CITY OF HOUSTON

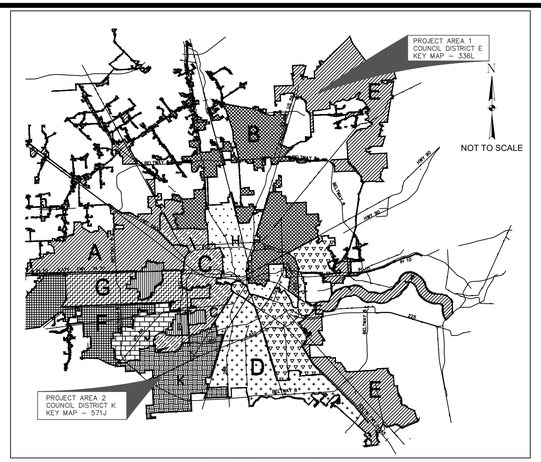
HOUSTON PUBLIC WORKS

CAPITAL PROJECTS

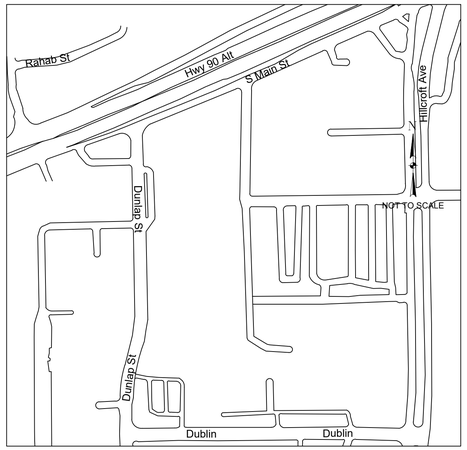
NEIGHBORHOOD SEWER SYSTEMS IMPROVEMENTS (NSSI) FONDREN GARDENS AND DEER RIDGE ESTATES

WBS NO. R-002011-0090C-3

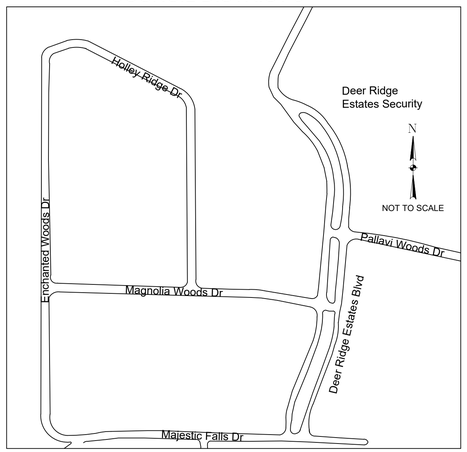
60% SUBMITTAL



LOCATION MAP



VICINITY MAP -FONDREN GARDENS
KEY MAP NO. 571J
COUNCIL DISTRICT J



VICINITY MAP -DEER RIDGE ESTATES
KEY MAP NO. 336L
COUNCIL DISTRICT E

TDLR EABPR N/A

MAYOR
JOHN WHITMIRE

CONTROLLER
CHRIS HOLLINS

DISTRICT COUNCIL MEMBERS

AMY PECK, DISTRICT A
TARSHA JACKSON, DISTRICT B
ABBIE KAMIN, DISTRICT C
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

DATE: DATE
JOB NP. 200621

DESIGNED BY: D CRUMP
DRAWN BY: Y LIK

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SURVEYED BY: KUO & ASSOCIATES
FB NO. P-XXXX

PARKS–FORESTRY DEPT.

METRO

HOUSTON WATER

TRANSPORTATION & DRAINAGE OPERATIONS

CAPITAL PROJECTS

SURVEY

FOR CITY OF HOUSTON USE ONLY

CITY ENGINEER DATE

DIRECTOR OF HOUSTON PUBLIC WORKS DATE

SHEET NO **1 of 111** SHEETS

C:\USERS\DCRUMP\APPDATA\LOCAL\REVIT\DG1\466-789-225\CAD\PRODUCTION\1 003 COVER SHEET1DWG[DCRUMPISAVED: Tuesday, June 30, 2026]COH_CTB_220714_CORRECT.CTB[PLOTTED: Tuesday, June 30, 2026]

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6	GENERAL NOTES (SHEET 4 OF 4)
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60% SUBMITTAL

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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SHEET INDEX

WBS#: R-002011-0090C-3

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE:
NOT TO SCALE

CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:
G-2

SHEET NO. **2 of 111**

C:\USERS\YLK\APPDATA\LOCAL\REVU\00\466-789-225\CAD\PRODUCTION\2_SHEET INDEX.DWG[YLK](SAVED: Wednesday, July 01, 2026)(COH_KAI.CTB)(PLOTTED: Wednesday, July 01, 2026

GENERAL NOTES– INSIDE CITY LIMIT

1. CONSTRUCT WASTEWAUNLESS OTHERWISE NOTED AND APPROVED ON DRAWINGS, CONSTRUCT CIVIL INFRASTRUCTURE IN ACCORDANCE WITH THE EFFECTIVE EDITION OF THE HOUSTON PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS, STANDARD CONSTRUCTION DETAILS, AND SUPPLEMENTS, ADDENDA AND AMENDMENTS THERETO. THE LATEST EDITION OF THE ABOVE PUBLICATIONS CAN BE FOUND AT:

2. THE DESIGN MUST BE CONSISTENT WITH THE EFFECTIVE EDITION OF HOUSTON PUBLIC WORKS INFRASTRUCTURE DESIGN MANUAL AND TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY) REQUIREMENTS.

3. THE GEOTECHNICAL INVESTIGATION FOR THIS PROJECT WAS CONDUCTED IN ACCORDANCE WITH CHAPTER 11 OF THE LATEST EDITION OF THE PUBLICATION INFRASTRUCTURE DESIGN MANUAL, PUBLISHED BY HOUSTON PUBLIC WORKS. SOILS REPORTS WERE PREPARED BY HVJ ASSOCIATES INC., REPORT NO. HGT1510260.5.3(A), DATED MAY 29, 2026, AND SOILS REPORT NO. [HGT1510260.5.3(B)] DATED [MAY 29, 2026].

4. UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 713–223–4567/811 OR 800–344–8377 AND LONE STAR NOTIFICATION CENTER AT 800–669–8344 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION. UTILITIES MARKED WITHIN THE PUBLIC RIGHT OF WAY OR IN EASEMENTS SHALL COMPLY WITH TAC TITLE 16, PART 1, CHAPTER 18, RULE §18.6 AND THE AMERICAN PUBLIC WORKS ADMINISTRATION (APWA) UNIFORM COLOR CODE.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE EFFECTIVE EDITION OF HOUSTON PUBLIC WORKS, STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, STREET PAVING, AND TRAFFIC AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, STREET PAVING, AND TRAFFIC, REFERENCED ABOVE AND SUPPLEMENTS, ADDENDA AND AMENDMENTS THERETO, AT NO ADDITIONAL COST TO THE CITY OF HOUSTON.

6. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, HOUSTON PUBLIC WORKS @ 832–394–9098 OR VIA FAX AT 832–395–4424 FOR INSPECTION AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.

7. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER AND TO THE SATISFACTION OF THE OWNING AUTHORITY.

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

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

10. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD AS–BUILT CONDITIONS DURING CONSTRUCTION. THESE AS–BUILT DRAWINGS WILL BE SUBMITTED TO THE DESIGN CONSULTANT WHO WILL MAKE THE CHANGES ON THE ORIGINAL TRACINGS, LABEL EACH SHEET IN THE SET AS "RECORD DRAWINGS", AND RETURN IT TO THE OFFICE OF THE CITY ENGINEER.

11. TER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING IN ACCORDANCE WITH THE LATEST EDITION OF THE PUBLICATIONS STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING, AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS. WATER LINES, STORM DRAINAGE, AND STREET PAVING PUBLISHED BY HOUSTON PUBLIC WORKS.

12. THE GEOTECHNICAL INVESTIGATION FOR THIS PROJECT WAS CONDUCTED IN ACCORDANCE WITH CHAPTER 11 OF THE LATEST EDITION OF THE PUBLICATION INFRASTRUCTURE DESIGN MANUAL, PUBLISHED BY HOUSTON PUBLIC WORKS. SOILS REPORT WAS PREPARED BY [HVJ ASSOCIATES, INC.] REPORT NO. [HGI1512060.5.1], DATED [02/07/2023].

13. 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.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE HOUSTON PUBLIC WORKS, STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, AND STREET PAVING AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING, REFERENCED ABOVE, AT NO ADDITIONAL COST.

15. 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.

16. 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.

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

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

19. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD AS–BUILT CONDITIONS DURING CONSTRUCTION. THESE REDLINE MARKED UP DRAWINGS WILL BE SUBMITTED TO THE DESIGN CONSULTANT WHO WILL MAKE THE CHANGES ON THE ORIGINAL TRACINGS, LABEL EACH SHEET IN THE SET AS "RECORD DRAWINGS", AND RETURN IT TO THE OFFICE OF THE CITY ENGINEER.

SANITARY SEWER CONSTRUCTION NOTES

1. ALL SEWERS SHALL 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 THE LATEST 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 NEW SANITARY SEWERS CROSSING WATER LINES WITH A CLEARANCE BETWEEN 12 INCHES AND 9 FEET SHALL HAVE A MINIMUM OF ONE 18' JOINT OF 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.

14. 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 317.2 LATEST AMENDMENT AND WITHOUT MECHANICAL PULLING DEVICES. NO BALL–TYPE MANDREL IS ALLOWED.

15. INFILTRATION, EXFILTRATION OR LOW–PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC, TITLE 30 317.2 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.

16.

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'

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.

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/EJECTION.

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

GENERAL NOTES

WBS#: R–002011–0090C–3

DRAWING SCALE:
NOT TO SCALE

CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:

SHEET NO. **3 of 111**

C:\USERS\YLIK\APPDATA\LOCAL\REVU\00\1466–789–225\CAD\PRODUCTION\4_GENERAL NOTES SHEET 10F2.DWG(YLIK(SAVED: Wednesday, July 01, 2026(COH_CAT(PLOTTED: Wednesday, July 01, 2026

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 (JULY 2019) AS APPLICABLE UNLESS OTHERWISW 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. STABLIZED 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 MECHNICALLY 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 T99).

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 PRPOSED 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 24-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 VALAVE 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.

13. 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.

14. 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.

15. 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. STABLIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL.

16. ALL TRENCH BACKFILL SHALL BE IN 8" LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS IN EACH LIFT, AND MECHNICALLY 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 T99).

17. CIRCULAR AND ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINT CONFORMING TO ASTM C443 AND ASTM C877 RESPECTIVELY.

18. ALL STORM SEWER PIPES AND INLET LEADS SHALL BE 24" AND LARGER R.C.P. (C-76, CLASSIII).

19. ALL PRP

20. OSED PIPE STUB-OUTS FROM MANHOLES AND INLET LEADS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.

21. 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.

22. ADJUST MANHOLE COVERS TO GRADE CONFORMING TO REQUIREMENTS OF SECTION 02086-ADJUSTING MANHOLES, INLETS, AND VALAVE BOXES TO GRADE.

23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING, AND RESTORING ANY BACK SLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF THIS WORK.

24. 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.

25. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

STREET & BRIDGE CONSTRUCTION NOTES:

1. HOUSTON PUBLIC WORKS "STANDARD CONSTRUCTION SPECIFICATIONS" AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING" UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN IS CONSISTENT WITH THE MINIMUM STANDARDS ESTABLISHED IN THE "INFRASTRUCTURE DESIGN MANUAL" REFERENCED AT:

FILL AREAS

STREET & BRIDGE CONSTRUCTION NOTES

1. 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.

2. UTILITY CONTRACTOR SHALL PROVIDE TEMPORARY SILT BARRIER FENCE ON ALL NON-CURBED INLETS WHICH WILL REMAIN IN PLACE AFTER UNDERGROUND CONTRACT IS COMPLETE.

3. CONTRACTOR SHALL PROVIDE SILT BARRIER FENCE ON ALL STAGE 1 CURB INLETS.

4. EXISTING PAVEMENTS, CURBS, DRIVEWAYS, AND SIDEWALKS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO CITY OF HOUSTON STANDARDS, WITH LATEST ADDENDA AND AMENDMENTS THERETO.

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

6. EXPOSED 15" OF REINFORCING STEEL AT PROPOSED SAWED JOINT IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE #6 BARS 24" LONG 24" C-C DRILLED AND EMBEDDED 8" INTO THE CENTER OF THE EXISTING SLAB WITH "PO ROC" OR EQUAL.

7. WHEELCHAIR RAMPS SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF HOUSTON STANDARDS AT ALL INTERSECTIONS WHERE SIDEWALKS EXIST AND THE EXISTING CURB OR SIDEWALK IS DAMAGED OR REMOVED DURING CONSTRUCTION.

8. PRIOR TO STREET CONSTRUCTION, THE CONTRACTOR SHALL CONTACT HOUSTON PUBLIC WORKS AT (PHONE) 832-394-9578 AND COMPLY WITH ALL REQUIREMENTS FOR THE ISSUANCE OF NECESSARY PERMITS/WORK ORDERS FOR STREET CONSTRUCTION.

9. DOUBLE REFLECTORIZED BLUE TRAFFIC MARKERS SHALL BE PLACED 6-INCHES OFFSET OF THE CENTERLINE OF ALL FIRE HYDRANT LOCATIONS BY THE PAVING CONTRACTOR. HYDRANTS LOCATED AT INTERSECTIONS SHALL HAVE A BUTTON PLACED ON EACH STREET.

10. 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.

11. UTILITY CONTRACTOR SHALL PROVIDE TEMPORARY SILT BARRIER FENCE ON ALL NON-CURBED INLETS WHICH WILL REMAIN IN PLACE AFTER UNDERGROUND CONTRACT IS COMPLETE.

12. CONTRACTOR SHALL PROVIDE SILT BARRIER FENCE ON ALL STAGE 1 CURB INLETS.

13. 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.

14. 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.

15. 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.

16. 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.

17. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG AREAS OF EXCAVATION.

18. 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.

19. 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.

20. 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".

21. 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.

22. 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.

23. 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.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND
DEER RIDGE ESTATES

GENERAL NOTES

WBS#:	R-002011-0090C-3
DRAWING SCALE:	
	NOT TO SCALE
	CITY OF HOUSTON PM
	MARIA GEORGE, P.E.
DRAWING NO:	
SHEET NO.	4 of 111

C:\USERS\VLIK\APPDATA\LOCAL\REVU\DO\466-789-225\CAD\PRODUCTION\4_GENERAL NOTES SHEET 1OF2.DWG(TLIK|SAVED) Wednesday, July 01, 2026(TLIK|PLOTTED) Wednesday, July 01, 2026

HARRIS COUNTY FLOOD CONTROL

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.

AT & T TEXAS/SWBT FACILITIES

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

2. THE CONTRACTOR SHALL CALL 1-800-344-8377 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 AT&T TEXAS/SBC FACILITIES.

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

5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES DOES NOT MEAN THAT THE DIRECT BURIED CABLES IN THE AREA. FOLLOW THE DIRECT BURIED CABLE PROCEDURES TO LOCATE THE AT&T TEXAS/SWBT DIRECT BURIED CABLES AS INDICATED IN THE AT&T TEXAS RESEARCH AND SIGNATURE PROCESS FOR AT&T TEXAS/SWBT FACILITIES.

6. PLEASE CONTACT THE AT&T TEXAS/SWBT DAMAGE PREVENTION MANAGER MR. ROOSEVELT LEE, JR. AT 713-567-4552 OR EMAIL HIM AT RL7259@ATT.COM IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

CENTERPOINT ENERGY - GAS

1. CAUTION: UNDERGROUND GAS FACILITIES LOCATION 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 713-233-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

   A. WHEN CENTERPOINT ENERGY PIPELINE MARKINGS ARE NOT VISIBLE, CALL 713-967-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

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

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

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

CENTERPOINT ENERGY - ELECTRICAL

1. 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 TEN (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.

2. HAND DIG WITHIN ONE (1) FOOT OF CENTERPOINT ENERGY UNDERGROUND CONDUIT OR CABLE SYSTEMS.

TREE AND PLANT PROTECTION

1. CONTRACTOR IS TO PRESERVE AND TO PROTECT EXISTING TREES AND PLANTS FROM FOLIAGE, BRANCH, TRUNK AND/OR ROOT DAMAGE THAT COULD RESULT FROM CONSTRUCTION ACTIVITIES.

2. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS PLANTS AND TREES ALONG AREA OF CONSTRUCTION.

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 SWEPT 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.

TRAFFIC CONSTRUCTION NOTES:

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

2. NO TRAFFIC LANES SHALL BE CLOSED DURING THE HOURS OF 5:30AM TO 7:00PM MONDAY THRU FRIDAY IN DOWNTOWN/MIDTOWN AREA.

3. NO LANES ON MAJORITY THOROUGHFARES MAY BE BLOCKED FROM 6:00AM TO 9:00AM AND 4:00PM TO 7:00PM UNLESS OUTLINED IN THE MOBILITY PERMIT.

4. NO TRAFFIC LANES SHALL BE CLOSED IN ALL RESIDENTIAL AREAS FROM 7:00PM TO 7:00AM.

5. CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS.

6. CONTRACTOR SHALL COVER OPEN EXCAVATIONS WITH STEEL PLATES ANCHORED PROPERLY DURING ON-WORKING HOURS, AND OPEN THE LANES FOR NORMAL TRAFFIC FLOW.

7. _OFF-DUTY UNIFORMED POLICE OFFICER(S)/:FLAGGER(S) IS/ARE REQUIRED TO DIRECT TRAFFIC WHEN THE LANES ARE BLOCKED.

8. IN THE EVENT THAT NO "TRAFFIC CONTROL PLANS" EXIST AS A PART OF CONTRACT DRAWINGS, CONTRACTOR MAY PREPARE PLANS* AND SUBMIT TO THE PLAN REVIEW SECTION FOR APPROVAL TEN DAYS PRIOR TO IMPLEMENTATION.

9. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, HE/SHE SHALL BE RESPONSIBLE FOR PREPARING AND SUBMITTING AN ALTERNATE SET OF PLANS* TO THE PLAN REVIEW SECTION FOR APPROVAL TEN WORKING DAYS PRIOR TO IMPLEMENTATION.

10. APPROVED COPIES OF TRAFFIC CONTROL PLANS AND MOBILITY PERMITS SHALL BE MADE AVAILABLE FOR INSPECTION AT THE JOB SITE AT ALL TIMES. CONTRACTORS MUST SECURE MOBILITY PERMITS FROM THE CITY'S TRAFFIC MANAGEMENT AND MAINTENANCE BRANCH BEFORE CLOSING A LANE/SIDEWALK. THE REQUEST MUST BE MADE AT LEAST 10 DAYS IN ADVANCE OF THE CLOSURE. NOTE THAT WORKING HOURS MAY BE RESTRICTED OR THE REQUEST MAY BE DENIED. CALL 832-395-3020 FOR AN APPLICATION OR LOGON TO WWW.GIMS.HOUSTONTX.GOV .

WATER 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.

60% SUBMITTAL

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TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

GENERAL NOTES

WBS#:R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 5 of 111	

C:\USERS\YLIK\APPDATA\LOCAL\PREV\107466-789-225\CAD\PRODUCTION\S_GENERAL NOTES SHEET 20F2.DWG(YLIK)(SAVED: Wednesday, July 01, 2026)(COH_AIA.CTB)(PLOTTED: Wednesday, July 01, 2026

AT & T TEXAS/SWBT FACILITIES

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

2. THE CONTRACTOR SHALL CALL 1-800-344-8377 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 AT&T TEXAS/SBC FACILITIES.

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

5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES DOES NOT MEAN THAT THE DIRECT BURIED CABLES IN THE AREA. FOLLOW THE DIRECT BURIED CABLE PROCEDURES TO LOCATE THE AT&T TEXAS/SWBT DIRECT BURIED CABLES AS INDICATED IN THE AT&T TEXAS RESEARCH AND SIGNATURE PROCESS FOR AT&T TEXAS/SWBT FACILITIES.

6. PLEASE CONTACT THE AT&T TEXAS/SWBT DAMAGE PREVENTION MANAGER MR. ROOSEVELT LEE, JR. AT 713-567-4552 OR EMAIL HIM AT RL7259@ATT.COM IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

CENTERPOINT ENERGY – GAS

1. CAUTION: UNDERGROUND GAS FACILITIES LOCATION 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 713-233-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

   A. WHEN CENTERPOINT ENERGY PIPELINE MARKINGS ARE NOT VISIBLE, CALL 713-967-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

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

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

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

CENTERPOINT ENERGY – ELECTRICAL

1. 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 TEN (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.

2. HAND DIG WITHIN ONE (1) FOOT OF CENTERPOINT ENERGY UNDERGROUND CONDUIT OR CABLE SYSTEMS.

TREE AND PLANT PROTECTION

1. CONTRACTOR IS TO PRESERVE AND TO PROTECT EXISTING TREES AND PLANTS FROM FOLIAGE, BRANCH, TRUNK AND/OR ROOT DAMAGE THAT COULD RESULT FROM CONSTRUCTION ACTIVITIES.

2. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS PLANTS AND TREES ALONG AREA OF CONSTRUCTION.

SWPPP CONSTRUCTION NOTES:

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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.

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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 CONTMINATION 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.

GRADING 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.

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND
DEER RIDGE ESTATES

GENERAL NOTES

WBS#: R-002011-0090C-3

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE:
NOT TO SCALE

CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:

SHEET NO. **6 of 111**

PLOT STYLE: Monochrome.ctb
Thursday, July 09, 2015 - 10:02AM yilk
C:\USERS\YILK\APPDATA\LOCAL\AUTODESK\AUTOCAD MAP 3D 2014\R19.1\ENU\SUPPORT\ACAD.CUIX WAS NOT FOUND. DEFAULT MENU WILL BE USED. Drawing: C:\USERS\YILK\DESKTOP\NSSI\GENERAL NOTES.DWG

EXISTING PLAN VIEW

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

PROPOSED PLAN VIEW

- WATER METER
- WATER VALVE (GATE)
- WATER VALVE (BUTTERFLY)
- FIRE HYDRANT/FLUSHING VALVE
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- SANITARY SEWER CLEANOUT & MANHOLE
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- STORM SEWER INLETS
- CULVERT PIPE AND HEADWALL
- TOP OF CURB ELEVATION
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- CONTOUR LINE
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- CENTER LINE OF ROW
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- FENCE LINE, WOOD
- FENCE LINE, CHAIN LINK
- FENCE LINE, BARBED WIRE
- FENCE LINE, HOG WIRE
- EDGE OF CONCRETE
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- DIMENSION LINE
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- AERIAL TELECOMM LINE
- RAILROAD LINE
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- SANITARY SEWER FORCE MAIN
- RECLAIMED WATER LINE
- NON–POTABLE WATER LINE
- GAS METER
- GAS VALVE
- PROPANE LINE
- STEAM LINE
- MISC UNDERGROUND PIPELINE LABLE
- MATCH LINE

EXISTING PLAN VIEW

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

EXISTING PROFILE VIEW

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

PROPOSED PLAN VIEW

- PAVING HEADER
- BUILDING, RESIDENTIAL
- BUILDING, COMMERCIAL
- TREE
- HEDGE
- IRON PIPE OR IRON ROD MONUMENT
- POINT OF INTERSECTION (PI)
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- NORTH OR EAST PROPERTY LINE
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- NORTH OR EAST CURB
- SOUTH OR WEST CURB
- NORTH OR EAST DITCH
- SOUTH OR WEST DITCH
- NORTH OR EAST NATURAL GROUND
- SOUTH OR WEST NATURAL GROUND
- NORTH OR EAST CULVERT
- SOUTH OR WEST CULVERT
- CENTERLINE OF ROW
- CENTERPOINT ENERGY CONDUIT
- GAS LINE
- WESTERN UNION
- AT&T CONDUIT
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- SANITARY SEWER FORCE MAIN
- RECLAIMED WATER LINE
- NON–POTABLE WATER LINE
- CENTERPOINT ENERGY MANHOLE
- AT&T MANHOLE
- WATER LINE MANHOLE
- SANITARY SEWER MANHOLE & CLEANOUT
- STORM SEWER MANHOLE
- STORM SEWER INLET

MISC STANDARD ELEMENTS

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

1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713–739–7744
Fax: 713–739–7746
www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF EDUARDO QUIROZ, P.E. (TX 85559) OF IMS ENGINEERS INC., TBPE REG NO. 18572. NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

LEGEND & ABBREVIATIONS

WBS#: R–002011–0090C–3

FOR CITY OF HOUSTON USE ONLY

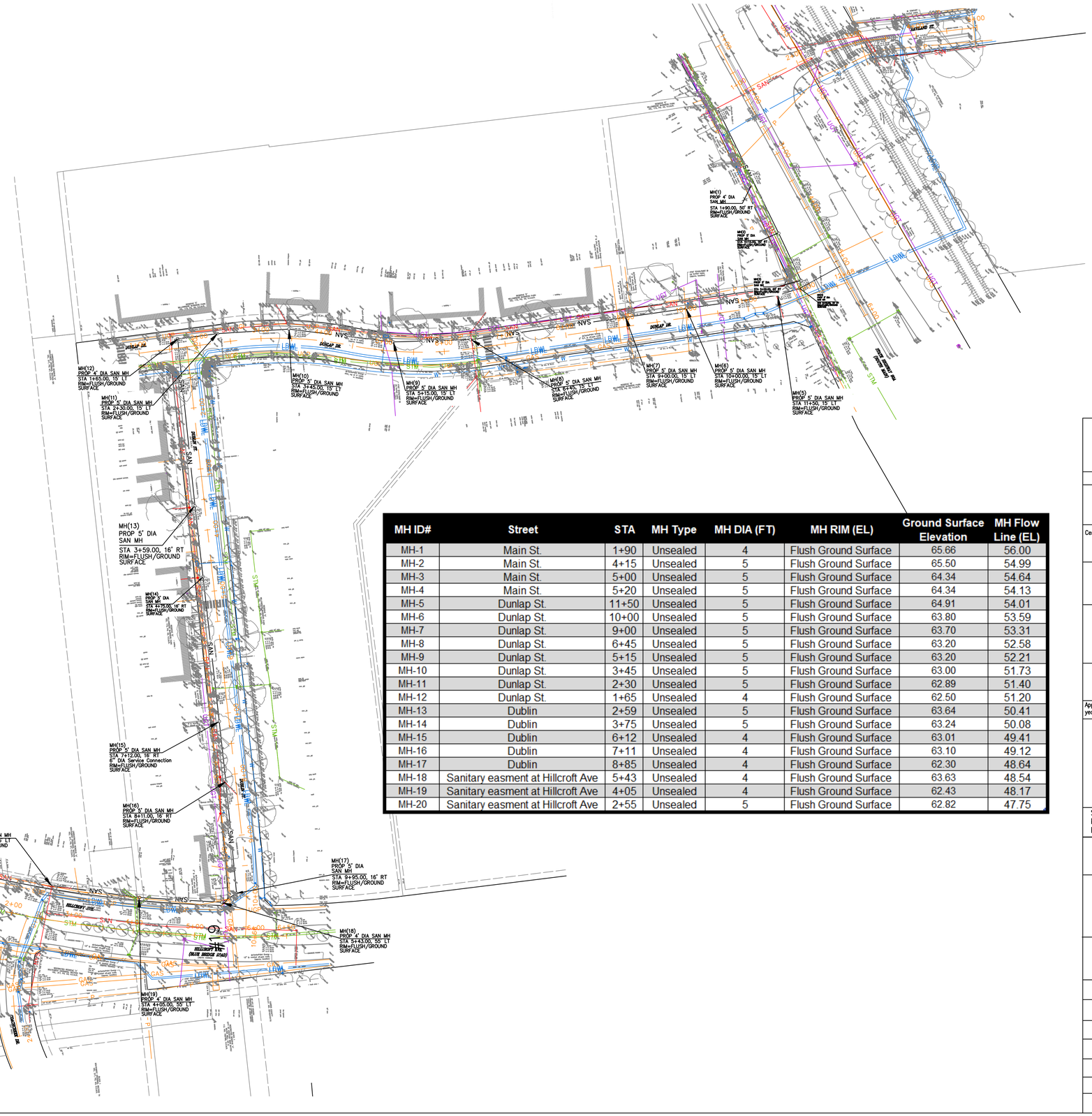
DRAWING SCALE:
NOT TO SCALE

CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:

SHEET NO. **7 of 111**

Z:\002 PROJECTS CLIENTS\001 CITY OF HOUSTON\001 PUBLIC WORKS ENGINEERING\002 FY2016 SEWERS\003 2024 NEW PROJECTS\004 ACAD\LEGEND&ABBREVIATIONS\L0001_FONDREN&DEER RIDGE.DWG\XL\KJS SAVED: Wednesday, July 01, 2026 CAD\LEGEND&ABBREVIATIONS\L0001_FONDREN&DEER RIDGE.CTB PLOTTED: Wednesday, July 01, 2026



MH ID#	Street	STA	MH Type	MH DIA (FT)	MH RIM (EL)	Ground Surface Elevation	MH Flow Line (EL)
MH-1	Main St.	1+90	Unsealed	4	Flush Ground Surface	65.66	56.00
MH-2	Main St.	4+15	Unsealed	5	Flush Ground Surface	65.50	54.99
MH-3	Main St.	5+00	Unsealed	5	Flush Ground Surface	64.34	54.64
MH-4	Main St.	5+20	Unsealed	5	Flush Ground Surface	64.34	54.13
MH-5	Dunlap St.	11+50	Unsealed	5	Flush Ground Surface	64.91	54.01
MH-6	Dunlap St.	10+00	Unsealed	5	Flush Ground Surface	63.80	53.59
MH-7	Dunlap St.	9+00	Unsealed	5	Flush Ground Surface	63.70	53.31
MH-8	Dunlap St.	6+45	Unsealed	5	Flush Ground Surface	63.20	52.58
MH-9	Dunlap St.	5+15	Unsealed	5	Flush Ground Surface	63.20	52.21
MH-10	Dunlap St.	3+45	Unsealed	5	Flush Ground Surface	63.00	51.73
MH-11	Dunlap St.	2+30	Unsealed	5	Flush Ground Surface	62.89	51.40
MH-12	Dunlap St.	1+65	Unsealed	4	Flush Ground Surface	62.50	51.20
MH-13	Dublin	2+59	Unsealed	5	Flush Ground Surface	63.64	50.41
MH-14	Dublin	3+75	Unsealed	5	Flush Ground Surface	63.24	50.08
MH-15	Dublin	6+12	Unsealed	4	Flush Ground Surface	63.01	49.41
MH-16	Dublin	7+11	Unsealed	4	Flush Ground Surface	63.10	49.12
MH-17	Dublin	8+85	Unsealed	4	Flush Ground Surface	62.30	48.64
MH-18	Sanitary easment at Hillcroft Ave	5+43	Unsealed	4	Flush Ground Surface	63.63	48.54
MH-19	Sanitary easment at Hillcroft Ave	4+05	Unsealed	4	Flush Ground Surface	62.43	48.17
MH-20	Sanitary easment at Hillcroft Ave	2+55	Unsealed	5	Flush Ground Surface	62.82	47.75

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.

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
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TX Firm 18572

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SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

CITY OF HOUSTON

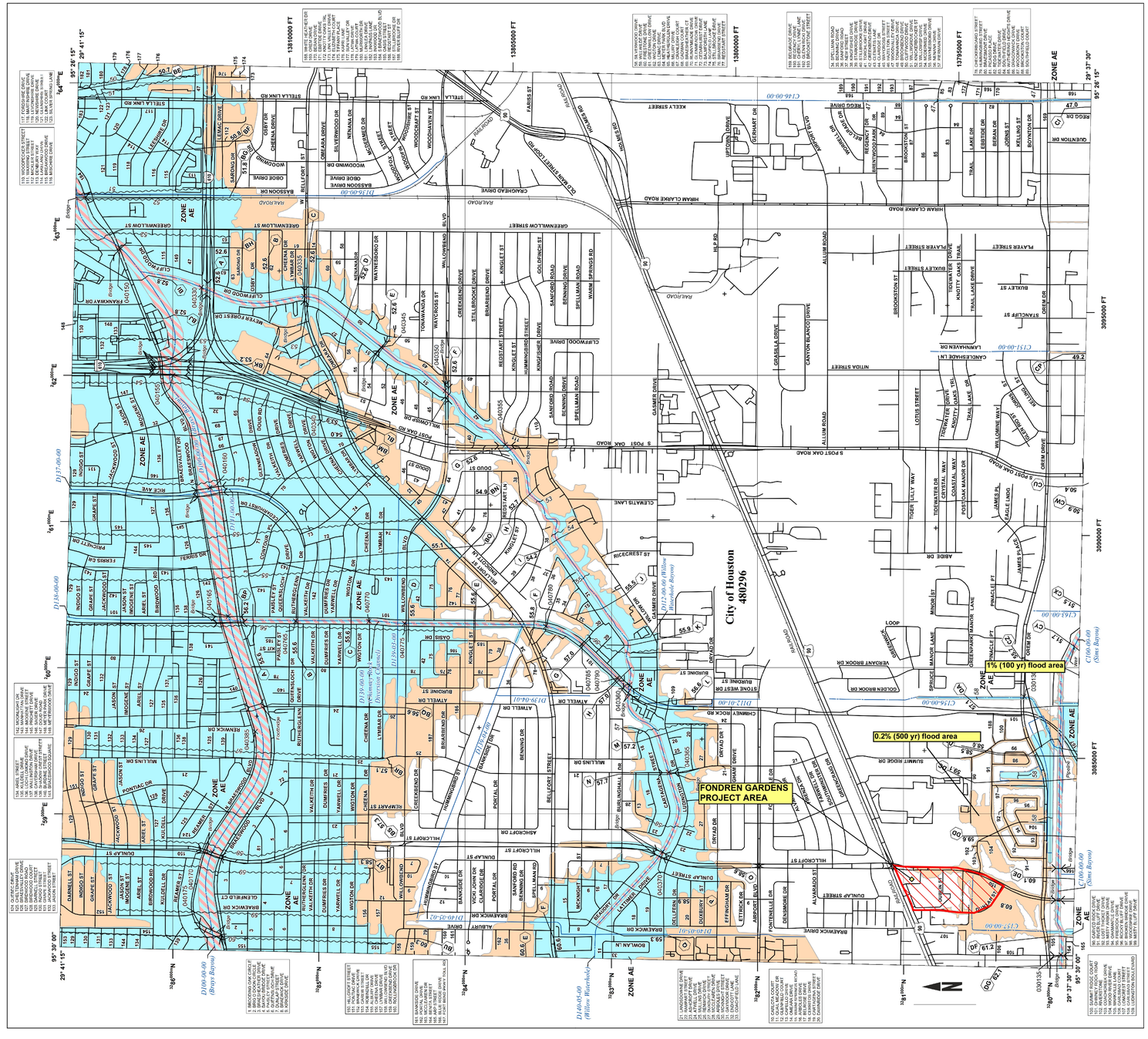
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

OVERALL LAYOUT

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **8 of 111**	

PLOT STYLE: COH_IAG_07_2016.ctb
C:\Users\Glenn\AppData\Local\Revu\00\106-578-957\CAD\PRODUCTION\200621-Fondren Gardens Overall Layout.dwgTRAFFIC CONTROL PLAN SHEET4 Jul 01, 2026 - 5:46PM glenn


FONDREN GARDENS PROJECT AREA
City of Houston 480296
1% (100 yr) flood area
0.2% (500 yr) flood area
S POST OAK ROAD
ALLUM ROAD
HILLCROFT ST
BRAESWICK DR
BRIARBEND DRIVE
BELLFORT STREET
MULLINS DR
ATWELL DR
CHIMNEY ROCK RD
BRIARGROVE LANE
BRIARMEADOW DRIVE
BRIARWOOD DRIVE
BRIARWOOD ST
BRAESWOOD BLVD
BRAESWOOD PLACE BLVD
BRAESWOOD PLACE DR
BRAESWOOD PLACE PL
BRAESWOOD PLACE WAY
BRAESWOOD PLACE CT
BRAESWOOD PLACE LN
BRAESWOOD PLACE CIR
BRAESWOOD PLACE TRL
BRAESWOOD PLACE PKWY
BRAESWOOD PLACE SQ
BRAESWOOD PLACE TER
BRAESWOOD PLACE ALY
BRAESWOOD PLACE RD
BRAESWOOD PLACE AVE
BRAESWOOD PLACE BLVD
BRAESWOOD PLACE ST

LOG OF BORING F-1

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13794874.97; E: 3081084.96
STATION: 01+94.46
OFFSET: 40.202' RT
SURFACE ELEVATION: 65.26 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 19 FT
DATE: 4/14/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 45 FT
WET ROTARY: N/A TO N/A FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.51.01.52.02.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
65	0		S1	PAVEMENT: 12.25" Concrete over 9.75" Cement Treated Base							
			S2	Stiff to very stiff, dark gray and brown, SANDY LEAN CLAY (CL) -w/ gravel and calcareous nodules 2'-6'		55.7		13	31	12	19
60	5		S3				119	13			
			S4	-w/ ferrous stains 6'-10'		56.3		22	35	12	23
55	10		S5					21			
			S6	Stiff to very stiff, reddish brown and gray, FAT CLAY (CH) -w/ ferrous stains 12'-18'		99.6		34	76	20	56
50	15		S7				96	32			
			S8	Very stiff, gray and reddish brown, FAT CLAY WITH SAND (CH)		81.5		25	55	15	40
45	20		S9	-w/ calcareous nodules and ferrous stains 18'-20'							
			S10	Very stiff to hard, gray and reddish brown, LEAN CLAY WITH SAND (CL) -w/ calcareous nodules and ferrous stains 20'-28'		73.6		20	48	16	32
40	25		S11				111	20			
			S12	Very stiff to hard, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules 28'-32' -w/ ferrous stains 28'-36'		64.9		15	23	12	11
35	30		S13				114	15			
			S14								
30	35		S15	Medium dense to dense, gray and brown, SILTY SAND (SM) -w/ clay seams 36'-40' -w/ ferrous stains 36'-38'		31.1		18	NP	NP	NP
	40		S16		25						
25			S17		35	14.5		18	NP	NP	NP
	45		S18		25						

Note: 'NP'- Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 18.0 FT; AFTER 10 MIN. AT 11.92 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 1

LOG OF BORING F-2

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13795010.22; E: 3081386.63
STATION: 05+24.73
OFFSET: 38.797' RT
SURFACE ELEVATION: 64.07 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 14 FT
DATE: 4/14/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 45 FT
WET ROTARY: N/A TO N/A FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.51.01.52.02.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0		S1	PAVEMENT: 11.25" Concrete over 1.25" Asphalt over 7" Cement Treated Base							
60	5		S2	Stiff to very stiff, brown and gray, LEAN CLAY WITH SAND (CL) -w/ calcareous nodules and ferrous stains below pavement to 8'	18	81.5	111	18	41	14	27
			S3					9			
55	10		S4	Stiff to very stiff, reddish brown and brown, FAT CLAY (CH) -w/ calcareous nodules 8'-18' -w/ ferrous stains 10'-16'		99.3		30	60	19	41
			S5				108	23			
50	15		S6			95.5		31	67	20	47
			S7								
45	20		S8	Firm to hard, brown and gray, LEAN CLAY WITH SAND (CL) -w/ calcareous nodules 18'-30' -w/ ferrous stains 18'-20'		76.9	106	21			
			S9					27	45	13	32
40	25		S10			74.7		23	45	14	31
			S11	-w/ ferrous stains 26'-32'			112	17			
35	30		S12								
			S13								
30	35		S14	Medium dense to dense, brown and gray, SILTY SAND (SM)	18			29.7	21	NP	NP	NP
			S15	-w/ ferrous stains 35.5'-43'	18			24			
25	40		S16		35						
			S17		18	14.4		22	NP	NP	NP
20	45		S18	Dense, gray and reddish brown, SAND WITH SILT (SP-SM) -w/ ferrous stains 43'-45'	24						
					35						
					40	11.6		19	NP	NP	NP

Note: 'NP'- Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 13.0 FT; AFTER 10 MIN. AT 10.67 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 2

LOG OF BORING F-3

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13794504.63; E: 3081434.17
STATION: 07+20.36
OFFSET: 06.706' LT
SURFACE ELEVATION: 63.48 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 34 FT
DATE: 4/9/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 45 FT
WET ROTARY: N/A TO N/A FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.51.01.52.02.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0		S1	PAVEMENT: 7.5" Concrete over 1" Shell w/ Sand Base		71.4		21	44	13	31
60	5		S2	Stiff to very stiff, gray and brown, LEAN CLAY WITH SAND (CL) -w/ gravel and calcareous nodules below pavement to 6' -w/ ferrous stains 4'-6'			111	15			
			S3	Very stiff, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules 6'-12' -w/ gravel 6'-8' -w/ ferrous stains 8'-12'		56.3		15	34	12	22
55	10		S4					17			
			S5	Very stiff, reddish brown and gray, FAT CLAY (CH) -w/ calcareous nodules and ferrous stains 12'-20'		97.2		26	53	16	37
50	15		S6				106	24			
			S7			95.6		22	57	19	38
45	20		S8	Very stiff to hard, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules 20'-34'			104	20			
			S9			66.6		18	47	13	34
40	25		S10								
			S11	-w/ ferrous stains 26'-34'			117	15			
35	30		S12			62.4		17	33	11	22
			S13					15			
30	35		S14	Medium dense, gray and brown, SAND WITH SILT (SP-SM) -w/ ferrous stains 34'-36'	11	11.6		16	NP	NP	NP
			S15		11						
25	40		S16	Dense, gray, brown and reddish brown, SILTY SAND (SM)	23			17			
			S17		35	12.2		20	NP	NP	NP
20	45		S18		35						
					42			17			

Note: 'NP'- Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 34.0 FT; AFTER 10 MIN. AT 14.42 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 3

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.

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

BORING LOG

FONDREN GARDENS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. 10 of 111	

PLOT STYLE: COH_IAG_07_2016.ctb

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LOG OF BORING F-4 (PZ-2)

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13794019.5; E: 3081395.97
STATION: 02+30.67
OFFSET: 06.702' LT
SURFACE ELEVATION: 62.89 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 32 FT
DATE: 4/10/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 45 FT
WET ROTARY: N/A TO N/A FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.51.01.52.02.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			PAVEMENT: 7" Concrete over 2" Shell w/ Sand Base				22			
60				Stiff to very stiff, dark gray and gray, LEAN CLAY WITH SAND (CL) -w/ calcareous nodules and gravel below pavement to 6' -w/ ferrous stains below pavement to 4'		73.2		18	45	14	31
	5						112	17			
55				Stiff to hard, gray and reddish brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules and gravel 6'-12' -w/ ferrous stains 8'-12'		59.5		18	41	13	28
	10										
								23			
50				Stiff to very stiff, gray, brown and reddish brown, FAT CLAY (CH) -w/ calcareous nodules and ferrous stains 12'-16'		98.6		27	58	19	39
	15						97	26			
45											
	20					88.0		24	57	17	40
				Very stiff to hard, gray, brown and reddish brown, LEAN CLAY WITH SAND (CL) -w/ ferrous stains 20'-36' -w/ calcareous nodules 22'-26'			111	24			
40											
	25					75.6		18	37	13	24
35							116	17			
	30										
30				-w/ calcareous nodules and gravel 32'-36'		74.8		17	29	11	18
	35										
								17			
				Very stiff to hard, gray, brown and reddish brown, FAT CLAY (CH) -w/ calcareous nodules and ferrous stains 36'-40'		96.5		20	53	15	38
25	40						111	20			
20					16	97.0		26	55	14	41
	45				20						

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 33.1 FT; AFTER 10 MIN. AT 30.33 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: 6.0 FT; AFTER 30 DAYS AT 5.75 FT

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 4

LOG OF BORING F-5

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13793983.27; E: 3081765.4
STATION: 03+60.55
OFFSET: 03.243' LT
SURFACE ELEVATION: 63.24 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 30 FT
DATE: 4/9/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 45 FT
WET ROTARY: N/A TO N/A FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.51.01.52.02.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			PAVEMENT: 7" Concrete							
				Stiff, dark gray, LEAN CLAY WITH SAND (CL) -w/ gravel below pavement to 4'		75.0		23	42	13	29
60											
	5			Very stiff, brown and gray, SANDY LEAN CLAY (CL) -w/ calcareous nodules and ferrous stains 4'-8'		67.0		26	45	14	31
55							110	18			
	10			Very stiff, reddish brown and gray, LEAN CLAY WITH SAND (CL) -w/ ferrous stains 8'-14'							
						74.4		23	40	13	27
50											
	15			Stiff to very stiff, reddish brown and light gray, FAT CLAY (CH) -w/ calcareous nodules and ferrous stains 14'-24'		90.2		25	54	16	38
45							103	23			
	20							20			
40							91	21			
	25			Very stiff to hard, light brown, reddish brown and gray, LEAN CLAY (CL) -w/ calcareous nodules 24'-28' -w/ ferrous stains 24'-30'		88.2		18	45	14	31
35							115	15			
	30										
30				Hard, light gray, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules and ferrous stains 30'-36'		54.6		13	31	13	18
	35							16			
				Very stiff to hard, gray, brown and reddish brown, FAT CLAY (CH) -w/ ferrous stains 36'-40'		91.7		22	61	15	46
25	40						110	20			
				-w/ calcareous nodules 40'-45'							
20						98.7		21	58	19	39
	45										

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 30.0 FT; AFTER 10 MIN. AT 17.0 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 5

LOG OF BORING F-6

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13794001.51; E: 3082238.48
STATION: 08+33.94
OFFSET: 06.709' LT
SURFACE ELEVATION: 62.68 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 26.5 FT
DATE: 4/13/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 45 FT
WET ROTARY: N/A TO N/A FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.51.01.52.02.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			PAVEMENT: 7" Concrete		74.6		24	47	13	34
				Stiff, dark gray and gray, LEAN CLAY WITH SAND (CL) -w/ calcareous nodules and ferrous stains below pavement to 6'							
60	5						105	22			
				Stiff to very stiff, brown, gray and reddish brown, FAT CLAY (CH) -w/ ferrous stains 6'-16' -w/ calcareous nodules 6'-8'		87.3		23	51	14	37
55	10										
50						99.6		26	58	18	40
	15			Stiff to very stiff, gray and brown, LEAN CLAY WITH SAND (CL) -w/ ferrous stains 16'-26'			111	20			
45				-w/ calcareous nodules 18'-26'		75.0		19	46	14	32
	20										
40						70.0		17	42	13	29
	25										
				Very stiff to hard, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules and ferrous stains 26'-32'		50.7		15	31	14	17
35							117	15			
	30										
30				Medium dense, gray and brown, SAND WITH SILT (SP-SM)	18	10.5		17	NP	NP	NP
	35				18						
				-w/ clay seams 35'-36.5'	18			18			
				Very stiff, gray and brown, SANDY LEAN CLAY (CL)	23	52.1		20	28	12	16
25	40			Medium dense to dense, gray and brown, SAND WITH SILT (SP-SM) -w/ clay seams at 38'-39.5' -w/ ferrous stains 41'-45'	32						
					35						
					36						
20					37	10.4		16	NP	NP	NP
	45				24						

Note: 'NP'- Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 32.0 FT; AFTER 10 MIN. AT 13.83 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 6

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.

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)
FONDREN GARDENS AREA

BORING LOG
FONDREN GARDENS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. 11 of 111	

PLOT STYLE: COH_IAG_07_2016.ctb

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LOG OF BORING F-7

PROJECT: Neighborhood Sewer System Imp (Fondren Gardens)
LOCATION: N: 13793685.03; E: 3082286.59
STATION: 02+68.60
OFFSET: 33.07' LT
SURFACE ELEVATION: 61.11 FT

PROJECT NO.: HGT1510260.5.3 (B)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 17 FT
DATE: 4/13/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 22 FT
WET ROTARY: 22 TO 45 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
⊘ UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			0.51.01.52.02.5							
60				PAVEMENT: 9.5" Concrete over 7.5" Cement Treated Base							
				Firm to hard, dark gray and brown, LEAN CLAY WITH SAND (CL)		76.3		26	46	14	32
55	5			-w/ gravel below pavement to 2'			107	22			
						74.2		27	45	14	31
50	10			-w/ calcareous nodules and ferrous stains 8'-22'		72.3		26	44	12	32
45	15					79.5		20	47	15	32
							118	17			
40	20					81.8		16	42	13	29
				Very stiff to hard, gray, brown and reddish brown, SANDY LEAN CLAY (CL)			116	16			
35	25			-w/ ferrous stains 22'-32'		67.2		16	33	12	21
							116	16			
30	30			Very stiff to hard, gray and brown, LEAN CLAY WITH SAND (CL)	21	78.7		20	37	12	25
25	35			-w/ calcareous nodules and ferrous stains 32'-37'	35						
				Hard, reddish brown, brown and gray, LEAN CLAY (CL)	39			19			
20	40			-w/ calcareous nodules 37'-45'	37			24			
						93.5		17	41	13	28
	45										

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 16.0 FT; AFTER 10 MIN. AT 11.0 FT
▽ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Star Drilling Logged By: MA

HVJ Associates, Inc.

APPENDIX A- 7

SOIL SYMBOLS

Soil Types: Clay, Silt, Sand, Gravel
Modifiers: Clayey, Silty, Sandy, Cemented
Construction Materials: Asphaltic Concrete, Stabilized Base, Fill or Debris, Portland Cement Concrete

SAMPLER TYPES

Thin Walled Shelby Tube; No Recovery; Split Barrel; Core; Liner Tube; Jar Sample

WATER LEVEL SYMBOLS

Groundwater level after drilling in open borehole or piezometer
Groundwater level determined during drilling operations

SOIL GRAIN SIZE

Classification	Particle Size	Particle Size or Sieve No. (U.S. Standard)
Clay	< 0.002 mm	< 0.002 mm
Silt	0.002 - 0.075 mm	0.002 mm - #200 sieve
Sand	0.075 - 4.75 mm	#200 sieve - #4 sieve
Gravel	4.75 - 75 mm	#4 sieve - 3 in.
Cobble	75 - 200 mm	3 in. - 8 in.
Boulder	> 200 mm	> 8 in.

DENSITY OF COHESIONLESS SOILS

Descriptive Term	Penetration Resistance "N" * Blows/Foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

CONSISTENCY OF COHESIVE SOILS

Consistency	Undrained Shear Strength (tsf)	Penetration Resistance "N" * Blows/Foot
Very Soft	0 - 0.125	0 - 2
Soft	0.125 - 0.25	2 - 4
Firm	0.25 - 0.5	4 - 8
Stiff	0.5 - 1.0	8 - 16
Very Stiff	1.0 - 2.0	16 - 32
Hard	> 2.0	> 32

PENETRATION RESISTANCE

3/6 — Blows required to penetrate each of three consecutive 6-inch increments per ASTM D-1586 *
50/4" — If more than 50 blows are required, driving is discontinued and penetration at 50 blows is noted
0/18" — Sampler penetrated full depth under weight of drill rods and hammer

* The N value is taken as the blows required to penetrate the final 12 inches

TERMS DESCRIBING SOIL STRUCTURE

Slickensided — Fracture planes appear polished or glossy, sometimes striated
Fissured — Breaks along definite planes of fracture with little resistance to fracturing
Inclusion — Small pockets of different soils, such as small lenses of sand scattered through a mass of clay
Parting — Inclusion less than 1/4 inch thick extending through the sample
Seam — Inclusion 1/4 inch to 3 inches thick extending through the sample
Layer — Inclusion greater than 3 inches thick extending through the sample
Laminated — Soil sample composed of alternating partings of different soil type
Stratified — Soil sample composed of alternating seams or layers of different soil type
Intermixed — Soil sample composed of pockets of different soil type and laminated or stratified structure is not evident
Calcareous — Having appreciable quantities of calcium carbonate
Ferrous — Having appreciable quantities of iron
Nodule — A small mass of irregular shape

6120 S. Dairy Ashford Road
Houston, Texas 77072-1010
281.933.7388
281.933.7293 Fax

KEY TO TERMS AND SYMBOLS USED ON BORING LOGS
WBS NO.: R-002011-0090C-3

PROJECT NO.: HGT125351023646.02
DRAWING NO.: 65.13B (BA))APPENDIX A-58

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.

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

BORING LOG
FONDREN GARDENS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. 12 of 111	

PLOT STYLE: COH_IAG_07_2016.ctb

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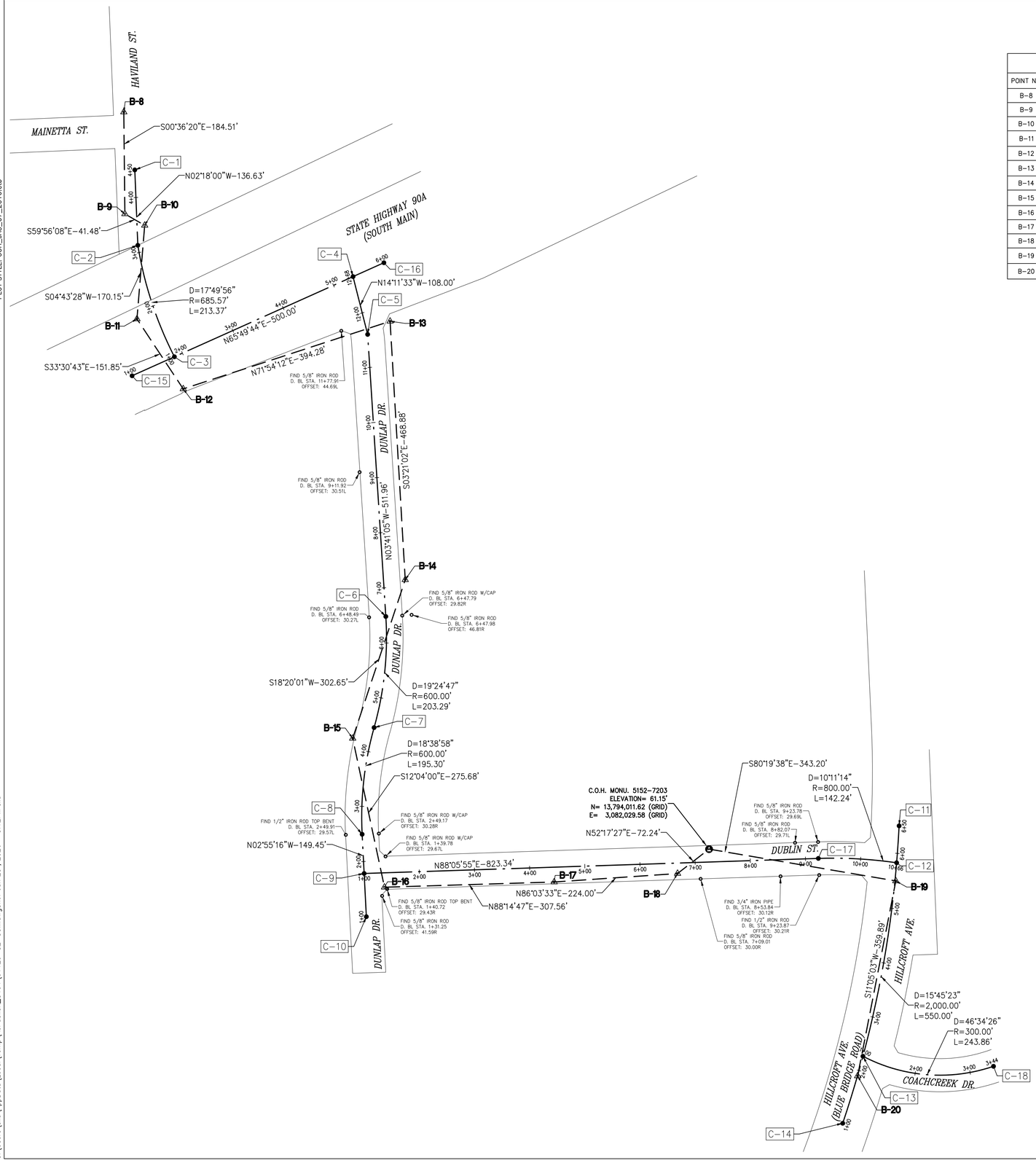

PLOT STYLE: COH_JAG_07_2016.ctb

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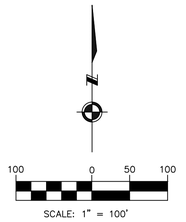
APP.			
NO.	DATE	REVISION	

SURVEY BASELINE POINTS DATA (TEMPORARY BENCHMARK)

POINT No.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)	ELEVATION	D. BL STA.	OFFSET	DESCRIPTION
B-8	13,797,139.85	3,081,369.88	13,795,346.46	3,080,969.35	66.67'	–	–	SET 'X' CUT ON CONC.
B-9	13,796,955.35	3,081,371.83	13,795,161.98	3,080,971.30	67.29'	3+71.15	21.15L	SET MAG NAIL
B-10	13,796,934.57	3,081,407.72	13,795,141.21	3,081,007.19	68.22'	3+48.94	13.89R	SET MAG NAIL
B-11	13,796,765.00	3,081,393.71	13,794,971.65	3,080,993.18	68.08'	1+87.59	35.11L	SET 1/2" IRON ROD W/CAP
B-12	13,796,638.39	3,081,477.54	13,794,845.06	3,081,077.00	65.53'	1+74.81	59.62R	SET 'X' CUT ON CONC.
B-13	13,796,760.86	3,081,852.32	13,794,967.52	3,081,451.73	63.95'	11+73.06	45.25R	SET 1/2" IRON ROD W/CAP
B-14	13,796,292.78	3,081,879.72	13,794,499.50	3,081,479.13	63.64'	7+12.23	39.37R	SET 'X' CUT ON CONC.
B-15	13,796,005.50	3,081,784.53	13,794,212.25	3,081,383.95	64.44'	4+16.96	32.75L	SET 1/2" IRON ROD W/CAP
B-16	13,795,735.91	3,081,842.16	13,793,942.70	3,081,441.57	62.70'	1+36.04	26.06R	SET 'X' CUT ON CONC.
B-17	13,795,745.32	3,082,149.57	13,793,952.11	3,081,748.94	63.61'	4+43.59	26.85R	SET 'X' CUT ON CONC.
B-18	13,795,760.72	3,082,373.04	13,793,967.50	3,081,972.39	62.28'	6+67.45	18.88R	SET 'X' CUT ON CONC.
B-19	13,795,747.24	3,082,768.52	13,793,954.02	3,082,367.81	62.50'	5+50.06	1.54R	SET 1/2" IRON ROD W/CAP
B-20	13,795,394.06	3,082,699.33	13,793,600.90	3,082,298.63	62.32'	1+89.85	0.27R	SET 1/2" IRON ROD W/CAP

DESIGN BASELINE POINTS DATA

POINT No.	D. BL STA.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)
C-1	4+50.00	13,797,034.99	3,081,389.79	13,795,241.61	3,080,989.26
C-2	3+13.37	13,796,898.47	3,081,395.28	13,795,105.11	3,080,994.75
C-3	1+00.00	13,796,696.56	3,081,461.56	13,794,903.23	3,081,061.02
C-4	12+68.00	13,796,841.81	3,081,785.18	13,795,048.45	3,081,384.60
C-5	11+60.00	13,796,737.10	3,081,811.66	13,794,943.76	3,081,411.07
C-6	6+48.04	13,796,226.20	3,081,844.56	13,794,432.92	3,081,443.97
C-7	4+44.74	13,796,024.99	3,081,823.34	13,794,231.74	3,081,422.75
C-8	2+49.45	13,795,831.77	3,081,801.65	13,794,038.55	3,081,401.07
C-9	1+78.34	13,795,760.76	3,081,805.28	13,793,967.54	3,081,404.69
C-10	1+00.00	13,795,682.52	3,081,809.27	13,793,889.31	3,081,408.68
C-11	6+50.00	13,795,847.04	3,082,774.46	13,794,053.81	3,082,373.75
C-12	5+82.98	13,795,780.17	3,082,770.00	13,793,986.95	3,082,369.29
C-13	2+26.87	13,795,429.81	3,082,708.97	13,793,636.64	3,082,308.27
C-14	1+00.00	13,795,308.37	3,082,672.31	13,793,515.21	3,082,271.61
C-15	1+00.00	13,796,662.15	3,081,384.88	13,794,868.82	3,080,984.36
C-16	6+00.00	13,796,866.88	3,081,841.05	13,795,073.52	3,081,440.46
C-17	9+23.34	13,795,788.08	3,082,628.16	13,793,994.86	3,082,227.47
C-18	3+43.86	13,795,411.56	3,082,945.47	13,793,618.39	3,082,544.74



BENCHMARK:

CITY OF HOUSTON MONUMENT 5152-7203 A BRASS DISK IN CONCRETE LOCATED ON THE NORTH SIDE OF DUBLIN ST APPROXIMATELY 340 FEET WEST FROM THE HILLCROFT ST INTERSECTION.

ELEV. 61.15 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 13, 2026.

NOTE:

ALL BEARINGS AND DISTANCES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NO. 4204, NAD83. ALL DISTANCES ARE IN SURFACE.

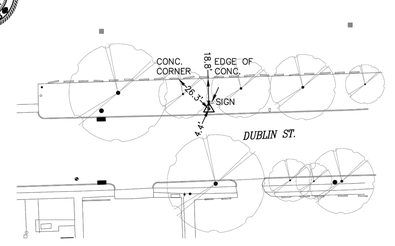
THE COORDINATES SHOWN HEREON ARE TEXAS SOUTH CENTRAL ZONE NO. 4204 STATE PLANE GRID COORDINATES (NAD83) AND MAY BE BROUGHT TO SURFACE BY DIVIDING BY THE COMBINED SCALE FACTOR 0.999870017.

LEGEND:

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

CITY OF HOUSTON

CITY SURVEY 5152
7203
SITE CONTROL MONUMENT



Project WBS# R-002011-090C-3
Texas Coordinate System of 1983, South Central Zone, U. S. Survey Feet
X= 3,082,029.58'
Y= 13,794,011.62'
Lat.= 29° 37' 55.0444" (N)
Lon.= 95° 29' 39.3276" (W)
Reference Frame Used: NAD '83 (2011) (EPOCH: 2010)
Vertical Adjustment used: NAVD '88
General Location: LOCATED APROX. 3 FEET ABOVE CURB ON THE NORTH SIDE OF DUBLIN STREET TO THE LEFT OF THE HILLCROFT AVE INTERSECTION ABOUT 340'
Date Set: 05-25-2010 Type of Mark: 4B

Keymap Page: 571J
Orthometric Elevation =61.15 FEET
Ellipsoid Height= -28.2742 FEET
Geoid: GEOID '18
Datum Source & Adjustment: GPS STATIC

3 Nearest project control points (bearings and distances stated below):
1 S 52° 21' 08" W 72.24'
2 S 78° 01' 37" W 286.92'
3 S 80° 20' 08" E 343.14'

NOTE:
1. Coordinates are shown in grid
2. Scale Factor = (S.F. 0.999870017)
3. Surface= Grid / S.F.

