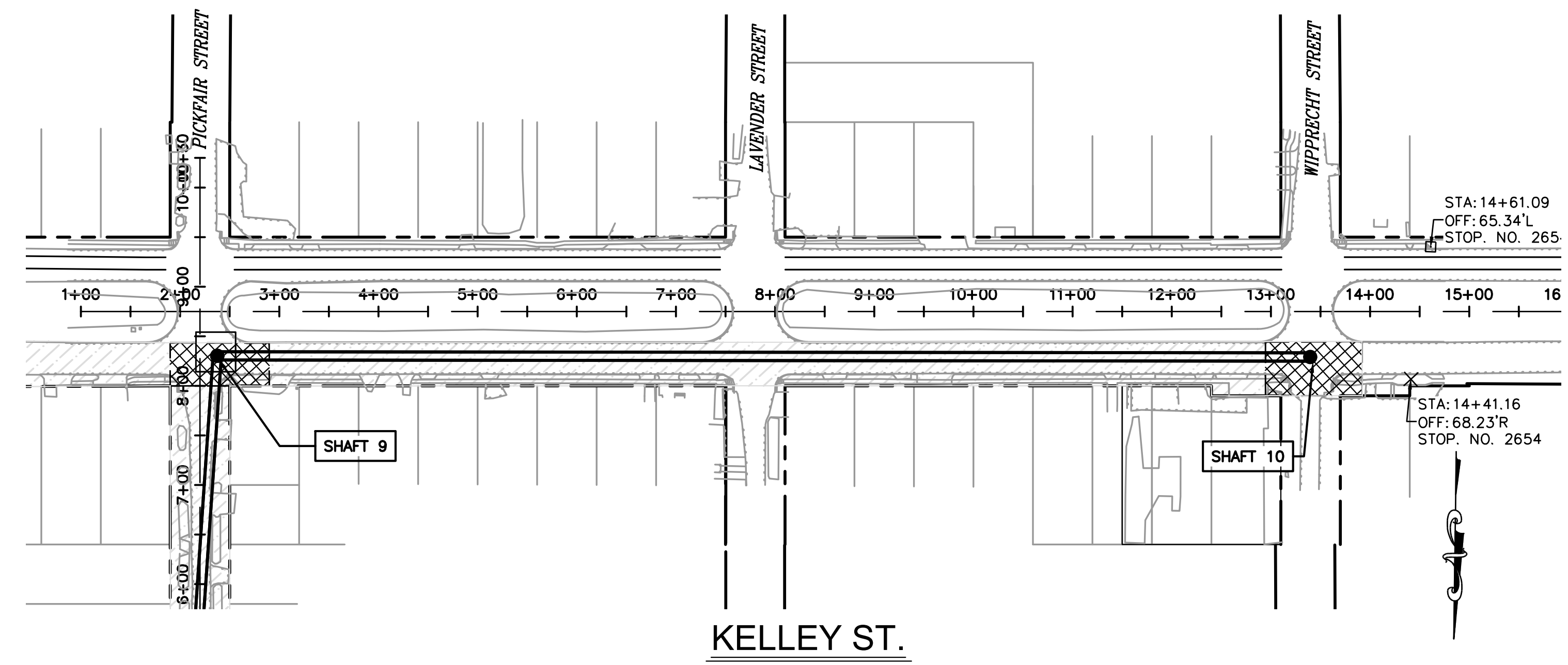
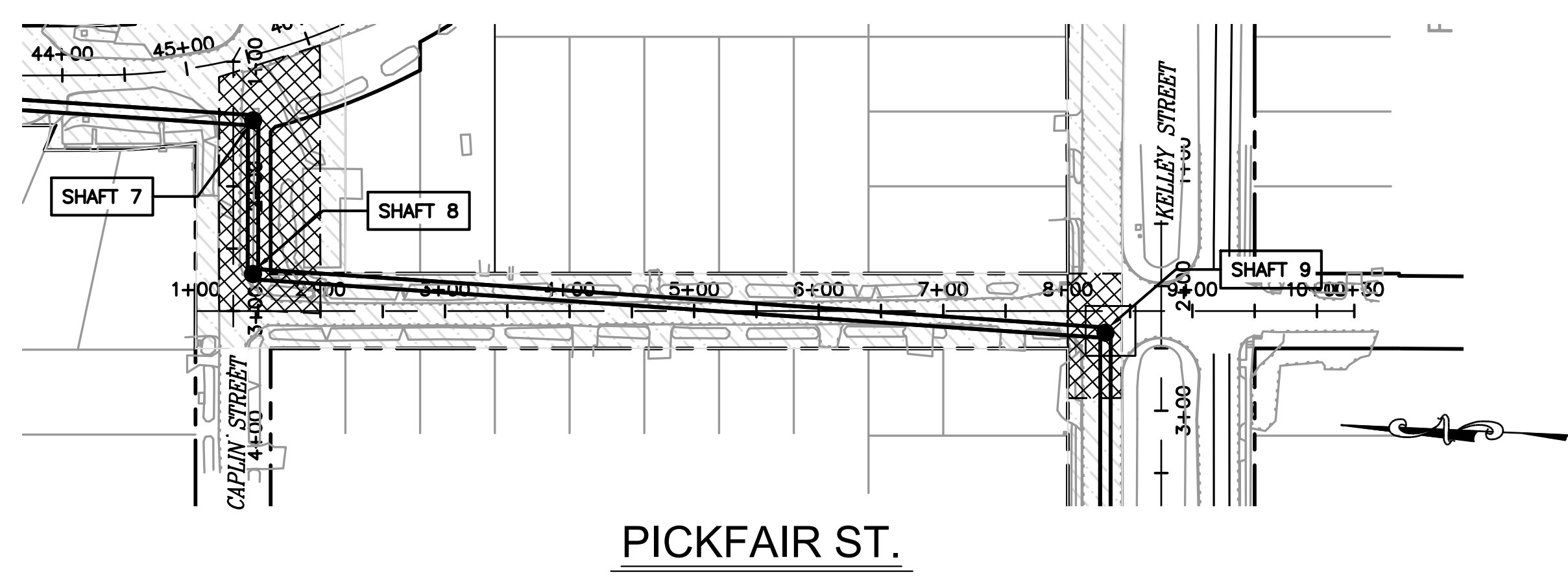
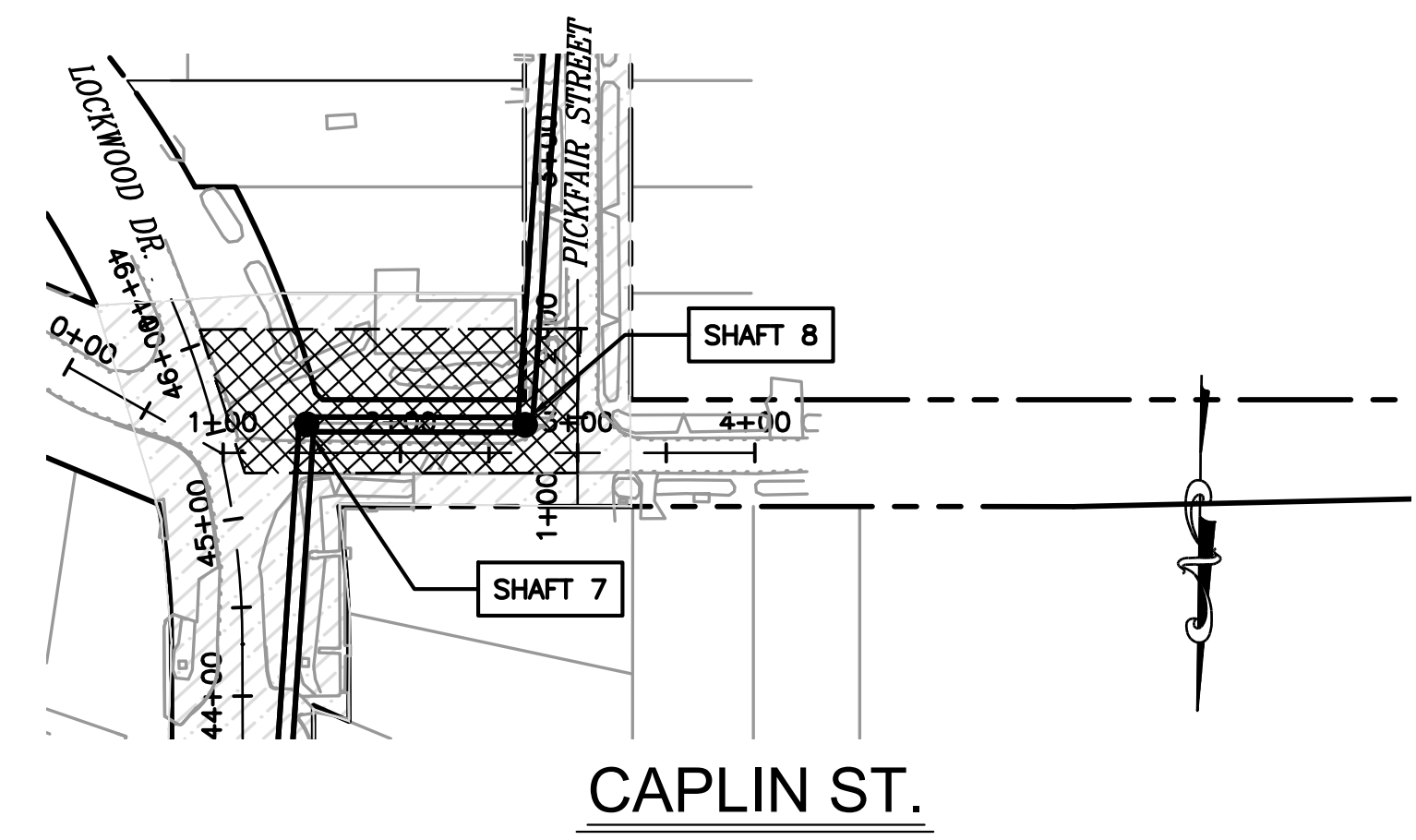
ACTUAL SEQUENCE OF WORK AT SHAFT SITE TO BE DETERMINED BY CONTRACTOR. SHAFT EXCAVATION SHALL NOT BEGIN UNTIL UTILITY RELOCATIONS ARE COMPLETE

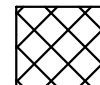
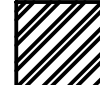

1. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AND MAINTAIN ACCESS
2. REMOVE EXISTING SURFACE FEATURES SUCH AS PAVEMENT, CURBS, SIDEWALKS, LANDSCAPING WITHIN SHAFT LIMITS
3. ESTABLISH CONSTRUCTION ACCESS AND STAGING AREAS
4. INSTALL TEMPORARY FENCING, BARRIERS AND SECURITY MEASURES
5. MOBILIZE SHAFT EXCAVATION, DEWATERING, AND BYPASS PUMPING EQUIPMENT AS NEEDED.
6. LAUNCH SHAFT
 - 6.1. EXCAVATE LAUNCH SHAFT TO DESIGN INVERT ELEVATION AS REQUIRED IN LIFTS
 - 6.2. INSTALL EARTH RETENTION SYSTEM
 - 6.3. INSTALL DEWATERING (IF REQUIRED)
 - 6.4. INSTALL THRUST BLOCKS AND HACKING FRAME SYSTEMS
 - 6.5. INSTALL VENTILATION, CONFINED SPACE ACCESS, AND SAFETY SYSTEMS
7. TUNNELING / JACK AND BORE OPERATIONS
 - 7.1. MOBILIZE TUNNELING OR BORING EQUIPMENT WITHIN LAUNCH SHAFT
 - 7.2. PERFORM LINE AND GRADE VERIFICATION
 - 7.3. TUNNEL TOWARD SHAFT

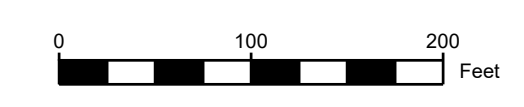
- 7.4. MONITOR GROUND MOVEMENT, SETTLEMENT GROUNDWATER INFILTRATION
- 7.5. REMOVE EXCAVATED SPOIL AND DISPOSE OF IN ACCORDANCE WITH PROJECT REQUIREMENTS
- 7.6. REMOVE TUNNELING EQUIPMENT AFTER BREAKTHROUGH AT RECEIVING SHAFT
8. RECEIVING SHAFT
 - 8.1. CONSTRUCT RECEIVING SHAFT AS NOTED WITH LAUNCH SHAFT PROCEDURES
 - 8.2. EXCAVATE TO REQUIRED DEPTH AND PREPARE FOR TUNNEL BREAKTHROUGH
 - 8.3. INSTALL DEWATERING AND SAFETY SYSTEMS AS REQUIRED
9. TESTING AND COMMISSIONING
 - 9.1. PERFORM LINE CLEANING AND INSPECTION
 - 9.2. CONDUCT TESTING AS SPECIFIED
 - 9.3. PERFORM CCTV INSPECTION
 - 9.4. CORRECT DEFICIENCIES IDENTIFIED DURING TESTING
 - 9.5. OBTAIN ENGINEER ACCEPTANCE
9. SITE RESTORATION
 - 9.1. REMOVE TEMPORARY STRUCTURES AND EQUIPMENT
 - 9.2. BACKFILL SHAFTS IN CONTROLLED LIFTS WITH APPROVED MATERIAL
 - 9.3. REMOVE DEWATERING SYSTEMS
 - 9.4. RESTORE PAVEMENT, SIDEWALKS, STRIPING, LANDSCAPING, FENCING AND SURFACE FEATURES.
 - 9.5. REMOVE TEMPORARY TRAFFIC CONTROL DEVICES
 - 9.6. CLEAN UP AND DEMOBILIZE



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TRAFFIC CONTROL PHASING PLAN (1 OF 2)			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3			
DRAWING SCALE			
SCALE: 1"=200' FOR 11'X17'			
SCALE: 1"=100' FOR 22'X34'			
CITY OF HOUSTON PM			
NEIL BARNSDALE, P.E.			
SHEET NO. 77 OF 106			

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- LEGEND:**
-  SHAFT WORK ZONE
 -  PHASE 1 CONSTRUCTION
 -  PHASE 2 CONSTRUCTION

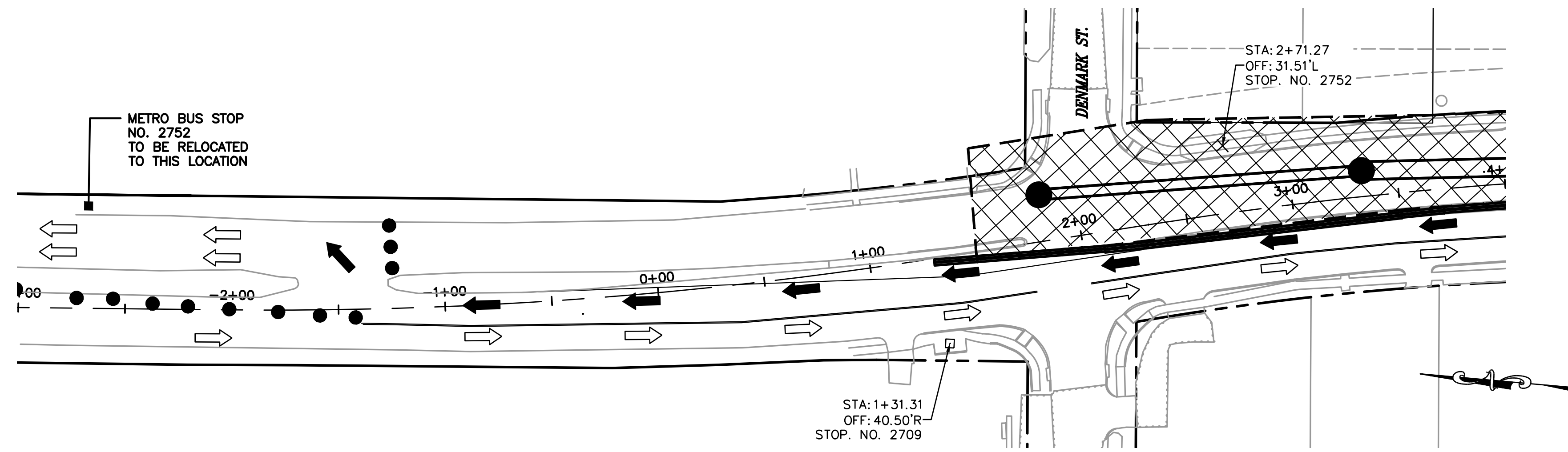


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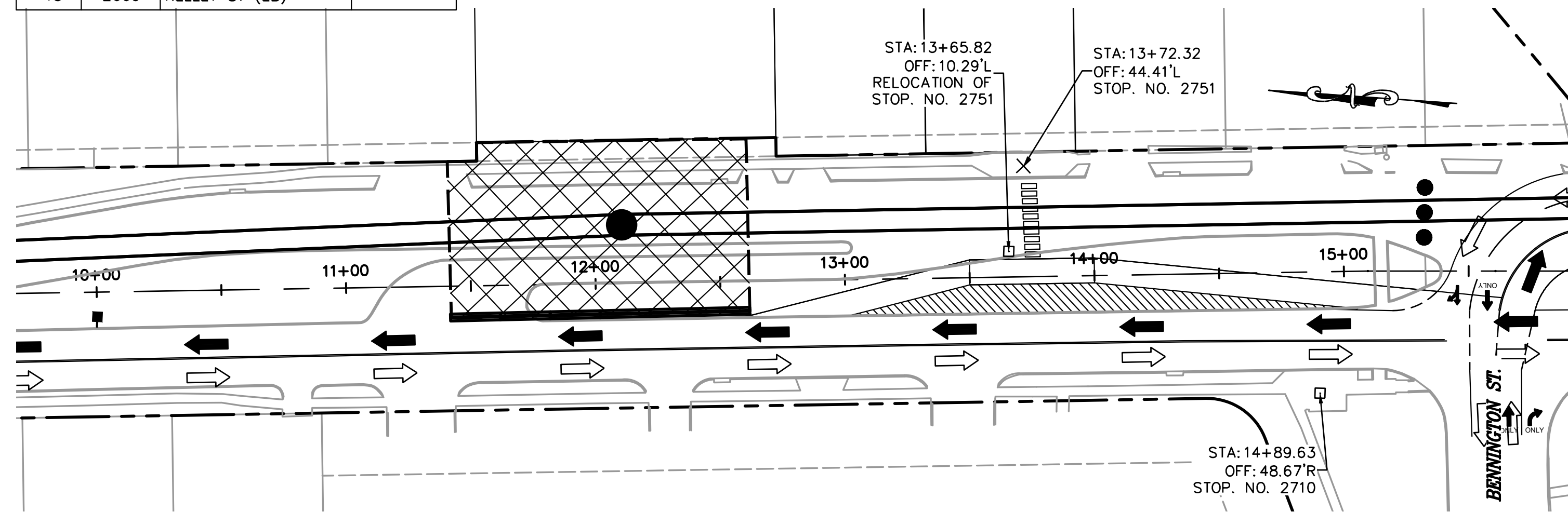
METRO BUS

BUS STOPS IDENTIFIED ON TCP SHEETS SHALL EITHER REMAIN IN SERVICE, BE TEMPORARILY RELOCATED, OR BE TEMPORARILY SUSPENDED AS INDICATED. CONTRACTOR SHALL COORDINATE WITH METRO FOR STOP RELOCATION/SUSPENSION (METRO: 713-615-6195). MAINTAIN ADA ACCESS WHERE STOPS REMAIN IN SERVICE, AND POST REQUIRED TEMPORARY SIGNING/NOTICES.

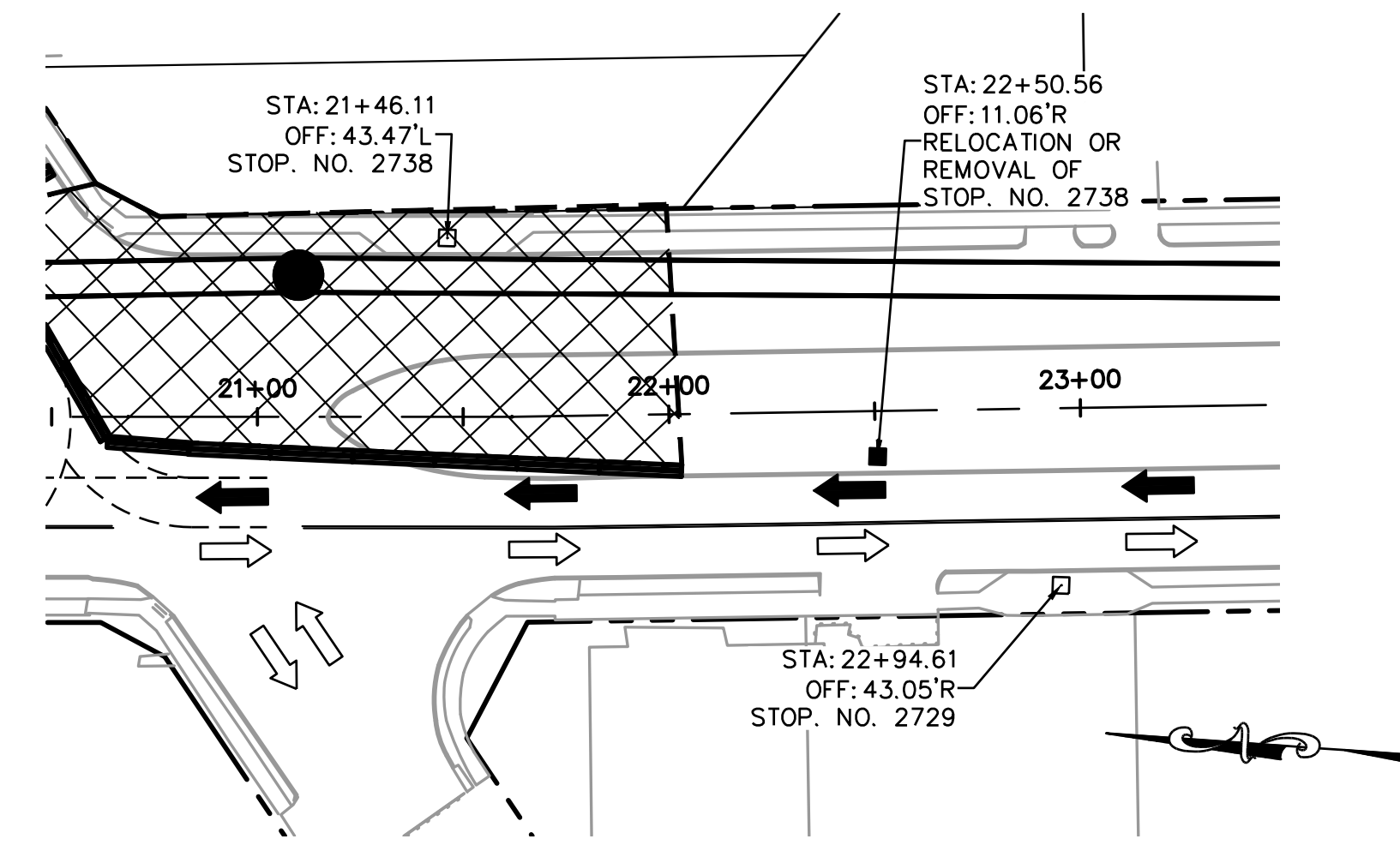
NO.	STOP #	STREET / DIRECTION	IMPACT
1	2709	LOCKWOOD DR. (SB) ↓	REMAIN
2	2752	LOCKWOOD DR. (NB) ↑	RELOCATE
3	2710	LOCKWOOD DR. (SB) ↓	REMAIN
4	2751	LOCKWOOD DR. (NB) ↑	RELOCATE
5	2729	LOCKWOOD DR. (SB) ↓	REMAIN
6	2738	LOCKWOOD DR. (NB) ↑	RELOCATE
7	2730	LOCKWOOD DR. (SB) ↓	REMAIN
8	2737	LOCKWOOD DR. (NB) ↑	RELOCATE
9	2652	LOCKWOOD DR. (SB) ↓	REMAIN
10	2736	LOCKWOOD DR. (NB) ↑	NO IMPACT
11	2732	LOCKWOOD DR. (SB) ↓	NO IMPACT
12	2662	KELLEY ST (EB) →	NO IMPACT
13	2735	LOCKWOOD DR. (NB) ↑	NO IMPACT
14	2654	KELLEY ST (WB) ←	RELOCATE
15	2660	KELLEY ST (EB) →	REMAIN



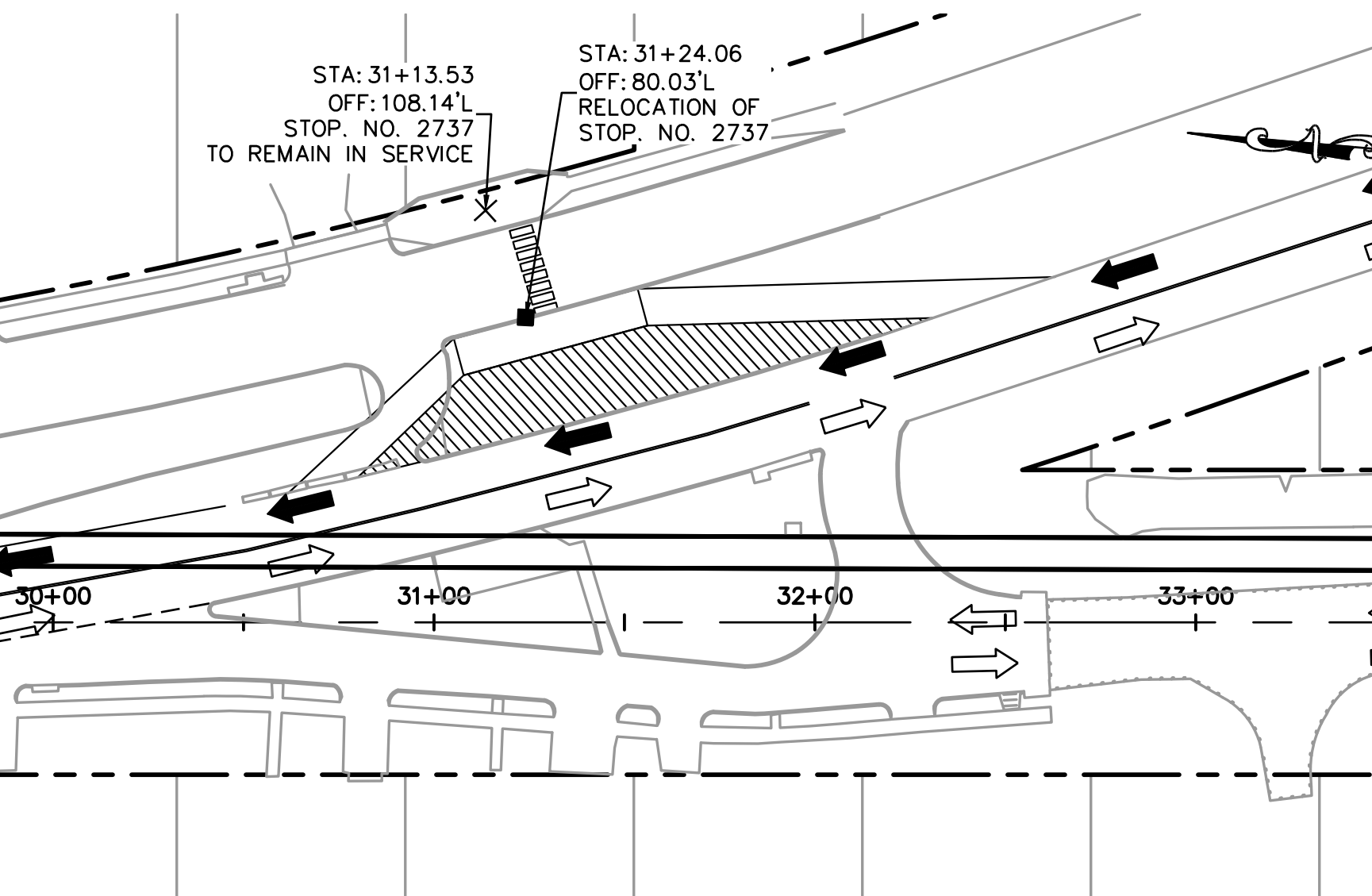
**2 - RELOCATE BUS STOP NO. 2752
LOCKWOOD DR.**



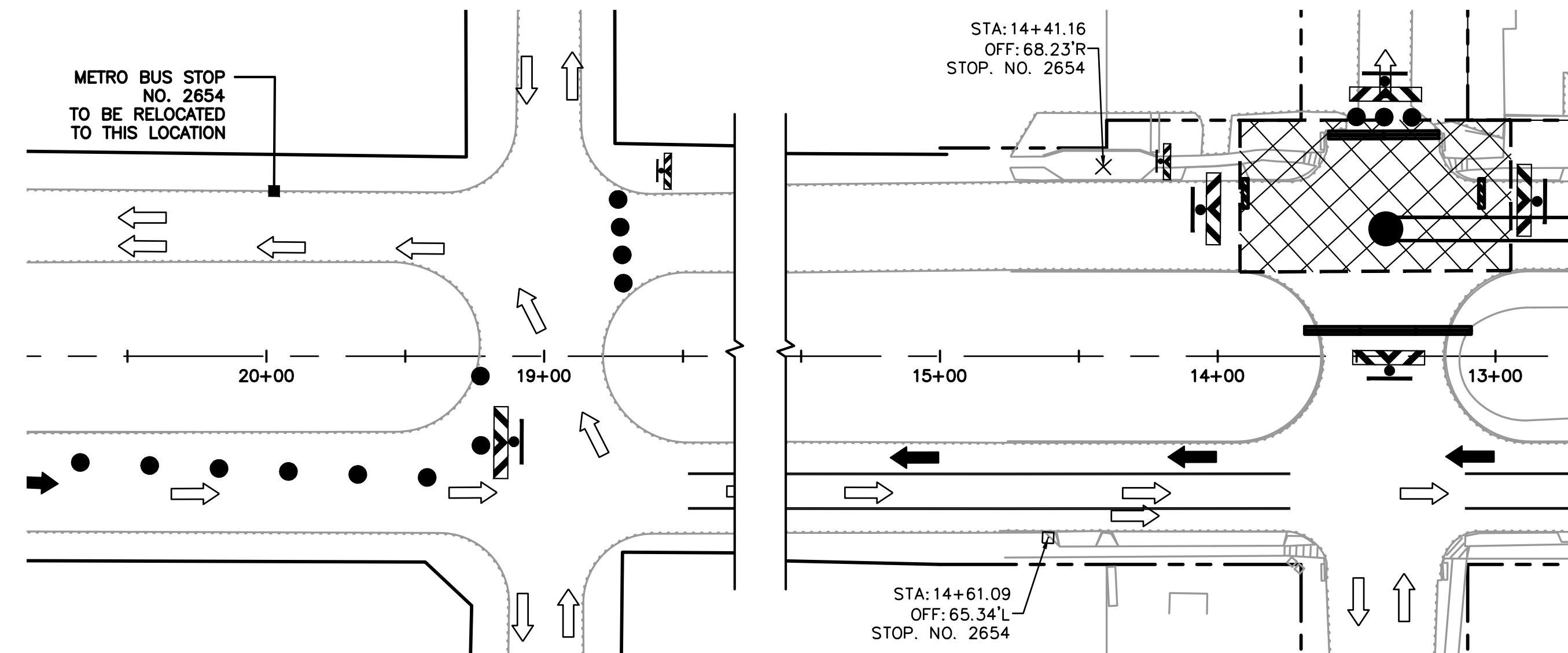
**4 - RELOCATE BUS STOP NO. 2751
LOCKWOOD DR.**



**6 - RELOCATE BUS STOP NO. 2738
LOCKWOOD DR.**



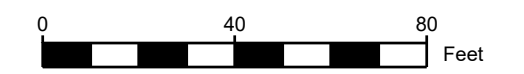
**8 - RELOCATE BUS STOP NO. 2737
LOCKWOOD DR.**



**14 - RELOCATE BUS STOP NO. 2654
KELLEY ST.**

LEGEND:

- SIGN
- FLAGGER
- CHANNELIZATION DEVICES
- BARRICADE (TYPE III)
- LONGITUDINAL CHANNEL DEVICE (LCD)
- ADVANCED ARROW PANEL
- SHAFT WORK ZONE
- EXISTING TRAFFIC FLOW
- PROPOSED TCP TRAFFIC FLOW
- CLOSED ROADS (ONLY LOCAL TRAFFIC)



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JUNE 2026
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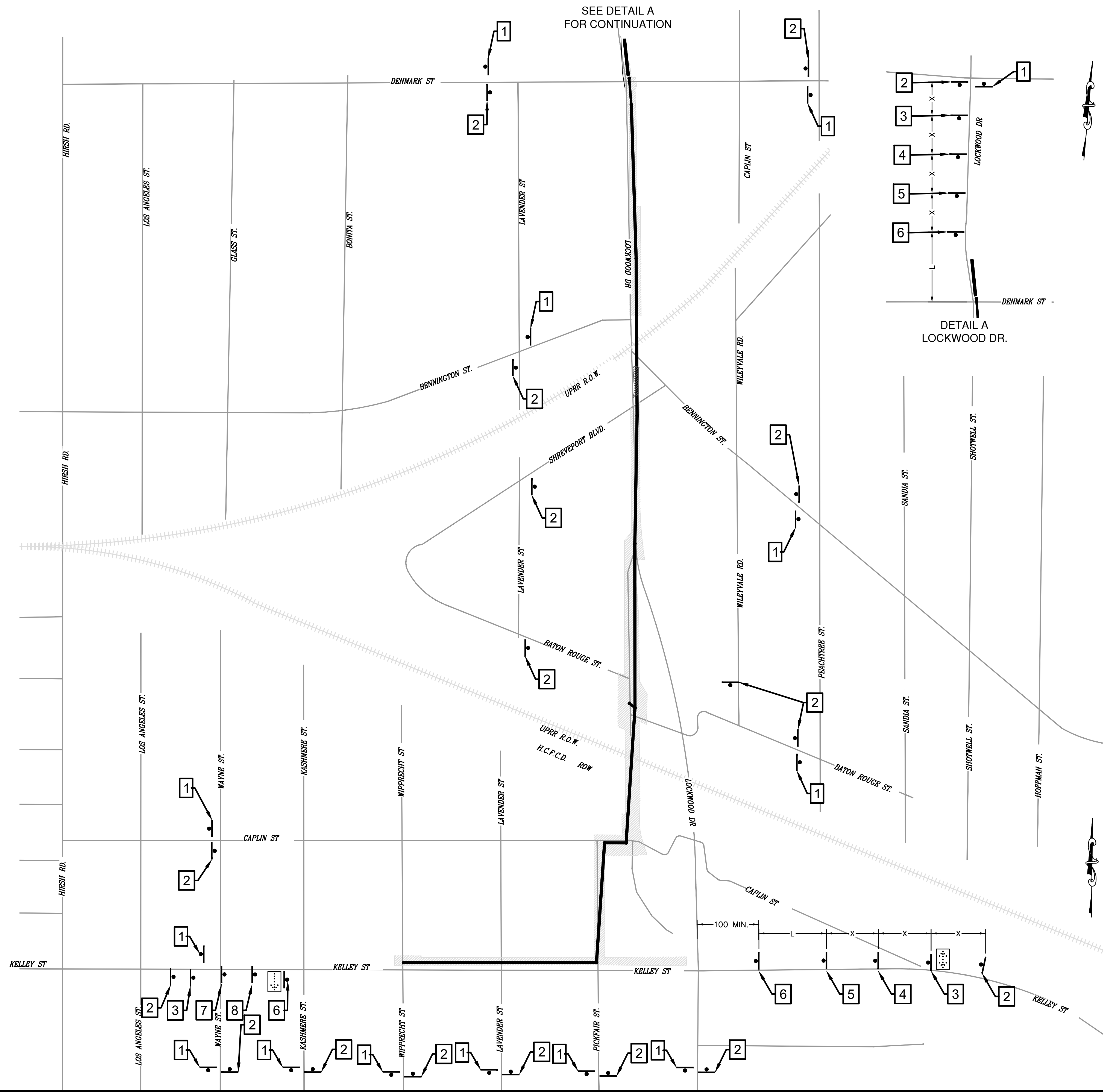
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL PLAN - BUS SERVICES

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=80' FOR 11"x17" SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 79 OF 106	

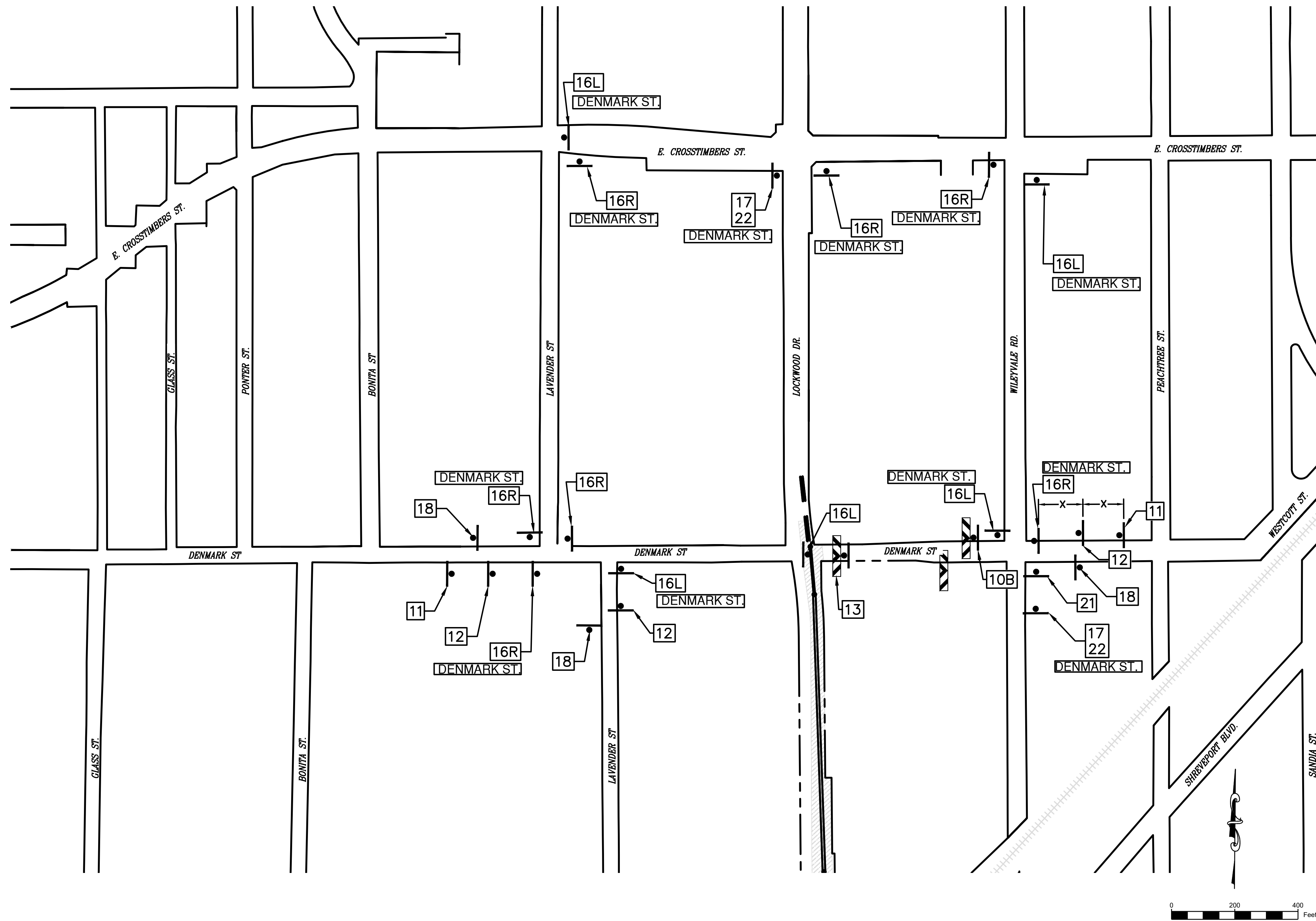
GRIS Engineering
 K:\202308.LAN.002\05-CAD\5.1 CD Plan Set\84-INCH CRMP TCP CDs.dwg Jun. 03, 2026



1	END ROAD WORK G20-2	2	ROAD WORK AHEAD CW20-1
3	LANES CLOSED AHEAD XXX FT CW20-5b	4	NEW TRAFFIC PATTERN AHEAD CW23-2
5	ALL LANES CW24-1cP	6	SLOW TRAFFIC AHEAD CW23-1
7	LEFT LANE CLOSED CW9-2 (L OR R)	8	CW4-2

- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW
 - ADDITIONAL ROAD CLOSURES

NO.	DATE	REVISION	APP.
EFF DATE: XXXX-XX-2027		DWG NO:	
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SURVEYED BY: FB NO. -		JUNE 2026 GRISELDA GONZALES, P.E. TX PE NO. 115678	
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TRAFFIC CONTROL PLAN ADVANCE WARNING SIGNS LAYOUT			
WBS NUMBER R-001000-0033-3		FOR CITY OF HOUSTON USE ONLY	
DRAWING SCALE SCALE: 1"=600' FOR 11"x17" SCALE: 1"=300' FOR 22"x34"			
CITY OF HOUSTON PM NEIL BARNSDALE, P.E.			
SHEET NO. 80 OF 106			



10 (A) ROAD CLOSED TO THRU TRAFFIC R11-4	11 ROAD CLOSED AHEAD CW20-3
12 DETOUR AHEAD CW20-2	13 ROAD CLOSED R11-2
14 (L) DETOUR M4-10L	15 DETOUR M4-9 (R,L)
16 STREET NAME DETOUR M4-9R MODIFIED (R OR L)	17 DETOUR M4-08
18 END DETOUR M4-08A	19 CENTER LANE M5-5
20 R3-1	21 R3-2
22 M6-3	23 DO NOT ENTER R5-1
24 (L) ONE WAY R6-1L	
(R) ONE WAY R6-1R	

LEGEND:

- CONSTRUCTION WORK ZONE
- BARRICADE
- SIGN

NO.	DATE	REVISION	APP.

