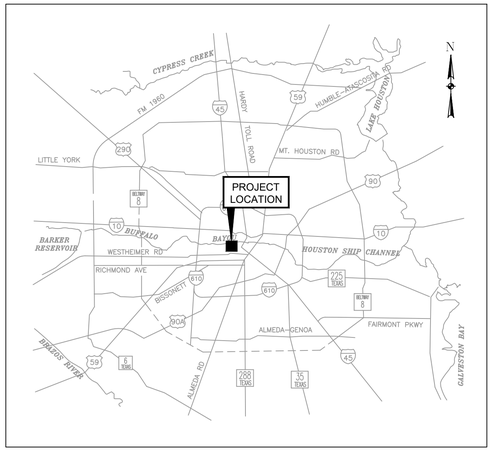
CITY OF HOUSTON SYSTEMIC SAFETY PROJECT

CONSTRUCTION PLANS FOR WAUGH SAFETY IMPROVEMENTS

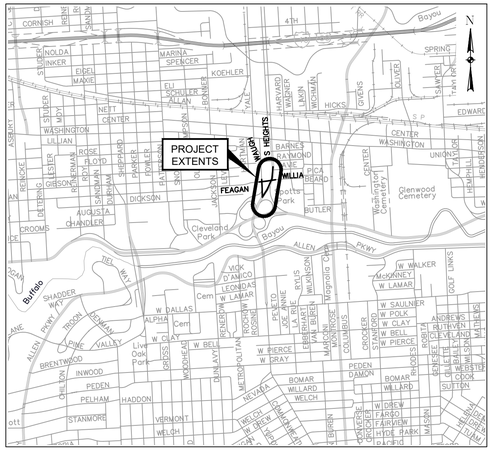
CCSJ NO. 0912-72-720, ETC.

SUB-CSJ NO. 0912-72-720

WBS NO. N-T05000-0012-7



LOCATION MAP
N.T.S.



VICINITY MAP
1:2000

COUNCIL DISTRICT C, H
KEY MAP 492M, 493J
GIMS MAP 5357a

TDLR NO.

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

NOTE: BEFORE TREE PROTECTION AND SITE PREPARATION FOR ANY TREE REMOVAL, CONTACT THE CITY OF HOUSTON URBAN FORESTRY DEPARTMENT AT (832) 395-8459

FLOOD PLAIN INFO:
PER FEMA PANEL NOS. 48201C0670M (JUNE 9, 2014) THE PROJECT AREA IS PARTIALLY LOCATED IN THE X-SHADED ZONE (AREA OF MINIMAL FLOOD HAZARD). BFE IS 37.66'.

THE CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING, OFFICE OF THE CITY ENGINEER, 48 HOURS PRIOR TO STARTING WORK ON THIS PROJECT. TELEPHONE NO. (832) 394-9098.

TEXAS 811 NOTIFICATION SYSTEM
CALL BEFORE YOU DIG!!!
WWW.TEXAS811.ORG/ OR
TEXAS811 OR 1-800-344-8377

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150,
Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY, AFTER DATE OF SIGNATURE.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

Director of Houston Public Works — Date:

SHEET NO 1 of 72

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

FOR CITY OF HOUSTON USE ONLY

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-001-GENERAL.DWG, 3/25/2024 6:25 PM