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

Date Revised: 03-14-2026
City of Houston, Harris County, Texas

IMS ENGINEERS
1225 North Loop West
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 Westoffice Dr., Suite 800, Houston, Texas 77042
Tel: 713-975-8769, Fax: 713-975-0920, www.kuoassociates.com
TBPE Firm Registration No. F-4578
TBPLS Firm Registration No. 1007560

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

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF

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

ON 06/23/2026
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

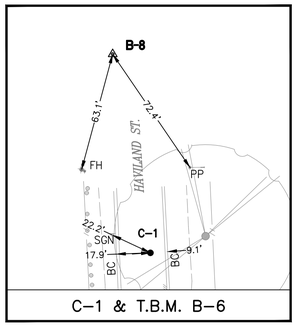
NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS

FONDREN GARDENS

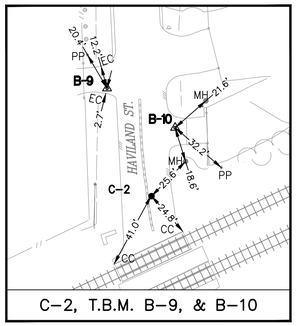
SURVEY CONTROL MAP

(SHEET 1 OF 2)

WBS NUMBER
R-002011-0090C-3
DRAWING SCALE
1" = 100'
CITY OF HOUSTON PM
SHEET NO. 13 of 111



C-1 & T.B.M. B-6



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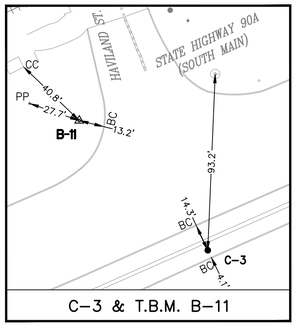

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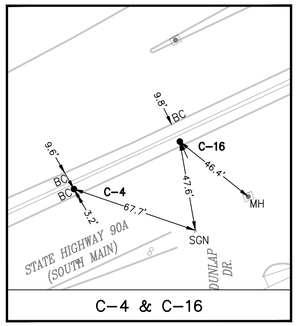

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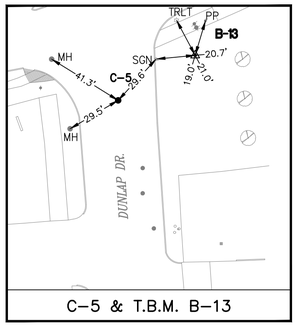

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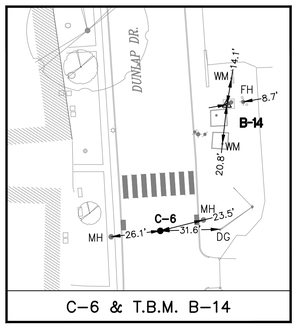

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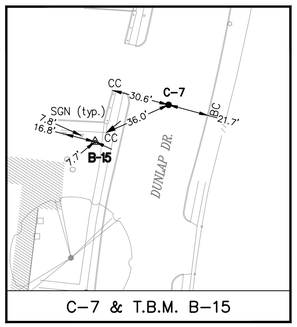

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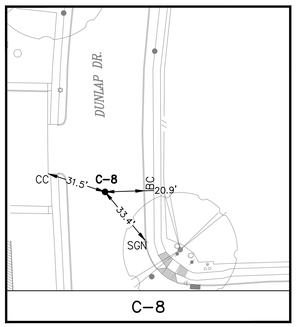
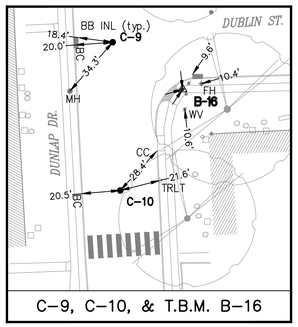
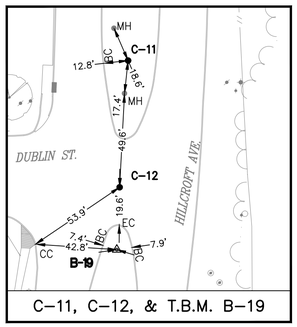


C-8



C-9, C-10, & T.B.M. B-16



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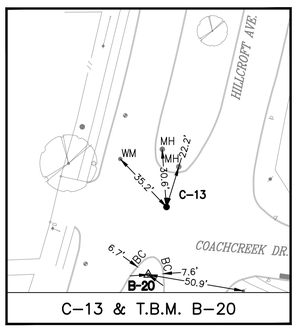

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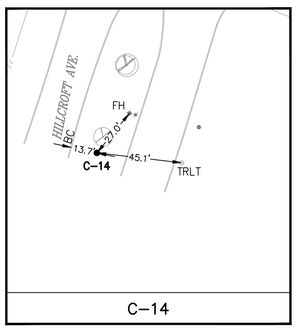

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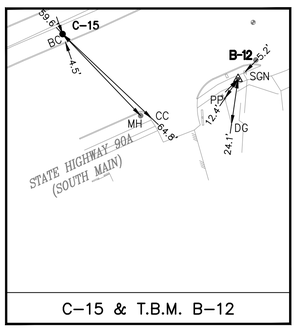
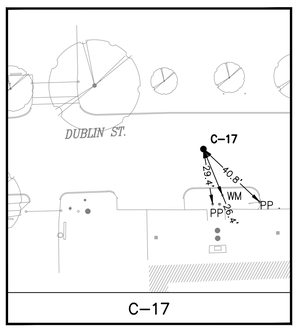


C-15 & T.B.M. B-12



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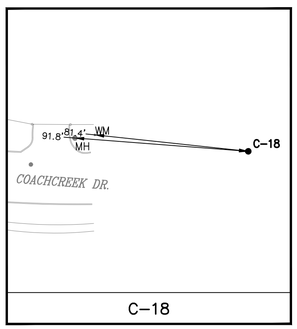

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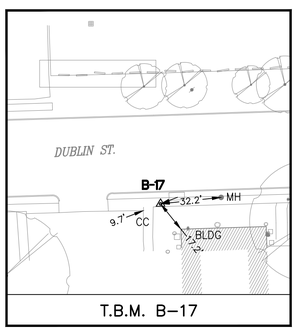

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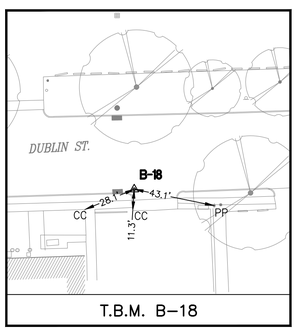

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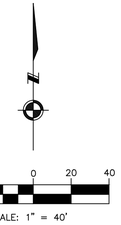

EXIST. TOPOGRAPHIC LEGEND

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

ABBREVIATIONS

BC – BACK OF CURB
BLDG – BUILDING CORNER
CC – CONCRETE CORNER
EA – EDGE OF ASPHALT
EC – EDGE OF CONCRETE
EG – EDGE OF GRAVEL
EF – EDGE OF FENCE
FH – FIRE HYDRANT
FC – FENCE CORNER
INL – INLET
LT – LIGHT POLE
MH – MANHOLE
PP – POWER POLE
PP/LT – POWER POLE W/LIGHT
STLT – STREET LIGHT
TRLT – TRAFFIC LIGHT
WM – WATER METER

NO.	DATE	REVISION	APP.

ims ENGINEERS
1225 North Loop West
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Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 Westoffice Dr., Suite 800, Houston, Texas 77042
Tel: 713-975-8769, Fax: 713-975-0920, www.kuoassociates.com
TBPE Firm Registration No.: F-4578
TBPLS Firm Registration No. 1007560

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

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

ON 06/23/2026
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS

FONDREN GARDENS

SURVEY CONTROL MAP

(SHEET 2 OF 2)

WBS NUMBER	
R-002011-0090C-3	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
SHEET NO. **14 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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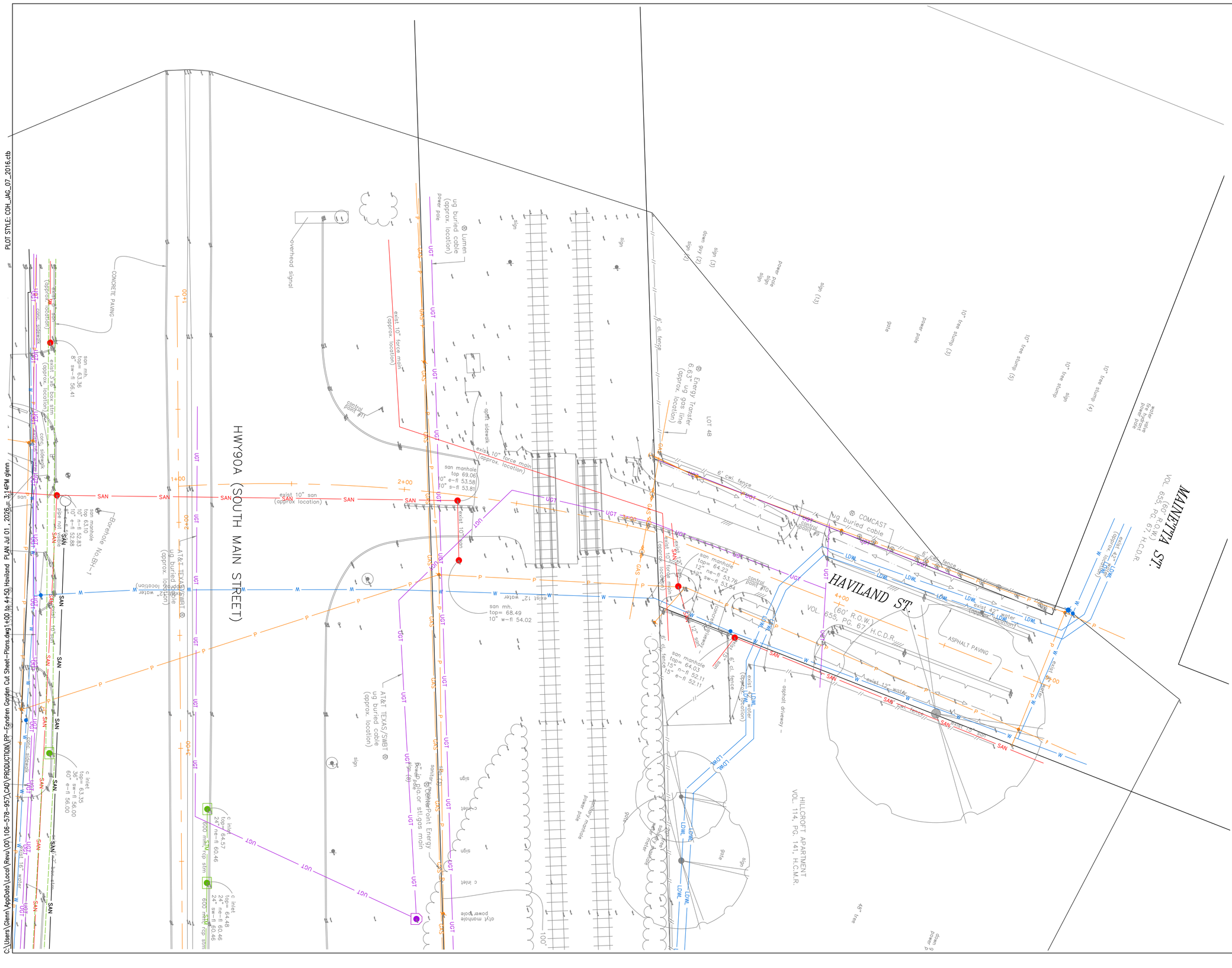

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CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

NO.	DATE	REVISION	APP.

60% SUBMITTAL

BENCHMARK:
CITY OF HOUSTON MONUMENT 5152-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXMATELY 340 FEET WESR FROM THE HILLCROFT ST INTERSECTION.

ELEV. 61.15 FEET NAVD 1988 (GEOID '18)*

*OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 13, 2026.

HORIZONTAL DATUM:
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Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

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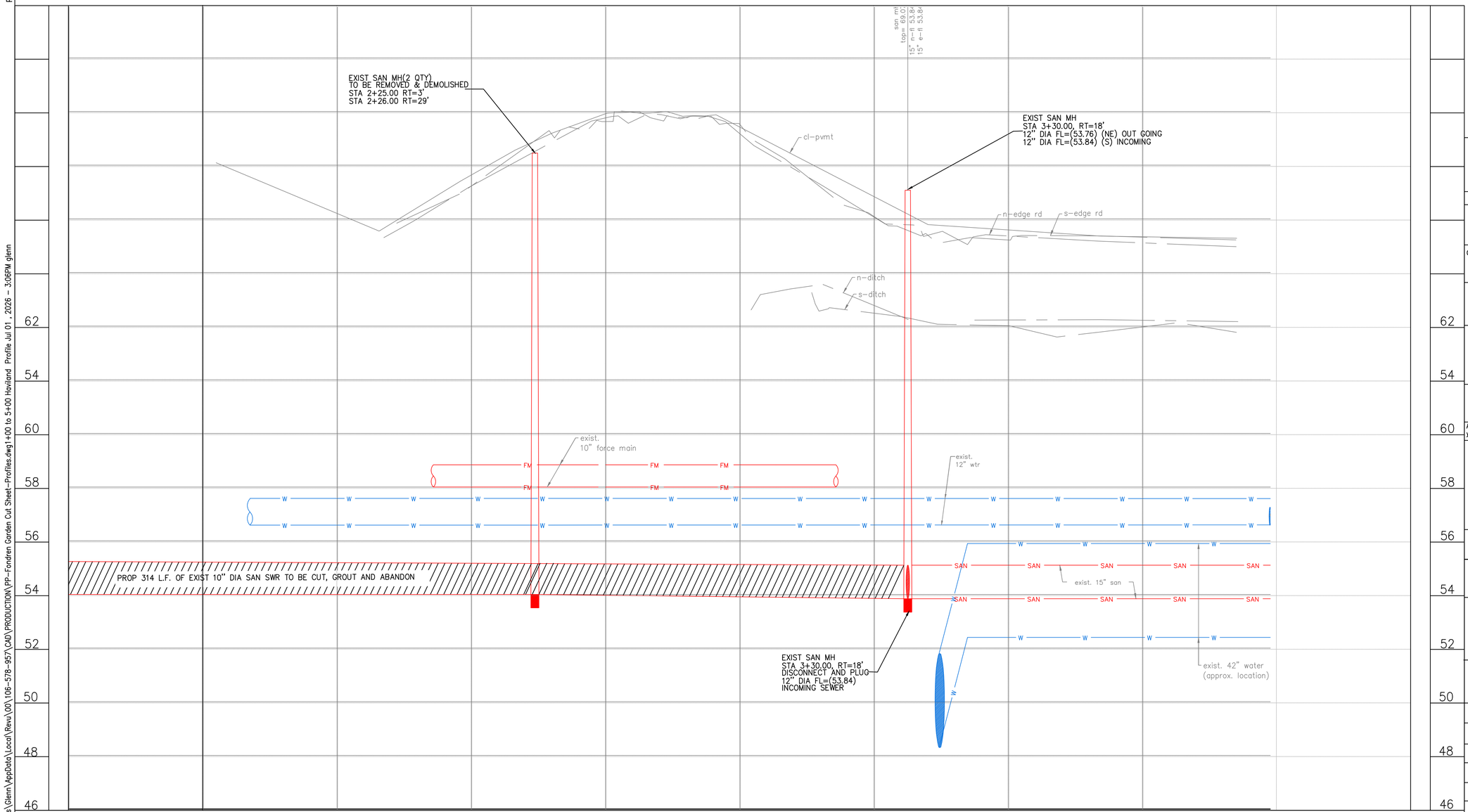
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
HAVILAND STREET
STA 1+00 TO STA 4+50.00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **15 of 111**	



CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
HAVILAND STREET
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **16 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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PLOT STYLE: COH_IAG_07_2016.ctb
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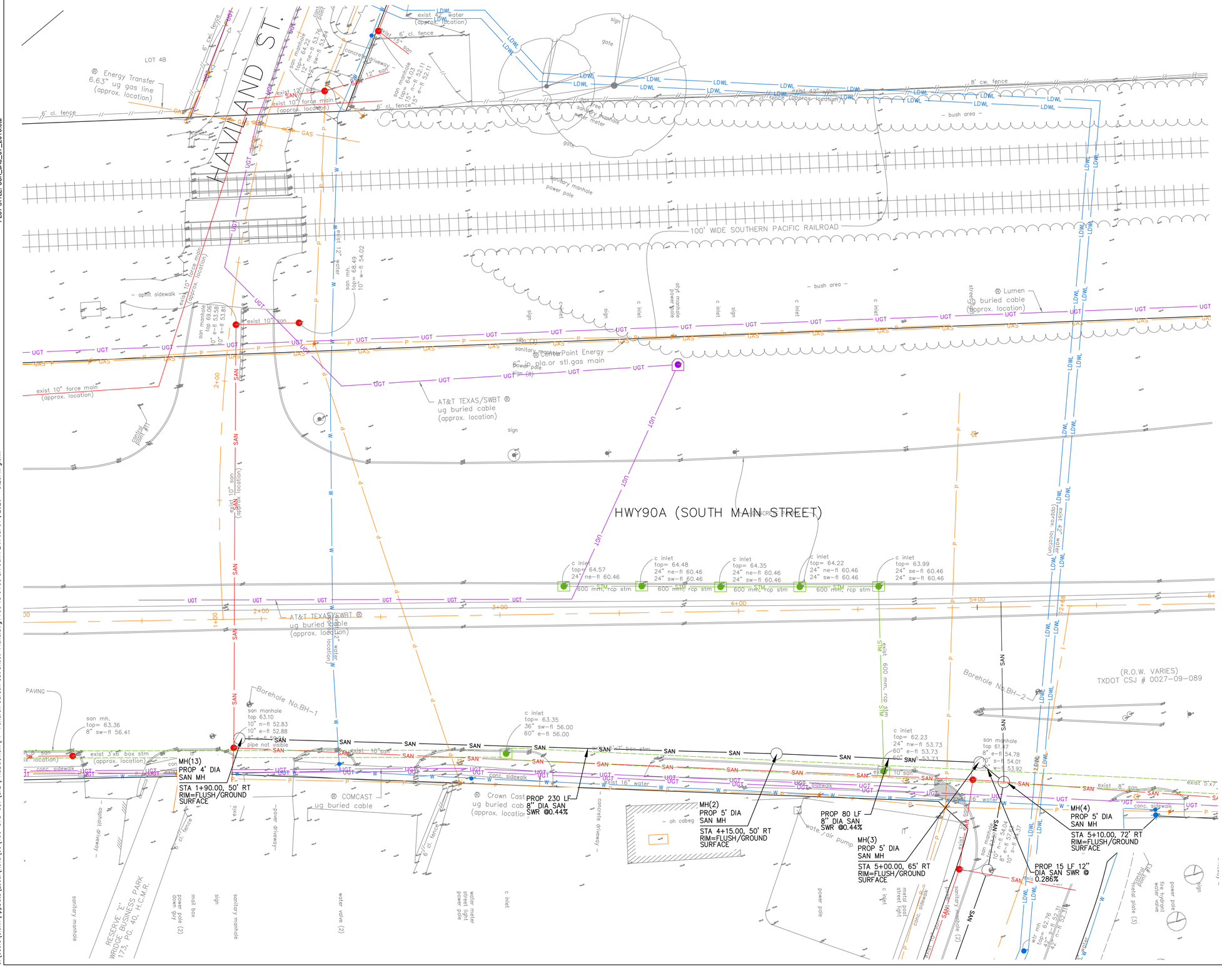
HAWLAND ST.
HWY90A (SOUTH MAIN STREET)
100' WIDE SOUTHERN PACIFIC RAILROAD
(R.O.W. VARIES)
TXDOT CSJ # 0027-09-089
LOT 4B
Energy Transfer 6.63" ug gas line (approx. location)
AT&T TEXAS/SWBT ug buried cable (approx. location)
CenterPoint Energy 6" in pla.or stl.gas main
Lumen ug buried cable (approx. location)
COMCAST ug buried cable
Crown Castle ug buried cable (approx. location)
exist 10" force main (approx. location)
exist 12" water (approx. location)
exist 42" water (approx. location)
exist 16" water
exist 10" san
exist 8" san
exist 6" cw. fence
6' cl. fence
8' cw. fence
8' cl. fence (approx. location)
exist 15" san
exist 12" san
exist 10" force main (approx. location)
exist 3'x6' box stm
exist 5'x7' box stm
exist 6'x7' box stm
exist 6'x8' box stm
exist 7'x8' box stm
exist 8'x8' box stm
exist 8'x9' box stm
exist 9'x9' box stm
exist 10'x10' box stm
exist 10'x11' box stm
exist 11'x11' box stm
exist 12'x12' box stm
exist 13'x13' box stm
exist 14'x14' box stm
exist 15'x15' box stm
exist 16'x16' box stm
exist 17'x17' box stm
exist 18'x18' box stm
exist 19'x19' box stm
exist 20'x20' box stm
exist

PLOT STYLE: COH_JAG_07_2016.ctb

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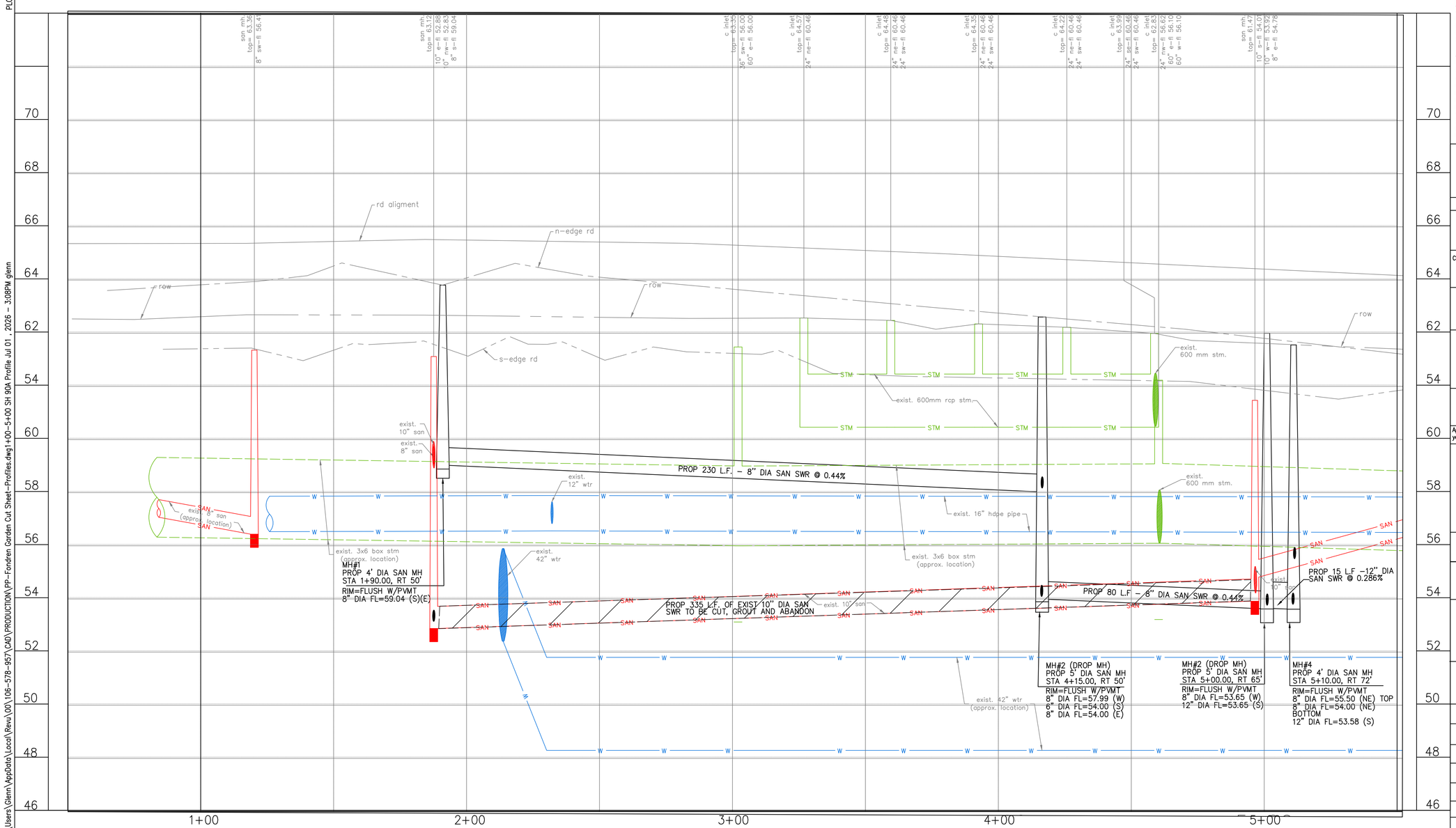

N

CITY OF HOUSTON

0 10 20 40

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON MONUMENT 5152-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXMATELY 340 FEET WESR FROM THE HILLCROFT ST INTERSECTION.

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CITY OF HOUSTON

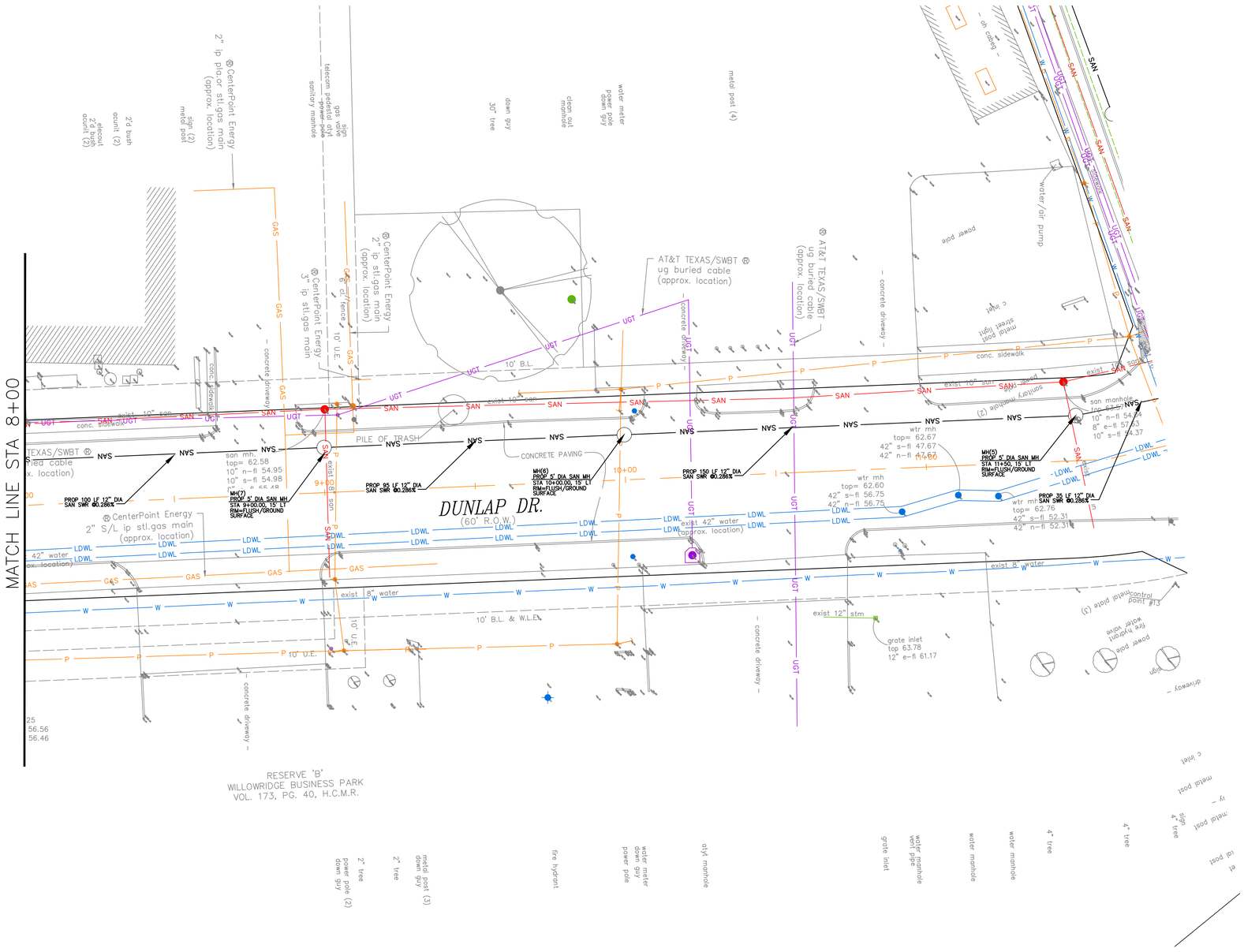
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
SH 90A
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **18 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb



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0 10 20 40
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
DUNLAP DRIVE
STA 8+00 TO STA 11+81

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **19 of 111**	

NO.	DATE	REVISION	APP.

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PLOT STYLE: COH_JAG_07_2016.ctb

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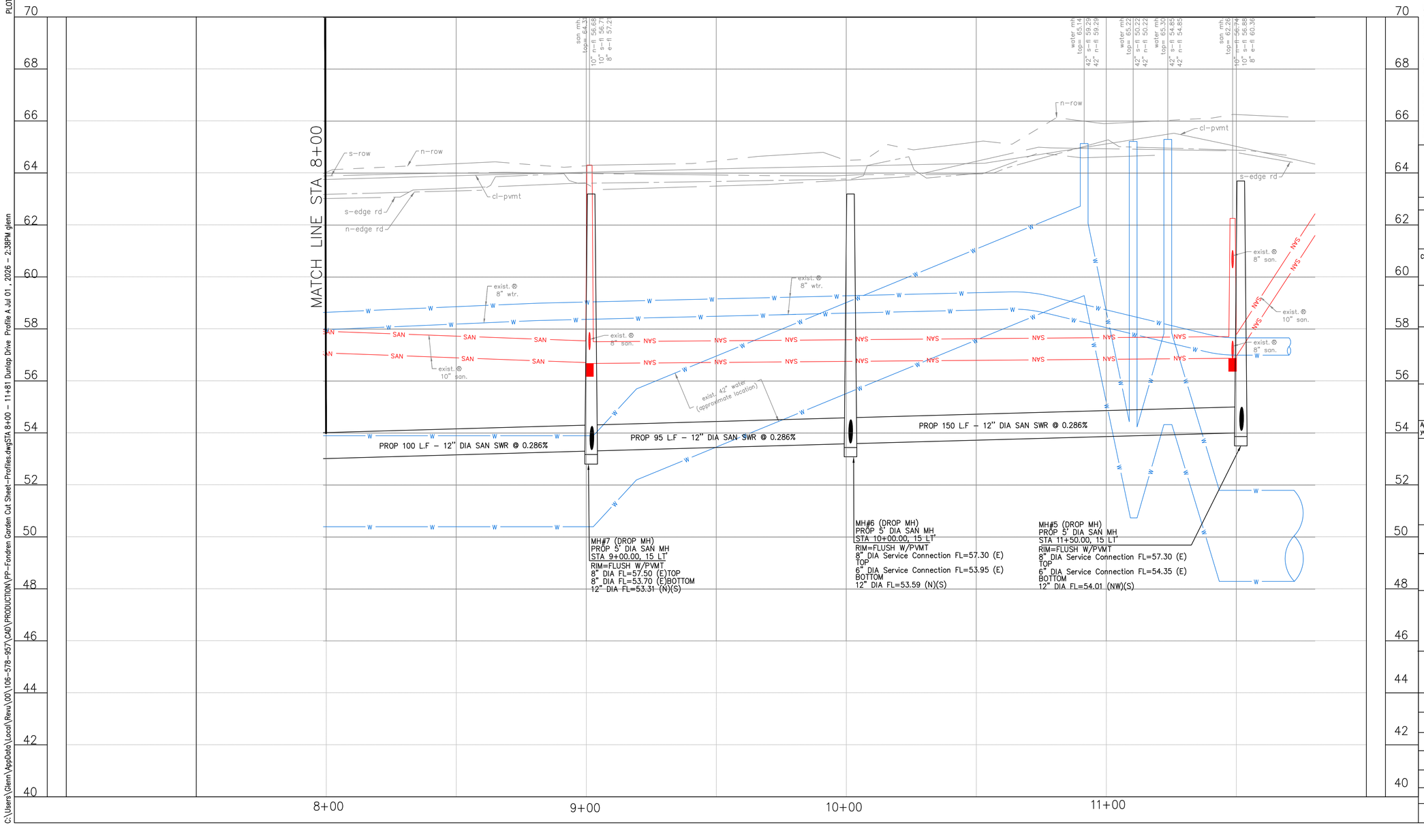

CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

NO.	DATE	REVISION	APP.

60% SUBMITTAL

BENCHMARK:
CITY OF HOUSTON MONUMENT 5152-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXMATELY 340 FEET WESR FROM THE HILLCROFT ST INTERSECTION.

ELEV. 61.15 FEET NAVD 1988 (GEOID '18)*

*OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 13, 2026.

HORIZONTAL DATUM:
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VERIFICATION OF PRIVATE UTILITY LINES

Date

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ims
1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
DUNLAP DRIVE
STA 8+00 TO STA 11+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **20 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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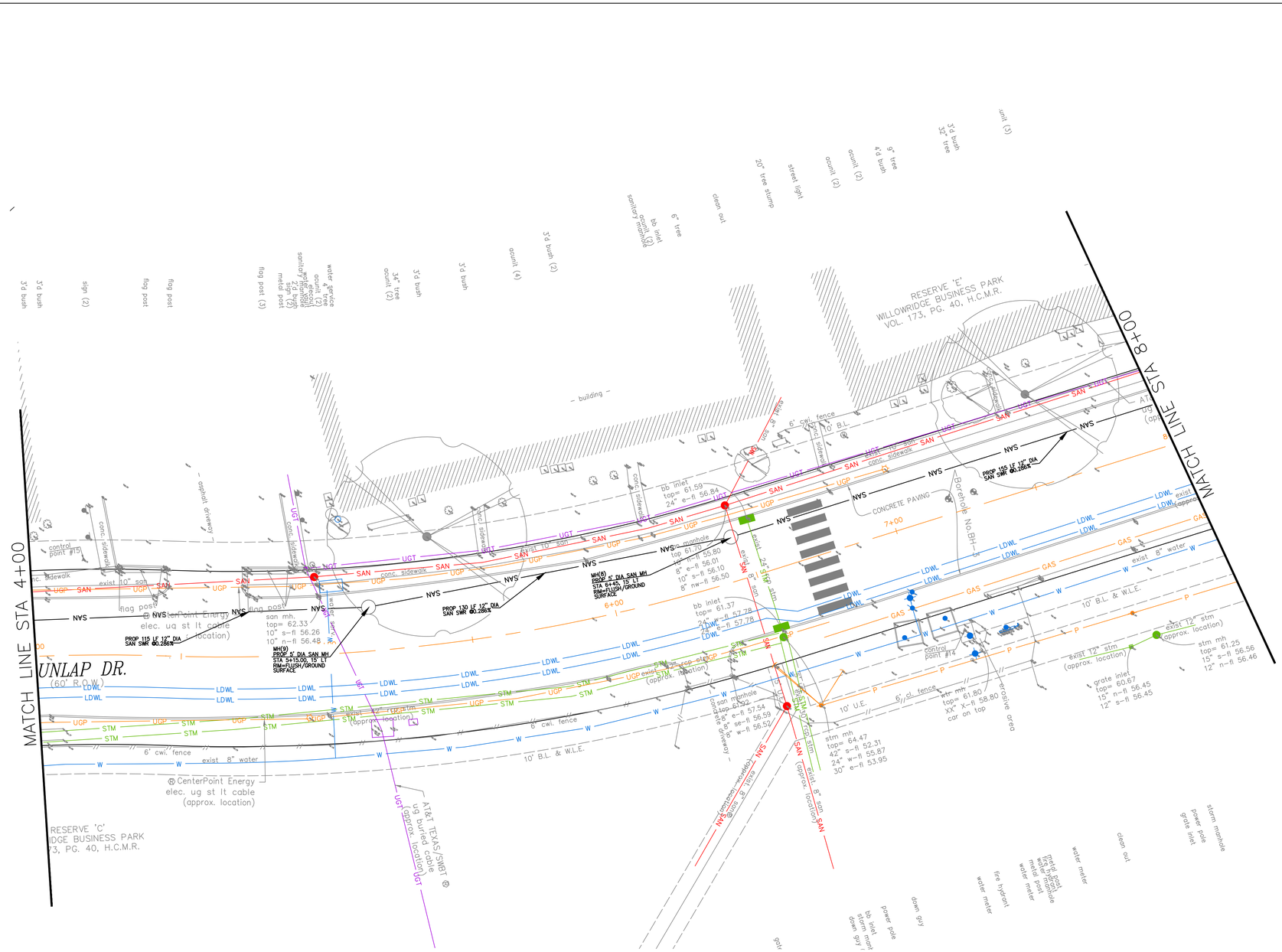

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PLAN
DUNLAP DRIVE
STA 4+00 TO STA 8+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **21 of 111**	

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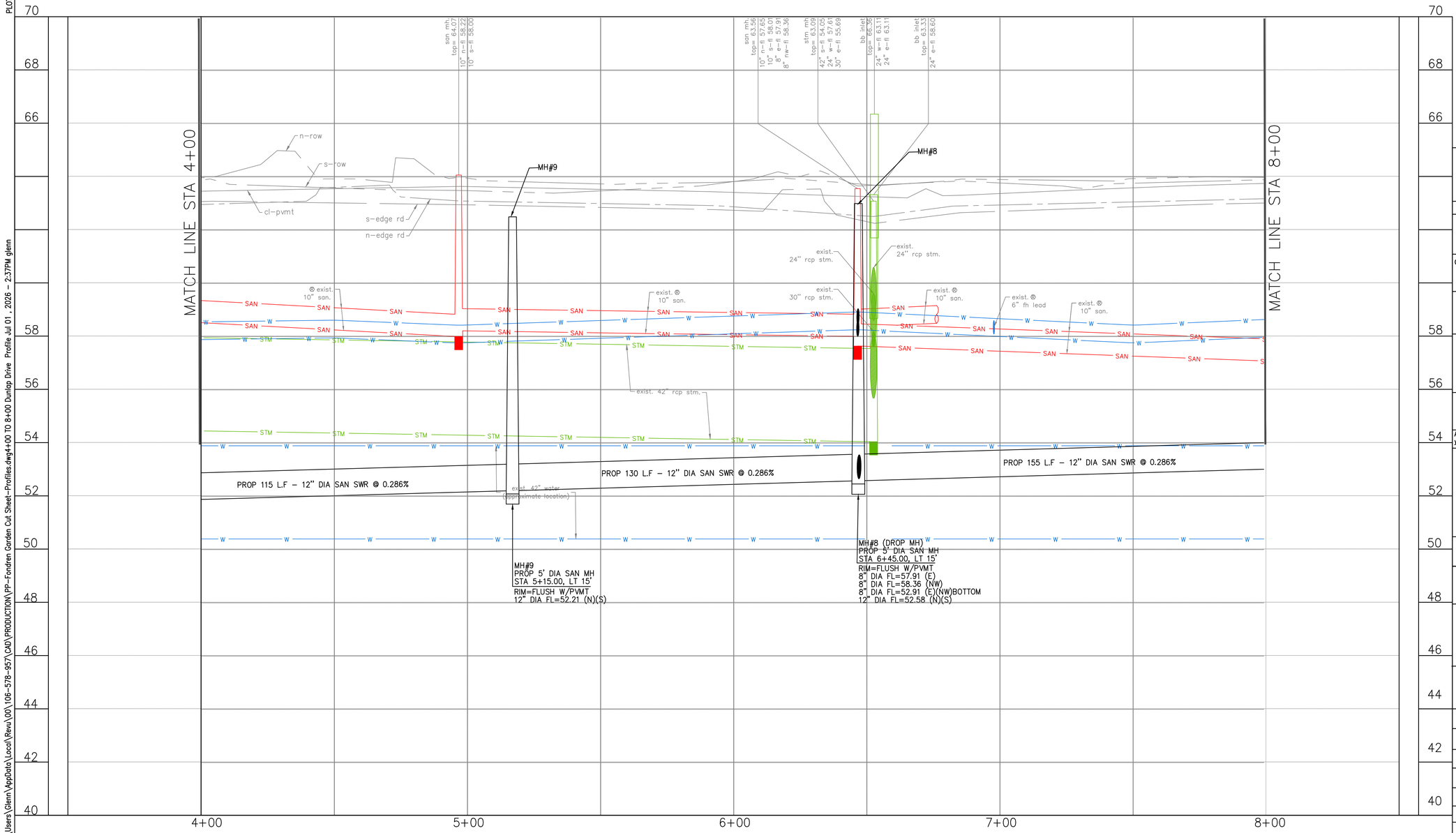

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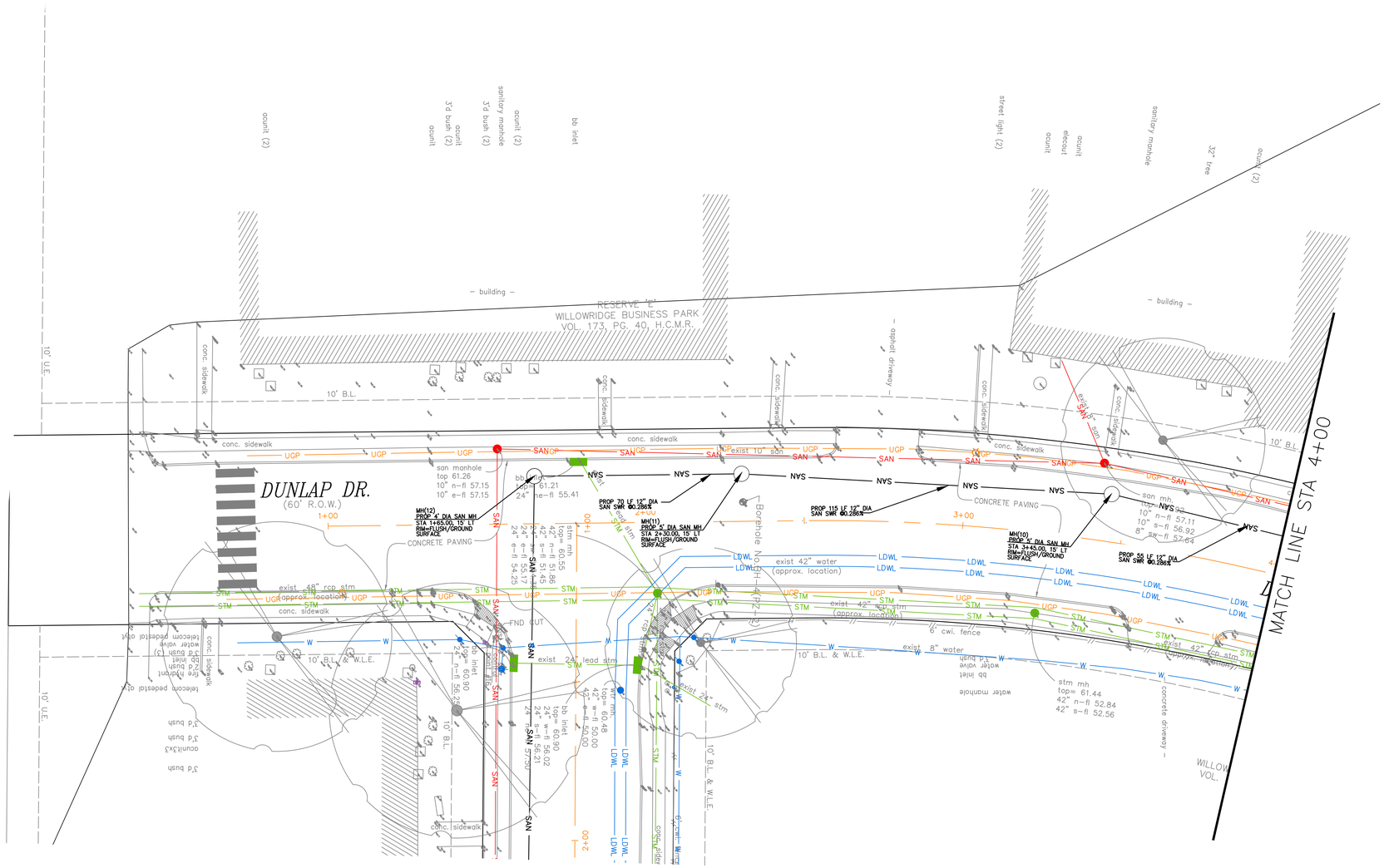
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **22 of 111**	



CITY OF HOUSTON

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GRAPHIC SCALE

60% SUBMITTAL

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
DUNLAP DRIVE
STA 1+00 TO STA 4+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R–002011–0090C–3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **23 of 111**	

NO.	DATE	REVISION	APP.

PLOT STYLE: COH_IAG_07_2016.ctb

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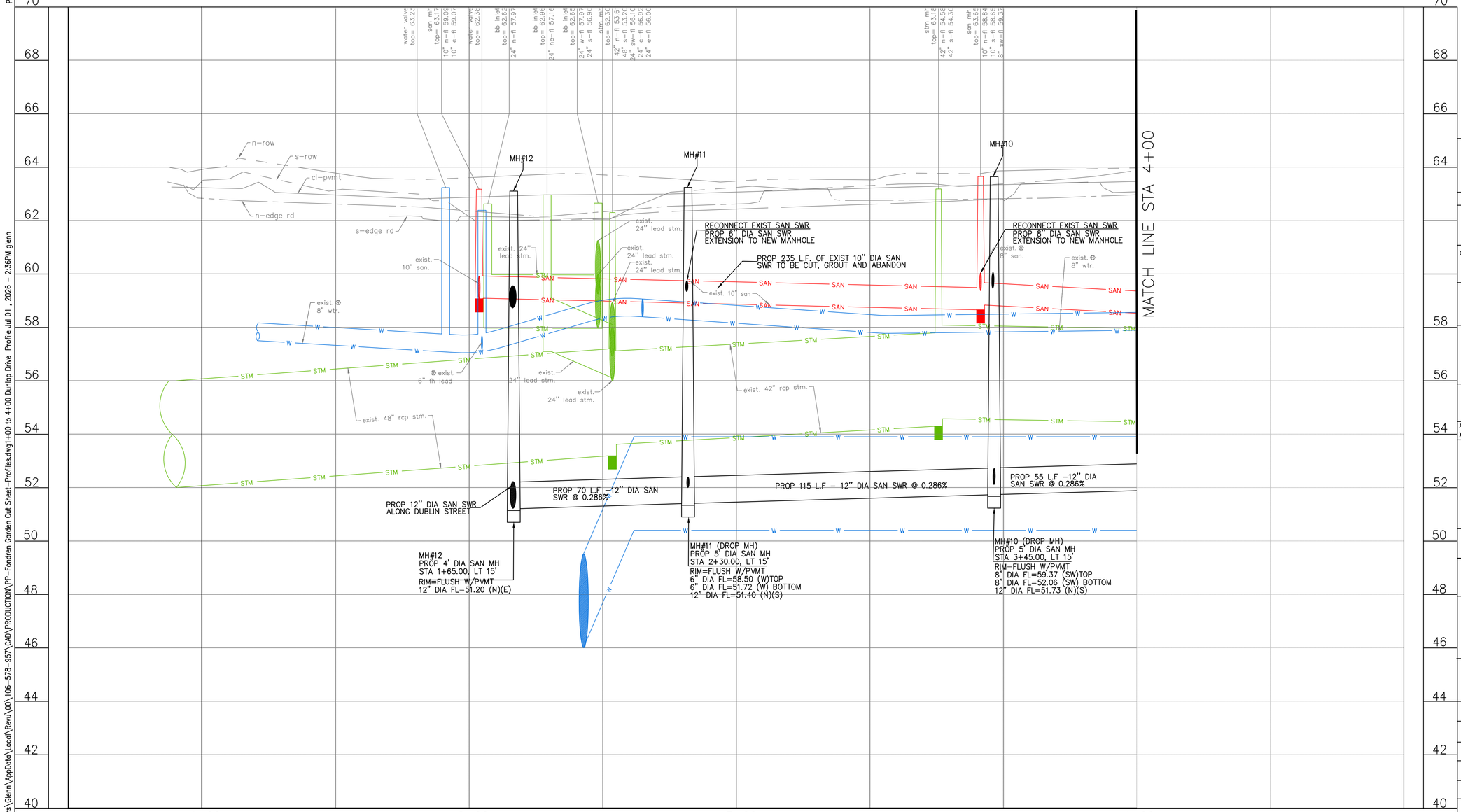

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HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
DUNLAP DRIVE
STA 1+00 TO STA 4+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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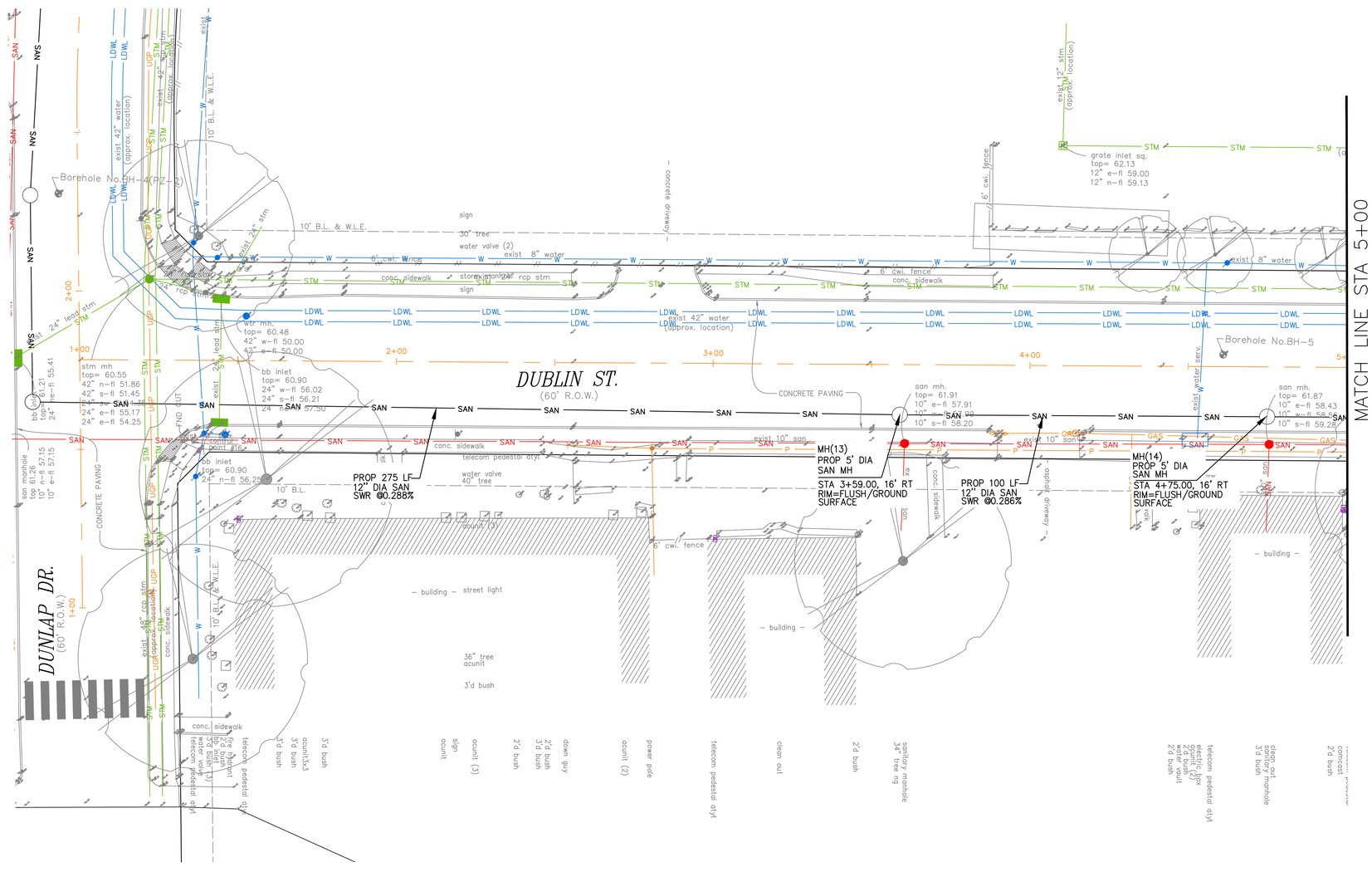
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **24 of 111**	

NO.	DATE	REVISION	APP.



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CITY OF HOUSTON

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George Maria P.E.	
SHEET NO. **25 of 111**	

PLOT STYLE: COH_IAG_07_2016.ctb

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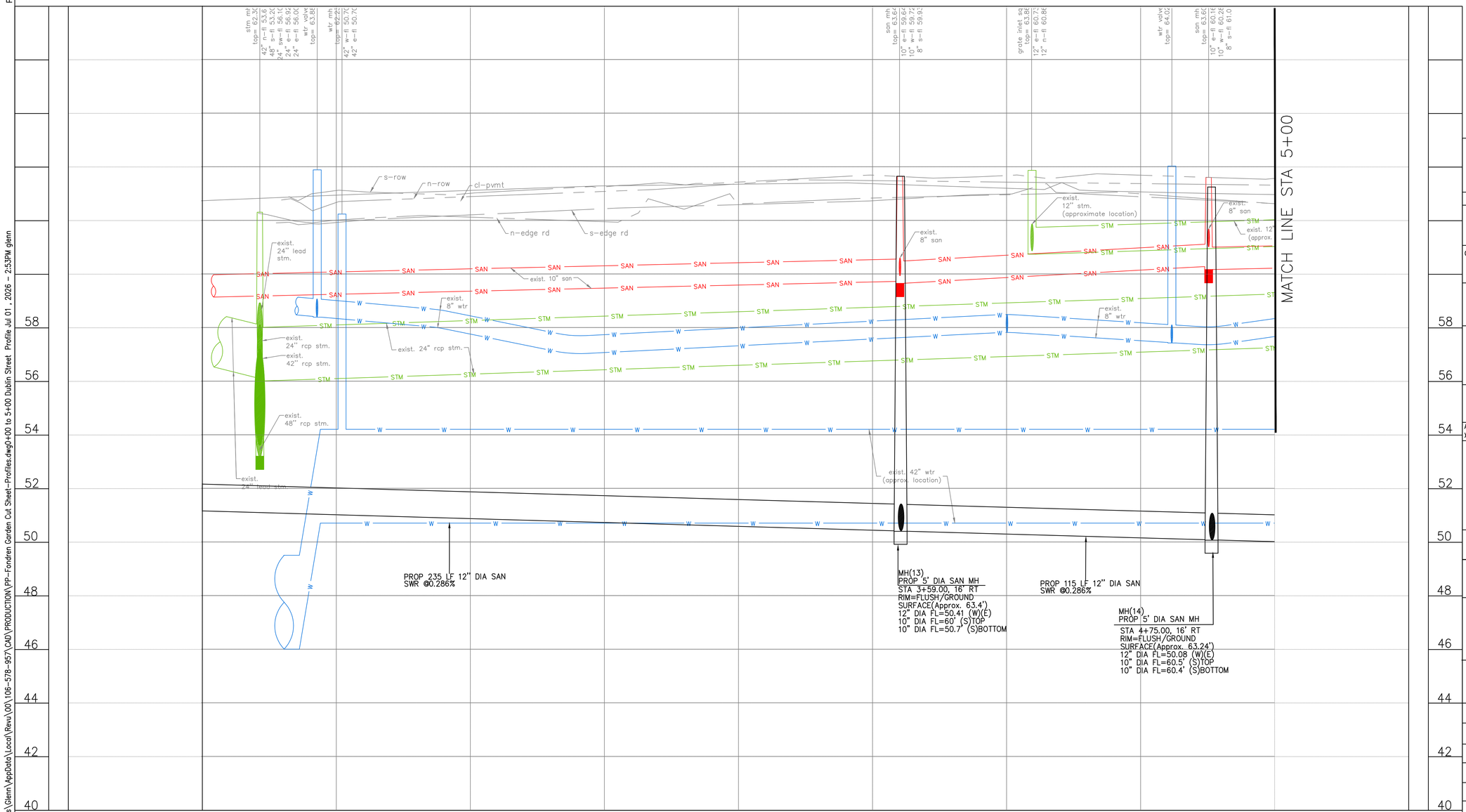

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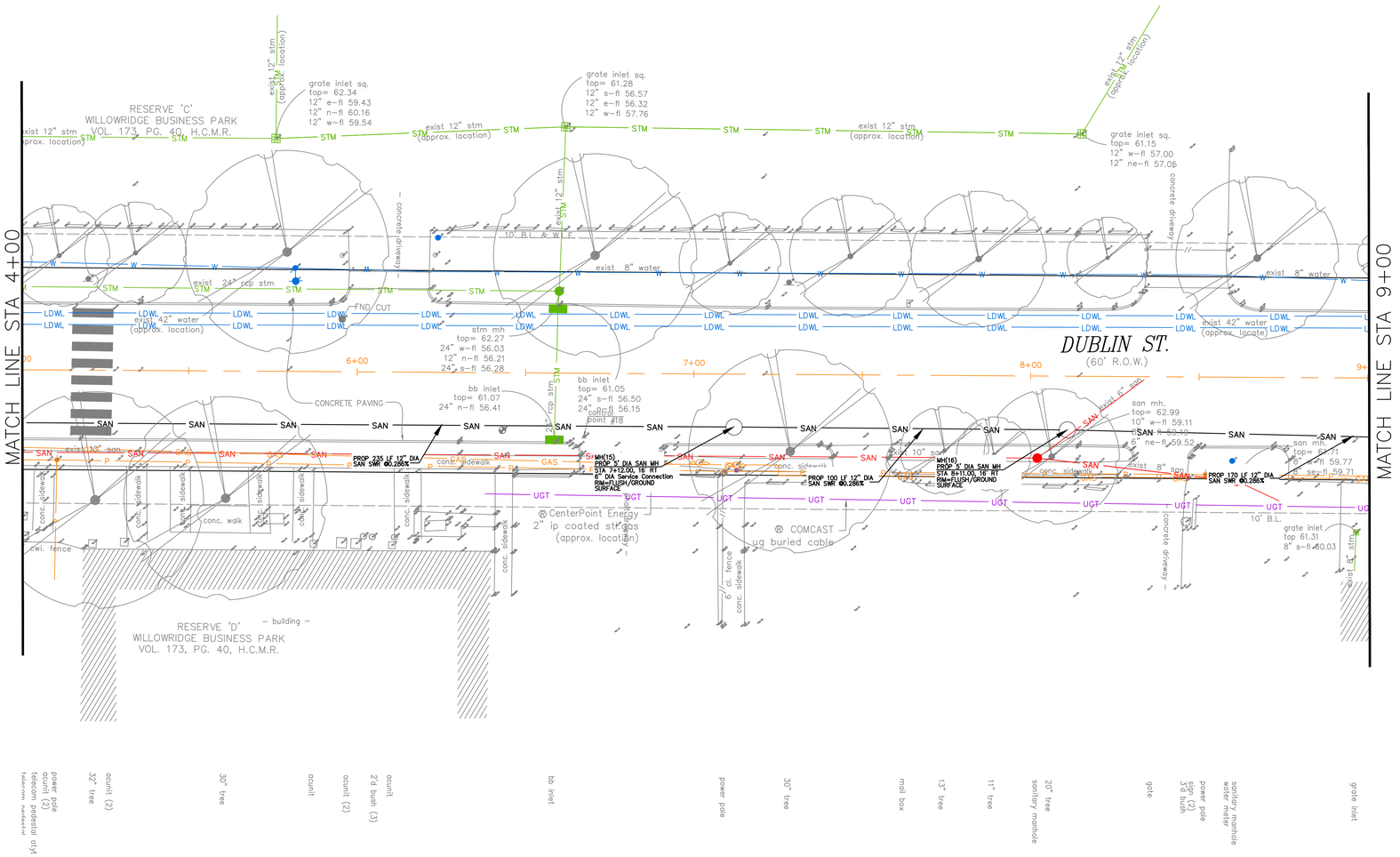
DUBLIN STREET
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **26 of 111**	



PLOT STYLE: COH_JAG_07_2016.ctb

C:\Users\Glenn\AppData\Local\Revu\00\106-578-957\CAD\PRODUCTION\PP-Fondren Garden Cut Sheet-Plans.dwg4+00 to 8+00 Dublin Street PLAN Jul 01 , 2026 - 3:23PM glenn

N

CITY OF HOUSTON

0 10 20 40

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

BENCHMARK:

CITY OF HOUSTON MONUMENT 5152-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXIMATELY 340 FEET WESR FROM THE HILLCROFT ST INTERSECTION.

ELEV. 61.15 FEET NAVD 1988 (GEOID '18)*

*OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 13, 2026.

HORIZONTAL DATUM:

ALL HORIZONTAL COORDINATES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83. THE COORDINATES & DISTANCES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A SCALE FACTOR OF 0.999870017.

EXISTING UTILITY NOTE:

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NOTICE:

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VERIFICATION OF PRIVATE UTILITY LINES

Date

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

Signature valid for six months.