LAN

EFF DATE: XXXX-XX-2027 DWG NO:

GRIS

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JUNE 2026
 GRISELDA GONZALES, P.E.
 TX PE NO. 115678

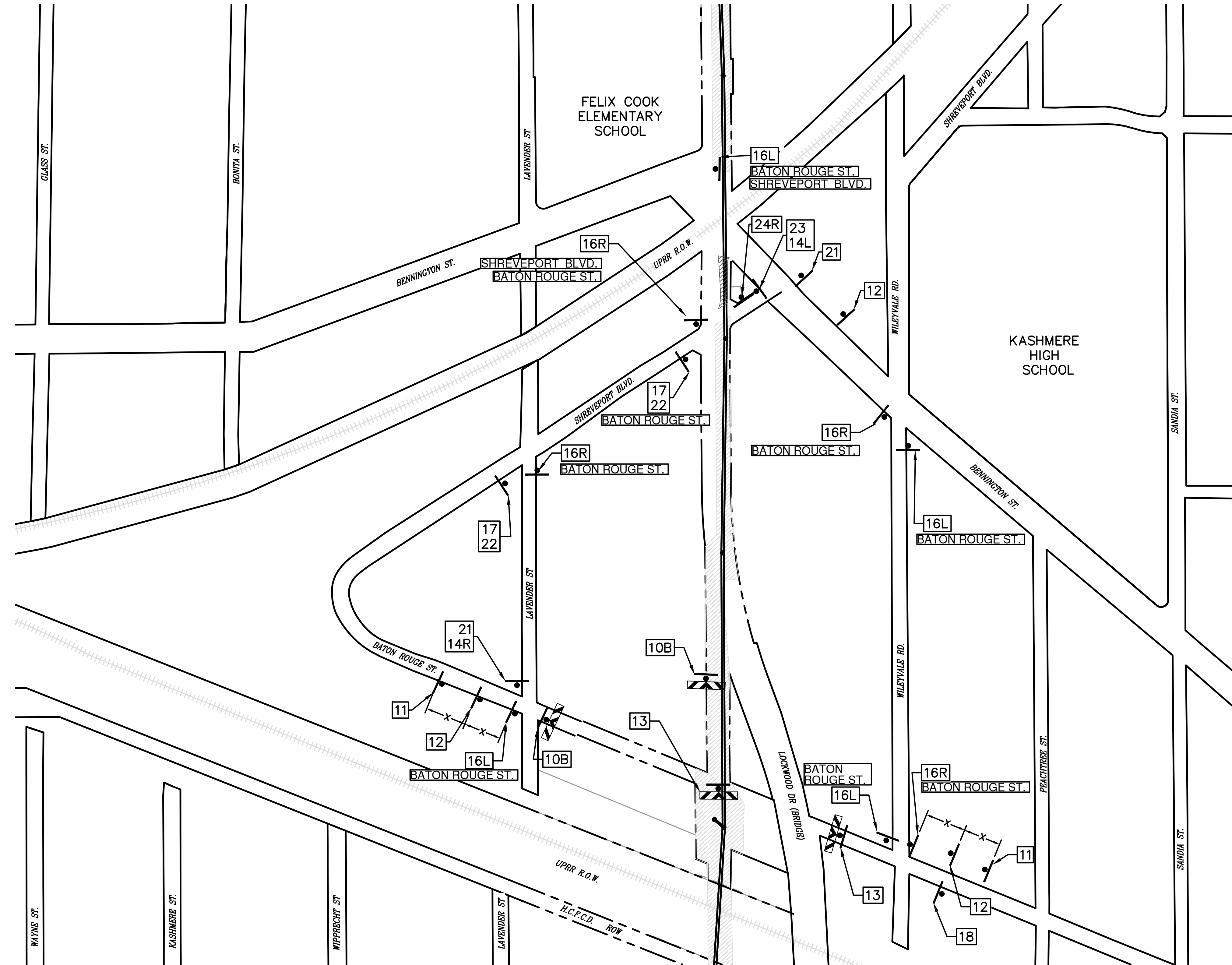
SURVEYED BY:
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL DETOUR PLAN
 (1 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=400' FOR 11"x17" SCALE: 1"=200' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 81 OF 106	




10 (A)	ROAD CLOSED TO THRU TRAFFIC R11-4	11	ROAD CLOSED AHEAD CW20-3
12	ROAD CLOSED LOCAL TRAFFIC ONLY R11-3	13	ROAD CLOSED R11-2
14 (L)	DETOUR AHEAD CW20-2	15	DETOUR M4-10L
16 (R)	DETOUR M4-10R	17	DETOUR M4-9 (R,L)
18	STREET NAME DETOUR M4-9R MODIFIED (R OR L)	19	DETOUR M4-08
20	END DETOUR M4-08A	21	CENTER LANE M5-5
22	R3-1	23	R3-2
24 (L)	ONE WAY R6-1L		
	(R)		
	ONE WAY R6-1R		

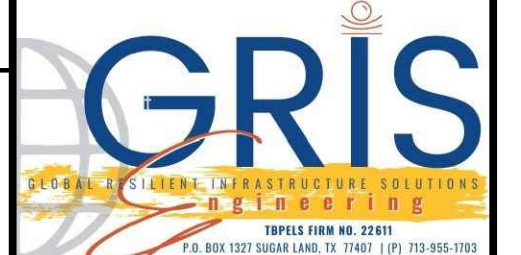
LEGEND:

	CONSTRUCTION ZONE
	BARRICADE
	SIGN

NO.	DATE	REVISION	APP.



EFF DATE: XXXX-XX-2027 DWG NO:



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 GRISelda GONZALES, P.E.
 TX PE NO. 115678

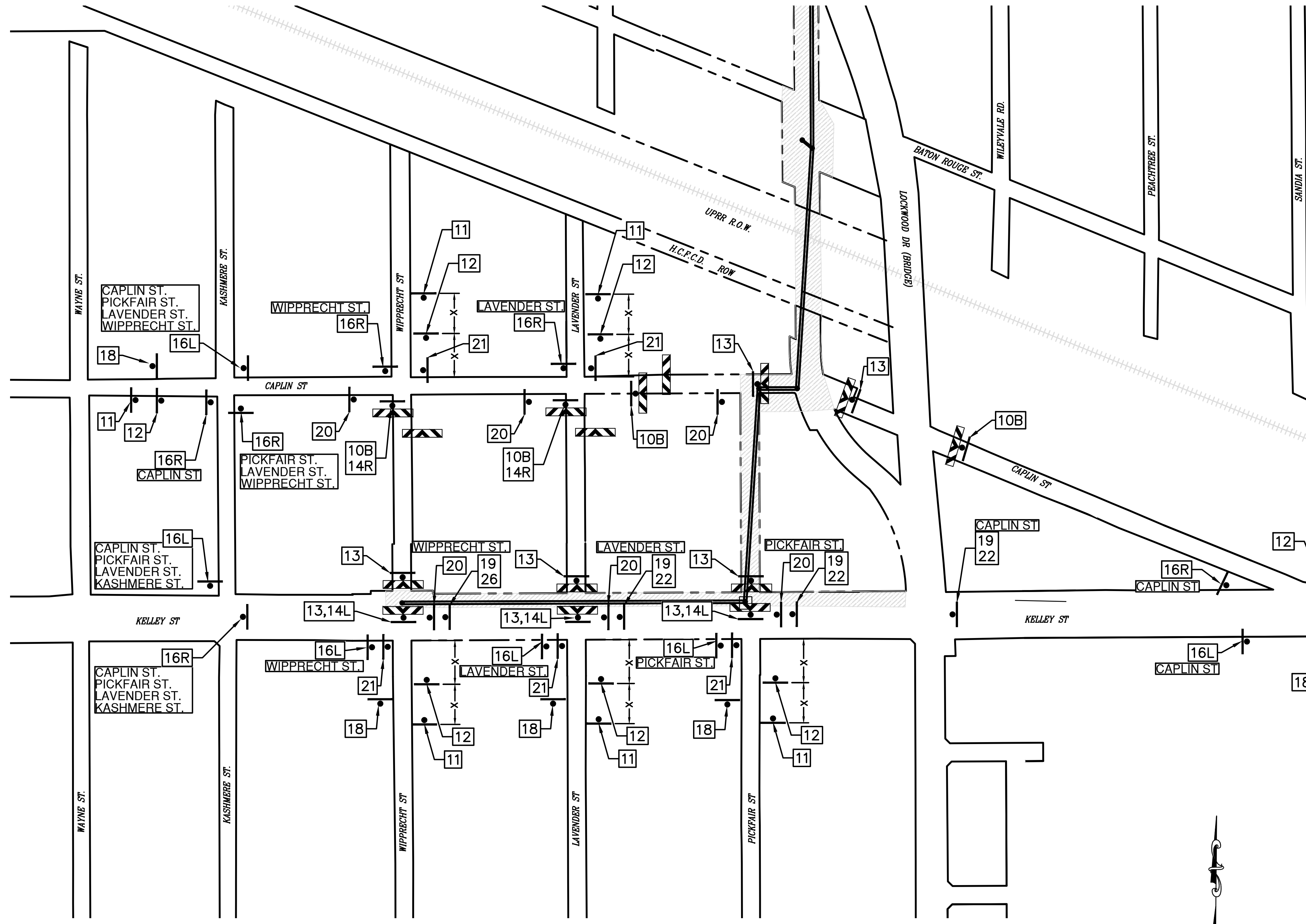
SURVEYED BY:
 FB NO. -

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL DETOUR PLAN
 (2 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=400' FOR 11"x17"	
SCALE: 1"=200' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 82 OF 106	



10 (A) ROAD CLOSED TO THRU TRAFFIC R11-4	11 ROAD CLOSED AHEAD CW20-3
12 (B) ROAD CLOSED LOCAL TRAFFIC ONLY R11-3	13 ROAD CLOSED R11-2
14 (L) DETOUR M4-10L	15 DETOUR M4-9 (R,L)
16 (R) DETOUR M4-10R	17 DETOUR M4-08
18 STREET NAME DETOUR M4-9R MODIFIED (R OR L)	19 DETOUR M4-08
20 END DETOUR M4-08A	21 CENTER LANE M5-5
22 R3-1	23 R3-2
24 M6-3	25 R5-1

LEGEND:

- CONSTRUCTION ZONE
- BARRICADE
- SIGN



NO.	DATE	REVISION	APP.



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 TX PE NO. 115678

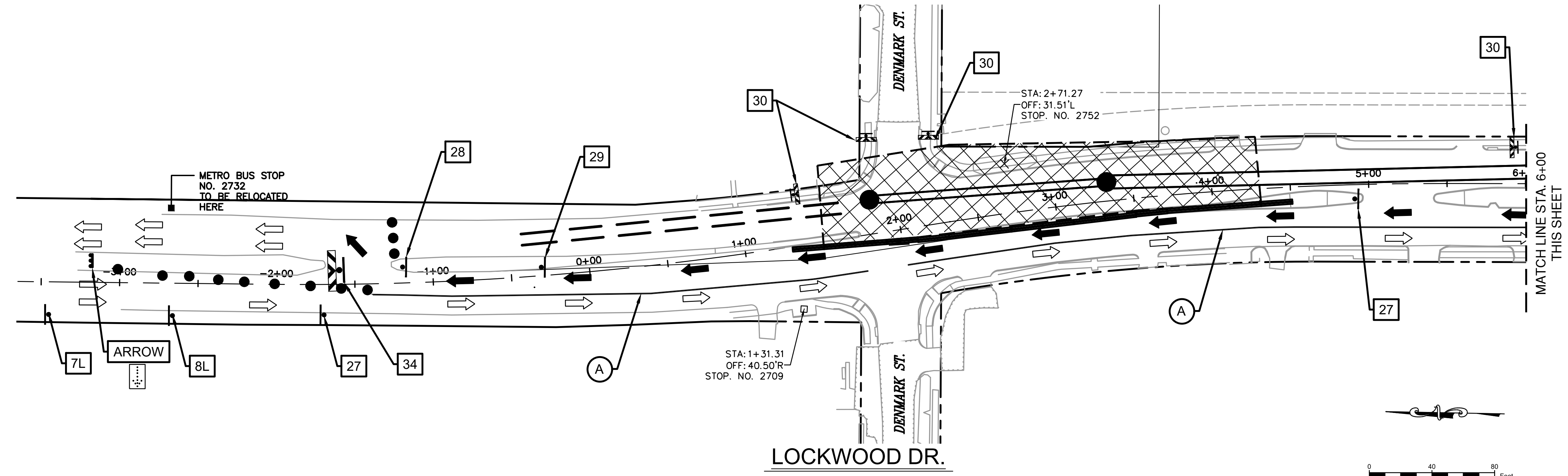
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

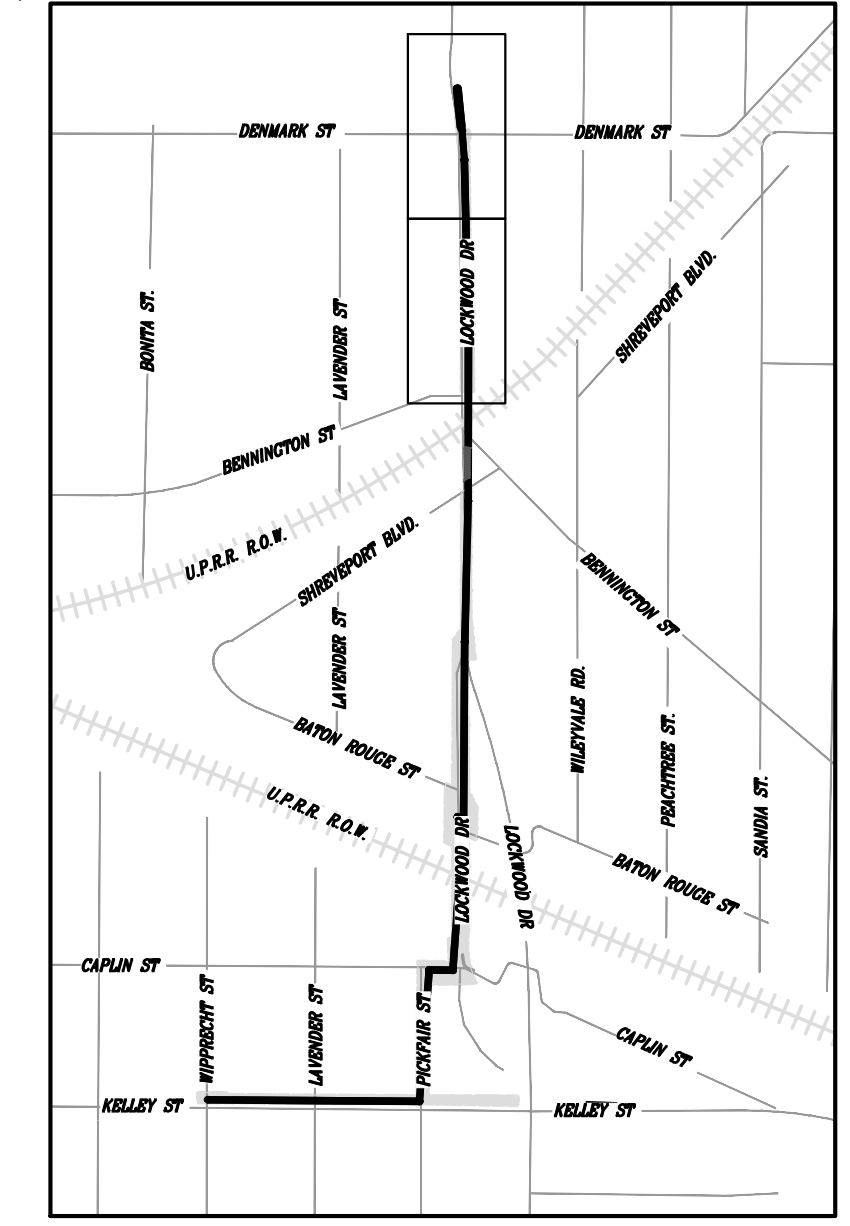
TRAFFIC CONTROL DETOUR PLAN
 (3 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=400' FOR 11"x17" SCALE: 1"=200' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 83 OF 106	

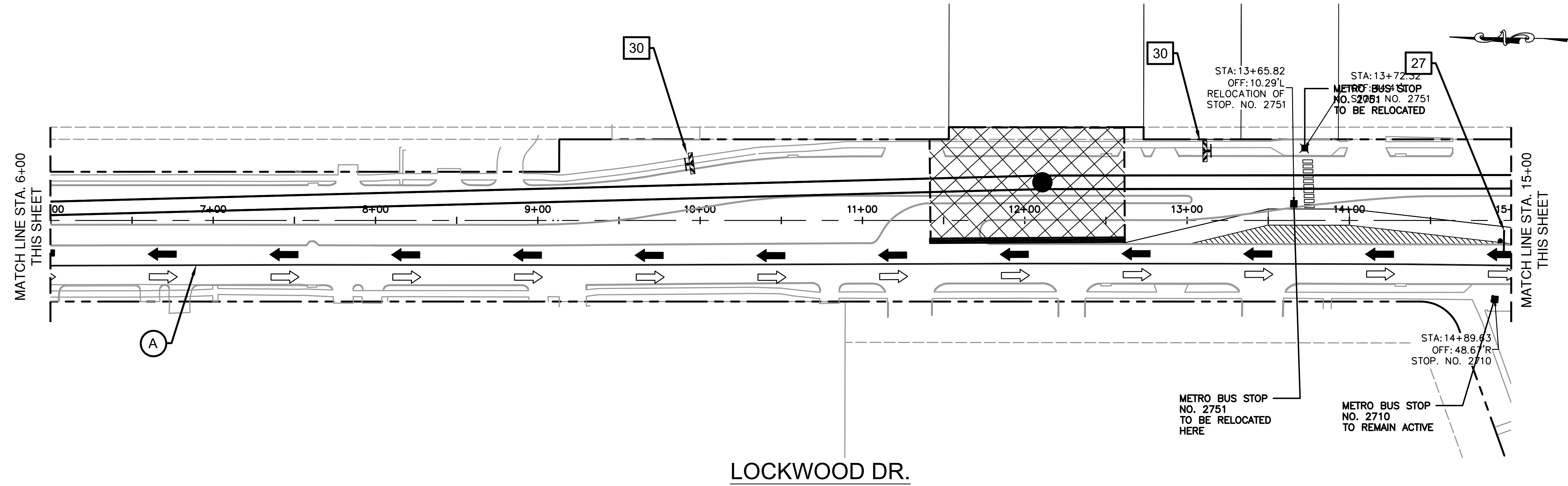
GRIS Engineering
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- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW



KEY MAP
SCALE: 1" = 1,000 FT



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DWG NO:

GRIS
GENERAL CONTRACTORS
CONSTRUCTION SERVICES
P.O. BOX 2027 SUGAR LAKE, TX 75081-2027
PH: 972-988-1100 FAX: 972-988-1103
WWW.GRISCONSTRUCTION.COM

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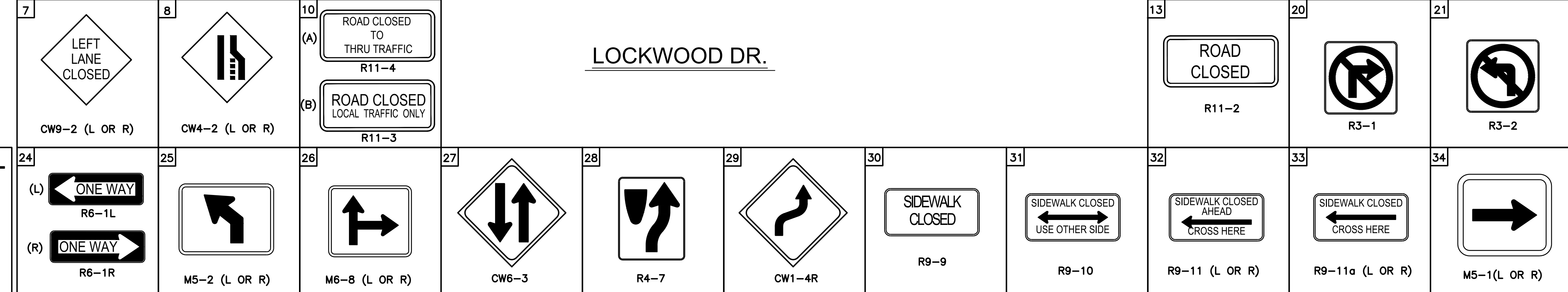
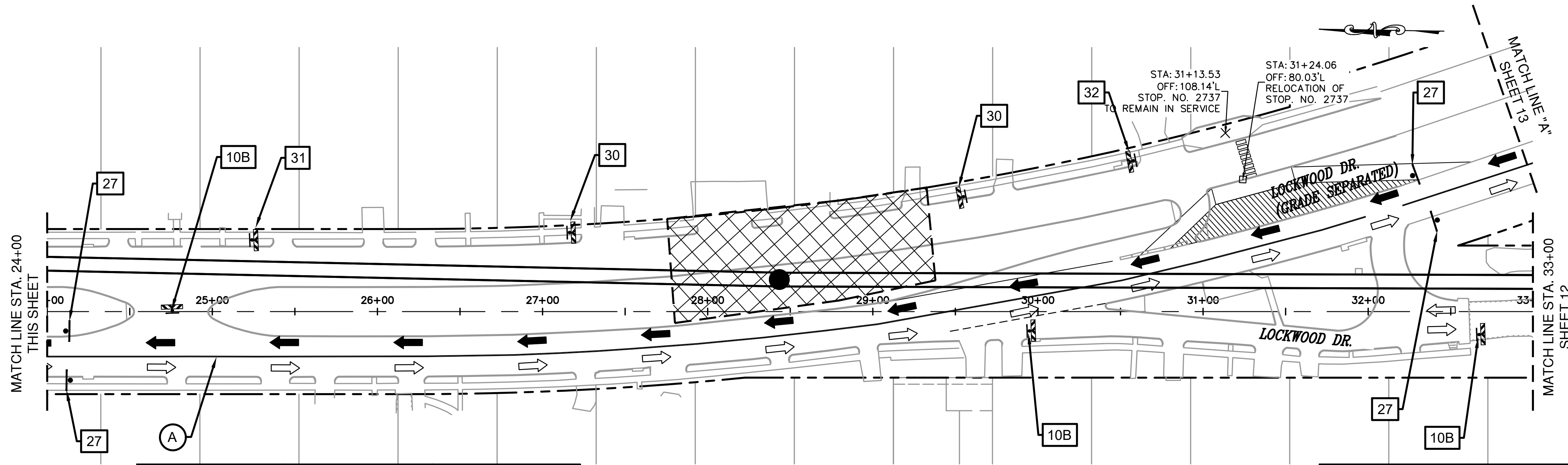
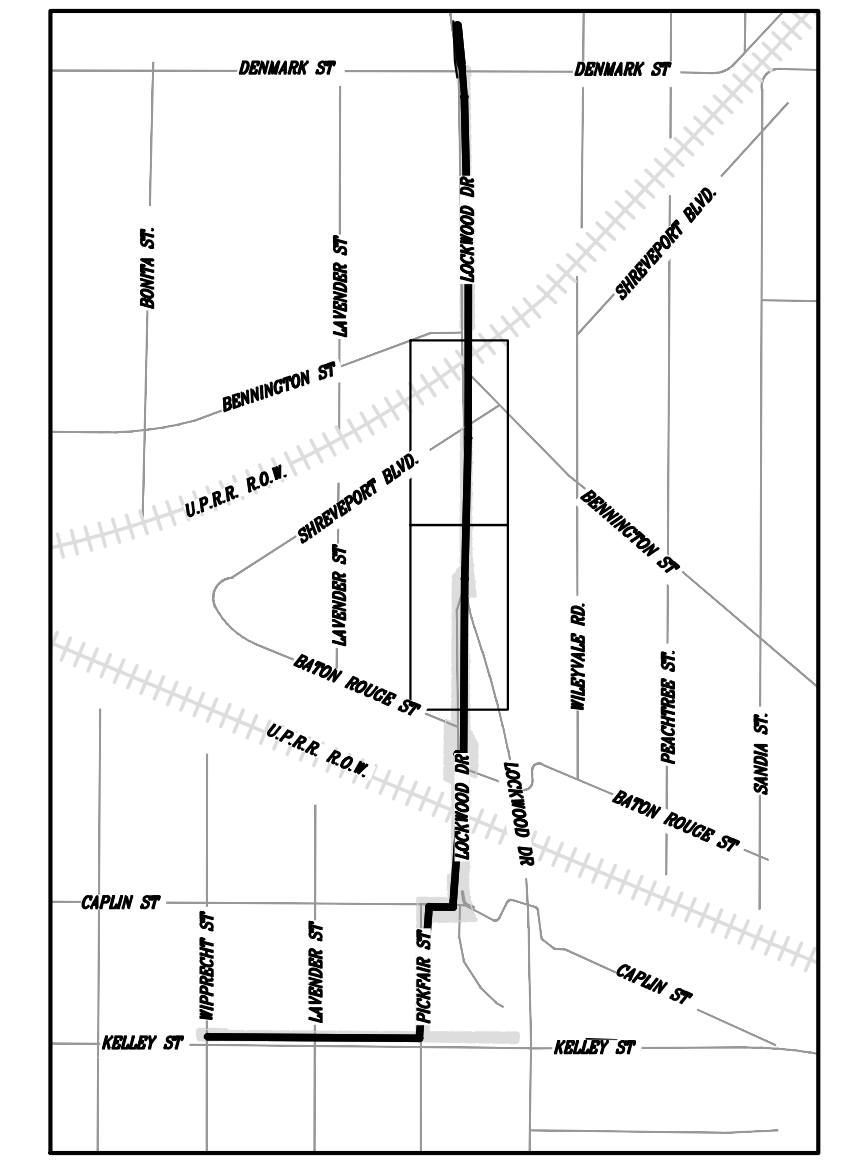
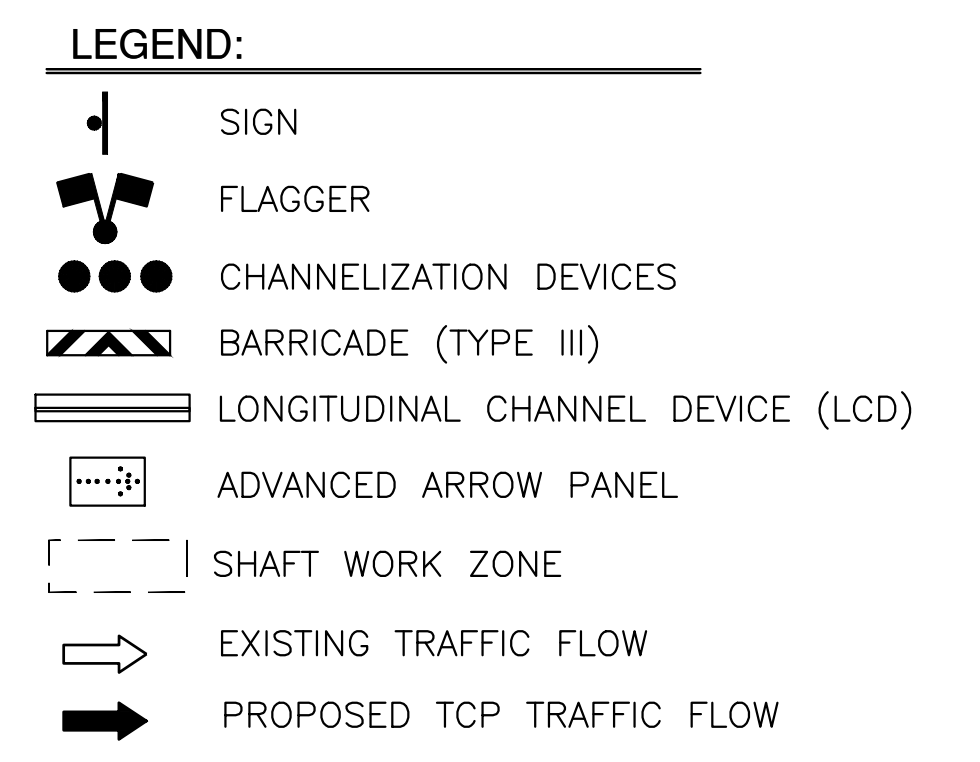
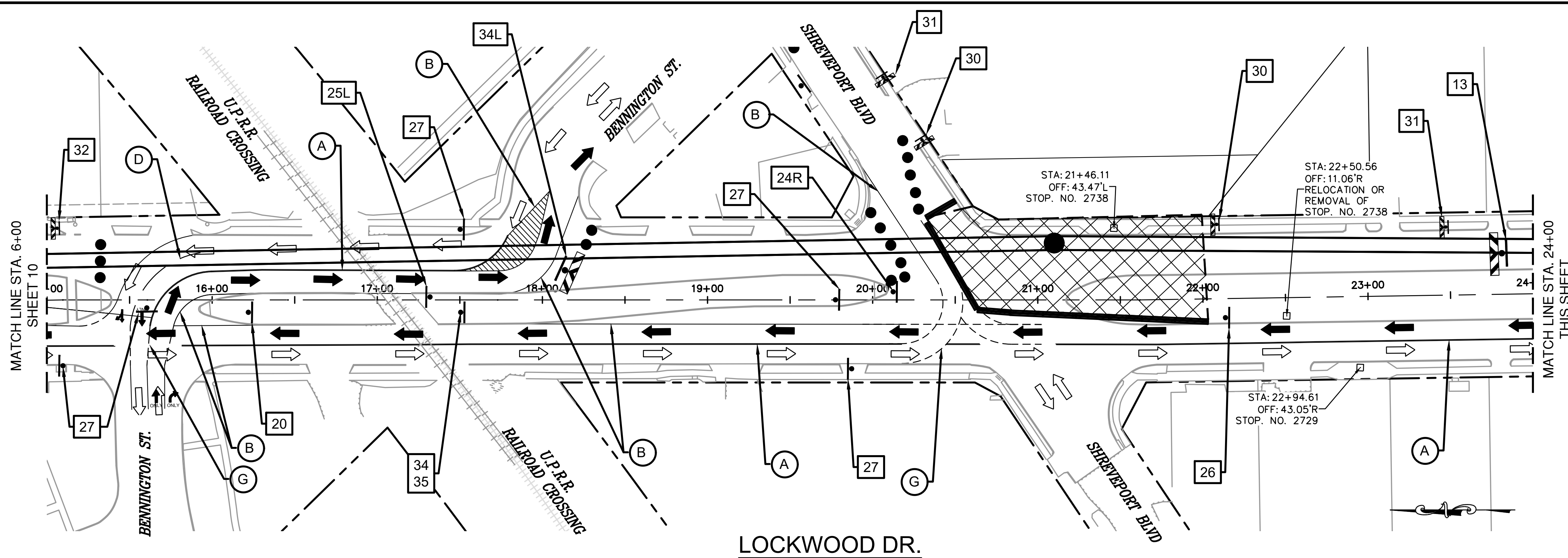
CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL PLAN FOR LOCKWOOD DR.
(1 OF 5)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=80' FOR 11"x17"	
SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 84 OF 106	

- PAVEMENT MARKING KEY NOTES:**
- *YELLOW 4" DOUBLE SOLID
 - *YELLOW 4" SOLID
 - *WHITE 4" SOLID
 - *WHITE 4" BROKEN
 - WHITE 24" SOLID
 - WHITE 8" SOLID
 - DOTTED
- *INCLUDE RPMs / BUTTONS

7	8	25	27	28	29	30	31	32	33	34
CW9-2 (L OR R)	CW4-2 (L OR R)	M5-2 (L OR R)	CW6-3	R4-7	CW1-4R	R9-9	R9-10	R9-11 (L OR R)	R9-11a (L OR R)	M5-1(L OR R)



NO.	DATE	REVISION	APP.

EFF DATE: XXXX-XX-2027 DWG NO: _____

GRIS ENGINEERING & CONSTRUCTION SOLUTIONS
P.O. BOX 2007 SUGAR LAKE, TX 75080-2007 TEL: 281-485-2200 FAX: 281-485-2201

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TX PE NO. 115678

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

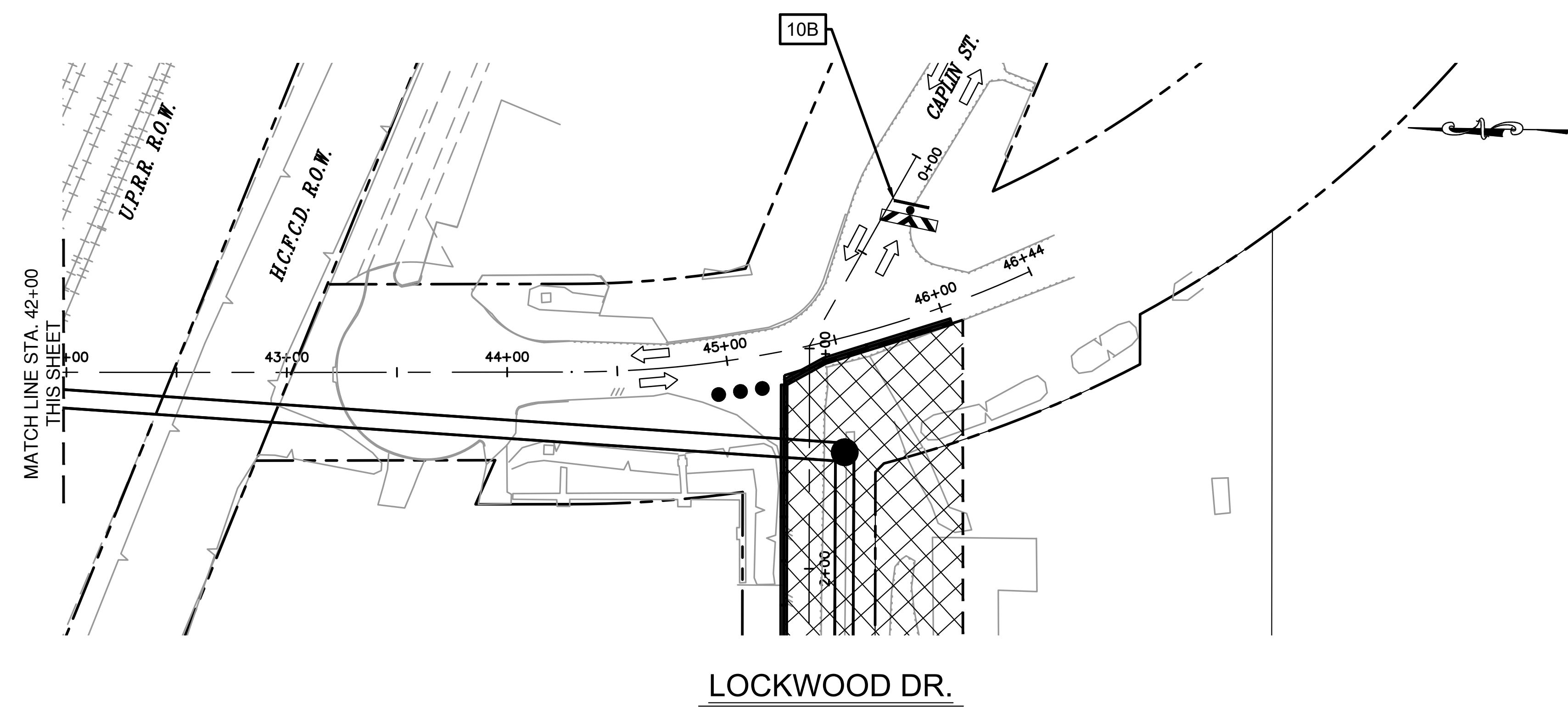
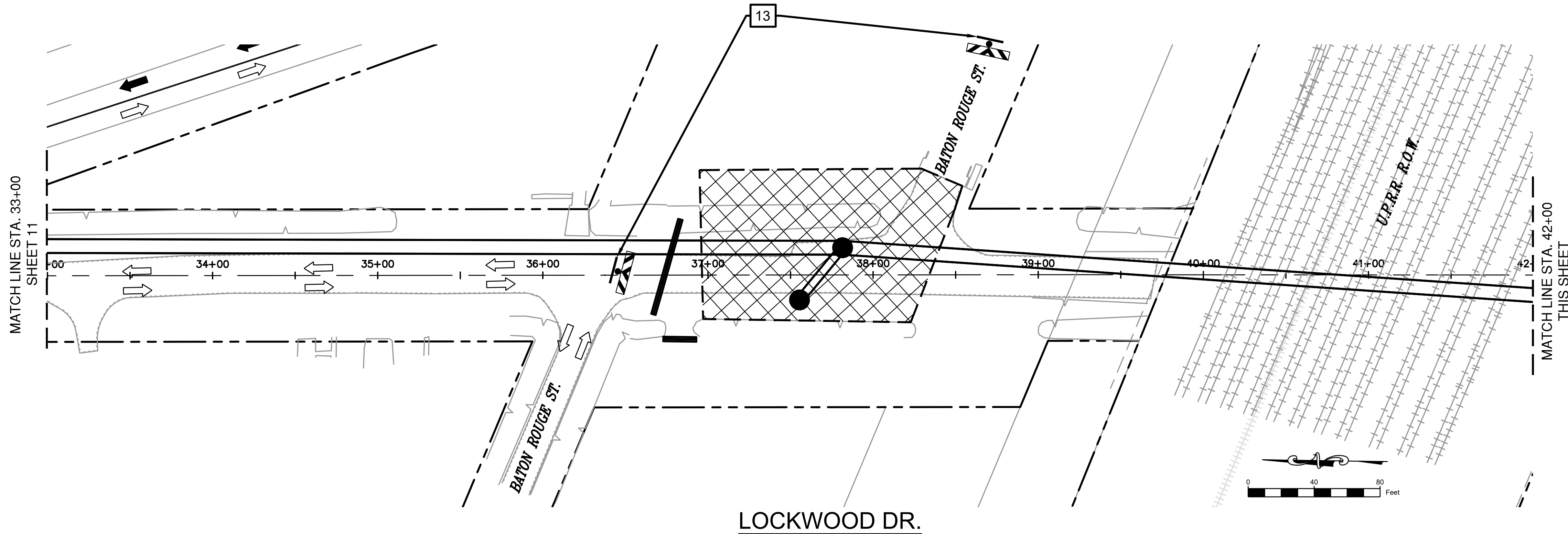
CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL PLAN FOR LOCKWOOD DR.
(2 OF 5)

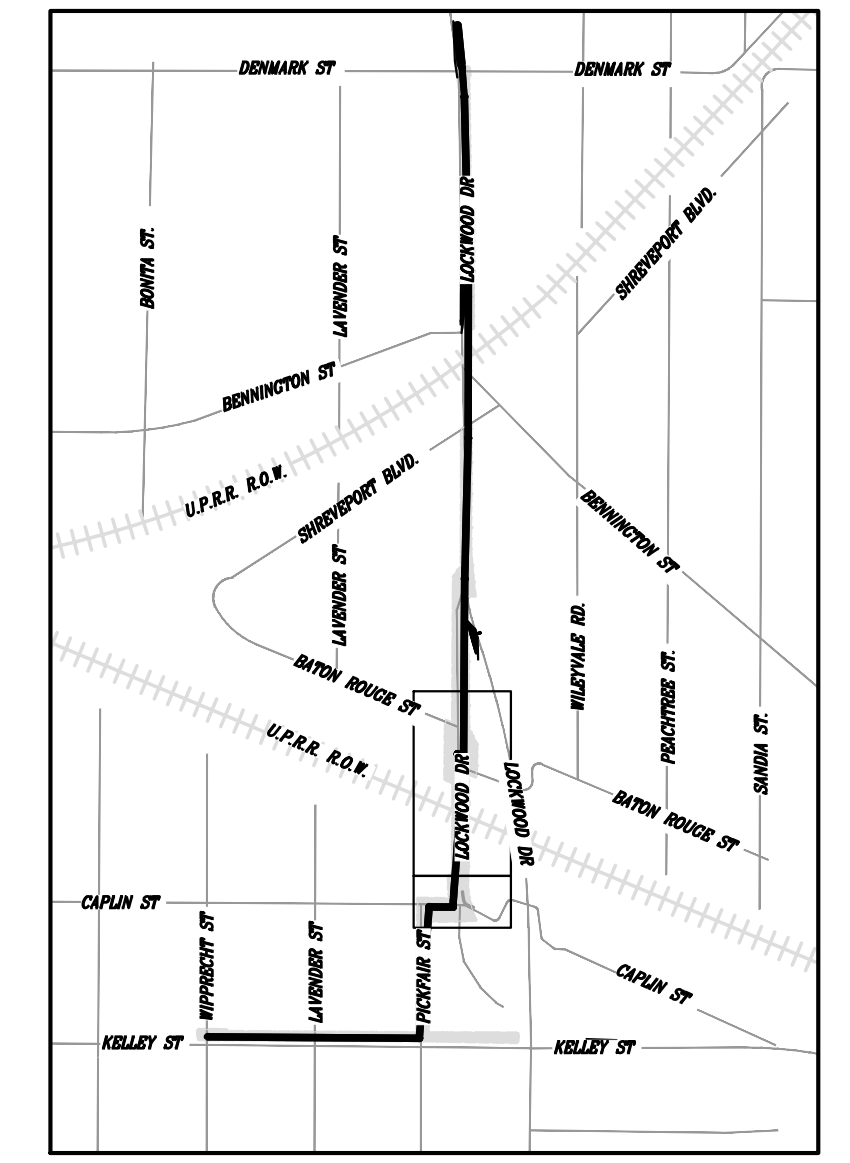
WBS NUMBER: R-001000-0033-3
DRAWING SCALE: SCALE: 1"=80' FOR 11"x17" SCALE: 1"=40' FOR 22"x34"
CITY OF HOUSTON PM: NEIL BARNSDALE, P.E.
SHEET NO. 85 OF 106

FOR CITY OF HOUSTON USE ONLY

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 INCLUDE RPMs / BUTTONS



- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW



KEY MAP
SCALE: 1" = 1,000 FT

NO.	DATE	REVISION	APP.