Date

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
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Date

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

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF EDUARDO QUIROZ, P.E. (TX 85559) OF IMS ENGINEERS INC., TBPE REG NO. 18572. NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

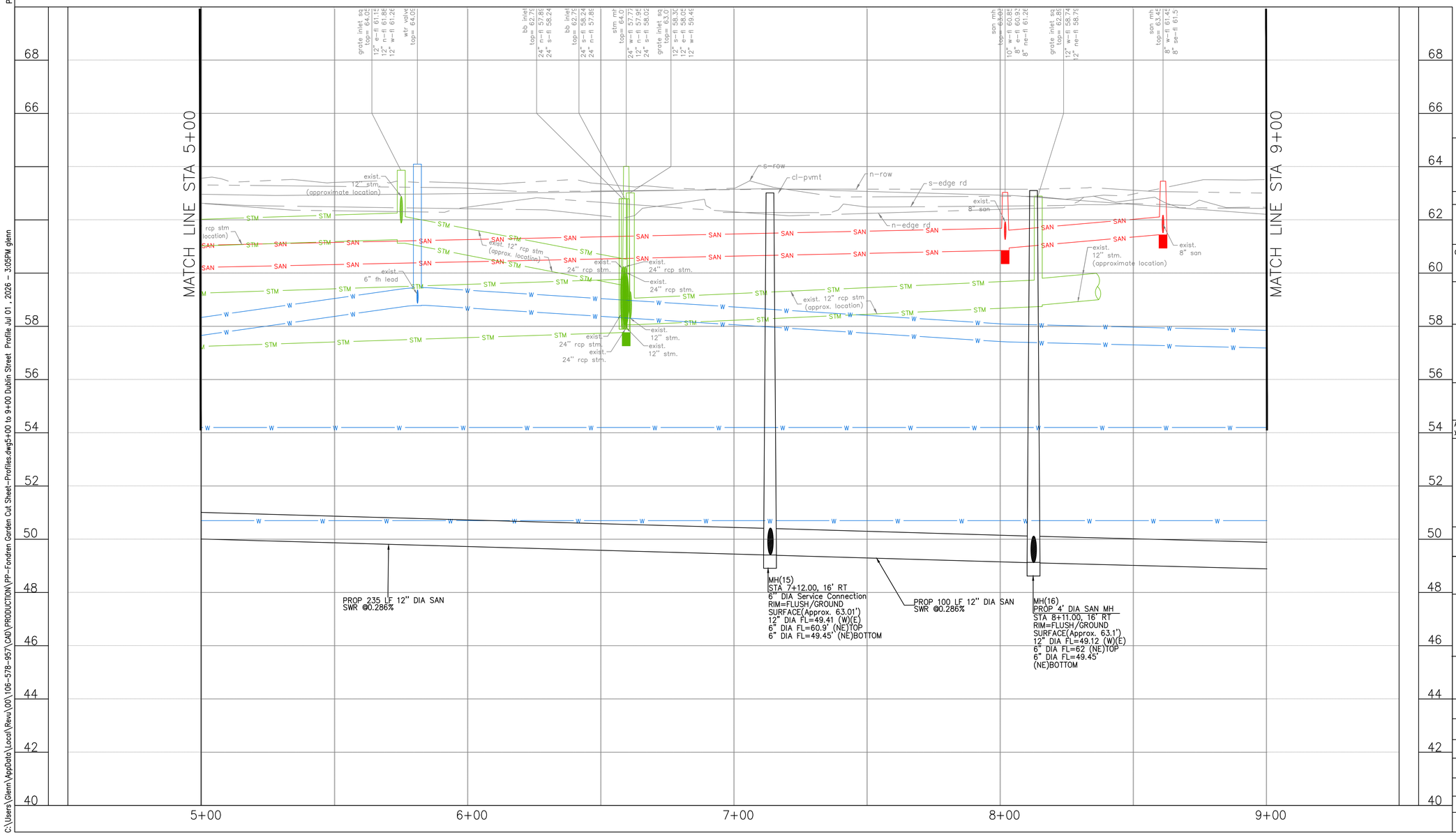
NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
DUBLIN STREET
STA 4+00 TO STA 9+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **27 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

C:\Users\Glenn\AppData\Local\Revu\00\106-578-957\CAD\PRODUCTION\PP-Fondren Garden Cut Sheet-Profiles.dwg5+00 to 9+00 Dublin Street Profile Jul 01, 2026 - 3:05PM glenn



N

CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

BENCHMARK:
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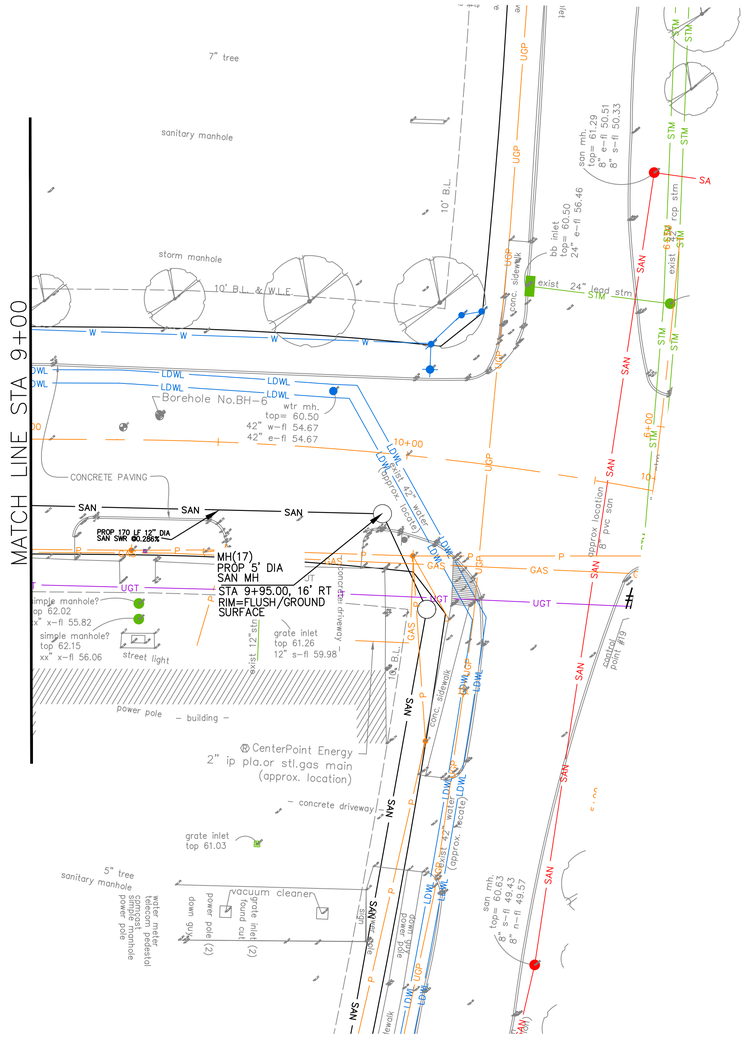
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
DUBLIN STREET
STA 5+00 TO STA 9+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **28 of 111**	



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CITY OF HOUSTON

0 10 20 40

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

BENCHMARK:

CITY OF HOUSTON MONUMENT 5152-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXIMATELY 340 FEET WESR FROM THE HILLCROFT ST INTERSECTION.

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TX Firm 18572

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
DUNLAP DRIVE
STA 9+00 TO STA 9+85

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **29 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb
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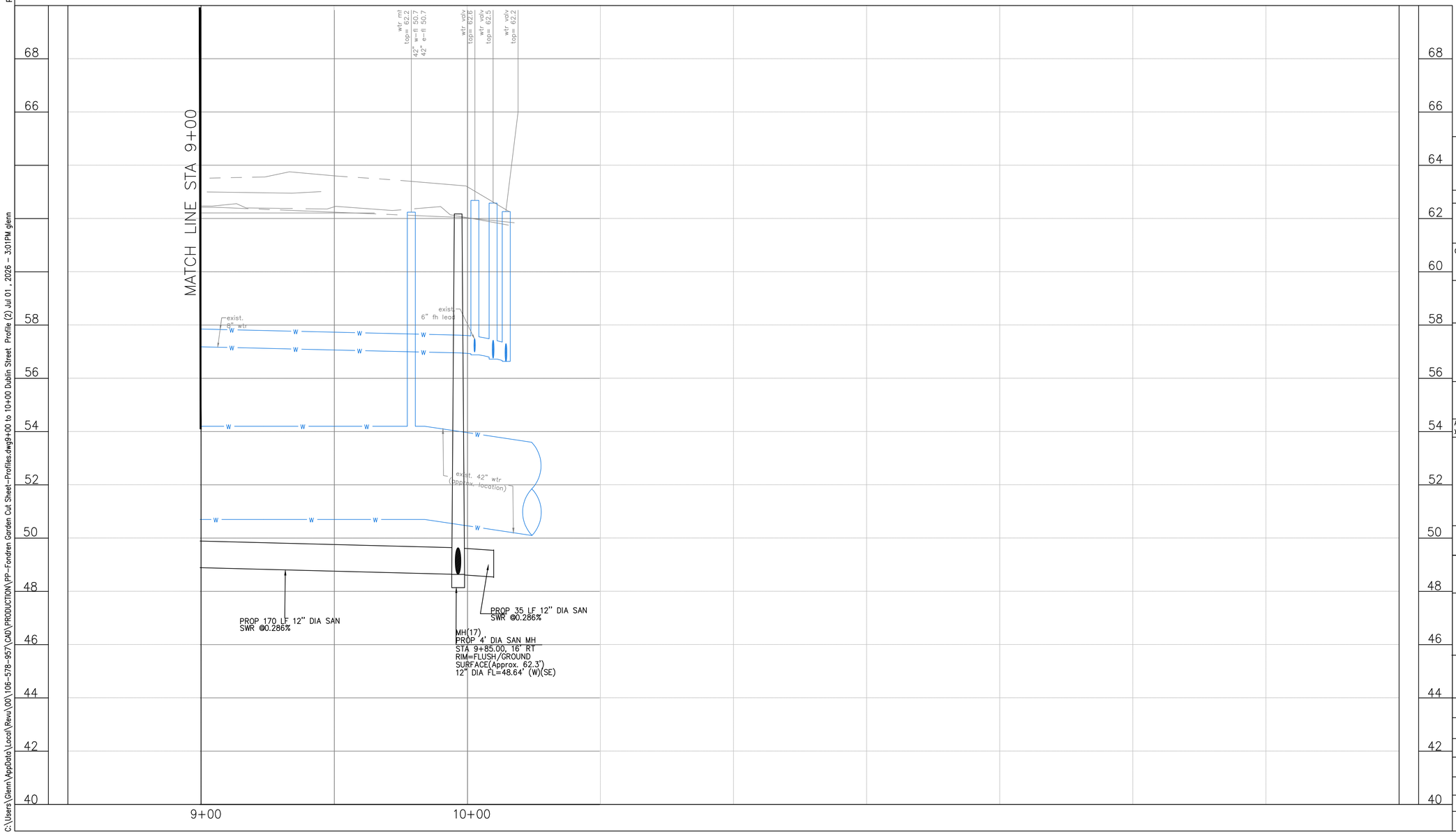

PLOT STYLE: COH_JAG_07_2016.ctb

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N

CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

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ims
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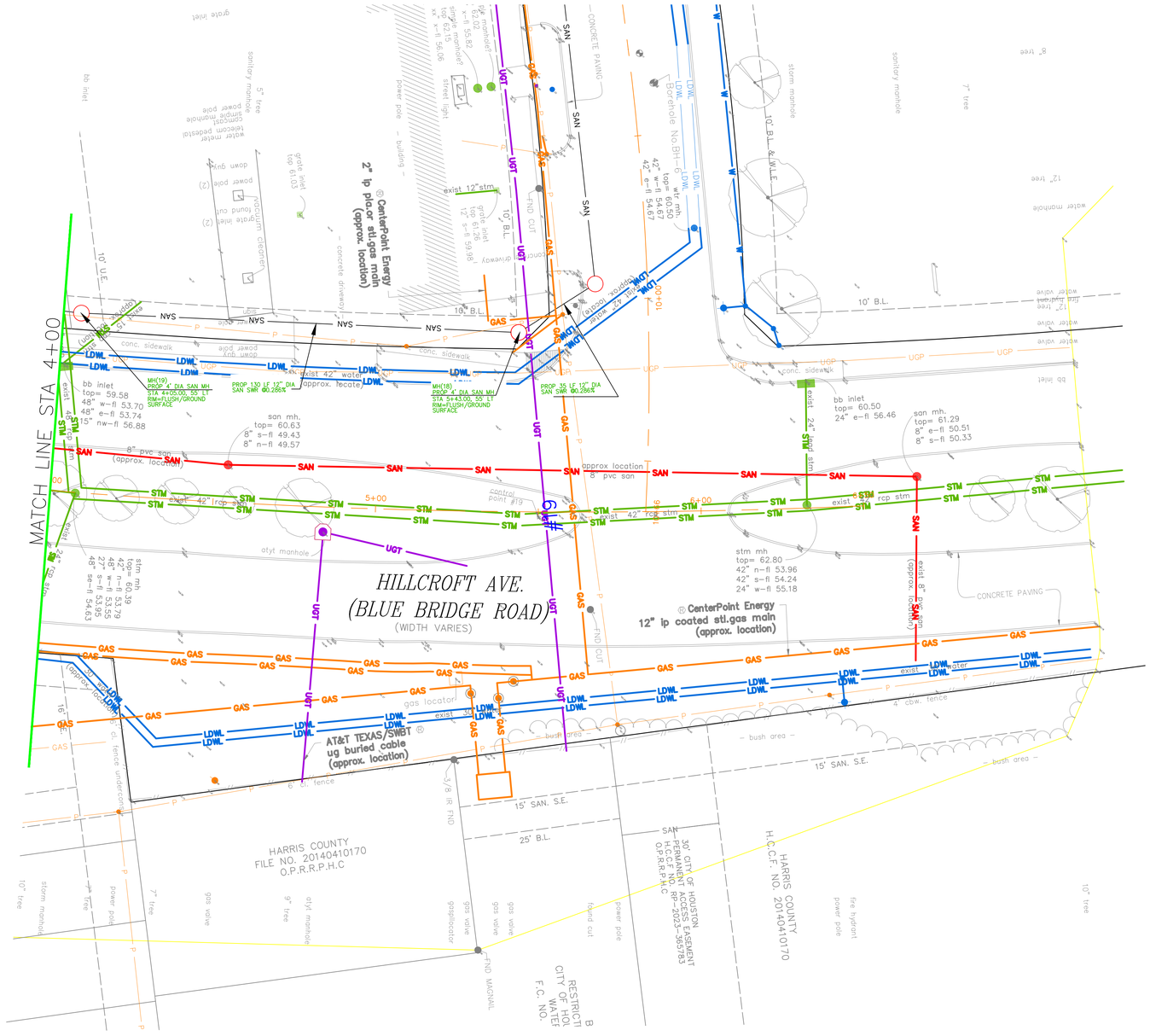
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
DUBLIN STREET
STA 9+00 TO STA 9+85

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **30 of 111**	


MATCH LINE STA 4+00
HILLCROFT AVE.
(BLUE BRIDGE ROAD)
(WIDTH VARIES)
STA 5+00
STA 6+00
STA 7+00
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
#15
#16
#17
#18
#19
#20
#21
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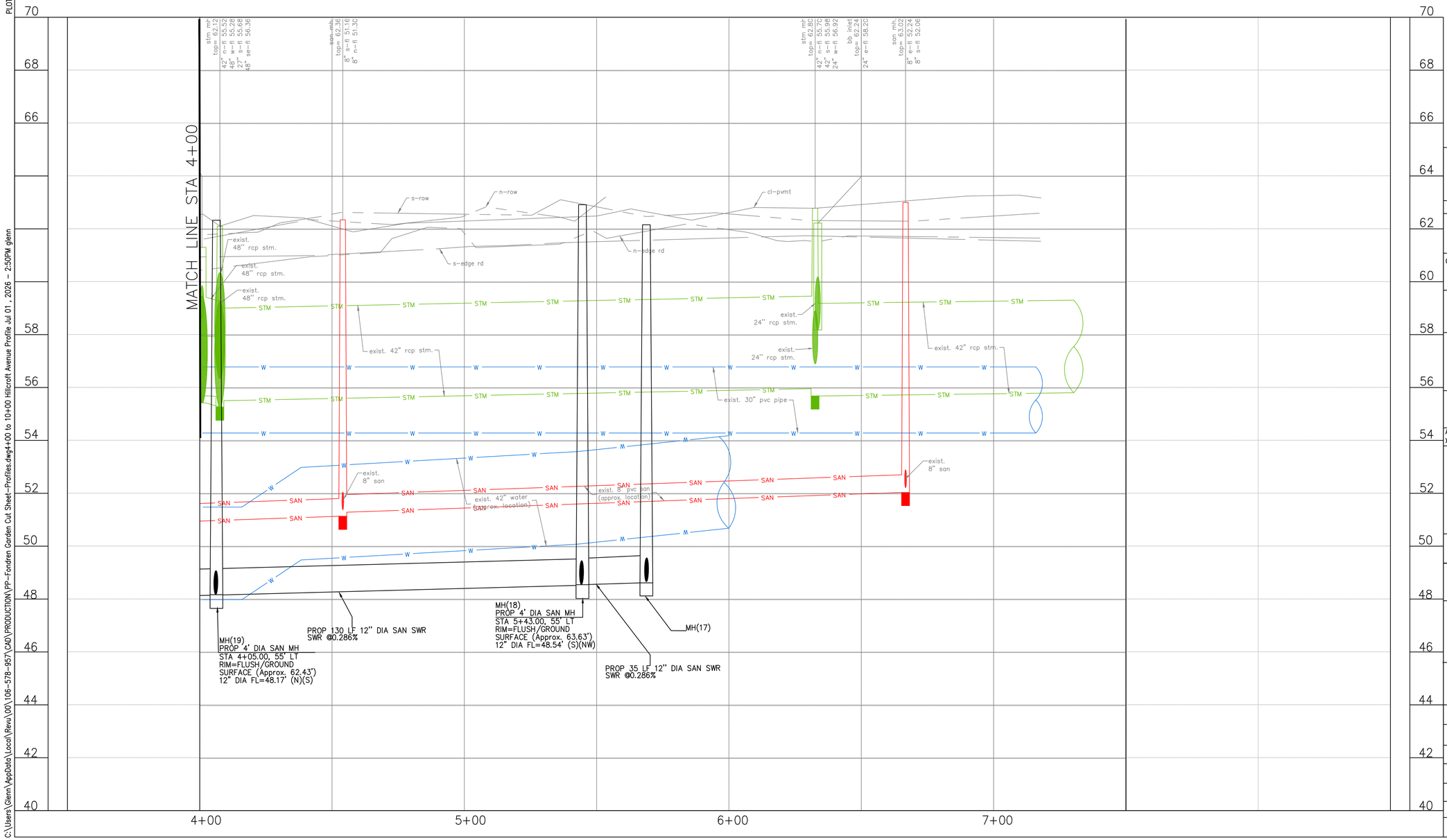
#35
#36
#37
#38
#39
#40
#41
#42
#43
#44

PLOT STYLE: COH_JAG_07_2016.ctb

C:\Users\Glenn\AppData\Local\Revu\00\106-578-957\CAD\PRODUCTION\PP-Fondren Garden Cut Sheet-Profiles.dwg4+00 to 10+00 Hillcroft Avenue Profile Jul 01, 2026 - 2:50PM glenn



N

CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

BENCHMARK:
CITY OF HOUSTON MONUMENT 5152-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXMATELY 340 FEET WESR FROM THE HILLCROFT ST INTERSECTION.

ELEV. 61.15 FEET NAVD 1988 (GEOID '18)*

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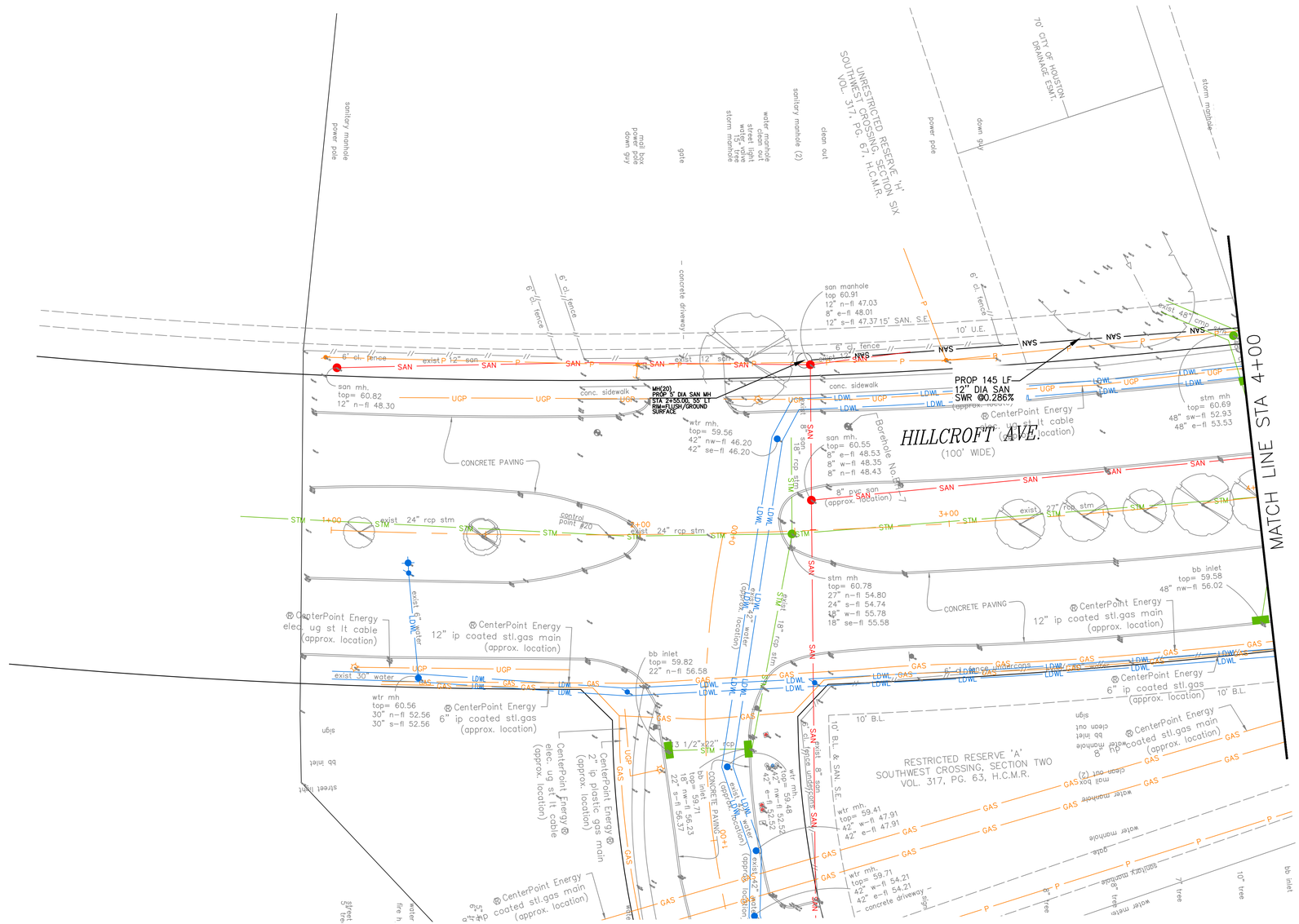
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
HILLCROFT AVENUE
STA 4+00 TO STA 7+33

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **32 of 111**	



CITY OF HOUSTON
0 10 20 40
GRAPHIC SCALE

60% SUBMITTAL

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NO.	DATE	REVISION	APP.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

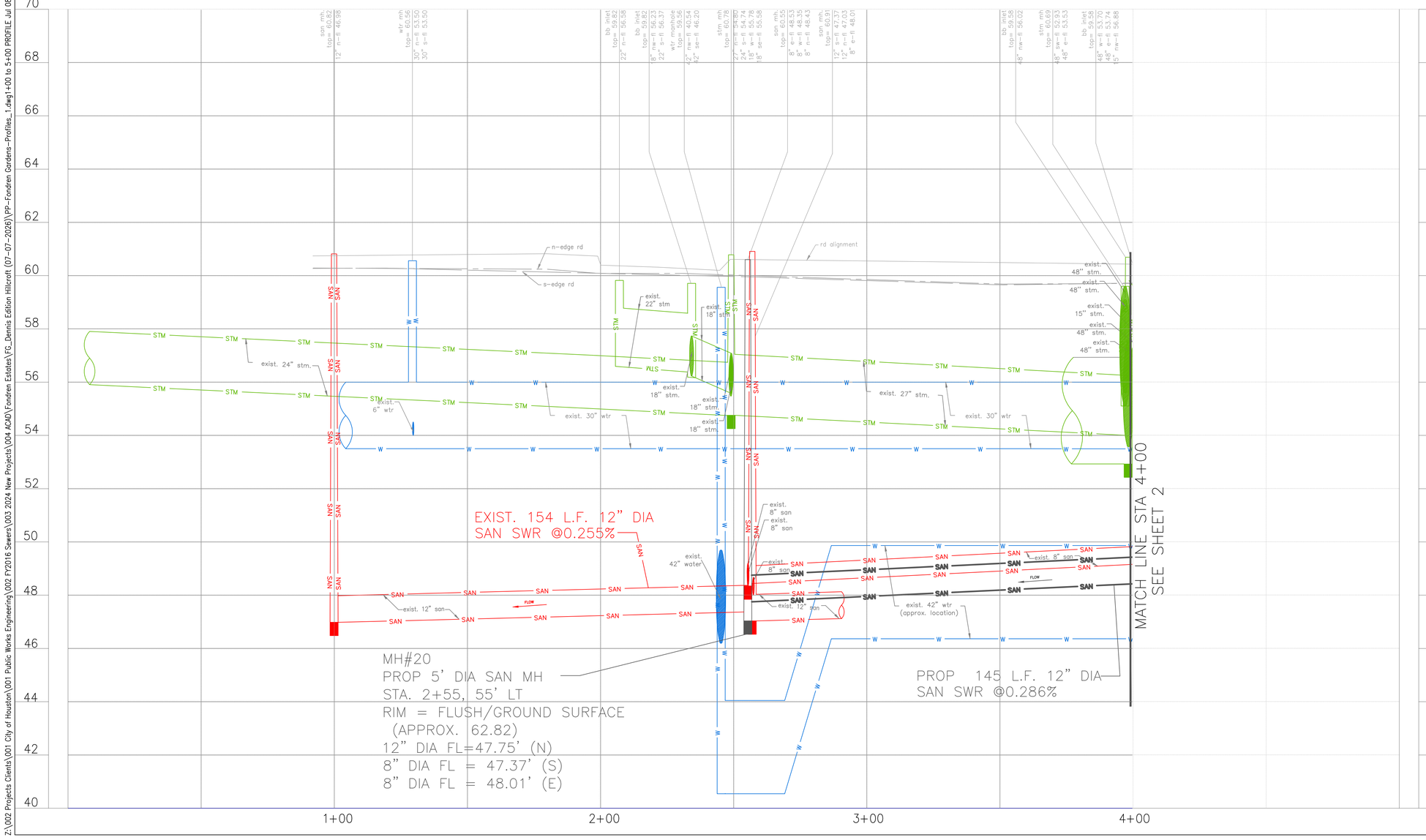
NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PLAN
HILLCROFT AVENUE
STA 1+00 TO STA 4+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **33 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb
C:\Users\Glenn\AppData\Local\Revu\100\106-578-957\CAD\PRODUCTION\PP-Fondren Garden Cut Sheet-Plans.dwg0+00 to 4+00 Hillcroft Avenue PLAN Jul 01 , 2026 - 3:25PM glenn

PLOT STYLE: COH_JAG_07_2016.ctb
Z:\002 Projects Clients\001 City of Houston\001 Public Works Engineering\002 FY2016 Sewers\003 2024 New Projects\004 ACAD\Fondren Estates\FG_Dennis Edition Hillcroft (07-07-2026)\PP-Fondren Gardens-Profiles_1.dwg 1+00 to 5+00 PROFILE Jul 08, 2026 - 9:54AM dcrump



CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

60% SUBMITTAL

BENCHMARK:

CITY OF HOUSTON MONUMENT 51+72-7203, A BRASS DISK IN CONCRETE LOCATED NORTH SIDE OF DUBLIN ST APPROXMATELY 340 FEET
WEST FROM THE HILLCROFT ST INTERSECTION.

ELEV. 61.15 FEET NAVD 1988 (GEOID '18)*

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EXISTING UTILITY NOTE:

EXISTING UNDERGROUND UTILITY INFORMATION (TYPE, SIZE & OWNERSHIP) ARE SHOWN APPROXIMATELY BASED ON THE AVAILABLE RECORD DRAWINGS AND FIELD VERIFICATION (WHERE FEASIBLE) WITHOUT PROBING AND EXCAVATION. NO WARRANTY IS MADE AS TO THE ACCURACY OR COMPLETENESS OF UTILITY LOCATION SHOWN ON THE DRAWING. CAUTION SHOULD BE EXERCISED WHEN EXCAVATING OR BORE AND JACKING IN THE VICINITY OF UNDERGROUND UTILITIES. OWNERS OF THE UTILITIES SHOULD BE NOTIFIED PRIOR TO SUCH ACTIVITIES. CALL UTILITY COORDINATING COMMITTEE AT 713-223-4567, AT LEAST 48 HOURS PRIOR TO EXCAVATING IN THE STREET RIGHT-OF-WAY.

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Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

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CITY OF HOUSTON

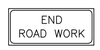
HOUSTON PUBLIC WORKS

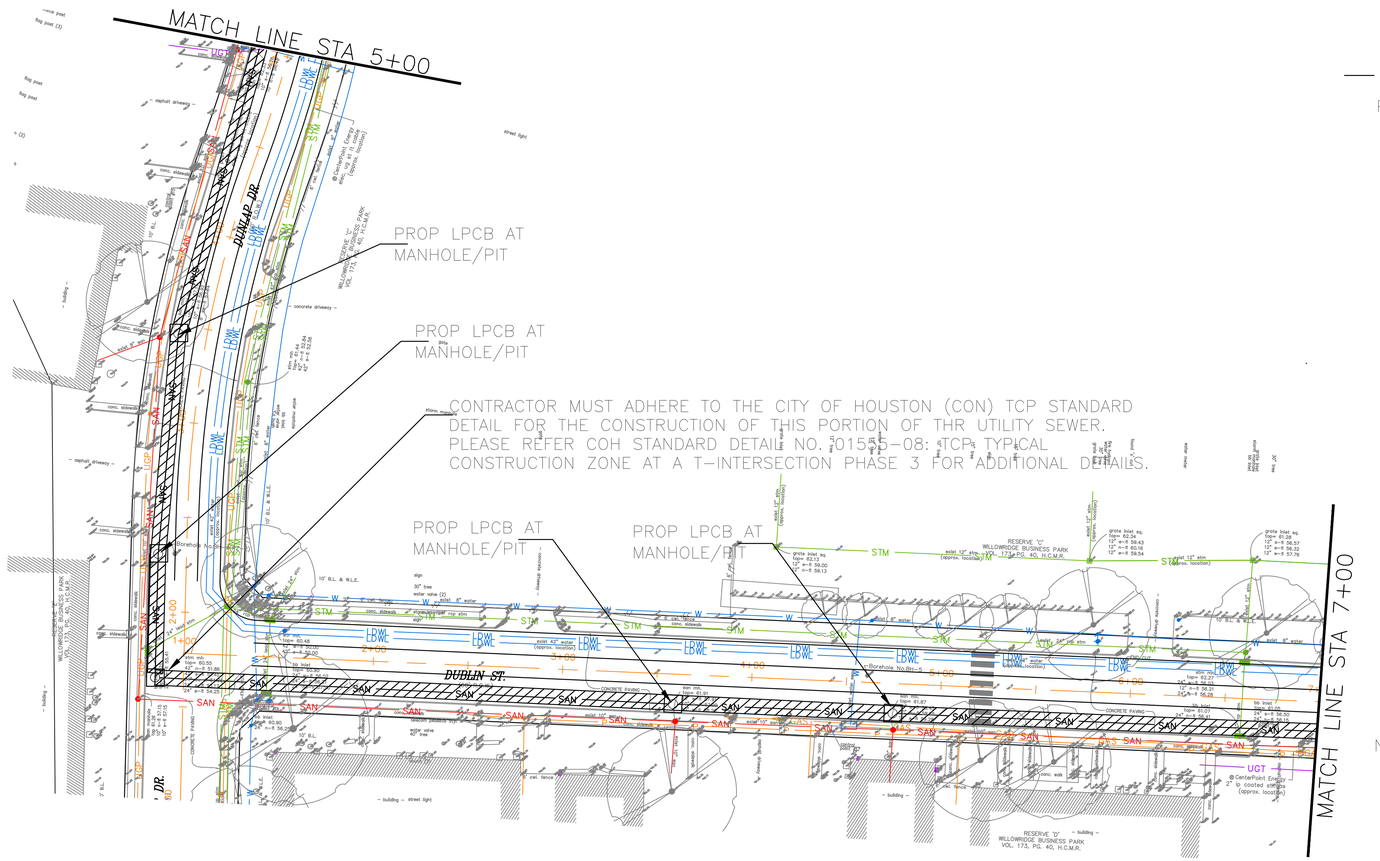
NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

PROFILE
HILLCROFT AVENUE
STA 1+00 TO 4+00

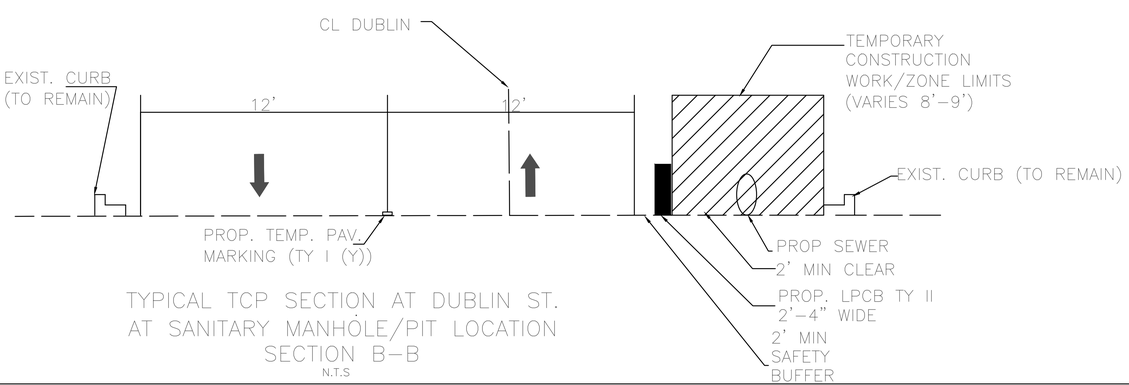
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. 34 OF 111	

NO.	DATE	REVISION	APP.

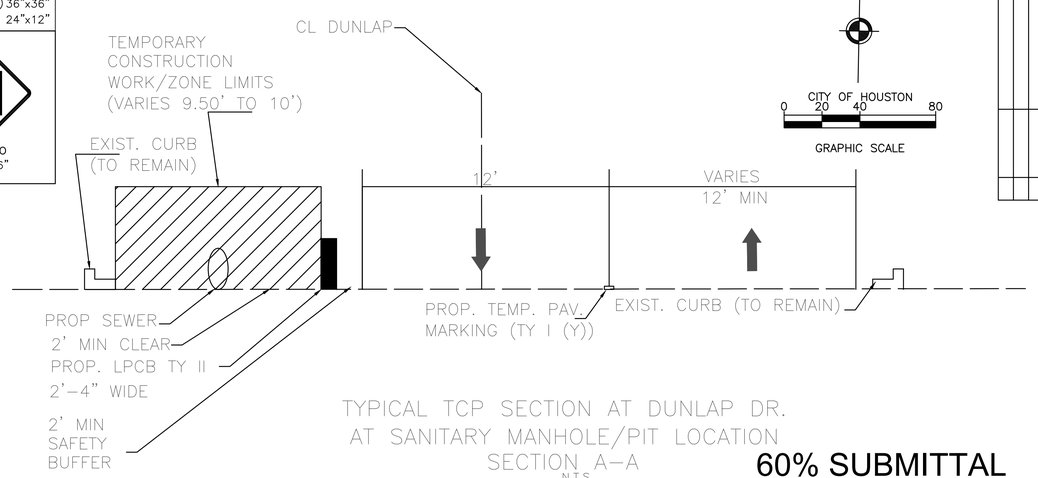
A	B	C	D	E	F	G	H	I	J
CW20-1 36"x36"	CW20-3 36"x36"	CW20-2 36"x36"	 G20-2 24"x18"	M4-9R 30"x24"	M4-9L 30"x24"	M4-8a 24"x18"	M4-9T 30"x24"	CW20-5(2) 36"x36" CW16-3 24"x12"	CW20-5(1) 36"x36" CW16-3 24"x12"
K	L	M	N	O	P	Q	R	S	T
R6-2(L) 24"x24"	R6-2(R) 24"x24"	R5-1 36"x36"	R11-2 48"x30"	M4-10(L) 30"x24"	R3-1 24"x24"	R3-2 24"x24"	R6-6 30"x36"	W4-2R-O 36"x36"	W4-2L-O 36"x36"



CONTRACTOR MUST ADHERE TO THE CITY OF HOUSTON (CON) TCP STANDARD DETAIL FOR THE CONSTRUCTION OF THIS PORTION OF THR UTILITY SEWER. PLEASE REFER COH STANDARD DETAIL NO. 01555-08: TCP-3 TYPICAL CONSTRUCTION ZONE AT A T-INTERSECTION PHASE 3 FOR ADDITIONAL DETAILS.



TYPICAL TCP SECTION AT DUBLIN ST. AT SANITARY MANHOLE/PIT LOCATION SECTION B-B
N.T.S



TYPICAL TCP SECTION AT DUNLAP DR. AT SANITARY MANHOLE/PIT LOCATION SECTION A-A
N.T.S

NO.	DATE	REVISION	APP.

LEGEND:

- SIGN
- FLAGGER
- PLASTIC DRUMS
- TY III BARRICADE
- FLASHING ARROW PANEL
- CONSTRUCTION WORK ZONE
- LOW PROFILE CONCRETE BARRIER (LPCB) (TY 1 AND TY 2)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW

NOTE:

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6. CONTRACTOR MUST MAINTAIN MIN. 12-FT TRAVEL LANE AT ALL THE TIMES DURING CONSTRUCTION.
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60% SUBMITTAL

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

TRAFFIC CONTROL PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **35 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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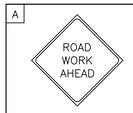
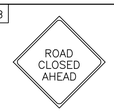
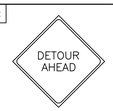
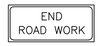
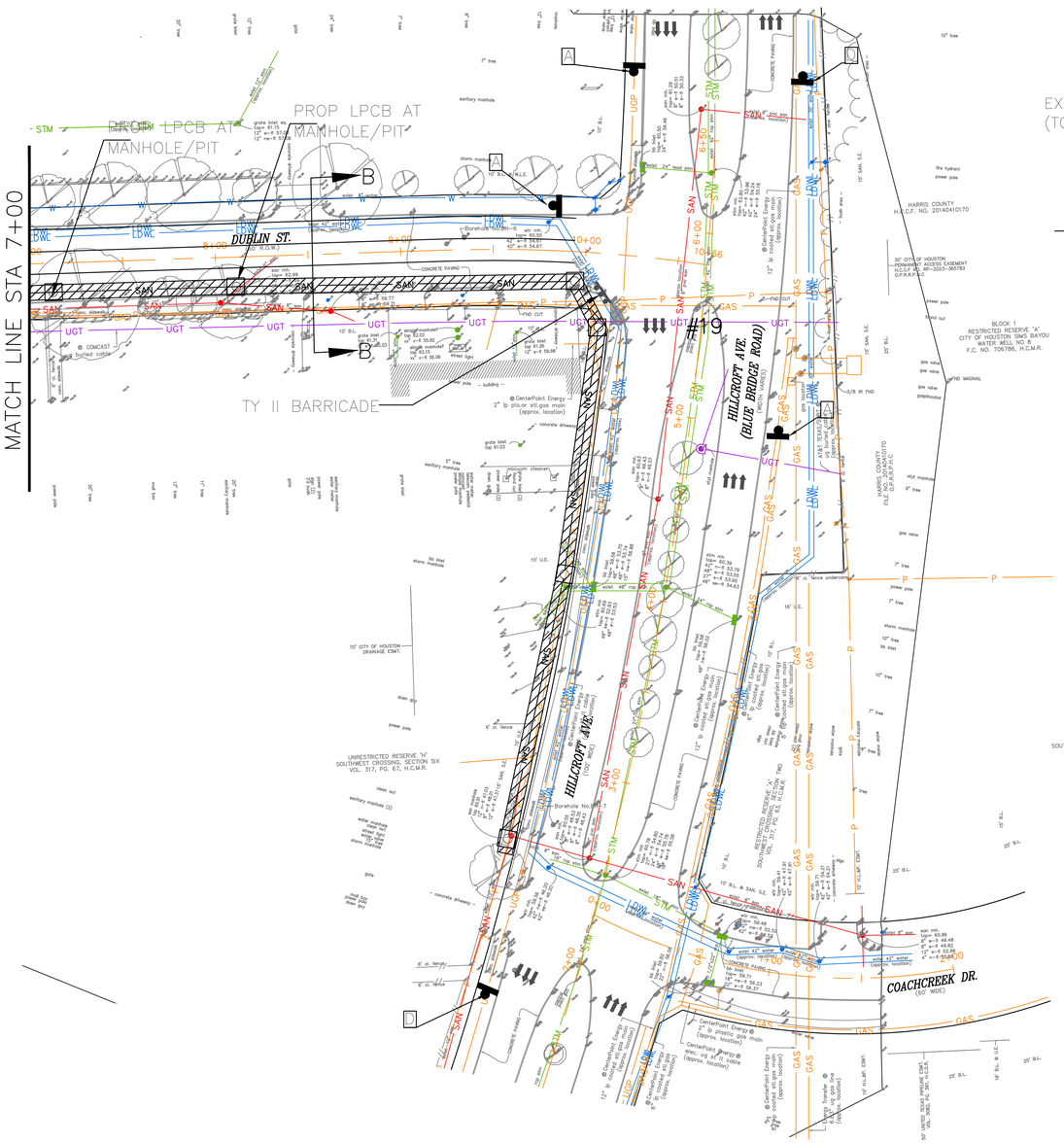
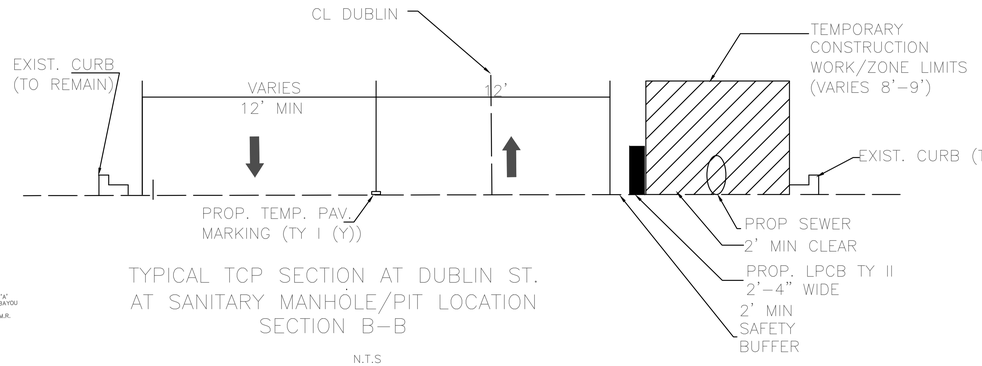
 CW20-1 36"x36"	 CW20-3 36"x36"	 CW20-2 36"x36"	 G20-2 24"x18"	M4-9R 30"x24"	M4-9L 30"x24"	M4-8a 24"x18"	M4-9T 30"x24"	CW20-5(2) 36"x36" CW16-3 24"x12"	CW20-5(1) 36"x36" CW16-3 24"x12"
K	L	M	N	O	P	Q	R	S	T
R6-2(L) 24"x24"	R6-2(R) 24"x24"	R5-1 36"x36"	R11-2 48"x30"	M4-10(L) 30"x24"	R3-1 24"x24"	R3-2 24"x24"	R6-6 30"x36"	W4-2R-O 36"x36"	W4-2L-O 36"x36"





TYPICAL TCP SECTION AT DUBLIN ST. AT SANITARY MANHOLE/PIT LOCATION SECTION B-B

N.T.S

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LEGEND:

- SIGN
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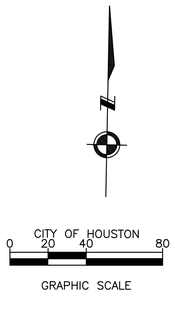

NO.	DATE	REVISION	APP.

60% SUBMITTAL

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

TRAFFIC CONTROL PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H : 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **36 of 111**	

PLOT STYLE: COH_IAG_07_2016.ctb
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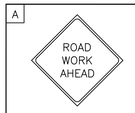
A	B	C	D	E	F	G	H	I	J	
 CW20–1 36"x36"	CW20–3 36"x36"	CW20–2 36"x36"	G20–2 24"x18"	M4–9R 30"x24"	M4–9L 30"x24"	M4–8a 24"x18"	M4–9T 30"x24"	CW20–5(2) 36"x36" CW16–3 24"x12"	CW20–5(1) 36"x36" CW16–3 24"x12"	
K	L	M	N	O	P	Q	R	S	T	
R6–2(L) 24"x24"	R6–2(R) 24"x24"	R5–1 36"x36"	R11–2 48"x30"	M4–10(L) 30"x24"	R3–1 24"x24"	R3–2 24"x24"	R6–6 30"x36"	W4-2R-O 36"x36"	W4-2L-O 36"x36"	

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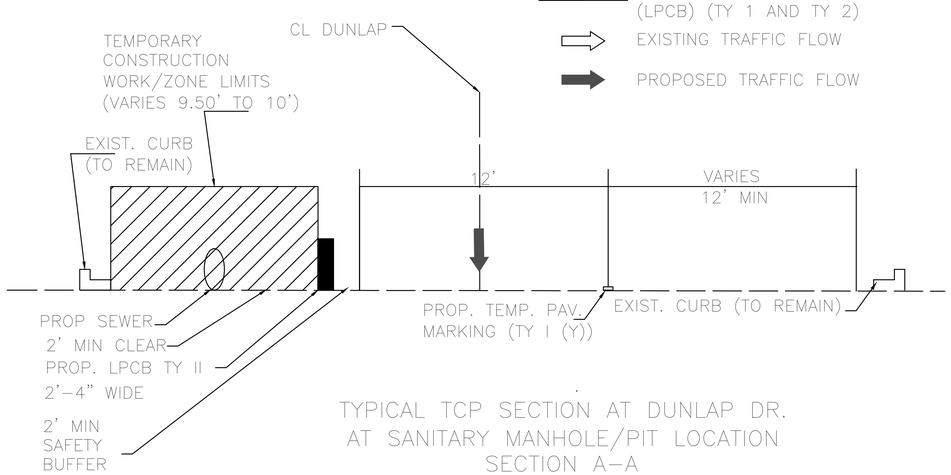
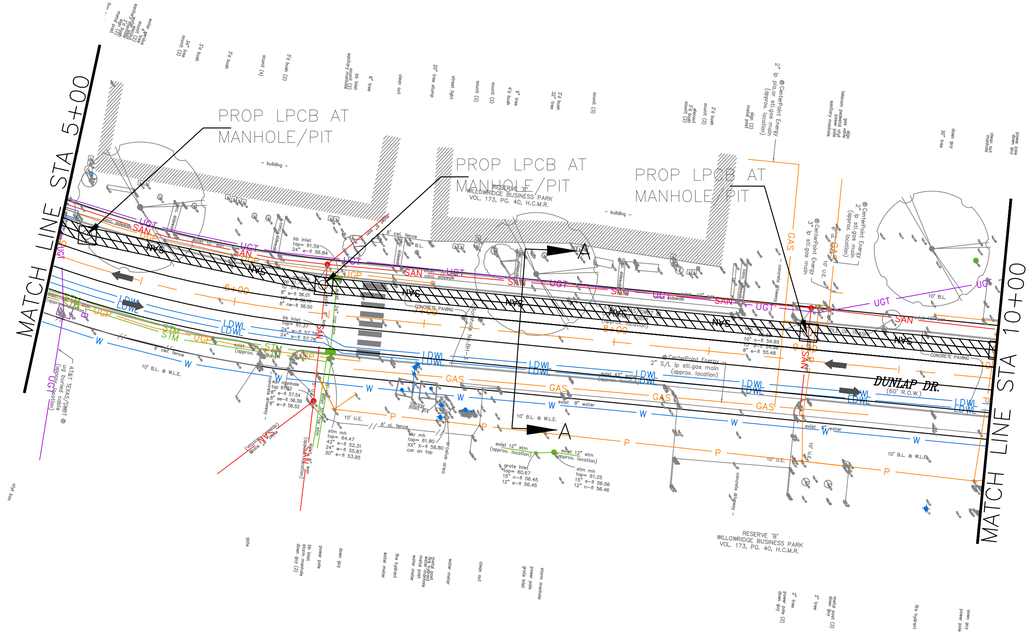
CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

NO.	DATE	REVISION	APP.



TYPICAL TCP SECTION AT DUNLAP DR.
AT SANITARY MANHOLE/PIT LOCATION
SECTION A–A
N.T.S



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H: 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **37 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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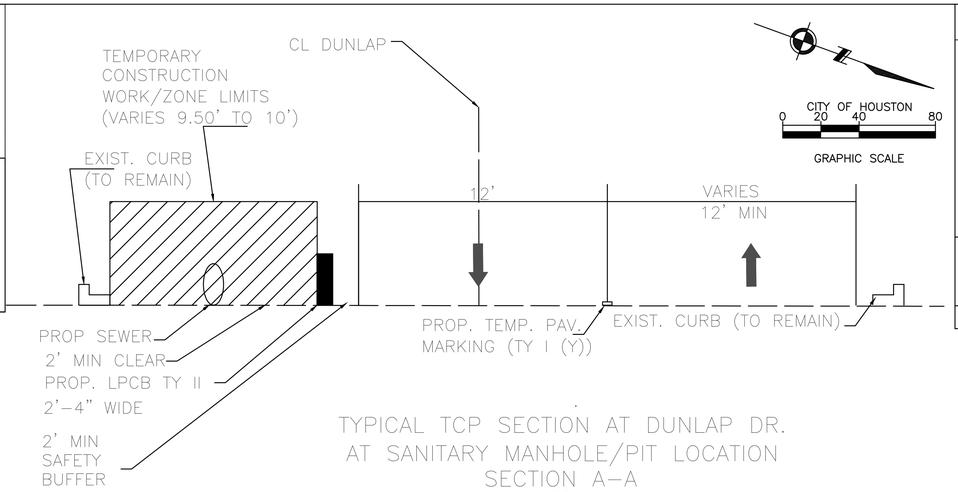
A	B	C	D	E	F	G	H	I	J
ROAD WORK AHEAD CW20–1 36"x36"	ROAD CLOSED AHEAD CW20–3 36"x36"	DETOUR AHEAD CW20–2 36"x36"	END ROAD WORK G20–2 24"x18"	STREET NAME DETOUR → M4–9R 30"x24"	STREET NAME DETOUR ← M4–9L 30"x24"	END DETOUR M4–8a 24"x18"	STREET NAME DETOUR ↑ M4–9T 30"x24"	RIGHT LANE CLOSED AHEAD CW20–5(2) 36"x36" CW16–3 24"x12"	LEFT LANE CLOSED AHEAD CW20–5(1) 36"x36" CW16–3 24"x12"

K	L	M	N	O	P	Q	R	S	T
ONE WAY ← R6–2(L) 24"x24"	ONE WAY → R6–2(R) 24"x24"	DO NOT ENTER R5–1 36"x36"	ROAD CLOSED R11–2 48"x30"	DETOUR M4–10(L) 30"x24"	R3–1 24"x24"	R3–2 24"x24"	BEGIN ONE WAY R6–6 30"x36"	W4-2R-O 36"x36"	W4-2L-O 36"x36"



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SECTION A–A
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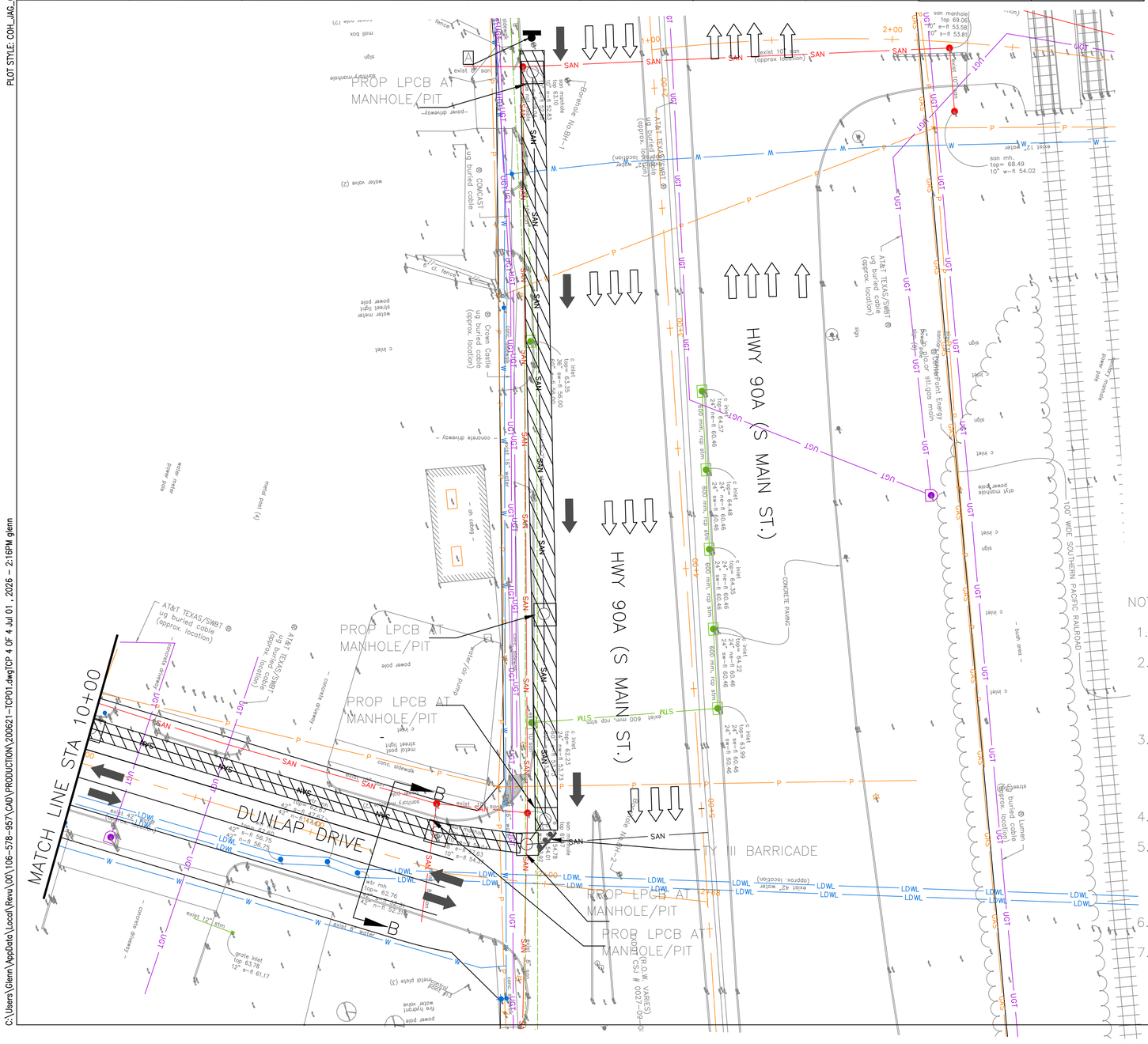

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2. CONTRACTOR SHALL MAINTAIN UNOBSTRUCTED ACCESS TO ALL DRIVEWAYS, AND SHALL PRESERVE ALL EXISTING ON THE STREET PARKING CONFIGURATIONS ALONG DUNLAP DR. & DUBLIN ST WITH THE EXCEPTION OF SANITARY MANHOLE/PIT LOCATION. THROUGHOUT THE ENTIRE DURATION OF CONSTRUCTION.
3. THIS TRAFFIC CONTROL PLAN IS INTENDED FOR THE PURPOSE OF CONSTRUCTION OF UTILITY SEWER ALONGSIDE ROADWAY ONLY AT THE SANITARY MANHOLE/PIT LOCATION. FOR THE REMAINDER INCLUDING UTILITY WORK AT THE INTERSECTION PLEASE REFER TO THE COH STANDARD SPECIFIED.
4. POSTED SPEED LIMIT ON DUNLAP DR. & DUNLIN ST 20 M.P.H. DUE TO THE PRESENCE OF SPEED HUMPS.
5. ALL SPACING FOR TRAFFIC CONTROL SIGNAGE AND CHANNELIZING DEVICES SHALL MEET THE POSTED SPEED LIMIT AND IN ACCORDANCE TO THE COH TCP NOTES CHANNELIZING DEVICES AND BARRICADES STANDARDS. PLEASE REFER COH STANDARD DETAIL NO. 01555–01 FOR ADDITIONAL DETAILS.
6. CONTRACTOR MUST MAINTAIN MIN. 12–FT TRAVEL LANE AT ALL THE TIMES DURING CONSTRUCTION.
7. CONTRACTOR SHALL RESTORE ROADWAY PAVEMENT TO THE EXISTING CONDITION AT THE SANITARY MANHOLE/PIT IN ACCORDANCE TO COH STANDARD AFTER THE UTILITY SEWER CONSTRUCTION.

60% SUBMITTAL

NOTICE:

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VERIFICATION OF PRIVATE UTILITY LINES

Date

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

Signature valid for six months.

Date

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

Signature valid for six months.

Date

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

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713–739–7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)
FONDREN GARDENS AREA

TRAFFIC CONTROL PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R–002011–0090C–3	
DRAWING SCALE	
H : 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **38 of 111**	

PLOT STYLE: COH_IAG_07_2016.ctb

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PLOT STYLE: COH_IAG_07_2016.ctb

DETOUR PLAN

Detour Plan for Dunlap and Hillcroft Streets

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N

CITY OF HOUSTON

0 10 20 40

GRAPHIC SCALE

NO.	DATE	REVISION	APP.

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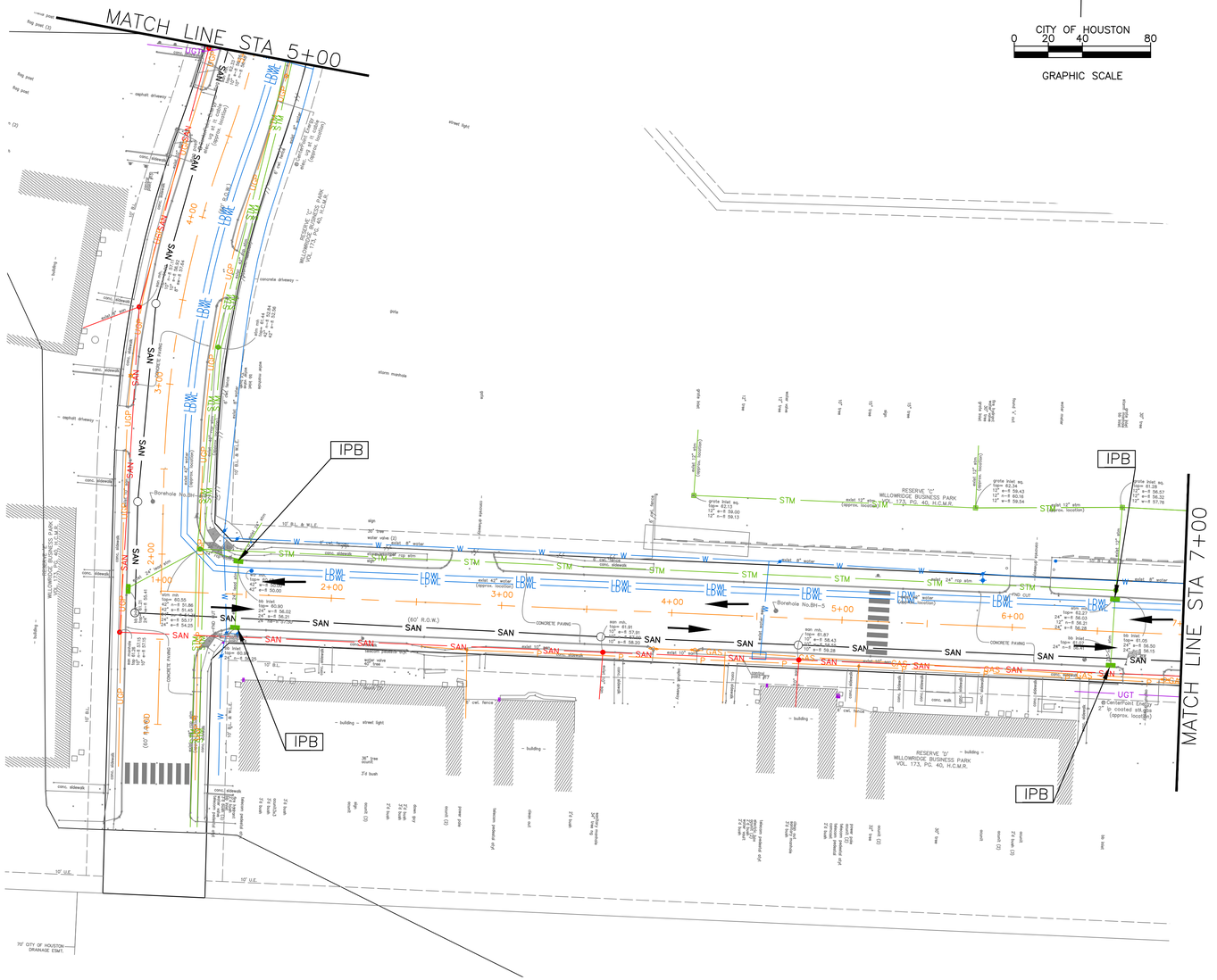
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

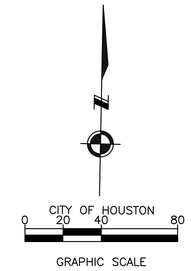
NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

DETOUR PLAN HILLCROFT AND DUNLAP STREET

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. 39 of 111	

PLOT STYLE: COH_IAG_07_2016.ctb





LEGEND:

- IPB — INLET PROTECTION BARRIER
- RFB — REINFORCED FILTER FABRIC BARRIER
- FF — FILTER FABRIC BARRIER
- SC — STABILIZED CONSTRUCTION ACCESS
- EXISTING TRAFFIC FLOW

NO.	DATE	REVISION	APP.

60% SUBMITTAL

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

STORM WATER POLLUTION PREVENTION PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **40 of 111**	

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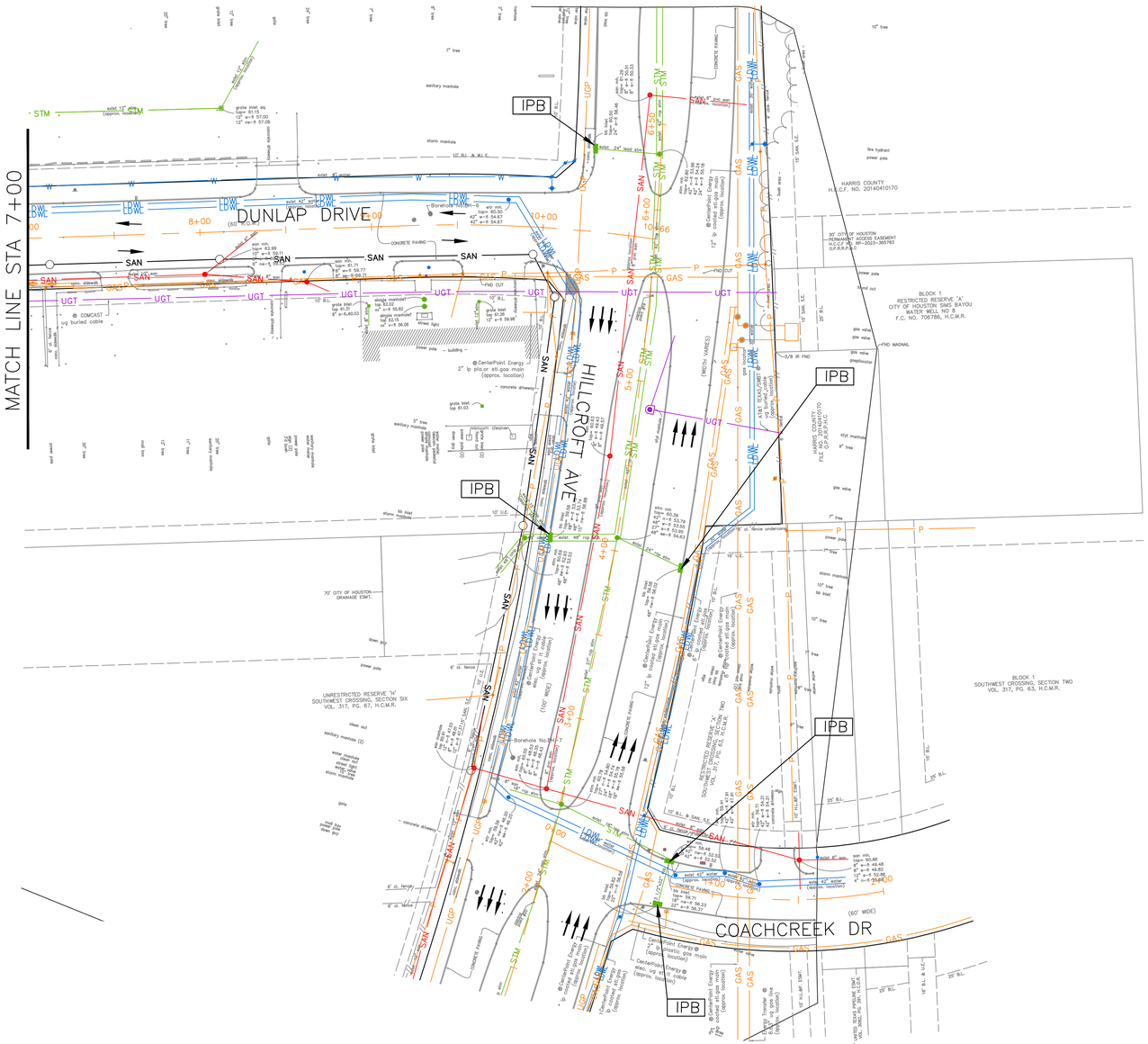
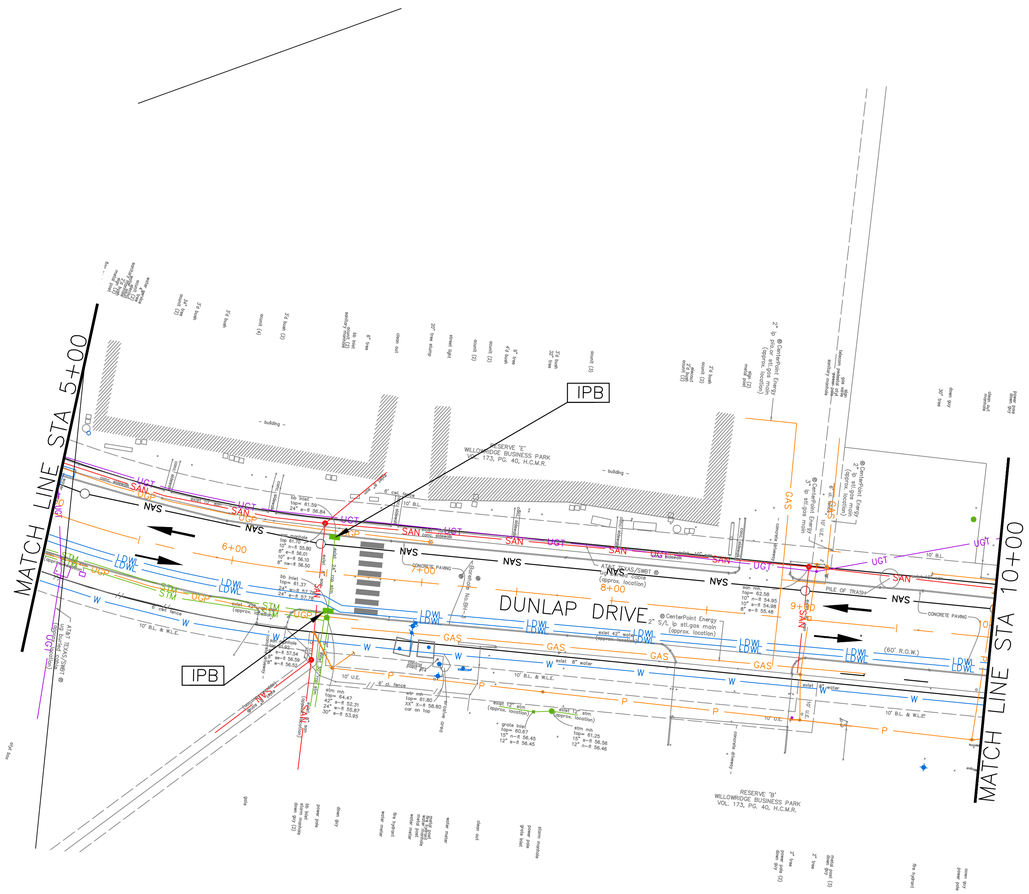

MATCH LINE STA 7+00
DUNLAP DRIVE
HILLCROFT AVE
COACHCREEK DR
IPB
IPB
IPB
IPB
IPB
RFB
RFB
RF



CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

LEGEND:

- IPB — INLET PROTECTION BARRIER
- RFB — REINFORCED FILTER FABRIC BARRIER
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NO.	DATE	REVISION	APP.

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)
FONDREN GARDENS AREA

STORM WATER POLLUTION PREVENTION PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H: 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **42 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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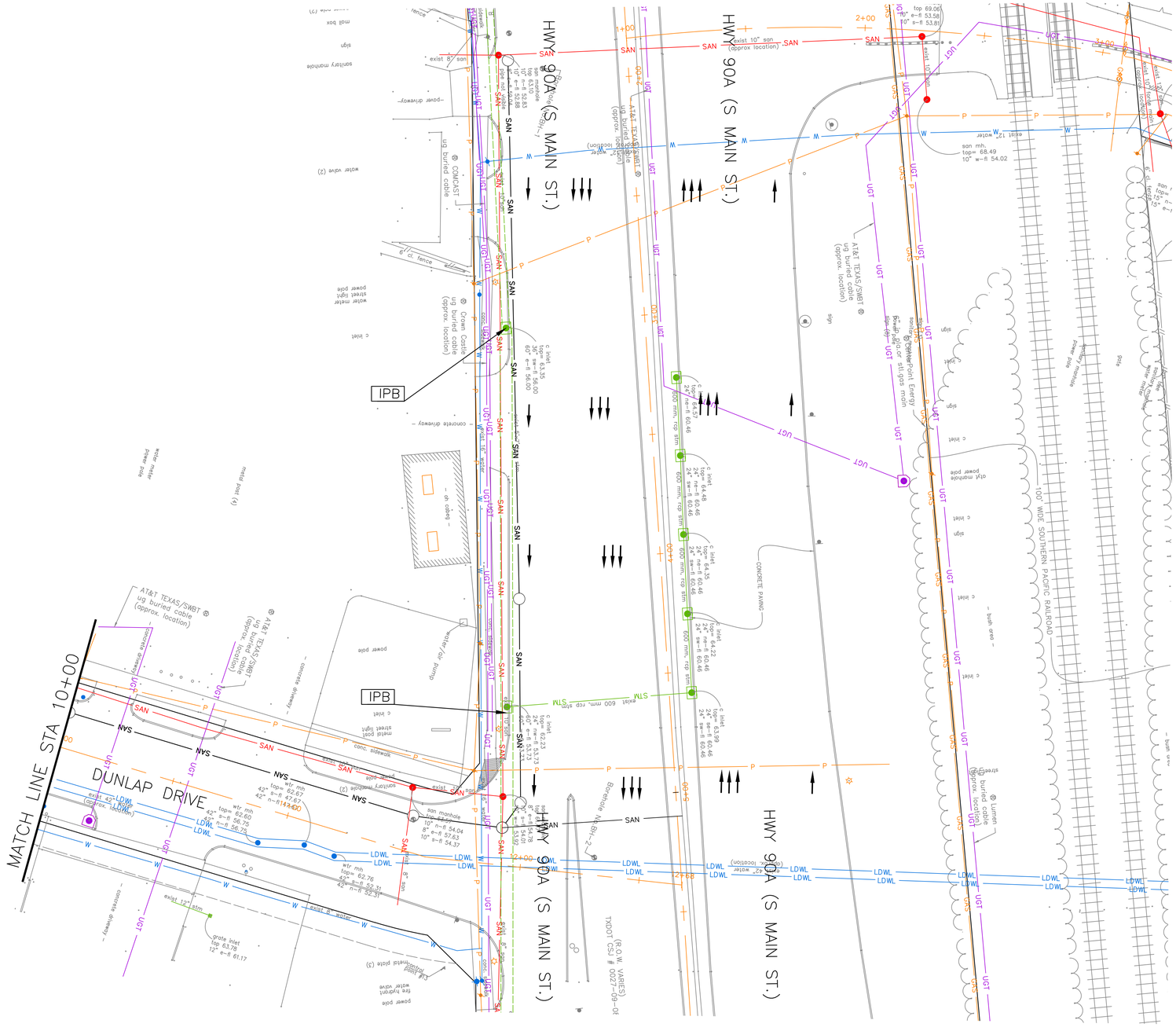
PLOT STYLE: COH_IAG_07_2016.ctb



CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

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- RFB — REINFORCED FILTER FABRIC BARRIER
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- EXISTING TRAFFIC FLOW

NO.	DATE	REVISION	APP.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI) FONDREN GARDENS AREA

STORM WATER POLLUTION PREVENTION PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-002011-0090C-3	
DRAWING SCALE	
H : 1" - 40'	
CITY OF HOUSTON PM	
George Maria P.E.	
SHEET NO. **43 of 111**	

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MH ID#	Street	STA	MH Type	MH DIA (FT)	MH RIM (EL)	Ground Surface Elevation	MH Flow Line (EL)
MH-1	Majestic Fall Dr.	4+83	Sealed	4	Flush Ground Surface	50.7	40.32
MH-2	Majestic Fall Dr.	3+25	Sealed	5	Flush Ground Surface	51.33	39.432
MH-3	Deer Ridge	1+50	Sealed	4	Flush Ground Surface	54.6	39.0324
MH-4	Deer Ridge	5+00	Unsealed	4	Flush Ground Surface	62.33	37.4784
MH-5	Deer Ridge	8+75	Unsealed	4	Flush Ground Surface	59.19	35.8134
MH-6	Deer Ridge	11+32	Unsealed	5	Flush Ground Surface	55.38	34.6146

N

60% SUBMITTAL

1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENT (NSSI)

DEER RIDGE ESTATES AREA

OVERALL LAYOUT

WBS#: R-002011-0090C-3

DRAWING SCALE:

CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:
GDR1

SHEET NO. **44 of 111**

C:\USERS\DORUMP\APPDATA\LOCAL\REVIT\DOR\466-789-225\CAD\PRODUCTION\DEER RIDGE OVERALL LAYOUT.DWG|DCRUMP|SAVED: Wednesday, July 01, 2026|CCHI_KAI.CTB|PLOTTED: Wednesday, July 01, 2026

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Tranverse Mercator (UTM) zone 15. The **horizontal datum** is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the Harris Galveston Area Council and was revised and enhanced by Harris County.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/mac

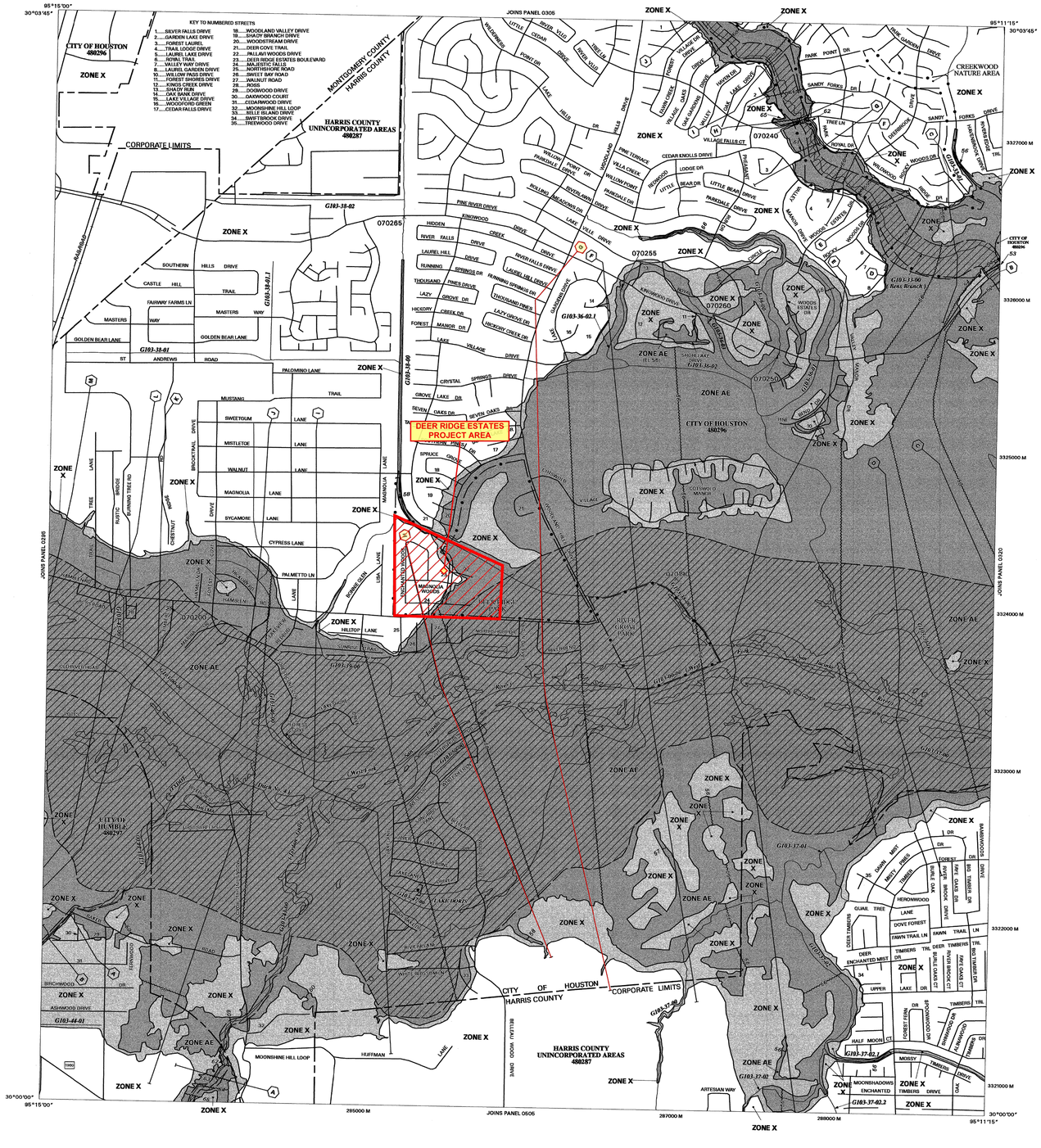
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

Vertical Datum Adjustment due to subsidence is the 2001 adjustment.

Benchmarks shown on this map were provided by either Harris County or the National Geodetic Survey. To obtain elevation, description, and location information for benchmarks provided by Harris County, please contact the Permits Office of the Public Infrastructure Departement at (713) 856-3000 or visit their website at http://www.eng.hctx.net/permits. For information regarding the benchmarks provided by the National Geodetic Survey, please see note above.

Some bridges and other structures shown on the detailed studied streams are not labeled. See corresponding flood profile for appropriate name.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.

ZONE A99 Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- Cross Section Line
- Transect Line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000M — 1000-meter Universal Transverse Mercator grid values, zone 15
- 600000 FT — 5000-foot grid ticks
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel).
- M1.5 — River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 28, 1990

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

SEPTEMBER 30, 1992
NOVEMBER 6, 1996
APRIL 20, 2000
JUNE 18, 2007: to change base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to reflect updated topographic information, and to change floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 0315L

FIRM
FLOOD INSURANCE RATE MAP
HARRIS COUNTY, TEXAS
AND INCORPORATED AREAS

PANEL 315 OF 1150
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HOUSTON, CITY OF	480296	0315	L
HARRIS COUNTY UNINCORPORATED AREAS	480287	0315	L
HUMBLE, CITY OF	480297	0315	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
48201C0315L

MAP REVISED:
JUNE 18, 2007

Federal Emergency Management Agency

60% SUBMITTAL

ims
1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENT (NSSI)

DEER RIDGE ESTATES AREA

FIRM MAP (FEMA)

WBS#: R-002011-0090C-3 — FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE:
NOT TO SCALE
CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:

GDR2 SHEET NO. **45 of 111**

C:\USERS\VLIK\APPDATA\LOCAL\REVIT\DO\466-789-225\CAD\PRODUCTION\45_FEMA FIRM DEER RIDGE ESTATES.DWG\VLIK(SAVED) Wednesday, July 01, 2026 8:06:01 AM, VLIK, Wednesday, July 01, 2026

LOG OF BORING D-1 (PZ-1)

PROJECT: Neighborhood Sewer System Imp (Deer Ridge Estates) PROJECT NO.: HGT1510260.5.3 (A)
LOCATION: N: 13940944.04; E: 3163421.95 WBS NO.: R-002011-0090C-3
STATION: 04+56.04 COMPLETION DEPTH: 45 FT
OFFSET: 8.064' LT CAVE-IN DEPTH: 9 FT
SURFACE ELEVATION: 50.6 FT DATE: 4/3/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 9 FT
WET ROTARY: 9 TO 45 FT

UNDRAINED SHEAR STRENGTH, TSF: ○ HAND PENETROMETER ● UNCONFINED COMPRESSION ■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION △ TORVANE — 0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
50	0	PAVEMENT: 6.25" Concrete							
		Loose, gray, SILTY SAND (SM)	6			14			
	5		9	41.8		14	18	14	4
		-w/ clay seams 3.5'-5'	10						
45		Firm to stiff, gray, SANDY LEAN CLAY (CL)	4	54.3		20	31	12	19
	10		10						
			10						
40		Loose, gray, SAND WITH SILT (SP-SM)	10	6.7		23	NP	NP	NP
	15		5						
		Loose to medium dense, light brown, SILTY SAND (SM)	11						
35		-w/ gravel 15.5'-20'	6						
	20		12	20.2		21	NP	NP	NP
			11						
			7						
30		Loose, light brown and gray, SAND (SP)	4	2.9		19	NP	NP	NP
	25	-w/ clay seams 23'-24.5'	6						
			8						
25		Medium dense, gray, CLAYEY SAND (SC)	17						
				26.2		11	35	14	21
	30								
20		Loose to medium dense, light brown and gray, SILTY SAND (SM)	23	27.3		25	NP	NP	NP
		-w/ clay seams 31.5'-37'	5						
	35								
15		-w/ ferrous stains 35'-37'		47.8		20	NP	NP	NP
			12						
	40	Medium dense to dense, gray, SAND WITH SILT (SP-SM)	26						
10		-w/ gravel 38.5'-40'	15	6.8		26	NP	NP	NP
			29						
	45		43						

Note: 'NP' denotes Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.92 FT; AFTER 10 MIN. AT 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: 5.92 FT; 30 DAYS AT 3.42 FT

Drilled By: Stars Drilling Logged By: FR

LOG OF BORING D-2

PROJECT: Neighborhood Sewer System Imp (Deer Ridge Estates) PROJECT NO.: HGT1510260.5.3 (A)
LOCATION: N: 13941239.83; E: 3163300.92 WBS NO.: R-002011-0090C-3
STATION: 03+10.77 COMPLETION DEPTH: 46 FT
OFFSET: 20.68' LT CAVE-IN DEPTH: 28 FT
SURFACE ELEVATION: 61.65 FT DATE: 4/6/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 33 FT
WET ROTARY: 33 TO 46 FT

UNDRAINED SHEAR STRENGTH, TSF: ○ HAND PENETROMETER ● UNCONFINED COMPRESSION ■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION △ TORVANE — 0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
60	0	PAVEMENT: 6.5" Concrete							
		FILL: Loose to medium dense, brown, SILTY SAND (SM)	7	23.7		15	NP	NP	NP
	5		19						
		Very stiff, brown and gray, SANDY LEAN CLAY (CL)	16	51.2		15	46	18	28
55			20						
	10		25						
		Medium dense, brown and gray, CLAYEY SAND (SC)	17						
50			20	26.4		7	28	19	9
	15		16						
			21						
45			12			14			
		Medium dense, brown and gray, SILTY CLAYEY SAND (SC-SM)	21						
	20			42.9		17	21	15	6
40			12						
		Loose to medium dense, brown and gray, SILTY SAND (SM)	17	48.1		23	21	17	4
	25		11						
35		-w/ clay seams 27'-30'	13						
			5			36			
	30		12						
		Stiff, gray, SANDY LEAN CLAY (CL)		52.0	110	25	25	17	8
30		Loose to medium dense, gray, SILTY SAND (SM)	10						
	35		13						
		-w/ clay seams 36.5'-39.5'	5	15.1		24	NP	NP	NP
25			18						
	40		20						
		Very stiff, gray, FAT CLAY (CH)	29	92.5		27	52	20	32
20		-w/ sand seams 41'-43'							
	45	Dense, gray, SILTY SAND (SM)	38	25.8		23	NP	NP	NP
			45						

Note: 'NP' denotes Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 29.0 FT; AFTER 10 MIN. AT 24.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Stars Drilling Logged By: FR

LOG OF BORING D-3

PROJECT: Neighborhood Sewer System Imp (Deer Ridge Estates) PROJECT NO.: HGT1510260.5.3 (A)
LOCATION: N: 13941704.71; E: 3163331.62 WBS NO.: R-002011-0090C-3
STATION: 07+81.84 COMPLETION DEPTH: 45 FT
OFFSET: 20.77' LT CAVE-IN DEPTH: 17 FT
SURFACE ELEVATION: 59.14 FT DATE: 4/7/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 19 FT
WET ROTARY: 19 TO 45 FT

UNDRAINED SHEAR STRENGTH, TSF: ○ HAND PENETROMETER ● UNCONFINED COMPRESSION ■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION △ TORVANE — 0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
55	0	PAVEMENT: 6.5" Concrete							
		Loose, brown and gray, SILTY SAND (SM)	4	36.5		7	NP	NP	NP
	5		8						
		Medium dense, brown and gray, SILTY CLAYEY SAND (SC-SM)	10						
50			14						
	10		12	48.4		10	21	15	6
			15						
45			16			11			
	15	Medium dense, brown, SILTY SAND (SM)	22						
		-w/ clay seams 12.5'-16'		47.1		18	NP	NP	NP
			11						
40	20	Loose, brown and gray, SILTY CLAYEY SAND (SC-SM)	12						
		-w/ roots 19'-20.5'	7						
			8	45.1		19	22	17	5
			6			24			
35	25	Stiff to very stiff, brown and gray, SANDY LEAN CLAY (CL)	9						
			10	59.2		19	25	16	9
		Medium dense, gray, SILTY SAND (SM)	17						
		-w/ roots 28'-31'	13						
30	30		22						
			16	23.4		26	NP	NP	NP
			20						
25			16						
	35	Very stiff to hard, gray and brown, LEAN CLAY (CL)	39						
			29	89.6		32	33	15	18
		Dense to very dense, gray, SAND WITH SILT (SP-SM)	38	9.8		22	NP	NP	NP
20	40		45						
			62			23			
		Stiff, brown, SANDY LEAN CLAY (CL)	8						
15	45		16	61.0		34	42	20	22

Note: 'NP' denotes Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 17.42 FT; AFTER 10 MIN. AT 15.83 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Stars Drilling Logged By: FR

60% SUBMITTAL

BENCHMARK:
CITY OF HOUSTON MONUMENT 5769-7308, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

ELEV. 74.75 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 12, 2026.

HORIZONTAL DATUM:
ALL HORIZONTAL COORDINATES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83. THE COORDINATES & DISTANCES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A SCALE FACTOR OF 0.999870017.

EXISTING UTILITY NOTE:
EXISTING UNDERGROUND UTILITY INFORMATION (TYPE, SIZE & OWNERSHIP) ARE SHOWN APPROXIMATELY BASED ON THE AVAILABLE RECORD DRAWINGS AND FIELD VERIFICATION (WHERE FEASIBLE) WITHOUT PROBING AND EXCAVATION. NO WARRANTY IS MADE AS TO THE ACCURACY OR COMPLETENESS OF UTILITY LOCATION SHOWN ON THE DRAWING. CAUTION SHOULD BE EXERCISED WHEN EXCAVATING OR BORE AND JACKING IN THE VICINITY OF UNDERGROUND UTILITIES. OWNERS OF THE UTILITIES SHOULD BE NOTIFIED PRIOR TO SUCH ACTIVITIES. CALL UTILITY COORDINATING COMMITTEE AT 713-223-4567, AT LEAST 48 HOURS PRIOR TO EXCAVATING IN THE STREET RIGHT-OF-WAY.

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.

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF EDUARDO QUIROZ, P.E. (TX 85559) OF IMS ENGINEERS INC., TBPE REG NO. 18572. NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)
BORING LOG
DEER RIDGE ESTATES

SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. 46 of 111	

NO.	DATE	REVISION	APP.

PLOT STYLE: COH_JAG_07_2016.ctb
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LOG OF BORING D-4

PROJECT: Neighborhood Sewer System Imp (Deer Ridge Estates)
LOCATION: N: 13942012.49; E: 3163249.04
STATION: 11+03.55
OFFSET: 34.092' RT
SURFACE ELEVATION: 56.21 FT

PROJECT NO.: HGT1510260.5.3 (A)
WBS NO.: R-002011-0090C-3
COMPLETION DEPTH: 45 FT
CAVE-IN DEPTH: 14.5 FT
DATE: 4/2/2026

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 15 FT
WET ROTARY: 15 TO 45 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			PAVEMENT: 6.5" Concrete							
55				Medium dense, gray, SILTY SAND (SM) -w/ calcareous nodules below pavement to 2' -w/ roots 2'-5'				11			
	5				16	46.9		10	NP	NP	NP
					10						
50				Gray, CLAYEY SAND (SC) -w/ wood 5'-9'		48.1		14	24	12	12
	10						107	17			
45				Loose to medium dense, gray and brown, SAND WITH SILT (SP-SM)	9	10.3		16	NP	NP	NP
					11						
	15				8						
40					10						
					10			17			
	20			Medium dense, gray and brown, SAND (SP)	15	4.6		20	NP	NP	NP
35					12						
				Loose, gray, CLAYEY SAND (SC)	5	39.8		20	25	15	10
	25				9						
30											
				Loose to medium dense, gray, SILTY SAND (SM)	15	35.2		19	21	17	4
	30				7						
25				Medium dense to very dense, gray, SAND WITH SILT (SP-SM)	24						
					38						
	35				63	11.9		20	NP	NP	NP
20					11						
					35						
	40				55						
15					45	11.9		19	NP	NP	NP
					43						
					16						
	45				21			21			

Note: 'NP' denotes Non-Plastic.

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 15.0 FT; AFTER 10 MIN. AT 14.83 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Stars Drilling Logged By: FR

HVJ Associates, Inc.

60% SUBMITTAL

NO.	DATE	REVISION	APP.

RENCHMARK:
CITY OF HOUSTON MONUMENT **5769-7308**, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

ELEV. 74.75 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 12, 2026.

HORIZONTAL DATUM:
ALL HORIZONTAL COORDINATES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, **SOUTH CENTRAL ZONE**, NAD83. THE COORDINATES & DISTANCES SHOWN ARE **SURFACE** AND MAY BE CONVERTED TO **GRID** BY **MULTIPLYING** BY A SCALE FACTOR OF **0.999870017**.

EXISTING UTILITY NOTE:
EXISTING UNDERGROUND UTILITY INFORMATION (TYPE, SIZE & OWNERSHIP) ARE SHOWN APPROXIMATELY BASED ON THE AVAILABLE RECORD DRAWINGS AND FIELD VERIFICATION (WHERE FEASIBLE) WITHOUT PROBING AND EXCAVATION. NO WARRANTY IS MADE AS TO THE ACCURACY OR COMPLETENESS OF UTILITY LOCATION SHOWN ON THE DRAWING. CAUTION SHOULD BE EXERCISED WHEN EXCAVATING OR BORE AND JACKING IN THE VICINITY OF UNDERGROUND UTILITIES. OWNERS OF THE UTILITIES SHOULD BE NOTIFIED PRIOR TO SUCH ACTIVITIES. CALL UTILITY COORDINATING COMMITTEE AT 713-223-4567, AT LEAST 48 HOURS PRIOR TO EXCAVATING IN THE STREET RIGHT-OF-WAY.

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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.

1225 North Loop West, Suite 1020
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Tel: 713-739-7744
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SURVEYED BY:
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FB NO.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

BORING LOG

DEER RIDGE ESTATES

SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **47 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb
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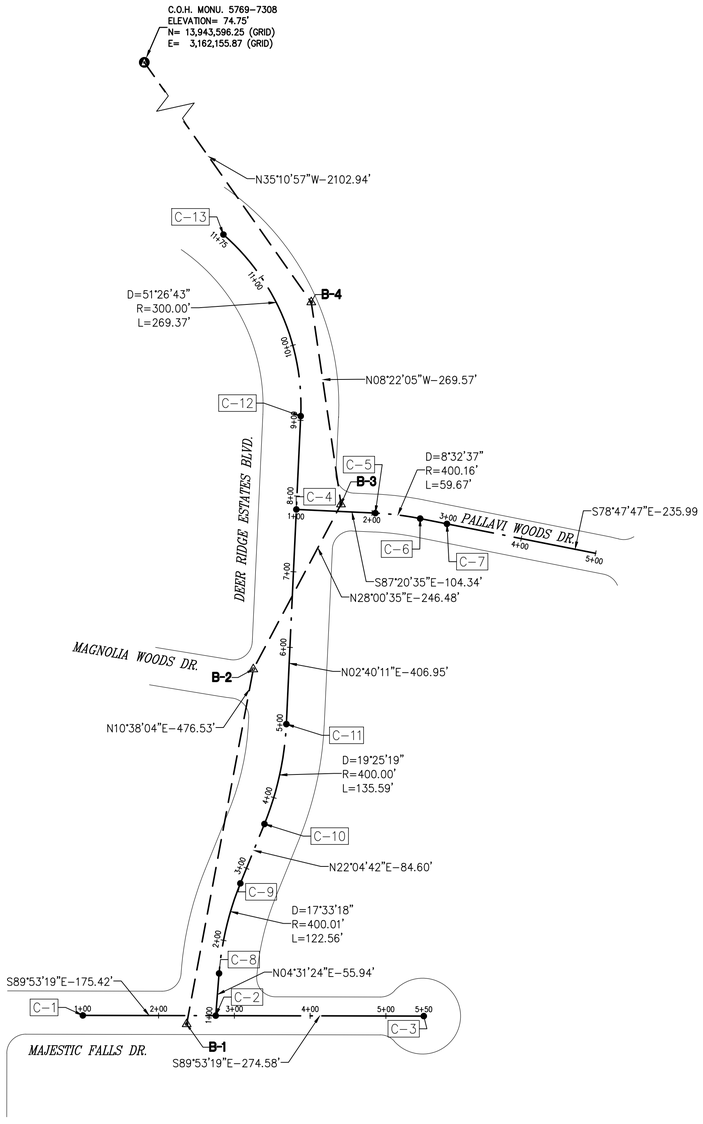
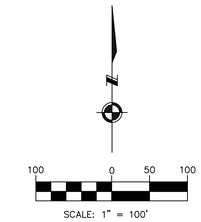


SURVEY BASELINE POINTS DATA (TEMPORARY BENCHMARK)								
POINT No.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)	ELEVATION	D. BL STA.	OFFSET	DESCRIPTION
B-1	13,942,737.51	3,163,614.19	13,940,925.19	3,163,202.98	54.77'	2+37.08	11.22R	SET 'X' CUT ON CONC.
B-2	13,943,205.85	3,163,702.13	13,941,393.47	3,163,290.90	67.53'	5+69.00	46.95L	SET 'X' CUT ON CONC.
B-3	13,943,423.46	3,163,817.88	13,941,611.05	3,163,406.64	60.89'	1+58.52	9.46L	SET 'X' CUT ON CONC.
B-4	13,943,690.16	3,163,778.65	13,941,877.71	3,163,367.41	55.43'	10+42.55	41.97R	FIND 5/8" IRON ROD W/CAP

DESIGN BASELINE POINTS DATA					
POINT No.	D. BL STA.	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)
C-1	1+00.00	13,942,748.99	3,163,477.14	13,940,936.67	3,163,065.94
C-2	2+75.42	13,942,748.65	3,163,652.55	13,940,936.33	3,163,241.33
C-3	5+50.00	13,942,748.12	3,163,927.14	13,940,935.80	3,163,515.88
C-4	7+82.29	13,943,416.72	3,163,758.99	13,941,604.31	3,163,347.76
C-5	2+04.34	13,943,411.88	3,163,863.22	13,941,599.47	3,163,451.97
C-6	2+64.01	13,943,404.69	3,163,922.40	13,941,592.28	3,163,511.14
C-7	3+00.00	13,943,397.70	3,163,957.70	13,941,585.29	3,163,546.44
C-8	1+55.94	13,942,804.41	3,163,656.97	13,940,992.08	3,163,245.74
C-9	2+78.49	13,942,923.22	3,163,685.05	13,941,110.87	3,163,273.83
C-10	3+63.09	13,943,001.61	3,163,716.85	13,941,189.26	3,163,305.62
C-11	4+98.68	13,943,133.42	3,163,745.75	13,941,321.05	3,163,334.52
C-12	9+05.63	13,943,539.93	3,163,764.71	13,941,727.51	3,163,353.47
C-13	11+75.00	13,943,779.52	3,163,662.68	13,941,967.07	3,163,251.46



BENCHMARK:

CITY OF HOUSTON MONUMENT 5769-7308 A BRASS DISK IN CONCRETE LOCATED ALONG WALNUT LN APPROXIMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

ELEV. 74.75 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 12, 2026.

NOTE:

ALL BEARINGS AND DISTANCES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NO. 4204, NAD83. ALL DISTANCES ARE IN SURFACE.

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

LEGEND:

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

NO.	DATE	REVISION	APP.

IMS ENGINEERS
1225 North Loop West
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

KUO & ASSOCIATES
ENGINEERING & SURVEYING
10300 Westoffice Dr., Suite 800, Houston, Texas 77042
Tel: 713-975-6769, Fax: 713-975-0920, www.kuoassociates.com
TBPE Firm Registration No. F-4578
TBPLS Firm Registration No. 1007560

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

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF

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

ON 06/23/2026
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS

DEER RIDGE ESTATES

SURVEY CONTROL MAP

(SHEET 1 OF 2)

WBS NUMBER
R-002011-0090C-3
DRAWING SCALE
1" = 100'
CITY OF HOUSTON PM
SHEET NO. **48 of 111**

PLOT STYLE: COH_JAG_07_2016.ctb
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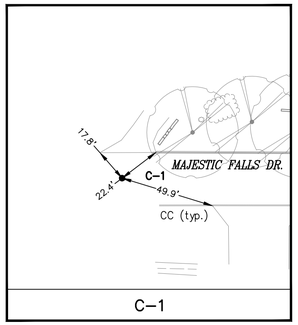
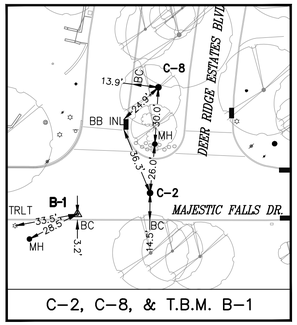
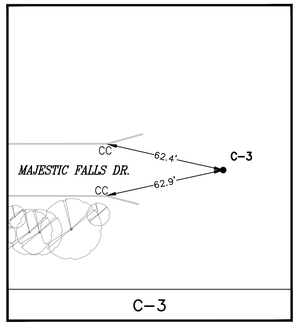


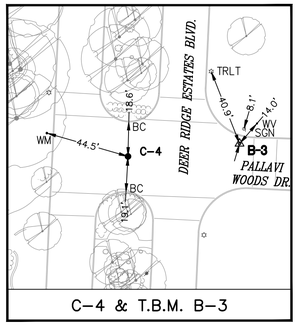
C-1



C-2, C-8, & T.B.M. B-1



C-3



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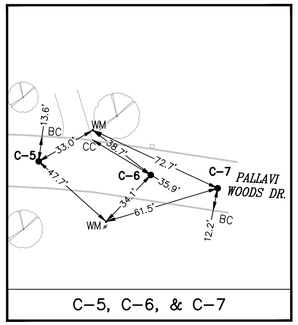

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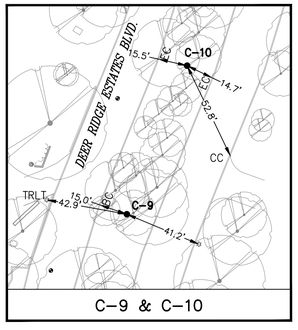

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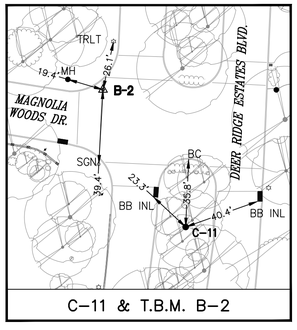
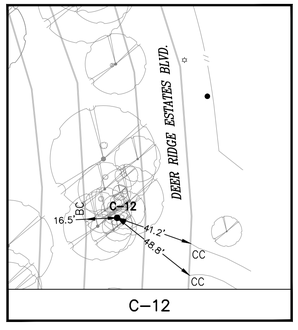


C-11 & T.B.M. B-2



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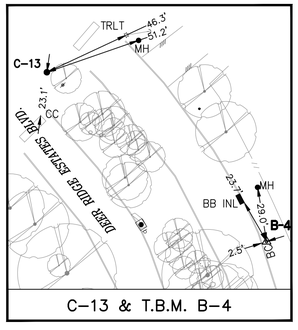
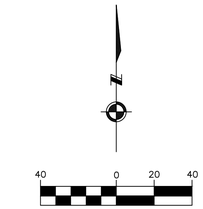


C-13 & T.B.M. B-4



NO.	DATE	REVISION	APP.

EXIST. TOPOGRAPHIC LEGEND

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

ABBREVIATIONS

BC – BACK OF CURB
CC – CONCRETE CORNER
EA – EDGE OF ASPHALT
EC – EDGE OF CONCRETE
EG – EDGE OF GRAVEL
EF – EDGE OF FENCE
FH – FIRE HYDRANT
FC – FENCE CORNER
INL – INLET
LT – LIGHT POLE
MH – MANHOLE
PP – POWER POLE
PP/LT – POWER POLE W/LIGHT
STLT – STREET LIGHT
TRLT – TRAFFIC LIGHT
WM – WATER METER

IMS ENGINEERS
1225 North Loop West
Suite 1020
Houston, TX 77008
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www.imsengineers.com
TX Firm 18572

KUO & ASSOCIATES
ENGINEERING + SURVEYING
10300 Westoffice Dr., Suite 800, Houston, Texas 77042
Tel: 713-975-9769, Fax: 713-975-0920, www.kuoassociates.com
TBPE Firm Registration No. F-4578
TBPLS Firm Registration No. 1007560

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

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
KUTUBUL A. M. MAINUDDIN, R.P.L.S.
TEXAS REG. NO.: 6404
ON 06/23/2026
IT IS NOT TO BE USED FOR PERMIT, BIDDING OR CONSTRUCTION PURPOSES

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS

DEER RIDGE ESTATES

SURVEY CONTROL MAP

(SHEET 2 OF 2)

WBS NUMBER
R-002011-0090C-3
DRAWING SCALE
1" = 40'
CITY OF HOUSTON PM
SHEET NO. **49 of 111**

PLOT STYLE: COH_JAG_07_2016.ctb
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BLOCK 3
DEER RIDGE ESTATES, SECTION ONE
F.C. NO. 359077, H.C.M.R.

BLOCK 4
DEER RIDGE ESTATES, SECTION ONE
F.C. NO. 359077, H.C.M.R.

(50' WIDE PRIVATE DR.)

MH#2 (SEALED MH)
PROP 4' DIA SAN MH
STA. 3+25, 24' RT

PROPOSED 154 LF 8" DIA
SAN SWR @ 0.44%

MH#1 (SEALED MH)
PROP 4' DIA SAN MH
STA. 4+83, 25' RT

154 LF 8" SAN SWR
TO BE ABANDONED

N

CITY OF HOUSTON

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

BENCHMARK:

CITY OF HOUSTON MONUMENT **5769-7308**, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

ELEV. 74.75 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 12, 2026.

HORIZONTAL DATUM:

ALL HORIZONTAL COORDINATES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, **SOUTH CENTRAL ZONE**, NAD83. THE COORDINATES & DISTANCES SHOWN ARE **SURFACE** AND MAY BE CONVERTED TO **GRID** BY **MULTIPLYING** BY A SCALE FACTOR OF **0.999870017**.

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VERIFICATION OF PRIVATE UTILITY LINES

Date

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Signature valid for six months.

Date

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Date

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1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

PLAN
MAJESTIC FALLS DRIVE
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **50 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb

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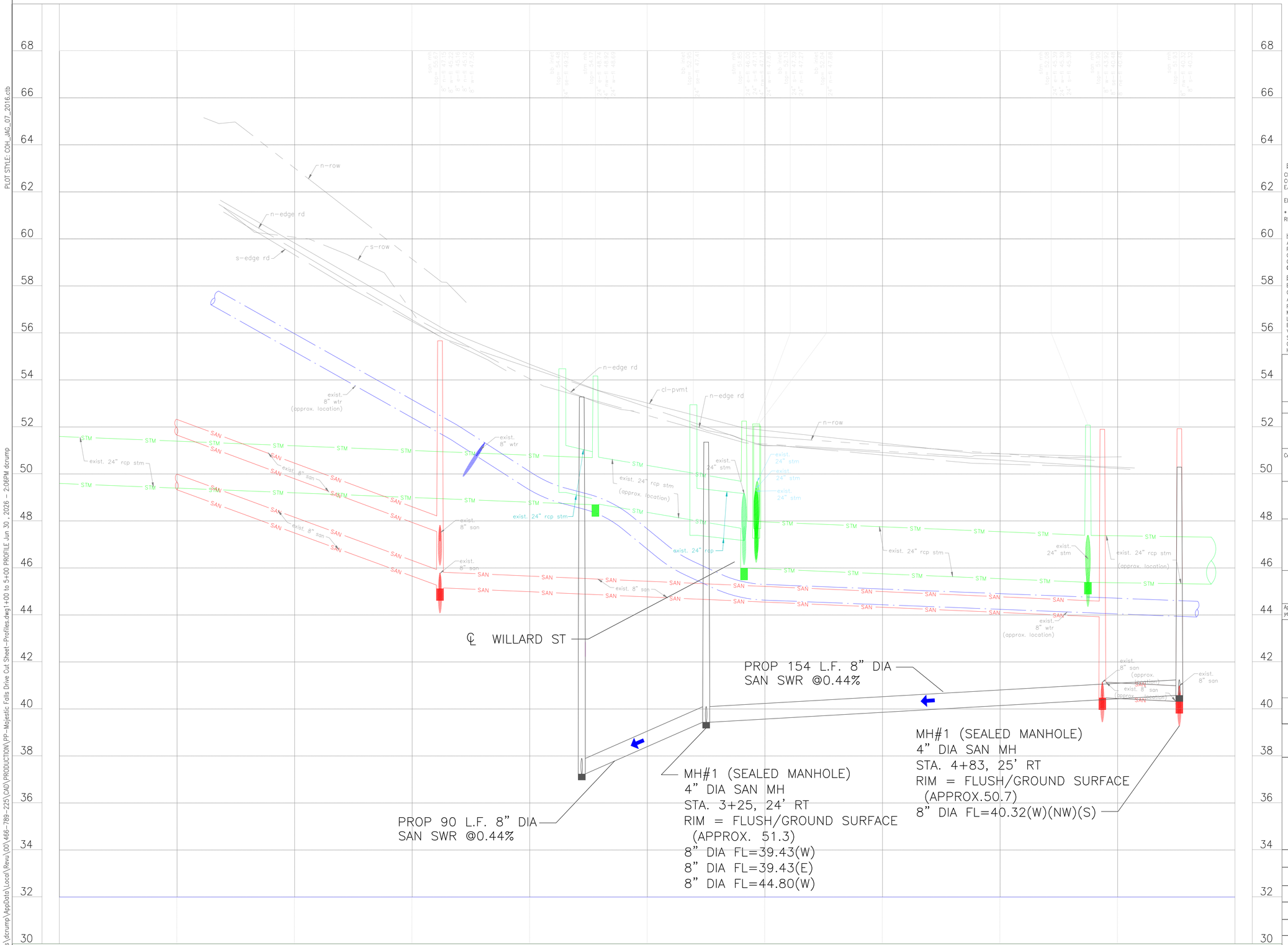

N

CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

60% SUBMITTAL

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APP.	NO.	DATE	REVISION

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CITY OF HOUSTON

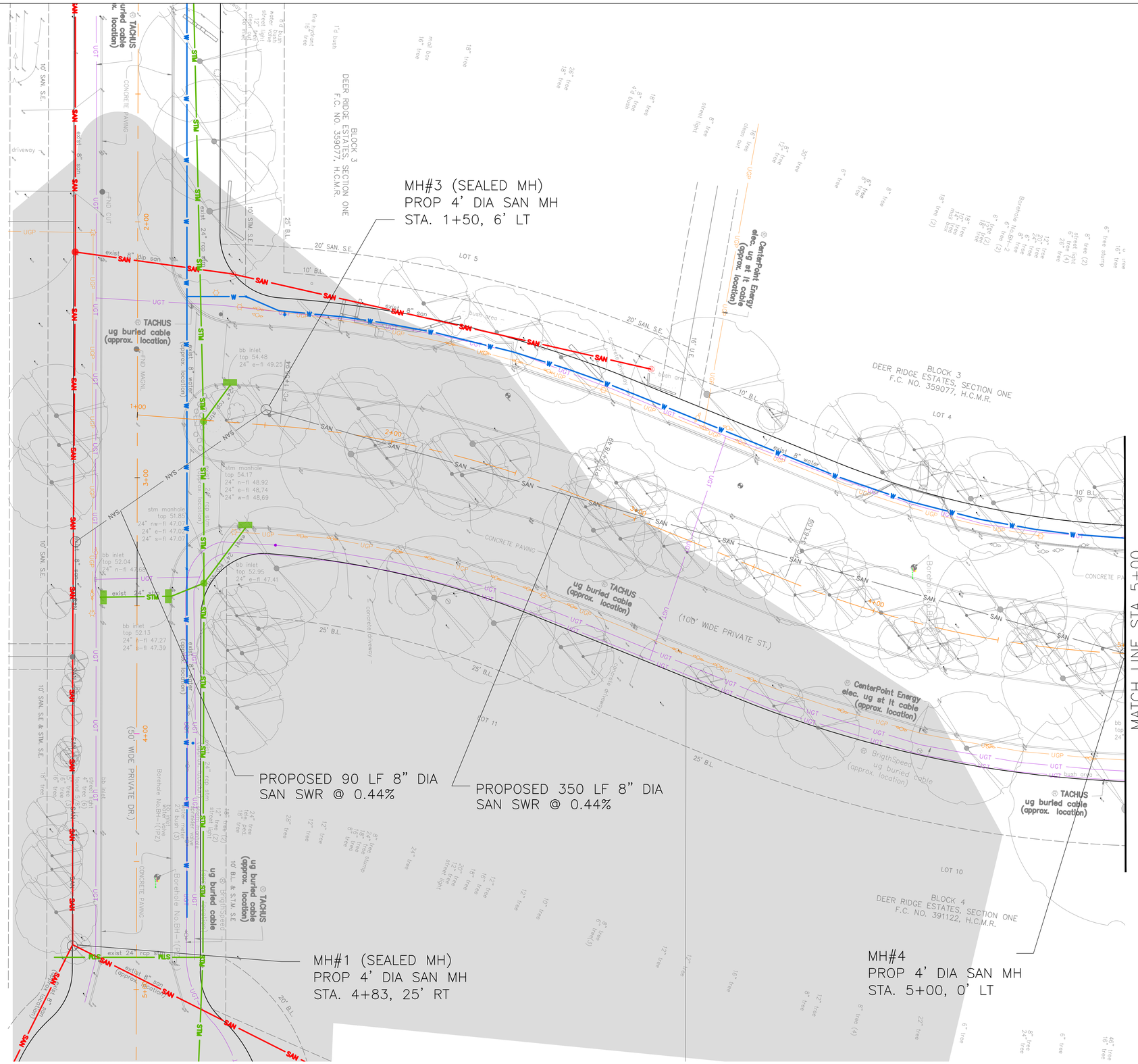
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

PROFILE
MAJESTIC FALLS DRIVE
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **51 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb



LEGEND:

100 YR BFE

CITY OF HOUSTON

GRAPHIC SCALE

60% SUBMITTAL

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ims
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NO.	DATE	REVISION	APP.

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

PLAN
DEER RIDGE ESTATES
BLVD
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **52 of 111**	

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PLOT STYLE: COH_JAG_07_2016.ctb
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70
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1+00
2+00
3+00
4+00
5+00

n-row
n-edge rd
cl-road
exist. 8" wtr.
exist. 8" san
cl-road
n-row
s-edge rd
s-row
exist. 6" fh lead.
exist. 8" san
exist. 24" stm (approx. location)
exist. 24" stm (approx. location)
exist. 24" stm
exist. 24" stm (approx. location)
exist. 24" stm (approx. location)
exist. 24" stm
exist. 24" stm

PROP 90 L.F. 8" DIA
SAN SWR @0.44%

PROP 350 L.F. 8" DIA
SAN SWR @0.44%

MH#3 (SEALED MANHOLE)
4" DIA SAN MH
STA. 1+50, 6' LT
RIM = FLUSH/GROUND SURFACE
(APPROX. 54')
8" DIA FL=39.03 (NE)(SE)

MATCH LINE STA 5+00
SEE SHEET

N

CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

RENCHMARK:

CITY OF HOUSTON MONUMENT 5769-7308, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

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1225 North Loop West, Suite 1020
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TX Firm 18572

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CITY OF HOUSTON

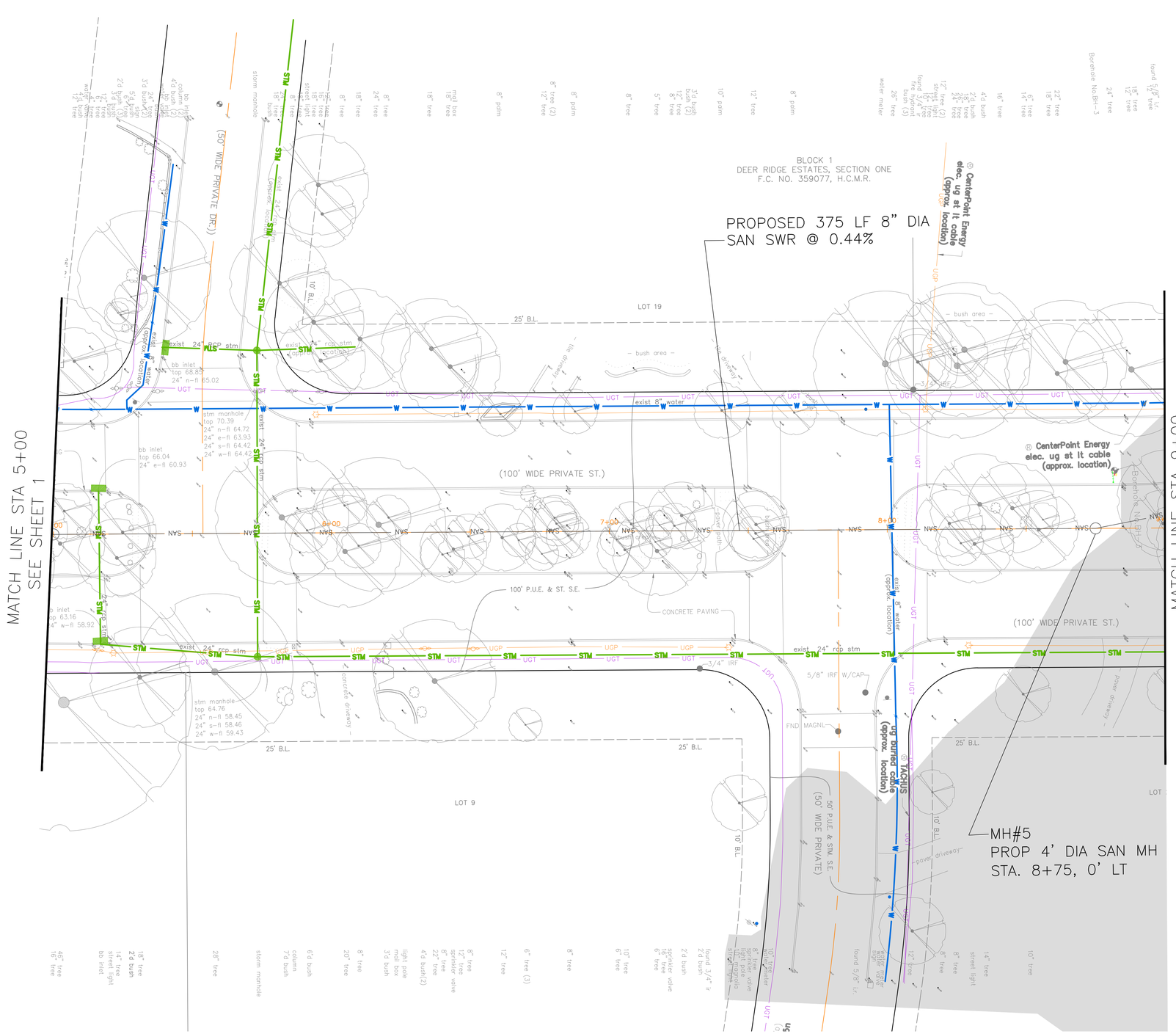
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

PROFILE
DEER RIDGE ESTATES BLVD
STA 1+00 TO STA 5+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **53 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb



LEGEND:

100 YR BFE

N

CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

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DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **54 of 111**	

C:\Users\jdcrump\AppData\Local\Revu\00\466-789-225\CAD\PRODUCTION\PP-Deer Ridge Cul Sheet-Plans.dwg5+00 to 9+00 PLAN Jun 30 , 2026 - 1:40PM dcrump

PLOT STYLE: COH_JAG_07_2016.ctb

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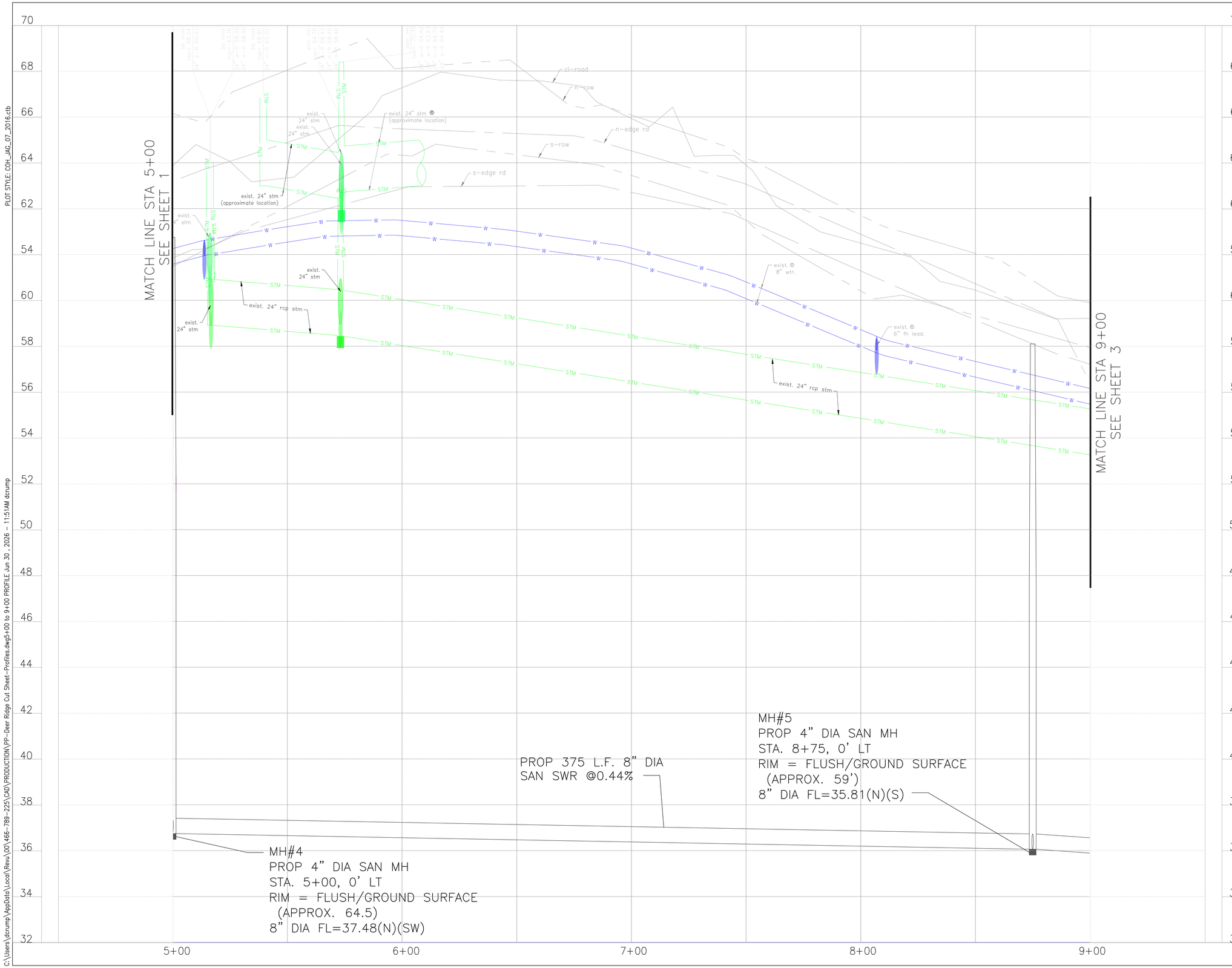


N

CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

RENCHMARK:

CITY OF HOUSTON MONUMENT 5769-7308, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

ELEV. 74.75 FEET NAVD 1988 (GEOID '18)*

* OBSERVED BY GPS SURVEYING AND PROCESSED IN REFERENCE TO THE CORS DATED MARCH 12, 2026.

HORIZONTAL DATUM:

ALL HORIZONTAL COORDINATES ARE BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83. THE COORDINATES & DISTANCES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A SCALE FACTOR OF 0.999870017.

EXISTING UTILITY NOTE:

EXISTING UNDERGROUND UTILITY INFORMATION (TYPE, SIZE & OWNERSHIP) ARE SHOWN APPROXIMATELY BASED ON THE AVAILABLE RECORD DRAWINGS AND FIELD VERIFICATION (WHERE FEASIBLE) WITHOUT PROBING AND EXCAVATION. NO WARRANTY IS MADE AS TO THE ACCURACY OR COMPLETENESS OF UTILITY LOCATION SHOWN ON THE DRAWING. CAUTION SHOULD BE EXERCISED WHEN EXCAVATING OR BORE AND JACKING IN THE VICINITY OF UNDERGROUND UTILITIES. OWNERS OF THE UTILITIES SHOULD BE NOTIFIED PRIOR TO SUCH ACTIVITIES. CALL UTILITY COORDINATING COMMITTEE AT 713-223-4567, AT LEAST 48 HOURS PRIOR TO EXCAVATING IN THE STREET RIGHT-OF-WAY.

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.

1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF EDUARDO QUIROZ, P.E. (TX 85559) OF IMS ENGINEERS INC., TBPE REG NO. 18572, NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

CITY OF HOUSTON

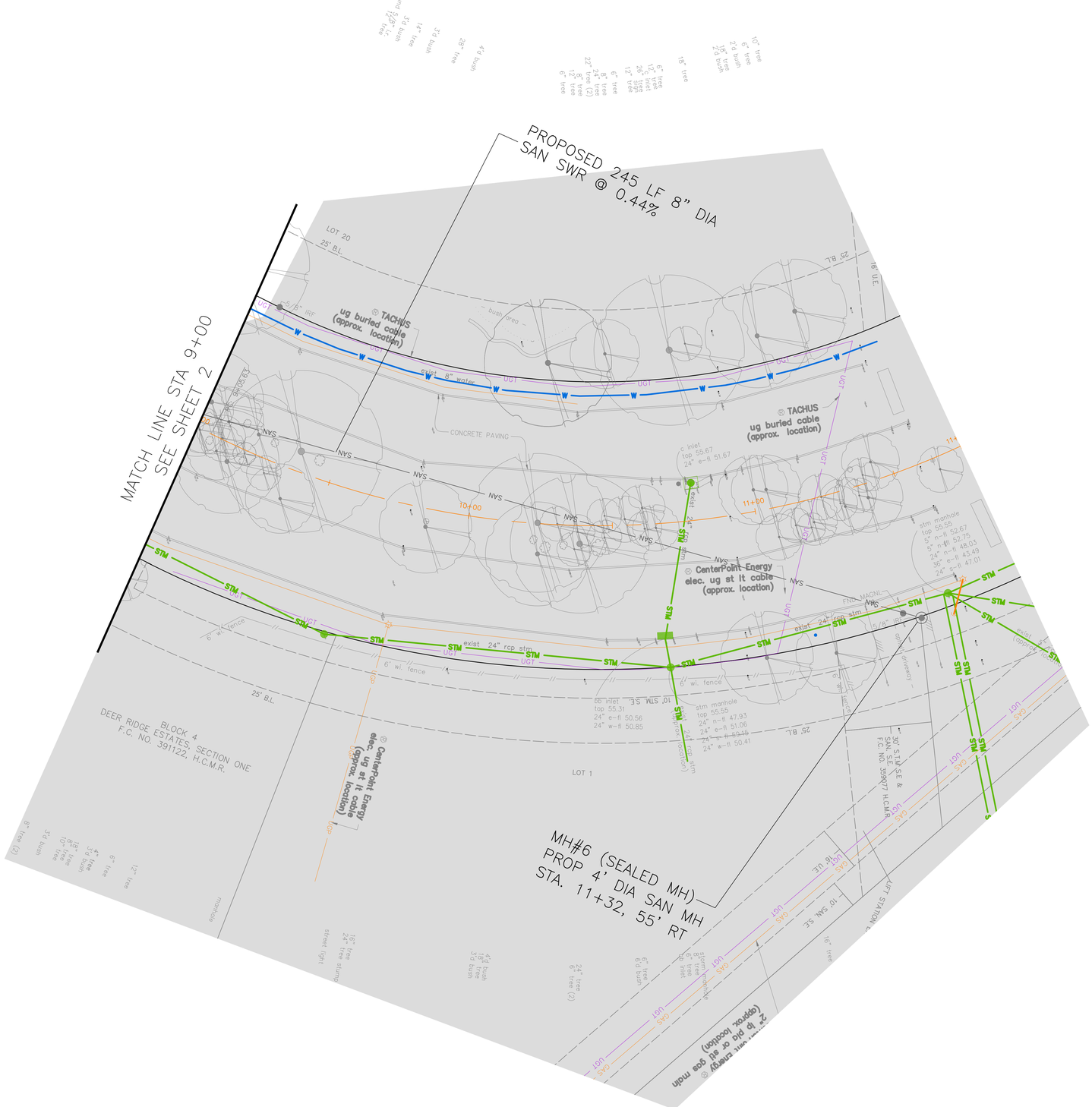
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

PLAN & PROFILE
DEER RIDGE ESTATES
BLVD
STA 5+00 TO STA 9+00

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **55 of 111**	

PLOT STYLE: COH_JAG_07_2016.ctb



CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

60% SUBMITTAL

BENCHMARK:

CITY OF HOUSTON MONUMENT **5769-7308**, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

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NO.	DATE	REVISION	APP.

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Signature valid for six months.

Date

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(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.

1225 North Loop West, Suite 1020
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Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

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FB NO.

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)

PLAN
DEER RIDGE ESTATES
BLVD
STA 9+00 TO STA 11+75

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **56 of 111**	

C:\Users\dcrump\AppData\Local\Revu\00\466-789-225\CAD\PRODUCTION\PP-Deer Ridge Cut Sheet-Plans.dwg900 to 12+00 PLAN Jun 30, 2026 - 1:42PM dcrump

PLOT STYLE: COH_JAG_07_2016.ctb

C:\Users\dcrump\AppData\Local\Revu\00\466-789-225\CAD\PRODUCTION\PP-Deer Ridge Cut Sheet-Profiles.dwg9+00 to 12+00 Jun 30 , 2026 - 11:31AM dcrump

MATCH LINE STA 9+00
SEE SHEET 2

n-row
cl-road
s-row
s-edge rd
n-edge rd

exist. 24" rcp stm
exist. 24" stm
exist. 24" stm
exist. 24" stm
exist. 24" rcp stm
exist. 24" rcp stm
(approx. location)
exist. @ 5" stm
exist. @ 5" stm
exist. @ 8" wtr
@ exist. 36" stm
(approximate location)

PROP 245 L.F. 8" DIA
SAN SWR @0.44%

MH#6 (SEALED MH)
PROP 4" DIA SAN MH
STA. 11+32, 55' RT
RIM = FLUSH/GROUND SURFACE
(APPROX. 55.5)
8" DIA FL=34.61(S)

70 68 66 64 62 60 58 56 54 52 50 48 46 44 42 40 38 36 34 32

9+00 10+00 11+00 12+00 13+00

N

CITY OF HOUSTON

0 10 20

GRAPHIC SCALE

60% SUBMITTAL

NO.	DATE	REVISION	APP.