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TX PE NO. 115678

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL PLAN FOR LOCKWOOD DR.
(3 OF 5)

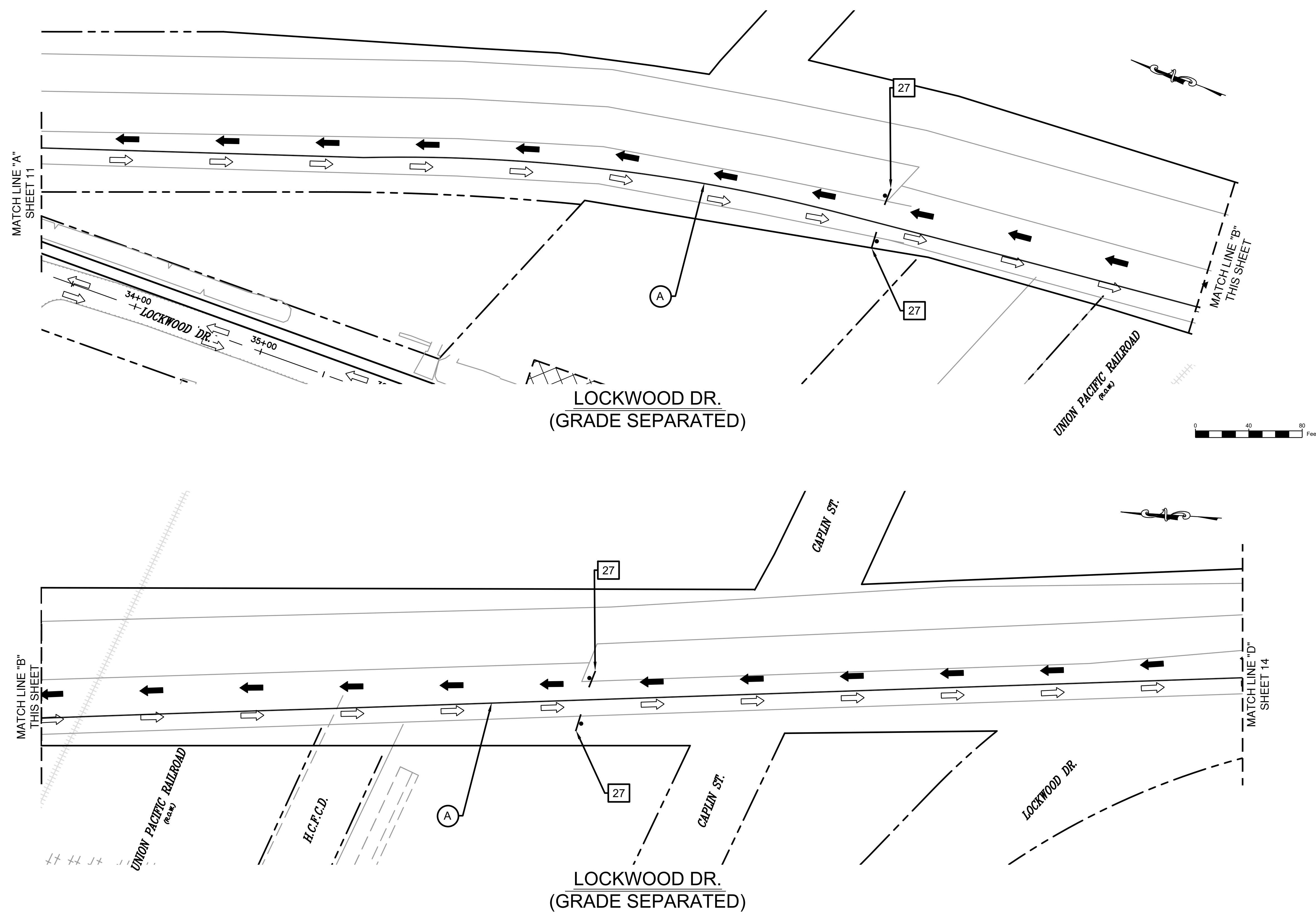
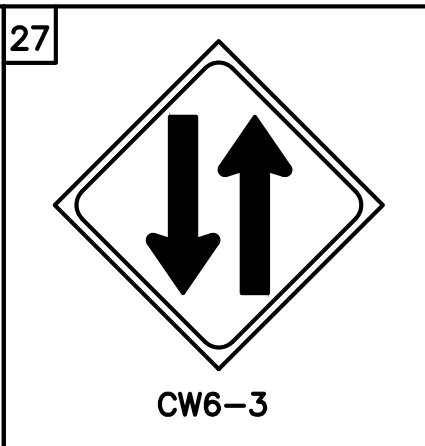
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=80' FOR 11"x17"	
SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 86 OF 106	

GRIS Engineering
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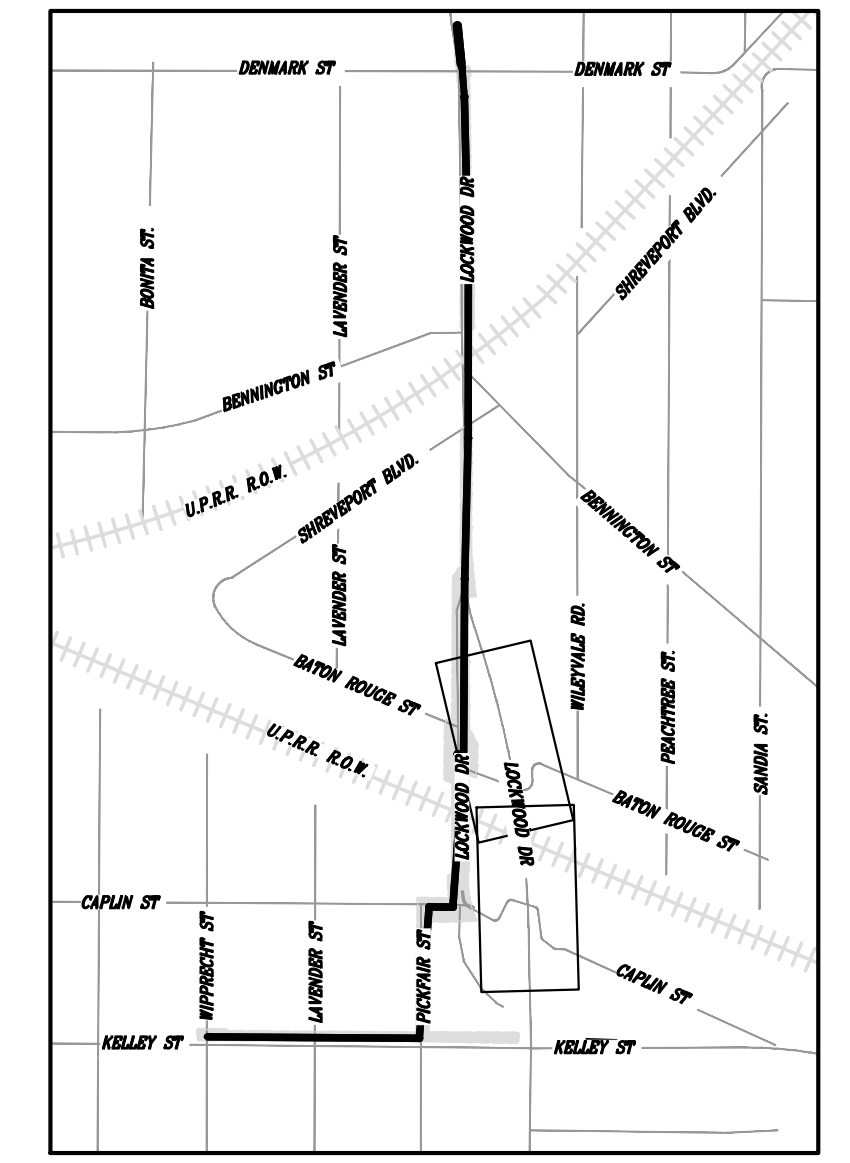
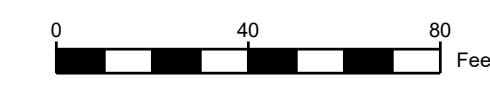
PAVEMENT MARKING KEY NOTES:	10	13
*YELLOW 4" DOUBLE SOLID	<p>ROAD CLOSED TO THRU TRAFFIC R11-4</p>	<p>ROAD CLOSED R11-2</p>
*YELLOW 4" SOLID		
*WHITE 4" SOLID		
*WHITE 4" BROKEN		
WHITE 24" SOLID		
WHITE 8" SOLID	<p>ROAD CLOSED LOCAL TRAFFIC ONLY R11-3</p>	
DOTTED		
*INCLUDE RPMS / BUTTONS		

K:\2023\08.LAN.002\05-CAD\5.1 CD Plan Set\84-INCH CRMP TCP CDs.dwg Jun. 03, 2026
 GRIS Engineering

- PAVEMENT MARKING KEY NOTES:
- ① *YELLOW 4" DOUBLE SOLID
 - ② *YELLOW 4" SOLID
 - ③ *WHITE 4" SOLID
 - ④ *WHITE 4" BROKEN
 - ⑤ WHITE 24" SOLID
 - ⑥ WHITE 8" SOLID
 - ⑦ DOTTED

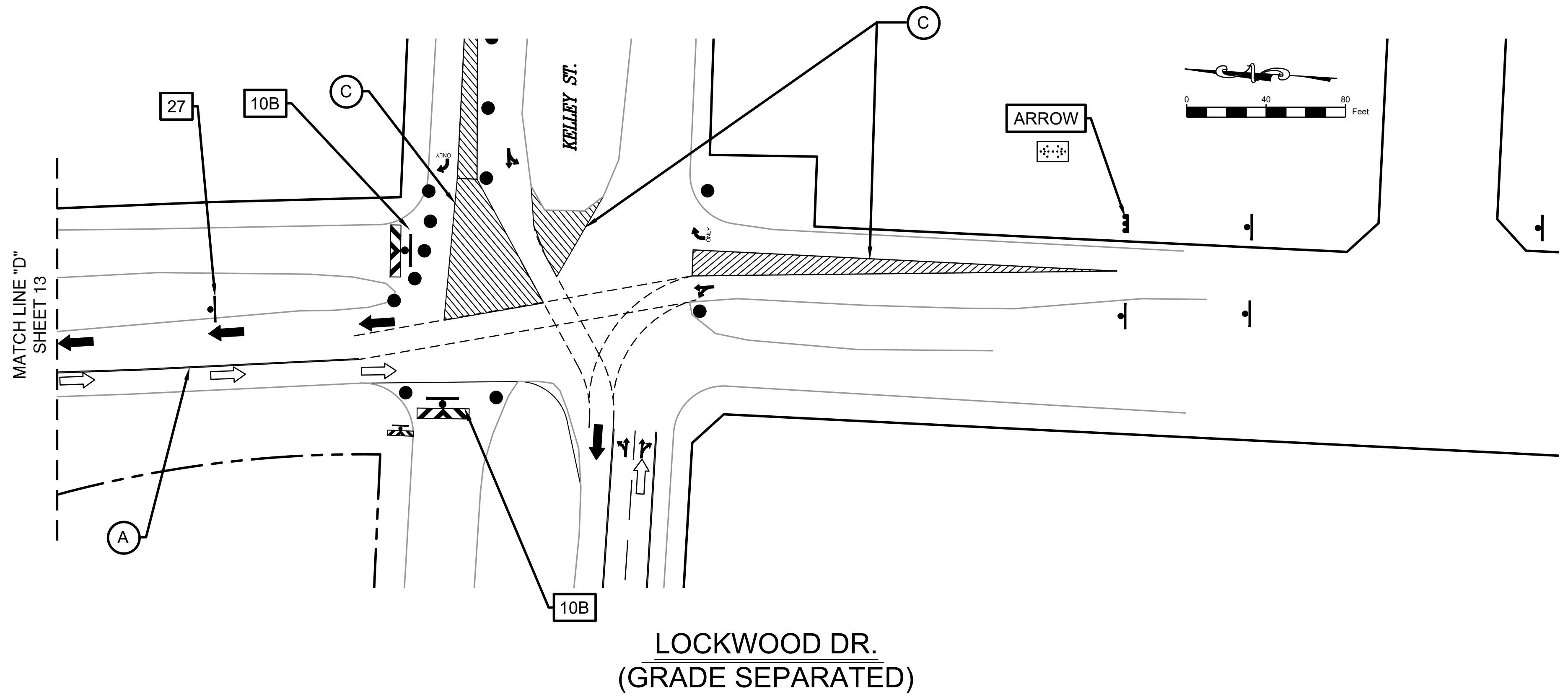


- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW

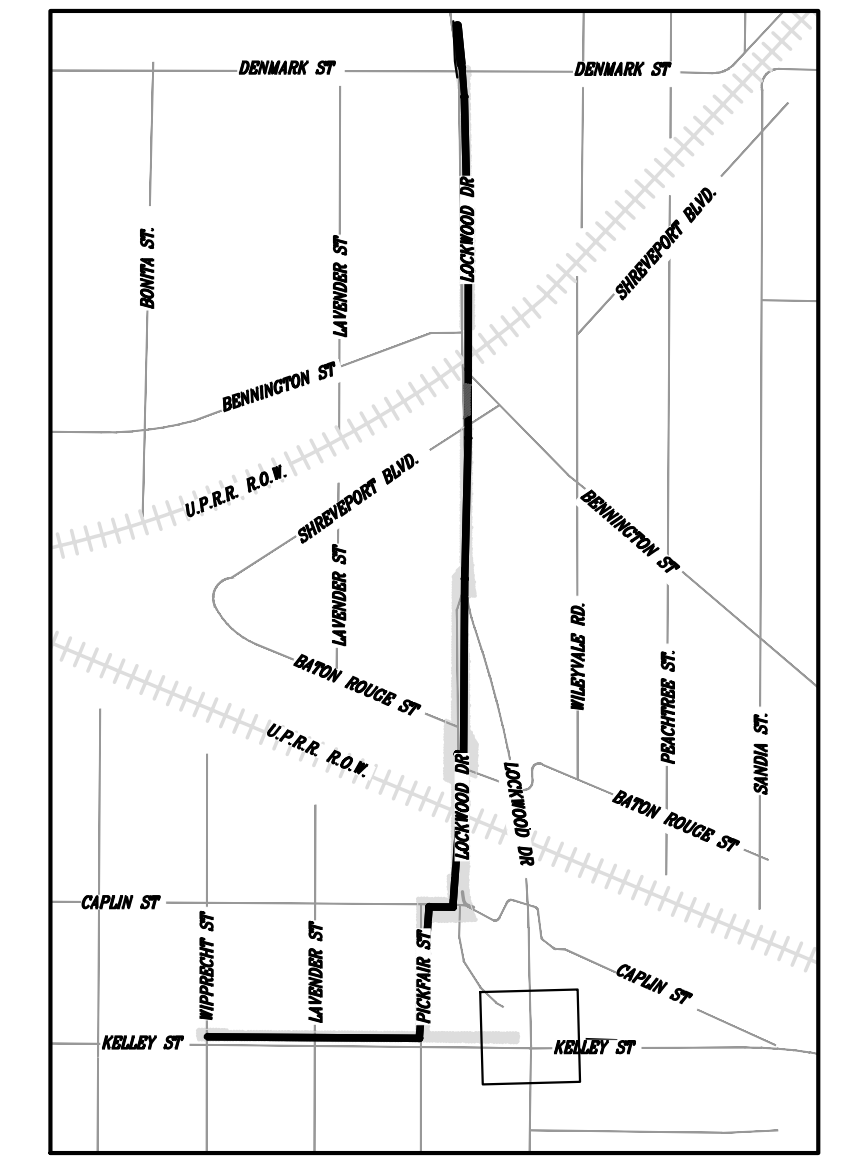


KEY MAP
SCALE: 1" = 1,000 FT

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SURVEYED BY: FB NO. -			
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TRAFFIC CONTROL PLAN FOR LOCKWOOD DR. (4 OF 5)			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3			
DRAWING SCALE			
SCALE: 1"=80' FOR 11"x17"			
SCALE: 1"=40' FOR 22"x34"			
CITY OF HOUSTON PM			
NEIL BARNSDALE, P.E.			
SHEET NO. 87 OF 106			



- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW



KEY MAP
SCALE: 1" = 1,000 FT

NO.	DATE	REVISION	APP.



EFF DATE: XXXX-XX-2027 DWG NO:



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JUNE 2026
GRISelda GONZALES, P.E.
TX PE NO. 115678

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

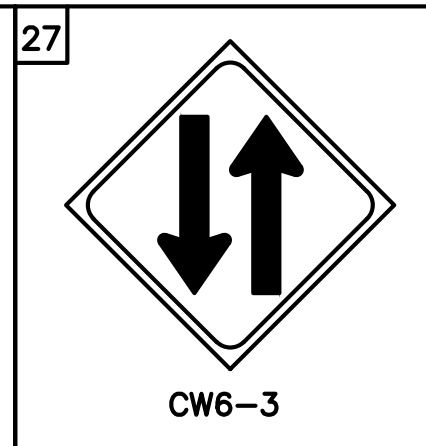
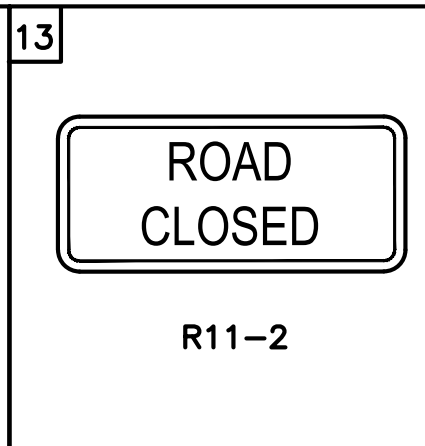
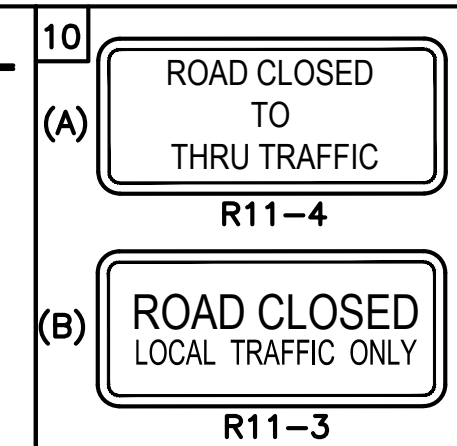
CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

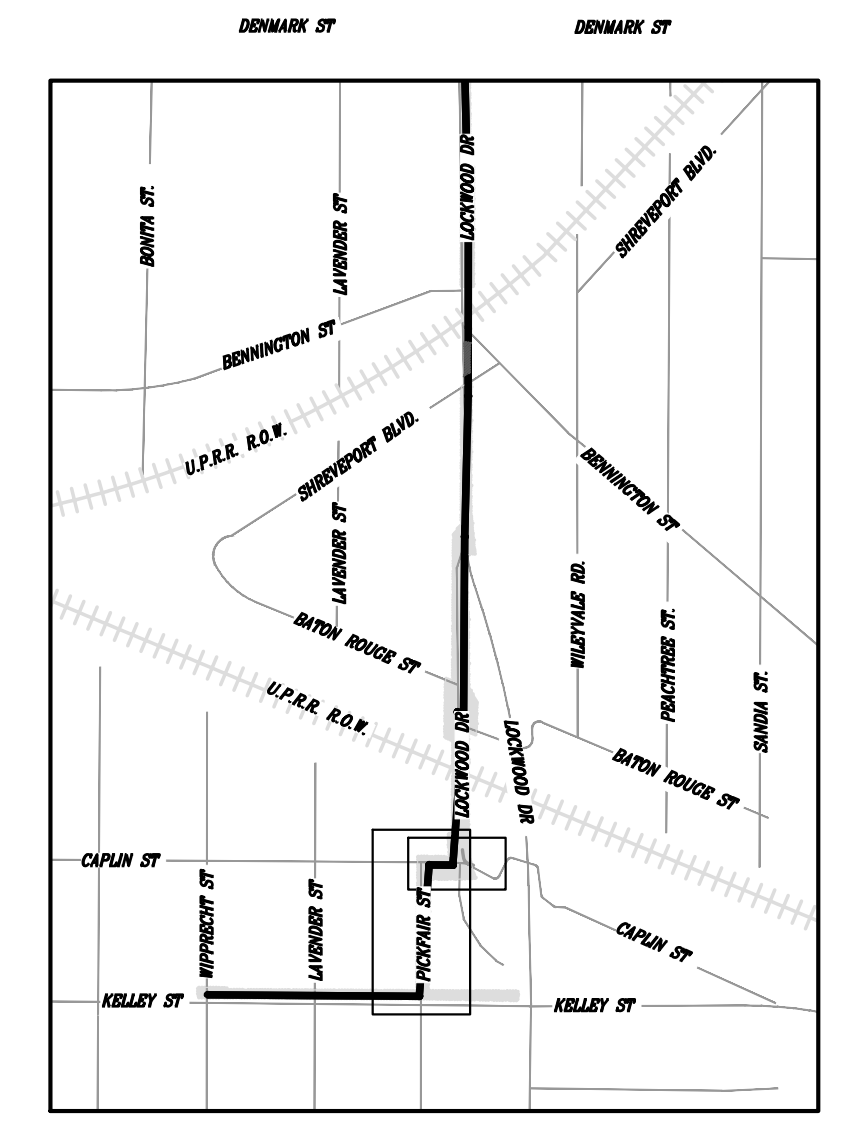
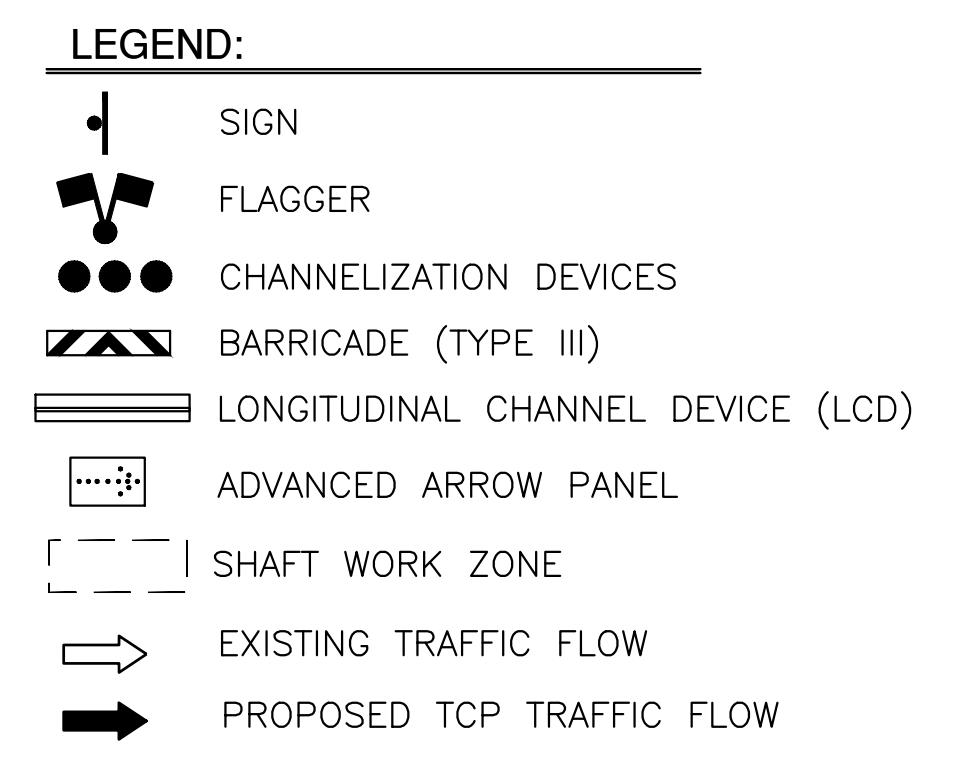
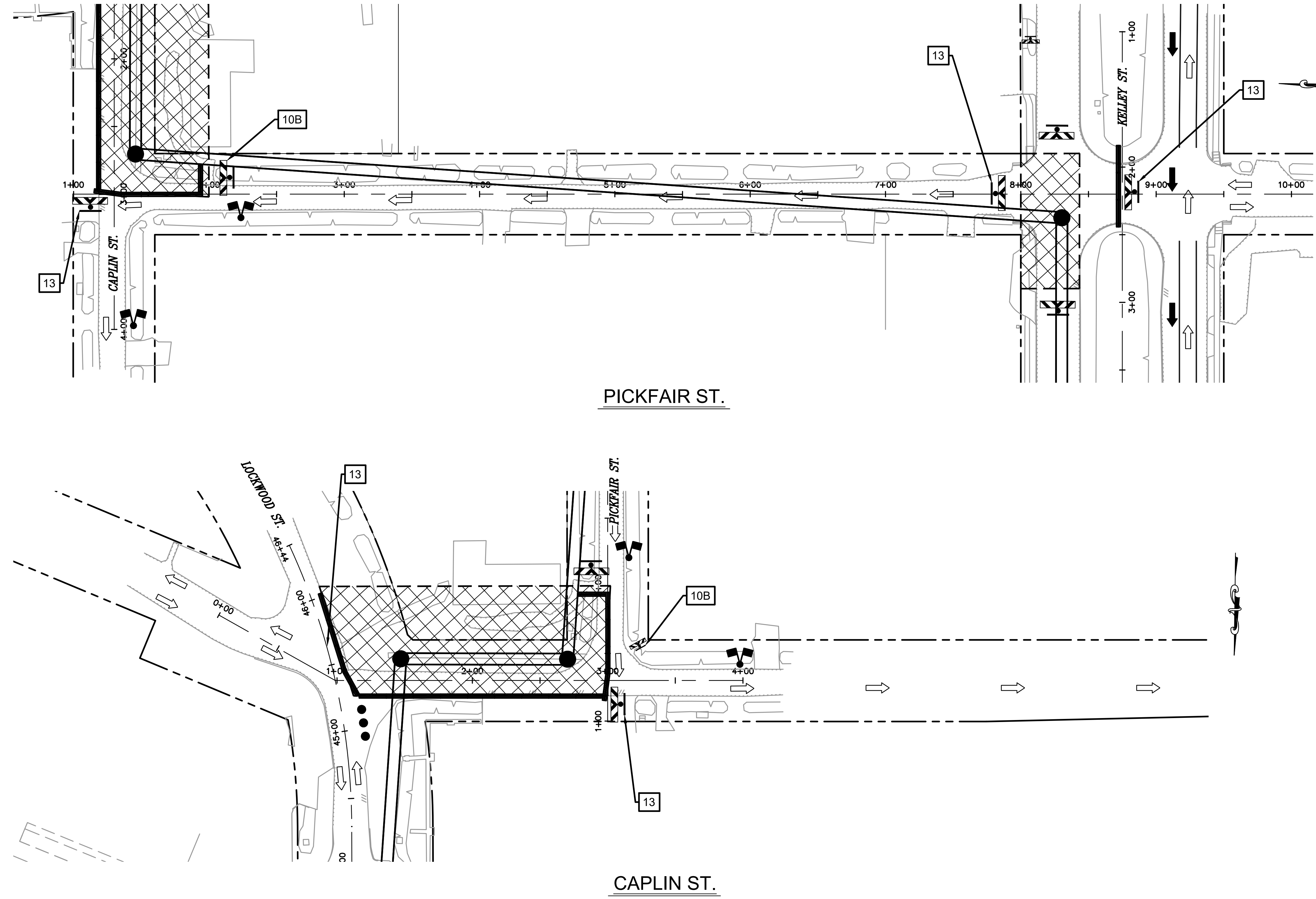
TRAFFIC CONTROL PLAN FOR LOCKWOOD DR.
(5 OF 5)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=80' FOR 11"x17"	
SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 88 OF 106	

PAVEMENT MARKING KEY NOTES:

- (A) *YELLOW 4" DOUBLE SOLID
- *YELLOW 4" SOLID
- *WHITE 4" SOLID
- *WHITE 4" BROKEN
- WHITE 24" SOLID
- WHITE 8" SOLID
- DOTTED





NO.	DATE	REVISION	APP.

GRIS
 CIVIL ENGINEERING & CONSTRUCTION SOLUTIONS
 11000 WESTHELL BLVD., SUITE 100
 HOUSTON, TEXAS 77036
 P.O. BOX 2007 SUGAR LAKE, TX 75081
 TEL: 281-486-2200 FAX: 281-486-2201
 WWW.GRISENGINEERING.COM

EFF DATE: XXXX-XX-2027 DWG NO:

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 FB NO. GRISELDA GONZALES, P.E.
 TX PE NO. 115678

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL PLAN FOR PICKFAIR ST. & CAPLIN ST.

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=80' FOR 11"x17" SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 89 OF 106	

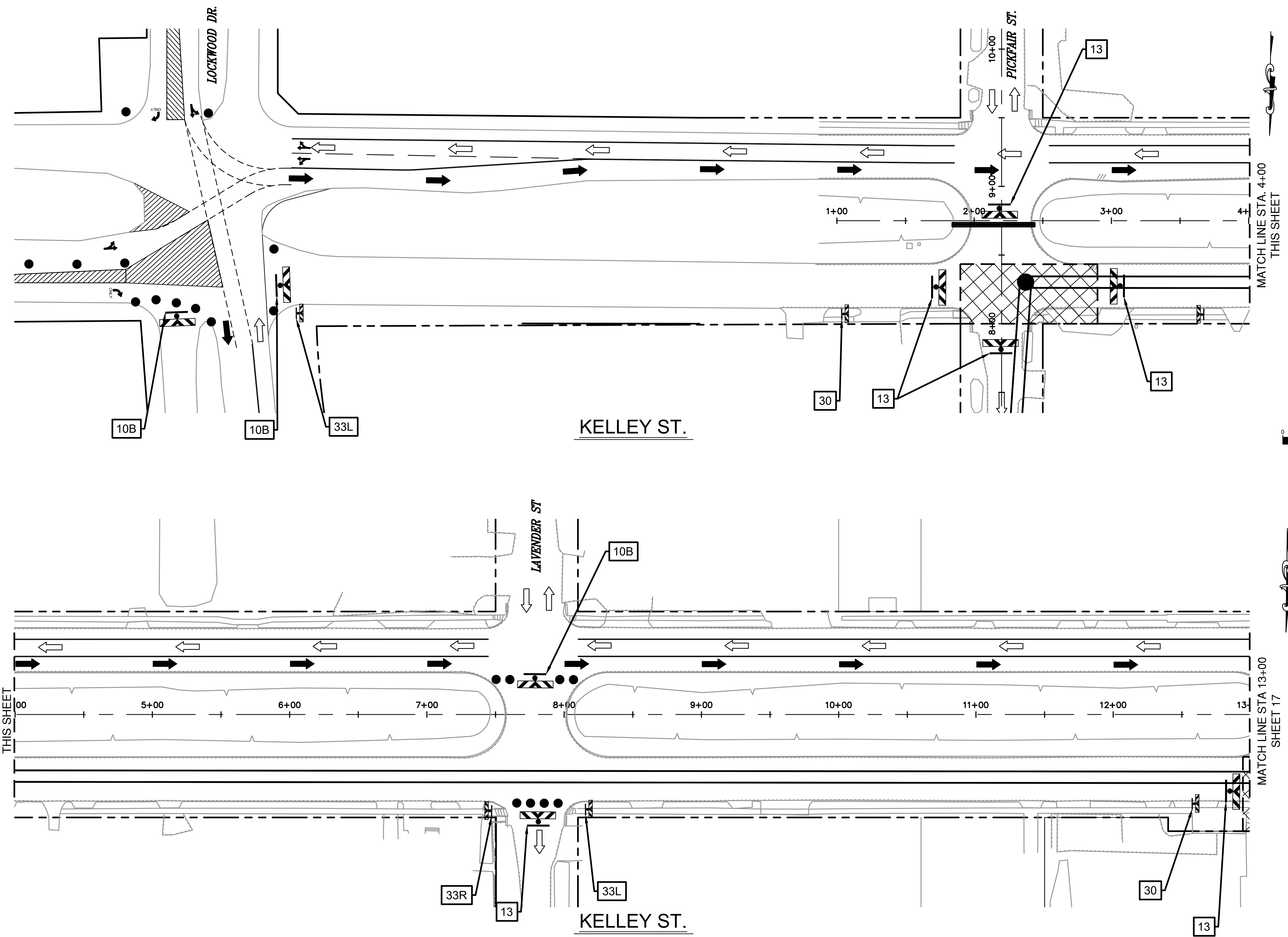
PAVEMENT MARKING KEY NOTES:

10	ROAD CLOSED TO THRU TRAFFIC R11-4	13	ROAD CLOSED R11-2
(A)			
(B)	ROAD CLOSED LOCAL TRAFFIC ONLY R11-3		

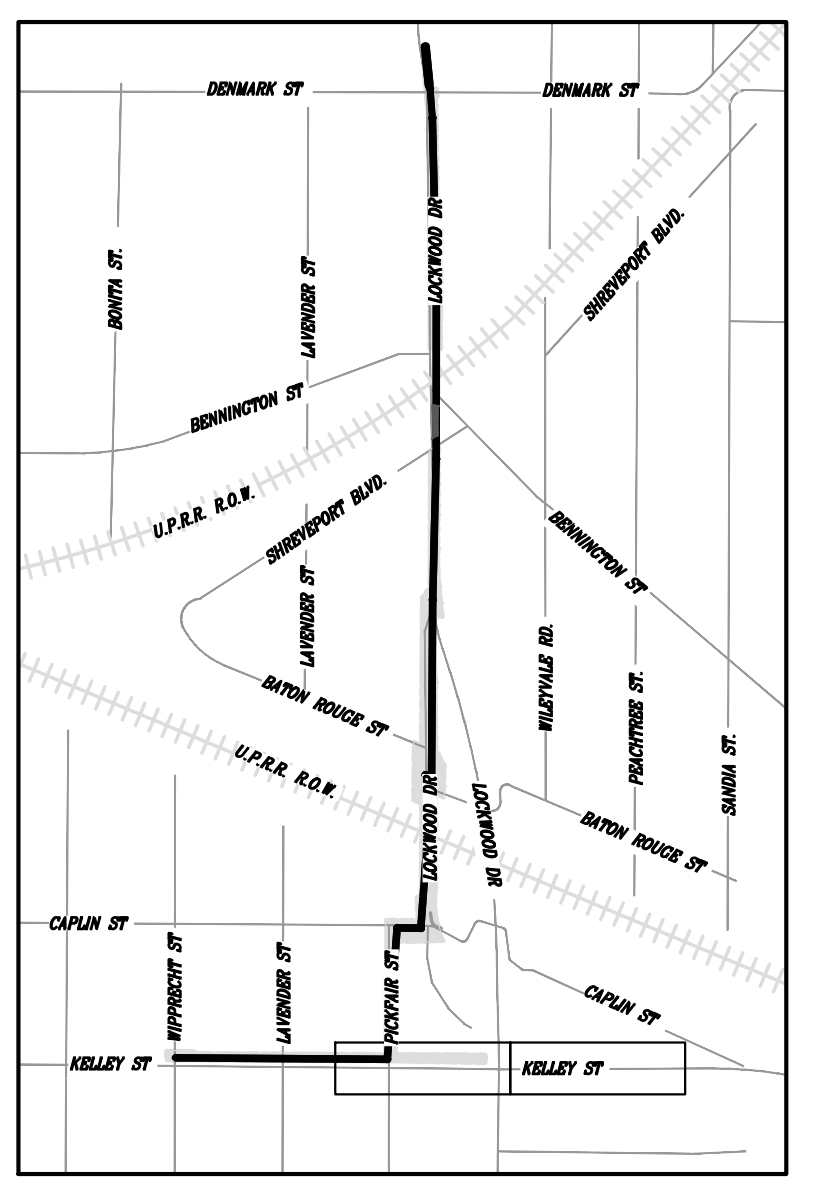
*YELLOW 4" DOUBLE SOLID
 *YELLOW 4" SOLID
 *WHITE 4" SOLID
 *WHITE 4" BROKEN
 WHITE 24" SOLID
 WHITE 8" SOLID
 DOTTED

*INCLUDE RPMs / BUTTONS

GRIS Engineering
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- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW



KEY MAP
SCALE: 1" = 1,000FT



MATCH LINE STA. 4+00
THIS SHEET

MATCH LINE STA. 13+00
SHEET 17

PAVEMENT MARKING KEY NOTES:

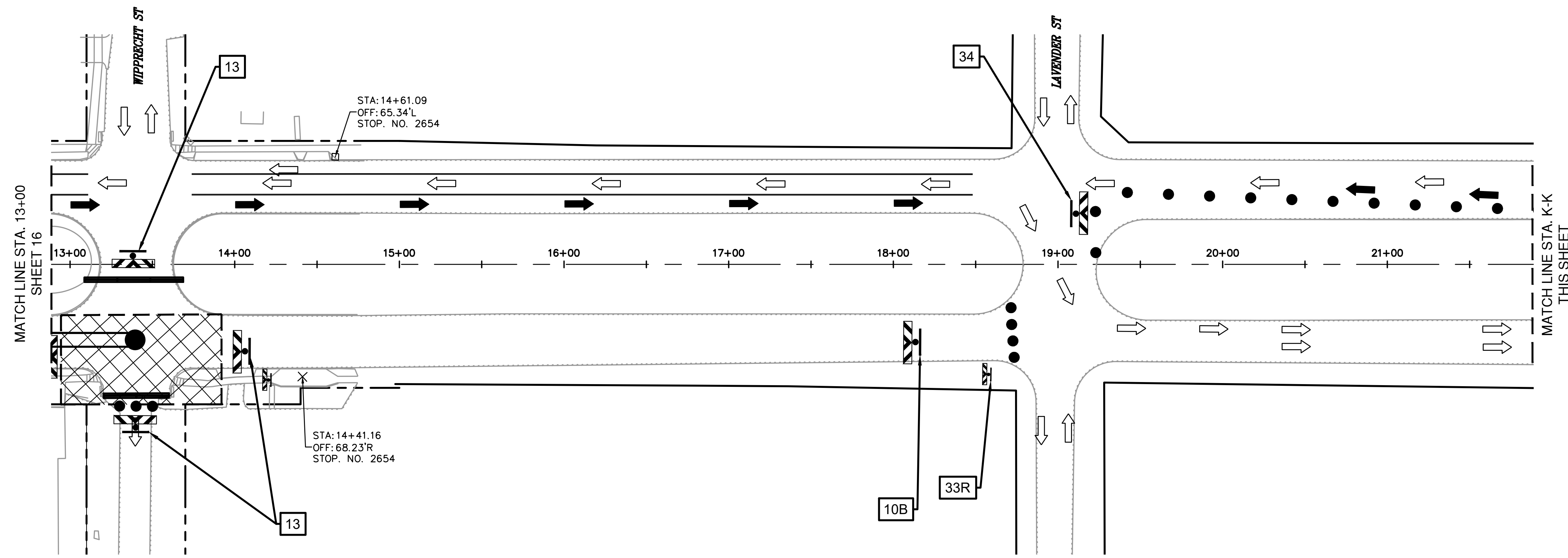
- *YELLOW 4" DOUBLE SOLID
- *YELLOW 4" SOLID
- *WHITE 4" SOLID
- *WHITE 4" BROKEN
- WHITE 24" SOLID
- WHITE 8" SOLID
- DOTTED