RENCHMARK:

CITY OF HOUSTON MONUMENT 5769-7308, A BRASS DISK IN CONCRETE, LOCATED ALONG WALNUT LN APPROXMATELY 370 FEET EAST FROM THE BUTTER CUP LN INTERSECTION.

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Date

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ims
1225 North Loop West, Suite 1020
Houston, TX 77008
Tel: 713-739-7744
www.imsengineers.com
TX Firm 18572

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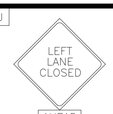
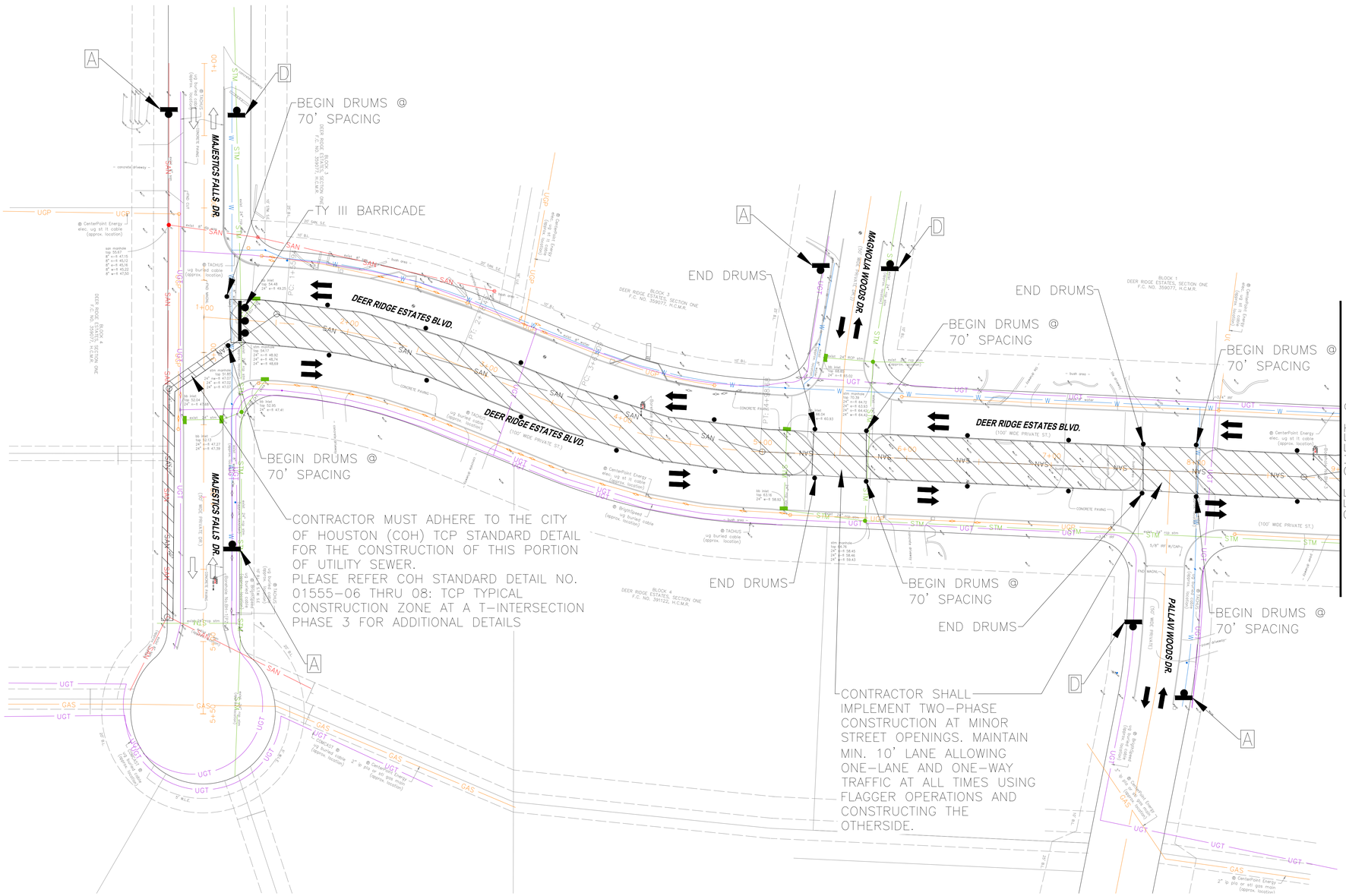
SURVEYED BY:
KUO & ASSOCIATES, INC.
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENTS (NSSI)
PLAN & PROFILE
DEER RIDGE ESTATES BLVD
STA 9+00 TO STA 11+75

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
R-0020-11-0090C-3	
DRAWING SCALE	
H: 1" = 20' V: 1" = 2'	
CITY OF HOUSTON PM	
MARIA GEORGE,P.E.	
SHEET NO. **57 of 111**	

A	B	C	D	E	F	G	H	I	J
CW21-7D 36"X36"	CW20-3 36"X36"	CW20-2 36"X36"	G20-2 36"X18"	M4-9R 30"X24"	M4-9L 30"X24"	M4-8a 24"X18"	M4-9T 30"X24"	CW20-5(2) 36"X36" CW16-3 24"X12"	 CW20-5(1) 36"X36" CW16-3 24"X12"
K	L	M	N	O	P	Q	R	S	T
R6-2(L) 24"X24"	R6-2(R) 24"X24"	R5-1 36"X36"	R11-2 48"X30"	M4-10(L) 30"X24"	R3-1 24"X24"	R3-2 24"X24"	R6-6 30"X36"	CW4-2R 36"X36"	CW4-2L 36"X36"



CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

LEGEND:

- SIGN
- FLAGGER
- PLASTIC DRUMS
- TY III BARRICADE
- FLASHING ARROW PANEL
- CONSTRUCTION WORK ZONE
- LOW PROFILE CONCRETE BARRIER (LPCB) (TY 1 AND TY 2)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW

NOTE:

1. CONTRACTOR SHALL IMPLEMENT TRENCHLESS CONSTRUCTION METHOD FOR THE PLACEMENT OF UTILITY SEWER.
2. CONTRACTOR SHALL PROTECT TREES ALONG THE MEDIAN DURING ALL CONSTRUCTION ACTIVITY. IN THE EVENT IF THIS IS NOT MET, IT IS CONTRACTORS RESPONSIBILITY TO RESTORE OR REPLACE TREES AT OWN EXPENSE.
3. CONTRACTOR SHALL RESTORE EXISTING CONDITION AT THE SANITARY MANHOLE/PIT ALONG THE MEDIAN IN ACCORDANCE TO COH STANDARD AFTER THE UTILITY SEWER CONSTRUCTION.
4. THIS TRAFFIC CONTROL PLAN IS FOR THE PURPOSE OF CONSTRUCTION OF UTILITY SEWER ALONG THE MEDIAN ONLY. FOR THE REMAINDER INCLUDING UTILITY WORK AT THE T-INTERSECTION & ALONG MINOR STREET OPENINGS – PLEASE REFER TO THE COH STANDARD SPECIFIED.
5. POSTED SPEED LIMIT ON DEER RIDGE ESTATES BLVD. IS 30 M.P.H.
6. ALL SPACING FOR TRAFFIC CONTROL SIGNAGE AND CHANNELIZING DEVICES SHALL MEET THE POSTED SPEED LIMIT AND IN ACCORDANCE TO THE COH TCP NOTES CHANNELIZING DEVICES AND BARRICADES STANDARDS. PLEASE REFER COH STANDARD DETAIL NO. 01555-01 FOR ADDITIONAL DETAILS.
7. CONTRACTOR MUST MAINTAIN A MINIMUM OF 10-FT TRAVEL LANE AT ALL THE TIMES DURING CONSTRUCTION.

60% SUBMITTAL

1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENT (NSSI)

DEER RIDGE ESTATES AREA

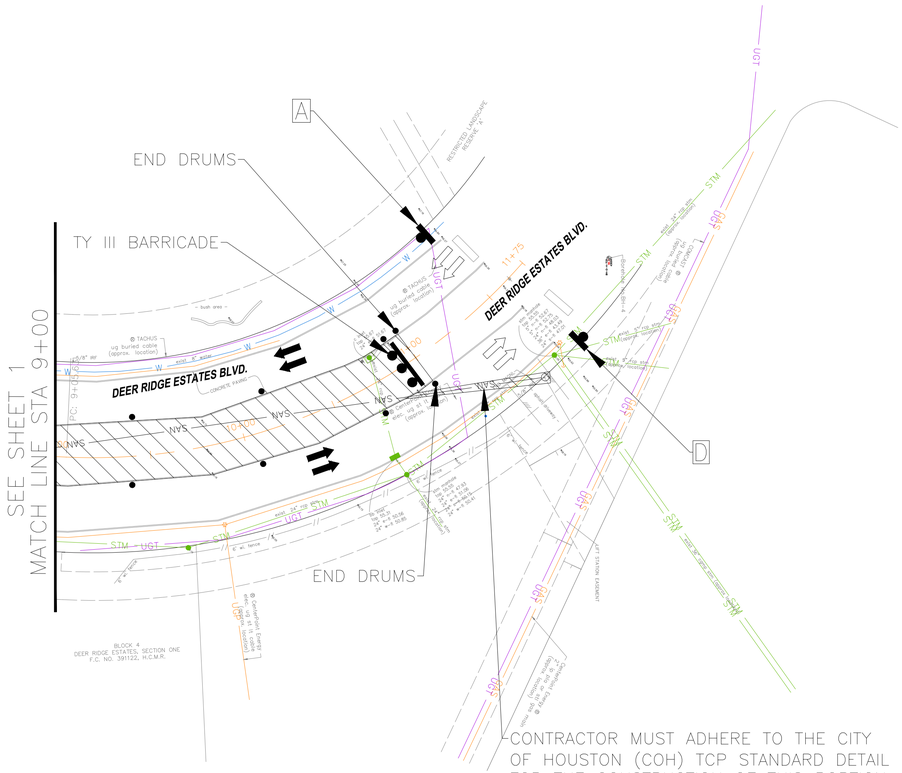
TRAFFIC CONTROL PLAN

SHEET 1 OF 2

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
H: 1" = 40'	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
TCP-1	SHEET NO. **58 of 111**

C:\USERS\YLIK\APPDATA\LOCAL\REVU\DO\466-789-225\CAD\PRODUCTION\200621-TCPOT_UPDATE.DWG(YLIK)SAVED: Tuesday, June 30, 2026\COH_KAI.CTB(PLOTTED: Tuesday, June 30, 2026

A UTILITY WORK AHEAD CW21-7D 36"X36"	B ROAD CLOSED AHEAD CW20-3 36"X36"	C DETOUR AHEAD CW20-2 36"X36"	D END ROAD WORK G20-2 36"X18"	E STREET NAME DETOUR M4-9R 30"X24"	F STREET NAME DETOUR M4-9L 30"X24"	G END DETOUR M4-8a 24"X18"	H STREET NAME DETOUR M4-9T 30"X24"	I RIGHT LANE CLOSED AHEAD CW20-5(2) 36"X36" CW16-3 24"X12"	J LEFT LANE CLOSED AHEAD CW20-5(1) 36"X36" CW16-3 24"X12"
K ONE WAY R6-2(L) 24"X24"	L ONE WAY R6-2(R) 24"X24"	M DO NOT ENTER R5-1 36"X36"	N ROAD CLOSED R11-2 48"X30"	O DETOUR M4-10(L) 30"X24"	P R3-1 24"X24"	Q R3-2 24"X24"	R BEGIN ONE WAY R6-6 30"X36"	S CW4-2R 36"X36"	T CW4-2L 36"X36"



CONTRACTOR MUST ADHERE TO THE CITY OF HOUSTON (COH) TCP STANDARD DETAIL FOR THE CONSTRUCTION OF THIS PORTION OF UTILITY SEWER.
PLEASE REFER COH STANDARD DETAIL NO. 01555-04: TCP ONE LANE CLOSURE PHASE 1 AND 2 FOR ADDITIONAL DETAILS.

CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

LEGEND:

- SIGN
- FLAGGER
- PLASTIC DRUMS
- TY III BARRICADE
- FLASHING ARROW PANEL
- CONSTRUCTION WORK ZONE
- LOW PROFILE CONCRETE BARRIER (LPCB) (TY 1 AND TY 2)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW

NOTE:

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60% SUBMITTAL

1225 NORTH LOOP WEST
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www.imsengineers.com
TX Firm 18572

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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENT (NSSI)

DEER RIDGE ESTATES AREA

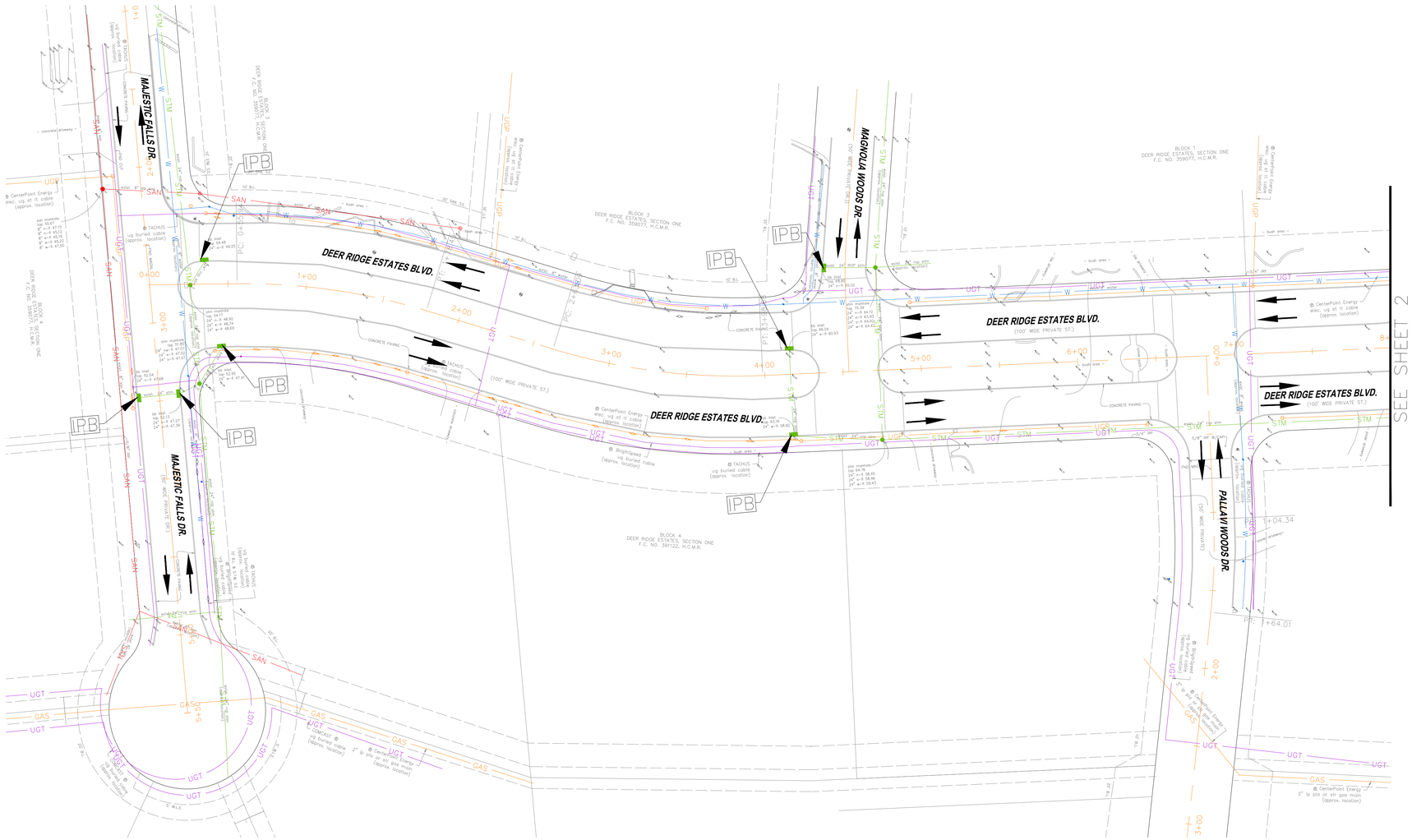
TRAFFIC CONTROL PLAN

SHEET 2 OF 2

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
H: 1" = 40'	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. **59 of 111**	

TCP-2

C:\USERS\YLK\APPDATA\LOCAL\REVU\00\466-789-225\CAD\PRODUCTION\200621-TCP01_UPDATE.DWG[YLK(SAVED; Tuesday, June 30, 2026(COH_KAI.CTB[PLOTTED; Tuesday, June 30, 2026



CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

LEGEND:

- IPB — INLET PROTECTION BARRIER
- RFB — REINFORCED FILTER FABRIC BARRIER
- FF — FILTER FABRIC BARRIER
- SC — STABILIZED CONSTRUCTION ACCESS
- EXISTING TRAFFIC FLOW

60% SUBMITTAL

1225 NORTH LOOP WEST
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENT (NSSI)

DEER RIDGE ESTATES AREA

STORM WATER PAOLLUTION PREVENTION PLAN

SHEET 1 OF 2

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
H: 1" = 40'	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SWPPP-1	SHEET NO. **60 of 111**

C:\USERS\YLIK\APPDATA\LOCAL\REVIT\07\466-789-225\CAD\PRODUCTION\200621-SWPPP.DWG|YLIK|SAVED:Monday, June 29, 2026|COH_KAL.CTB|PLOTTED:Monday, June 29, 2026

CITY OF HOUSTON
0 20 40 80
GRAPHIC SCALE

LEGEND:

- IPB — INLET PROTECTION BARRIER
- RFB — REINFORCED FILTER FABRIC BARRIER
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- EXISTING TRAFFIC FLOW

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NEIGHBORHOOD SEWER SYSTEM IMPROVEMENT (NSSI)

DEER RIDGE ESTATES AREA

STORM WATER POLLUTION PREVENTION PLAN

SHEET 2 OF 2

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
H: 1" = 40'	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SWPPP-2	SHEET NO. **61 of 111**

C:\USERS\YLK\APPDATA\LOCAL\REVIT\00\466-789-225\CAD\PRODUCTION\200621-SWPPP.DWG|YLK|SAVED: Monday, June 29, 2026|COH_KAI.CTB|PLOTTED: Monday, June 29, 2026

DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6

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 WITIH REVISIONS DURING THE ENTIRE CONSTRUCTION PERIOD.
2. ALL SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM THE LATEST VERSION OF THE TMUTCD.
3. NO LANES SHALL BE CLOSED DURING THE HOURS OF 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM MONDAY THRU FRIDAY WITHOUT APPROVAL OF THE CITY TRAFFIC ENGINEER.
4. NO WORK SHALL BE PERFORMED IN RESIDENTIAL AREAS FROM 7:00 PM TO 7:00 AM.
5. CONTRACTOR SHALL MAINTAIN APPROVED NUMBER OF THROUGH LANES OF TRAFFIC IN EACH DIRECTION DURING CONSTRUCTION WORKING HOURS. TRAFFIC CONTROL PLANS SHALL INCLUDE ONE-WAY AND/OR DETOUR PLANS. CONTRACTOR SHALL MAINTAIN ADA COMPLIANT PEDESTRIAN ACCESS TO BUS STOPS AND ADEQUATE BUS ACCESS TO ALL THE BUS STOPS.
6. CONTRACTOR SHALL MAINTAIN TRAFFIC LANES AND DETOURS ACCORDING TO TRAFFIC CONTROL PLANS DURING WORKING HOURS.
7. CONTRACTOR SHALL COVER OPEN PAVEMENT EXCAVATIONS FOR MINOR UTILITY WORK WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS, AND OPEN LANES FOR NORMAL TRAFFIC FLOW WHEN FEASIBLE.
8. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE TO PREPARE AND SUBMIT AN ALTERNATE SET OF TRAFFIC CONTROL PLANS TO THE CITY OF HOUSTON PROJECT MANAGER FOR APPROVAL TEN WORKING DAYS PRIOR TO IMPLEMENTATION. THESE PLANS SHALL BE DRAWN TO SCALE ON REPRODUCIBLE MYLARS AND SHALL BE SEALED BY A LICENSED ENGINEER IN THE STATE OF TEXAS. OFFICE OF CITY ENGINEER, MOBILITY PERMITS SECTION REPRESENTATIVE APPROVAL IS REQUIRED TO ACCEPT THE PROPOSED CHANGES.
9. CONTRACTOR SHALL SECURE LANE/SIDEWALK/BICYCLE FACILITY CLOSURE PERMITS FROM OFFICE OF CITY ENGINEER (MOBILITY PERMIT SECTION AT https://geohub.houstontx.gov) BEFORE IMPLEMENTING THE TRAFFIC CONTROL PLAN. THE APPLICATION MUST BE SUBMITTED AT LEAST TEN DAYS PRIOR TO THE IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN AND/OR BEGINNING CONSTRUCTION WORK. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLANS, CONSTRUCTION SEQUENCING, AND CONSTRUCTION SCHEDULE WITH THE APPLICATION.
10. CONTRACTOR SHALL HAVE APPROVED TRAFFIC CONTROL PLAN AND PERMIT AT THE JOB SITE FOR INSPECTION AT ALL TIMES.
11. DURING PAVEMENT SURFACE RESTORATION PROJECTS; THE CONTRACTOR SHALL NOT OPEN CLOSED LANES UNTIL THE PAVEMENT SURFACE HAS CURED ENOUGH TO ALLOW VEHICULAR TRAFFIC ACCORDING TO CITY OF HOUSTON STANDARD SPECIFICATIONS.
12. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING AND COORDINATING ALL CONSTRUCTION ACTIVITIES WITH STAKE HOLDERS IN THE VICINITY INCLUDING EMERGENCY RESPONSE AGENCIES SUCH AS HOUSTON POLICE DEPARTMENT, HOUSTON FIRE DEPARTMENT, AND METROPOLITAN TRANSIT AUTHORITY.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ISSUING ALL WORK DIRECTIVES TO ALL SUB-CONTRACTORS, UTILITY COMPANIES, AND ALL OTHER ENTITIES PERFORMING CONSTRUCTION WORK ASSOCIATED WITH THE PROJECT.
14. NOTHING IN THESE NOTES OR PLANS SHALL RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT; INCLUDING SAFETY OF ALL MODES OF TRANSPORTATION, PERSONS, AND PROPERTY, AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO WORKING HOURS.
15. THE OFFICE OF CITY ENGINEER (MOBILITY PERMITS GROUP) PER THE DIRECTION OF THE CITY TRAFFIC ENGINEER HAVE THE RIGHT TO DEMAND THE INSTALLATION OF ADDITIONAL TRAFFIC CONTROL DEVICES OR MODIFICATIONS OF THESE PLANS AND NOTES, AS DEEMED NECESSARY TO PROMOTE THE SAFE AND ORDERLY FLOW OF TRAFFIC, INCLUDING PEDESTRIANS AND BICYCLES, THROUGH THE CONSTRUCTION WORK ZONE. THE CONTRACTOR SHALL COMPLY WITH THESE ADDITIONAL REQUESTS OR MODIFICATIONS WITH DUE DILIGENCE.
16. ALL EXISTING TRAFFIC CONTROL SIGNS AND PAVEMENT MARKINGS SHALL BE MAINTAINED IN VISIBLE LOCATIONS DURING CONSTRUCTION UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM CITY OF HOUSTON PROJECT MANAGER. THE CONTRACTOR SHALL RESTORE OR REPLACE (AT THE DISCRETION OF THE CITY TRAFFIC ENGINEER) ANY PAVEMENT MARKING OR SIGNING DAMAGE DURING CONSTRUCTION OPERATIONS, INCLUDING RAISED PAVEMENT MARKERS (RPMS).
17. WHEN ENTERING OR LEAVING ROADWAYS CARRYING PUBLIC TRAFFIC, THE CONTRACTOR'S EQUIPMENT, WHETHER EMPTY OR LOADED SHALL IN ALL CASES YIELD TO PUBLIC TRAFFIC WITH THE ASSISTANCE OF CONTRACTOR PROVIDED CERTIFIED FLAGGER/PEACE OFFICER.
18. ACCESS TO DRIVEWAYS ADJACENT TO THE CONSTRUCTION WORK ZONE SHALL BE MAINTAINED AT ALL TIMES AS MUCH AS POSSIBLE. ADDITIONAL CONES AND/OR DELINEATORS MAY BE REQUIRED TO DELINEATE THE DRIVEWAY ACCESS ROUTE THROUGH THE CONSTRUCTION WORK ZONE. A MINIMUM OF ONE TRAVEL LANE SHALL BE MAINTAINED ACROSS THE DRIVEWAYS, UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM CITY OF HOUSTON PROJECT MANAGER.
19. SPILLAGE RESULTING FROM HAULING OPERATIONS ALONG OR ACROSS ANY PUBLIC TRAVELED WAY SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
20. THE CONTRACTOR SHALL SUBMIT AN APPLICATION FOR TEMPORARY PARKING RESTRICTIONS IF THERE ARE PARKING METERS LOCATED AT THE PROPOSED LANE CLOSURES FROM PARKING MANAGEMENT DIVISION (832-393-8690) AT LEAST TEN BUSINESS DAYS BEFORE IMPLEMENTATION OF LANE CLOSURES. IN ADDITION, TEMPORARY NO PARKING SIGNS SHALL BE POSTED 24 HOURS PRIOR TO COMMENCEMENT OF WORK.
21. ADDITIONAL OFF DUTY OFFICERS/FLAGGERS MAY BE REQUESTED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED AT THE DISCRETION OF THE CITY PROJECT MANAGER EVEN IF THEY ARE NOT SPECIFICALLY IDENTIFIED ON THE PROJECT PLANS.
22. THE CONTRACTOR SHALL REPLACE WITHIN 72 HOURS, ALL TRAFFIC SIGNAL LOOP DETECTORS DAMAGED DURING CONSTRUCTION.
23. IN GENERAL, A SOLAR POWERED FLASHING ARROW BOARD SHALL BE REQUIRED ON ALL MAJOR THOROUGHFARE LANES CLOSURES. EXCEPTIONS TO FLASHING ARROW BOARDS AND/OR IMPLEMENTATION ON RESIDENTIAL LANE CLOSURES SHALL BE APPROVED BY CITY TRAFFIC ENGINEER.
24. APPROVED TRAFFIC CONTROL PLAN SHALL BE IN PLACE BEFORE STARTING ANY EXCAVATION.
25. WATER FILLED BARRIERS CAN BE USED AS INSTRUCTED BY THE ENGINEER AND APPROVED BY THE CITY FOR PROJECTS WHERE SPACE IS LIMITED AND HEAVY EQUIPMENT TO PLACE CONCRETE BARRIERS IS NOT FEASIBLE. WATER FILLED BARRIERS SHALL NOT BE USED ON ROADWAYS WITH A POSTED SPEED LIMIT MORE THAN 45 MPH.
26. WATER FILLED BARRIERS MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S REQUIREMENTS AND ROUTINELY INSPECTED FOR DEFECTS.
27. IF WATER FILLED BARRIER IS PROVIDED, USE ENVIRONMENTALLY SAFE ANTI-FREEZING AGENT IN THE WATER WHEN IT IS APPLICABLE PER MANUFACTURER SPECIFICATIONS AND RECOVER AGENT WHEN THE BARRIER IS DRAINED.
28. DISPOSE OF WATER AND AGENT PROPERLY. DO NOT DRAIN WATER FILLED BARRIER INTO OR ACROSS AN EXISTING TRAVEL LANE.
29. PROVIDE BARRIER UNITS THAT ARE CAPABLE OF BEING LIFTED AND MOVED WHEN FILLED IF DRAINING IS NOT POSSIBLE.
30. PROVIDE WATER FILLED BARRIER THAT ACTS AS ITS OWN FREE STANDING, NON-REDIRECTIVE END TREATMENT.
31. WHEN WATER FILLED BARRIERS ARE USED TO CHANNELIZE PEDESTRIANS, THEY MUST HAVE A CONTINUOUS DETECTABLE BOTTOM FOR USERS OF LONG CANES AND THE TOP OF THE UNIT SHALL NOT BE LESS THAN 32 INCHES IN HEIGHT.
32. ANY CLOSURE OF A PEDESTRIAN OR BICYCLE FACILITY SHALL REQUIRE THE SHORTEST DETOUR THAT MAINTAINS THE SAFETY OF PEDESTRIAN AND/OR BICYCLISTS.

SPACING FOR CHANNELIZING DEVICES

A. PLASTIC DRUMS ON MERGING TAPER @ 30' C – C WITH CHEVRON SIGN @ 60' C – C AND WARNING LIGHTS FOR OVERNIGHT CLOSURE.

B. PLASTIC DRUMS ON DOWNSTREAM TAPER @ 30' C – C (RETURN TAPER AND BARRICADE ARE OPTIONAL AND DIVIDED ROADWAY SECTION)

C. PLASTIC DRUMS ON RADII @ 35' C –C.

D. PLASTIC DRUMS ON TANGENT @ 35' C – C WITH VERTICAL PANEL AT 70' C – C AND APPROVED WARNING LIGHT @ 70' C – C (FOR OVERNIGHT CLOSURE).

E. PLASTIC DRUMS IN FRONT OF CONSTRUCTION ZONE @ 20' C – C WITH VERTICAL PANEL AT 40' C – C AND APPROVED WARNING LIGHT @ 40' C – C (FOR OVERNIGHT CLOSURE).

F. CONCRETE TRAFFIC BARRIER (CTB) OR LOW PROFILE CONCRETE TRAFFIC BARRIER (LPCTB) WITH APPROVED REFLECTORS @ 10' C – C IF PAVEMENT DROP IS GREATER THAN 1 FOOT.

G. PLASTIC DRUMS W/GUARD RAIL MOUNTED.

H. SELF- RIGHTING VERTICAL PANEL SPACING.
- 4 LANES TO 2 LANES UNDIVIDED ROADWAY SECTION @ 20' C – C.
- 4 LANES DIVIDED ROADWAY TO ONE SIDE TWO WAY ROADWAY @ 20' C – C.
- LEFT LANE AND RIGHT LANE STORAGE BAYS @ 15' C – C.

I. SPACING SHOWN ON TRAFFIC CONTROL SHALL SUPERSEDE THE ABOVE SPACING.

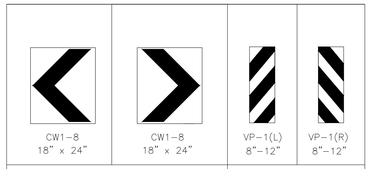
J. SPACING MAY BE ADJUSTED TO PROVIDE DRIVEWAYS, INTERSECTIONS AND /OR MEDIAN OPENINGS.

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

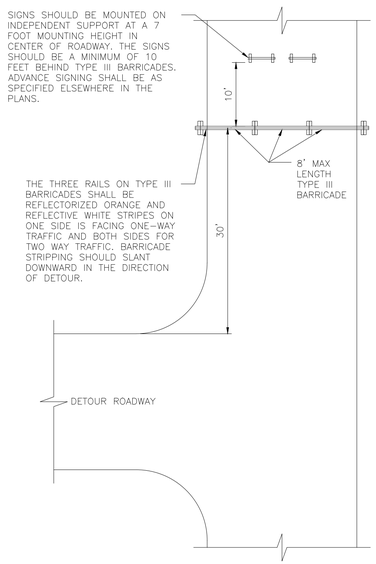
POSTED SPEED (MPH)	SIGN SPACING "X" (FEET)	MIN. DESIRABLE TAPER LENGTH "L"			SUGGESTED MAXIMUM SPACING OF DEVICE	
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER	ON A TANGENT
30	120'	150'	165'	180'	30'	60'–75'
35	160'	205'	225'	245'	35'	70'–90'
40	240'	265'	295'	320'	40'	80'–100'
45	320'	450'	495'	540'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

TABLE C4 – STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

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



CHANNELIZATION AND BARRICADES



PLAN VIEW
TYPE III BARRICADE (POST AND SKID)
TYPICAL APPLICATION

LEGEND:

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

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DIRECTOR OF HOUSTON PUBLIC WORKS	
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TCP NOTES CHANNELIZING DEVICES AND BARRICADES

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D1

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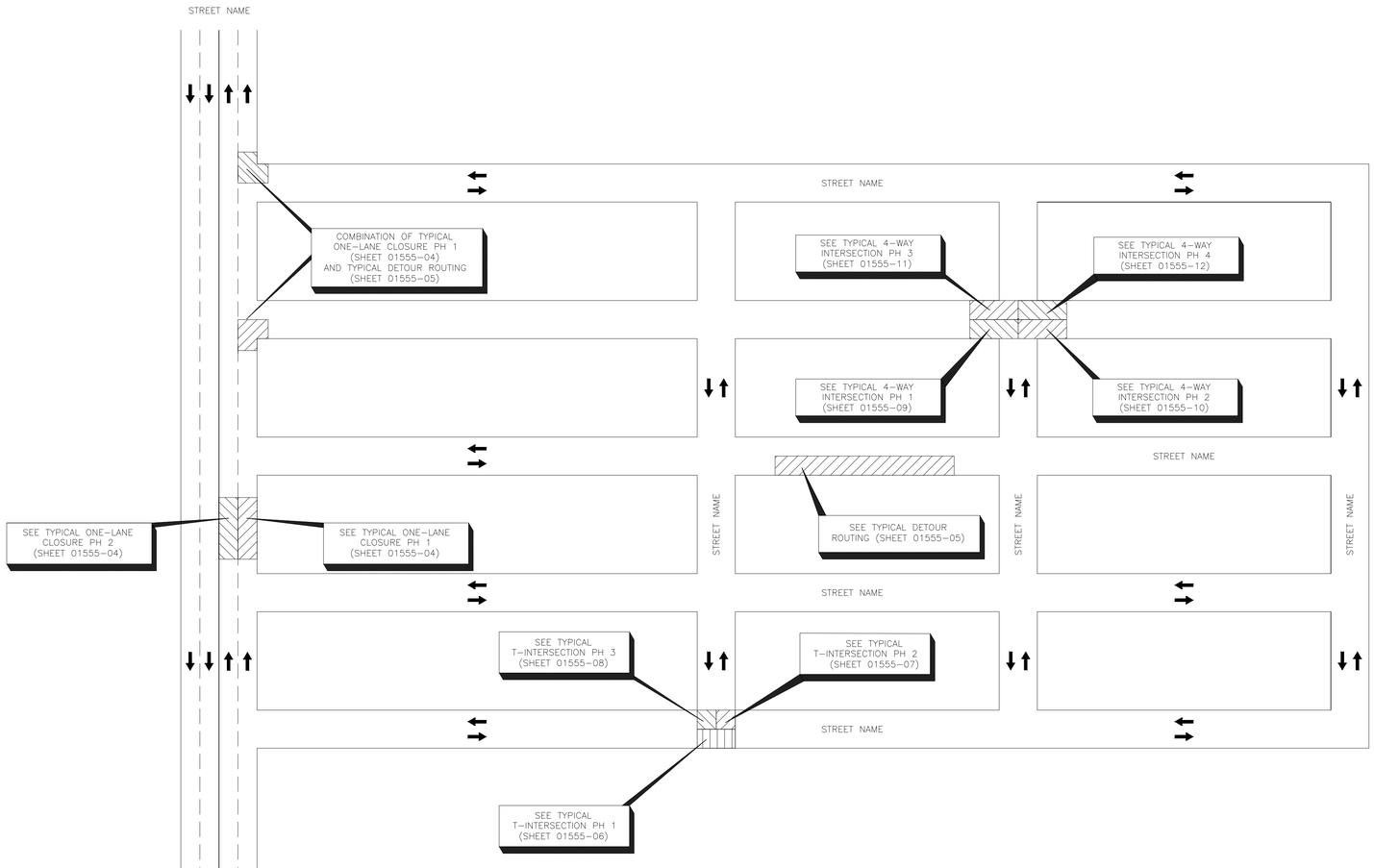

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A	B	C	D	E	F	G	H
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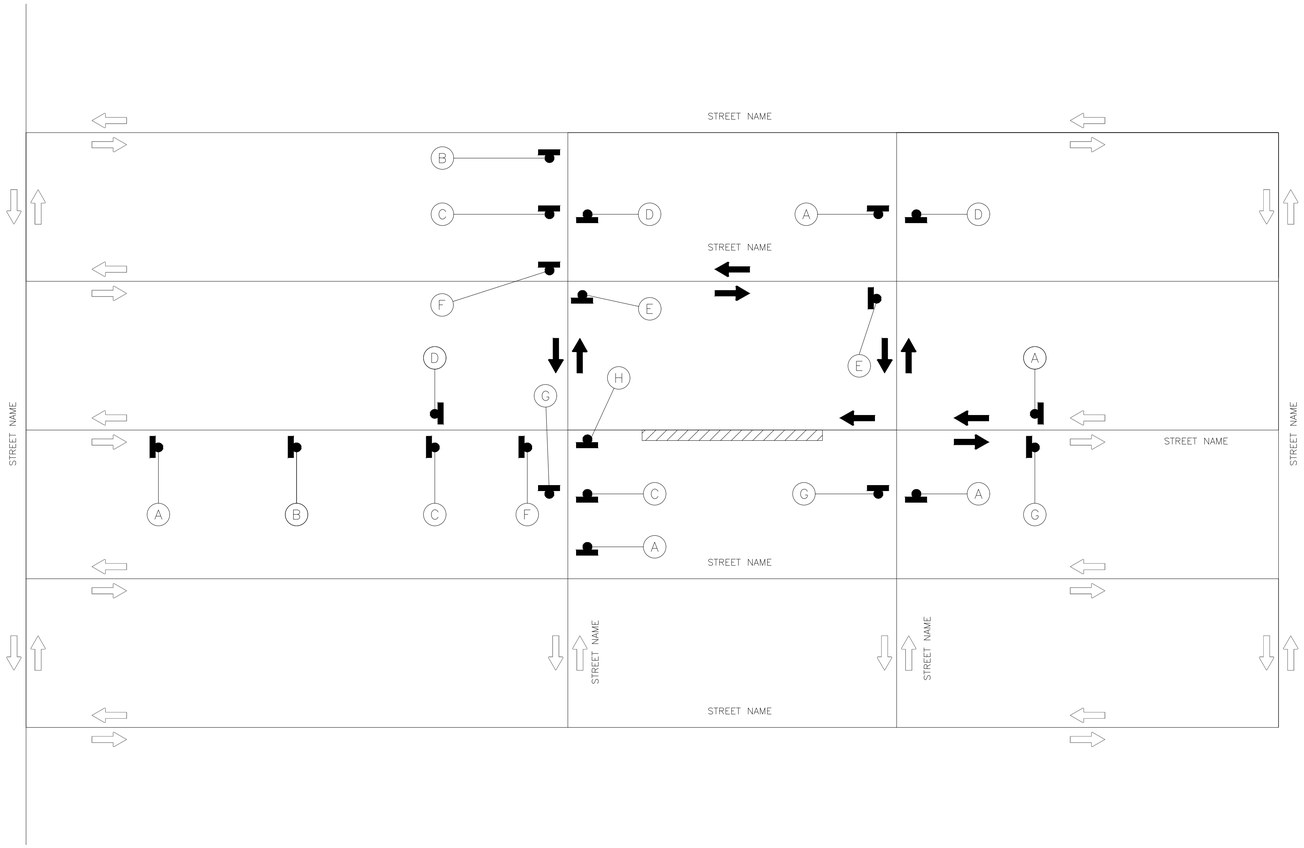

LEGEND:

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

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TRAFFIC CONTROL LAYOUT

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A	D	I	J
ROAD WORK AHEAD	END ROAD WORK	RIGHT LANE CLOSED	LEFT LANE CLOSED
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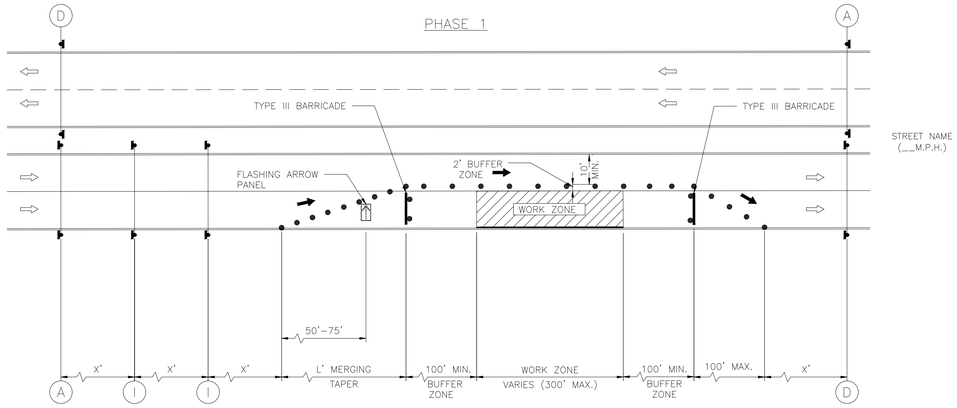

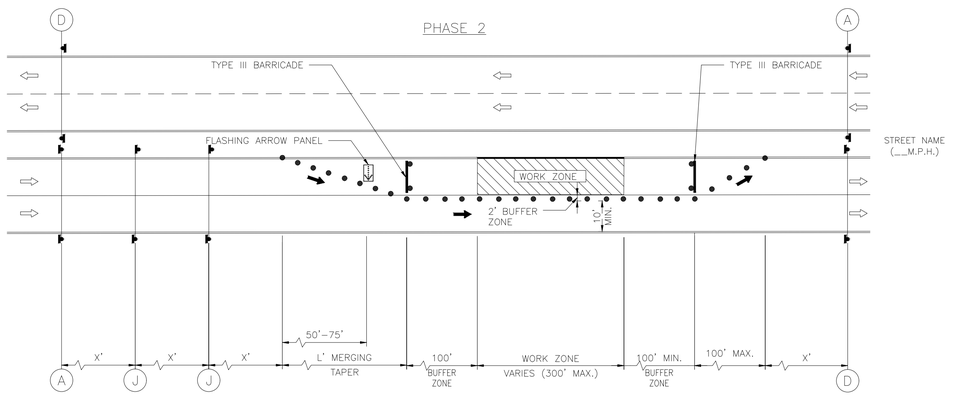

LEGEND:

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NOTES:

1. RETURN TAPERS AND DOWNSTREAM BARRICADES ARE OPTIONAL ON A DIVIDED ROADWAY SECTION.
2. DOUBLE SIGNS SHALL BE USED ONLY ON ROADWAYS WITH MEDIANS.
3. FOR DIMENSIONS REFER TO SHEET 01555-01.
4. INSTALL FLASHERS ON DRUMS WHERE REQUIRED AND APPROVED BY CITY TRAFFIC ENGINEER.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

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TCP ONE LANE CLOSURE
PHASE 1 & 2

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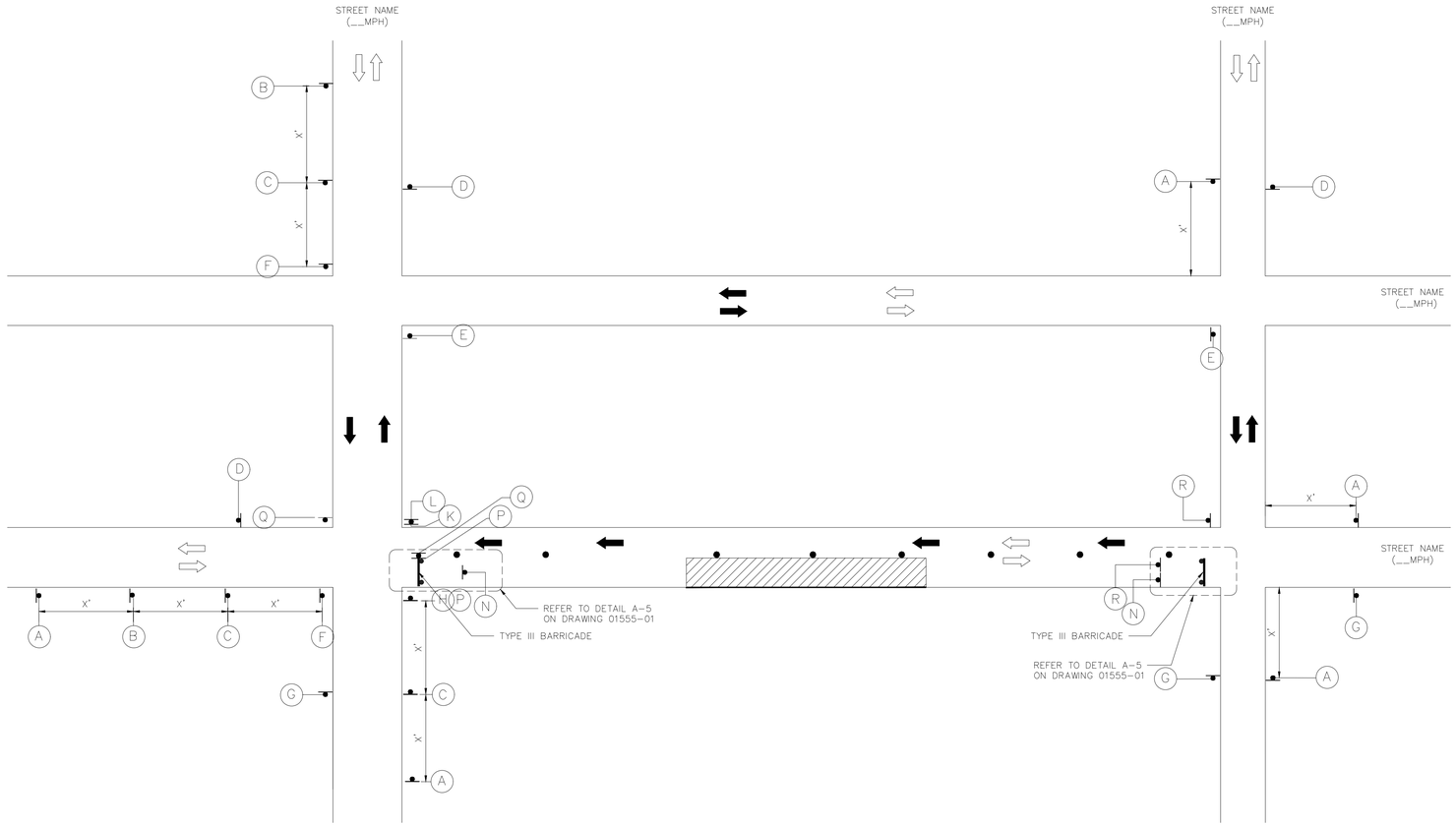
K	L	M	N	O	P	Q	R
R6–2(L)	R6–2(R)	R5–1	R11–2	M4–10(L)	R3–1	R3–2	R6–6



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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DocuSigned by: Suhail Kanwar SEF8B0C641F5478...	DocuSigned by: KHANG NGUYEN 95A29EFDA75B40D...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Hallbeck A83C4108728E3431...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 01555–05

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP TYPICAL DETOUR ROUTING WITH ONE LANE CLOSURE (ONE BLOCK)

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DRAWING SCALE	
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Fax: 713–739–7746
www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TCP TYPICAL DETOUR ROUTING WITH ONE LANE CLOSURE (ONE BLOCK)

WBS#:	R–002011–0090C–3
DRAWING SCALE:	NOT TO SCALE
CITY OF HOUSTON PM	MARIA GEORGE, P.E.
DRAWING NO:	
SHEET NO.	66 of 111

D5

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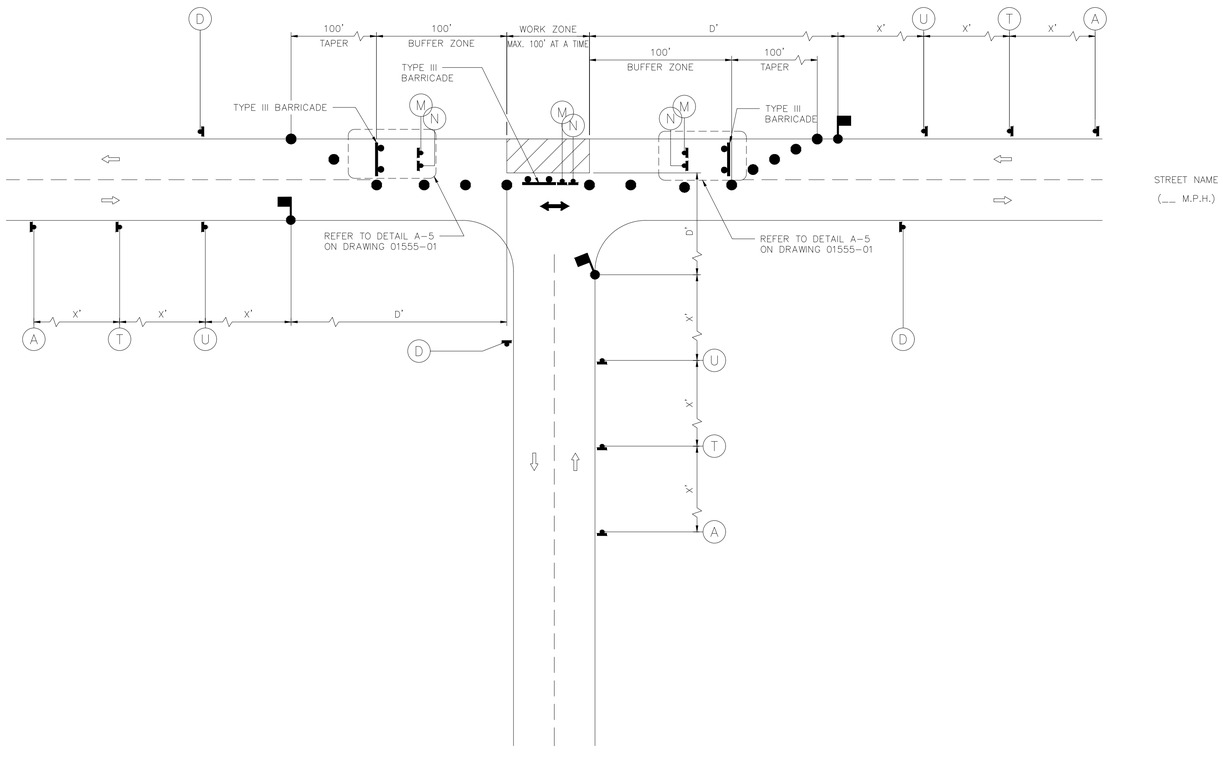

LEGEND:

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

NOTES:

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CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock A83C410B72B3453...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 01555-06

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP TYPICAL CONSTRUCTION ZONE AT A T-INTERSECTION PHASE 1 OF 3

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FONDREN GARDENS AND DEER RIDGE ESTATES

TCP TYPICAL CONSTRUCTION ZONE AT A T-INTERSECTION PHASE 1 OF 3

WBS#: R-002011-0090C-3	
DRAWING SCALE:	
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CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
D6	SHEET NO. 67 of 111

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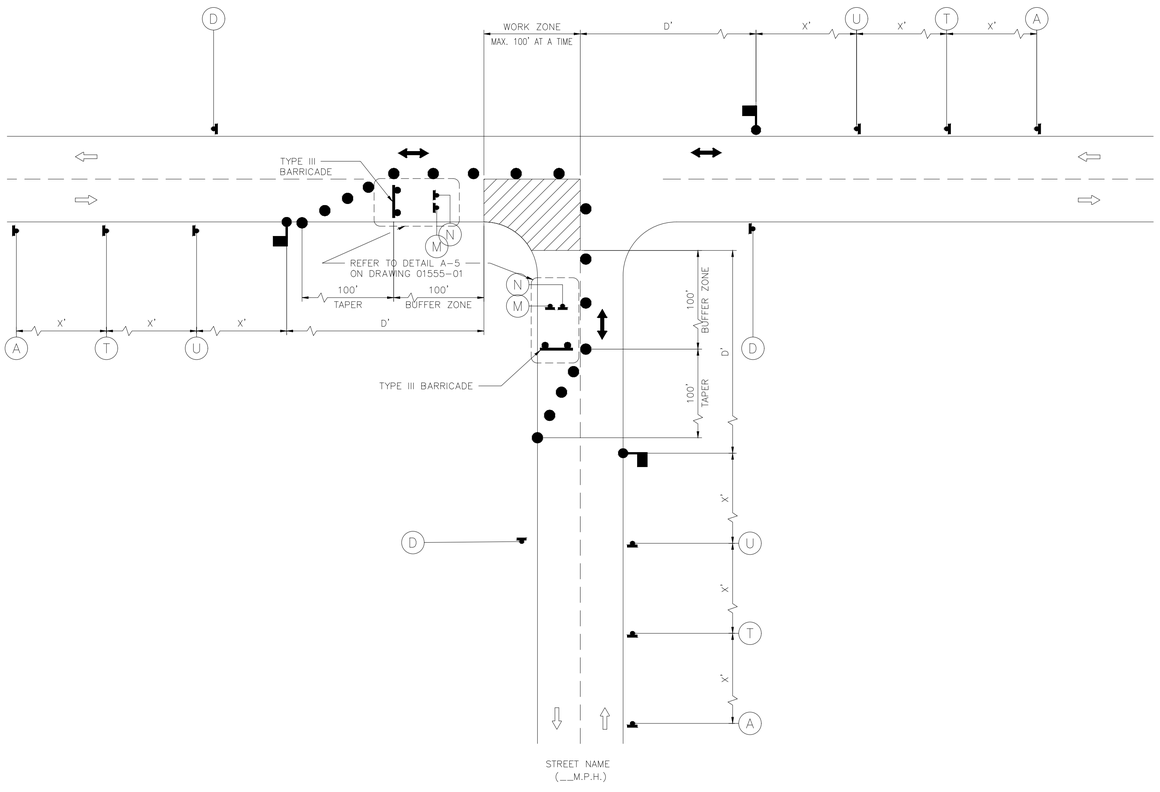

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CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock 4E0C4706E2B24E3...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
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HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

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TCP TYPICAL CONSTRUCTION ZONE AT A T-INTERSECTION PHASE 2 OF 3

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MARIA GEORGE, P.E.	
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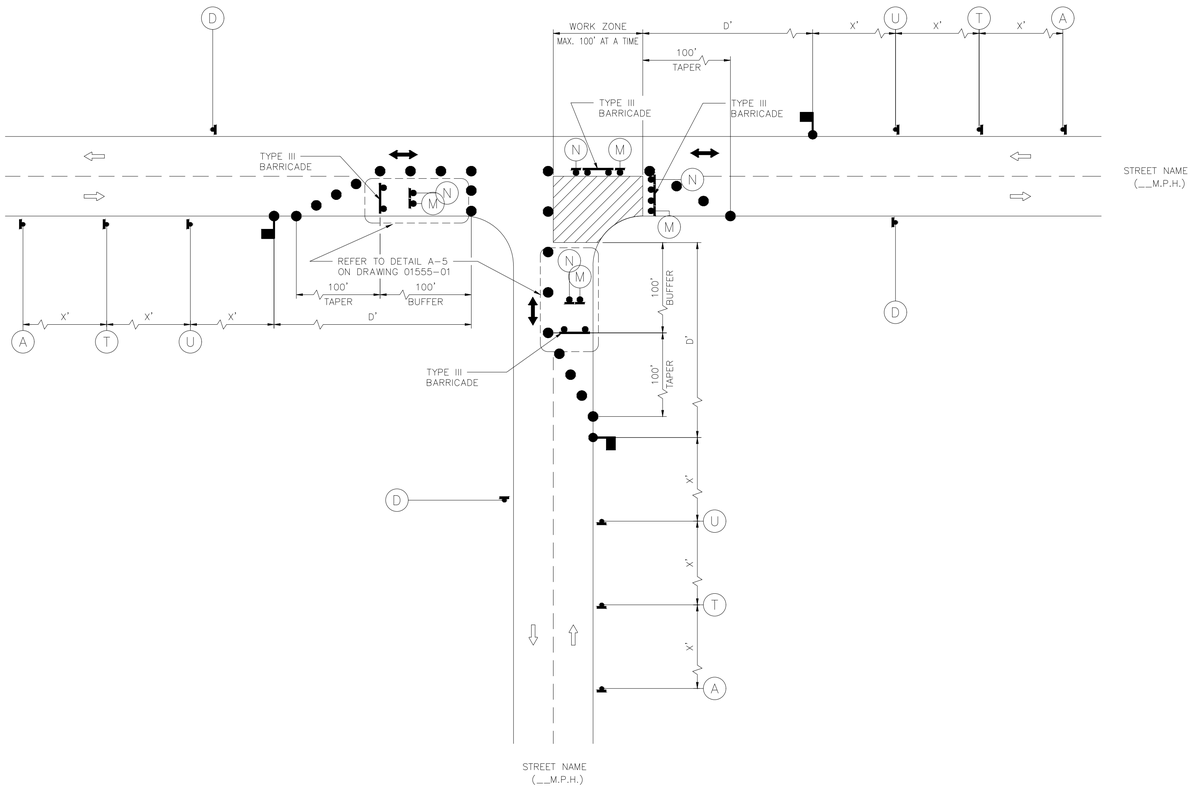

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CITY OF HOUSTON
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TCP TYPICAL CONSTRUCTION ZONE AT A T-INTERSECTION PHASE 3 OF 3

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TCP TYPICAL CONSTRUCTION ZONE AT A T-INTERSECTION PHASE 3 OF 3

WBS#: R-002011-0090C-3	
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CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. **69 of 111**	

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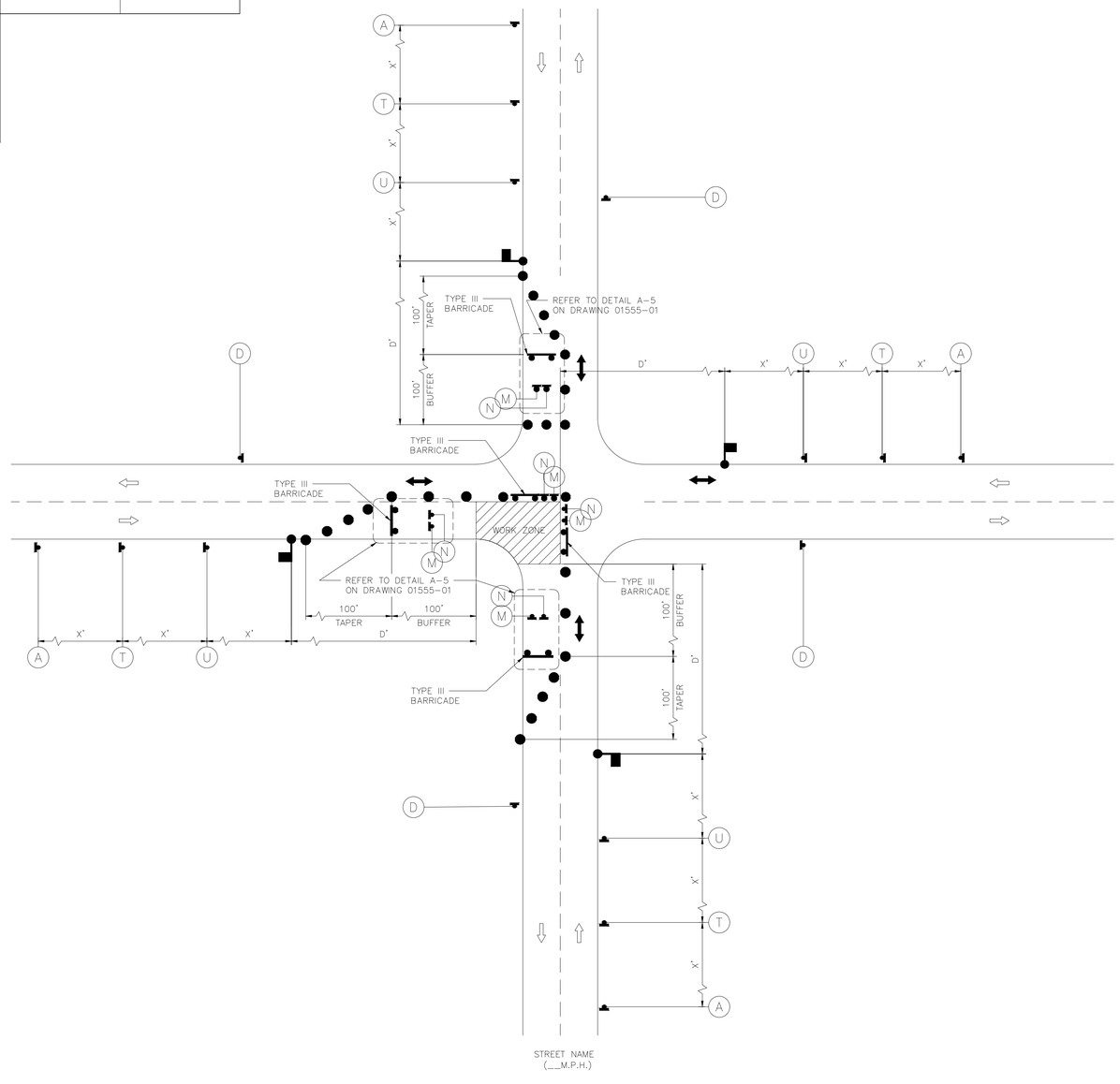

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 1 OF 4

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

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FONDREN GARDENS AND DEER RIDGE ESTATES

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 1 OF 4

WBS#:	R-002011-0090C-3
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CITY OF HOUSTON PM	MARIA GEORGE, P.E.
DRAWING NO:	
SHEET NO.	70 of 111

D9

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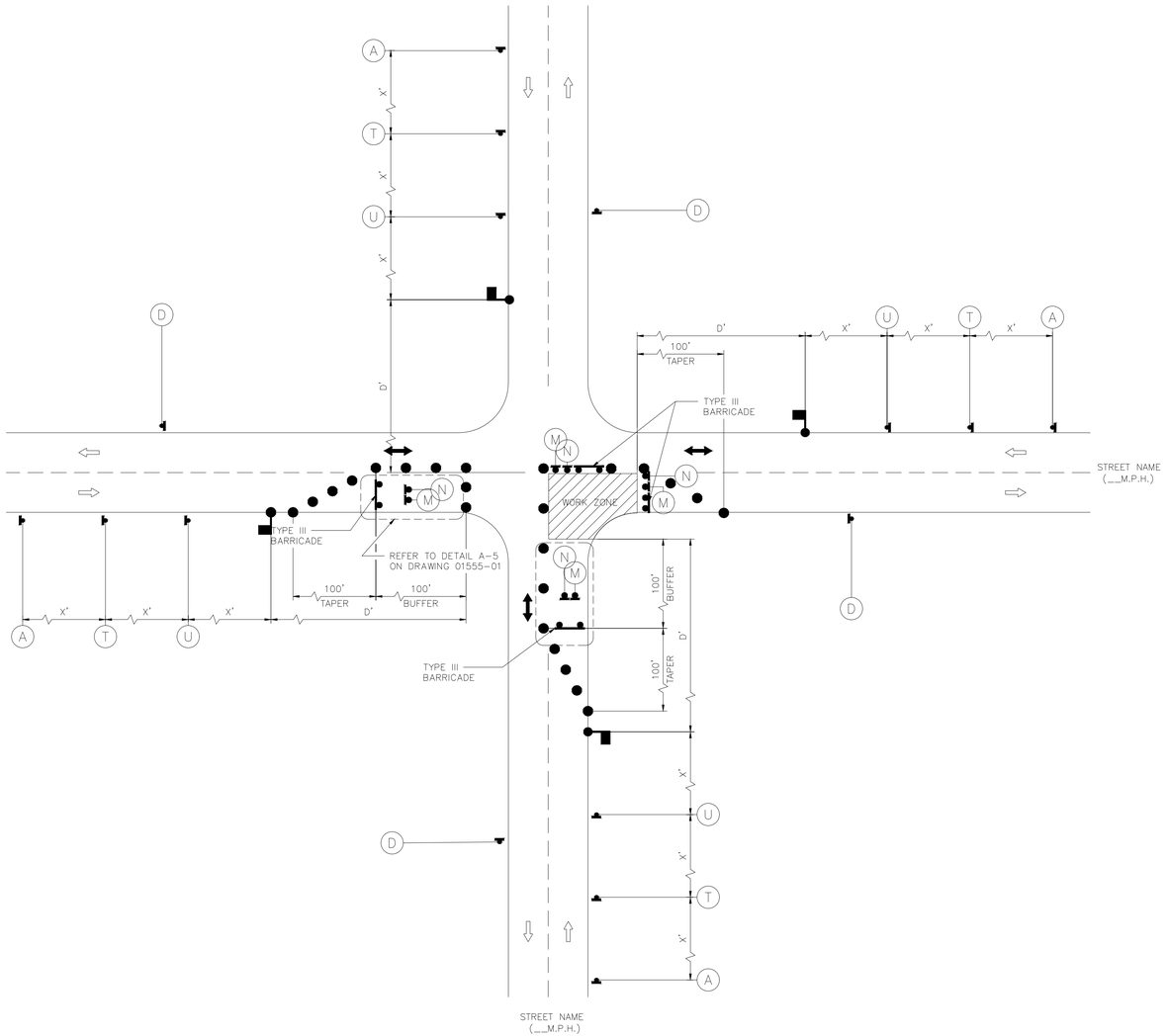

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 2 OF 4

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 2 OF 4

WBS#: R-002011-0090C-3
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CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:
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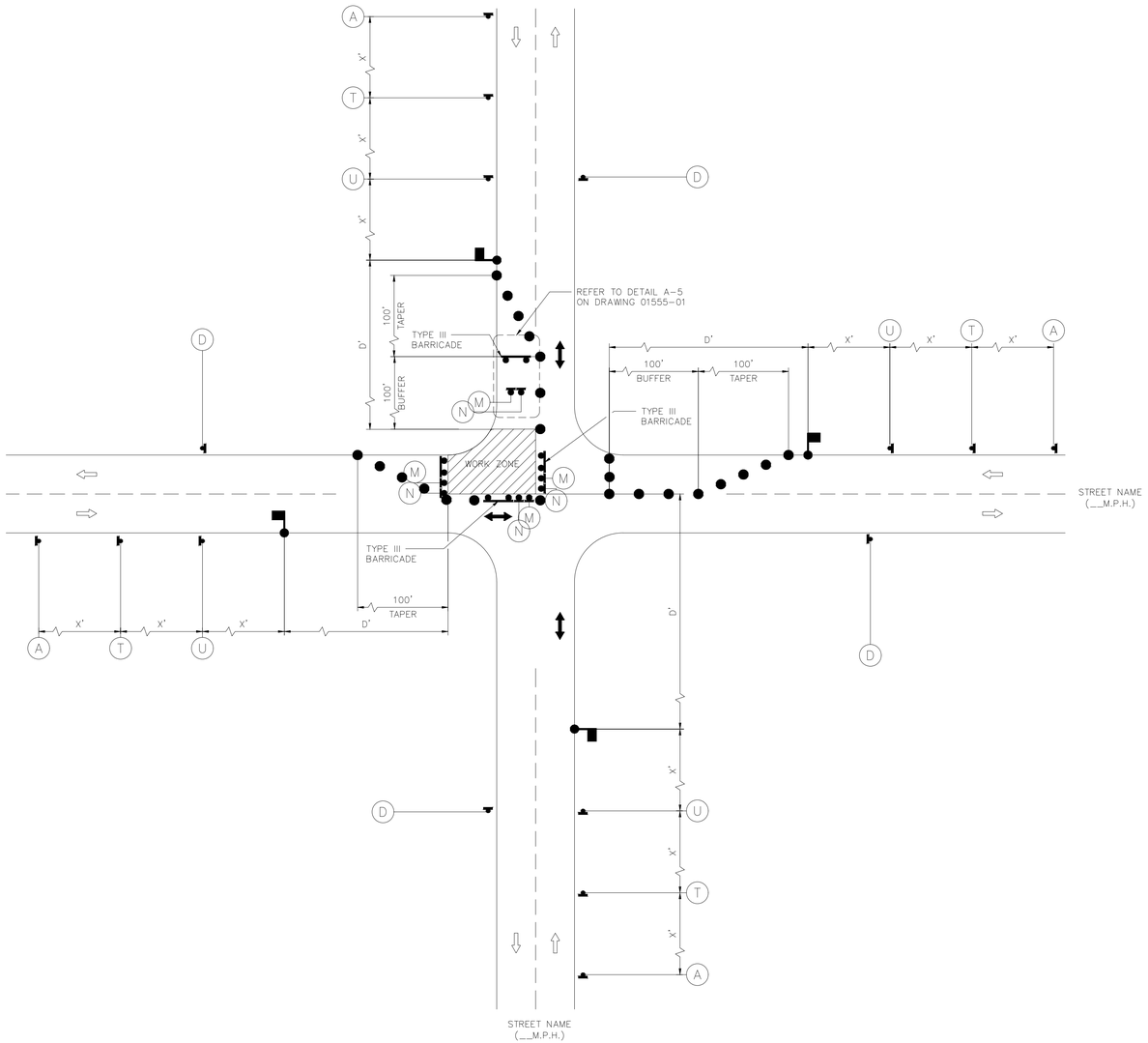

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EFF DATE: NOV-27-2023	DWG NO: 01555-11

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 3 OF 4

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D11

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C:\USERS\VLIK\APPDATA\LOCAL\REVIT\DOTV66-789-225\CAD\PRODUCTION\STD COH 01555-11 DWG\VLIK[SAVED:Thursday, June 25, 2026]COH_KAI.CTB[PLOTTED:Thursday, June 25, 2026

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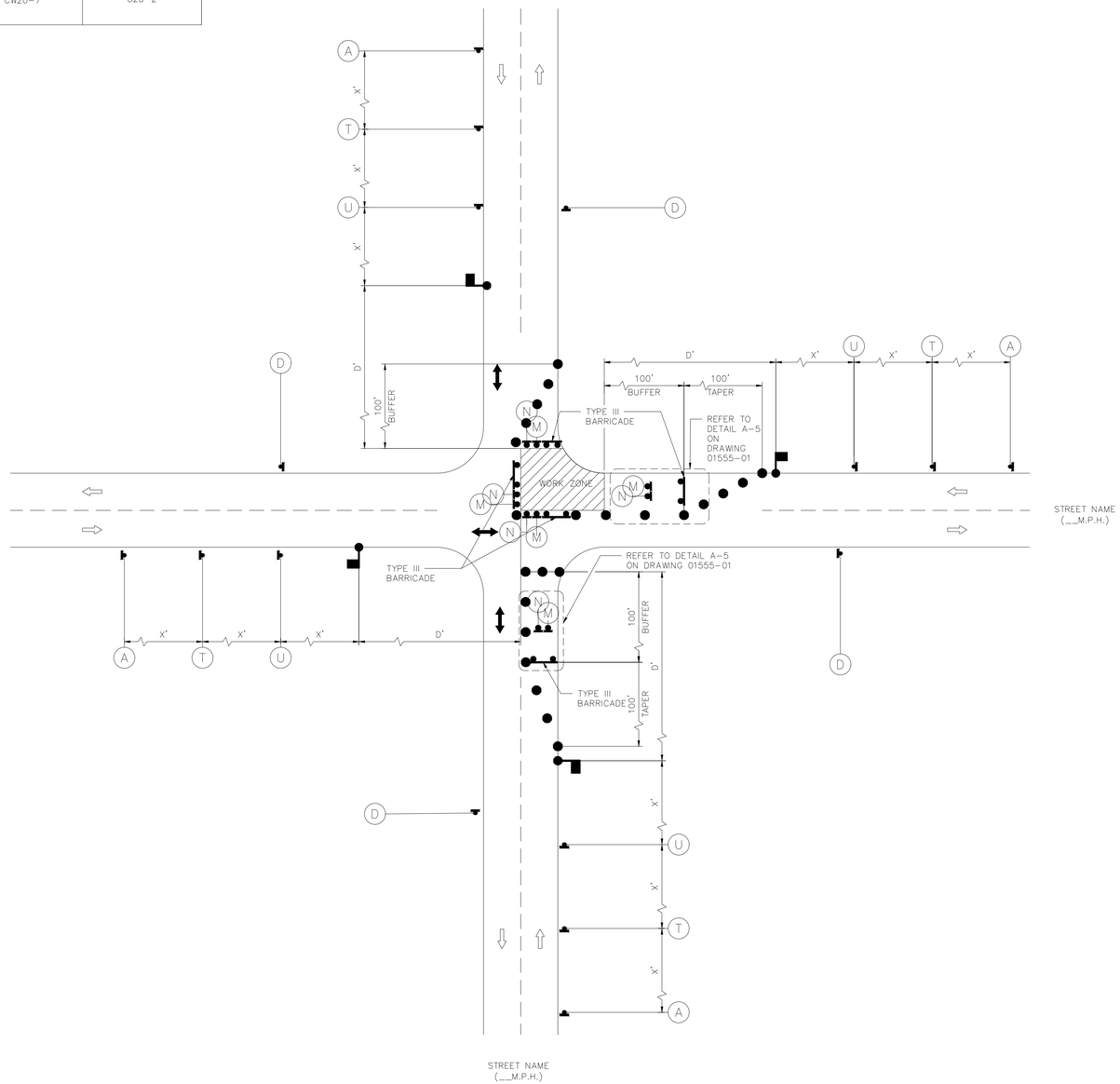
A	T	U	D
CW20-1	CW20-4	CW20-7	G20-2

M	N
R5-1	R11-2



LEGEND:

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

NOTES:

1. MINOR WORK AND DAYTIME OPERATIONS ONLY.
2. REFER TO PROJECT SPECIFIC TRAFFIC CONTROL PLANS FOR MAJOR OPERATIONS AND OVERNIGHT LANE CLOSURES.
3. FOR DIMENSIONS REFER TO SHEET 01555-01.
4. INSTALL FLASHERS ON DRUMS WHERE REQUIRED AND APPROVED BY CITY TRAFFIC ENGINEER.
5. MAX. 100' WORK ZONE AT A TIME.

APPROVED BY:	APPROVED BY:
DocuSigned by: Sulad Kunwar 3EFB5DDA1F5A48...	DocuSigned by: KHANG NGUYEN 9AA3EF0A758A4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock 5A5C41B57B5A453...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 01555-12

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 4 OF 4

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

60% SUBMITTAL

ims
1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TCP TYPICAL CONSTRUCTION ZONE AT A 4-WAY INTERSECTION (LOW VOLUME TRAFFIC) PHASE 4 OF 4

WBS#: R-002011-0090C-3
DRAWING SCALE:
NOT TO SCALE
CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:
D12 SHEET NO. **73 of 111**

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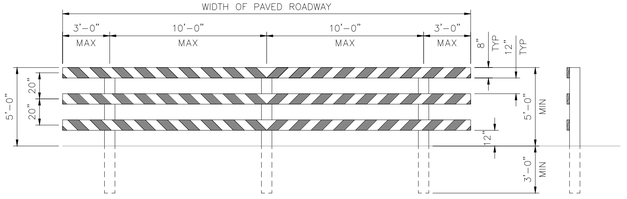
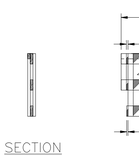
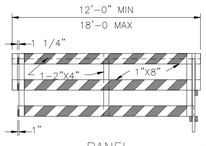
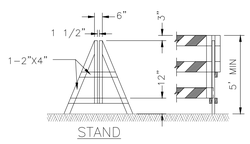


TYPE III BARRICADE FOR END OF ROAD

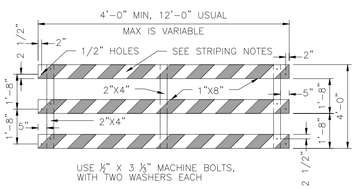
FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND RELFLECTIVE WHITE STRIPES ON SIDE FACING TRAFFIC



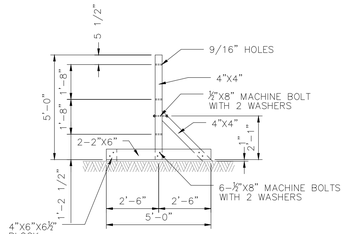




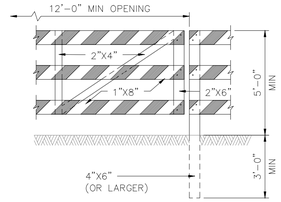
DEMOUNTABLE TYPE III BARRICADE



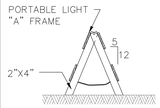
PANEL FOR TYPE III BARRICADE



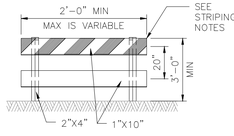
STAND FOR TYPE III BARRICADE



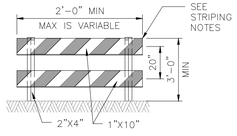
GATE FOR TYPE III BARRICADE



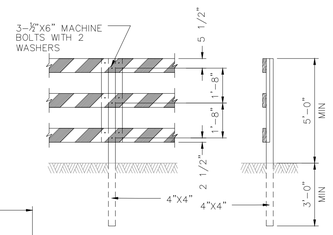
"A" FRAME



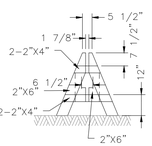
TYPE I



TYPE II



POST FOR TYPE III BARRICADE



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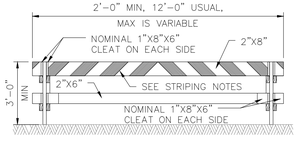

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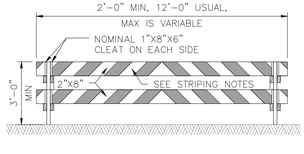

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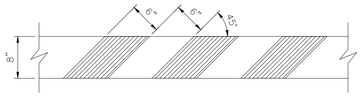
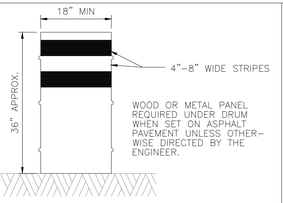


STRIPING FOR BARRICADE

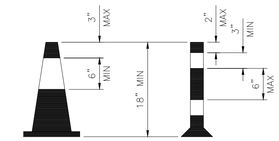
BARRICADE NOTES:

1. THE MOST RECENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND IT'S REVISIONS, SHALL GOVERN THE CONSTRUCTION AND USE OF ALL ITEMS HEREIN DESCRIBED.
2. CHANNELIZATION DEVICES OTHER THAN BARRICADES SHOULD NORMALLY BE USED FOR CHANNELIZATION PURPOSES.
3. BARRICADES SHOULD NORMALLY BE PLACED PERPENDICULAR TO THE TRAFFIC FLOW. OTHER CHANNELIZING DEVICES, SUCH AS DRUMS, VERTICAL PANELS OR PORTABLE BARRIERS, SHOULD BE USED WHERE NEEDED TO SEPARATE TRAFFIC FROM THE WORK AREA. IN ALL CASES, THE BARRICADES SHOULD BE SO LOCATED AS TO MOST ADVANTAGEOUSLY WARN AND DIRECT TRAFFIC.
4. BARRICADES MAY BE DESIGNED AND CONSTRUCTED FROM WOOD OR ANY OTHER SUITABLE MATERIAL APPROVED BY THE TMUTCD. THE CONSTRUCTION DETAILS SHOWN HEREON ARE TYPICAL AND ARE SUGGESTED DETAILS FOR WOOD SUPPORT SYSTEMS FOR BARRICADES. THE DETAILS OF RAIL WIDTH AND STRIPING, NUMBER AND SPACING OF RAILS, MINIMUM LENGTH AND HEIGHT (ABOVE PAVEMENT) OF RAILS MUST BE ADHERED TO WHEN ALTERNATE DESIGNS ARE USED.
5. BARRICADES ARE TO BE CONSTRUCTED OF CLEAN SOUND MATERIAL. ALL SURFACES ABOVE GROUND, WHICH ARE NOT STRIPED, SHALL BE WHITE EXCEPT THE UNPAINTED GALVANIZED METAL OR ALUMINUM COMPONENTS MAY BE USED. COMPONENTS MADE OF LUMBER SHALL BE PAINTED WITH A MINIMUM OF TWO COATS OF AN APPROVED BRAND OF WHITE PAINT TO SECURE THOROUGH COVERAGE AND A UNIFORM WHITE COLOR.
6. THE REFLECTORIZED WHITE AND REFLECTORIZED ORANGE (REFLECTORIZED RED) STRIPES FOR BARRICADES, DRUMS AND VERTICAL PANELS SHALL BE CONSTRUCTED OF HIGH INTESITY SHEETING AND SHALL BE MAINTAINED TO MEET THE APPEARANCE, COLOR AND REFLECTIVITY REQUIREMENTS SET BY DOTT.
7. THE CONTRACTOR SHALL MAINTAIN EACH BARRICADE IN A CLEAN AND GOOD CONDITION.
8. BARRICADES SHALL BE REMOVED UPON COMPLETION OF THE WORK AND/OR THE ELIMINATION OF THE HAZARD ON ANY SECTION.



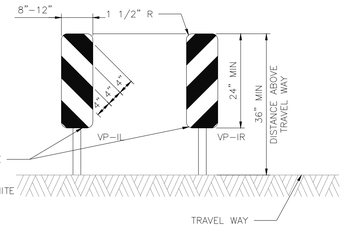
DRUMS

1. DRUMS, SET ON END, AND USED FOR TRAFFIC WARNING OR CHANNELIZATION SHALL BE APPROX 36" IN HEIGHT AND A MIN OF 18" IN DIAMETER. THE CONTRACTOR, AT HIS OPTION, MAY USE DRUMS MADE FROM STEEL BARRELS OR BLACK POLYETHYLENE PLASTIC DRUM LINERS WEIGHING APPROX EIGHT POUNDS EACH. THE MARKINGS ON DRUMS SHALL BE HORIZONTAL, CIRCUMFERENTIAL, REFLECTORIZED ORANGE AND REFLECTORIZED WHITE STRIPES, 4 TO 8 INCHES WIDE, THE FIRST REFLECTORIZED STRIPE SHOULD START WITHIN TWO (2) INCHES OF THE TOP OF THE DRUM. THERE SHALL BE AT LEAST TWO ORANGE AND TWO WHITE STRIPES ON EACH DRUM. IF THERE ARE NON-REFLECTORIZED SPACES BETWEEN THE HORIZONTAL ORANGE AND WHITE STRIPES, THEY SHALL BE NO MORE THAN 2 INCHES WIDE. METAL DRUMS SHALL BE PAINTED BLACK OR ORANGE BEFORE REFLECTORIZED STRIPES ARE ADDED. ALL DRUMS ON PROJECT WILL BE THE SAME COLOR. WHEN DRUMS ARE PLACED IN THE ROADWAY, APPROPIATE WARNING SIGNS SHOULD BE USED. DURING HOURS OF DARKNESS, A FLASHING WARNING LIGHT SHOULD BE PLACED ON DRUMS USED SINGLY AS A WARNING DEVICE. STEADY BURN ELECTRIC LIGHTS OR DELINEATORS SHOULD BE PLACED ON DRUMS USED IN SERIES FOR TRAFFIC CHANNELIZATION. DRUMS SHALL BE WEIGHTED WITH SAND TO THE EXTENT INDICATED IN THE PLANS.
2. CWI-8 CHEVRON SIGNS, CWI-6A ARROW SIGNS OR VP-I VERTICAL PANELS MOUNTED ABOVE DRUMS MAY BE USED AS SUPPLEMENTS TO DRUM DELINEATION.



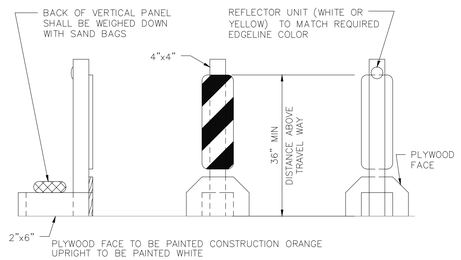
CONES

1. TRAFFIC CONES AND TUBULAR MARKERS SHALL BE A MIN OF 18" INCHES IN HEIGHT WITH A BROADENED BASE AND MAY BE MADE OF VARIOUS MATERIALS TO WITHSTAND IMPACT WITHOUT DAMAGE TO THEMSELVES OR TO VEHICLES. LARGER SIZES SHOULD BE USED ON FREEWAYS AND OTHER ROADWAYS WHERE SPEED ARE RELATIVELY HIGH OR WHERE EVER MORE CONSPICUOUS GUIDANCE IS NEEDED. ORANGE SHALL BE THE PREDOMINANT COLOR ON CONES AND TUBULAR MARKERS. THEY SHOULD BE KEPT CLEAN AND BRIGHT FOR MAX TARGET VALUE. FOR NIGHT TIME USE THEY SHALL BE REFLECTORIZED OR EQUIPPED WITH LIGHTING DEVICES FOR MAX VISIBILITY. REFLECTORIZED MATERIAL SHALL HAVE A SMOOTH, SEALED OUTER SURFACE WHICH WILL DISPLAY THE SAME APPROX COLOR DAY AND NIGHT.
2. REFLECTORIZATION OF TUBULAR MARKERS SHALL BE A MIN OF TWO THREE-INCH BANDS PLACED A MAX OF 2" FROM THE TOP WITH A MAX OF 6" BETWEEN THE BANDS. REFLECTORIZATION OF CONES SHALL BE PROVIDED BY A MIN 6" BAND PLACED A MAX OF 3" FROM THE TOP.
3. CONES OR TUBULAR MARKERS ARE GENERALLY ONLY SUITABLE FOR TEMPORARY USAGE (UP TO 8 HOURS) WITH OTHER CHANNELIZATION DEVICES SUCH AS VERTICAL PANELS OR BARRICADES PREFERRED FOR LONGER TERM USAGE. CARE SHOULD BE TAKEN TO INSURE THAT THEY REMAIN IN THEIR PROPER LOCATION AND IN AN UPRIGHT POSITION.



VERTICAL PANELS (VP)

VERTICAL PANELS ARE NORMALLY USED AS CHANNELIZING DEVICES TO INDICATE TANGENT OR NEARLY TANGENT ROADWAY ALIGNMENT WHERE GOOD TARGET VALUE OF A DEVICE IS NEEDED IN DAYTIME AS WELL AS THE NIGHTTIME. IN ADDITION, VERTICAL PANELS SHOULD BE USED AT THE EDGE OF SHOULDER DROP-OFFS AND OTHER SUCH AREAS AS LANE TRANSITIONS WHERE POSITIVE DAY AND NIGHT DELINEATION MAY BE REQUIRED. VERTICAL PANELS SHOULD BE MOUNTED BACK TO BACK IF USED AT THE EDGE OF CUTS ADJACENT TO TWO-WAY TWO LANE ROADWAYS. STRIPES SHOULD ALWAYS SLOPE DOWNWARD TOWARD THE TRAVELED WAY.



TYPICAL PORTABLE VERTICAL PANEL OR DELINEATOR

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

APPROVED BY:	APPROVED BY:
DocuSigned by: Sukat Kanwar 9EF8B0C841F5478...	DocuSigned by: kelling NGUYEN 95A29EFDA758404CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock A2DCA1057D5A4F5...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 01555-14

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

BARRICADE AND CHANNELIZING DEVICES

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

60% SUBMITTAL

ims
1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

BARRICADE AND CHANNELIZING DEVICES

WBS#:	R-002011-0090C-3
DRAWING SCALE:	NOT TO SCALE
CITY OF HOUSTON PM	MARIA GEORGE, P.E.
DRAWING NO:	
SHEET NO.	74 of 111

D13

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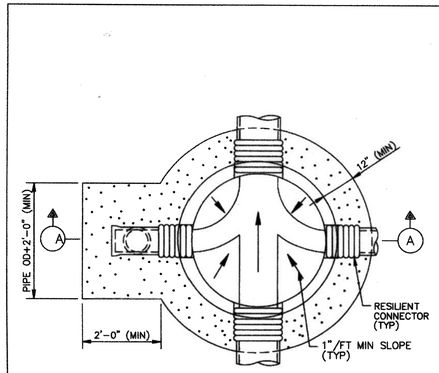
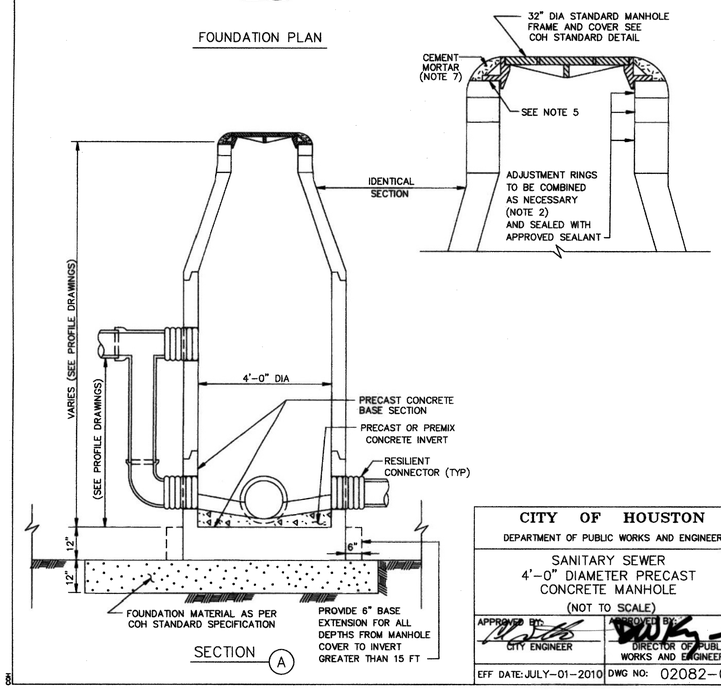


FOUNDATION PLAN

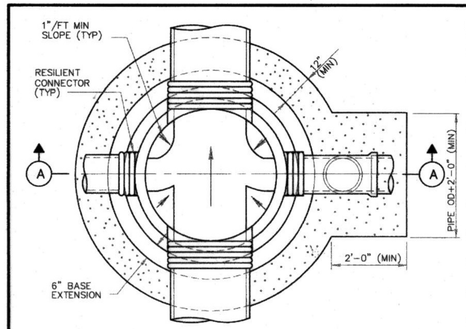
NOTES:

1. DEPTH OF MANHOLE DETERMINES SECTIONS REQUIRED.
2. PRECAST CONCRETE RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF AT LEAST 12". THE TOTAL HEIGHT OF THE ADJUSTMENT RINGS SHALL NOT EXCEED 1'-6".
3. MANHOLE WALL THICKNESS FOR DEPTH EXCEEDING 12'-0" SHALL BE DETERMINED TO MEET LOADING CONDITIONS. MIN THICKNESS 5".
4. MANHOLE DROP AND INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWING.
5. SEAT MANHOLE FRAME IN SEALANT PER COH STANDARD SPECIFICATION.
6. ECCENTRIC PRECAST CONCRETE MANHOLE MAY BE USED.
7. OMIT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREAS.
8. MIN REINFORCING IN THE PRECAST CONCRETE BASE SHALL BE # 5 @ 8 EW.



SECTION (A)

CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
SANITARY SEWER 4'-0" DIAMETER PRECAST CONCRETE MANHOLE (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02082-02



FOUNDATION PLAN

NOTES:

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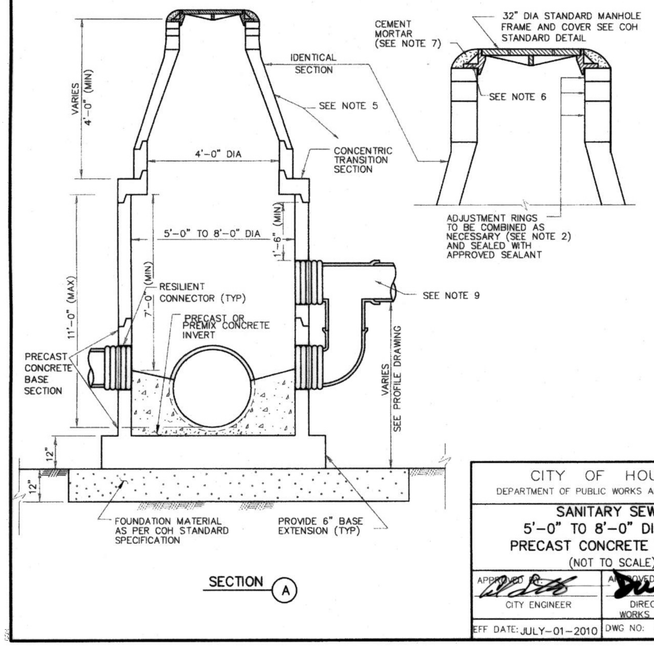
4. MANHOLE DROP AND INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWING.
5. ALTERNATE ECCENTRIC CONE AND/OR TRANSITION SECTION MAY BE USED.
6. SEAT MANHOLE FRAME IN SEALANT PER COH STANDARD SPECIFICATION.
7. OMIT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREAS.
8. MIN REINFORCING IN THE PRECAST CONCRETE BASE SHALL BE # 5 @ 8 EW.
9. WHERE DIMENSIONAL RESTRICTIONS DICTATE, THE MANHOLE BASE HEIGHT SHALL BE ADJUSTED TO HAVE THE UPPER INLET PIPE OF THE DROP ENTER INTO THE 4'-0" DIAMETER RISER SECTION.



SECTION (A)

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: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 02082-03

60% SUBMITTAL

ims
1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

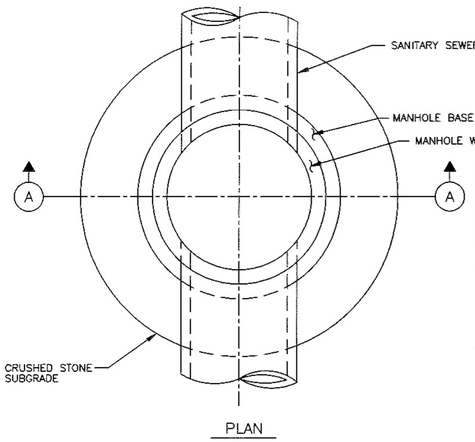
NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
4'-0" TO 8'-0" DIAMETER
PRECAST CONCRETE MANOLE

WBS#: R-002011-0090C-3	
DRAWING SCALE:	
NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 75 of 111	

D14

C:\USERS\YLM\APPDATA\LOCAL\NEVU\D0\V6B-789-225\CAD\PRODUCTION\STD COH 02082-02.DWG(TUE,WEDNESDAY, JUNE 24, 2026)(COH_KAI.CTB)PLOTTED: Thursday, June 25, 2026



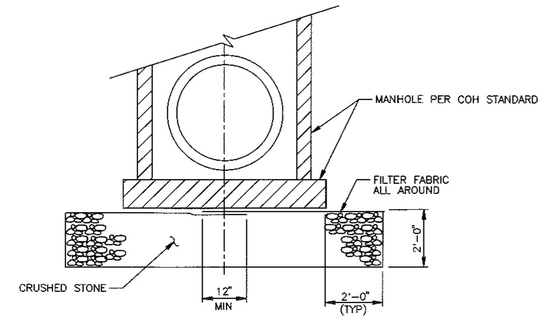
PLAN

NOTES:

1. CRUSHED STONE SUPPORT UNDER A MANHOLE BASE SHALL BE INSTALLED AT LOCATIONS WHERE REQUIRED SUBGRADE COMPACTION OR DEWATERING CANNOT BE ACHIEVED.
2. WHERE HEAVING SUBGRADE CONDITIONS OCCUR, AS DETERMINED BY THE CITY ENGINEER, A PILE SUPPORTED MANHOLE SHALL BE PROVIDED.

NOTE TO SPECIFIER:

1. *INCLUDE THIS DETAIL ONLY IF THE GEOTECHNICAL REPORT INDICATES THAT AN UNSTABLE FOUNDATION (ONE WHICH WILL NOT ALLOW COMPACTION OR DEWATERING AS SPECIFIED) IS POSSIBLE. IF THIS CONDITION IS REPORTED BY THE GEOTECHNICAL ENGINEER, NOTIFY THE CITY'S PROJECT MANAGER.*
2. *ALWAYS INCLUDE COMPANION STANDARD DETAIL FOR PILE SUPPORTED MANHOLE FOR UNSTABLE SUBGRADE WITH THIS DETAIL. IF GEOTECHNICAL REPORT INDICATES HEAVING SUBGRADE IS LIKELY.*



SECTION A

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

SANITARY SEWER
CRUSHED STONE SUPPORTED
MANHOLE FOR WET STABLE TRENCH
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02082-05

60% SUBMITTAL

1225 NORTH LOOP WEST
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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
CRUSHED STONE SUPPORTED
MANHOLE FOR WET STABLE TRENCH

WBS#: R-002011-0090C-3

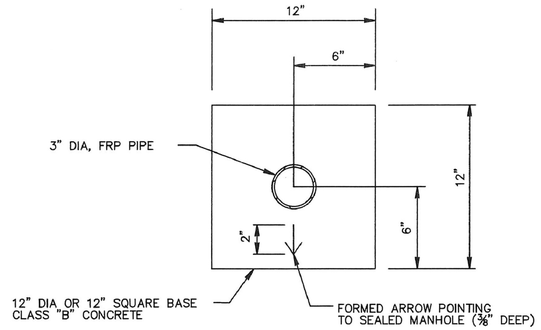
FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE:
NOT TO SCALE

CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:
D15

C:\USERS\YLHK\APPDATA\LOCAL\REVU\00\466-789-225\CAD\PRODUCTION\STD COH 02082-05.DWG[YLHK|SAVED:Thursday, June 25, 2026|COH_KAI.CTB|PLOTTED:Monday, June 29, 2026



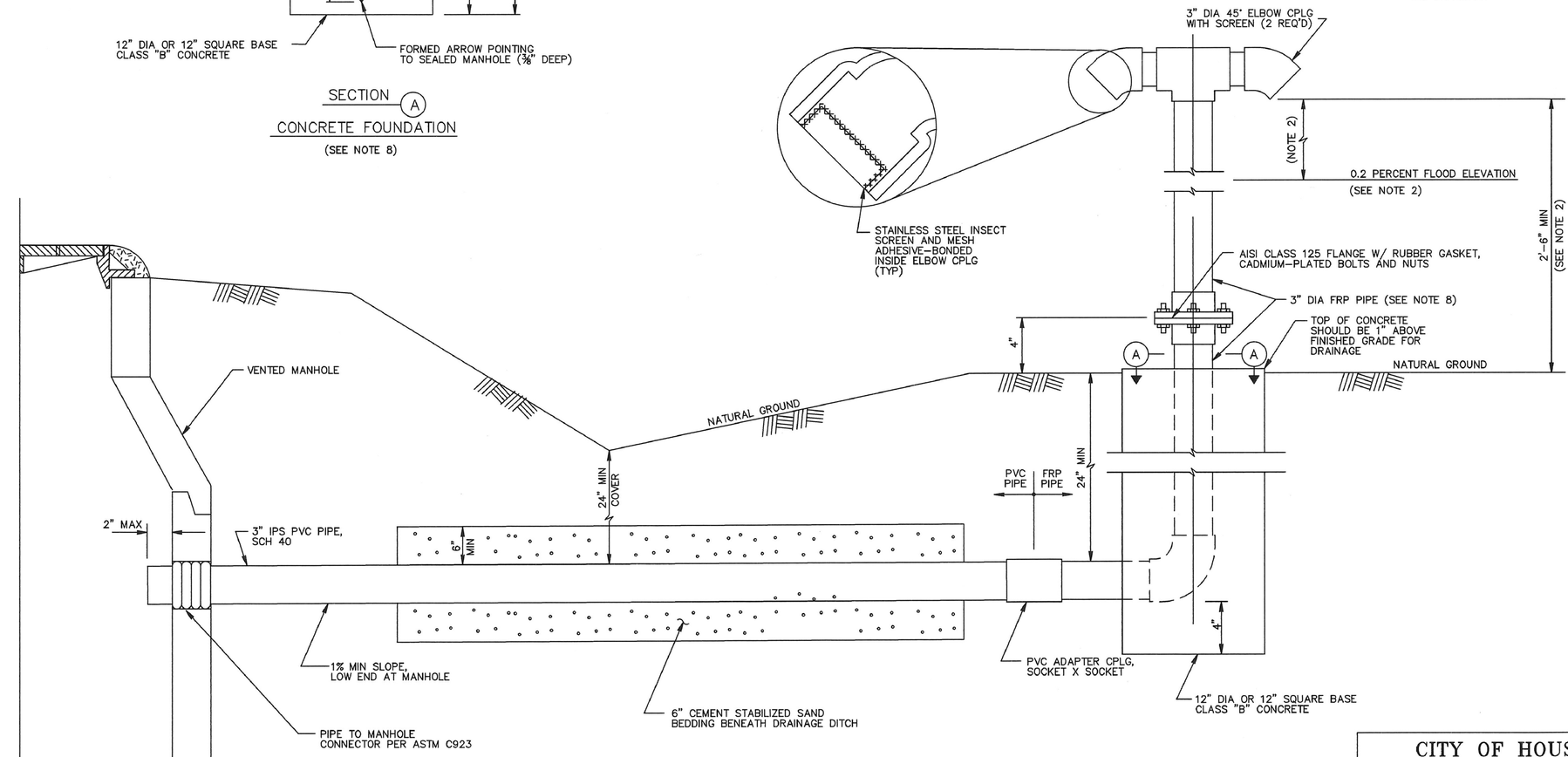
SECTION (A)

CONCRETE FOUNDATION

(SEE NOTE 8)

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.



CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SANITARY SEWER
MANHOLE VENT FOR SEALED MANHOLE
(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
Suhail Kanwar	Carol Haddock
CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2021	DWG NO: 02082-06

60% SUBMITTAL

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TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

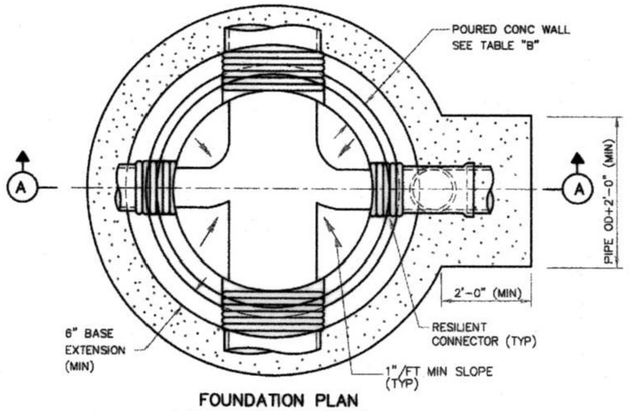
SANITARY SEWER
MANHOLE VENT FOR SEALED MANHOLE

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 77 of 111	

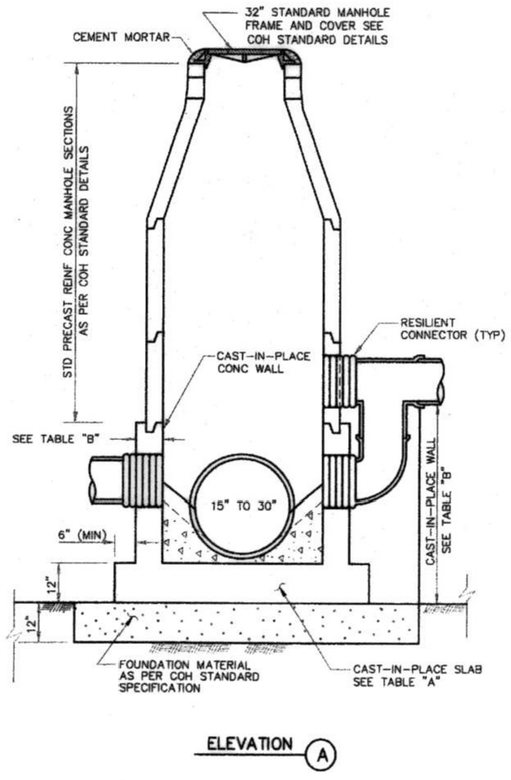
D16

COH

C:\USERS\VLIK\APPDATA\LOCAL\REVIT\DB\466-789-225\CAD\PRODUCTION\STD COH 02082-06.DWG[VLIK](SAVED) Wednesday, June 24, 2026[COH_KAI.CTB]PLOTTED:Monday, June 29, 2026



FOUNDATION PLAN



ELEVATION (A)

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"
	≤ 60	1'-10"	# 6 @ 6"
6	≤ 15	1'-0"	# 5 @ 8"
	≤ 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"
	≤ 60	1'-4"	# 6 @ 7"
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"
	≤ 50	1'-2"	# 6 @ 9"
	≤ 60	1'-2"	# 6 @ 8"
4	≤ 20	1'-0"	# 5 @ 8"
	≤ 25	1'-0"	# 5 @ 8"
	≤ 30	1'-0"	# 5 @ 7"
	≤ 40	1'-0"	# 6 @ 10"

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"	
	≤ 60	10'-0"	1'-4"	# 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"	# 5 @ 8"
	≤ 40	7'-0"	0'-10"	# 5 @ 8"	
	≤ 50	7'-0"	1'-0"	# 6 @ 8"	
	≤ 60	8'-0"	1'-2"	# 6 @ 7"	
5	≤ 15	5'-0"	0'-8"	# 5 @ 8"	# 4 @ 12"
	≤ 20	5'-4"	0'-8"	# 5 @ 7"	
	≤ 25	5'-8"	0'-10"	# 5 @ 6"	
	≤ 30	6'-0"	0'-10"	# 6 @ 10"	# 5 @ 12"
	≤ 40	6'-4"	0'-10"	# 6 @ 10"	
	≤ 50	6'-8"	1'-0"	# 6 @ 8"	
	≤ 60	7'-0"	1'-0"	# 6 @ 8"	
4	≤ 20	4'-6"	0'-8"	# 5 @ 12"	# 4 @ 12"
	≤ 25	5'-0"	0'-8"	# 5 @ 10"	
	≤ 30	5'-8"	0'-10"	# 6 @ 12"	
	≤ 40	6'-0"	0'-10"	# 6 @ 12"	

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.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER
PRECAST CONCRETE MANHOLE
WITH CAST-IN-PLACE BASE
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 | DWG NO: 02082-08

60% SUBMITTAL

1225 NORTH LOOP WEST
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TX Firm 18572

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
PRECAST CONCRETE MANHOLE
WITH CAST-IN-PLACE BASE

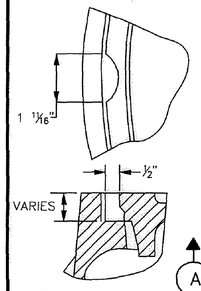
WBS#: R-002011-0090C-3 | FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE:
NOT TO SCALE
CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:

D17 | SHEET NO. 78 of 111

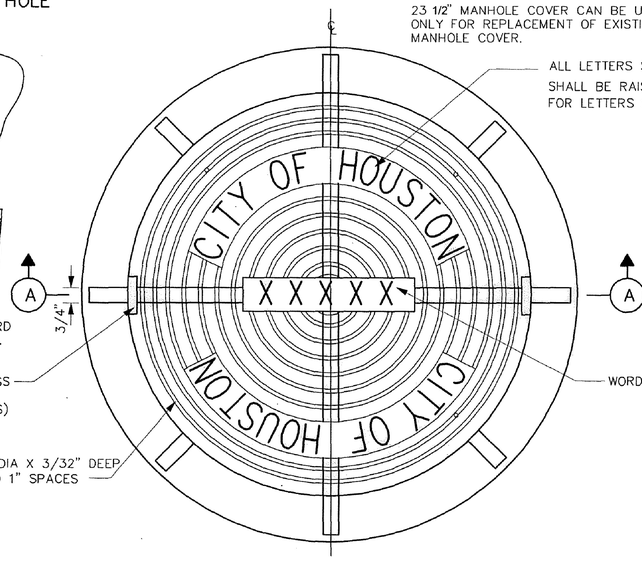
C:\USERS\YLIK\APPDATA\LOCAL\REVU\001\466-789-225\CAD\PRODUCTION\STD COH 02082-08.DWG|YLIKSAVED: Wednesday, June 24, 2026|COH_KA|CTB|PLOTTED: Monday, June 29, 2026

TYPE 1
OPEN PICK HOLE



OTHER OPEN PICK HOLES ARE STANDARD ON CERTAIN COVERS.

NOTE:
23 1/2" MANHOLE COVER CAN BE USED ONLY FOR REPLACEMENT OF EXISTING MANHOLE COVER.



ALL LETTERS SHALL BE 2" HIGH AND SHALL BE RAISED 1/8" LINE WIDTH FOR LETTERS SHALL BE 1/4" WIDE.

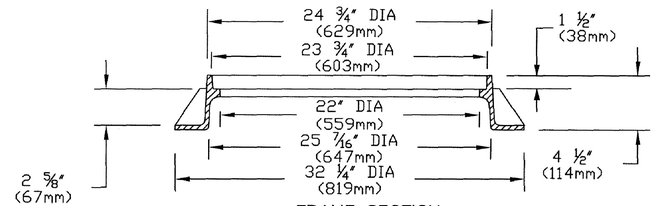
WORD "SANITARY OR WATER"

1/2" x 2 1/2" RECESS (SEE SECTION OF COVER THRU RECESS)

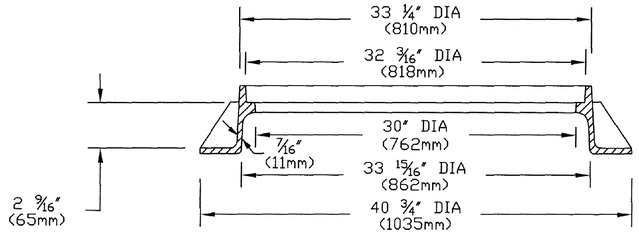
GROOVES 3/16" DIA X 3/32" DEEP APPROX 3/4" TO 1" SPACES

PLAN

23 1/2" MANHOLE COVER WITH FRAME



FRAME SECTION



SECTION (A)

32" MANHOLE COVER WITH FRAME

1) NOTE: APPROXIMATE WEIGHTS.
   FRAME- 170 LBS 77 kg
   COVER- 270 LBS 123 kg
   UNIT- 440 LBS 200 kg
2) MATERIAL- GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-14240 ASY OR APPROVED EQUAL

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER AND WATER
MANHOLE FRAME AND COVER
(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2016	DWG NO: 02090-01

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

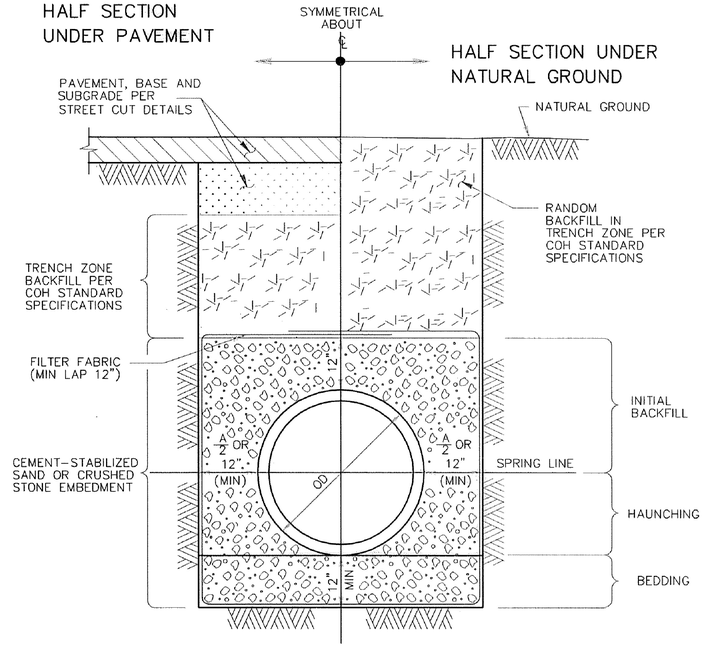
SANITARY SEWER AND WATER MANHOLE FRAME AND COVER

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
D18 SHEET NO. 79 of 111	

C:\USERS\YLIK\APPDATA\LOCAL\REVU\DO\466-789-225\CAD\PRODUCTION\STD COH 02090-01.DWG?YLIK(SAVED: Wednesday, June 24, 2026(COH_KAI.CTB(PLOTTED: Monday, June 29, 2026

HALF SECTION
UNDER PAVEMENT

HALF SECTION UNDER
NATURAL GROUND



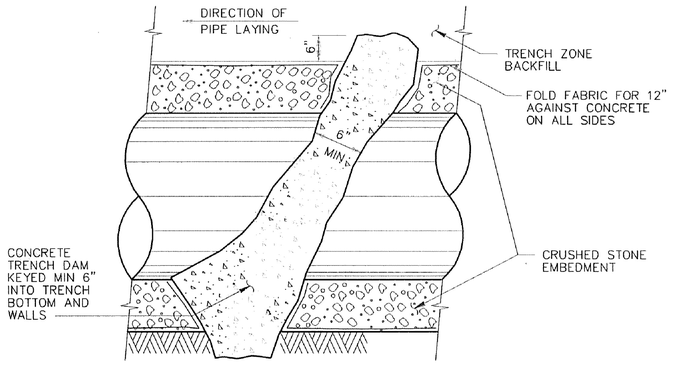
TYPICAL CROSS-SECTION

NOTES:

1. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "A" FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	"A"
18" TO 30"	24"
OVER 30"	36"

2. MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
3. TRENCH DAM MAY BE FORMED OR UNFORMED. ACTUAL SHAPE OF CONCRETE TRENCH DAM CROSS SECTION MAY BE DETERMINED BY CONTRACTOR IN FIELD, MEETING MINIMUM THICKNESS AND KEY DEPTH REQUIREMENTS.
4. TRENCH DAM SHALL BE PLACED AT LEAST 5 FT AWAY FROM ANY PIPELINE STRUCTURE. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
5. PLACE TRENCH DAMS IN CLASS I EMBEDMENTS AT THE MIDPOINT OF LINE SEGMENTS LONGER THAN 100 FEET BETWEEN MANHOLES.
6. CEMENT-STABILIZED SAND IS PREFERRED FOR EMBEDMENT, BUT CRUSHED STONE MAY BE USED ONLY WHEN SPECIFIED ON THE PLANS.



LONGITUDINAL SECTION ALONG PIPE ℄
AT EMBEDMENT TRENCH DAM

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SANITARY SEWER EMBEDMENT
AND TRENCH ZONE BACKFILL
FOR DRY OR WET STABLE TRENCH
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2016	DWG NO: 02317-01

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND
DEER RIDGE ESTATES

SANITARY SEWER EMBEDMENT
AND TRENCH ZONE BACKFILL
FOR DRY OR WET STABLE TRENCH

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 80 of 111	

D19

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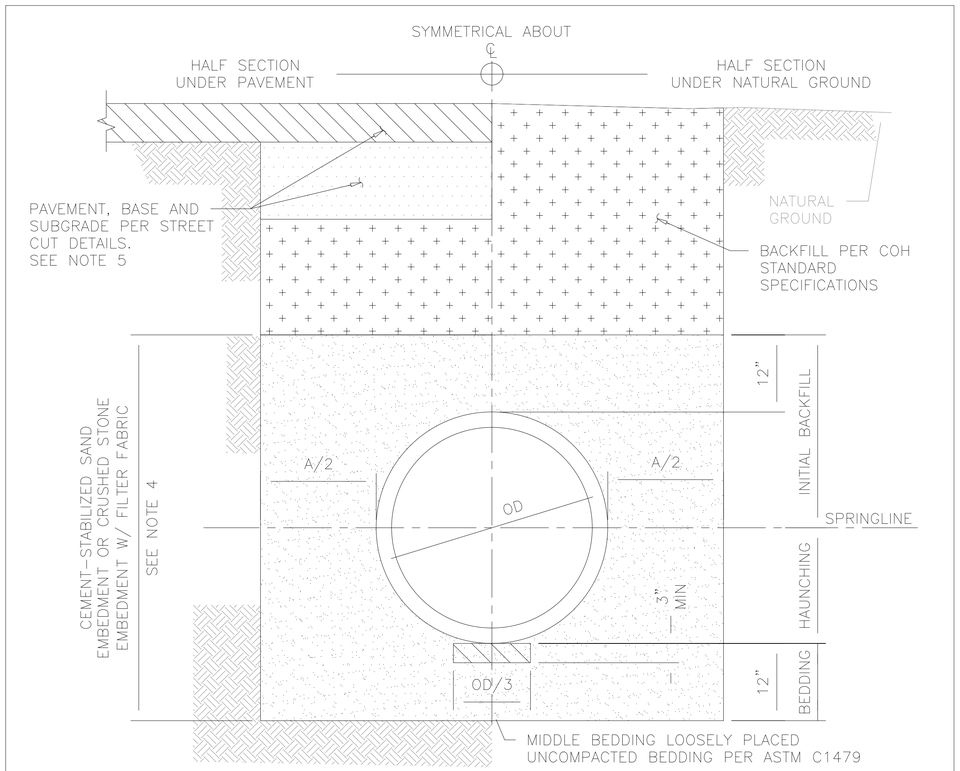

TYPICAL CROSS-SECTION

NOTES:

1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS PER COH STANDARD. SEE COH STANDARD SPECIFICATION FOR REQUIREMENTS IN OTHER CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "A" FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	"A"
30" OR LESS	24"
36" TO 42"	36"
GREATER THAN 42"	48"

3. MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
4. ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR FORCE MAINS MAY BE ALLOWED. SEE COH STANDARD SPECIFICATIONS.
5. REFER TO THE COH STD DETAILS 02951-01 THROUGH 05 FOR STREET CUT REQUIREMENTS.
6. FOR THERMOPLASTIC STORM SEWER PIPE INSTALLATION REFER TO COH STD DETAIL 02317-10G.

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.

APPROVED BY:

CITY ENGINEER

DIRECTOR OF HPW

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

SANITARY OR STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH

(SCALE: NOT TO SCALE)

EFF DATE: MAR-02-2026 | DWG NO: 02317-03

60% SUBMITTAL

1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY OR STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH

WBS#: R-002011-0090C-3

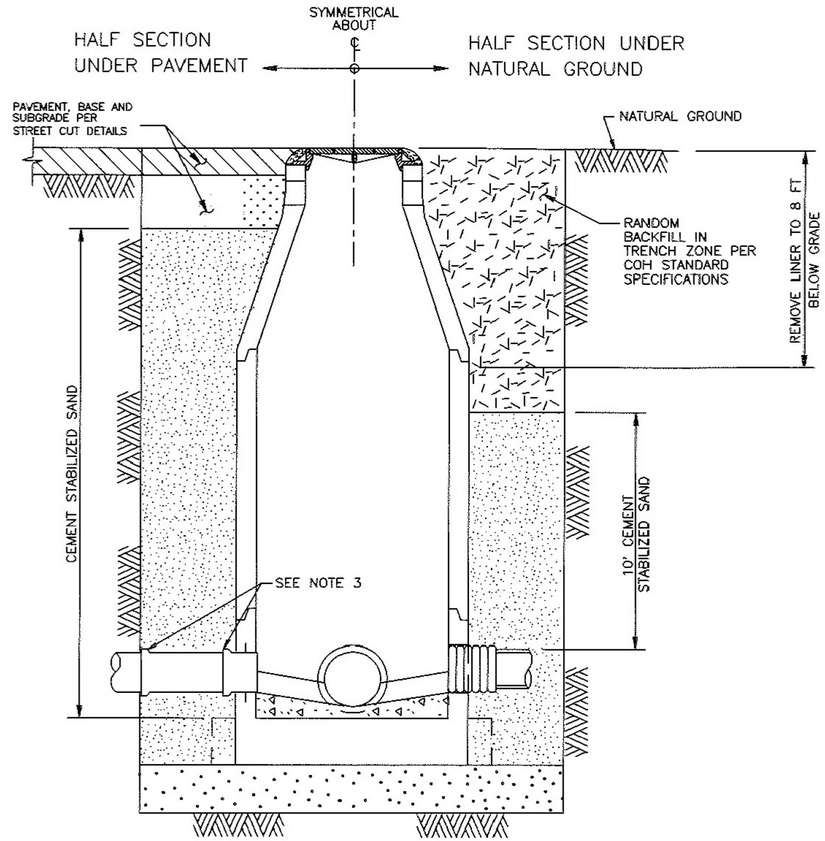
FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE:
NOT TO SCALE
CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:
D20
SHEET NO. **81 of 111**

C:\USERS\YLIK\APPDATA\LOCAL\REVU\DD\466-789-225\CAD\PRODUCTION\STD COH 02317-03.DWG[YLIK(SAVED:Wednesday, June 24, 2026(COH_KAL.CTB[PLOTTED:Monday, June 29, 2026

NOTES:

1. GROUTING OF MANHOLE STRUCTURE ANNULAR SPACE WILL BE PERMITTED IN CASES WHERE INSUFFICIENT WORK SPACE EXISTS FOR PLACEMENT AND COMPACTATION OF CEMENT STABILIZED SAND, PER COH STANDARD SPECIFICATION FOR TUNNEL GROUT.
2. THIS DETAIL ALSO APPLIES TO BACKFILL OF SHAFTS WITHOUT STRUCTURES.
3. ARRANGE PIPE JOINTS AS SHOWN WHEN USING RIGID CONNECTION TO CAST IN PLACE MANHOLE BASE.



TYPICAL CROSS – SECTION

COH

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: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02317-08

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
BACKFILL OF SHAFTS

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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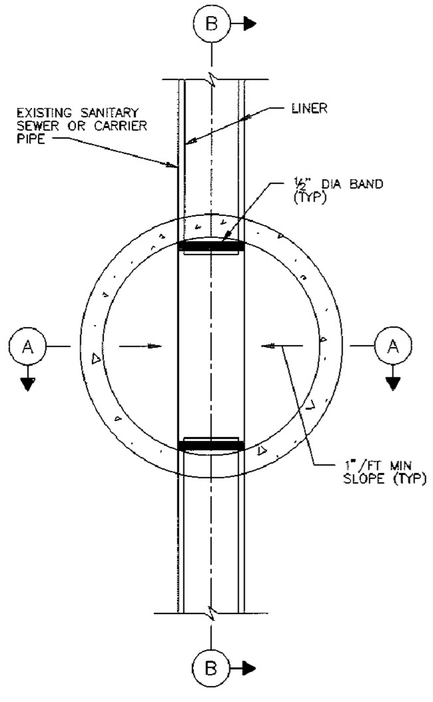
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 82 of 111	

D21

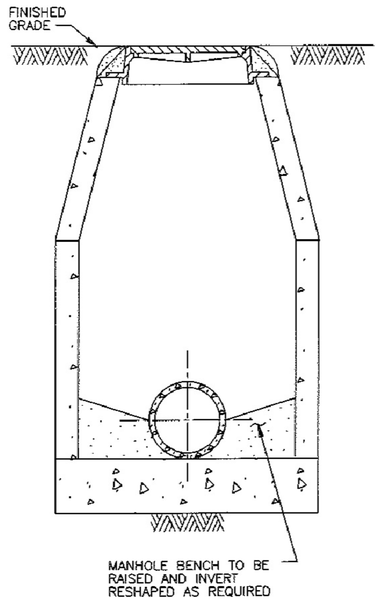
C:\USERS\YLIK\APPDATA\LOCAL\REVU\DD\466-789-225\CAD\PRODUCTION\STD COH 02317-08.DWG[YLIK(SAVED:Monday, June 29, 2026(COH_KA).CTB(PLOTTED:Monday, June 29, 2026

NOTES:

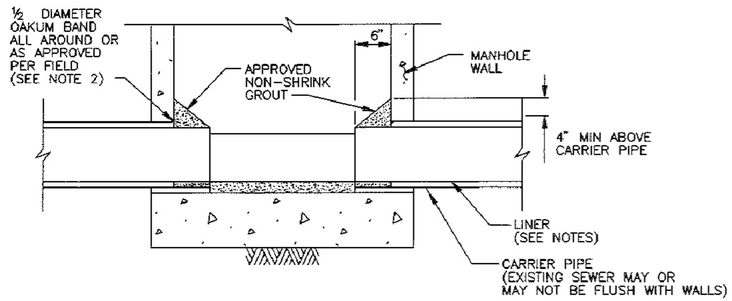
1. ALL LINER SHALL TIGHTLY FIT INSIDE THE EXISTING PIPE. ANNULAR SPACE, IF ANY, SHALL BE FILLED WITH NON-SHRINK GROUT, MINIMUM 12-INCH OR ONE-HALF PIPE DIAMETER.



PLAN



SECTION A



SECTION B

COH

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

SANITARY SEWER
SEALING OF CURED-IN-PLACE
LINER AT MANHOLE
(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02531-02

60% SUBMITTAL

1225 NORTH LOOP WEST
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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

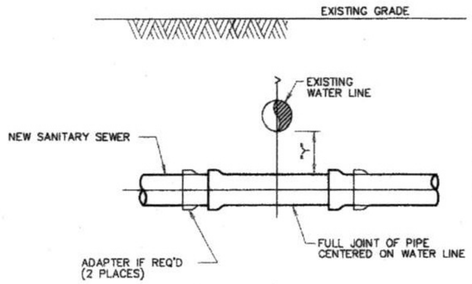
CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
SEALING OF CURED-IN-PLACE
LINER AT MANHOLE

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:	
NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
D22 SHEET NO. 83 of 111	

C:\USERS\YLIK\APPDATA\LOCAL\REVU\V01\466-789-225\CAD\PRODUCTION\STD COH 02531-02.DWG(YLIKISAVED:Monday, June 29, 2026)COH_AKA.CTB(PLOTTED:Monday, June 29, 2026



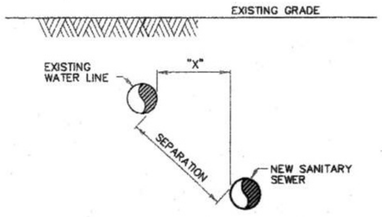
INSTALLATION REQUIREMENTS

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

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 STIFFNES 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.