*INCLUDE RPMs / BUTTONS

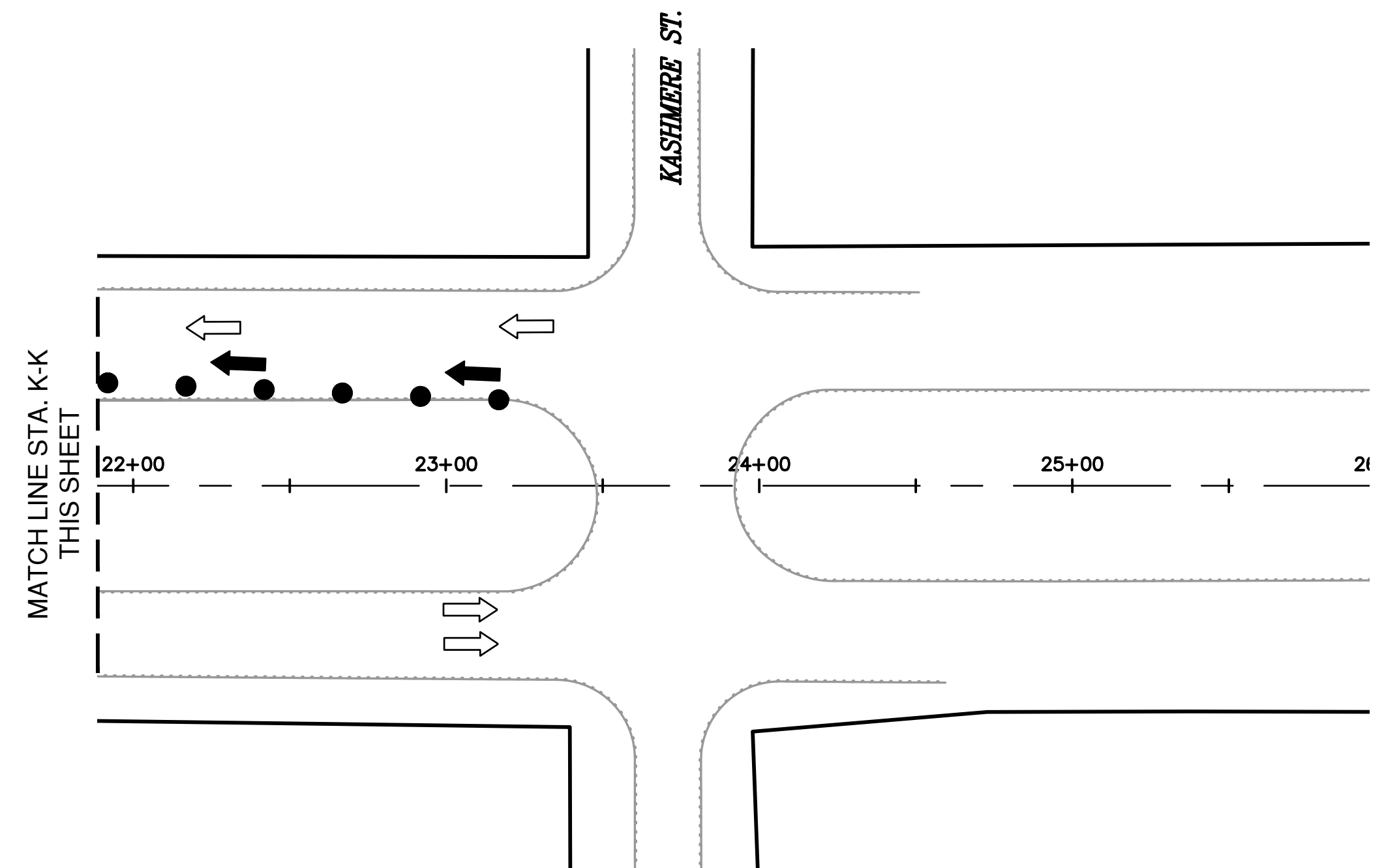
10	13	30	33	34
 ROAD CLOSED TO THRU TRAFFIC R11-4	 ROAD CLOSED R11-2	 SIDEWALK CLOSED R9-9	 SIDEWALK CLOSED CROSS HERE R9-11a (L OR R)	 ARROW M5-1(L OR R)
 ROAD CLOSED LOCAL TRAFFIC ONLY R11-3				

NO.	DATE	REVISION	APP.
EFF DATE: XXXX-XX-2027		DWG NO:	
		THESE DOCUMENTS ARE ISSUED FOR INTERIM REVIEW ONLY AND ARE NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.	
SURVEYED BY: FB NO. -		JUNE 2026 GRISELDA GONZALES, P.E. TX PE NO. 115678	
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TRAFFIC CONTROL PLAN FOR KELLEY ST. (1 OF 2)			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3			
DRAWING SCALE			
SCALE: 1"=80' FOR 11"x17"			
SCALE: 1"=40' FOR 22"x34"			
CITY OF HOUSTON PM			
NEIL BARNSDALE, P.E.			
SHEET NO. 90 OF 106			

GRIS Engineering
 K:\2023\08.LAN.002\05-CAD\5.1_CD_Plan_Sat\84-INCH_CRMP_TCP_CDs.dwg Jun. 03, 2026

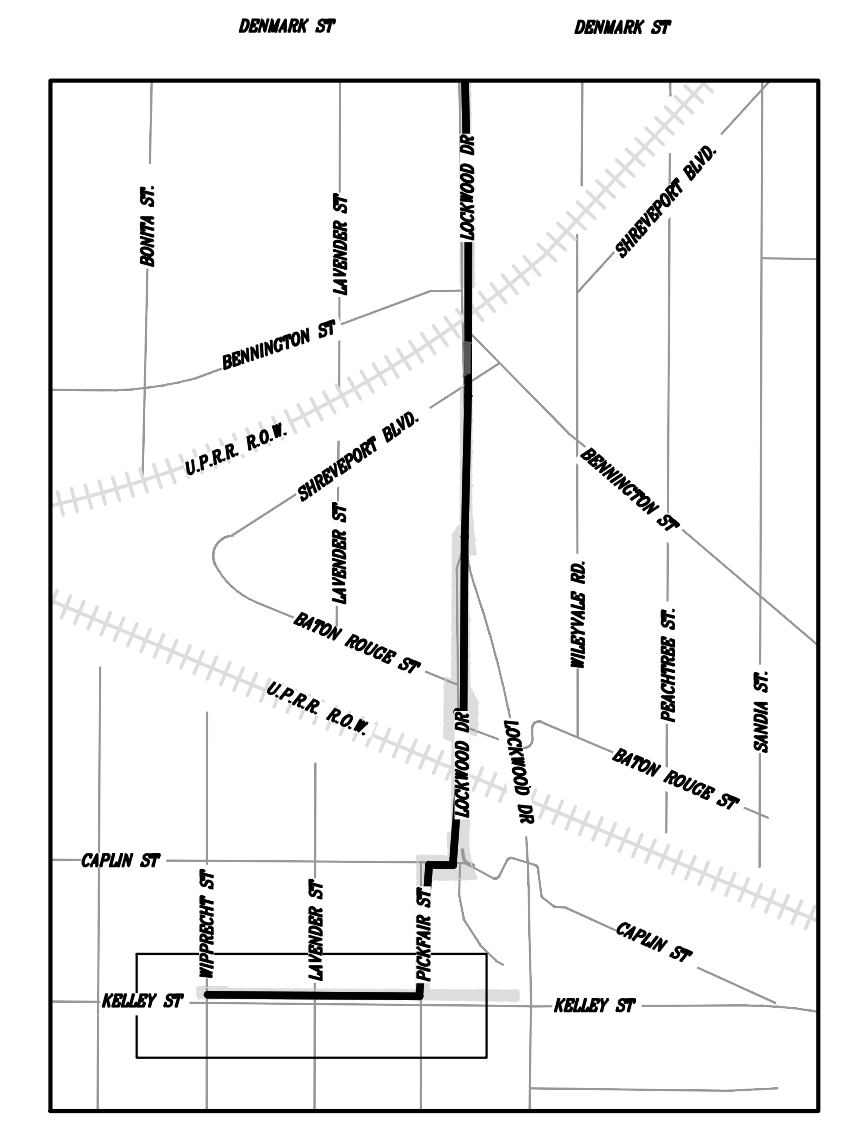


KELLEY ST.



KELLEY ST.

- LEGEND:**
- SIGN
 - FLAGGER
 - CHANNELIZATION DEVICES
 - BARRICADE (TYPE III)
 - LONGITUDINAL CHANNEL DEVICE (LCD)
 - ADVANCED ARROW PANEL
 - SHAFT WORK ZONE
 - EXISTING TRAFFIC FLOW
 - PROPOSED TCP TRAFFIC FLOW



KEY MAP
SCALE: 1" = 1,000FT

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SURVEYED BY: FB NO. -			

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

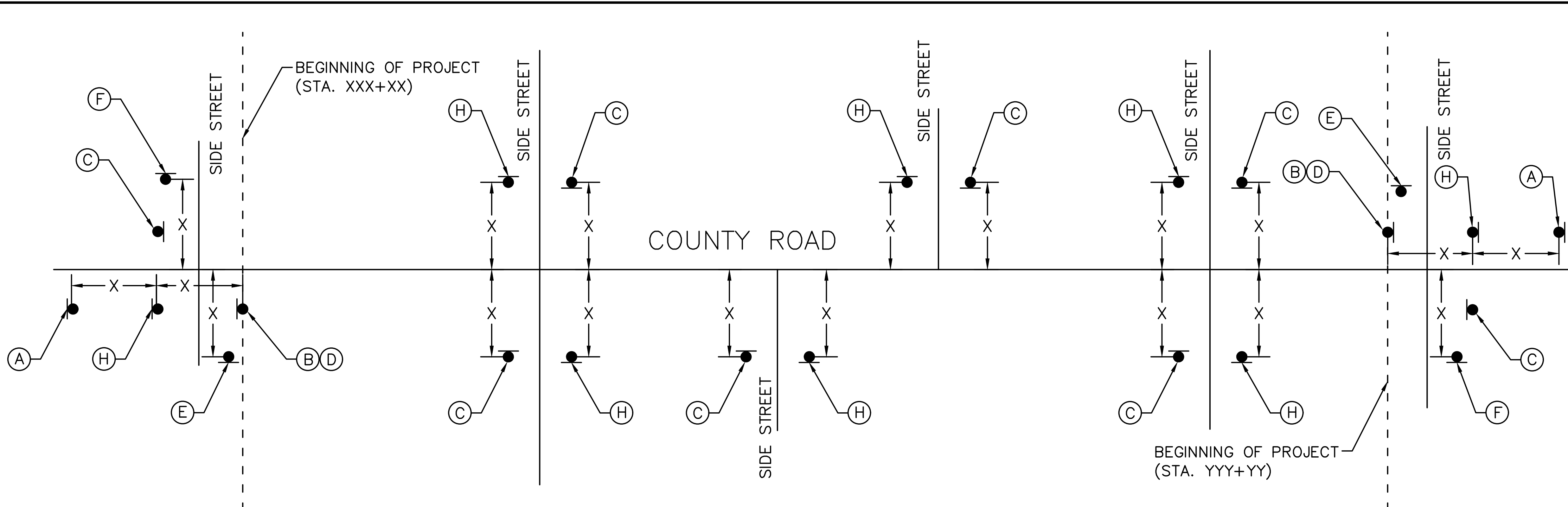
CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

**TRAFFIC CONTROL PLAN FOR
KELLEY ST. (2 OF 2)**

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1"=80' FOR 11"x17" SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 91 OF 106	

- PAVEMENT MARKING KEY NOTES:**
- *YELLOW 4" DOUBLE SOLID
 - *YELLOW 4" SOLID
 - *WHITE 4" SOLID
 - *WHITE 4" BROKEN
 - WHITE 24" SOLID
 - WHITE 8" SOLID
 - DOTTED
- INCLUDE RPMs / BUTTONS

10 (A) ROAD CLOSED TO THRU TRAFFIC R11-4	13 ROAD CLOSED R11-2	30 SIDEWALK CLOSED R9-9	33 SIDEWALK CLOSED CROSS HERE R9-11a (L OR R)	34 M5-1(L OR R)
10 (B) ROAD CLOSED LOCAL TRAFFIC ONLY R11-3				



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 Spacing of Taper Lengths "L"			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing Distance	Suggested Longitudinal Buffer Space "B"
	10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
35 L=WS ² / 60	150'	165'	180'	30'	60'	120'	90'
40	205'	225'	245'	35'	70'	160'	120'
45	265'	295'	320'	40'	80'	240'	155'
50	450'	495'	540'	45'	90'	320'	195'
55	500'	550'	600'	50'	100'	400'	240'
60	550'	605'	660'	55'	110'	500'	295'
65	600'	660'	720'	60'	120'	600'	350'
70	650'	715'	780'	65'	130'	700'	410'
75	700'	770'	840'	70'	140'	800'	475'
80	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)

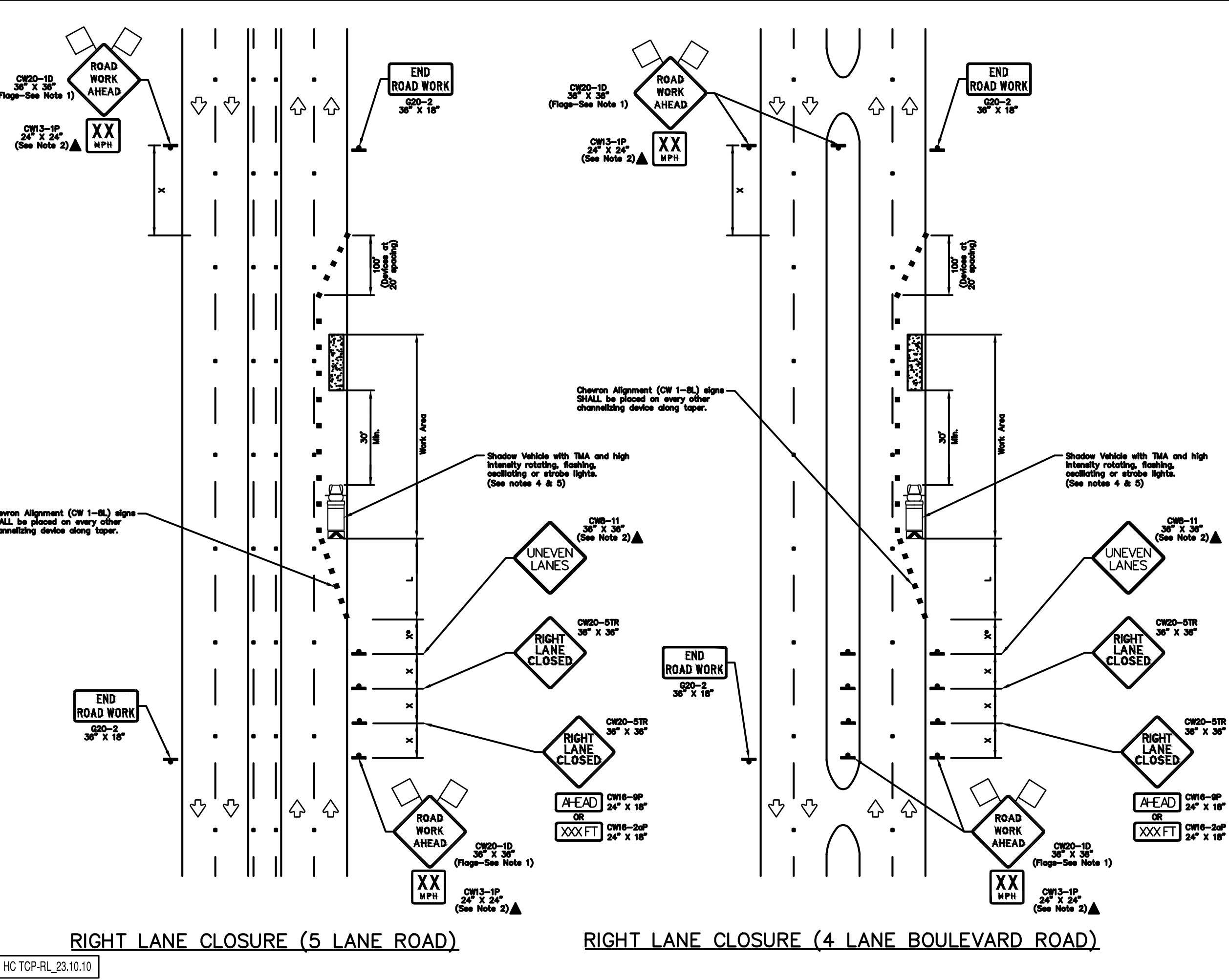
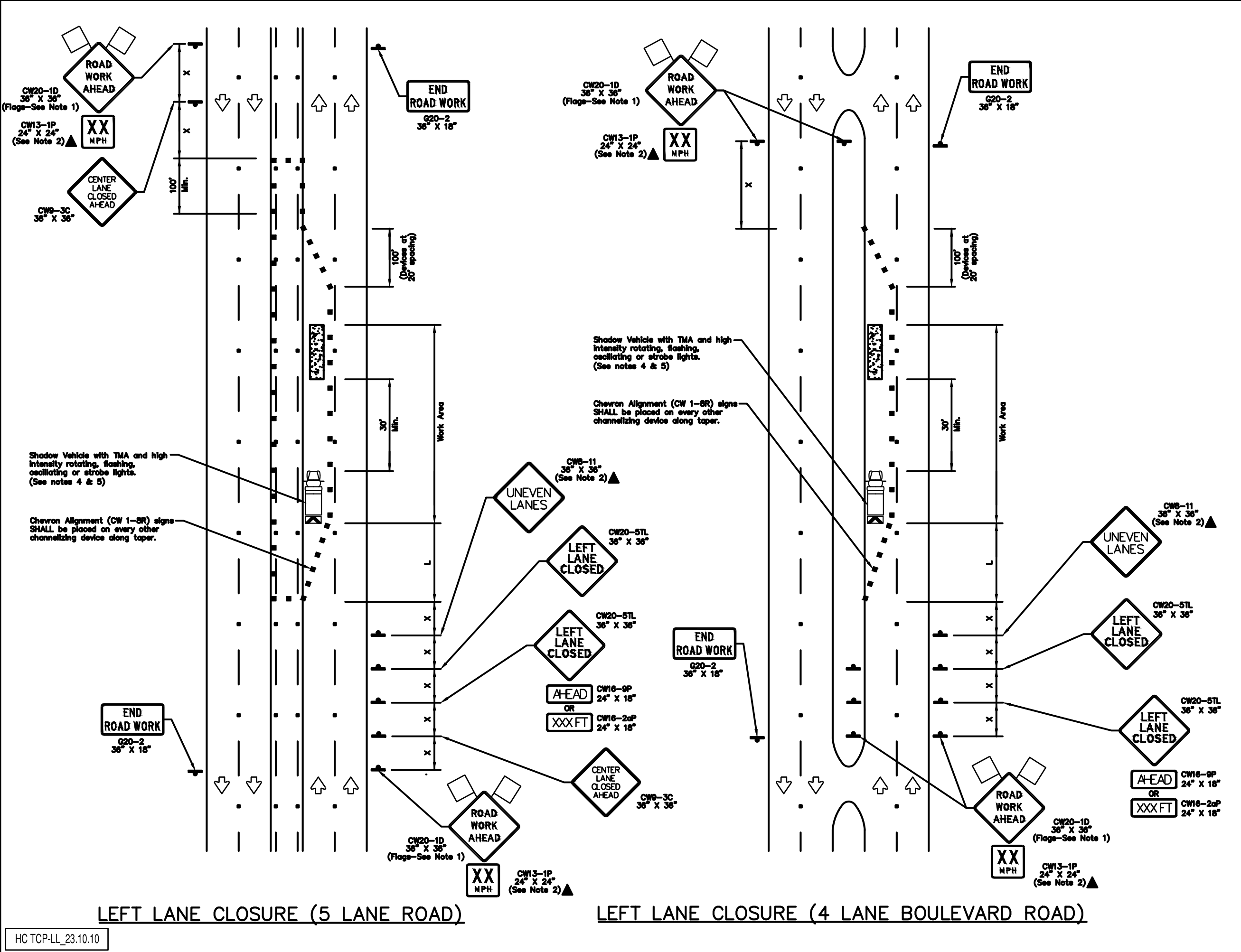
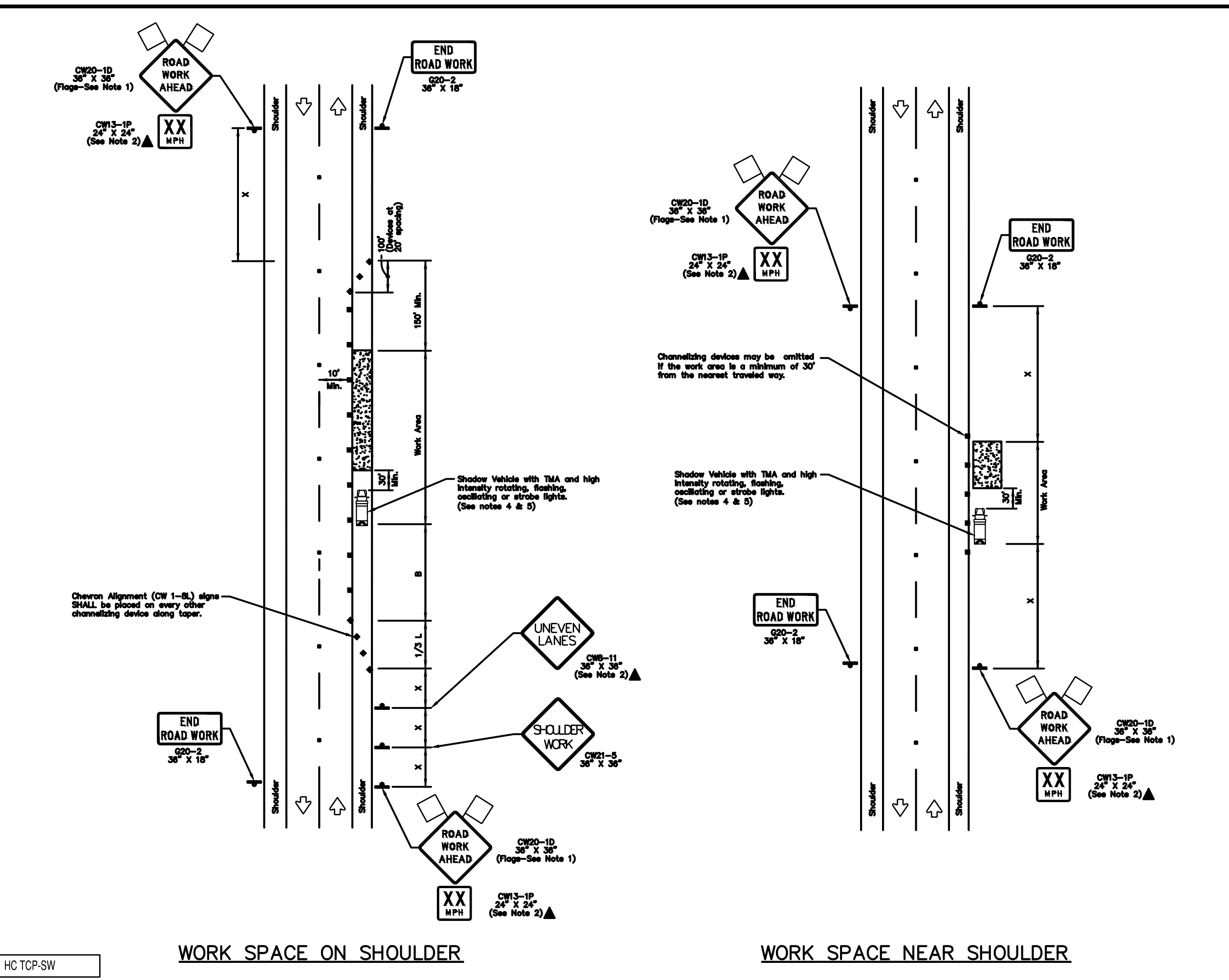
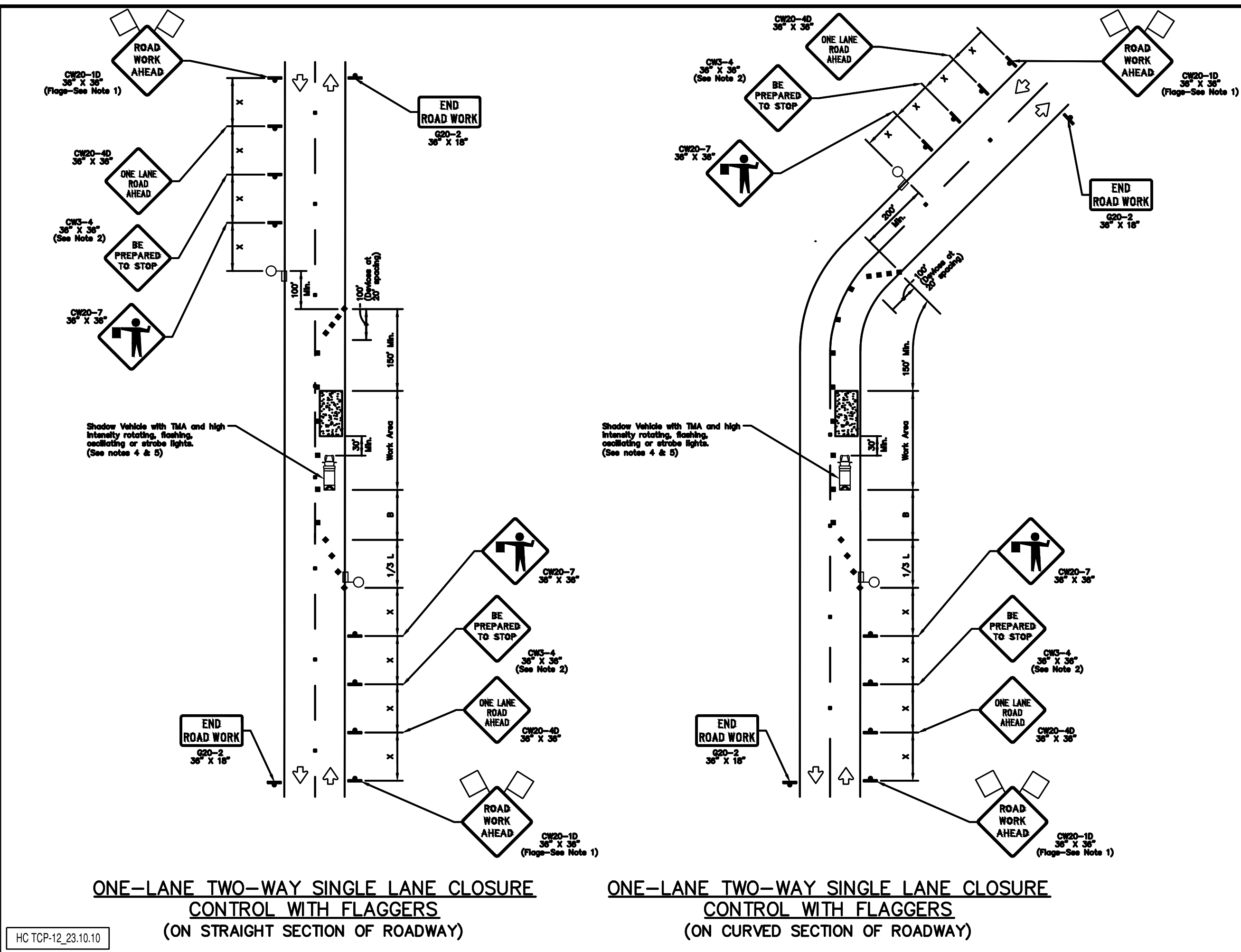
- GENERAL NOTES**
- Flags attached to signs where shown are OPTIONAL.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol are OPTIONAL.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
 - 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.
 - Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - 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).
 - Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.
 - No lanes shall be blocked from 7am to 9am and 4pm to 6:30pm Monday thru Friday.
 - Off duty uniformed law enforcement officers required to direct traffic when applicable.
 - 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.

WORK ZONE SIGNS

(A)	OBEY WARNING SIGNS STATE LAW R20-3T	(E)	ROAD WORK NEXT YY MILES →
(B)	ROAD WORK NEXT YY MILES G20-1	(F)	ROAD WORK ← NEXT YY MILES G20-1b
(C)	END ROAD WORK G20-2	(G)	ROAD WORK ← NEXT XX MILES NEXT YY MILES → G20-1a
(D)	NAME ADDRESS CITY STATE CONTRACTOR G20-6	(H)	 CW20-1D CW13-1P (SEE NOTE 2)

HC_TCP_PAS_23.10.10

NO.	DATE	REVISION	APP.
		EFF DATE: XXXX-XX-20XX DWG NO: XXXXX-XX	
		THESE DOCUMENTS ARE ISSUED FOR INTERIM REVIEW ONLY AND ARE NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. MAY 2026 GRISELDA GONZALES, P.E. TX PE NO. 115678	
SURVEYED BY: FB NO. -		CITY OF HOUSTON HOUSTON PUBLIC WORKS	
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TRAFFIC CONTROL STANDARDS SHEET 1 PROJECT APPROACH SIGNING			
WBS NUMBER R-001000-0033-3		FOR CITY OF HOUSTON USE ONLY	
DRAWING SCALE AS NOTED			
CITY OF HOUSTON PM NEIL BARNSDALE, P.E.			
SHEET NO. 92 OF 106			



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 Spacing of Taper Lengths "L"			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing Distance	Suggested Longitudinal Buffer Space "B"
	10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
35	150'	165'	180'	30'	60'	120'	90'
40	205'	225'	245'	35'	70'	160'	120'
45	265'	295'	320'	40'	80'	240'	155'
50	325'	365'	395'	45'	90'	320'	195'
55	385'	435'	470'	50'	100'	400'	240'
60	445'	505'	545'	55'	110'	500'	295'
65	505'	575'	620'	60'	120'	600'	350'
70	565'	645'	695'	65'	130'	700'	410'
75	625'	715'	770'	70'	140'	800'	475'
80	685'	785'	845'	75'	150'	900'	540'

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

- GENERAL NOTES**
- Flags attached to signs where shown are OPTIONAL.
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 - If the 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.	DATE	REVISION	APP.

EFF DATE: XXXX-XX-20XX DWG NO: XXXXX-XX

GRIS
 GEOTECHNICAL RESEARCH SOLUTIONS
 11000 WESTHELL DRIVE, SUITE 200
 HOUSTON, TEXAS 77036-1100
 P.O. BOX 1001 SUGAR LAKE TX 75088-1001 (713) 965-9993
 WWW.GRIS-INC.COM

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MAY 2026
 GRISELDA GONZALES, P.E.
 TX PE NO. 115678

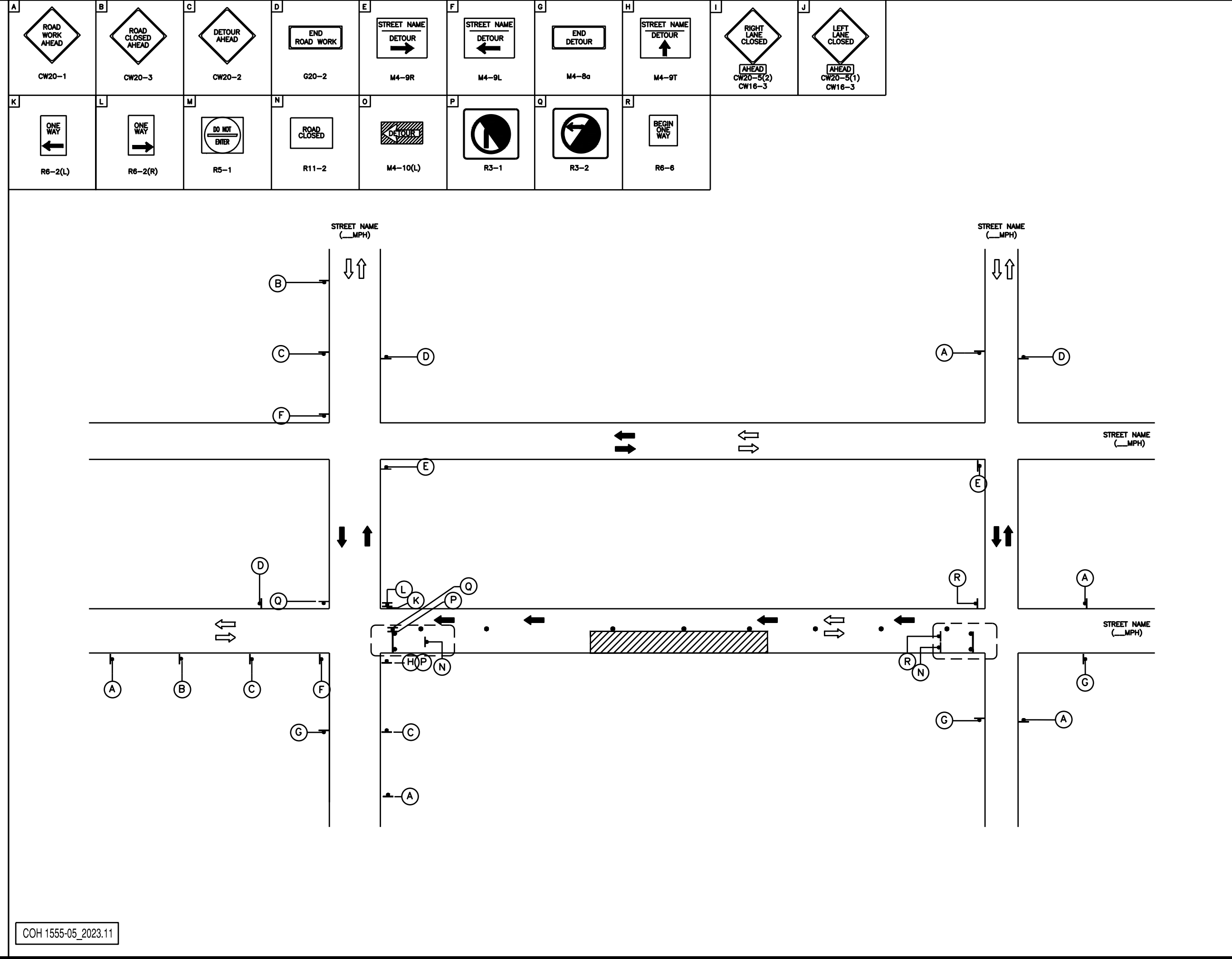
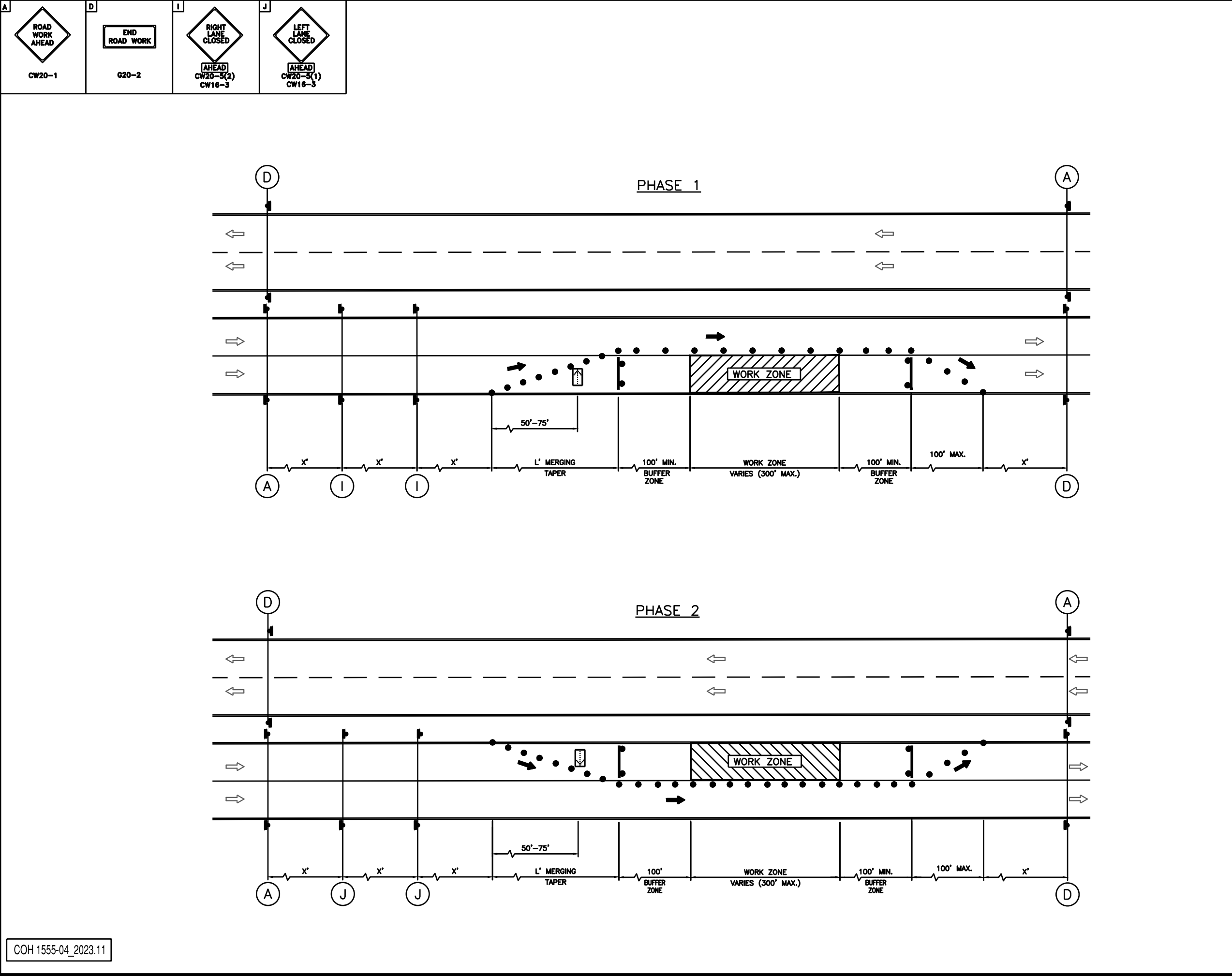
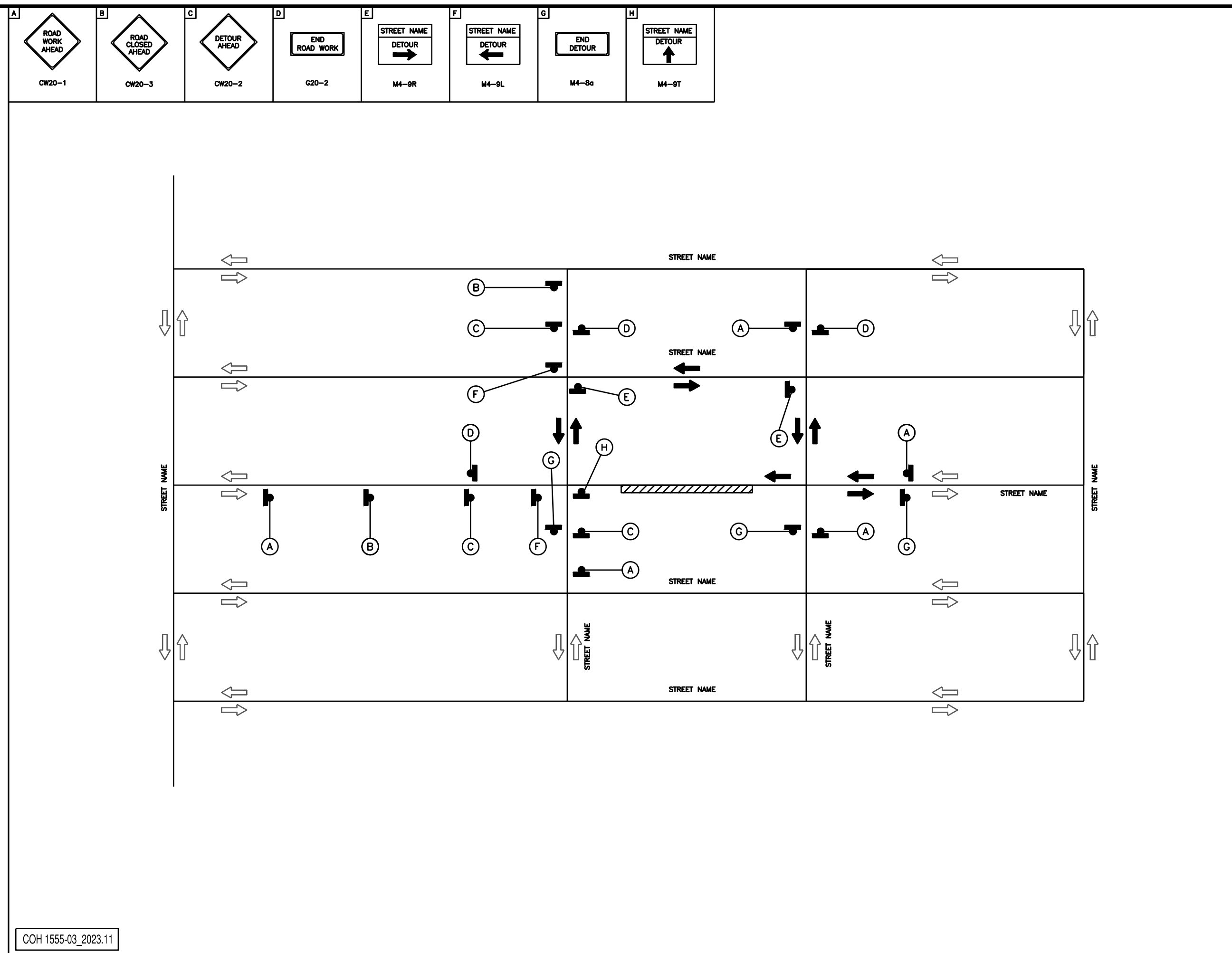
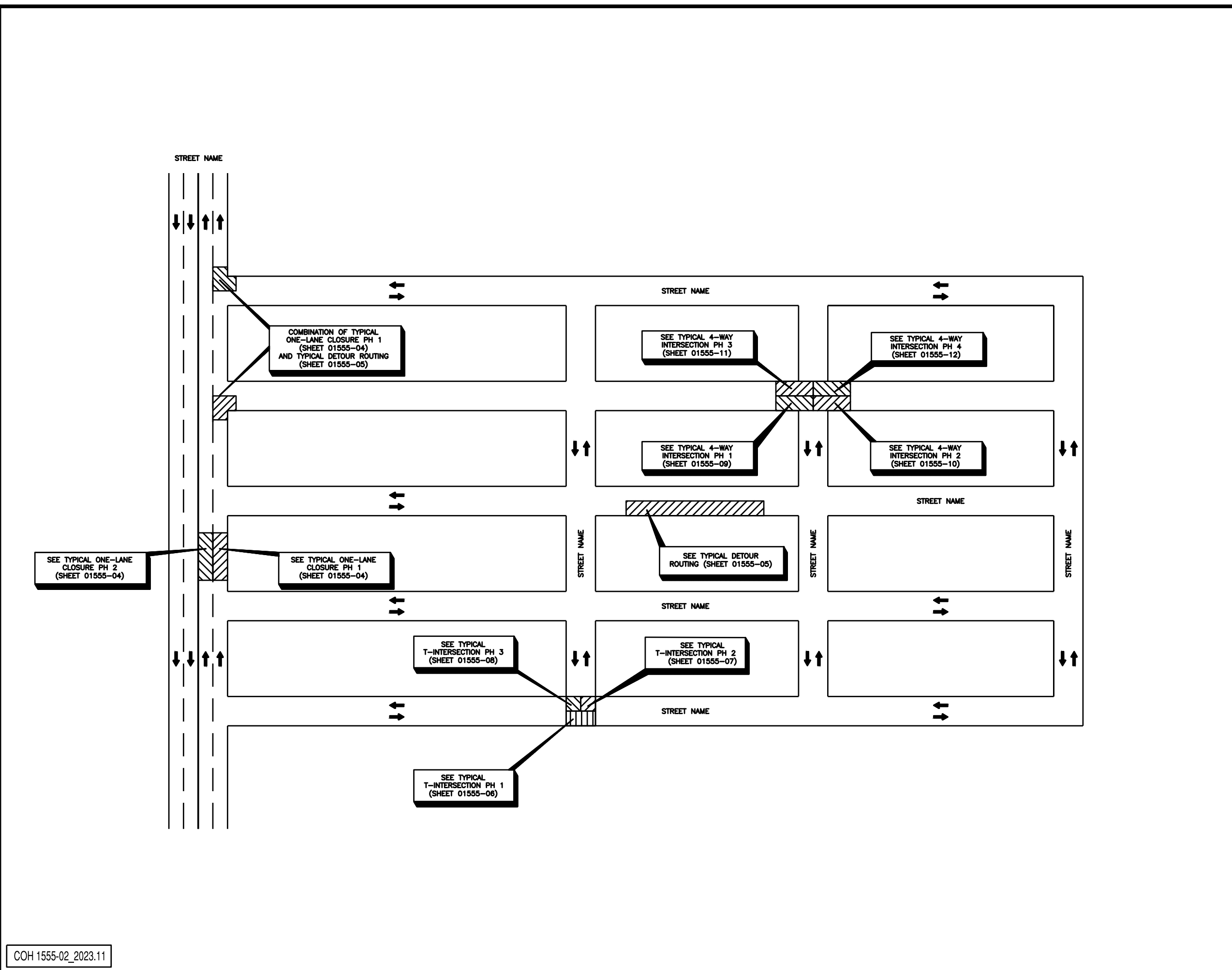
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL STANDARDS SHEET 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 93 OF 106	

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 GRIS Engineering



- LEGEND:**
- SIGN
 - FLAGGER
 - APPROVED CHANNELIZATION DEVICE
 - BARRICADE
 - FLASHING ARROW PANEL
 - AREA UNDER CONSTRUCTION
 - EXISTING TRAVEL WAY
 - TRAFFIC CONTROL PLAN DETOUR TRAVEL WAY
- NOTES:**
- A 10' MINIMUM LANE WIDTH FOR EMERGENCY SHALL BE MADE AVAILABLE AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES.
 - FOR DIMENSIONS REFER TO SHEET 01555-01.
 - INSTALL FLASHERS ON DRUMS WHERE REQUIRED AND APPROVED BY CITY TRAFFIC ENGINEER.

NO.	DATE	REVISION	APP.

EFF DATE: XXXX-XX-20XX DWG NO: XXXXX-XX

GRIS ENGINEERING, INC.
 10000 WESTHELL BLVD, SUITE 200
 HOUSTON, TEXAS 77036
 P.O. BOX 2007 SUGAR LAKE, TEXAS 77050
 TEL: 281.416.2200 FAX: 281.416.2201
 WWW.GRISENGINEERING.COM

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MAY 2026
 GRISELDA GONZALES, P.E.
 TX PE NO. 115678

SURVEYED BY: FB NO. -

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

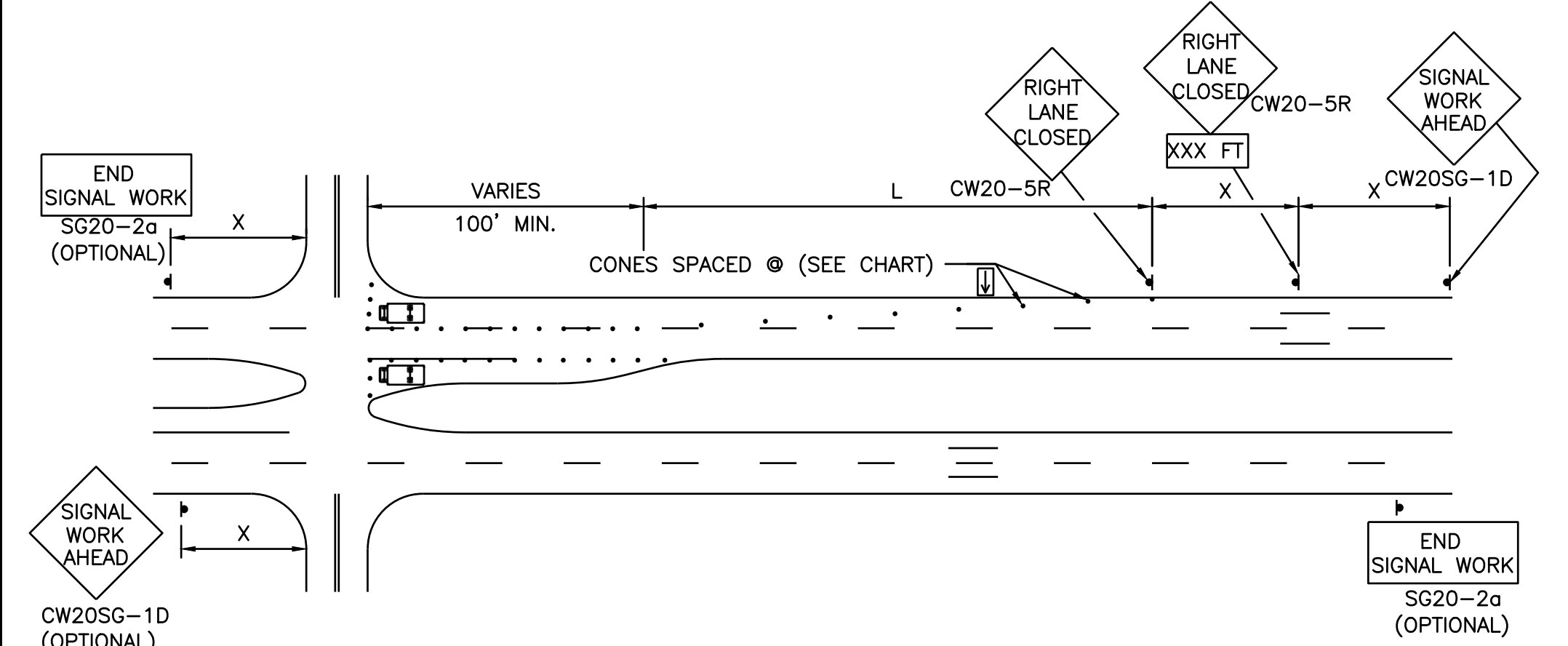
CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL STANDARDS SHEET 3

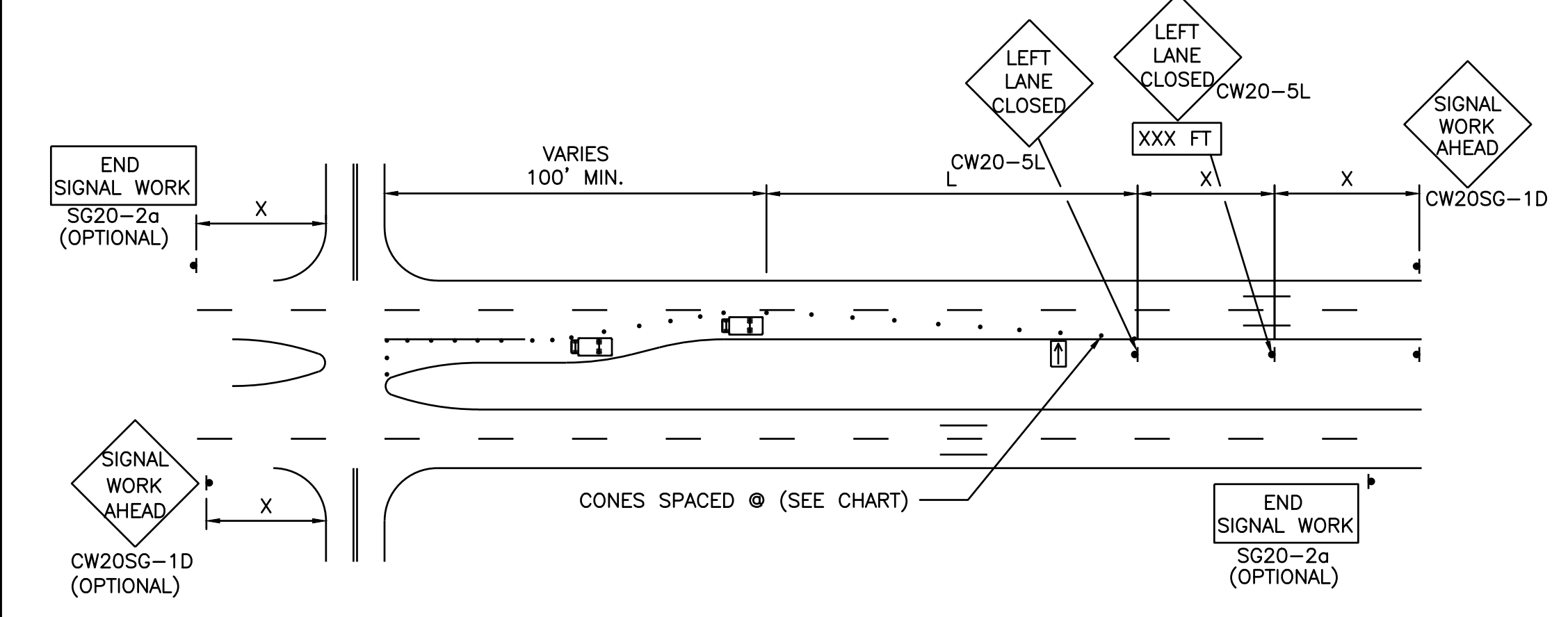
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R-001000-0033-3	
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NEIL BARNSDALE, P.E.	
SHEET NO. 94 OF 106	

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 GRIS Engineering

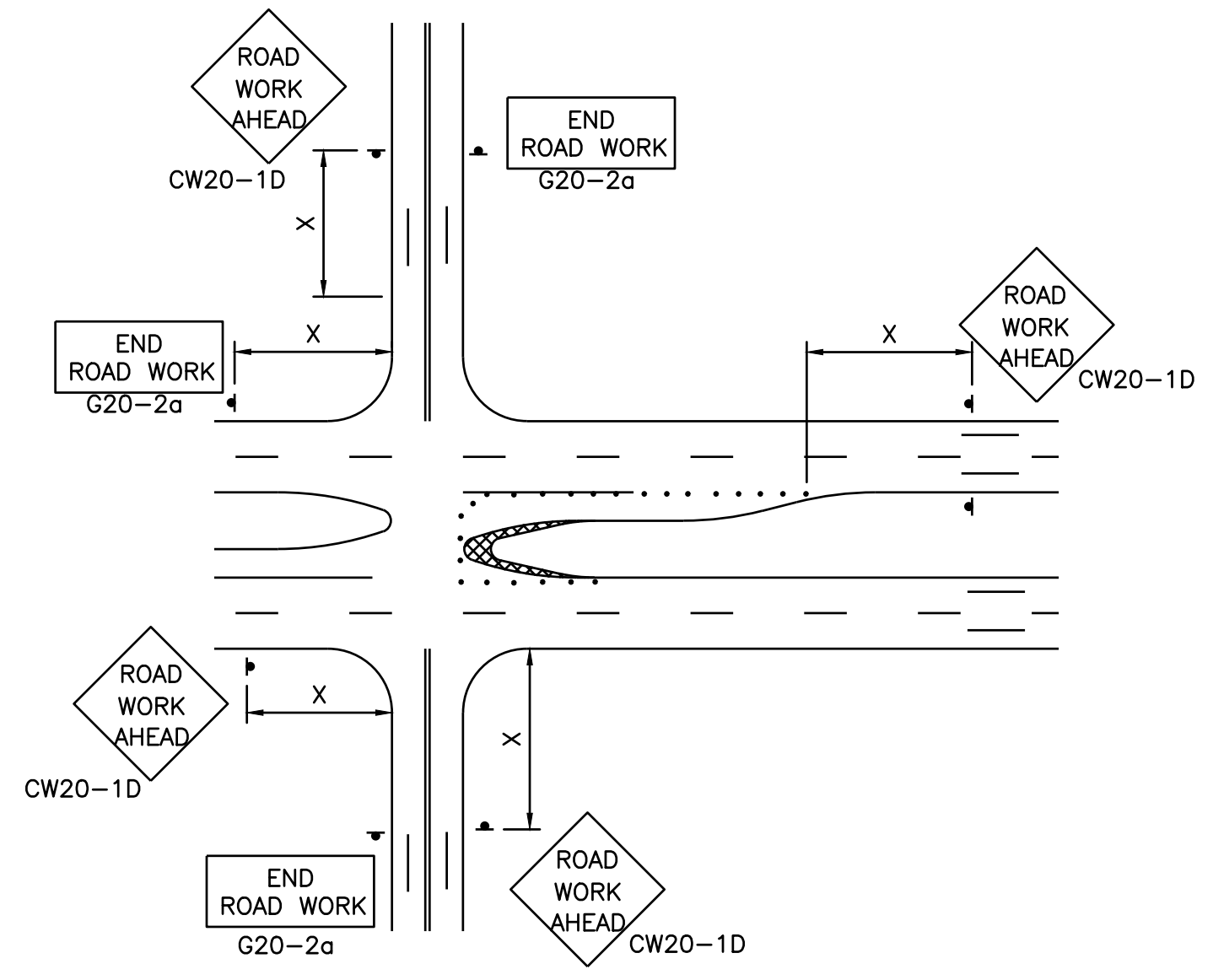
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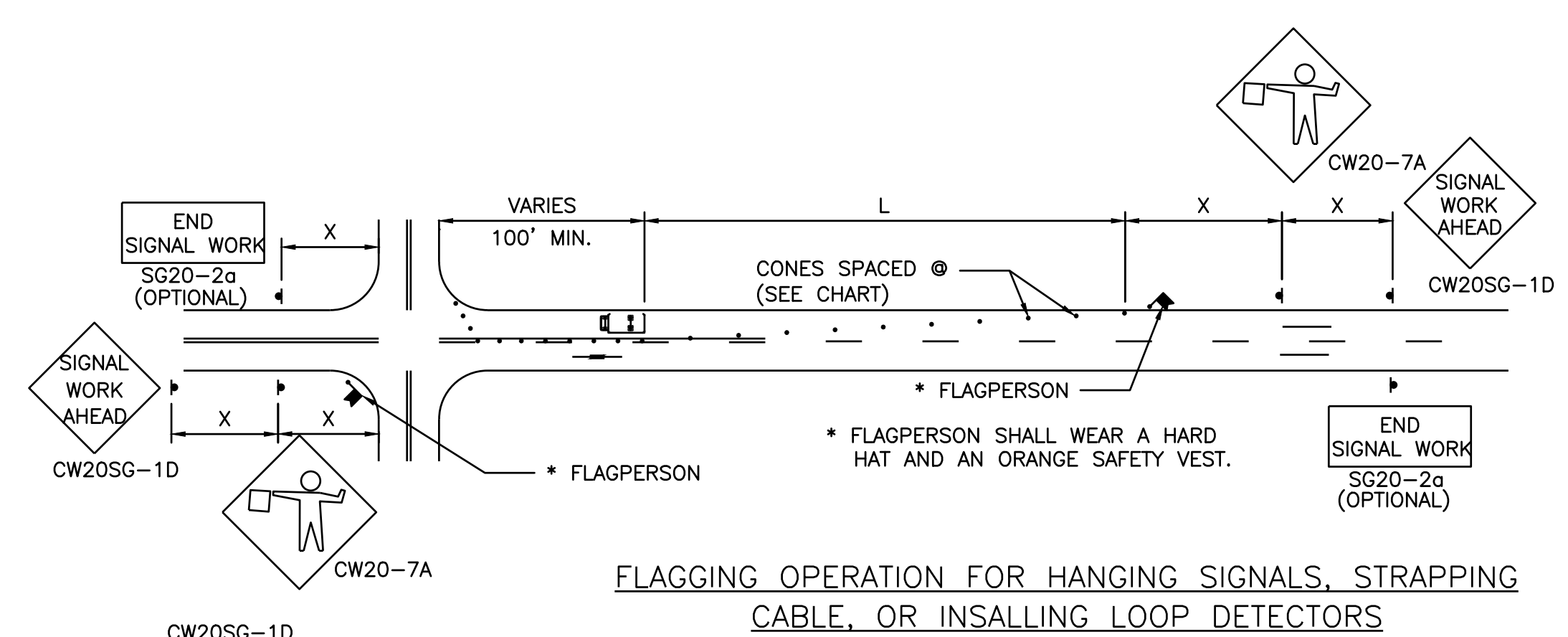
ONE LANE CLOSURE W/ RIGHT LANE AND/OR LEFT TURN LANE CLOSED



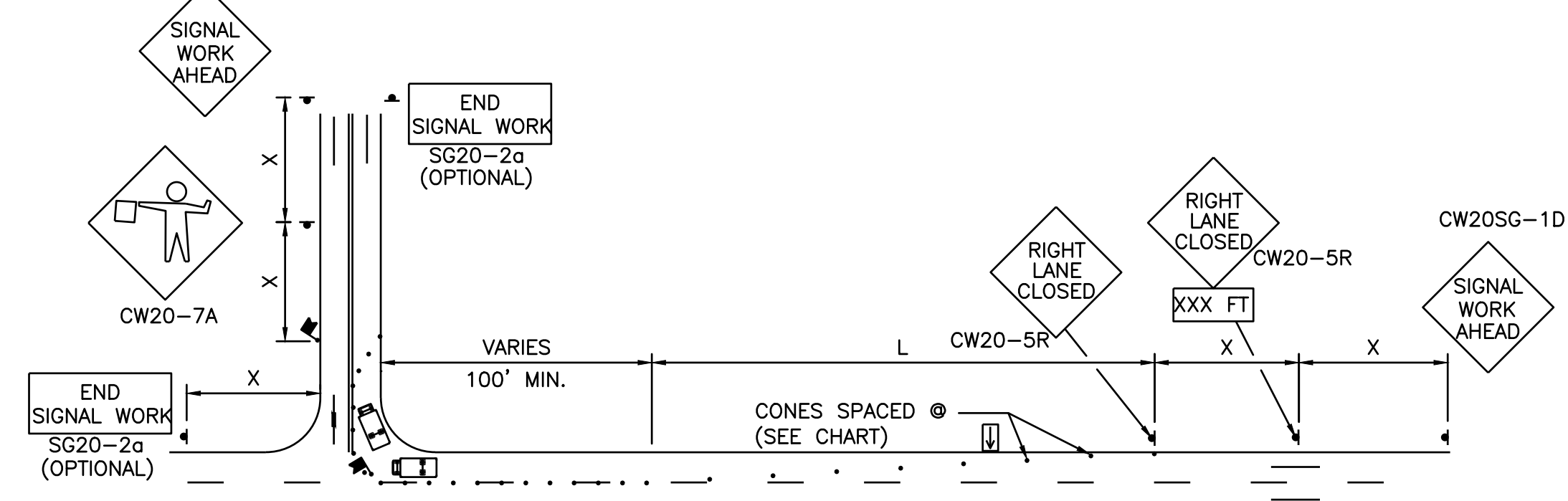
ONE LANE CLOSURE W/ LEFT LANE AND/OR LEFT TURN LANE CLOSED



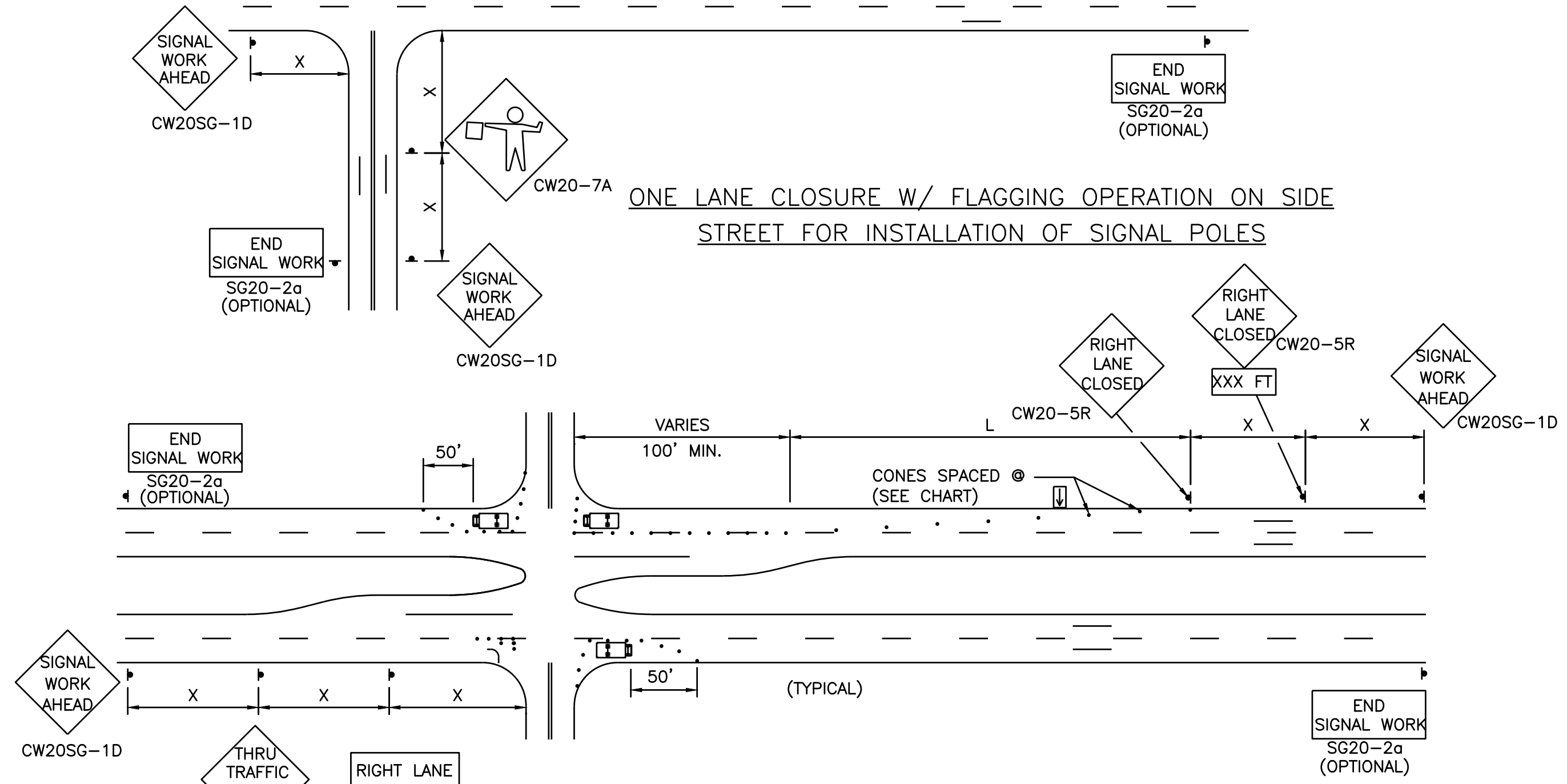
MEDIAN NOSE MODIFICATION



FLAGGING OPERATION FOR HANGING SIGNALS, STRAPPING CABLE, OR INSTALLING LOOP DETECTORS



ONE LANE CLOSURE W/ FLAGGING OPERATION ON SIDE STREET FOR INSTALLATION OF SIGNAL POLES



ONE LANE CLOSURE IN EACH DIRECTION FOR HANGING SPAN WIRE AND TEMPORARY CABLE

TYPICAL TRANSITION LENGTHS

SUGGESTED MAXIMUM SPACING OF DEVICES

POSTED SPEED	FORMULA	MINIMUM DESIRABLE TAPER LENGTHS **			SUGGESTED MAXIMUM SPACING OF DEVICE		MINIMUM SIGN SPACING X DISTANCE
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER	ON A TANGENT	
30	L=WS ² /60	150'	165'	180'	30'	60'-75'	120'
35		205'	225'	245'	35'	70'-90'	160'
40		265'	295'	320'	40'	80'-100'	240'
45	L=WS	450'	495'	540'	45'	90'-110'	320'
50		500'	550'	600'	50'	100'-125'	400'
55		550'	605'	660'	55'	100'-140'	500'
60		600'	660'	720'	60'	120'-150'	600'

** TAPER LENGTHS HAVE BEEN ROUNDED OFF
 L=LENGTH OF TAPER (FT.)
 W=WIDTH OF OFFSET (FT.)
 S=POSTED SPEED(MPH)

- NOTES:**
- ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.
 - THE MINIMUM LANE WIDTH ALLOWED IS 10 FEET. THE MINIMUM BUFFER ZONE BETWEEN THE WORK ZONE AND ADJACENT TRAFFIC IS 2 FEET.
 - FLORESCENT ORANGE SHALL BE THE BACKGROUND COLOR ON ALL WORK ZONE SIGNS.
 - THE CONTRACTOR SHALL REMOVE ADVANCE SIGNS WHEN NO CONSTRUCTION OPERATIONS ARE UNDERWAY.
 - OBSTRUCTIONS OR HAZARDS AT THE WORK AREA SHALL BE CLEARLY MARKED AND DELINEATED AT ALL TIMES.
 - ALL HOLES, TRENCHES OR OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY LIGHTS OR OTHER PROTECTIVE DEVICES.
 - TRENCHES SHALL BE COVERED OR SURROUNDED WITH ORANGE PLASTIC CONSTRUCTION FENCE AS DIRECTED BY THE ENGINEER.
 - FLAGGER AND CW20-7a SIGN MAY BE REQUIRED ACCORDING TO FIELD CONDITIONS.
 - VEHICLES PARKED IN ROADWAY SHALL BE EQUIPPED WITH TWO STROBES.

- LEGEND:**
- HEAVY WORK VEHICLE
 - FLASHING ARROW PANEL

MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX

NO.	DATE	REVISION	APP.



EFF DATE: NOV-27-2023 DWG NO: 01555-13

GRIS
 CONSTRUCTION SOFTWARE SOLUTIONS
 17000 W. 10th Street, Suite 1000, Houston, TX 77058
 (713) 865-1100
 www.gris.com

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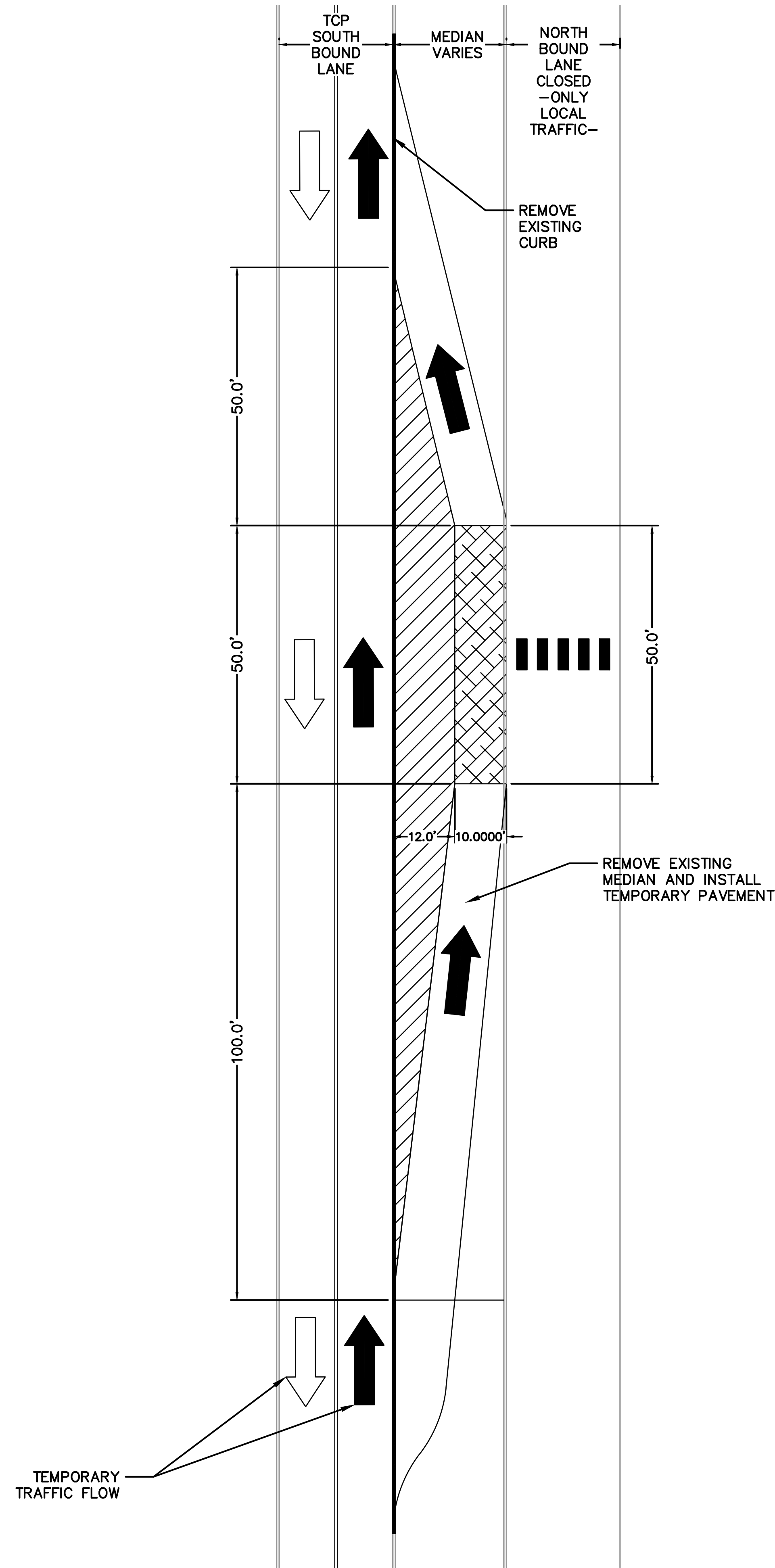
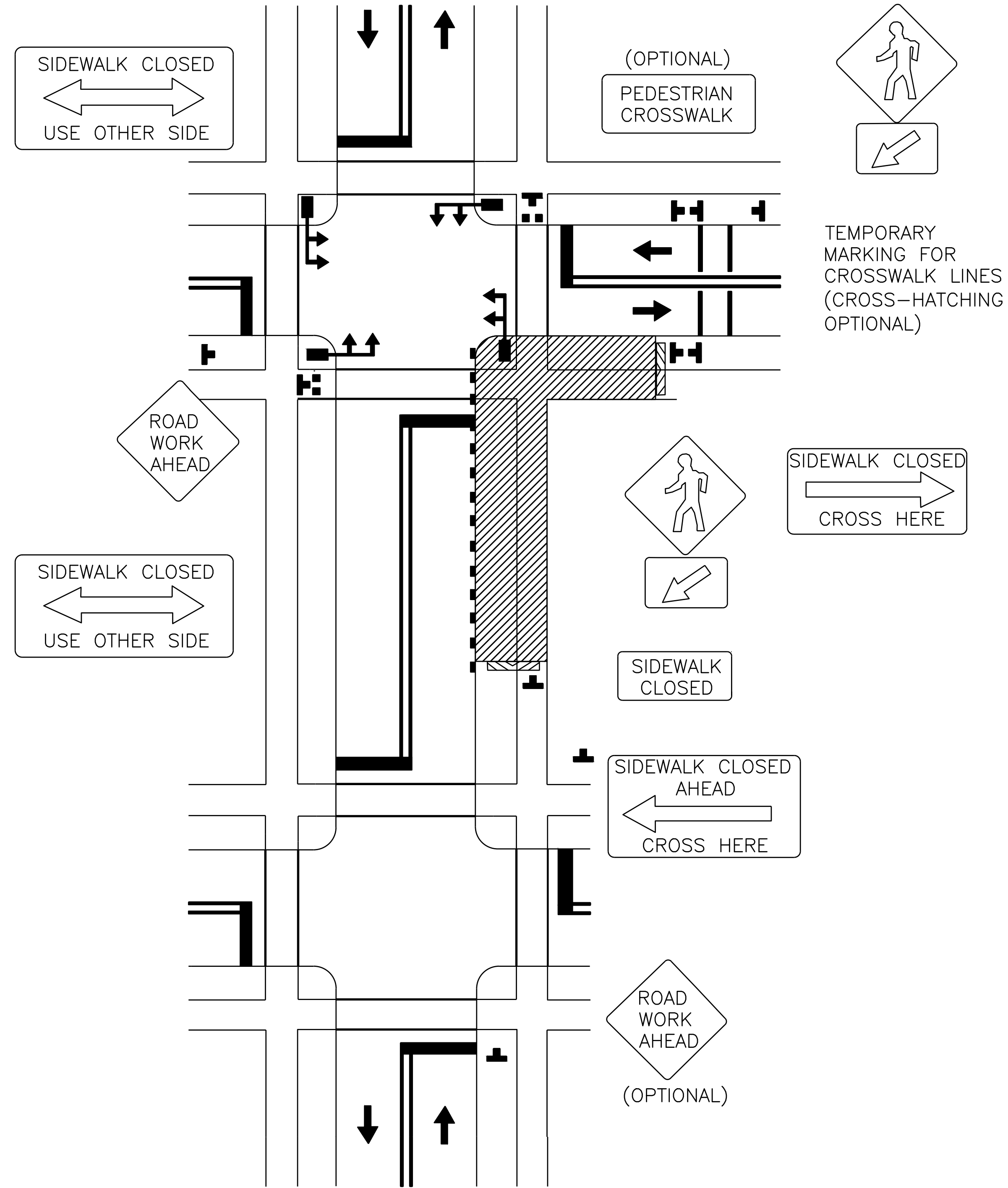
SURVEYED BY: FB NO. -
 MAY 2026
 GRISELDA GONZALES, P.E.
 TX PE NO. 115678

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

TRAFFIC CONTROL STANDARDS SHEET 4
 SIGNAL MODIFICATIONS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
NOT TO SCALE	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 95 OF 106	



LEGEND:

- SIGN
- FLAGGER
- APPROVED CHANNELIZATION DEVICE
- BARRICADE
- FLASHING ARROW PANEL
- AREA UNDER CONSTRUCTION
- EXISTING TRAVEL WAY
- TRAFFIC CONTROL PLAN DETOUR TRAVEL WAY

NOTES:

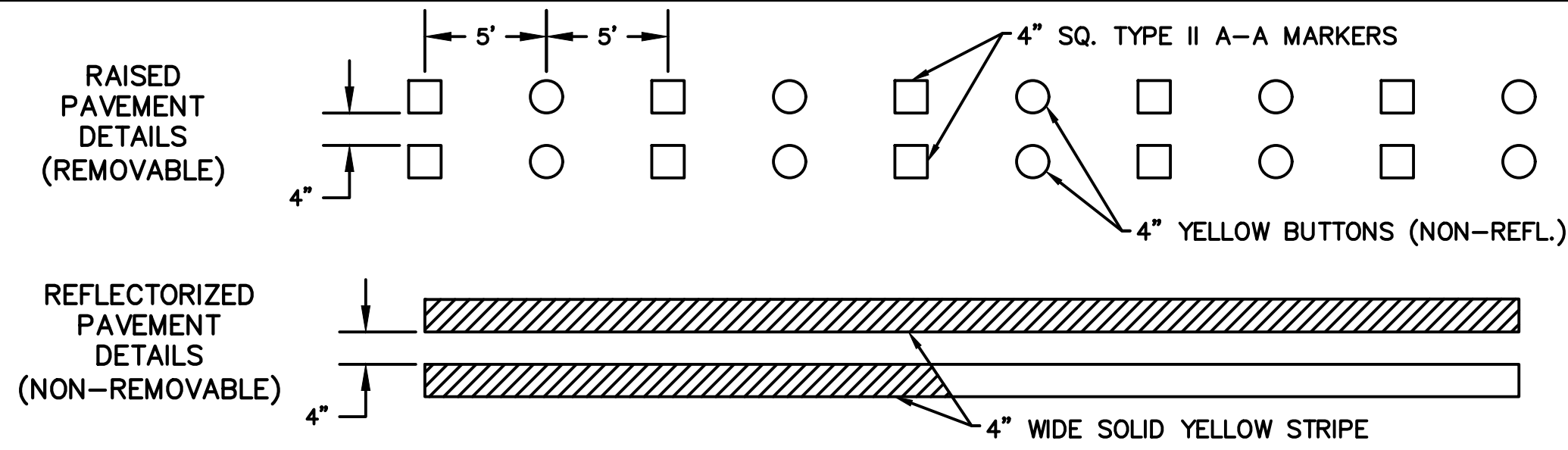
1. A 10' MINIMUM LANE WIDTH FOR EMERGENCY SHALL BE MADE AVAILABLE AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES.
2. FOR DIMENSIONS REFER TO SHEET 01555-01.
3. INSTALL FLASHERS ON DRUMS WHERE REQUIRED AND APPROVED BY CITY TRAFFIC ENGINEER.