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

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

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

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010
DWG NO: 02531-05

60% SUBMITTAL

1225 NORTH LOOP WEST
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SURVEYED BY: KUO & ASSOCIATES
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
INSTALLING SANITARY SEWERS
CROSSING OR PARALLEL TO WATER LINES

WBS#: R-002011-0090C-3
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CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:
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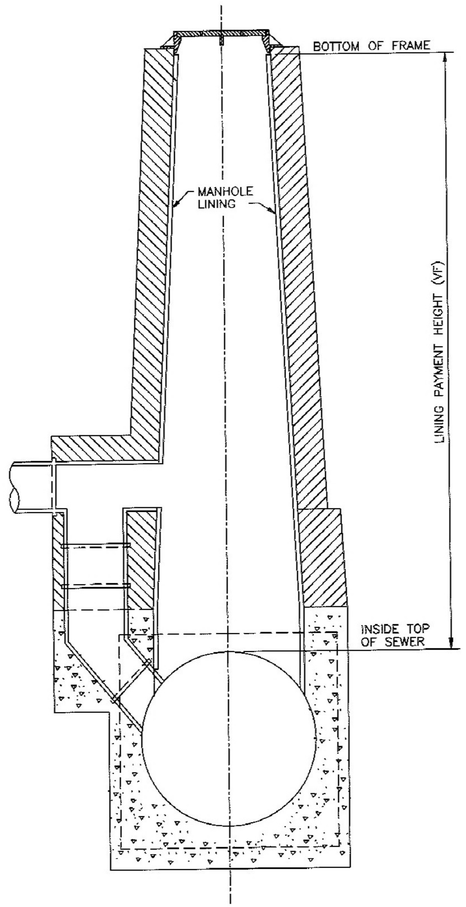
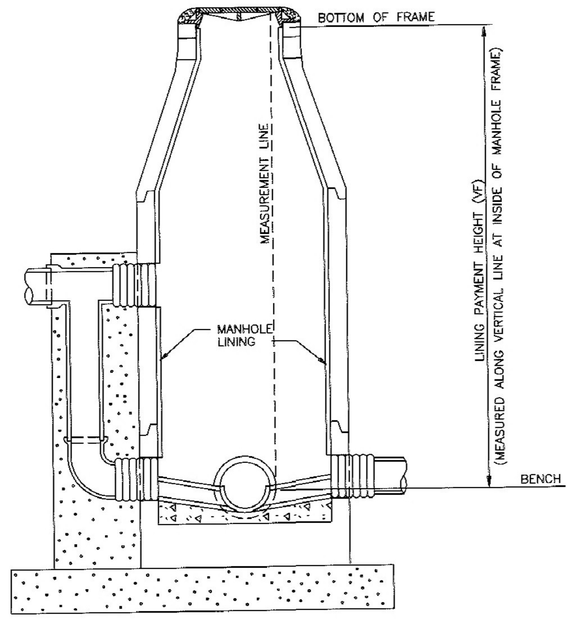
SHEET NO. 84 of 111

C:\USERS\YLIK\APPDATA\LOCAL\REVU\DO\466-789-225\CAD\PRODUCTION\STD COH 02531-05.DWG[YLIK(SAVED):Monday, June 29, 2026(COH_KAI.CTB)PLOTTED:Monday, June 29, 2026



TYPICAL MONOLITHIC SEWER MANHOLE



TYPICAL PIPE SEWER MANHOLE

THIS IS NOT A STANDARD DETAIL.
IT IS TO BE USED ONLY AS A GUIDE
FOR MEASUREMENT PURPOSES

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

SANITARY SEWER
MANHOLE LINING
PAYMENT LIMITS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER

APPROVED BY: DIRECTOR OF PU WORKS AND ENGIN

EFF DATE: OCT-01-2002 | DWG NO: 02534

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND
DEER RIDGE ESTATES

SANITARY SEWER
MANHOLE LINING
PAYMENT LIMITS

WBS#: R-002011-0090C-3

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CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:
D24

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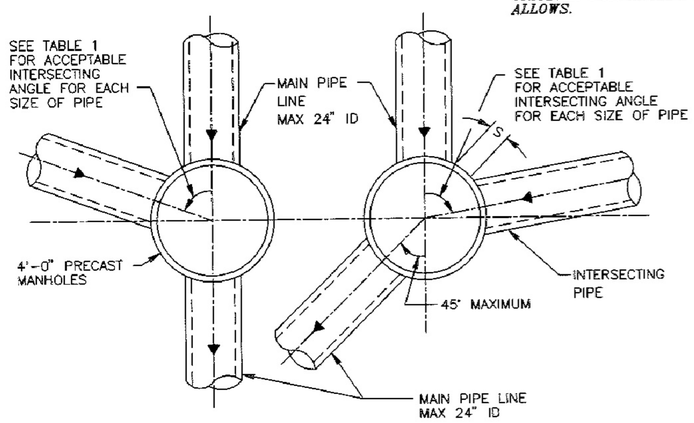
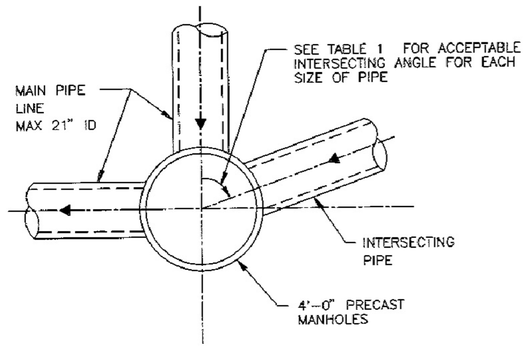
NOTES ON USE OF STANDARD DETAIL 02082-02

NOTES TO SPECIFIER:

1. *"–" INDICATES THAT A SPECIAL DESIGN OR THE NEXT LARGER MANHOLE SIZE SHALL BE USED.*
2. *TABLE 1 IS 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 TABLE 1 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 TABLE ALLOWS.*



MAX 24" ID MAIN PIPE ALLOWED FOR STRAIGHT THROUGH TO 45° DEFLECTION



MAX 21" ID MAIN PIPE ALLOWED FOR 45° TO 90° DEFLECTION

TABLE 1

MIN ANGLE AND INTERSECTING PIPE SIZES FOR A 4'-0" DIA MANHOLE

INTERSECTING PIPE SIZE (INCHES)	MIN INTERSECTING ANGLE IN DEGREES FOR FOR VARIOUS MAIN PIPE SIZES IN INCHES							
	6"	8"	10"	12"	15"	18"	21"	24"
6	55	58	60	65	70	75	80	85
8		60	63	68	73	77	82	87
10			66	71	75	80	85	90
12				76	80	85	90	–
15					85	90	–	–
18						–	–	–
21							–	–
24								–

NOT APPLICABLE UNLESS HYDRAULICS DICTATE (INTERSECTING PIPE > MAIN PIPE)

COH

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

SANITARY SEWER
4'-0" DIAMETER PRECAST
CONCRETE MANHOLE NOTES
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2002
DWG NO: 02082N-02

60% SUBMITTAL

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SURVEYED BY: KUO & ASSOCIATES
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
4'-0" DIAMETER PRECAST
CONRETE MANHOLE NOTES

WBS#: R-002011-0090C-3
FOR CITY OF HOUSTON USE ONLY

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CITY OF HOUSTON PM
MARIA GEORGE, P.E.

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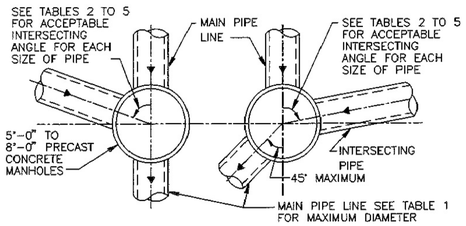
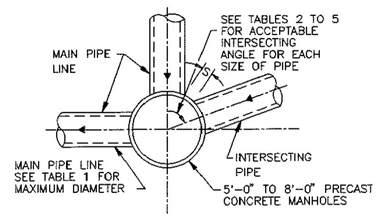


FOR MAIN PIPES FROM STRAIGHT THROUGH TO 45° DEFLECTION



FOR MAIN PIPE WITH 45° TO 90° DEFLECTION

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	50	54	58	61	66	69	73	77	82	86
10		53	57	61	64	68	71	76	79	84	88
12			61	65	68	72	75	80	83	88	–
15				68	71	75	79	83	87	–	–
18					75	79	82	87	90	–	–
21						83	86	90	–	–	–
24							90	–	–	–	–
27								–	–	–	–
30									–	–	–
33										–	–
36											–

* NOT APPLICABLE
(INTERSECTING PIPE GREATER THAN MAIN PIPE)

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	42	45	49	51	54	57	61	63	67	70	78
10		44	47	50	53	56	59	62	65	69	72	79
12			50	54	56	60	62	66	68	72	75	83
15				57	59	62	65	69	71	75	78	85
18					62	65	68	71	74	78	81	88
21						68	71	74	77	81	84	–
24							74	77	80	84	87	–
27								83	85	89	–	–
30									–	–	–	–
33										–	–	–
36											–	–
42												–

*

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	36	39	42	44	47	49	52	54	57	59	65	71
10		38	40	43	45	48	50	53	55	59	61	67	73
12			43	46	48	51	53	56	58	61	64	70	76
15				48	50	53	55	58	61	64	66	72	78
18					58	56	58	61	63	66	69	74	81
21						58	60	63	66	69	71	77	83
24							63	66	68	71	74	79	86
27								70	72	76	78	84	90
30									78	81	83	89	–
33										86	88	–	–
36											–	–	–
42												–	–
48													–

*

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	32	34	36	38	41	43	45	47	50	52	56	61	67	74
10		33	35	38	40	42	44	46	48	51	53	58	63	68	77
12			38	40	42	44	46	49	51	53	55	60	65	71	79
15				42	44	47	48	51	53	56	58	62	67	73	81
18					46	49	51	53	55	58	66	64	70	75	83
21						51	53	55	57	60	62	67	72	77	85
24							55	57	59	62	64	69	74	79	89
27								61	63	66	68	73	78	83	–
30									67	70	72	77	82	87	–
33										74	76	81	86	–	–
36											81	86	–	–	–
42												–	–	–	–
48													–	–	–
54														–	–
60															–

*

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.*

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:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02082N-03

60% SUBMITTAL

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www.imsengineers.com
TX Firm 18572

SURVEYED BY: KUO & ASSOCIATES
FB NO.:

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
5'-0" TO 8'-0" DIAMETER
PRECAST CONCRETE MANHOLE NOTES

WBS#: R-002011-0090C-3
FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE:
NOT TO SCALE
CITY OF HOUSTON PM
MARIA GEORGE, P.E.
DRAWING NO:

C:\USERS\YLHK\APPDATA\LOCAL\REVIT\200\466-789-225\CAD\PRODUCTION\STD CDH 02082N-03.DWG(YLHK(SAVED:Monday, June 29, 2026(CDH_KAI(TBPLOTTED:Monday, June 29, 2026

NOTES:

1.) MATERIAL SHALL MEET OR EXCEED MINIMUM REQUIREMENTS OF ASTM A36 CARBON STEEL.

2.) TOP AND BOTTOM RINGS SHALL HAVE A CONTINOUS WELD.

3.) ALL "M5" STYLE RISERS ARE FOR HEIGHT ADJUSTMENTS EQUAL TO OR LESS THAN THE THICKNESS OF THE MANHOLE COVER.

4.) EACH RISER IS CUSTOM FABRICATED FROM MEASUREMENTS PROVIDED WITH EACH ORDER. REQUIRED MEASUREMENTS INCLUDE THE FOLLOWING:
A. EXIST. MANHOLE COVER DIAMETER - TOP & BOTTOM
B. EXISTING MANHOLE COVER THICKNESS
C. REQUIRED HEIGHT OF ADJUSTMENT

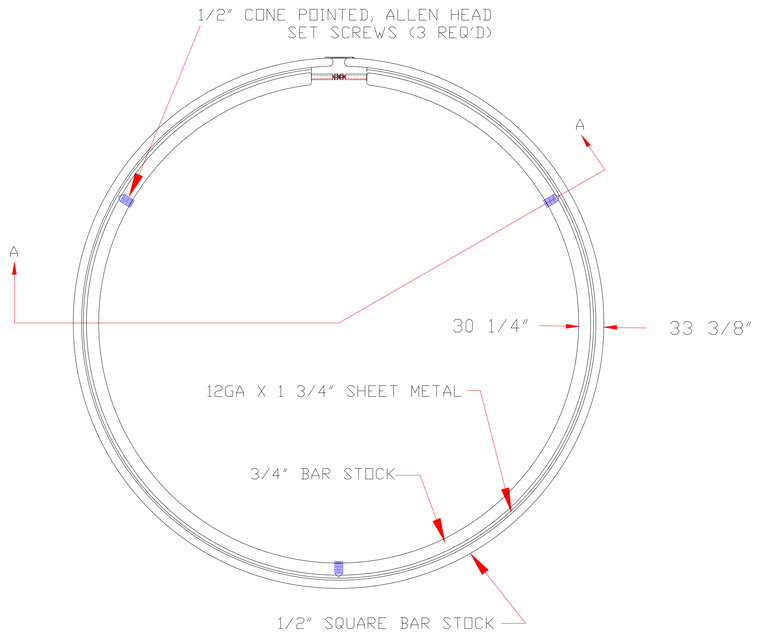
5.) MINIMUM RECOMMENDED HEIGHT OF ADJUSTMENT FOR REPAVING PROJECTS IS 1".

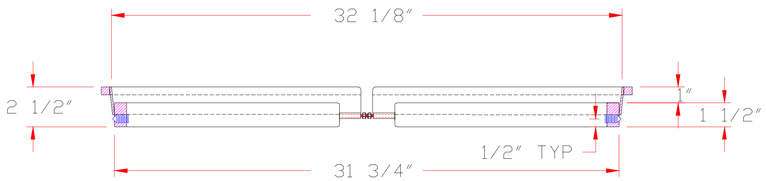
6.) HEIGHT ADJUSTMENTS ARE AVAILABLE IN 1/4" INCREMENTS.

7.) DURING INSTALLATION CHECK FOR FULL BEARING OF LOWER FRAME SECTION ON EXISTING CASTING.

8.) DIMENSIONS MAY VARY TO MEET EXISTING FIELD CONDITIONS. ANY CHANGE IN DIMENSIONS SHALL BE APPROVED BY THE OWNER.

9.) AFTER FABRICATION, RISERS ARE COATED WITH EITHER A WATER BASED BITUMINOUS ASPHALT EMULSION PAINT OR BASF E-COAT W/ CHARCOAL BLACK TOPCOAT.





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

STEEL ADJUSTING RISER

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: XX-XX-XX	DWG. NO: 02084-02A

60% SUBMITTAL

1225 NORTH LOOP WEST
Suite 1020
Houston, TX 77008
Tel: 713-739-7744
Fax: 713-739-7746
www.imsengineers.com
TX Firm 18572

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

STEEL ADJUSTING RISER

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 88 of 111	

D27

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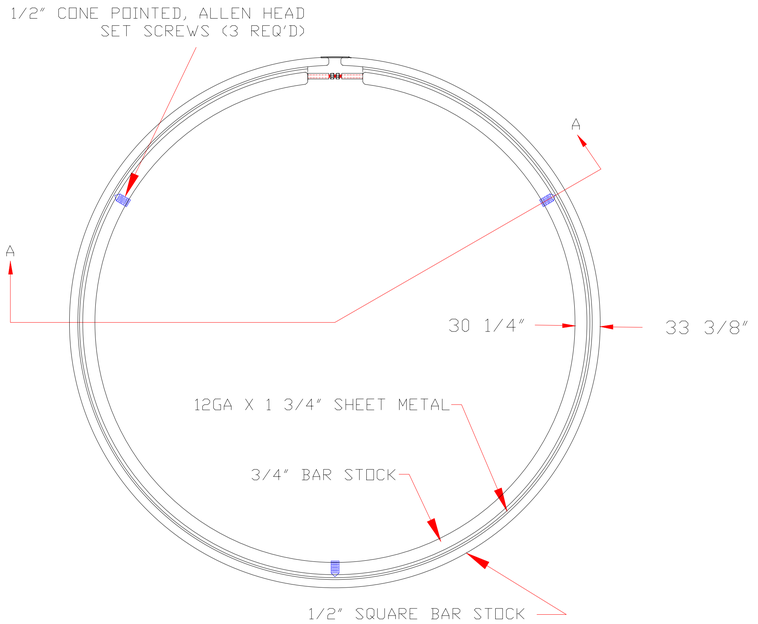

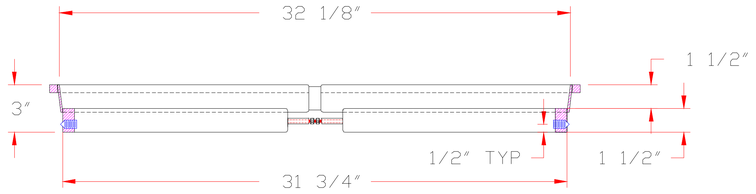

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

STEEL ADJUSTING RISER

(NOT TO SCALE)

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EFF. DATE: XX-XX-XX	DWG. NO: 02084-02B

60% SUBMITTAL

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

STEEL ADJUSTING RISER

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
D28 SHEET NO. 89 of 111	

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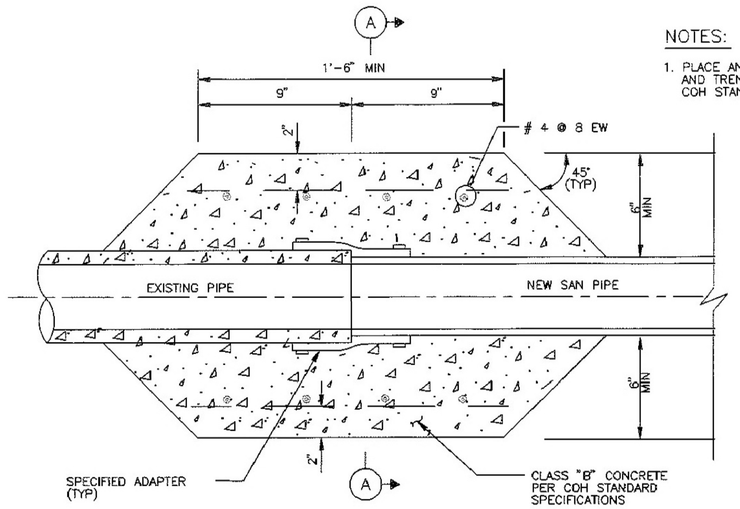
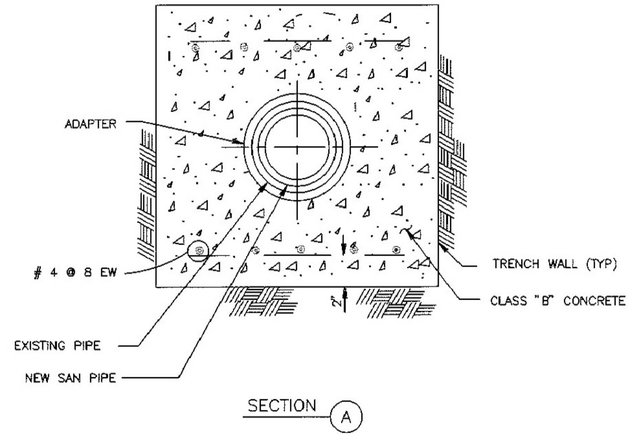


NOTES:

1. PLACE AND COMPACT EMBEDMENT AND TRENCH ZONE BACKFILL PER COH STANDARD SPECIFICATIONS.

LONGITUDINAL SECTION



SECTION A

COH

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
SANITARY SEWER PIPE TRANSITION FOR 36" SEWER AND SMALLER (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02531-04

60% SUBMITTAL

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Suite 1020
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Tel: 713-739-7744
Fax: 713-739-7746
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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SANITARY SEWER
PIPE TRANSITION FOR 36"
SEWER AND SMALLER

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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NOT TO SCALE	
CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
SHEET NO. 90 of 111	

D29

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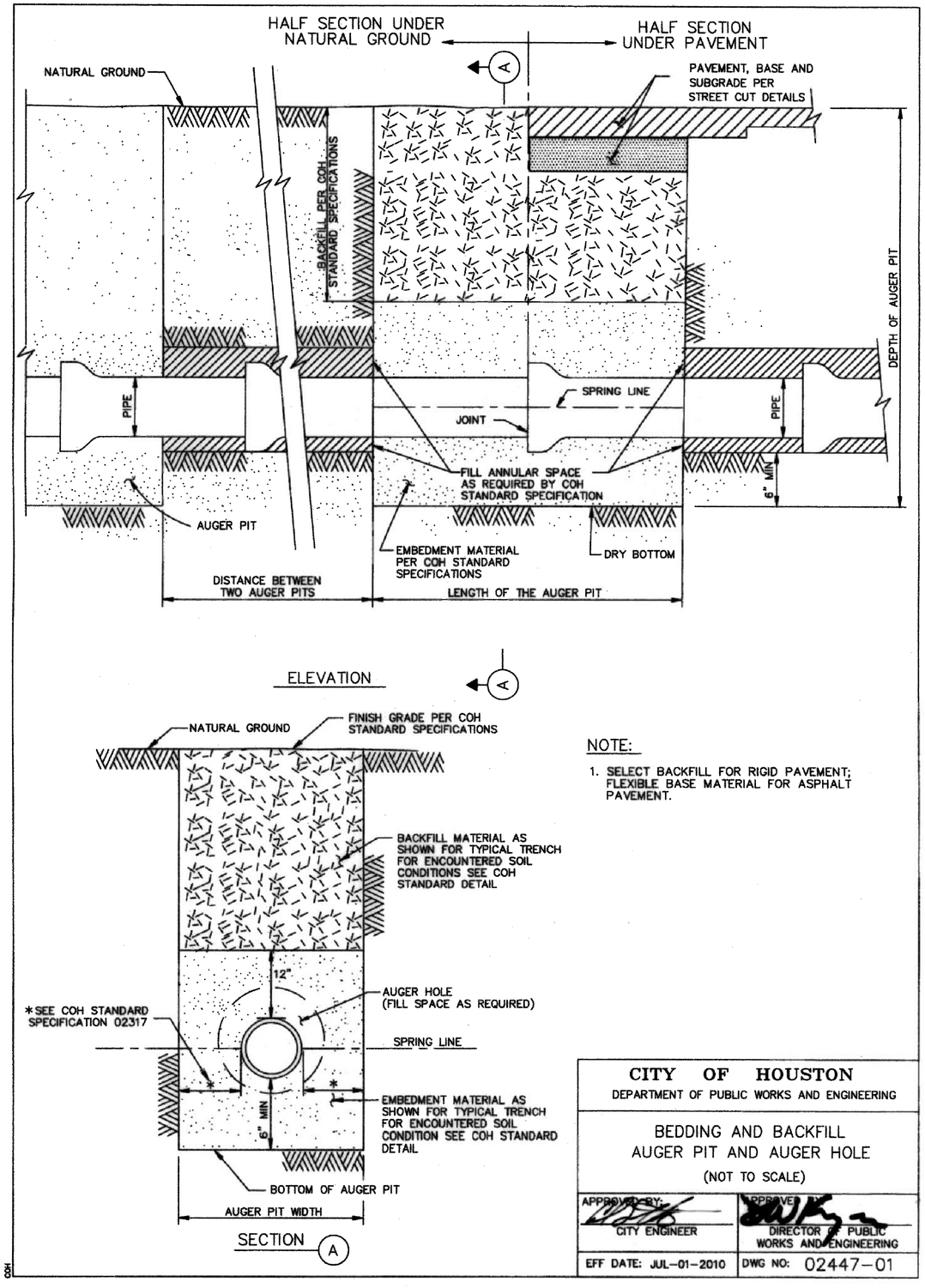

NOTE:

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

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

BEDDING AND BACKFILL
AUGER PIT AND AUGER HOLE
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010	DWG NO: 02447-01

60% SUBMITTAL

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Tel: 713-739-7744
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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

BEDDING AND BACKFILL
AUGER PIT AND AUGER HOLE

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
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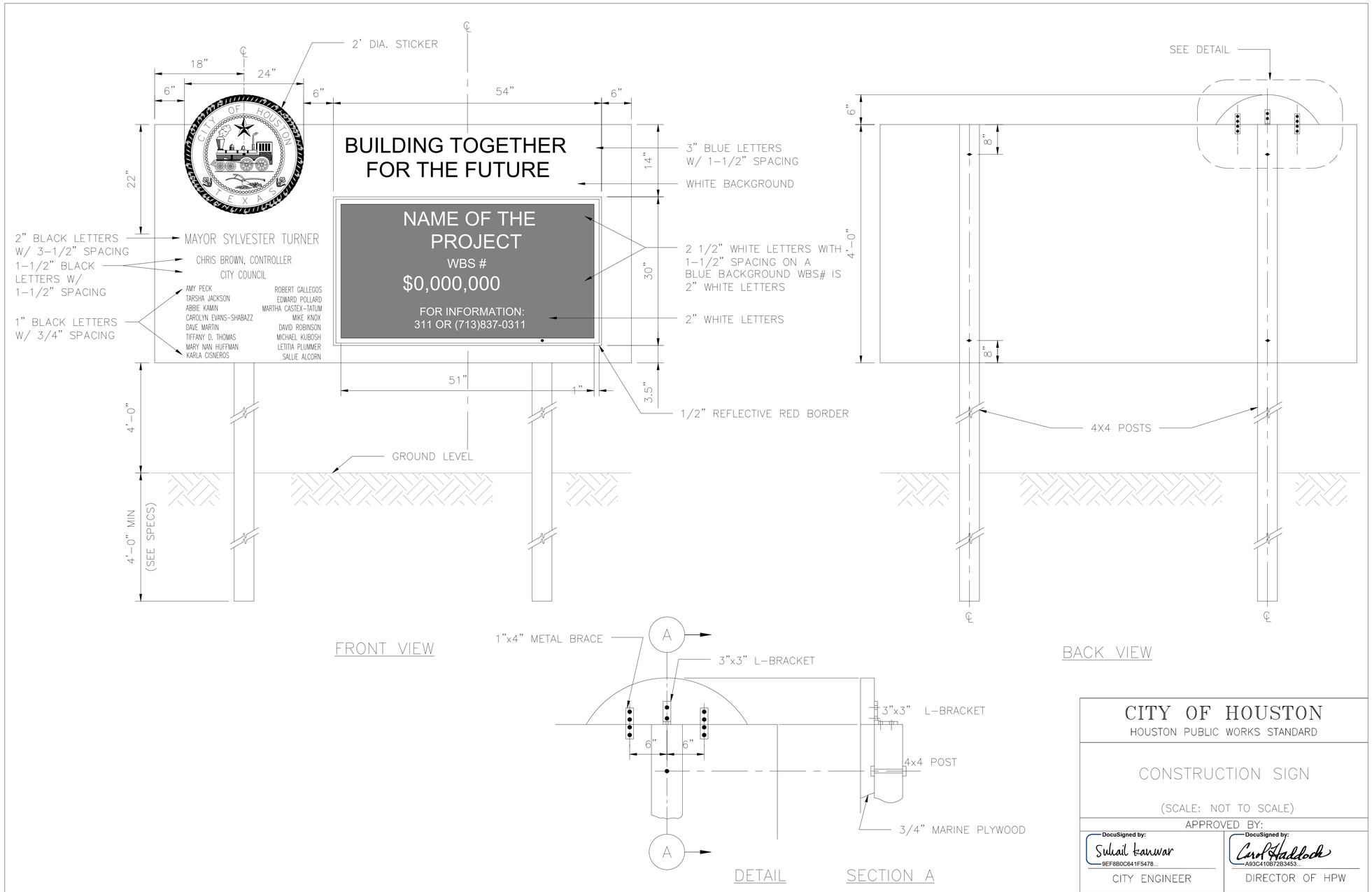
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6



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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONSTRUCTION SIGN

(SCALE: NOT TO SCALE)

APPROVED BY:	
DocuSigned by: Suhail Kanwar 9EF8B0C641F5478...	DocuSigned by: Carol Haddock A93C410B72B3453...
CITY ENGINEER	DIRECTOR OF HPW
EFF DATE: NOV-27-2023	DWG NO: 01580-01

60% SUBMITTAL

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DRAWING NO:	
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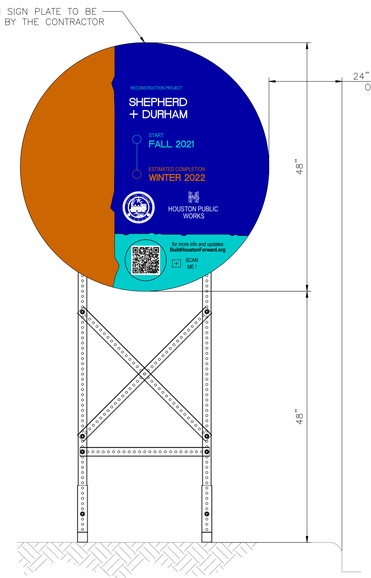
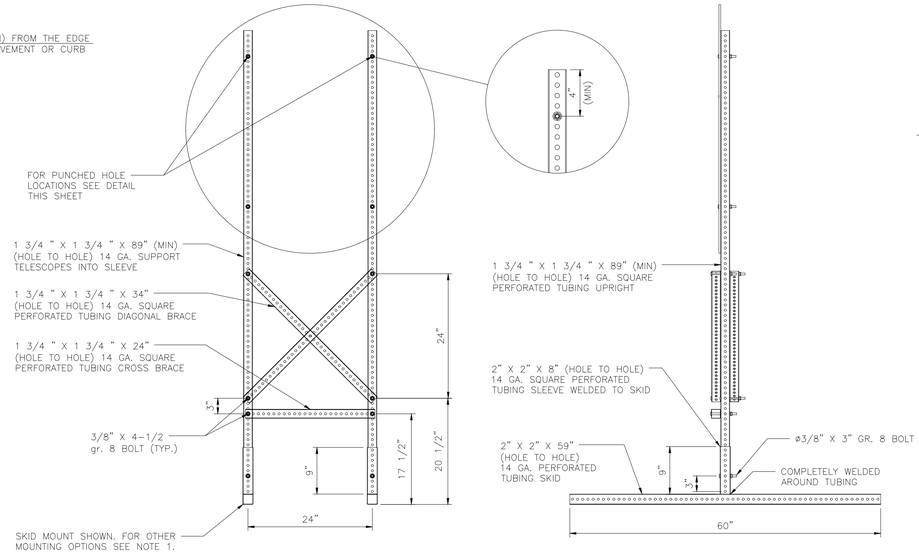
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6



FRONT VIEW

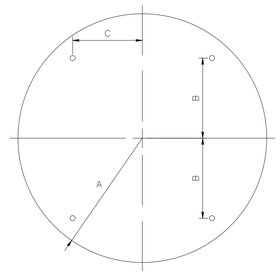
PROJECT SIGN – 48"



FRONT VIEW

SIDE VIEW

SKID MOUNTED SUPPORTS FOR 48" PROJECT SIGN



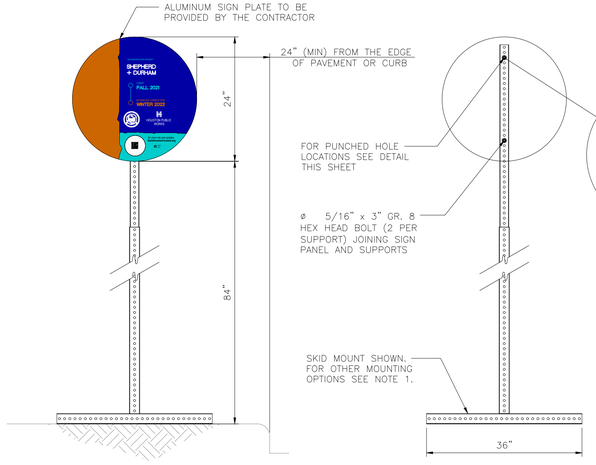
CIRCLE

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

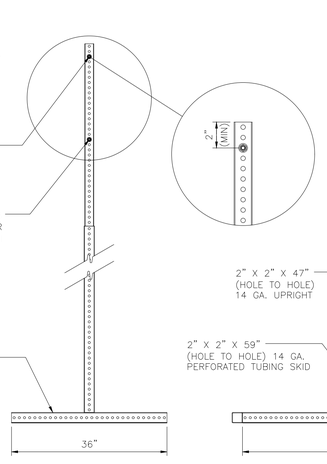
48" SIGN PLATE HOLE DETAIL

NOTES:

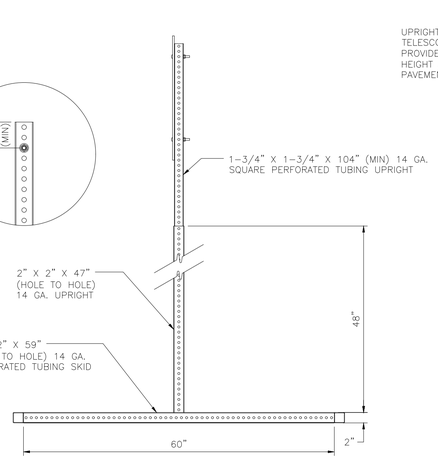
1. ALLOWABLE POST INSTALLATION METHODS ARE: CONCRETE FOOTING, SURFACE MOUNTING, SKID MOUNTING AND PILE DRIVEN POSTS.
2. FOR POST INSTALLATION WITH CONCRETE FOOTING, REFER TO DETAIL 01554–01.
3. FOR SURFACE MOUNTED POST INSTALLATION, REFER TO DETAIL 01554–02.
4. FOR SKID MOUNTING REQUIREMENTS REFER TO 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

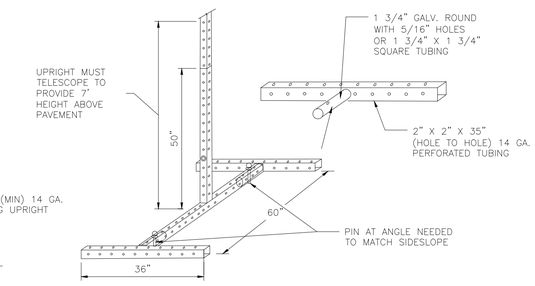


FRONT VIEW

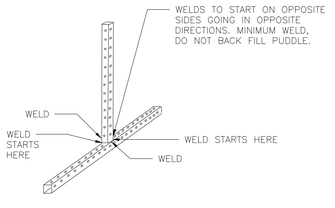


SIDE VIEW

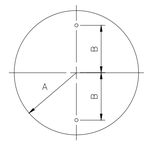
SKID MOUNTED SUPPORTS FOR 24" PROJECT SIGN



ISO VIEW



ISO VIEW



A	B	C
12"	8"	0.080"

24" SIGN PLATE HOLE DETAIL

APPROVED BY:	APPROVED BY:
Docusigned by: Suhail Kanwar 9EF8B0C6417F5478...	Docusigned by: Carol Haddock A83C410972B3403...
CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: NOV–27–2023	DWG NO: 01582–01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONSTRUCTION SIGN BUILD HOUSTON FORWARD

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HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

CONSTRUCTION SIGN BUILD HOUSTON FORWARD

WBS#: R–002011–0090C–3	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
D32 SHEET NO. **93 of 111**	

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WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER.

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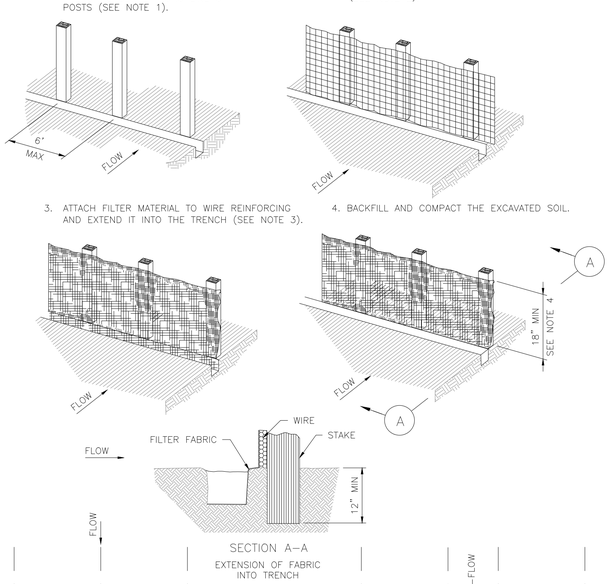
1. SET POSTS AND EXCAVATE 4"x4" TRENCH UPSLOPE ALONG LINE OF POSTS (SEE NOTE 1).
2. SECURE WIRE REINFORCING TO POSTS (SEE NOTE 2).
3. ATTACH FILTER MATERIAL TO WIRE REINFORCING AND EXTEND IT INTO THE TRENCH (SEE NOTE 3).
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

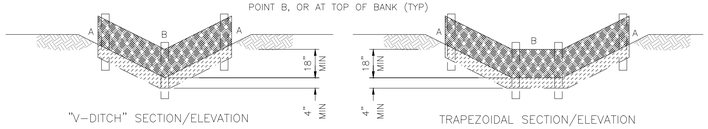


SECTION A–A
EXTENSION OF FABRIC INTO TRENCH

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

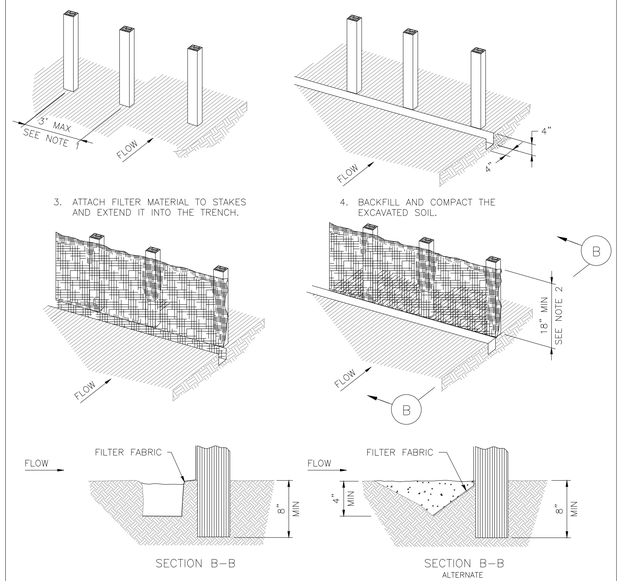
CONSTRUCTION NOTES:

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

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

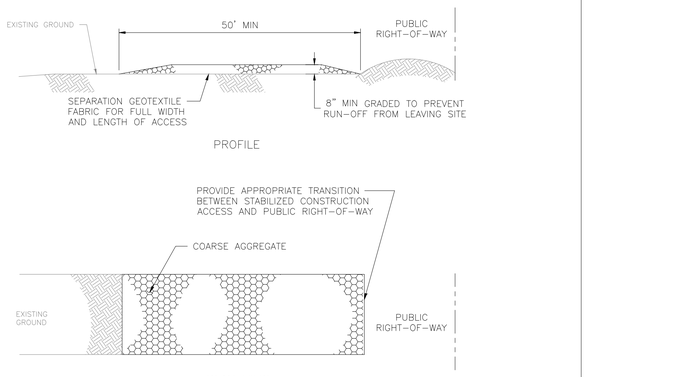
SECTION B–B
ALTERNATE
V–TRENCH EXTENSION OF FABRIC INTO TRENCH

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.

SYMBOL

FILTER FABRIC BARRIER

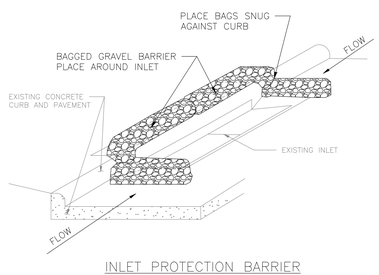


CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE WASHING AREA.
6. COH STANDARD SPECIFICATION 01575 FOR STABILIZED CONSTRUCTION ACCESS.
7. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

SYMBOL

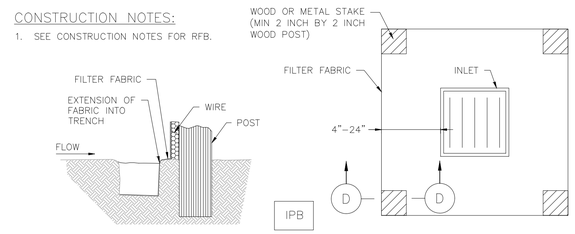
STABILIZED CONSTRUCTION ACCESS



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

CONSTRUCTION NOTES:

1. SEE CONSTRUCTION NOTES FOR RFB.

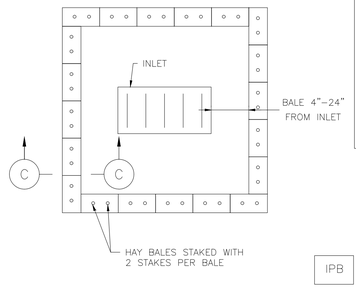


SECTION D–D

SYMBOL

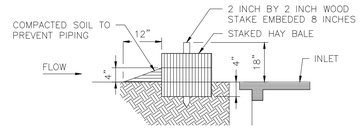
PLAN VIEW

SILT FENCE INLET PROTECTION BARRIER



PLAN VIEW

SYMBOL



SECTION C–C

HAY BALE INLET PROTECTION BARRIER

APPROVED BY:	APPROVED BY:
Signed by: 19EEB522072F84DC...	Signed by: BE4E36F0DF4548B...
CITY ENGINEER	DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: MAR–02–2026	DWG NO: 01570–01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STORMWATER POLLUTION PREVENTION PLAN DETAILS

	FOR CITY OF HOUSTON USE ONLY
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SURVEYED BY: KUO & ASSOCIATES
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

STORMWATER POLLUTION PREVENTION PLAN DETAILS

WBS#: R–002011–0090C–3	FOR CITY OF HOUSTON USE ONLY
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D33

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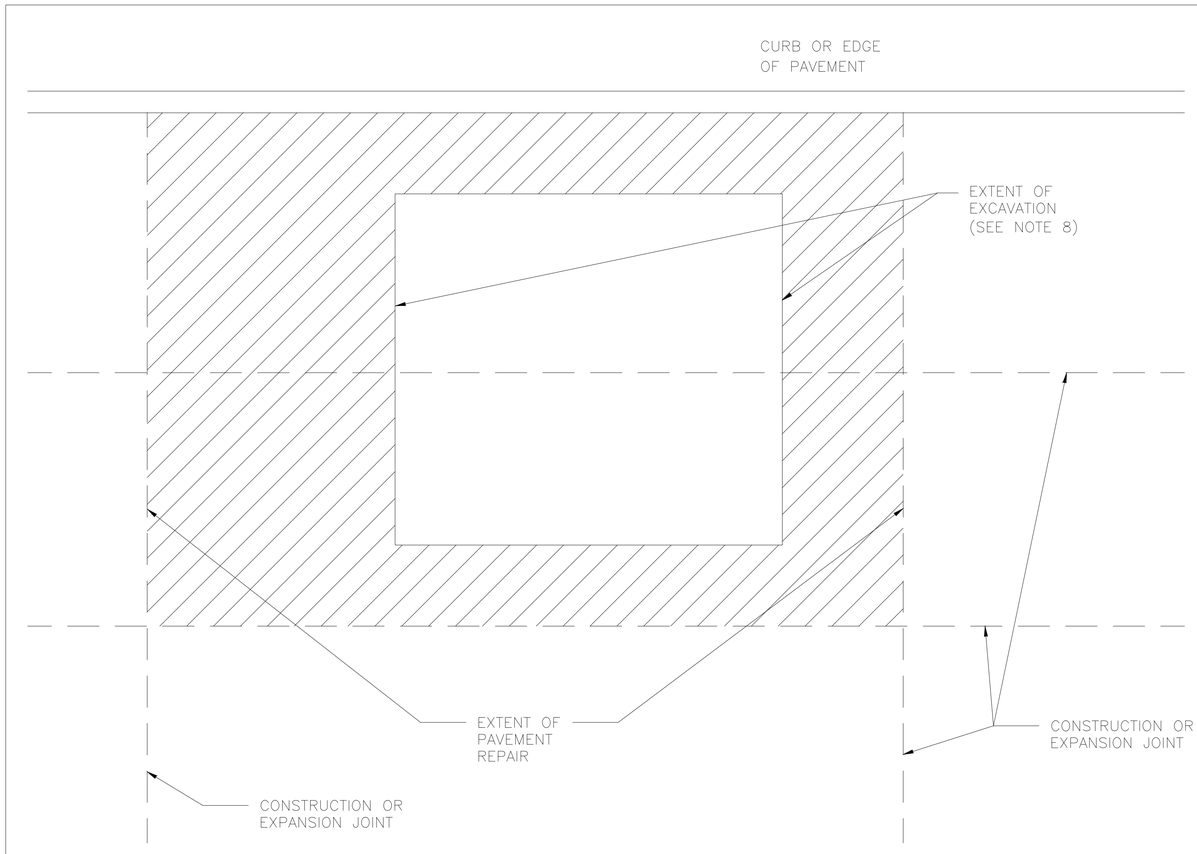

NOTES:

1. EXTENT OF PAVEMENT REPAIR SHALL BE PERPENDICULAR AND PARALLEL TO TRAVEL WAY.
2. REPLACE ENTIRE PANEL WIDTH AND LENGTH TO NEAREST CONSTRUCTION OR EXPANSION JOINT BEYOND EDGE OF EXCAVATION.
3. SAW CUT AND EXPOSE 15" OF REINFORCING STEEL WITHIN EXISTING PAVEMENT. PROVIDE HORIZONTAL DOWELS (PER SPECIFICATION SECTION 02951–PAVEMENT REPAIR AND RESTORATION) IF EXISTING REINFORCING IS BROKEN OFF.
4. REPLACE CURB WHEN ADJACENT LANE IS REPLACED.
5. MAINTAIN EXPANSION JOINTS AT EXISTING LOCATIONS UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
6. SPECIALTY PAVEMENTS (IE: BRICK PAVERS) TO BE REPLACED WITH MATCHING PAVEMENT IN ALL CASES.
7. REPLACE PAVEMENT MARKINGS IN ACCORDANCE WITH CITY OF HOUSTON STANDARD SPECIFICATIONS 02764–RAISED PAVEMENT MARKERS AND 02767–THERMOPLASTIC PAVEMENT MARKINGS.
8. EXTENT OF EXCAVATION INCLUDES 18" OVERCUT AS SHOWN ON STANDARD DETAIL 02951–04 PAVEMENT REPAIR DETAIL FOR STREET CUTS (FLEX–BASE PAVEMENT & CONCRETE PAVEMENT).

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

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

APPROVED BY:

DocuSigned by: Sukait Kanwar 9EF8B0C641F5478...
CITY ENGINEER

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 02951–01

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
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STREET CUT FOR CONCRETE PAVEMENT REPLACEMENT/RESTORATION AGE OF PAVEMENT ≥ 5YRS

WBS#: R–002011–0090C–3	FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
DRAWING NO:	
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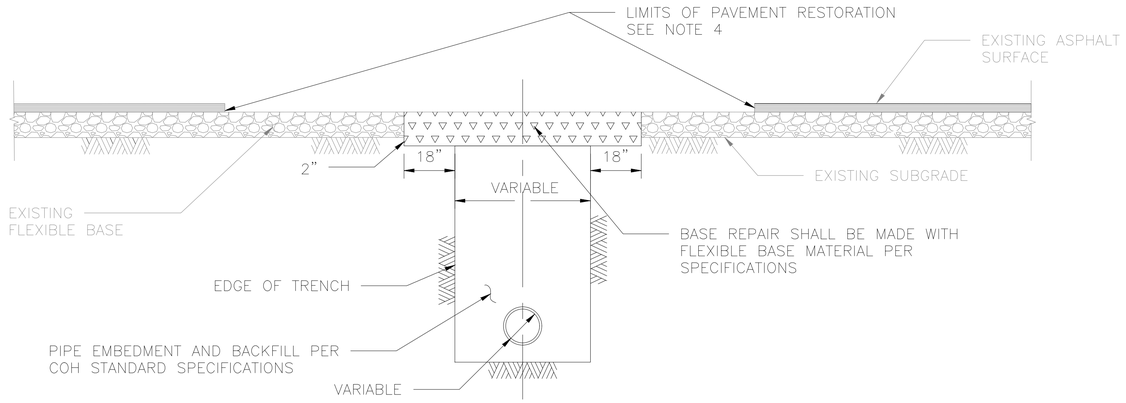
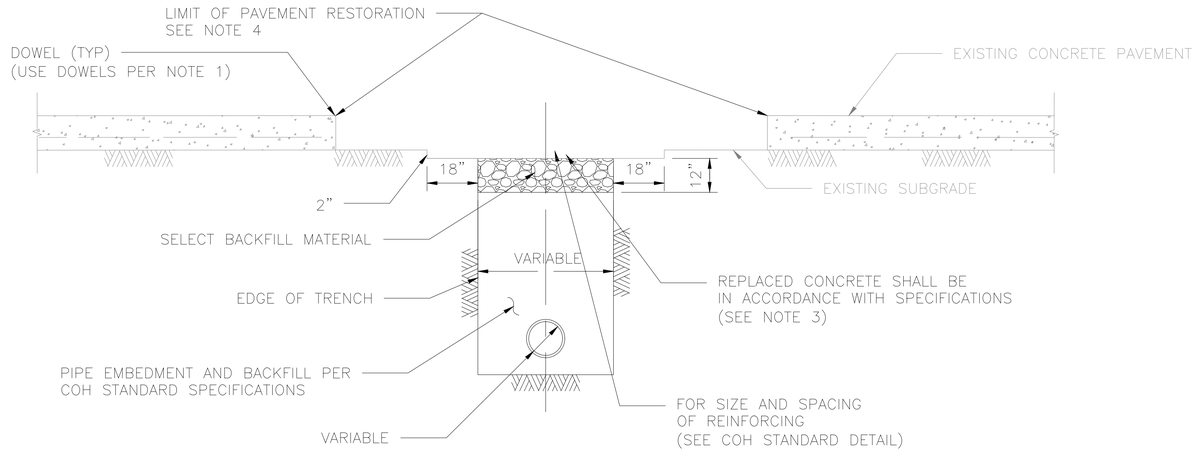


ELEVATION A
REPAIR OF FLEXIBLE BASE PAVEMENT

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.



ELEVATION B
REPAIR OF REINFORCED CONCRETE PAVEMENT

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PAVEMENT REPAIR DETAIL
FOR STREET CUTS
(FLEX-BASE PAVEMENT & CONCRETE PAVEMENT)
(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail Kanwar 9EF8B0C641F5478...
CITY ENGINEER

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND
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PAVEMENT REPAIR DETAIL
FOR STREET CUTS
(FLEX-BASE PAVEMENT & CONCRETE PAVEMENT)

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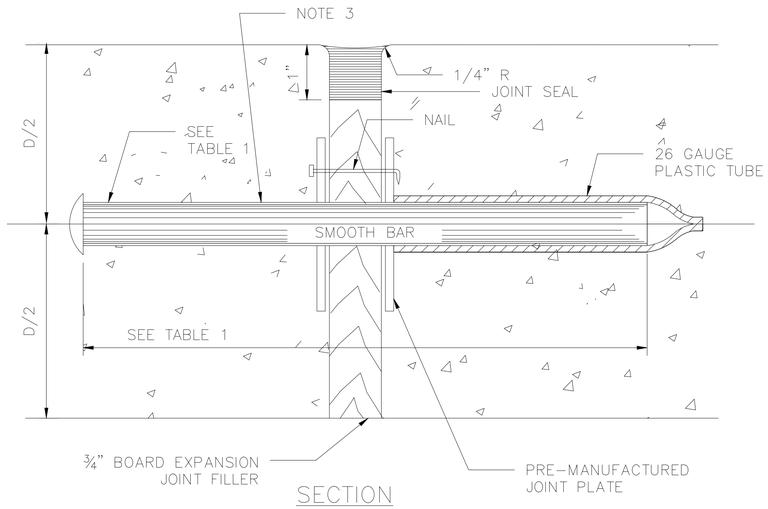
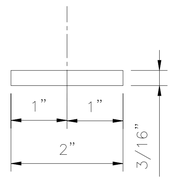


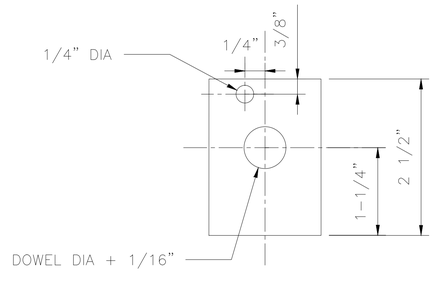
SECTION

DOWEL TYPE EXPANSION JOINT



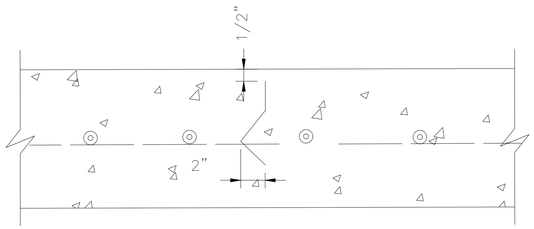
PLAN VIEW

JOINT PLATE



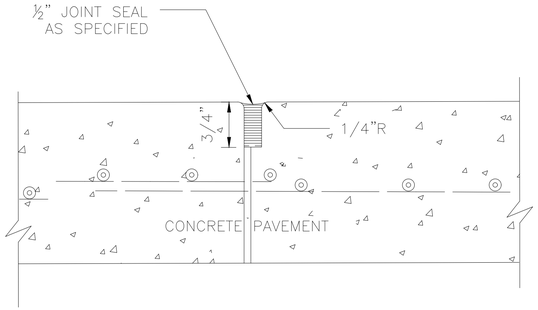
ELEVATION VIEW

JOINT PLATE



SECTION

DEFORMED METAL STRIP



SECTION

CONSTRUCTION JOINT SEAL

TABLE 1

PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS		
	DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12

NOTES:

1. STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS. UNITS TO BE SPACED 12" CENTER ON CENTER.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS.
3. CENTER DOWEL HORIZONTALLY ON JOINT.
4. CENTER DOWEL VERTICALLY IN CONCRETE BASE. EXTEND THICKENED CONCRETE AS NEEDED TO MAINTAIN 3" MIN COVER.
5. CITY OF HOUSTON APPROVED PRODUCTS MAY BE USED AS JOINT PLATE ALTERNATIVE.

CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

PAVEMENT EXPANSION AND CONSTRUCTION JOINT DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail Kanwar 9EF8B0C641F5478...
CITY ENGINEER

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

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HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

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PAVEMENT EXPANSION AND CONSTRUCTION JOINT DETAILS

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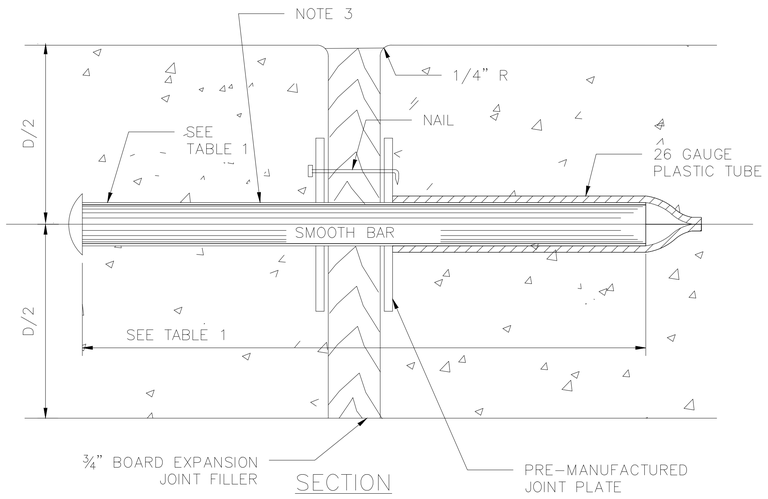
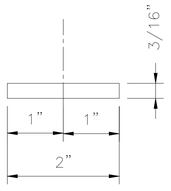


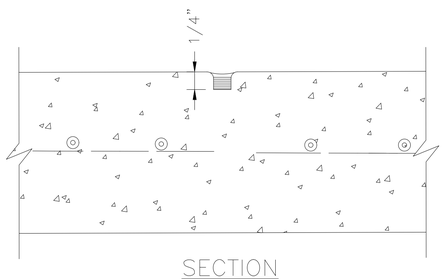
SECTION

DOWEL TYPE EXPANSION JOINT



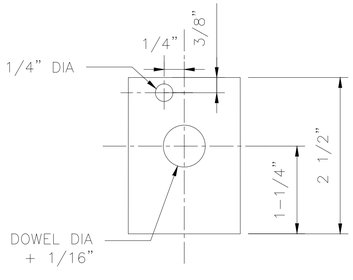
PLAN VIEW

JOINT PLATE



SECTION

CONTROL JOINT

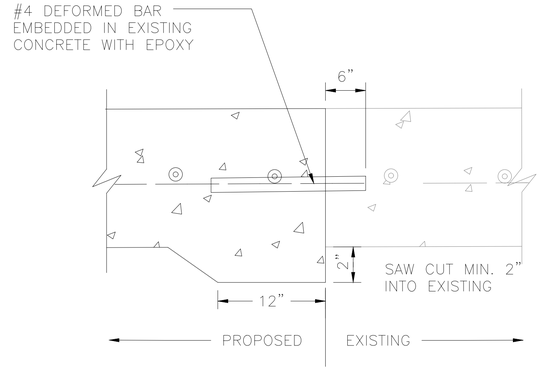


ELEVATION VIEW

JOINT PLATE

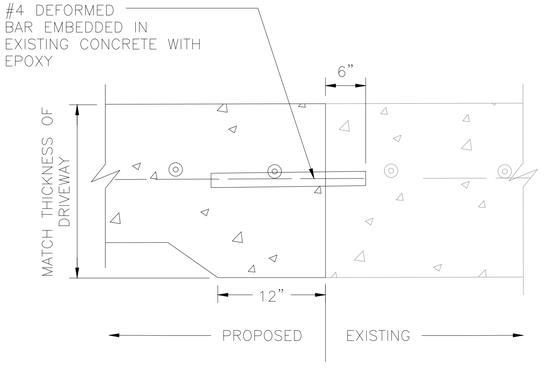
TABLE 1

PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS		
	DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
4 1/2	1/2	18	12
5	1/2	18	12
6	3/4	18	12
7	1	18	12



SECTION

SIDEWALK TO EXISTING SIDEWALK



SECTION

SIDEWALK TO EXISTING DRIVEWAY

NOTES:

1. STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED AT A MAXIMUM DISTANCE OF 3 FEET MAXIMUM SPACING FOR CONTROL JOINTS SHALL BE 5 FEET.
3. CENTER DOWEL HORIZONTALLY ON JOINT.
4. CENTER DOWEL VERTICALLY IN CONCRETE AS NEEDED TO MAINTAIN A 2 INCH MINIMUM COVER.

DISCLAIMER:
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

SIDEWALK EXPANSION AND CONSTRUCTION JOINT DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail kanwar 9EF8B0C641F5478...
CITY ENGINEER

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

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

60% SUBMITTAL

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TX Firm 18572

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SURVEYED BY: KUO & ASSOCIATES
FB NO.:

CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

SIDEWALK EXPANSION AND CONSTRUCTION JOINT DETAILS

WBS#: R-002011-0090C-3 — FOR CITY OF HOUSTON USE ONLY

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DRAWING NO:
D37
SHEET NO. 98 of 111

C:\USERS\YLUK\APPDATA\LOCAL\REVU\DO\466-789-225\CAD\PRODUCTION\STD COH 02752-02.DWG|YLUK|SAVED: Monday, June 29, 2026|COH_KA.CTB|PLOTTED: Tuesday, June 30, 2026

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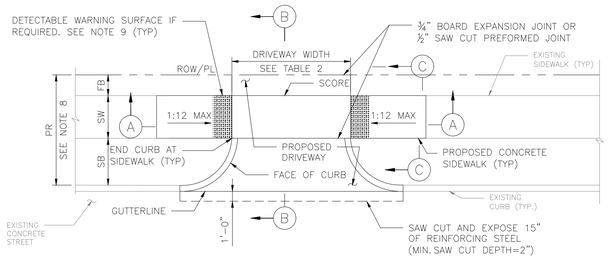
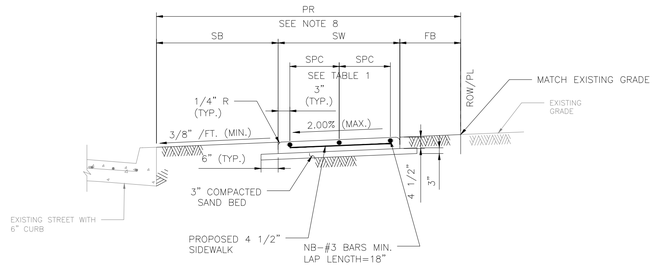
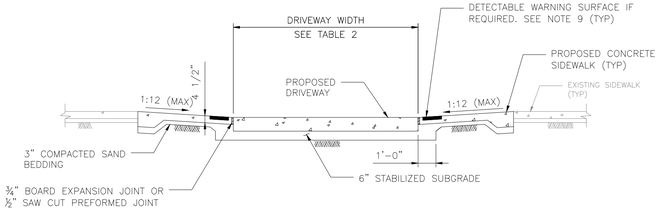


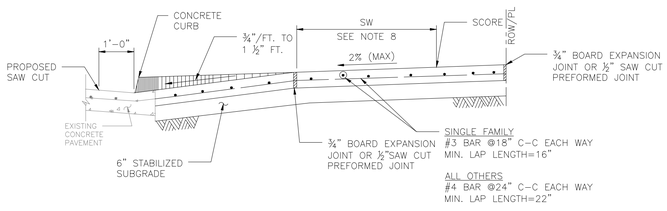
PLAN VIEW
DRIVEWAY



SECTION C-C
TYPICAL SIDEWALK SECTION



SECTION A-A
PROPOSED SIDEWALK THROUGH DRIVEWAY
WITH EXCESSIVE ELEVATION DIFFERENCE
WITH EXISTING SIDEWALK



SECTION B-B
TYPICAL DRIVEWAY SECTION

TABLE 1

REINFORCING STEEL INFORMATION
FOR 4 ½ " THICK SIDEWALKS
EXPANSION JOINT SPACING = 40 FT
fc' = 3,500 PSI AND fy = 60,000 PSI
REFER TO CONTRACT DRAWINGS FOR SIDEWALKS WIDER THAN 6 FEET.

SIDEWALK THICKNESS (IN)	SIDEWALK WIDTH (FT)	LONGITUDINAL STEEL			TRANSVERSE STEEL #3 BARS SPACING (IN)
		#3 BARS			
		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

DRIVEWAY DESIGN CRITERIA (1)(2)

TRAFFIC TYPE	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)	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
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 SWEPT PATH ANALYSIS.
(2) REFER TO INFRASTRUCTURE DESIGN MANUAL ARTCILES 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.

NOTES:

1. REPAIR, RECONSTRUCTION OR REPLACEMENT OF SIDEWALKS SHALL MEET PERMITTING REQUIREMENTS OF CODE OF ORDINANCES SECTION 40-552.
2. FOR REPAIR, RECONSTRUCTION, OR REPLACEMENT OF EXISTING SIDEWALKS:
   - 2.1. EXISTING SIDEWALKS LESS THAN OR EQUAL TO 20 FEET IN TOTAL LENGTH:
     - 2.1.1. THE PROPOSED SIDEWALK WIDTH WILL BE ALLOWED TO MATCH THE EXISTING SIDEWALK.
   - 2.2. EXISTING SIDEWALKS GREATER THAN 20 FEET IN TOTAL LENGTH:
     - 2.2.1. THE SIDEWALK WIDTH FOR THE ENTIRE PROPERTY WIDTH SHALL BE IMPROVED TO MEET WIDTH REQUIREMENTS ACCORDING TO THE LATEST INFRASTRUCTURE DESIGN MANUAL.
   - 2.3. 20 FOOT TOTAL LENGTH IS DEFINED AS:
     - 2.3.1. UP TO 10 FEET ON BOTH SIDES OF THE DRIVEWAY; OR
     - 2.3.2. UP TO 20 FEET WHEN SIDEWALK AFFECTED IS LOCATED ONLY ON ONE SIDE OF THE DRIVEWAY.
3. ALL JOINTS ALONG THE SIDEWALK SHALL BE CONSTRUCTED ACCORDING TO DRAWING 02752-02 AND SPECIFICATION 02752.
4. 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.)
5. DRIVEWAYS AND SIDEWALKS SHALL BE CONSTRUCTED WITH PORTLAND CEMENT CONCRETE AND INCLUDE 5 1/2 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
6. 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.
7. CURB RAMPS THAT ARE STEEPER THAN A 1:12 MAX SLOPE WILL NOT BE ACCEPTED BY THE CITY OF HOUSTON.
8. REFER TO CONTRACT DRAWINGS FOR PEDESTRIAN REALM (PR), SIDEWALK (SW), FRONTAGE BUFFER (FB), AND SAFETY BUFFER (SB) WIDTHS.
9. DETECTABLE WARNING SURFACES:
   - 9.1. SIDEWALK SHALL HAVE A DETECTABLE WARNING SURFACE WHERE:
     - 9.1.1. SIDEWALK INTERSECTS TYPE C DRIVEWAYS (COMMERCIAL DRIVEWAYS) THAT ARE STOP, YIELD, OR TRAFFIC SIGNAL CONTROLLED; OR
     - 9.1.2. SIDEWALK SLOPE IS GREATER THAN 1:20 AND INTERSECTS A TYPE C DRIVEWAY (COMMERCIAL DRIVEWAY)
   - 9.2. 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).
   - 9.3. REFER TO STANDARD DETAILS 02775-06 TO 02775-07 FOR DETECTABLE WARNING SURFACE STANDARDS.