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SURVEYED BY: FB NO. -		MAY 2026 GRISelda GONZALES, P.E. TX PE NO. 115678	
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
CROSSWALK CLOSURES & PEDESTRIAN DETOURS			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3			
DRAWING SCALE			
AS NOTED			
CITY OF HOUSTON PM			
NEIL BARNSDALE, P.E.			
SHEET NO. 96 OF 106			

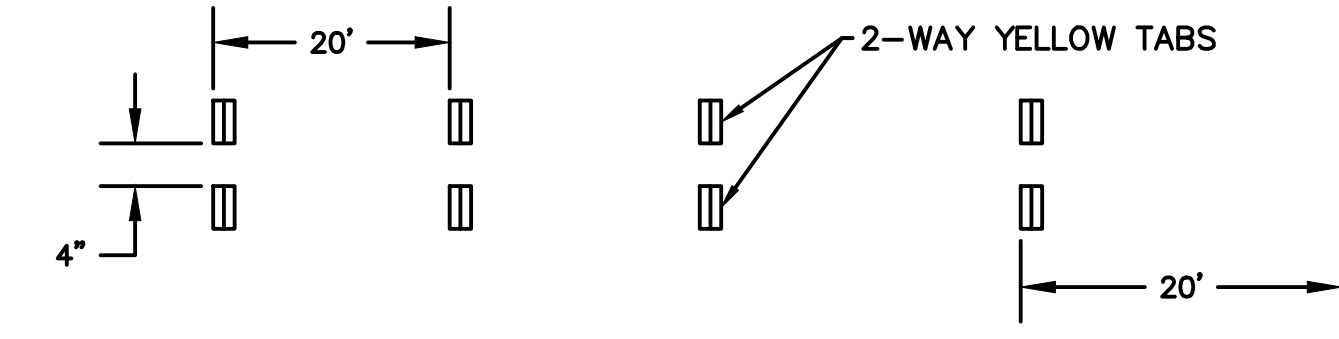
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SHORT TERM WORK ZONE PAVEMENT MARKINGS DETAILS ASPHALT SURFACE TREATMENTS (ONLY)

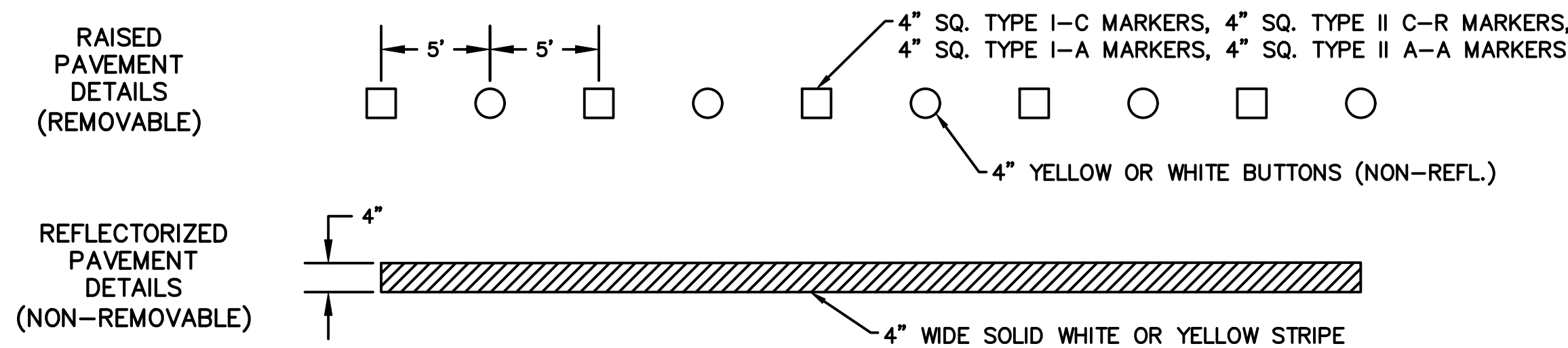
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NO-PASSING
LINE



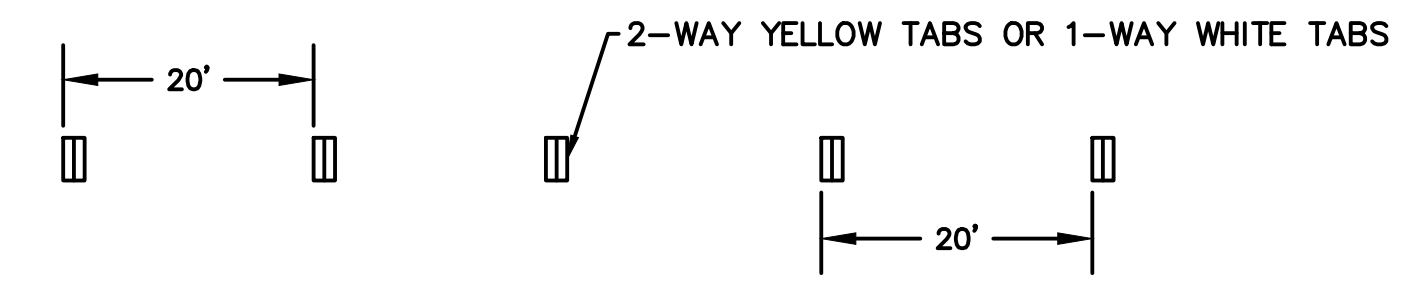
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LINE



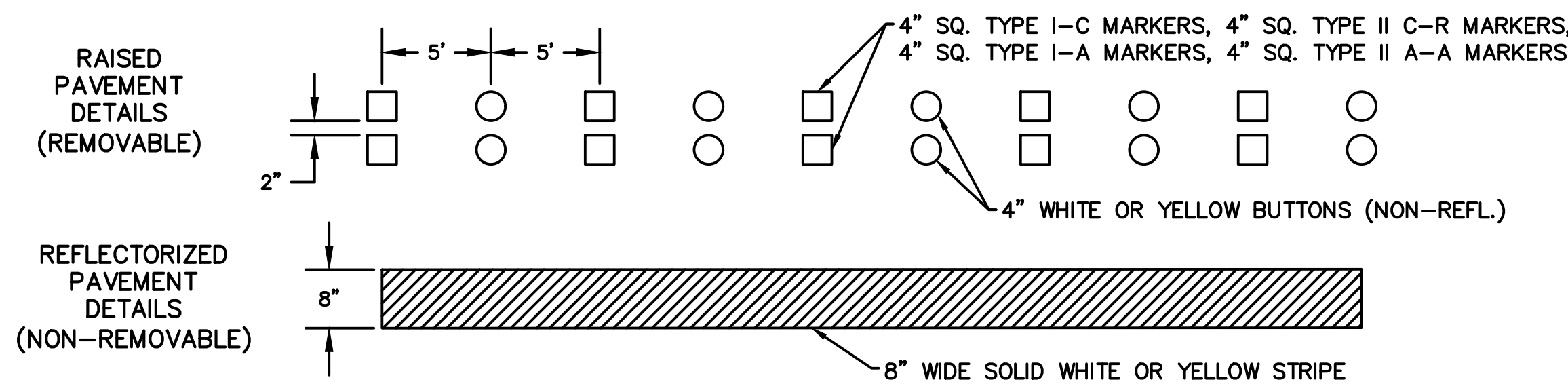
EDGE LINE
OR SINGLE
NO-PASSING LINE



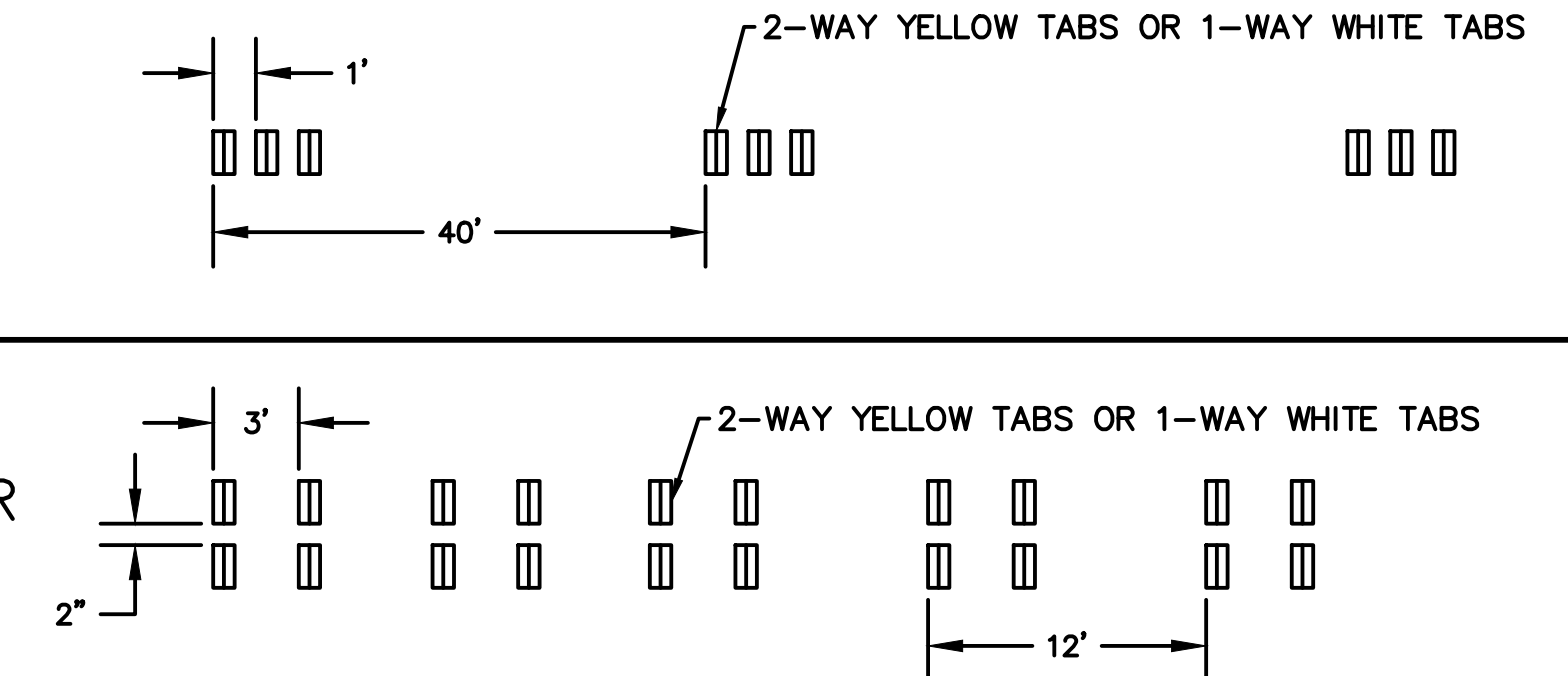
EDGE LINE
OR SINGLE
NO-PASSING LINE



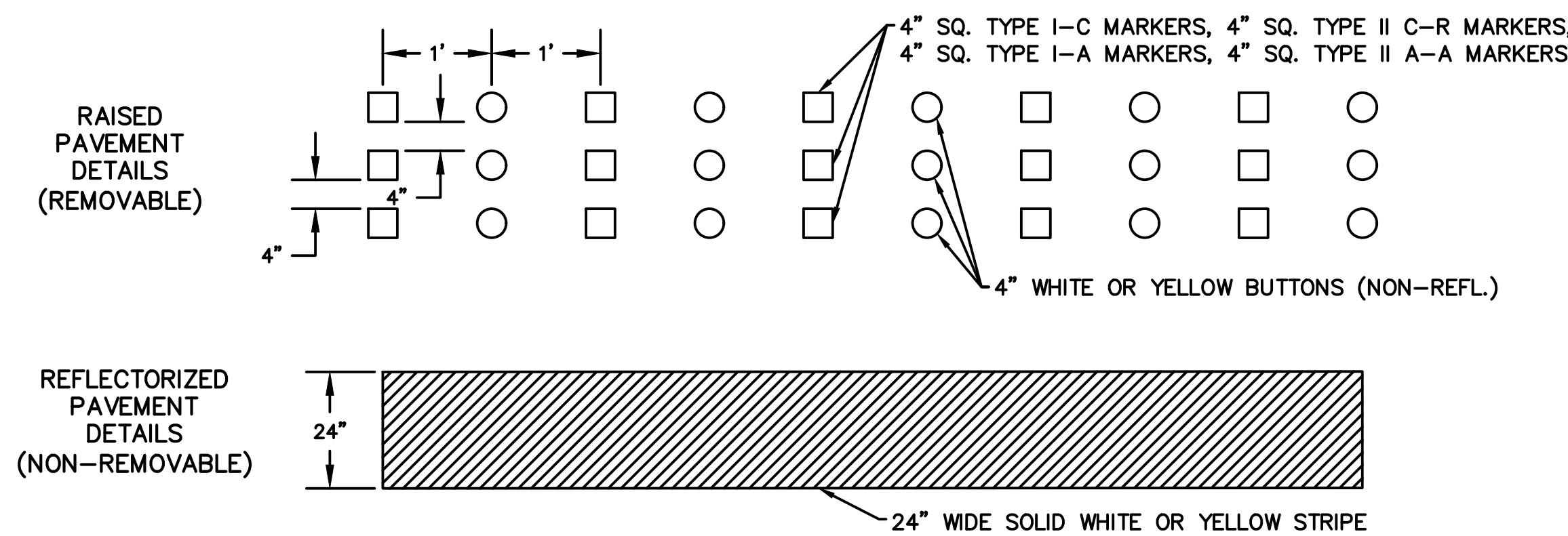
WIDE LINE
(LEFT TURN LANE
CHANNELIZING)



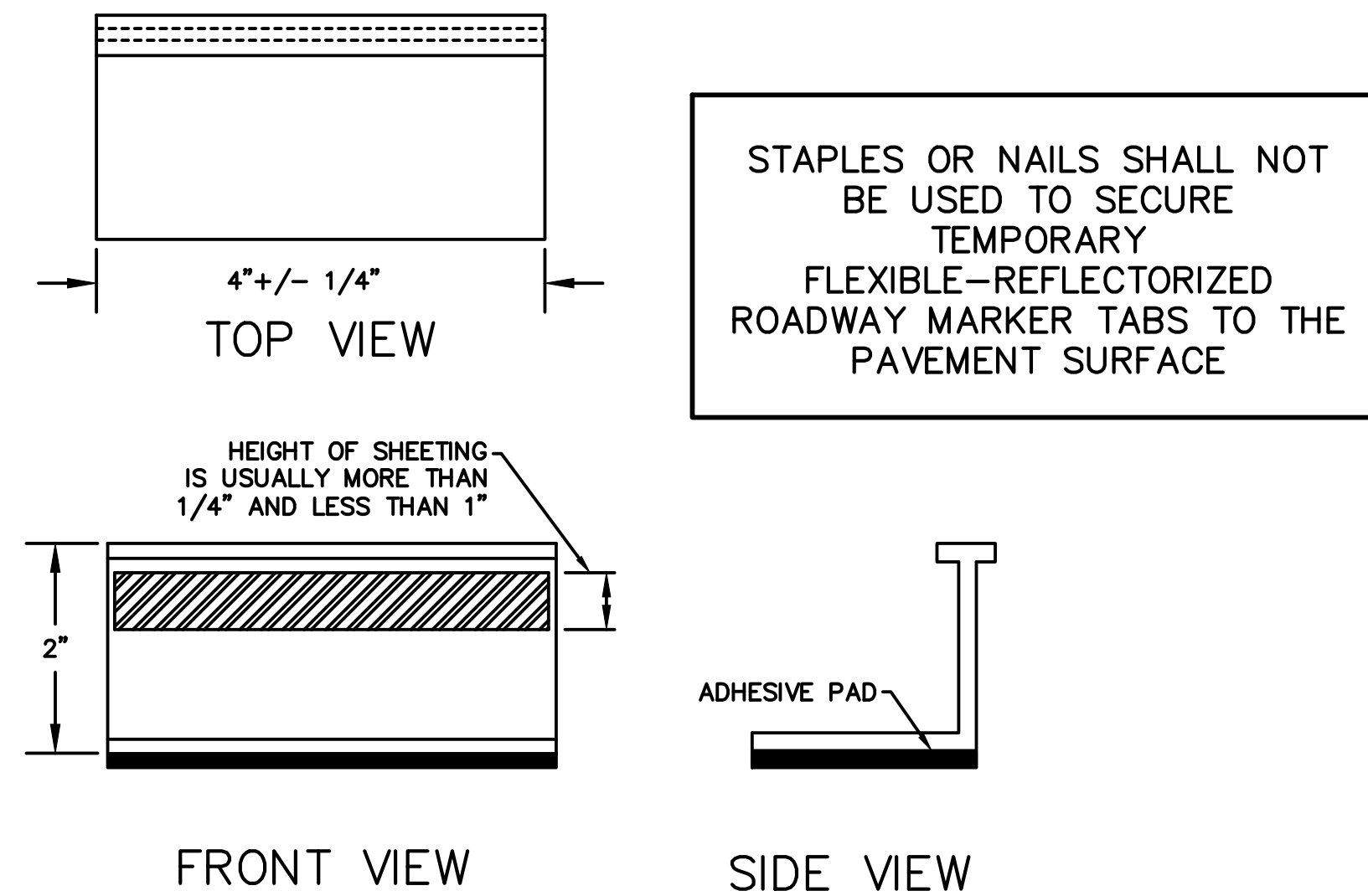
WIDE LINE
(WIDTH 8" OR
GREATER)



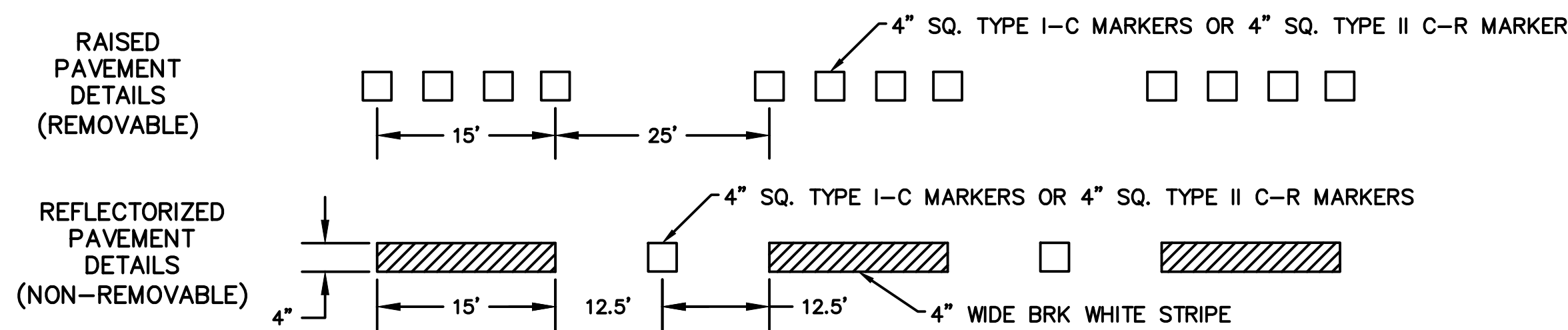
WIDE LINE
(CROSS HATCHING)


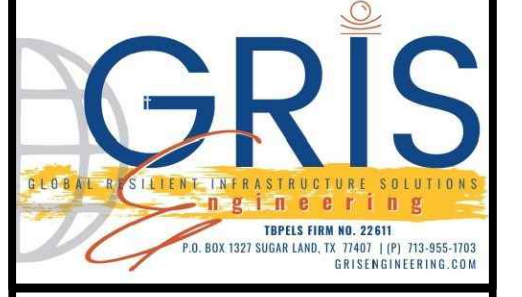


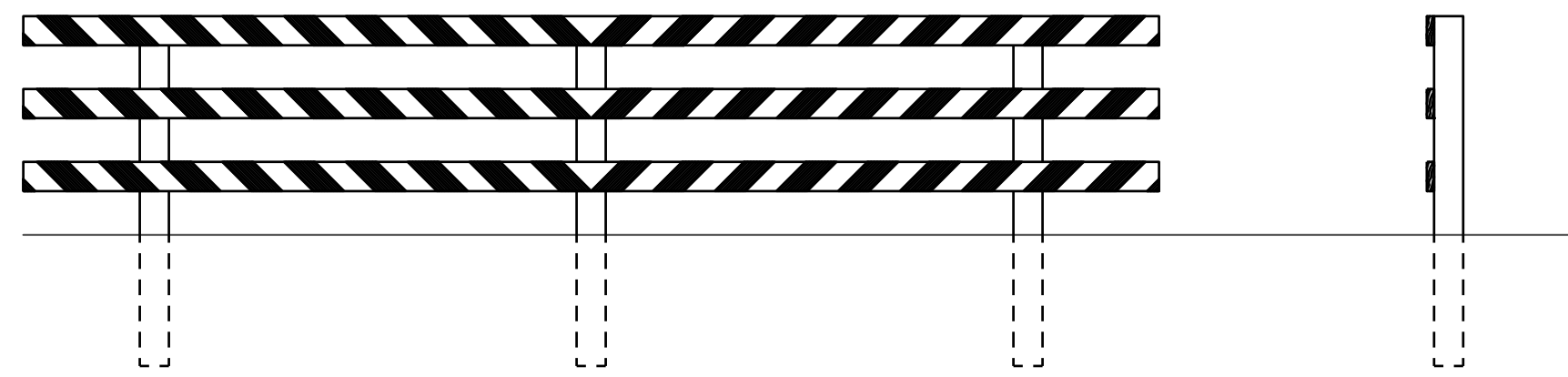
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



BROKEN
LINES



NO.	DATE	REVISION	APP.
			
EFF DATE: XXXX-XX-20XX		DWG NO: XXXXX-XX	
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SURVEYED BY: FB NO. -			
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8			
TEMPORARY PAVEMENT MARKING DETAILS			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3			
DRAWING SCALE			
AS NOTED			
CITY OF HOUSTON PM			
NEIL BARNSDALE, P.E.			
SHEET NO. 97 OF 106			

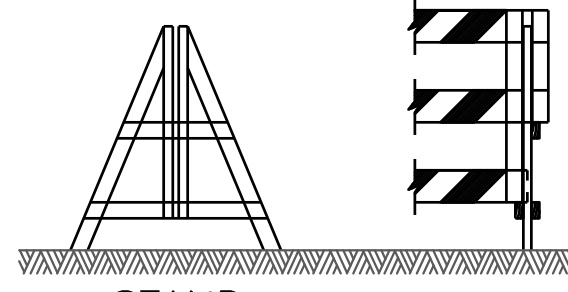


TYPE III BARRICADE FOR END OF ROAD

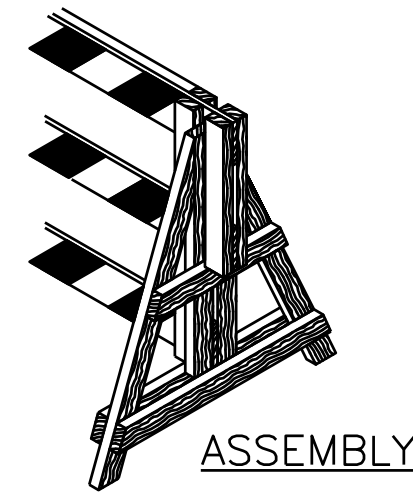
FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND REFLECTIVE WHITE STRIPES ON SIDE FACING TRAFFIC

SECTION

PANEL

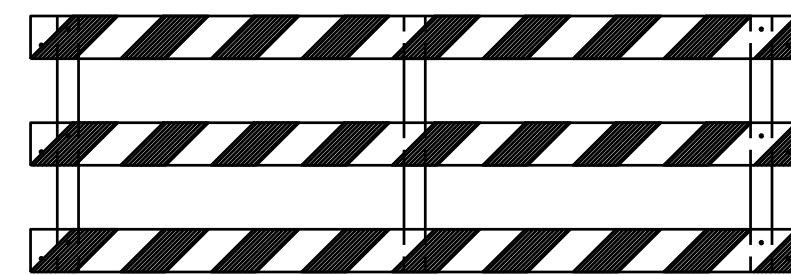


STAND



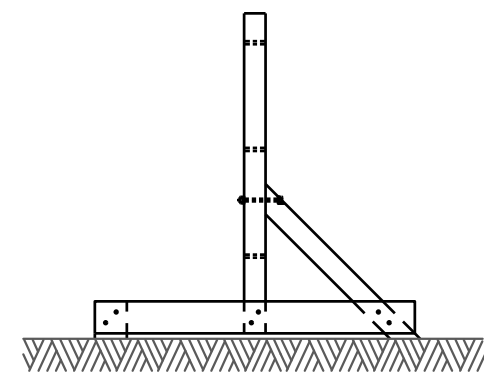
ASSEMBLY

DEMOUNTABLE TYPE III BARRICADE

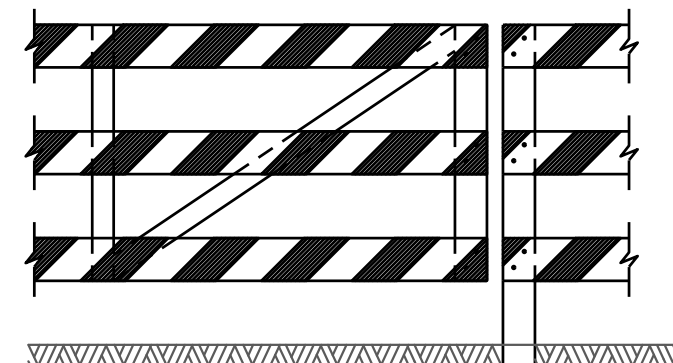


USE 1/2" X 3/8" MACHINE BOLTS, WITH TWO WASHERS EACH

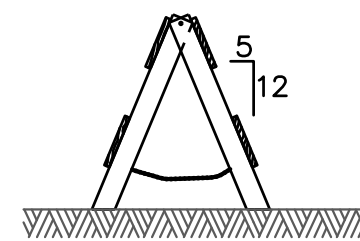
PANEL FOR TYPE III BARRICADE



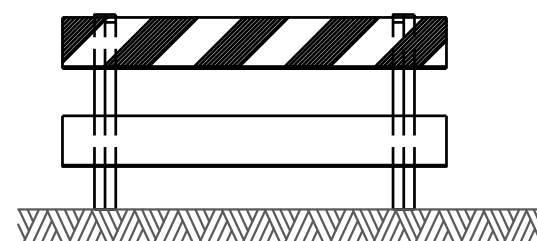
STAND FOR TYPE III BARRICADE



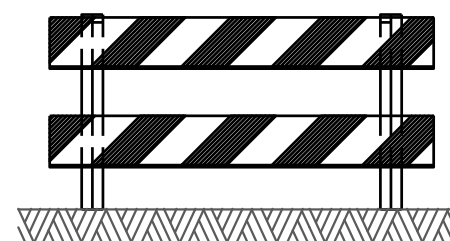
GATE FOR TYPE III BARRICADE



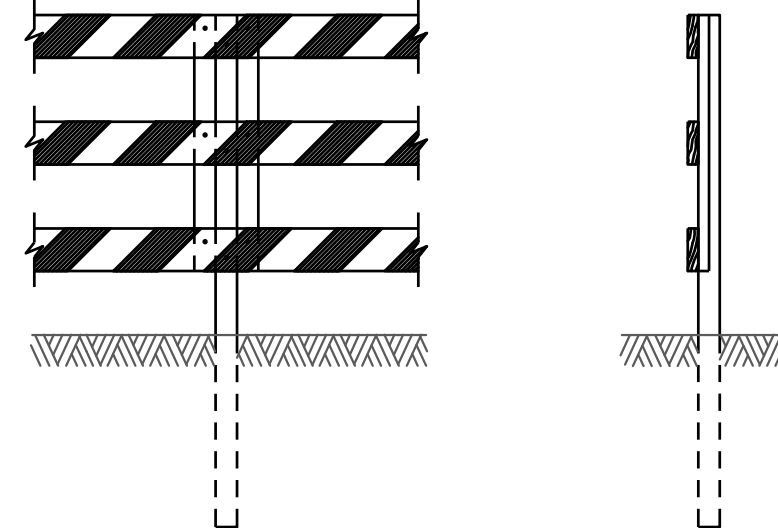
"A" FRAME



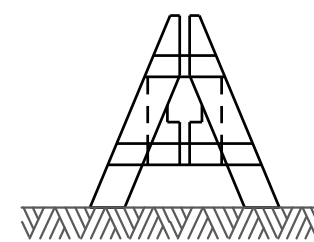
TYPE I



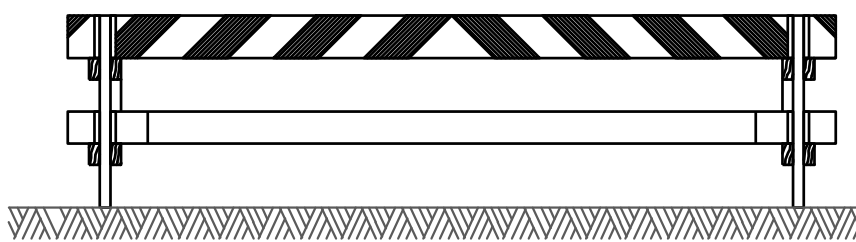
TYPE II



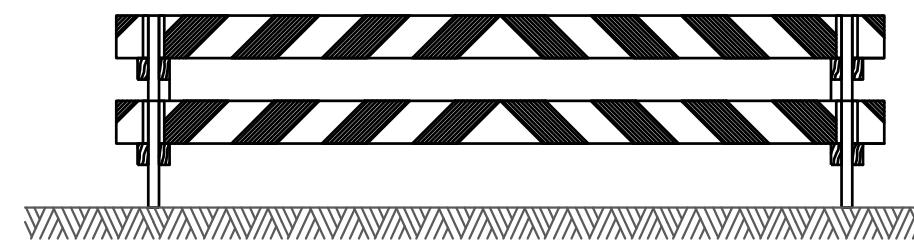
POST FOR TYPE III BARRICADE



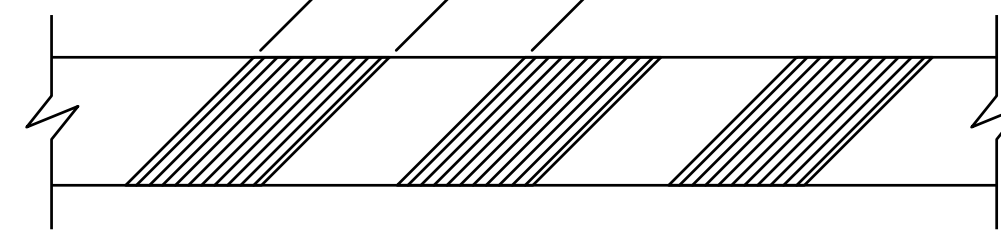
DEMOUNTABLE



TYPE I



TYPE II

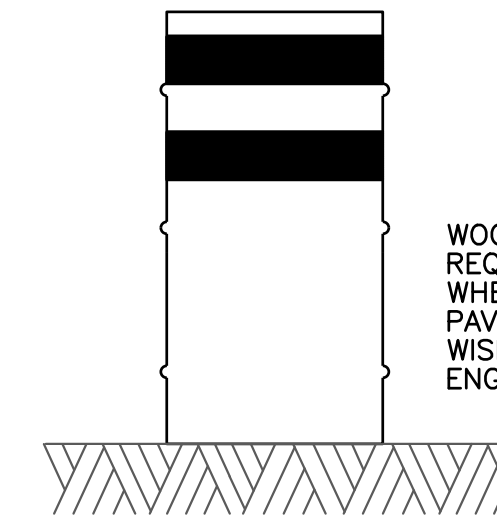


STRIPING FOR BARRICADE

BARRICADE NOTES:

- THE MOST RECENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND ITS REVISIONS, SHALL GOVERN THE CONSTRUCTION AND USE OF ALL ITEMS HEREIN DESCRIBED.
- CHANNELIZATION DEVICES OTHER THAN BARRICADES SHOULD NORMALLY BE USED FOR CHANNELIZATION PURPOSES.
- 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.
- BARRICADES MAY BE DESIGNED AND CONSTRUCTED FROM WOOD OR ANY OTHER SUITABLE MATERIAL APPROVED BY THE TMTCD. 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.
- 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.
- THE REFLECTORIZED WHITE AND REFLECTORIZED ORANGE (REFLECTORIZED RED) STRIPES FOR BARRICADES, DRUMS AND VERTICAL PANELS SHALL BE CONSTRUCTED OF HIGH INTENSITY SHEETING AND SHALL BE MAINTAINED TO MEET THE APPEARANCE, COLOR AND REFLECTIVITY REQUIREMENTS SET BY DOT.
- THE CONTRACTOR SHALL MAINTAIN EACH BARRICADE IN A CLEAN AND GOOD CONDITION.
- BARRICADES SHALL BE REMOVED UPON COMPLETION OF THE WORK AND/OR THE ELIMINATION OF THE HAZARD ON ANY SECTION.

- FOR ALL TYPES OF BARRICADES WITH RAILS LESS THAN 3'-0" LONG, STRIPES 4" WIDE SHALL BE USED. IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON BACK SIDE OF BARRICADE RAILS.
- STRIPING SHOULD COVER THE FULL WIDTH OF THE RAIL. STRIPING OF RAILS, PANELS, ETC, SHOULD SLOPE DOWNWARD AT AN ANGLE OF 45° DEGREES IN DIRECTIONS TRAFFIC IS TO PASS.
- WHERE A BARRICADE EXTENDS ENTIRELY ACROSS A ROADWAY, IT IS DESIRABLE THAT THE STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING. WHEN BOTH RIGHT AND LEFT TURNS ARE PROVIDED FOR, THE CHEVRON STRIPING MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE.



DRUMS

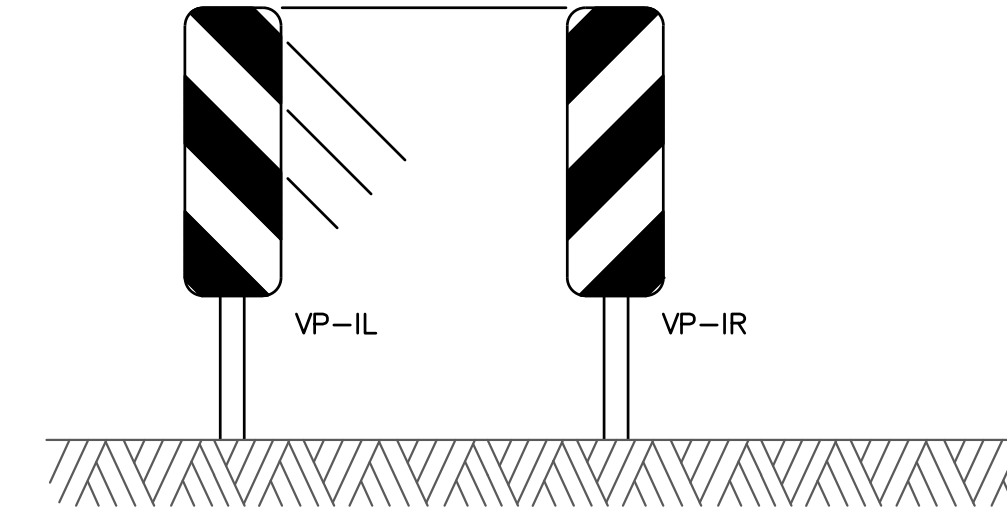
WOOD OR METAL PANEL REQUIRED UNDER DRUM WHEN SET ON ASPHALT PAVEMENT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

- 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, APPROPRIATE 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.
- CW-8 CHEVRON SIGNS, CW-6A ARROW SIGNS OR VP-1 VERTICAL PANELS MOUNTED ABOVE DRUMS MAY BE USED AS SUPPLEMENTS TO DRUM DELINEATION.



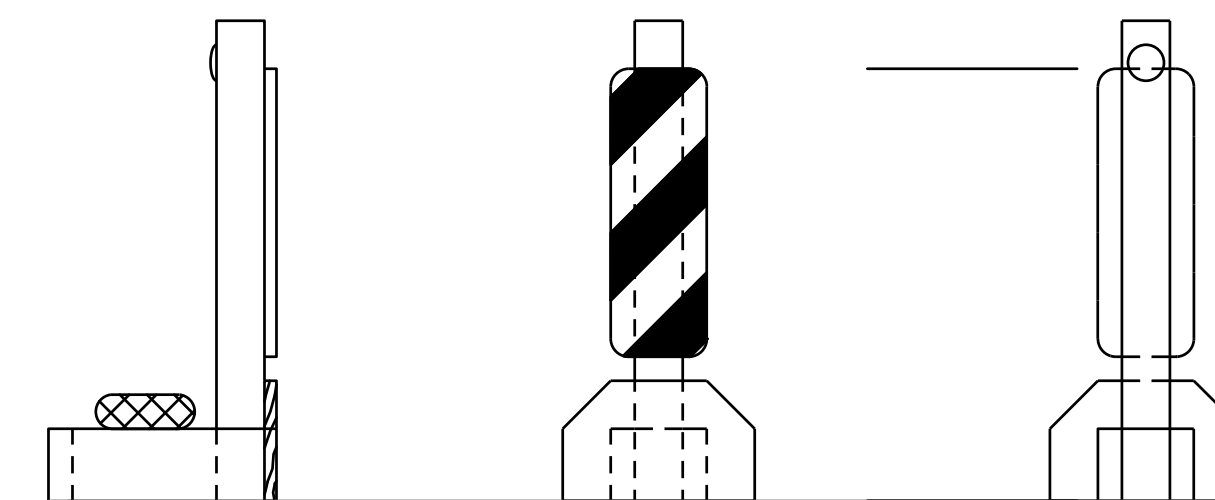
CONES

- 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.
- 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.
- 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 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.



PLYWOOD FACE TO BE PAINTED CONSTRUCTION ORANGE UPRIGHT TO BE PAINTED WHITE

TYPICAL PORTABLE VERTICAL PANEL OR DELINEATOR

OTHER SIMILAR SUPPORTS MAY BE USED WHEN APPROVED BY TMTCD AND DIRECTED BY THE CITY OF HOUSTON.

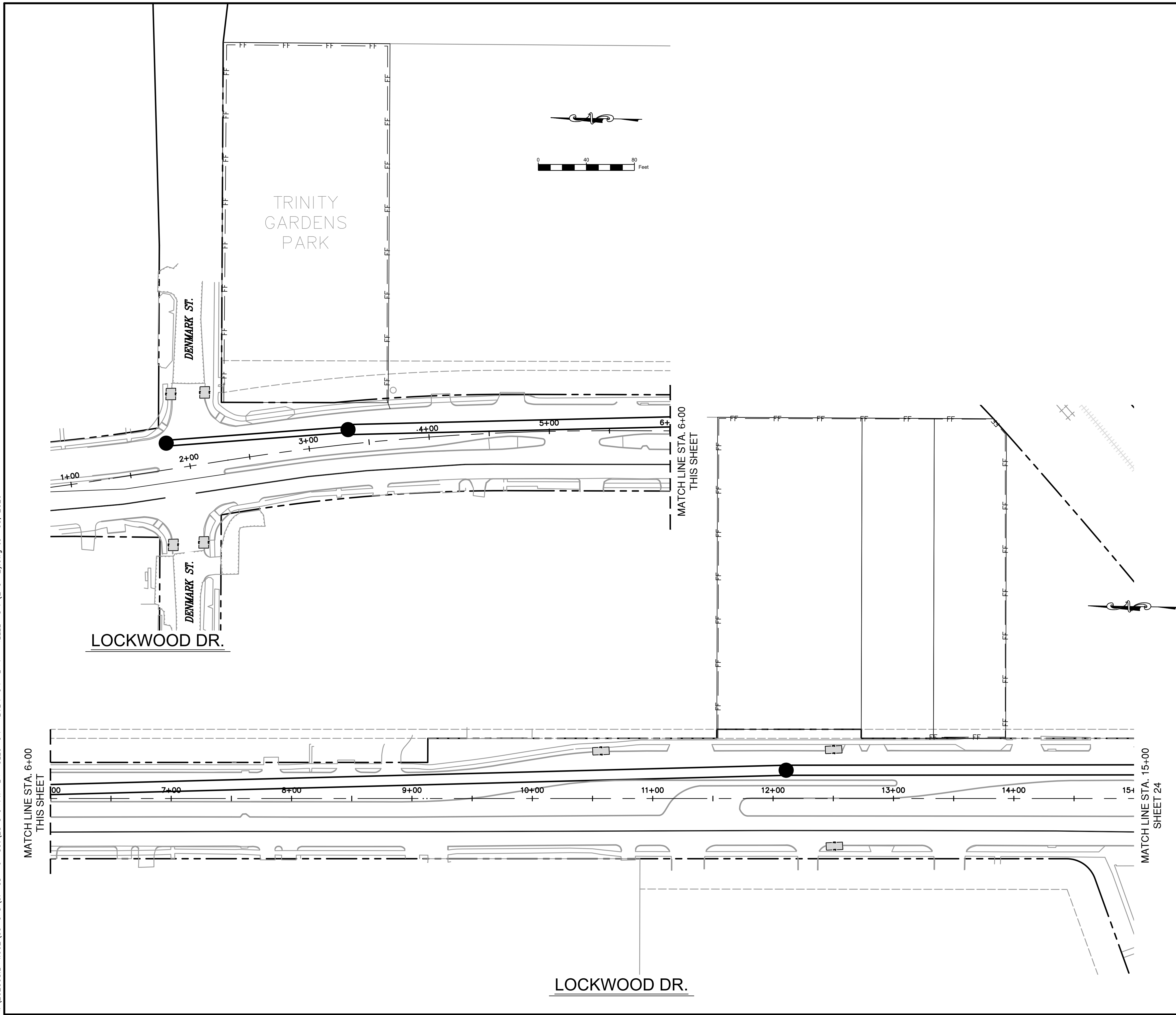
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SURVEYED BY: FB NO. -			

CITY OF HOUSTON HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8

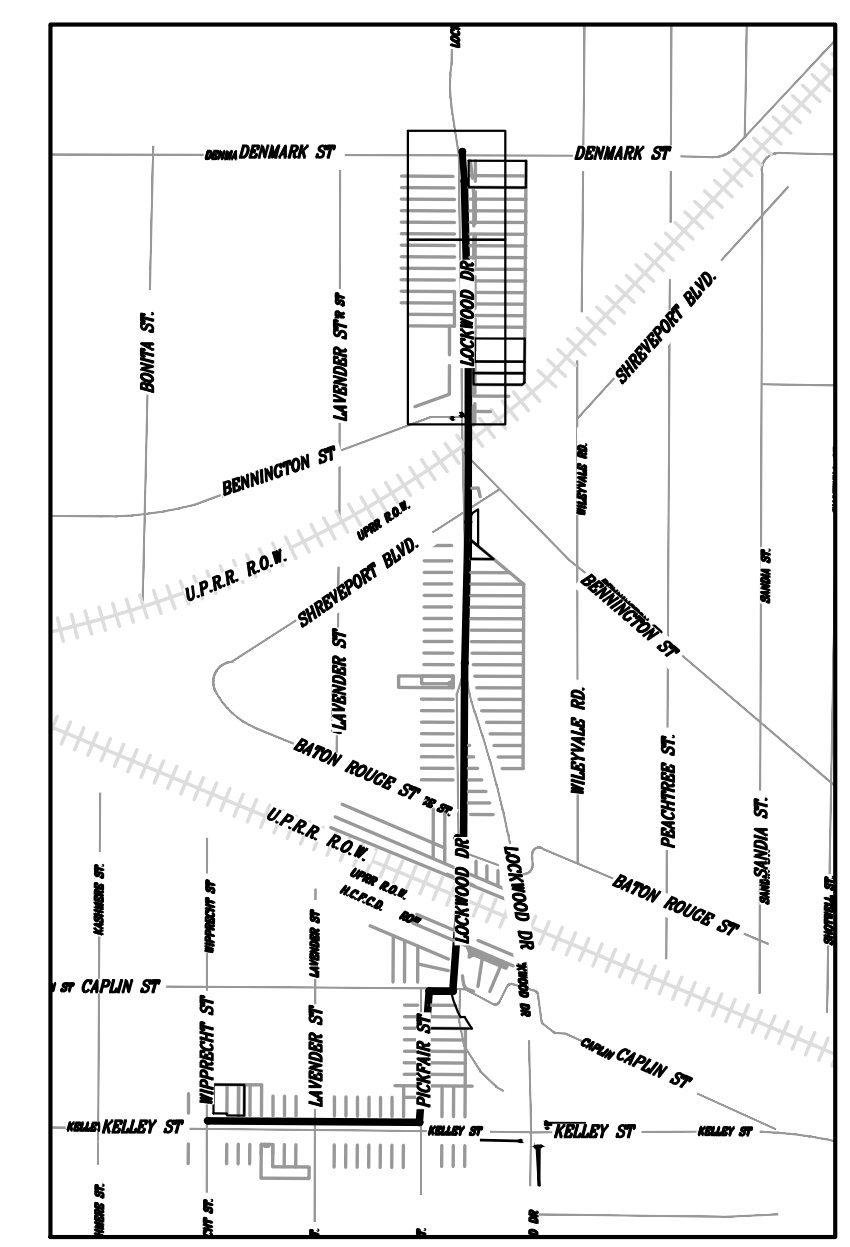
TYPE III BARRICADE DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 98 OF 106	



LEGEND:

— RB —	ROCK BERM
▨	MULCH SOCK
— FF —	FILTER FABRIC
▣	INLET PROTECTION BARRIER
— RFB —	REINFORCED FILTER BARRIER
○	TREE PROTECTION
— LOC —	LIMITS OF CONSTRUCTION

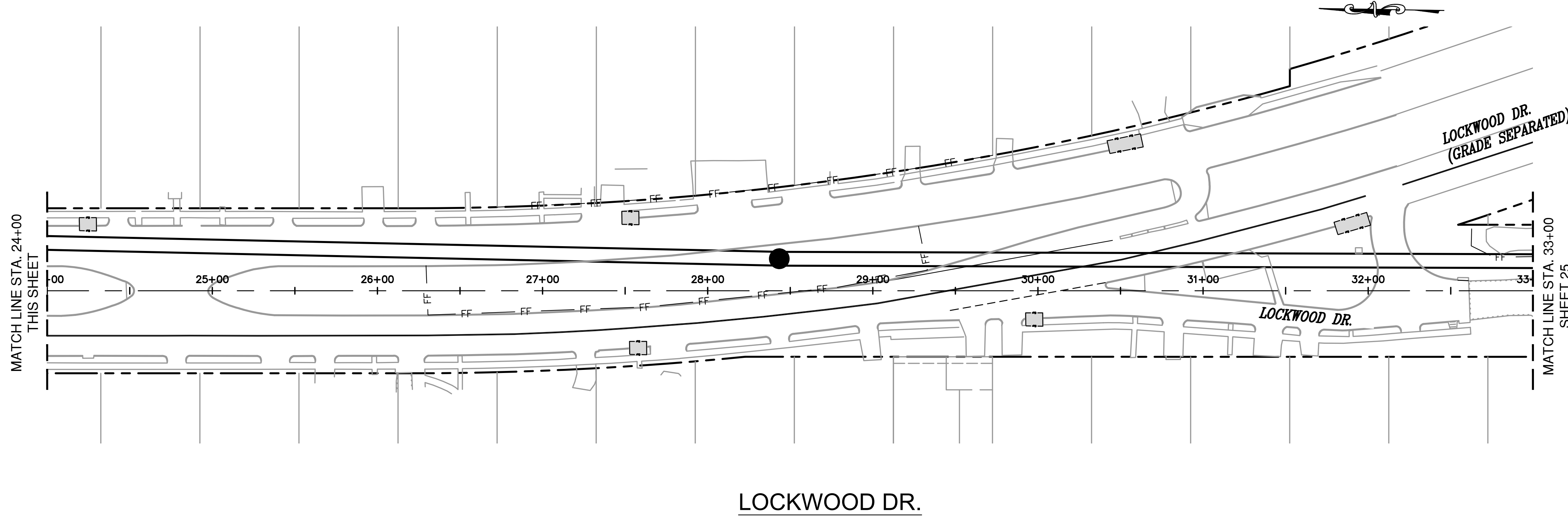
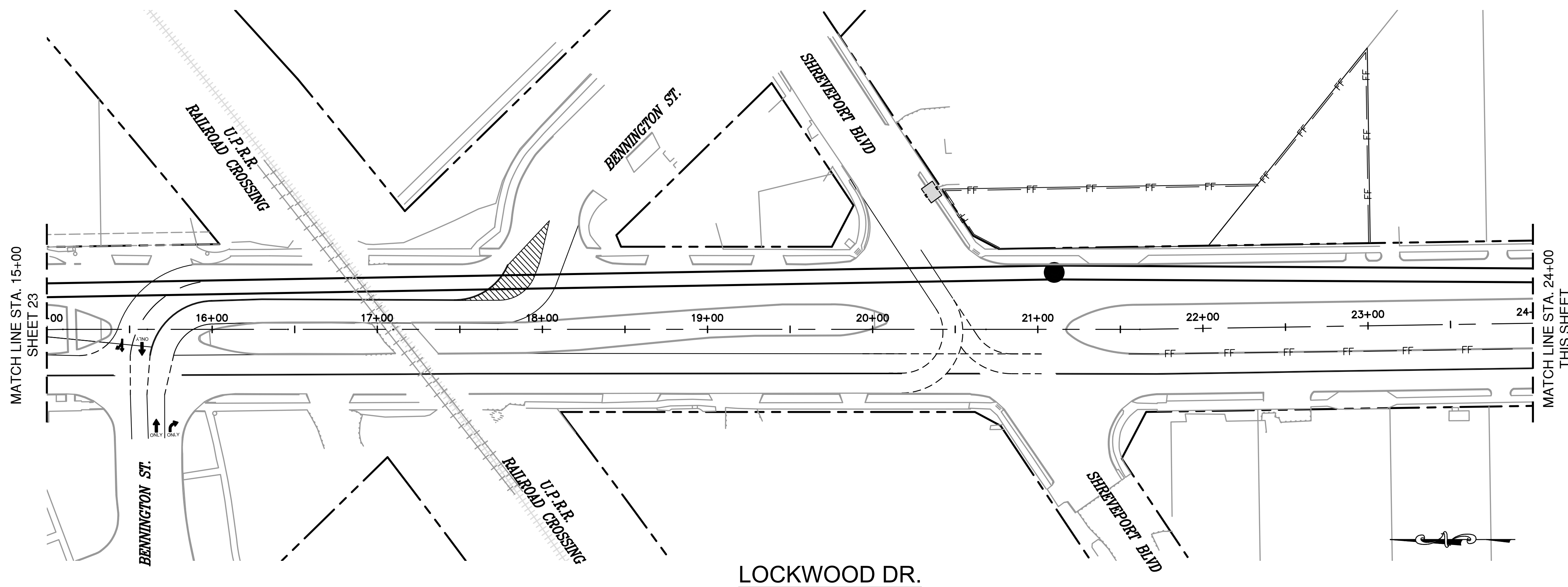


KEY MAP
 SCALE: 1" = 1,000 FT

MM/DD/YY	BRIEF DESCRIPTION	XXX
NO.	DATE	REVISION
		APP.
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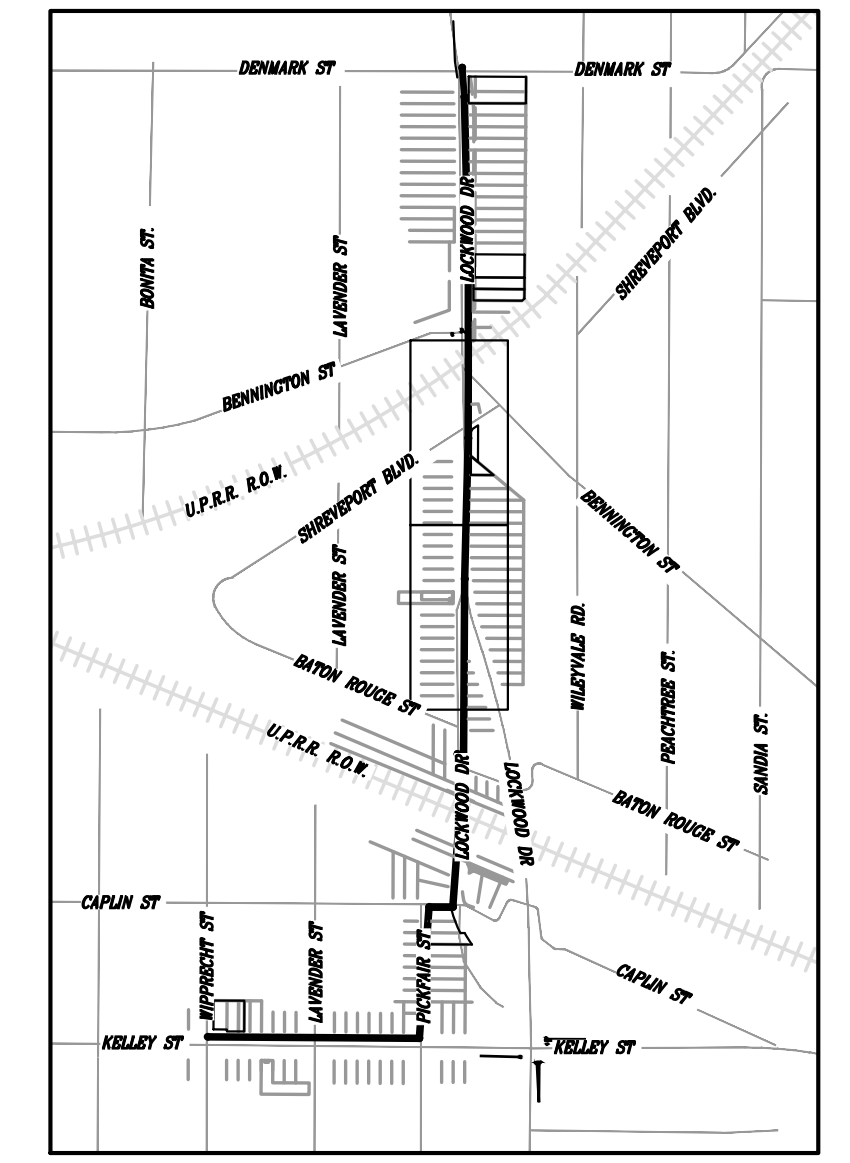
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8
 STORMWATER POLLUTION PREVENTION PLAN
 LOCKWOOD DR. (2 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 5'-0" FOR 11"x17" SCALE: 1"=40' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 99 OF 106	


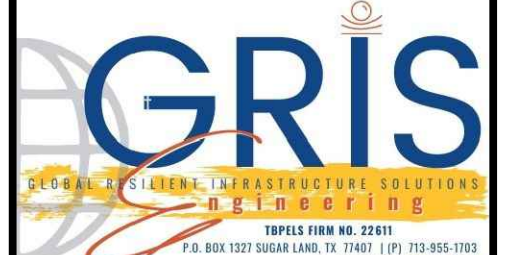


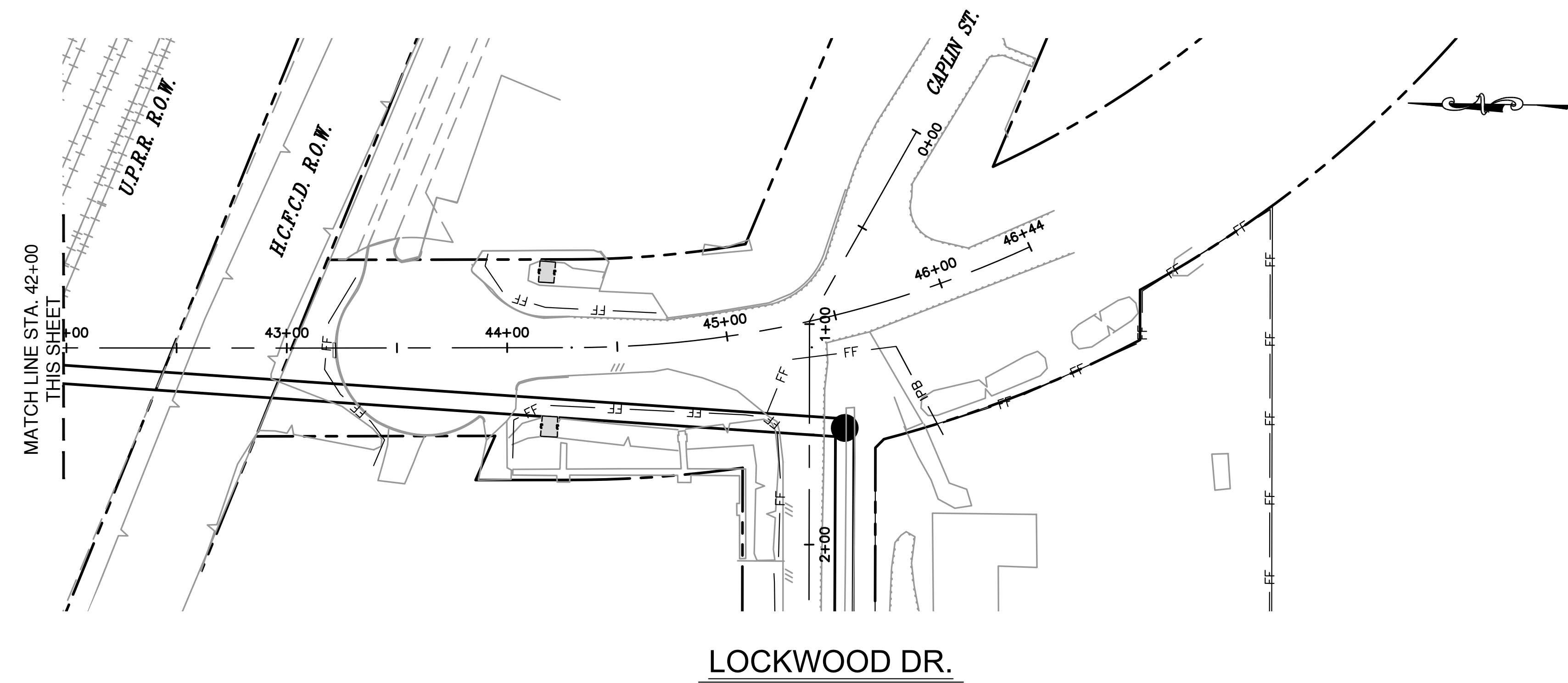
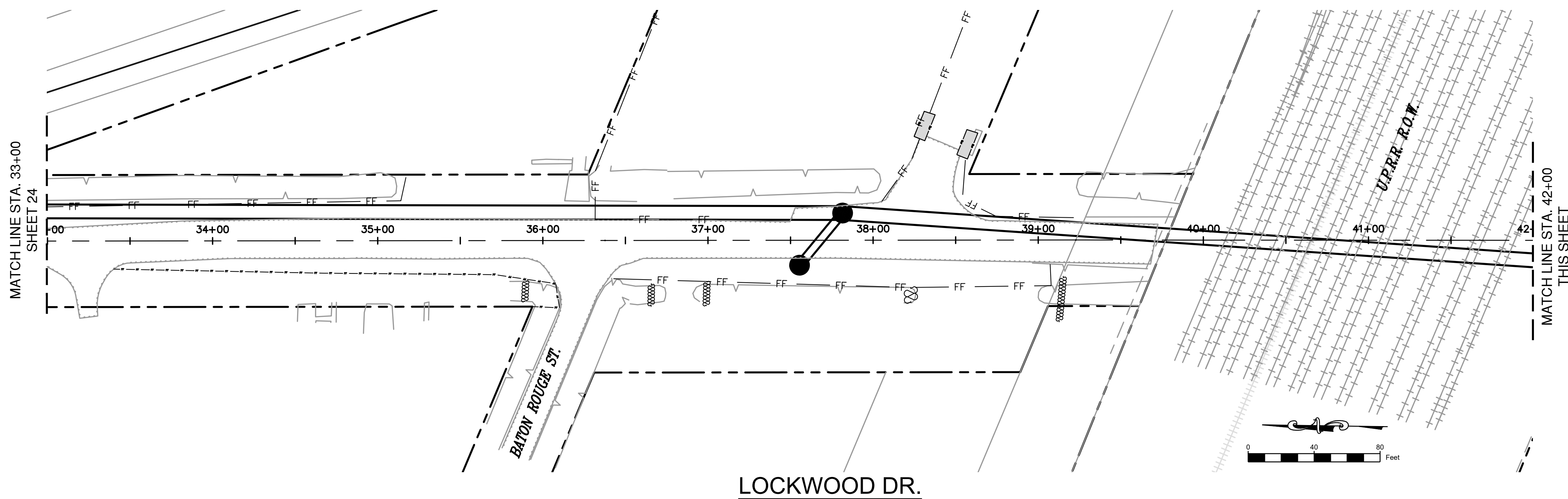
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IPB	INLET PROTECTION BARRIER
RFB	REINFORCED FILTER BARRIER
○	TREE PROTECTION
— LOC —	LIMITS OF CONSTRUCTION

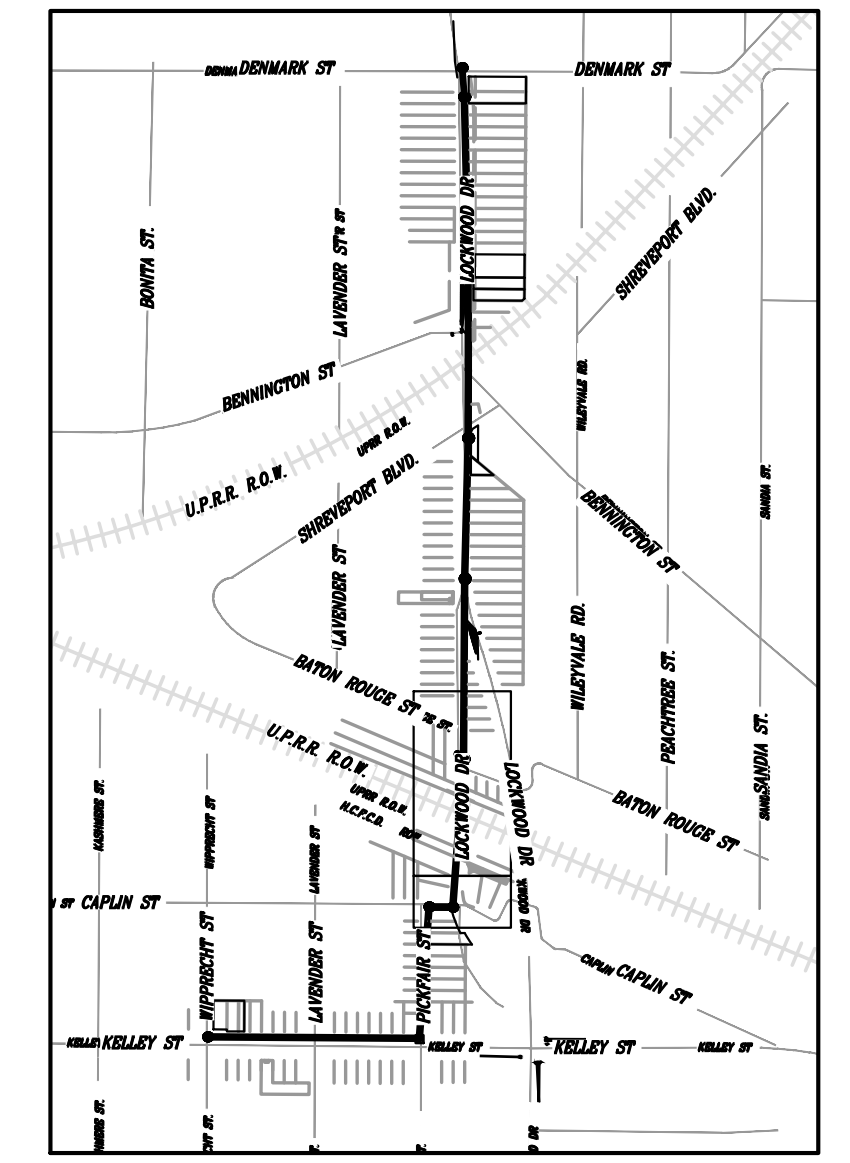


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CITY OF HOUSTON HOUSTON PUBLIC WORKS		
CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8		
STORMWATER POLLUTION PREVENTION PLAN LOCKWOOD DR. (2 OF 3)		
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY	
R-001000-0033-3		
DRAWING SCALE		
SCALE: 5" = 80' FOR 11"X17" SCALE: 5" = 100' FOR 22"X34"		
CITY OF HOUSTON PM		
NEIL BARNSDALE, P.E.		
SHEET NO. 100 OF 106		




- LEGEND:**
- RB — ROCK BERM
 - ▨ MULCH SOCK
 - FF — FILTER FABRIC
 - ▭ INLET PROTECTION BARRIER
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EFF DATE: XXXX-XX-20XX DWG NO: XXXX-XX



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MAY 2026
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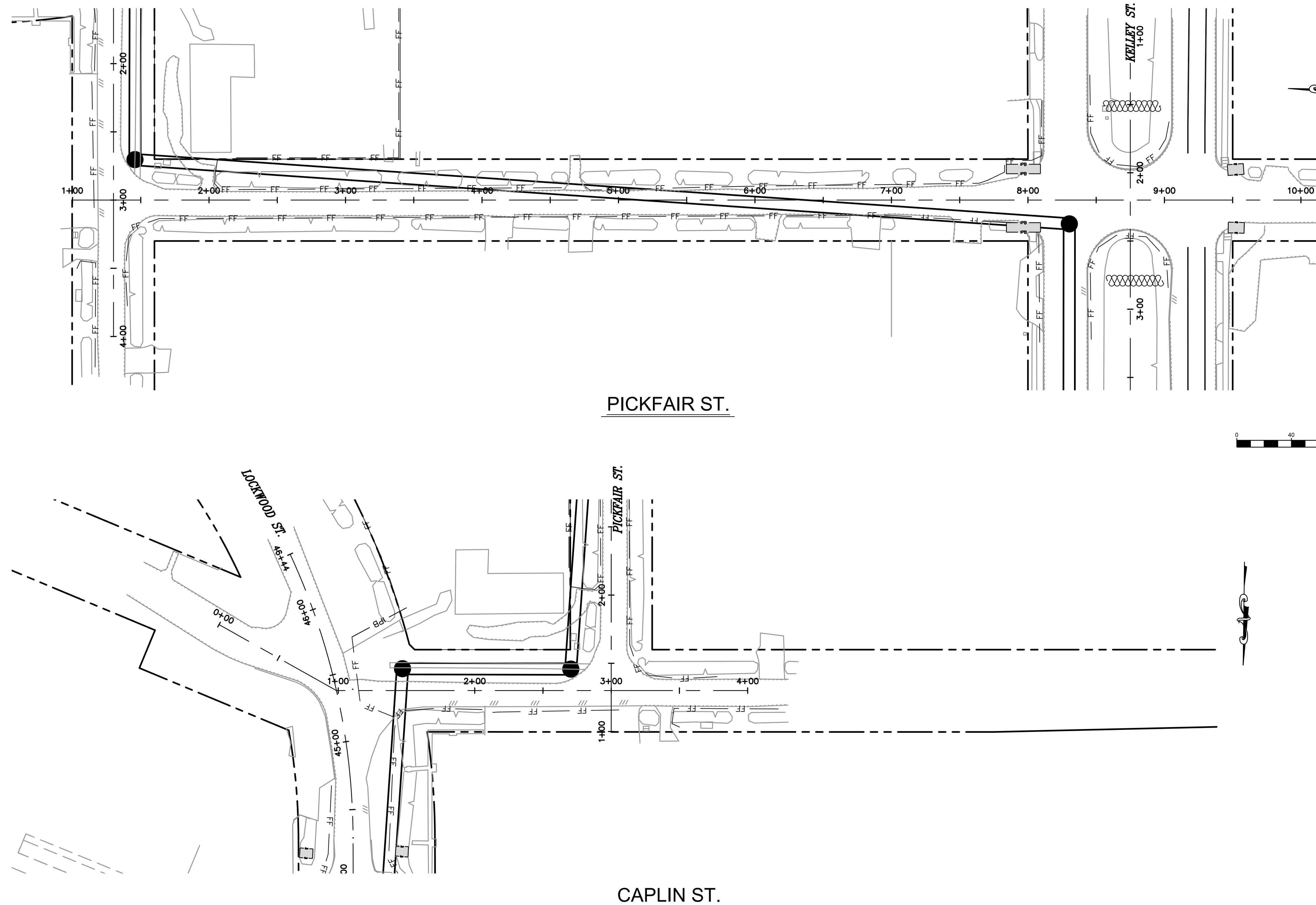
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

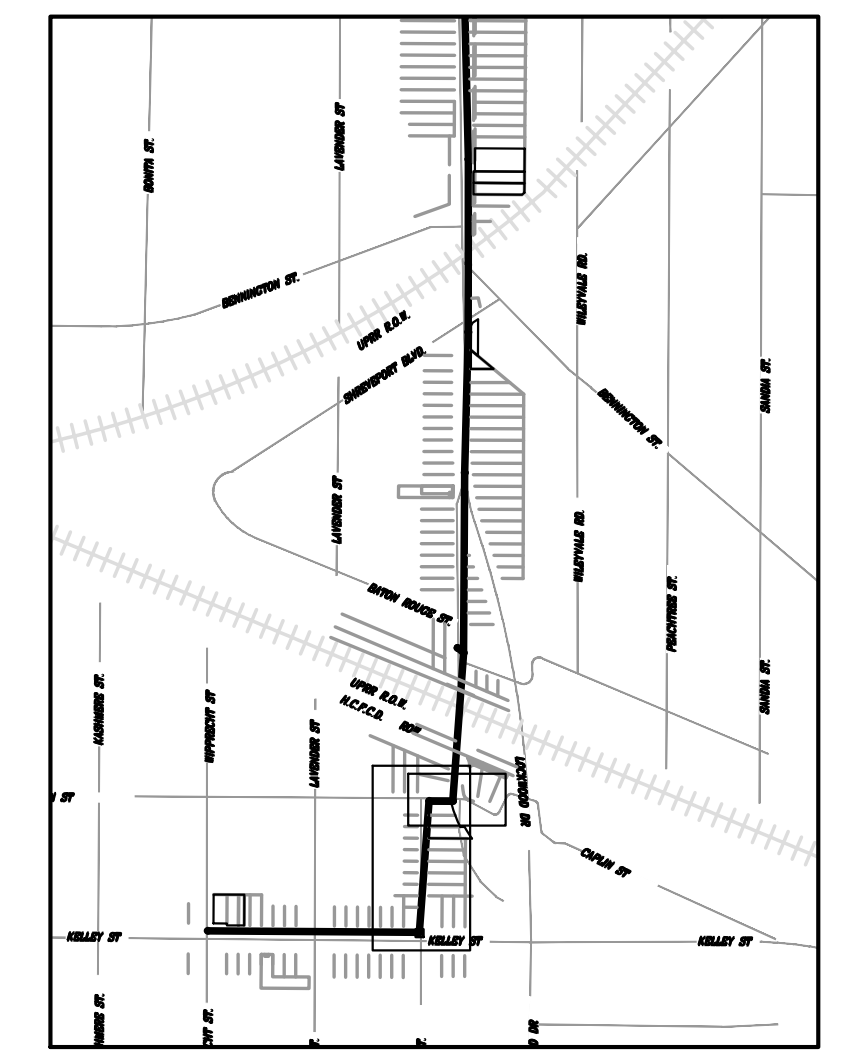
STORMWATER POLLUTION PREVENTION PLAN
LOCKWOOD DR. (3 OF 3)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 5"=80' FOR 11"x17" SCALE: 1"=100' FOR 22"x34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 101 OF 106	



LEGEND:


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	MULCH SOCK	
	FF	FILTER FABRIC
	IPB	INLET PROTECTION BARRIER
	RFB	REINFORCED FILTER BARRIER
		TREE PROTECTION
	LOC	LIMITS OF CONSTRUCTION



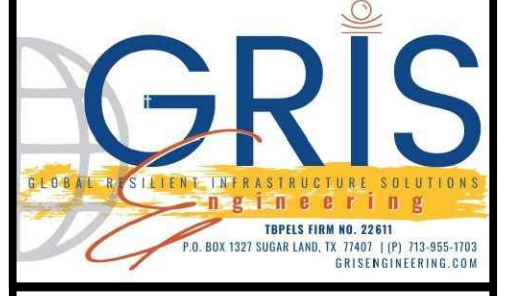
KEY MAP

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NO.	DATE	REVISION	APP.



EFF DATE: XXXX-XX-20XX DWG NO: XXXX-XX



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P.O. BOX 1001 DUBOIS LAKE, TX 75002-1001
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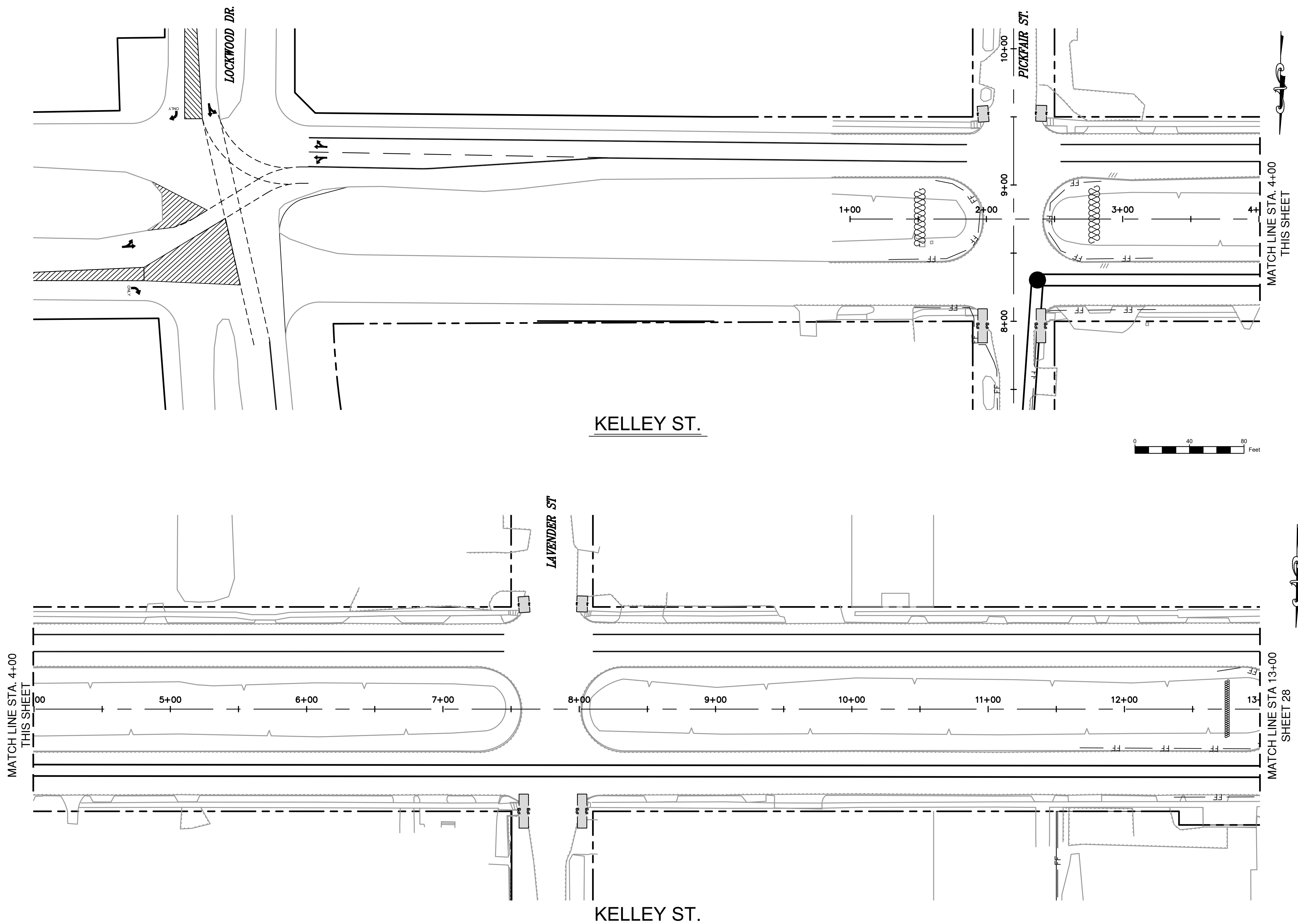
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

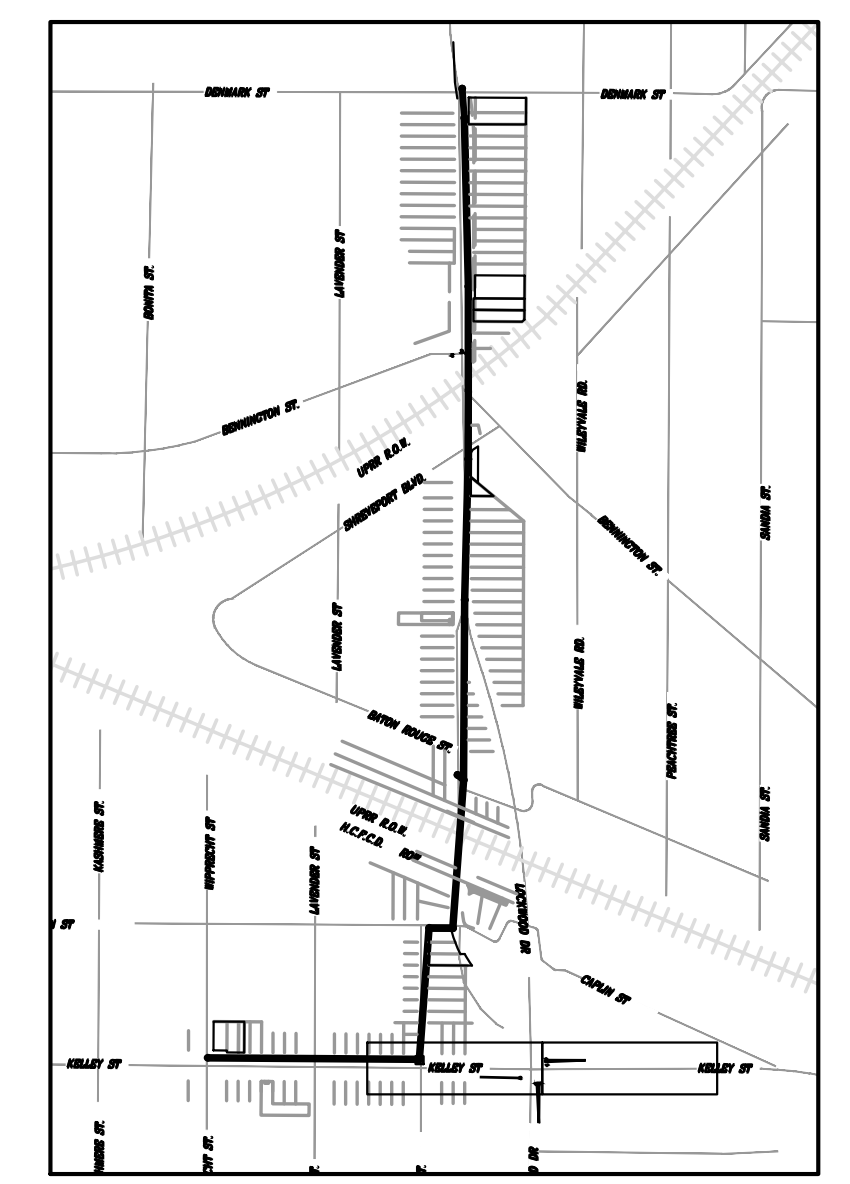
STORMWATER POLLUTION PREVENTION PLAN
PICKFAIR & CAPLIN ST.

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 1" = 80' FOR 11"X17" SCALE: 1" = 100' FOR 22"X34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 102 OF 106	



LEGEND:

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KEY MAP
 SCALE: 1" = 1,000FT

MATCH LINE STA. 4+00 THIS SHEET

MATCH LINE STA. 13+00 SHEET 28

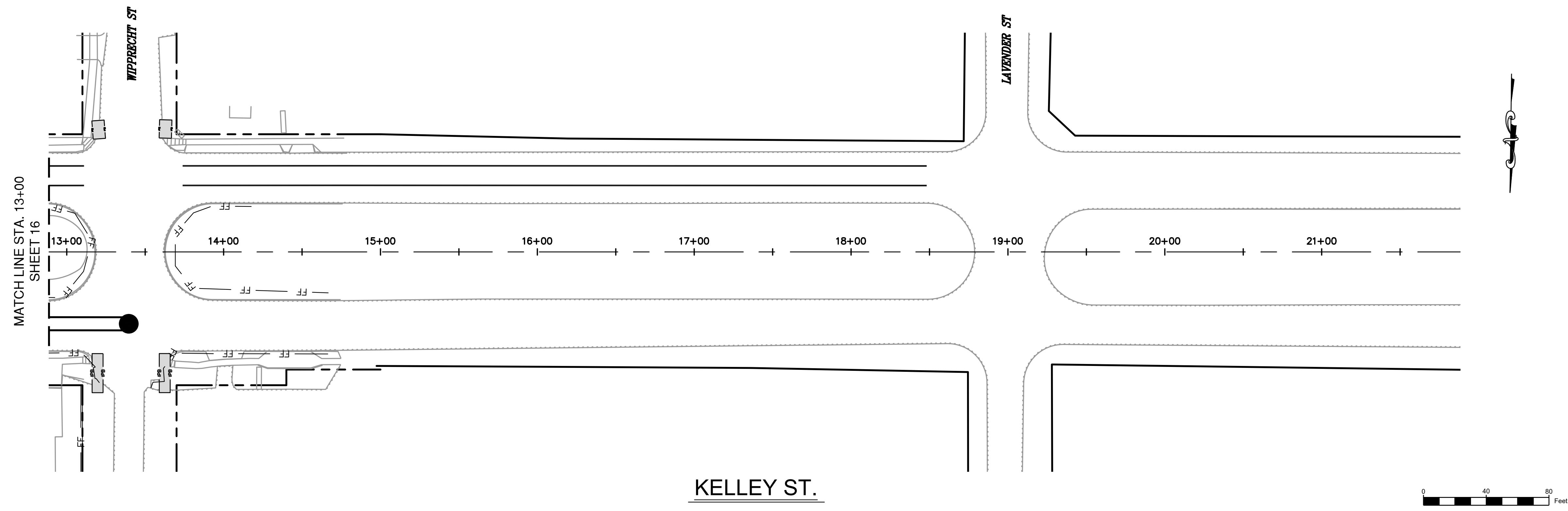
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

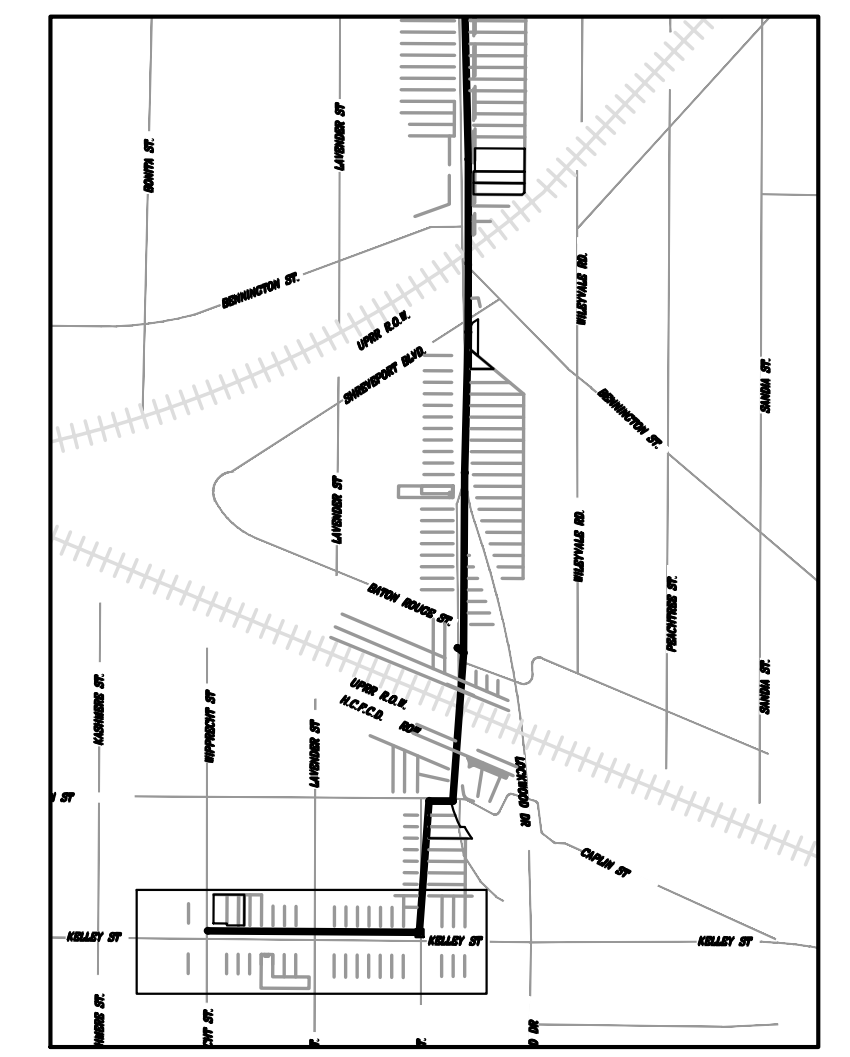
STORMWATER POLLUTION PREVENTION PLAN
 KELLEY ST. (1 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: 5" = 80' FOR 11"X17" SCALE: 1" = 100' FOR 22"X34"	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 103 OF 106	



LEGEND:

	RB	ROCK BERM
	MULCH SOCK	
	FF	FILTER FABRIC
	IPB	INLET PROTECTION BARRIER
	RFB	REINFORCED FILTER BARRIER
	TREE PROTECTION	
	LOC	LIMITS OF CONSTRUCTION



KEY MAP

SCALE: 1" = 1,000FT

MM/DD/YY	BRIEF DESCRIPTION	XXX

NO.	DATE	REVISION	APP.