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CITY ENGINEER	CITY TRAFFIC ENGINEER

APPROVED BY:
DocuSigned by: Carl Haddock A80C41B8728343D...
DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: NOV-27-2023 | DWG NO: 02754-01B

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

DRIVEWAY DETAIL WITH 6" CURBED STREETS

FOR CITY OF HOUSTON USE ONLY

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

DRIVEWAY DETAIL WITH 6" CURBED STREETS

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CITY OF HOUSTON PM
MARIA GEORGE, P.E.
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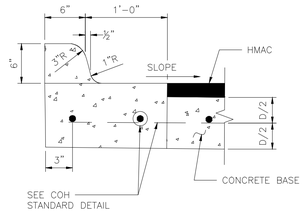
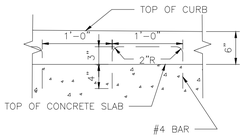
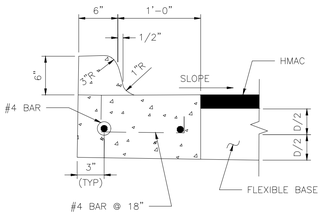


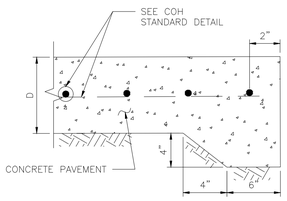
ESPLANADE CURB CONNECTED TO CONCRETE BASE



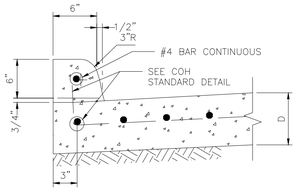
ALTERNATE CONCRETE CURB REINFORCEMENT



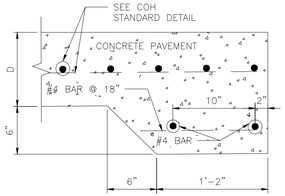
ESPLANADE CURB CONNECTED TO FLEXIBLE BASE



STANDARD CONCRETE PAVING HEADER

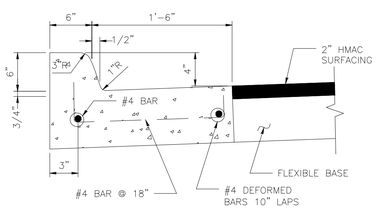


CONCRETE CURB

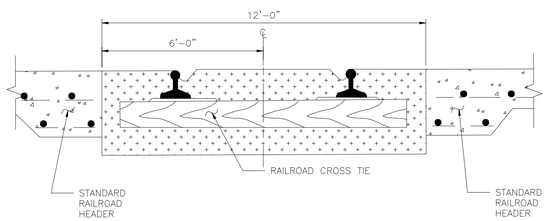


STANDARD RAILROAD HEADER

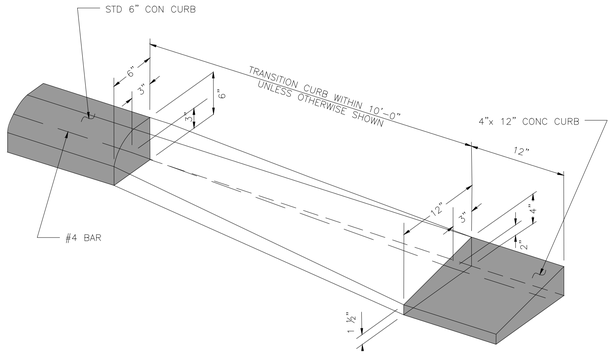
WHEN CONCRETE CURB IS TO BE PLACED EXISTING CONCRETE USE BASE #4 BAR @ 18x10" LONG, DOWELED AND SET IN EPOXY GROUT. SET #4 DOWEL BARS, 25" LONG AT 12" C-C WHEN PAVEMENT SECTION POURED.



MONOLITHIC CURB AND GUTTER

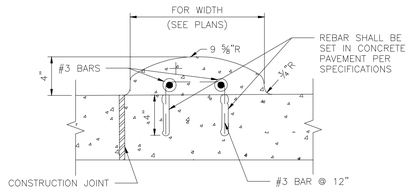


STANDARD RAILROAD CROSSING – SINGLE TRACK

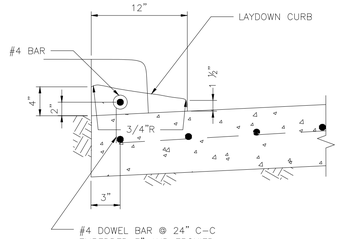


CURB TRANSITION

(SEE NOTES)

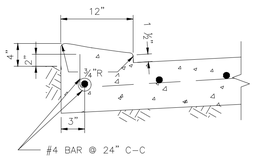


MOUNTABLE CURB



4-INCH x 12-INCH TRANSITION CURB

(SEE NOTES)



4-INCH x 12-INCH MONOLITHIC CURB

(SEE NOTES)

4"x12" MONOLITHIC AND TRANSITION CURB NOTES:

1. 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS, NON-RESIDENTIAL STREETS, AND RESIDENTIAL STREETS.
2. TRANSITIONS FROM 6- INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10-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.

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DocuSigned by: Sukai Kanwar 8DFFB80C6A1F4A7B...	DocuSigned by: Kelly Nguyen 9BA2BE1DA7884CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock A5DC41B73B3A43...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02771-01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CURB, CURB AND GUTTER AND HEADER DETAILS

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CITY OF HOUSTON
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CURB, CURB AND GUTTER AND HEADER DETAILS

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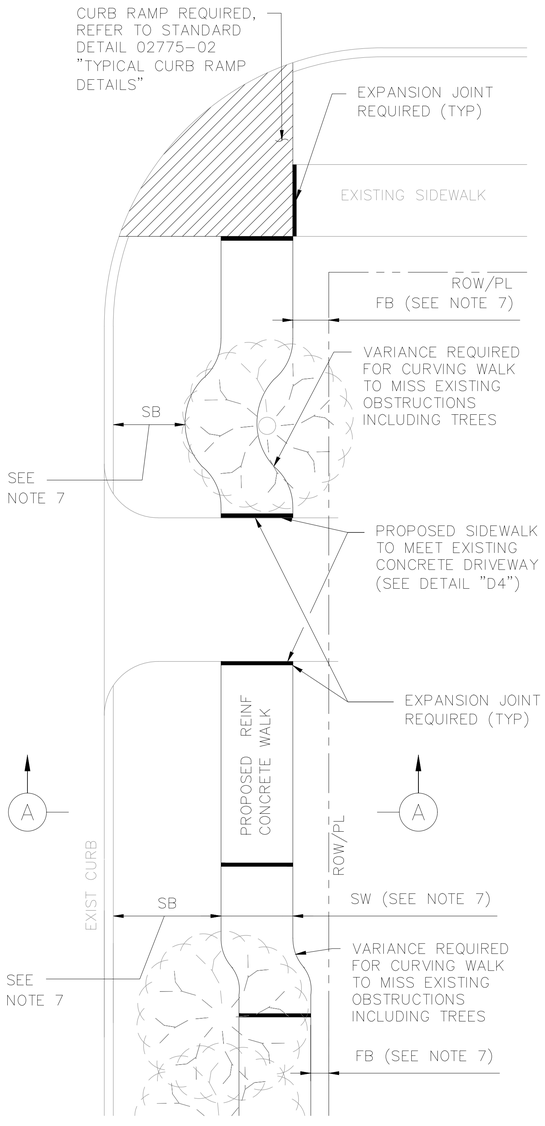
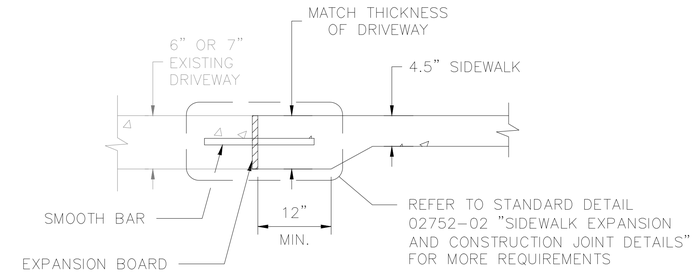


PLAN VIEW

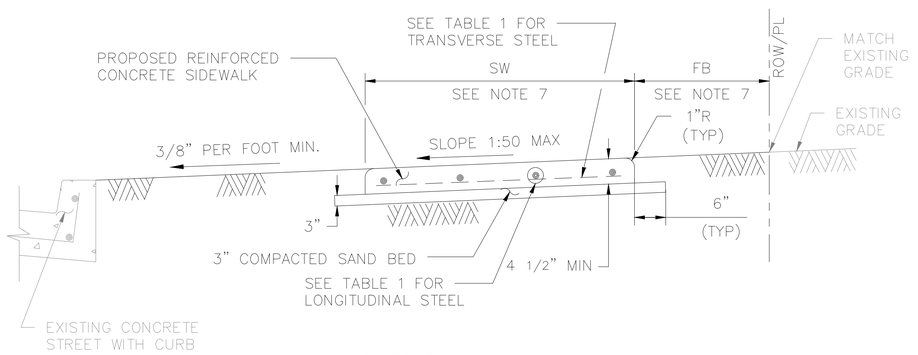


DETAIL D4
DRIVEWAY/SIDEWALK HEADER

TABLE 1

REINFORCING STEEL INFORMATION
FOR 4 ½ " THICK SIDEWALKS
EXPANSION JOINT SPACING = 40 FT
fc' = 3,500 PSI AND fy = 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	SPACING (IN)	END BAR SPACING (IN)	
4.5	5	3	27	3	48
4.5	6	4	22	3	48



SECTION A-A

NOTES:

1. 6X6 – W2.9XW2.9 WELDED WIRE FABRIC MAY BE USED IN LIEU OF THE REINFORCING STEEL GIVEN IN TABLE 1.
2. REINFORCED CONCRETE SIDEWALKS THRU DRIVEWAYS OPENINGS SHALL BE EITHER 6" THICK OR 7" THICK AS SPECIFIED ON 6" STABILIZED SUBGRADE. FOR THE REINFORCING STEEL REQUIREMENTS, SEE CITY OF HOUSTON STANDARD DETAILS 02754-01A, 02754-01B, 02754-03, AND 02754-04.
3. MAXIMUM SPACING FOR EXPANSION JOINTS SHALL BE 40 FEET.
4. CONTRACTOR SHALL CONSTRUCT SIDEWALK IN A MANNER NOT TO BLOCK THE NATURAL DRAINAGE FROM ADJACENT PROPERTY.
5. 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.
6. CURB RAMPS THAT ARE STEEPER THAN A 1:12 MAX SLOPE WILL NOT BE ACCEPTED BY THE CITY OF HOUSTON UNLESS NOTED OTHERWISE.
7. REFER TO CONTRACT DRAWINGS FOR SIDEWALK (SW), FRONTAGE BUFFER (FB), AND SAFETY BUFFER (SB) WIDTHS.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL SIDEWALK LAYOUT AND DETAILS FOR STREETS WITH CURBS
(SCALE: NOT TO SCALE)

APPROVED BY:

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CITY ENGINEER

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

EFF DATE: NOV-27-2023 | DWG NO: 02775-01

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TYPICAL SIDEWALK LAYOUT AND DETAILS FOR STREETS WITH CURBS

WBS#: R-002011-0090C-3 | FOR CITY OF HOUSTON USE ONLY
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CITY OF HOUSTON PM: MARIA GEORGE, P.E.
DRAWING NO: D40
SHEET NO. 101 of 111

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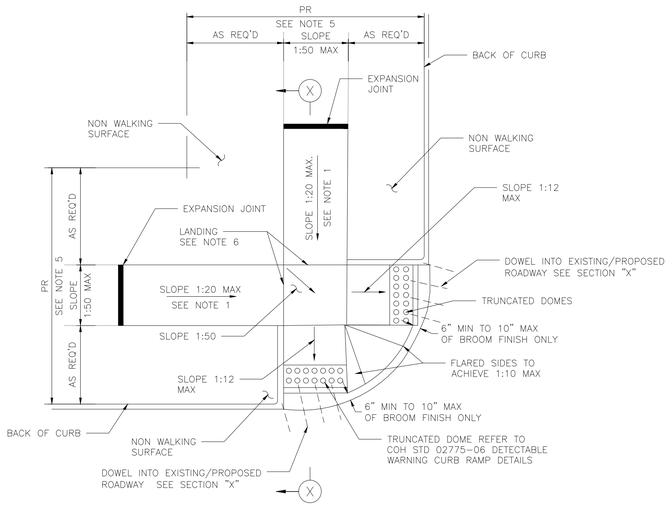
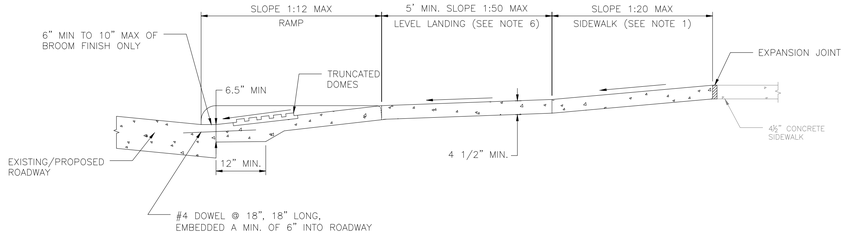


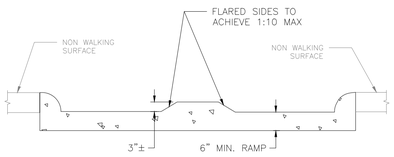
STREETS WITH NON– WALKING SURFACE BEHIND CURB
SEE NOTE–7



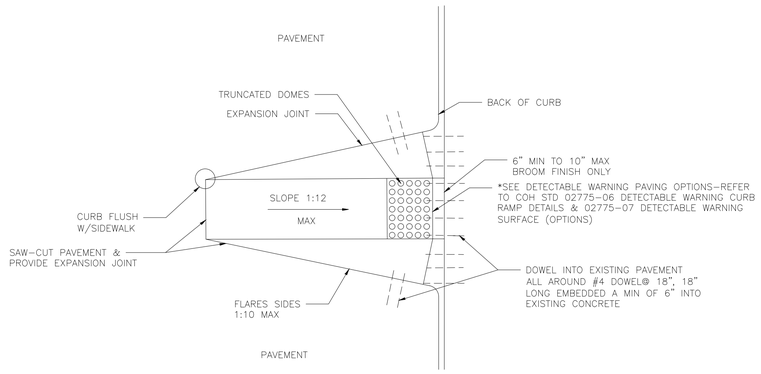
SECTION X–X

NOTES:

1. REPLACE EXISTING SIDEWALK FROM LEVEL LANDING AS NECESSARY TO ACHIEVE 1:20 SLOPE
2. BROOM FINISH IS MEASURED FROM FACE OF CURB.
3. 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.
4. CURB RAMPS THAT ARE STEEPER THAN A 1:12 MAX SLOPE WILL NOT BE ACCEPTED BY THE CITY OF HOUSTON UNLESS NOTED OTHERWISE.
5. REFER TO CONTRACT DRAWINGS FOR PEDESTRIAN REALM (PR) WIDTH.
6. MINIMUM 5'x5' LANDING PAD ACCORDING TO ADA REQUIREMENTS. WHEN THE APPROACHING SIDEWALK IS WIDER THAN 5', THE LANDING PAD AND RAMP WIDTH MUST MATCH THE SIDEWALK WIDTH.
7. FOR STREETS WITH WALKABLE SURFACES IMMEDIATELY BEHIND THE CURB A FLARE IS REQUIRED ON BOTH SIDES OF THE RAMP.



ELEVATION
LOOKING UP RAMP



CURB RAMP CONSTRUCTION FOR EXISTING PAVEMENT

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DocuSigned by: Suhail Kanwar 9EF8B0C6415F47B...	DocuSigned by: kHUNG NGUYEN 95A29EFDA75B4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock 4ADCA10573E0483...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02775–02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL CURB RAMP DETAILS

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TYPICAL CURB RAMP DETAILS

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D41

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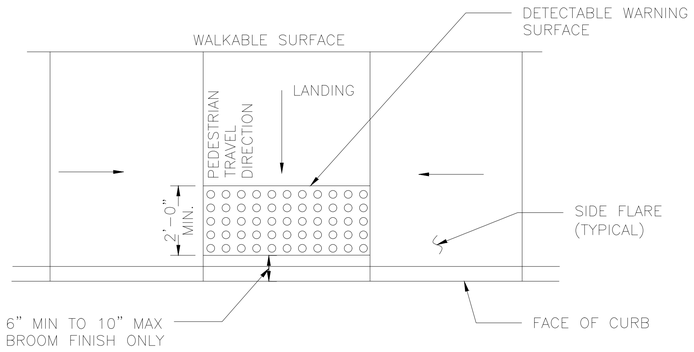
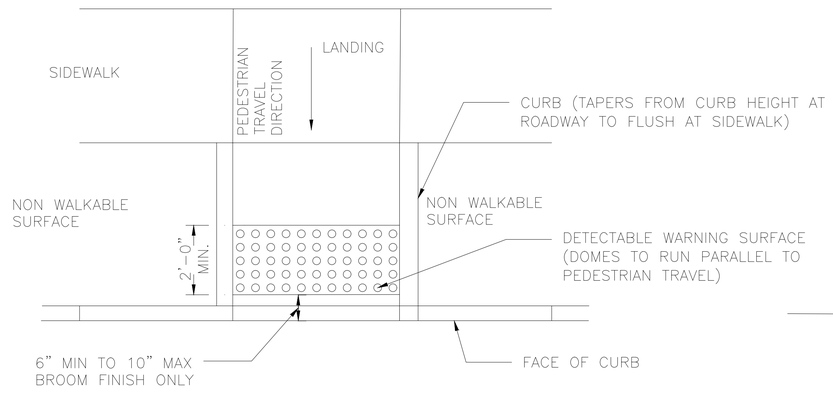
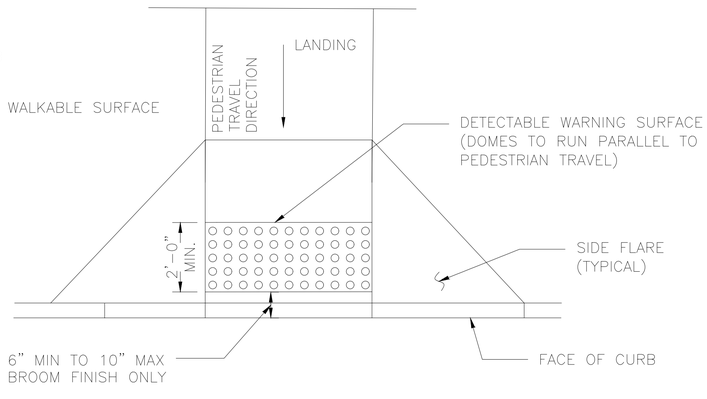


TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE





TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN

GENERAL NOTES FOR DETECTABLE WARNINGS:

1. DETECTABLE WARNING SURFACES MUST BE FULLY ADA COMPLIANT.
2. ALL NEW CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES. THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACE, INCLUDING SIDE FLARES. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
3. DETECTABLE WARNING SURFACES MUST MAINTAIN A SLIP RESISTANCE WITH FA–VALUE OF EQUAL TO OR GREATER THAN 0.8.
4. DETECTABLE WARNING SURFACES MUST MAINTAIN A WATER ABSORPTION RATE OF LESS THAN 1%, DETECTABLE WARNING SHALL NOT ALLOW WATER TO ACCUMULATE.
5. DETECTABLE WARNINGS INSTALLED INTO FRESH CONCRETE SHALL BE WITHOUT VOIDS AND UTILIZING AN ACCEPTABLE ANCHORING SYSTEM.
6. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
7. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
8. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 6" MIN TO 10" MAX FROM THE DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
9. 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.
10. CURB RAMPS THAT ARE STEEPER THAN A 1:12 MAX SLOPE WILL NOT BE ACCEPTED BY THE CITY OF HOUSTON.

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

DETECTABLE WARNING CURB RAMP DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Sukail kanwar 9EF8B0C641F5478...
CITY ENGINEER

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 02775–06

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

DETECTABLE WARNING CURB RAMP DETAILS

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MARIA GEORGE, P.E.	
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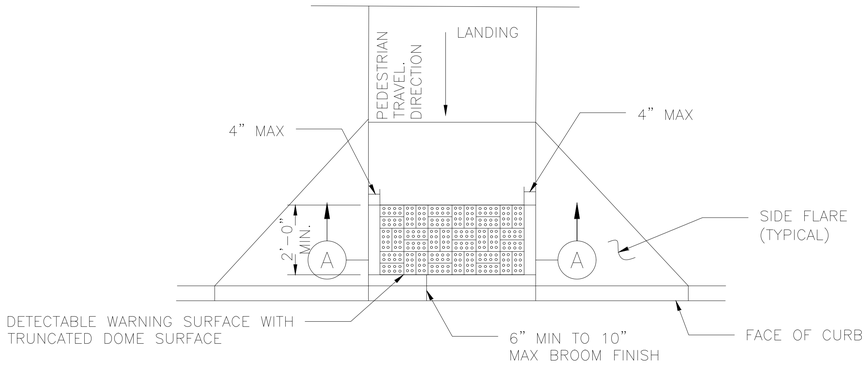
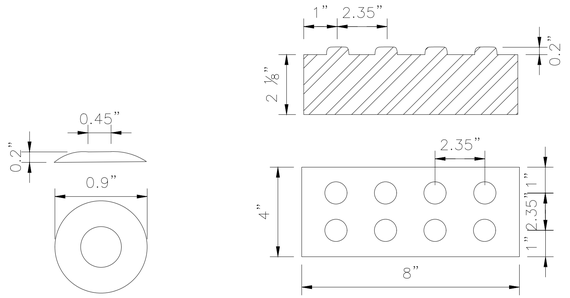


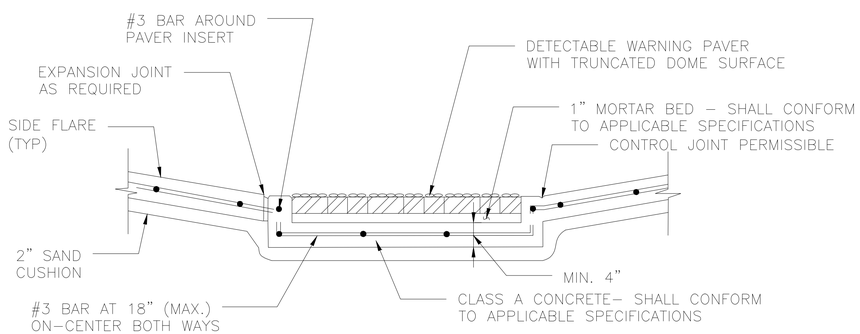
PLAN VIEW

DETECTABLE WARNING SURFACE



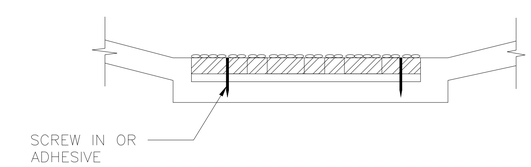
DETAIL

DETECTABLE WARNING PAVER



SECTION A–A

PAVER



DETAIL A–5

NOTES:

GENERAL NOTES

1. 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.
2. CURB RAMPS THAT ARE STEEPER THAN A 1:12 MAX SLOPE WILL NOT BE ACCEPTED BY THE CITY OF HOUSTON.

PAVERS

1. FURNISH DETECTABLE WARNING SURFACE UNITS MEETING ALL REQUIREMENTS OF ASTM C–936, C–33. LAY IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.
2. LAY FULL–SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25 PERCENT OF A FULL UNIT. CUT DETECTABLE WARNING POWER UNITS USING A POWER SAW.

POLYMER CONCRETE

1. DETECTABLE WARNING TILES SHALL BE MADE OF POLYMER CONCRETE MATERIALS.
2. DETECTABLE WARNING TILES SHALL BE INSTALLED INTO FRESH CONCRETE (CAST–IN–PLACE) UTILIZING AN ANCHORING SYSTEM.
3. DETECTABLE WARNING TILES SHALL BE OF TERRACOTTA (BRICK–RED) COLOR AND COLORED THROUGHOUT TO GUARANTEE THE ADA REQUIRED COLOR CONTRAST.
4. DETECTABLE WARNING TILES SHALL MEET OR EXCEED THE FOLLOWING ASTM–BASED "STANDARDS" FOR CONCRETE MATERIALS.
   A. COMPRESSION STRENGTH > 12,500 PSI PER ASTM C 39–04
   B. WATER ABSORPTION < 0.25% PER ASTM C 97–09

PADS

1. FURNISH REQUIREMENTS OF ADAAG (MARCH 2003).
2. OTHER MATERIALS MAY BE USED IF APPROVED BY THE CITY ENGINEER

CITY OF HOUSTON

HOUSTON PUBLIC WORKS STANDARD

DETECTABLE WARNING SURFACE (OPTIONS)

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail Kanwar 9EF8B0C641F5478...
CITY ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

DocuSigned by: KHANG NGUYEN 95A29EFDA75B4CD...
CITY TRAFFIC ENGINEER

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

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DETECTABLE WARNING SURFACE (OPTIONS)

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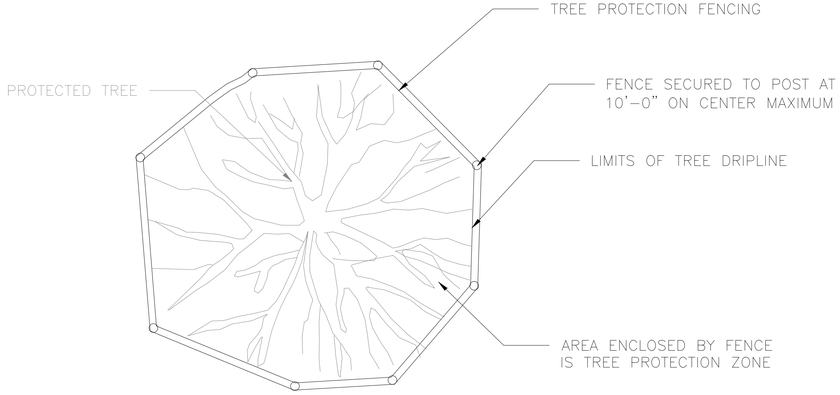
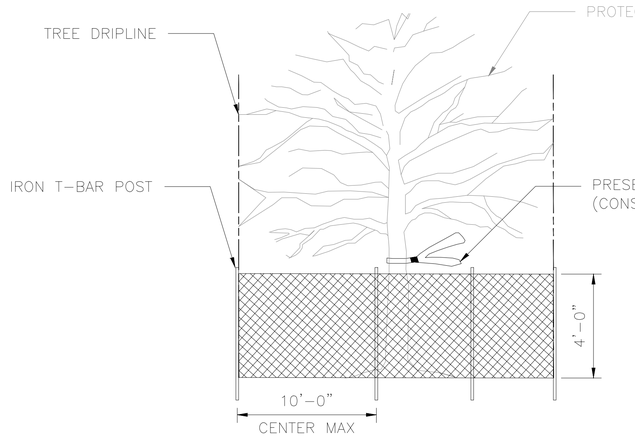
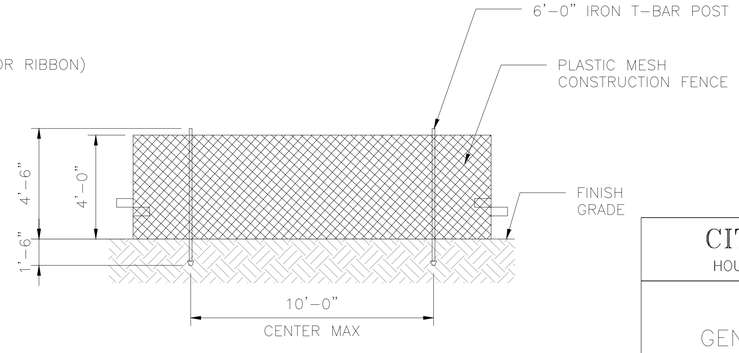


PLAN VIEW
TREE PROTECTION FENCING DETAIL



FRONT VIEW
TREE PROTECTION FENCING DETAIL



DETAIL B-4
PROTECTIVE PLASTIC MESH FENCE

NOTES:

FENCE LOCATION MAY BE ADJUSTED TO ACTUAL SITE CONDITIONS.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION
GENERAL REQUIREMENTS

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by:	DocuSigned by:
Suhail Kanwar 9EF8B0C641F5478...	Carol Haddock A93C410B72B3453...
CITY ENGINEER	DIRECTOR OF HPW
EFF DATE: NOV-27-2023	DWG NO: 01562-01

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

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DEER RIDGE ESTATES

TREE PROTECTION
GENERAL REQUIREMENTS

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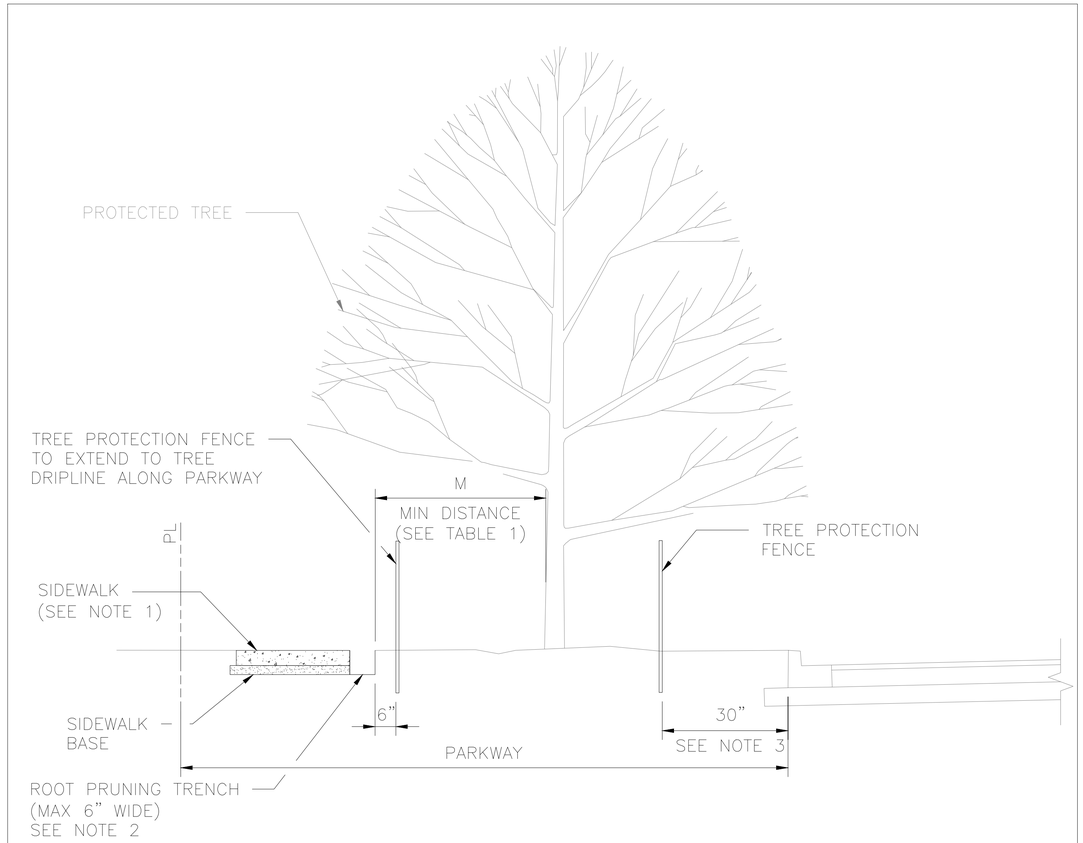

TABLE 1 "M" DISTANCE TABLE	
TREE TRUNK DIA. (IN)	*MINIMUM DISTANCE 'M'
< 6"	3 FEET
6" ≤ DIA. ≤ 20"	0.75 FEET PER DIA.–INCH
> 20"	CONSULT CITY ARBORIST

*MINIMUM DISTANCE FROM TREE TRUNK TO EDGE OF TRENCH

NOTES:

1. SIDEWALK SHALL BE CONSTRUCTED OF EITHER CEMENT, CONCRETE, ASPHALT OR OTHER DURABLE MATERIAL AS THE COUNCIL MAY DESIGNATE (CHAPTER 40–91, CODE OF ORDINANCES).
2. TRENCHING DEPTH SHALL BE TO THE ANTICIPATED BOTTOM OF SIDEWALK AND BASE MATERIAL FOR SIDEWALK ROOT PRUNING, ROOTS LOWER THAN SIDEWALK SHALL NOT BE PRUNED.
3. FENCES SHALL BE PLACED 30" BACK OF EXISTING CURB OR EDGE OF PAVEMENT WHERE ROOT PRUNING OR ZERO CURB CUT BACK IS NOT SPECIFIED.

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APPROVED BY:

DocuSigned by: Suhail Kanwar 9EF8B0C841F5478...
CITY ENGINEER

DocuSigned by: Carol Haddock A93C410B72B3453...
DIRECTOR OF HPW

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION/
IN SIDEWALK REPAIRS
IN PARKWAY AREAS

(SCALE: NOT TO SCALE)

EFF DATE: NOV–27–2023 | DWG NO: 01562–03

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TREE PROTECTION/
IN SIDEWALK REPAIRS
IN PARKWAY AREAS

WBS#: R–002011–0090C–3

FOR CITY OF HOUSTON USE ONLY

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CITY OF HOUSTON PM
MARIA GEORGE, P.E.

DRAWING NO:
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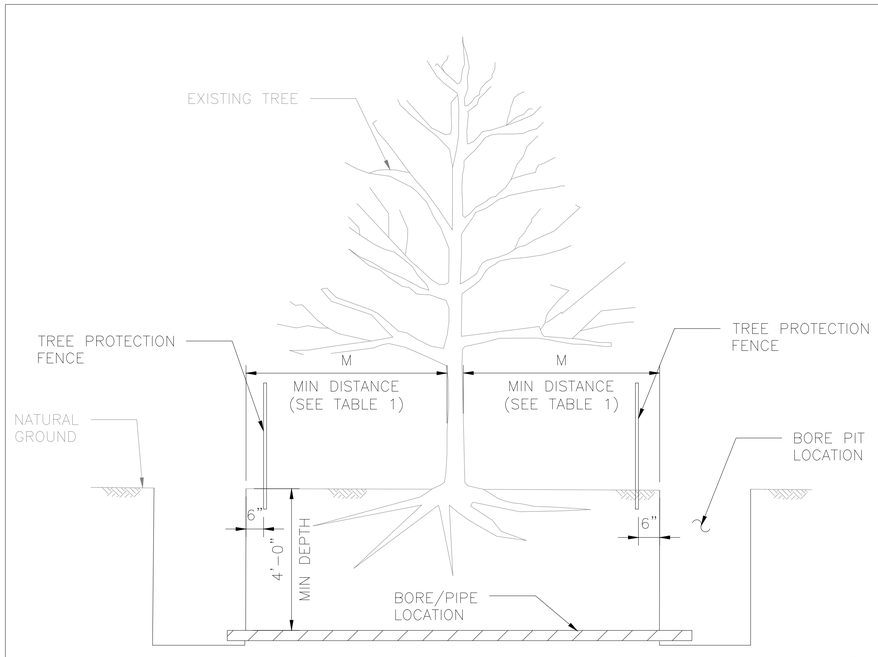
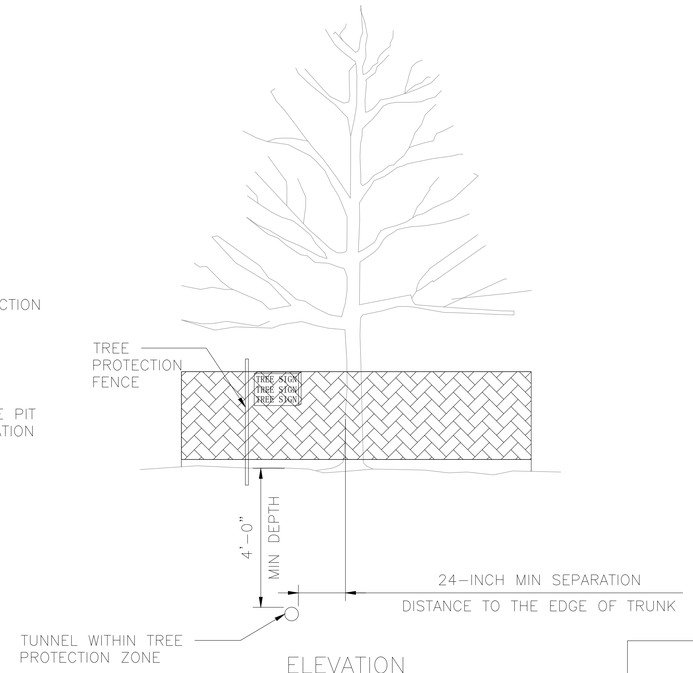
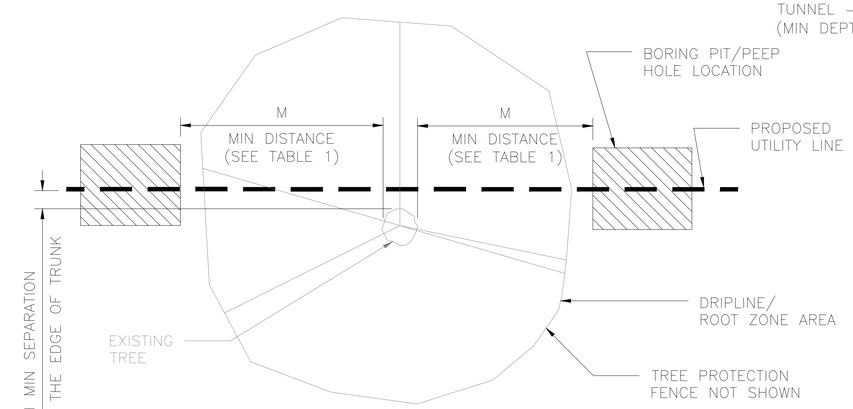


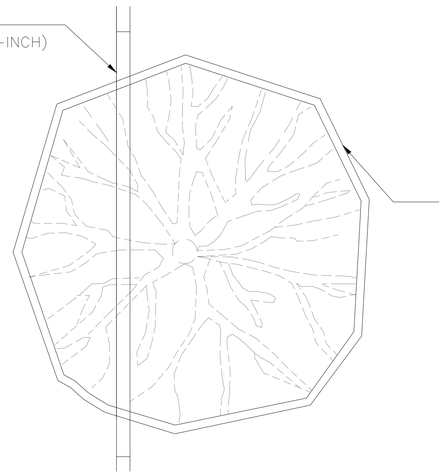
ELEVATION
BORE PIT LOCATION



ELEVATION
TUNNEL LOCATION



PLAN
BORE PIT LOCATION



PLAN
TUNNEL LOCATION

TABLE 1
"M" DISTANCE TABLE

TREE TRUNK DIA. (IN)	*MINIMUM DISTANCE 'M'
< 6"	3 FEET
6" ≤ DIA. ≤ 20"	0.75 FEET PER DIA.-INCH
> 20"	CONSULT CITY ARBORIST

*MINIMUM DISTANCE FROM TREE TRUNK TO EDGE OF BORE PIT.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION TUNNELING REQUIREMENTS

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by:	DocuSigned by:
Suhail Kanwar 9EF8B0C641F5478...	Carol Haddock A93C410B72B3453...
CITY ENGINEER	DIRECTOR OF HPW
EFF DATE: NOV-27-2023	DWG NO: 01562-05

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS - CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TREE PROTECTION TUNNELING REQUIREMENTS

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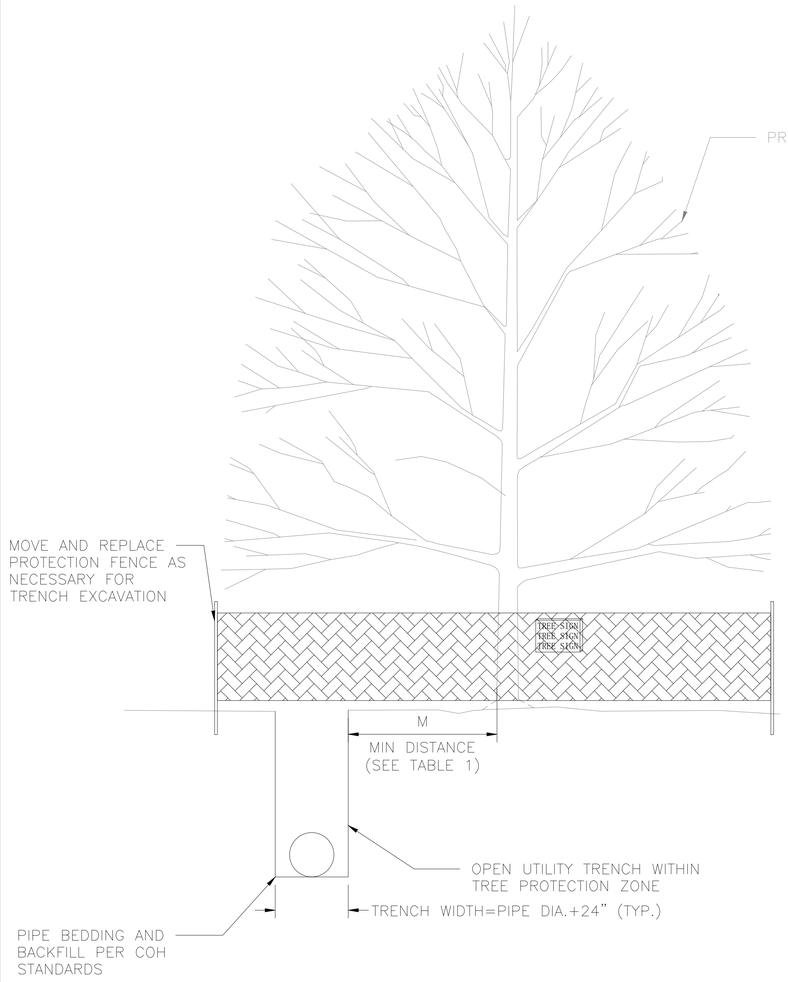
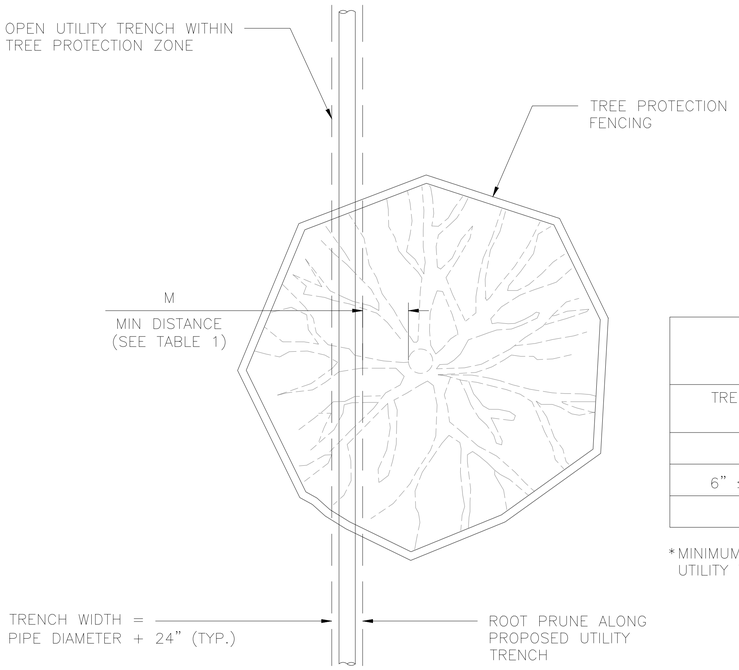


ELEVATION
TRENCH EXCAVATION



PLAN
TRENCH EXCAVATION

TABLE 1
"M" DISTANCE TABLE

TREE TRUNK DIA. (IN)	*MINIMUM DISTANCE 'M'
< 6"	3 FEET
6" ≤ DIA. ≤ 20"	0.75 FEET PER DIA.–INCH
> 20"	CONSULT CITY ARBORIST

*MINIMUM DISTANCE FROM TREE TRUNK TO EDGE OF UTILITY TRENCH

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION
TRENCH REQUIREMENTS

(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW
DocuSigned by: Suhail Kanwar 9EF8B0C641F5478...	DocuSigned by: Carol Haddock A93C410B72B3453...
EFF DATE: NOV–27–2023	DWG NO: 01562–06

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TREE PROTECTION
TRENCH REQUIREMENTS

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CITY OF HOUSTON PM	
MARIA GEORGE, P.E.	
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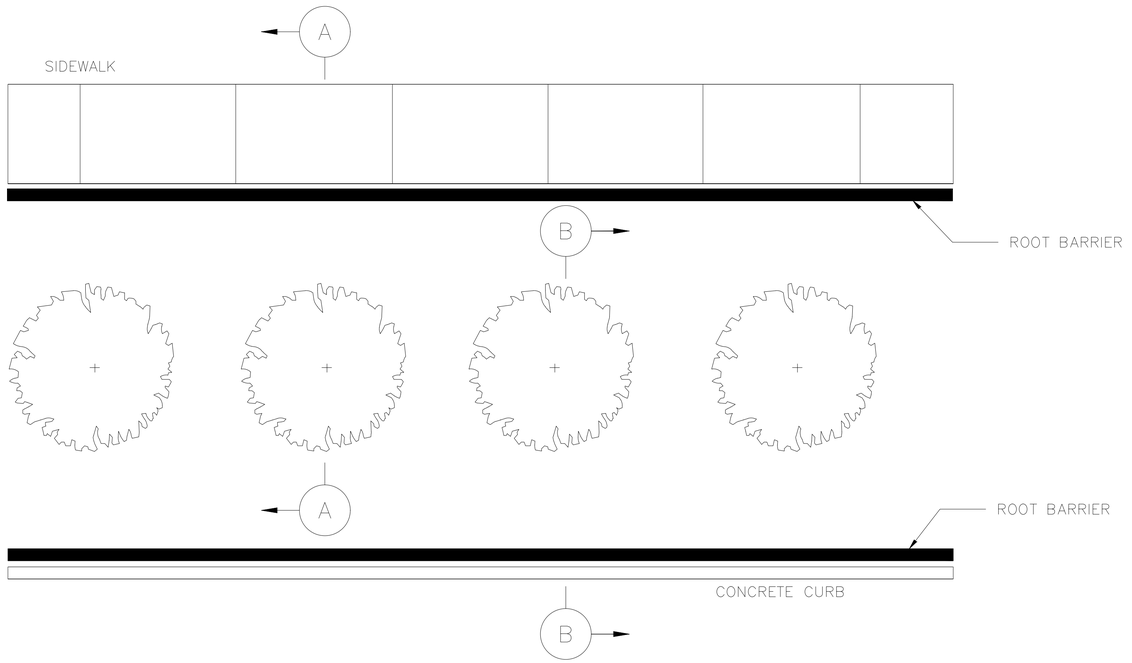
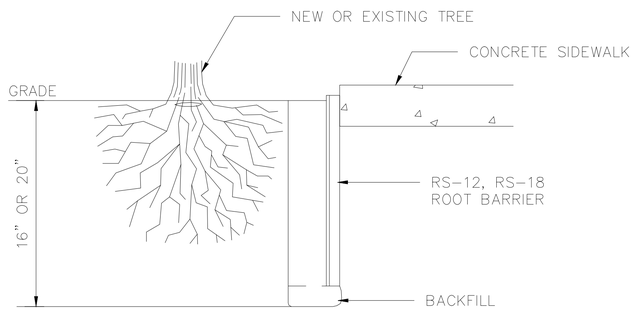
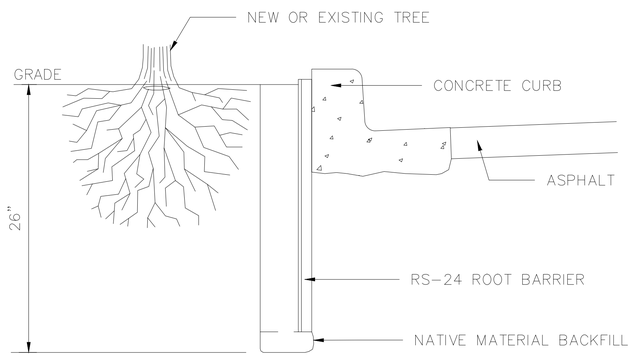


NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. THE RAISED ROOT GUIDING RIBS MUST BE FACING TOWARDS THE TREE ROOTS.
3. THE TOP OF THE BARRIER PANELS MUST BE SLIGHTLY ABOVE GRADE (NEVER BELOW GRADE).
4. POSITION BARRIER PANELS VERTICALLY WITH TOP AGAINST THE STRUCTURE TO BE PROTECTED.
5. SEE LANDSCAPE SITE PLAN TO DETERMINE TREES THAT REQUIRE BARRIER PANEL.
6. KEEP THE BARRIER TOP EDGE AT LEAST 1/2" ABOVE GRADE.



SECTION A–A
SIDEWALK



SECTION B–B
CURB & GUTTER PROTECTIONS

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE ROOT BARRIERS (LINEAR)

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by:	DocuSigned by:
Suhail kanwar 9EF8B0C641F5478...	Carol Haddock A93C410B72B3453...
CITY ENGINEER	DIRECTOR OF HPW
EFF DATE: NOV-27-2023	DWG NO: 02912-02

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CITY OF HOUSTON
HOUSTON PUBLIC WORKS – CAPITAL PROJECTS

NSSI
FONDREN GARDENS AND DEER RIDGE ESTATES

TREE ROOT BARRIERS (LINEAR)

WBS#: R-002011-0090C-3	FOR CITY OF HOUSTON USE ONLY
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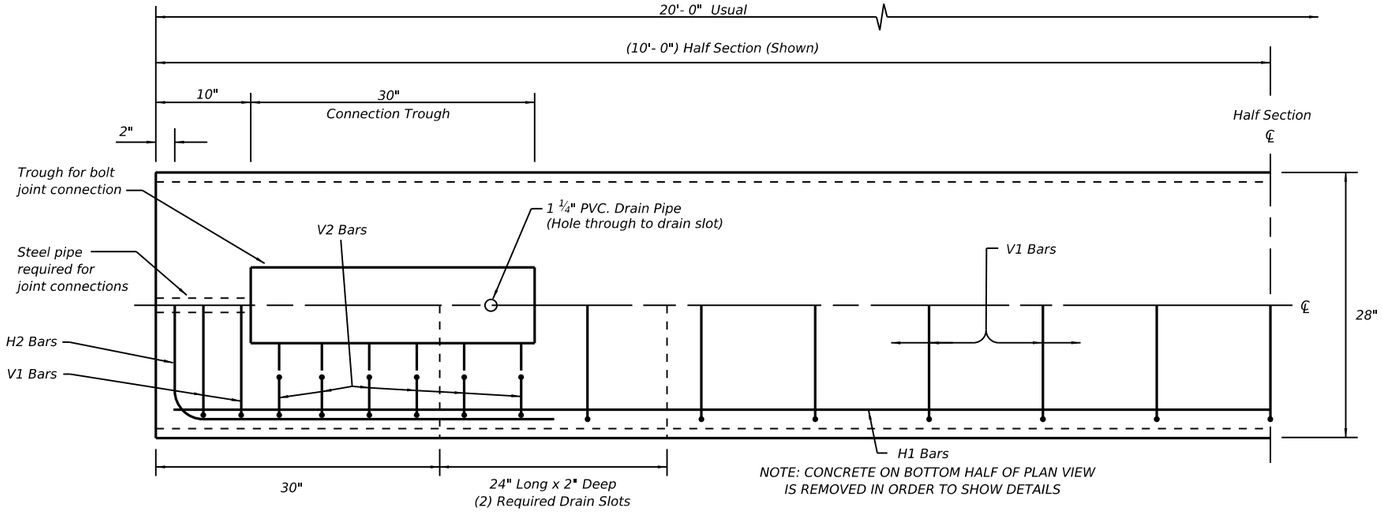
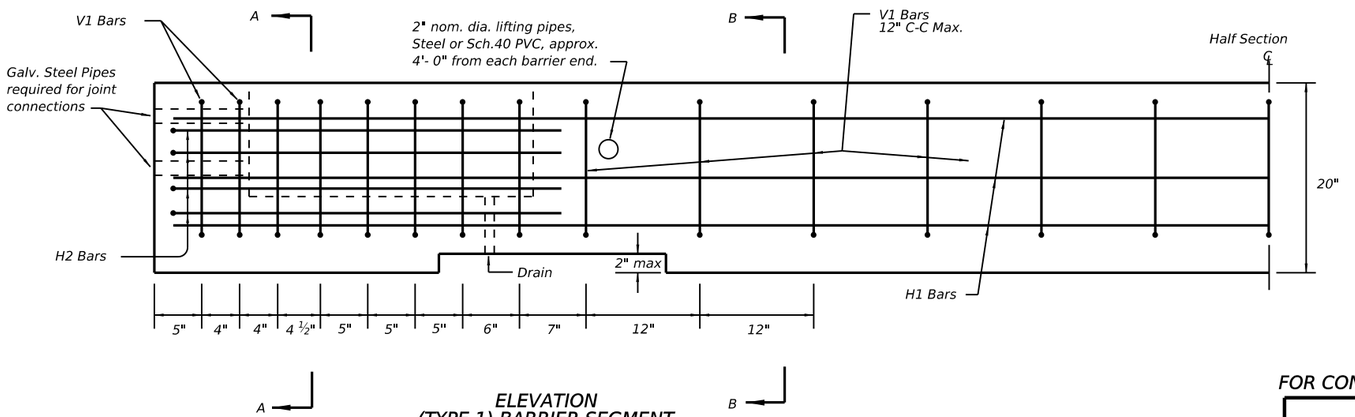


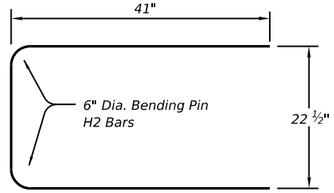
PLAN
(TYPE 1) BARRIER SEGMENT

(SYMMETRICAL ABOUT CENTER LINES)

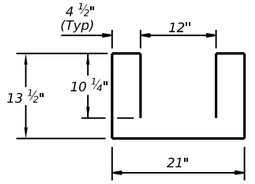


ELEVATION
(TYPE 1) BARRIER SEGMENT

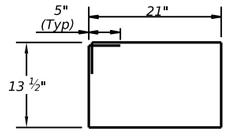
(SYMMETRICAL ABOUT CENTER LINES)



(8)~H2 Bars
(#5) Bars



(12)~V2 Bars
(#4) Bars

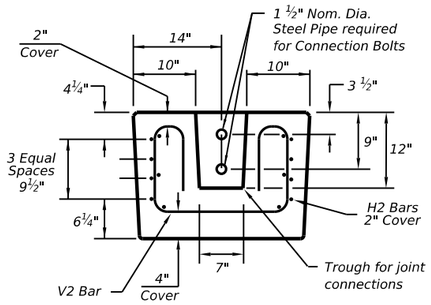


(17)~V1 Bars
(#4) Bars

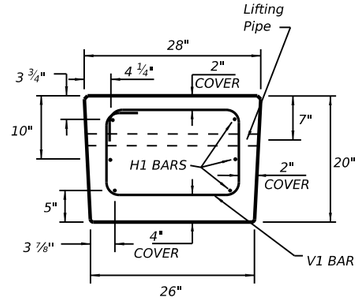
REINFORCING STEEL DETAILS

TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



SECTION B-B

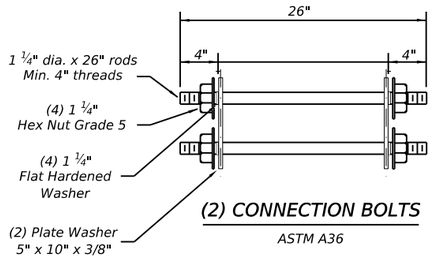
GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts," and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445,"Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1)
APPROX. QUANTITIES 20 FT. SECTION

CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



(2) CONNECTION BOLTS

ASTM A36

Note: Rods, Hex nuts and Washers shall be Galvanized.

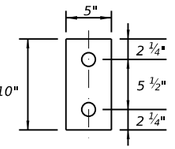
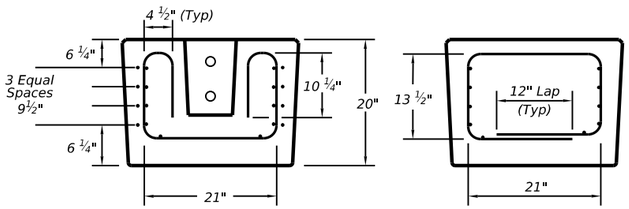


PLATE WASHER

5" x 10" x ⅜"



SECTION A-A

SECTION B-B

(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		

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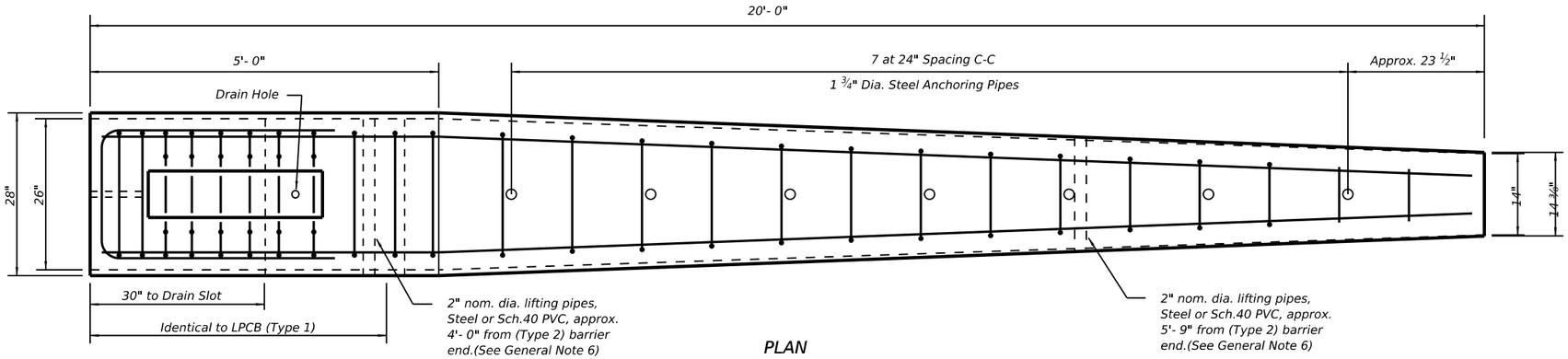
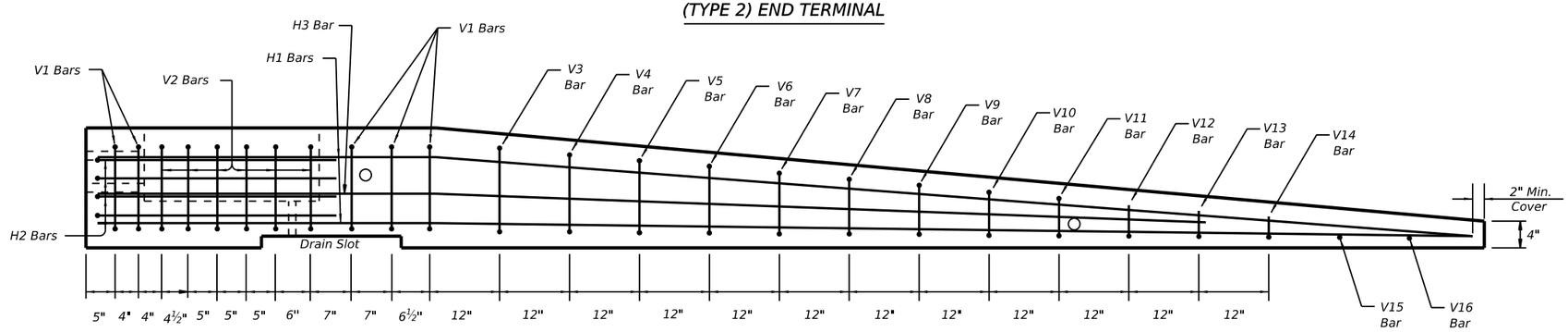
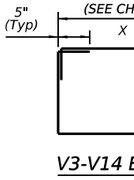


PLAN
(TYPE 2) END TERMINAL



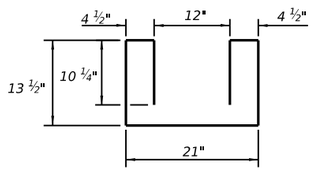
ELEVATION
(TYPE 2) END TERMINAL

Note:
Anchoring pipes not shown in Elevation View

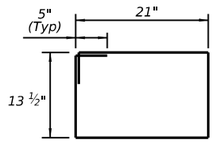


V3-V14 Bars

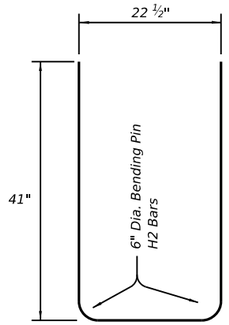
BAR(#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6



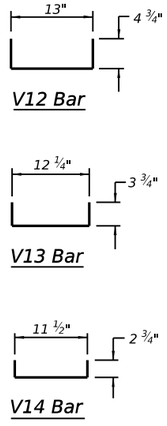
(6)~V2 Bars



(5)~V1 Bars

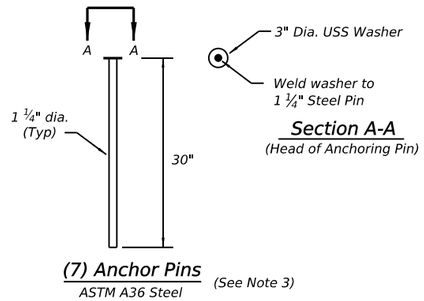


(4)~H2 Bars
(#5) Bars



REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

Note: All V Bars are (#4)



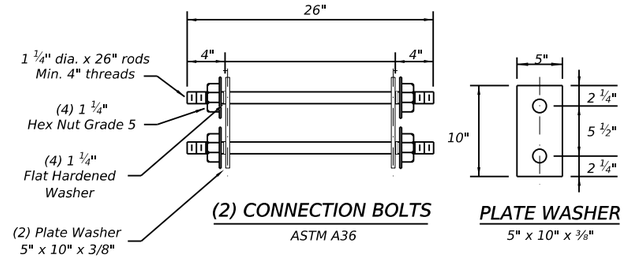
Section A-A
(Head of Anchoring Pin)

(7) Anchor Pins
ASTM A36 Steel (See Note 3)

APPROACH VIEW

TYPE 2 - NOTES

1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment.The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

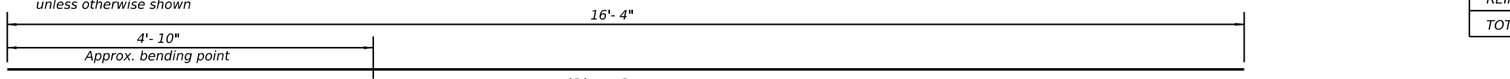


(2) CONNECTION BOLTS
ASTM A36

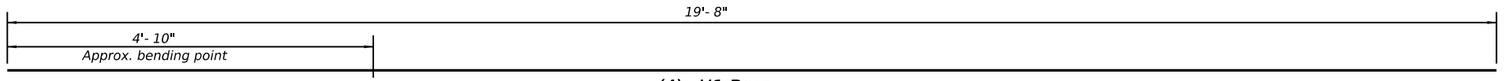
PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

Note: Use 2" Dia. Bending Pin, unless otherwise shown



(2)~H3 Bars
(#5) Bar



Note: Bends on H1 and H3 bars are slight and do not require formal bends.

(4)~H1 Bars
(#5) Bar

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation

Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 2)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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REVISIONS				
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