EFF DATE: XXXX-XX-20XX DWG NO: XXXX-XX

GRIS
GENERAL CONTRACTORS, LANDSCAPE ARCHITECTS, ENGINEERS, PLANNERS & CONSTRUCTORS
10000 WESTHELL DRIVE, SUITE 100, HOUSTON, TEXAS 77036
TEL: 281.416.2200 FAX: 281.416.2201

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SURVEYED BY: MAY 2026
 FB NO. GRISelda GONZALES, P.E.
 TX PE NO. 115678

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

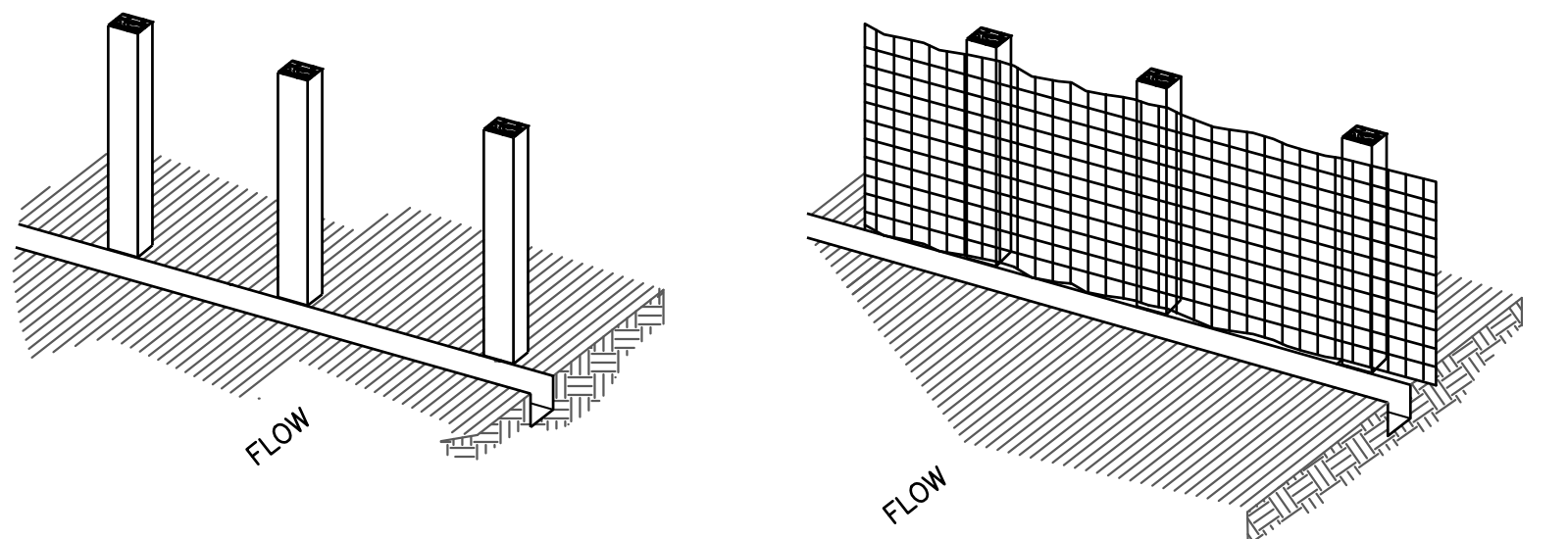
CAPACITY REMEDIAL MEASURES
 PLAN AREA 1. PACKAGE 8

STORMWATER POLLUTION PREVENTION PLAN
KELLEY ST. (2 OF 2)

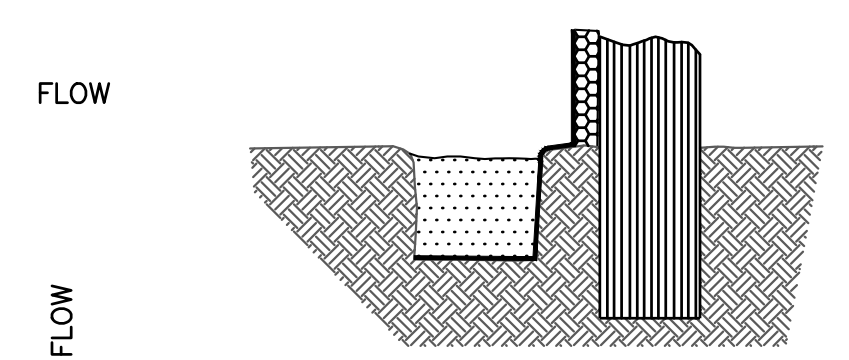
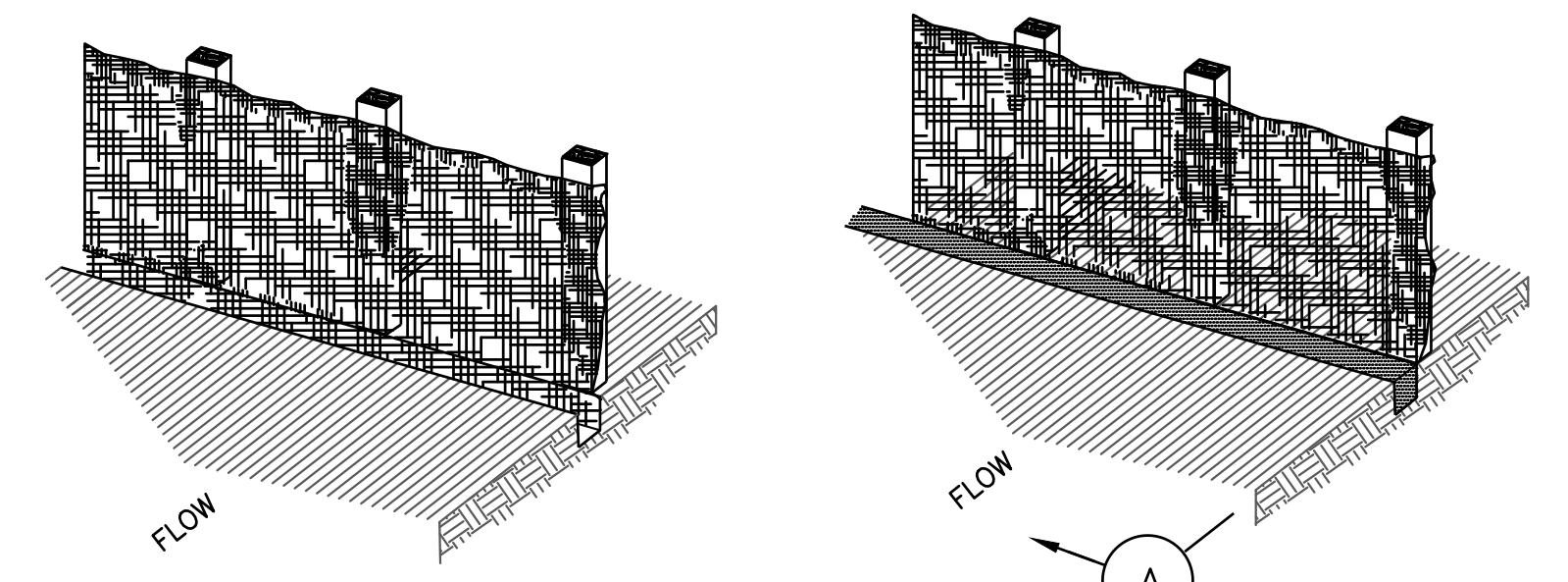
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-001000-0033-3	
DRAWING SCALE	
SCALE: AS SHOWN FOR 11"X17" DRAWING SCALE: AS SHOWN FOR 22"X34" DRAWING	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 104 OF 106	

K:\202308.LAN.002\05-CAD\5.1 CO Plan Set\28 STORMWATER POLLUTION PREVENTION PLAN - KELLEY ST. (2 OF 2).dwg Jun 03, 2026

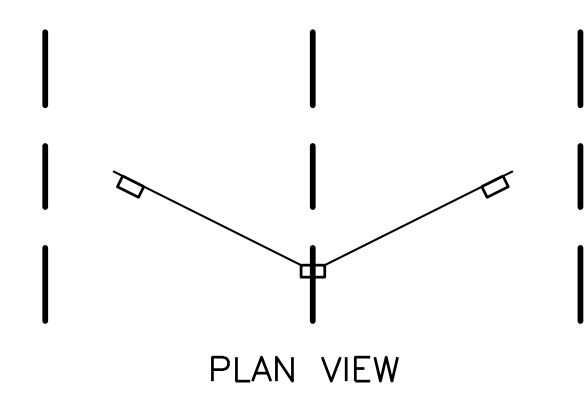
1. SET POSTS AND EXCAVATE 4"x4" TRENCH UPSLOPE ALONG LINE OF POSTS (SEE NOTE 1).
2. SECURE WIRE REINFORCING TO POSTS (SEE NOTE 2).



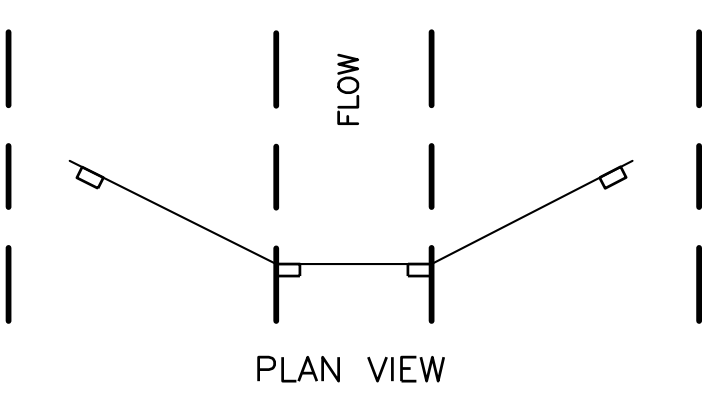
3. ATTACH FILTER MATERIAL TO WIRE REINFORCING AND EXTEND IT INTO THE TRENCH (SEE NOTE 3).
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SECTION A-A
EXTENSION OF FABRIC INTO TRENCH

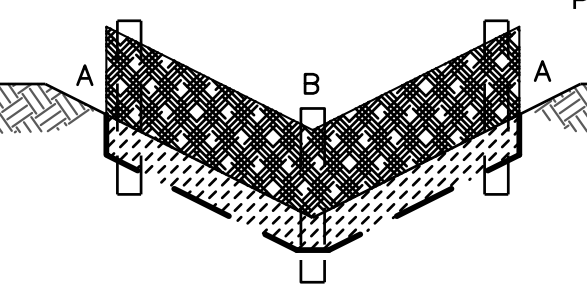


PLAN VIEW

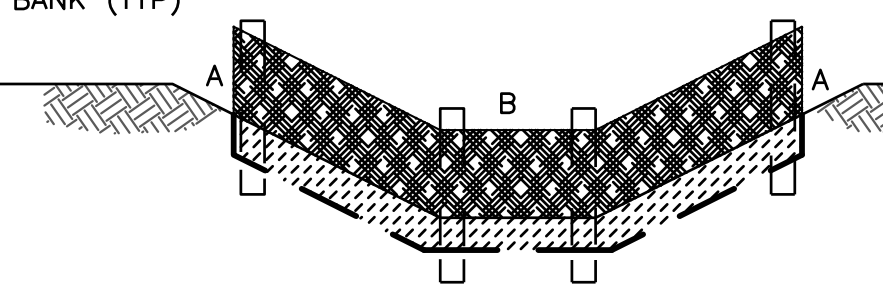


PLAN VIEW

POINTS A SHOULD BE HIGHER THAN POINT B, OR AT TOP OF BANK (TYP)



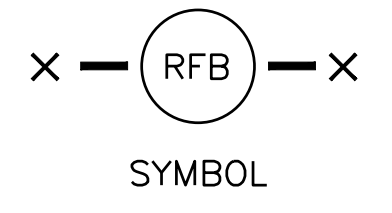
"V-DITCH" SECTION/ELEVATION



TRAPEZOIDAL SECTION/ELEVATION

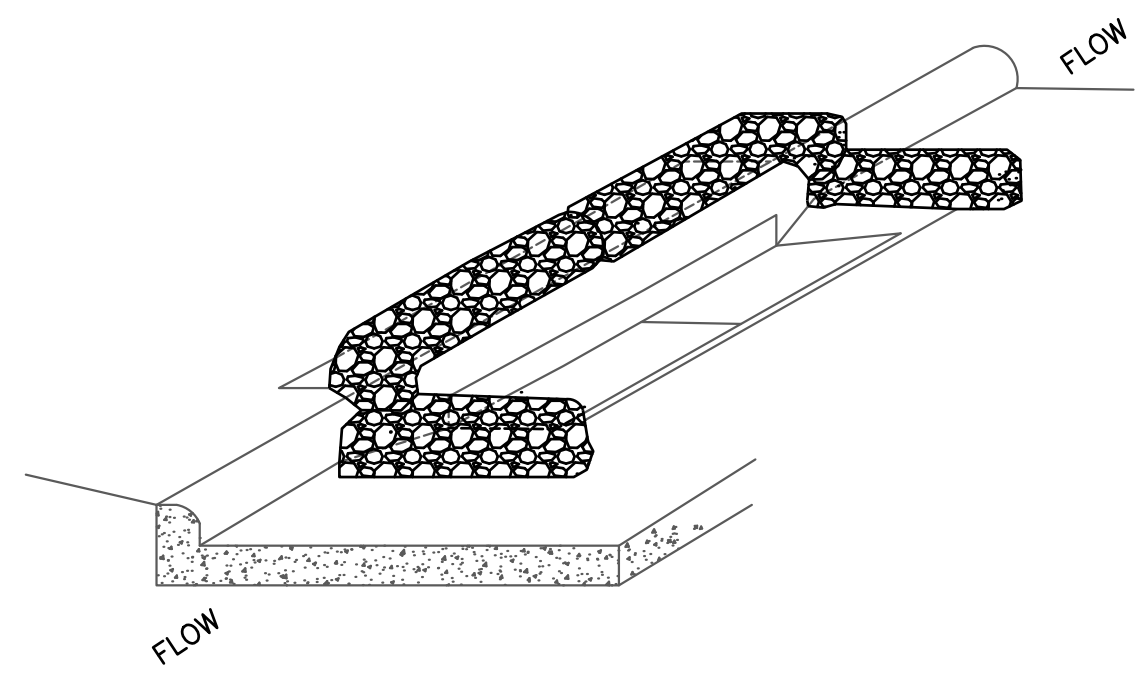
CONSTRUCTION NOTES:

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 01570 FOR FILTER FABRIC BARRIER.



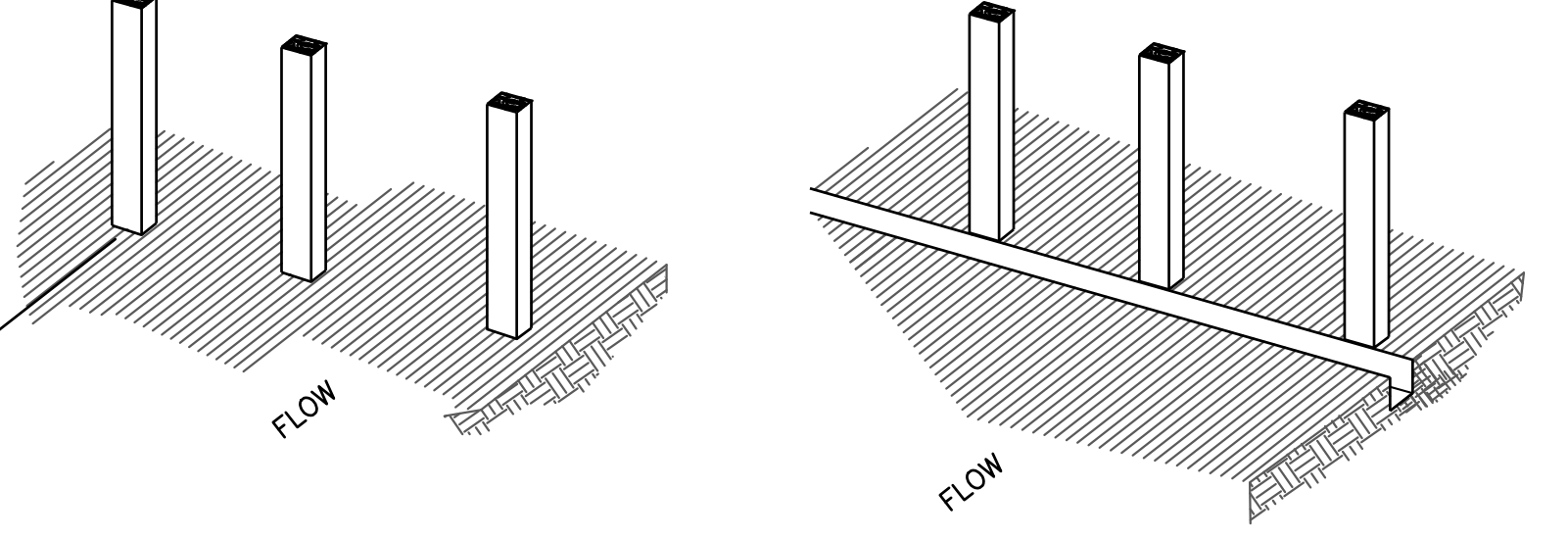
SYMBOL

REINFORCED FILTER FABRIC BARRIER

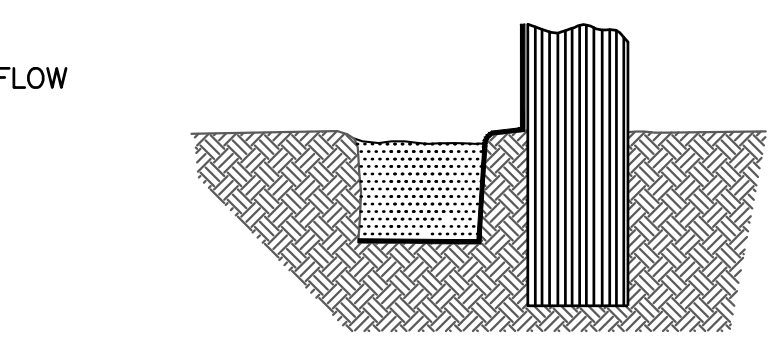
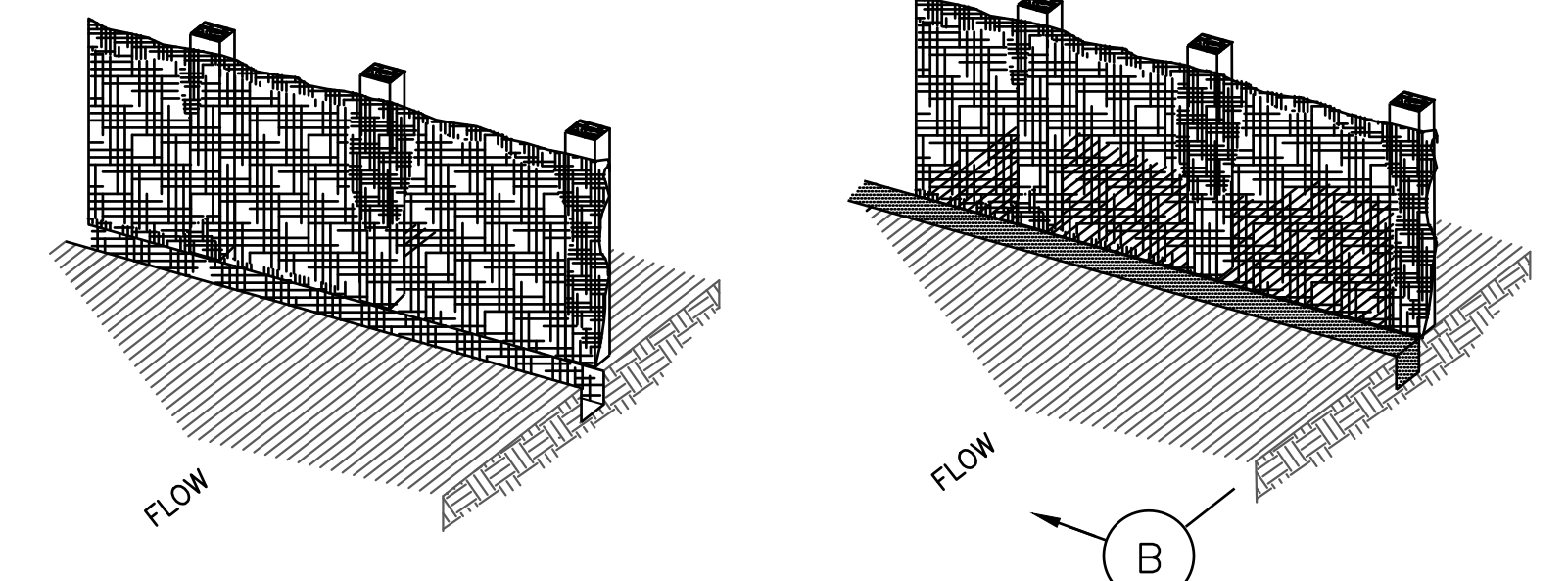


INLET PROTECTION BARRIER
(FOR STAGE II INLETS)
BAGGED GRAVEL BARRIER

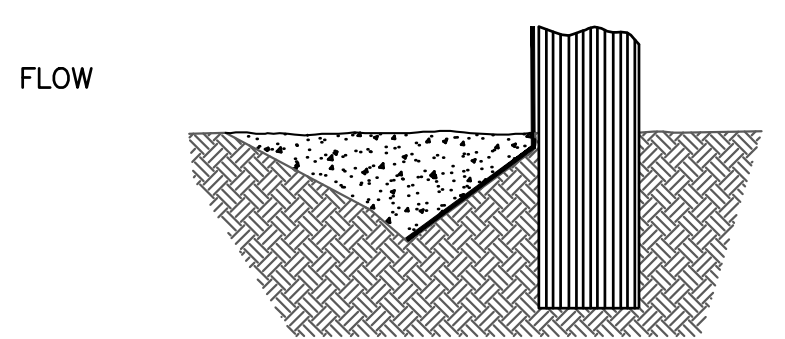
1. SET POSTS AT REQUIRED SPACING.
2. EXCAVATE A 4"x4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



3. ATTACH FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SECTION B-B
EXTENSION OF FABRIC INTO TRENCH

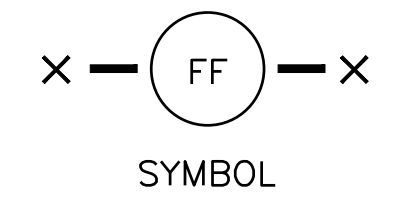


SECTION B-B
ALTERNATE
V-TRENCH EXTENSION OF FABRIC INTO TRENCH

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 01570 FOR FILTER FABRIC BARRIER.

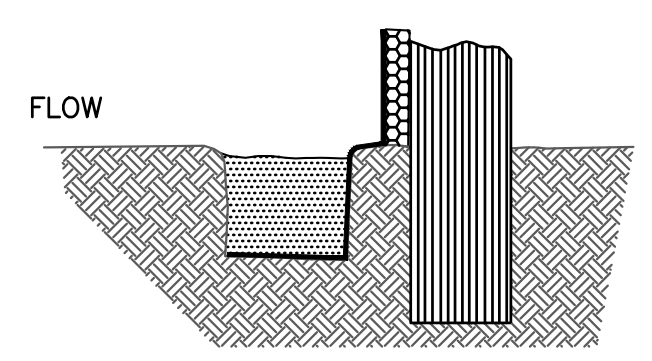
FILTER FABRIC BARRIER



SYMBOL

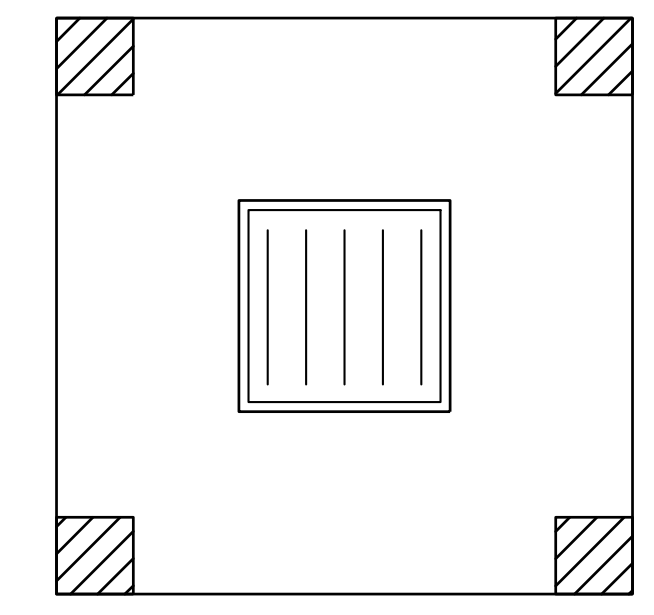
CONSTRUCTION NOTES:

1. SEE CONSTRUCTION NOTES FOR RFB.



SECTION D-D

SYMBOL



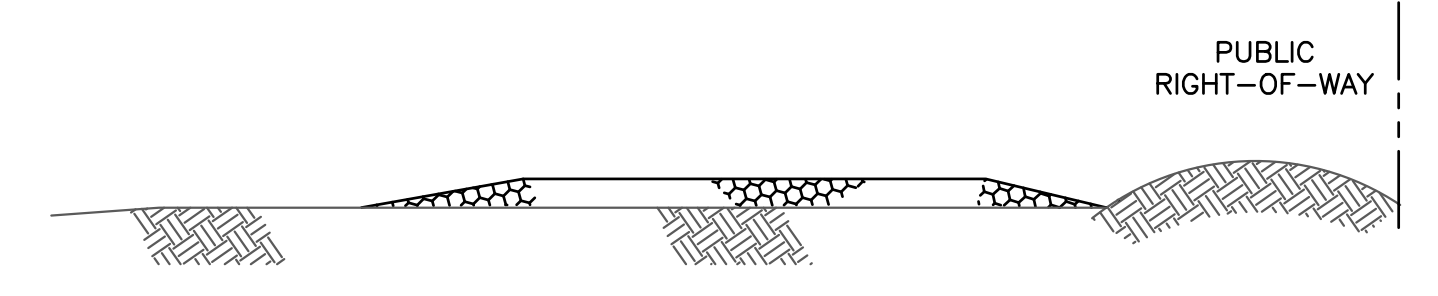
PLAN VIEW

SILT FENCE INLET PROTECTION BARRIER

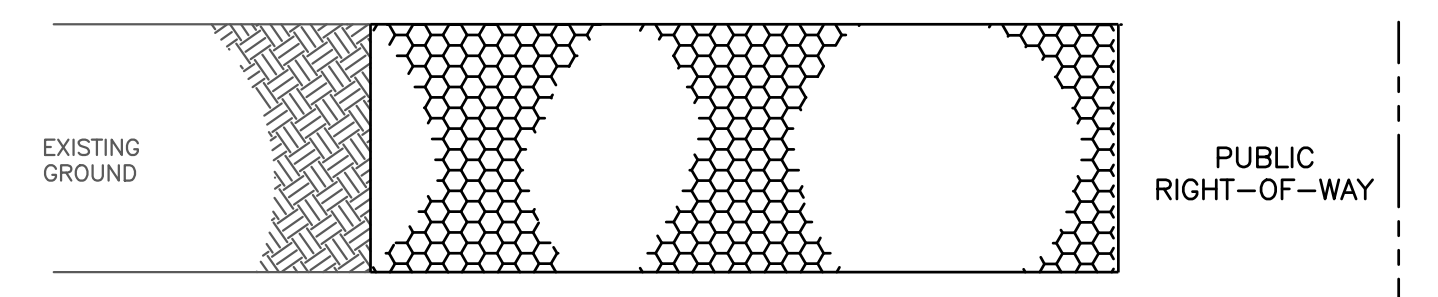


SYMBOL

HAY BALE INLET PROTECTION BARRIER



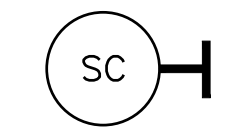
PROFILE



PLAN VIEW

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 ACCOMMODATE A WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE WASHING AREA.
6. COH STANDARD SPECIFICATION 01575 FOR STABILIZED CONSTRUCTION ACCESS.
7. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.



SYMBOL

STABILIZED CONSTRUCTION ACCESS

MM/DD/YY	BRIEF DESCRIPTION	XXX

NO.	DATE	REVISION	APP.

EFF DATE: XXXX-XX-20XX DWG NO: XXXXX-XX

GRIS
GENERAL INVESTIGATIVE RESEARCH AND CONSULTING
INCORPORATED
P.O. BOX 1001 SUGAR LAKE, TX 75080-1001 (972) 496-1100
WWW.GRISCONSULTING.COM

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MAY 2026
GRISelda GONZALES, P.E.
TX PE NO. 115678

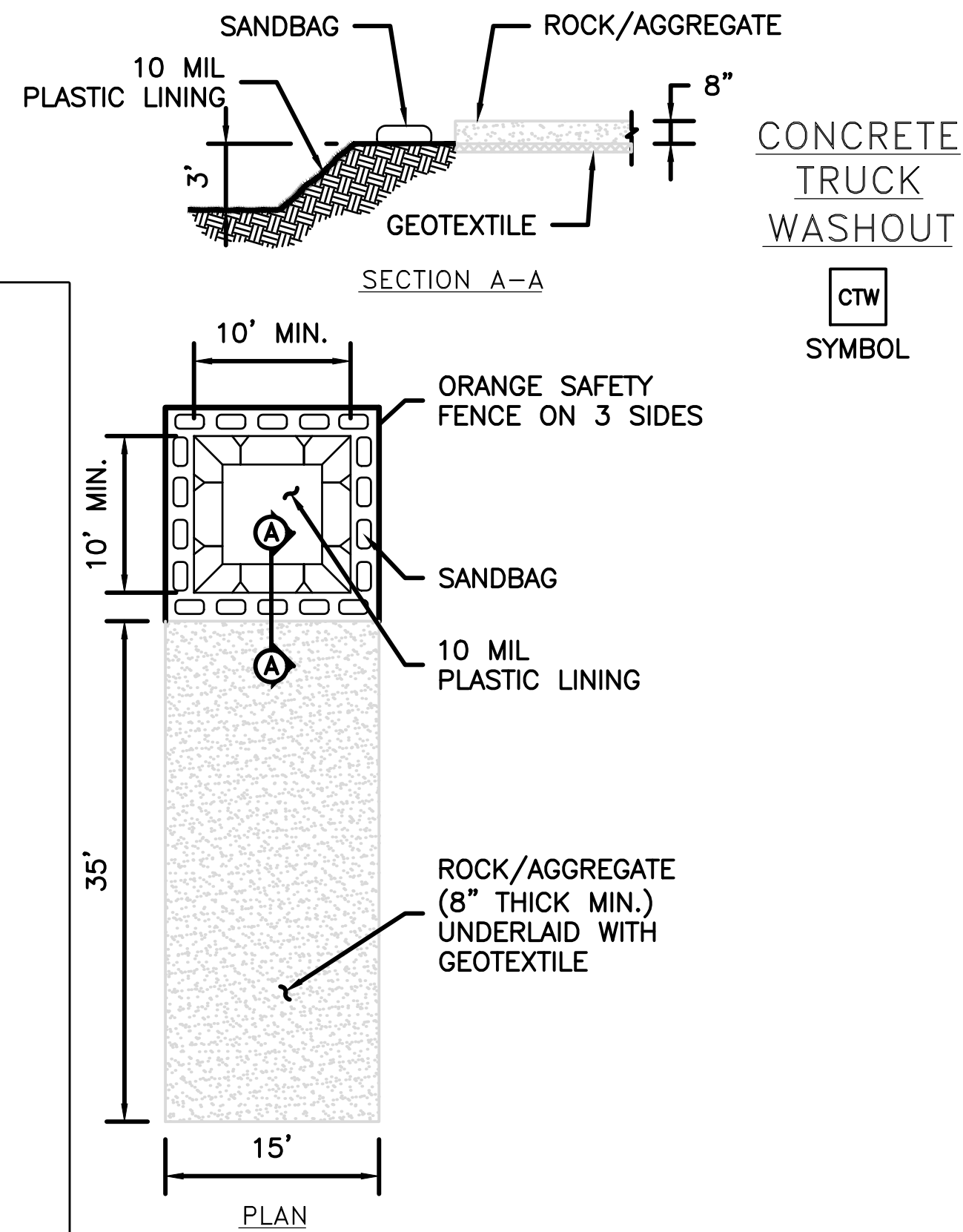
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HOUSTON PUBLIC WORKS

CAPACITY REMEDIAL MEASURES
PLAN AREA 1. PACKAGE 8

STORMWATER POLLUTION PREVENTION PLAN
DETAILS (1 OF 2)

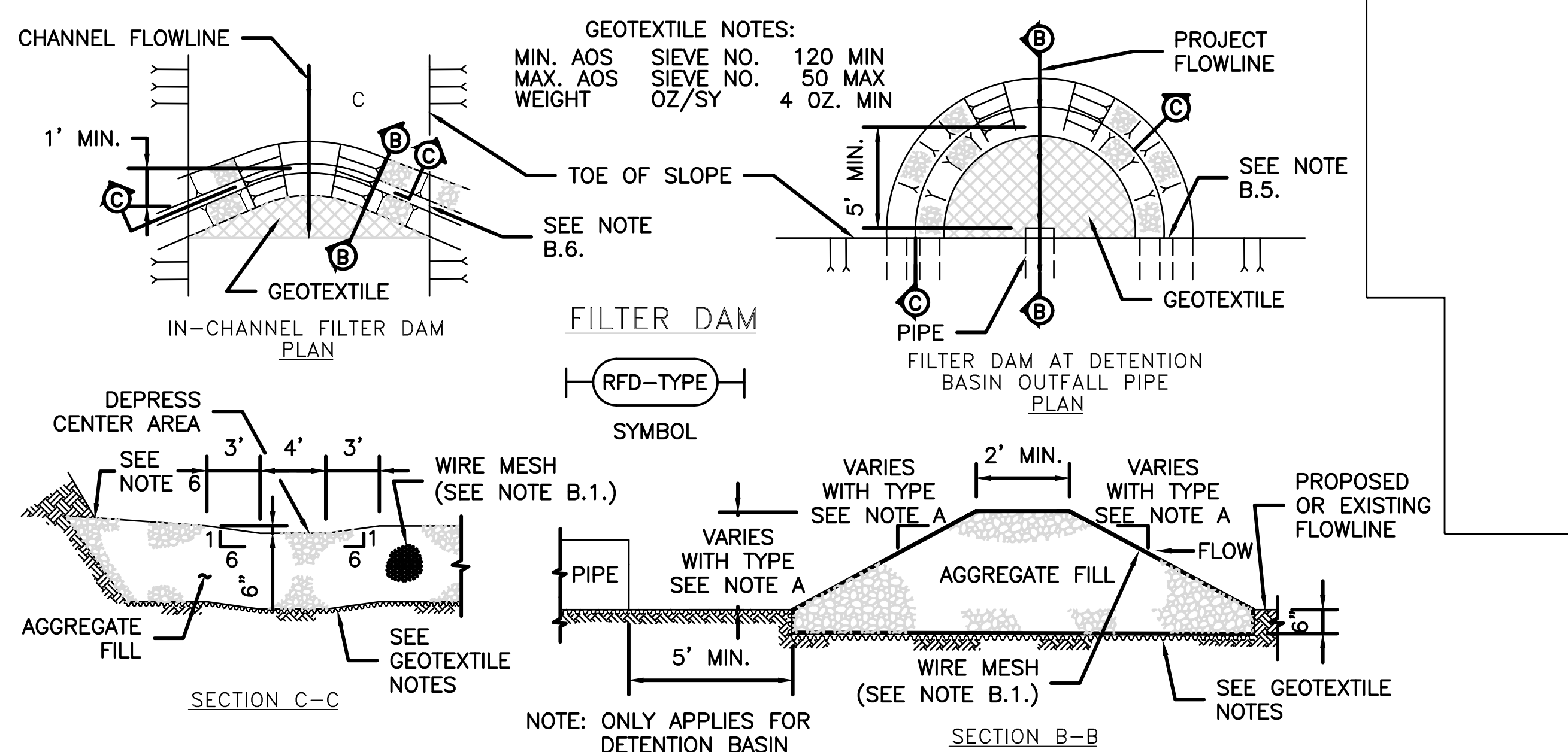
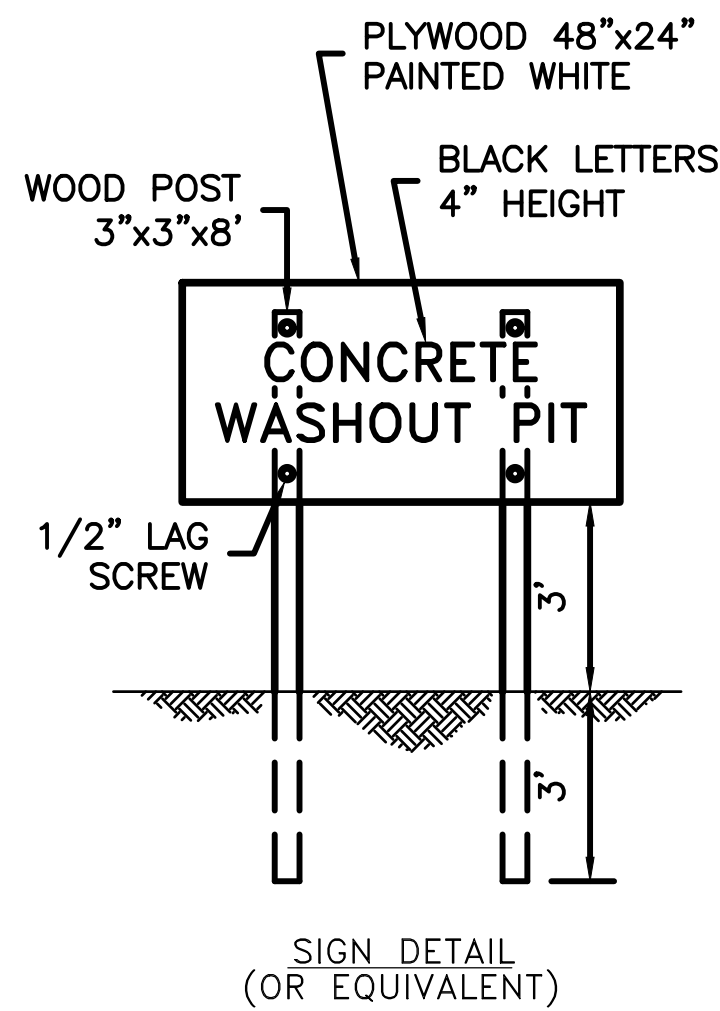
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DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
NEIL BARNSDALE, P.E.	
SHEET NO. 105 OF 106	



CONCRETE TRUCK WASHOUT
 CTW
 SYMBOL

GENERAL NOTES:

1. POST A SIGN READING "CONCRETE WASHOUT PIT" NEXT TO THE PIT.
2. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASHOUT THEIR TRUCKS IN THE PIT AND NOWHERE ELSE.
3. UPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASHOUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
4. CONCRETE WASHOUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
5. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.





A. TYPES OF FILTER DAMS

1. TYPE 1 (NON-REINFORCED)
 - a. HEIGHT - 18-24 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM)
 - c. SLOPES - 2:1 (MAXIMUM).
2. TYPE 2 (REINFORCED).
 - a. HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM).
 - c. SLOPES - 2:1 (MAXIMUM).
3. TYPE 3 (REINFORCED)
 - a. HEIGHT - 36-48 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM).
 - c. SLOPES - 3:1 (MAXIMUM).
4. TYPE 4 (GABION)
 - a. HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM).
5. TYPE 5. AS SHOWN ON THE PLANS.

B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.

1. TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
2. PLACE AGGREGATE FILL ON THE WIRE MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
 - a. 3-5 INCHES FOR ROCK FILTER DAM TYPES 1, 2 AND 4.
 - b. 4-8 INCHES FOR ROCK FILTER DAM TYPE 3.
3. FOLD WIRE MESH AT UPSTREAM SIDE OVER AGGREGATE FILL AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR RINGS.
4. IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
5. EMBED ONE FOOT MINIMUM INTO SLOPE AND RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA AT SLOPE.

MM/DD/YY	BRIEF DESCRIPTION	XXX
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		APP.
EFF DATE: XXXX-XX-20XX		DWG NO: XXXXX-XX
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CAPACITY REMEDIAL MEASURES PLAN AREA 1. PACKAGE 8		
STORMWATER POLLUTION PREVENTION PLAN DETAILS (2 OF 2)		
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SHEET NO. 106 OF 106		