INDEX OF SHEETS

GENERAL	
1	COVER
2	INDEX & GENERAL NOTES
3	GENERAL NOTES
4	OVERALL LAYOUT
5	SURVEY CONTROL MAP
DEMOLITION PLAN	
6	WAUGH DR AT FEAGAN ST & S. HEIGHTS BLVD AT FEGAN ST
7	WAUGH DR AT S. HEIGHTS BLVD
PAVING AND DRAINAGE LAYOUT	
8	WAUGH DR AT FEAGAN ST PAVING
9	S. HEIGHTS BLVD AT FEAGAN ST PAVING
10	WAUGH DR AT S. HEIGHTS BLVD PAVING
DETAILS	
11	CONSTRUCTION SIGN DETAIL
12	PAVING DETAILS
13	PAVING DETAILS
14	PAVING DETAILS
15	PAVING DETAILS
16	PAVING DETAILS
17	STORM DETAILS
18	TREE PROTECTION DETAILS
19	TREE PROTECTION DETAILS
PAVEMENT MARKING & SIGNAGE	
20	WAUGH DR AT FEAGAN ST
21	S. HEIGHTS BLVD AT FEAGAN ST
22	WAUGH DR AT S. HEIGHTS BLVD
23	SIGNING AND PAVEMENT MARKING DETAILS
24	SIGNING AND PAVEMENT MARKING DETAILS
25	SIGNING AND PAVEMENT MARKING DETAILS
26	SIGNING AND PAVEMENT MARKING DETAILS
27	SIGNING AND PAVEMENT MARKING DETAILS
28	SIGNING AND PAVEMENT MARKING DETAILS
29	SIGNING AND PAVEMENT MARKING DETAILS
30	SIGNING AND PAVEMENT MARKING DETAILS
31	SIGNING AND PAVEMENT MARKING DETAILS
32	SIGNING AND PAVEMENT MARKING DETAILS
STORM WATER POLLUTION PREVENTION PLAN	
33	STORM WATER POLLUTION PREVENTION PLAN
34	STORM WATER POLLUTION PREVENTION PLAN DETAILS
TRAFFIC CONTROL PLAN	
35	TCP DETAIL
36	WAUGH AT FEAGAN
37	SOUTH HEIGHTS AT FEAGAN
38	MEDIAN
39	TCP DETAIL
40	SIDEWALK CLOSURE DETAIL
TRAFFIC SIGNAL PLANS	
41	LEGEND
42	EXISTING CONDITIONS (1 OF 2)
43	EXISTING CONDITIONS (2 OF 2)
44	PROPOSED CONDITIONS (1 of 2)
45	PROPOSED CONDITIONS (2 of 2)
46	POLE SCHEDULE (1 of 2)
47	POLE SCHEDULE (2 of 2)
48	HIGH VOLTAGE
49	LOW VOLTAGE

TRAFFIC SIGNAL DETAILS	
50	01 TRAFFIC
51	02 TRAFFIC
52	03 TRAFFIC
53	04 TRAFFIC
54	05 TRAFFIC
55	06 TRAFFIC
56	07 TRAFFIC
57	08 TRAFFIC
58	09 TRAFFIC
59	10 TRAFFIC
60	11 TRAFFIC
61	12 TRAFFIC
62	13 TRAFFIC
63	14 TRAFFIC
64	15 TRAFFIC
65	16 TRAFFIC
66	17 TRAFFIC
67	18 TRAFFIC
68	19 TRAFFIC
69	20 TRAFFIC
70	21 TRAFFIC
71	22 TRAFFIC
72	23 TRAFFIC

TRAFFIC SIGNAL GENERAL NOTES:

1. ALL EQUIPMENT / MATERIALS AND CONSTRUCTION SHALL MEET OR EXCEED THE REQUIREMENTS CONTAINED IN THE CURRENT CITY OF HOUSTON STANDARD SPECIFICATIONS AND STANDARD DRAWINGS, THE PROJECT SPECIFIC SPECIFICATIONS AND THE PLANS.
2. ALL ELECTRICAL WORK SHALL BE IN CONFORMANCE WITH THE PROVISIONS AND REQUIREMENTS OF THE CITY ELECTRICAL CODE.
3. ALL SIGNS SHALL BE MANUFACTURED IN ACCORDANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4. THE CONTRACTOR SHALL ARRANGE THE INSTALLATION OF SIGNALS, POLES AND CONDUIT SO AS TO PERMIT THE CONTINUOUS MOVEMENT OF TRAFFIC IN ALL DIRECTIONS AT ALL TIMES. THE CONTRACTOR SHALL NOT CLOSE MORE THAN ONE LANE OF A ROADWAY AT ONE TIME WITHOUT PRIOR APPROVAL OF THE CITY.
5. THE CONTRACTOR SHALL CLEAN UP AND REMOVE FROM THE WORK AREA ALL LOOSE MATERIAL RESULTING FROM CONTRACT OPERATIONS EACH DAY PRIOR TO WORK BEING SUSPENDED FOR THAT DAY.
6. THE CONTRACTOR SHALL CONTACT THE ENGINEER AND/OR THE APPROVED CITY OF HOUSTON REPRESENTATIVE TO ARRANGE FOR METER AND ELECTRICAL SERVICE CONNECTION FROM THE POWER COMPANY.
7. ALL PEDESTRIAN PUSH BUTTON ASSEMBLIES SHALL MEET ADA REQUIREMENTS. THE SIGNS THAT SHALL BE USED ARE IDENTIFIED IN THE TMUTCD AS R10-3E. CITY OF HOUSTON STANDARDS FOR PEDESTRIAN FACILITIES SHALL BE MET IN ADDITION TO ANY TEXAS ACCESSIBILITY STANDARDS BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).
8. PEDESTRIANS PUSH BUTTONS SHALL BE SEPARATED BY A MINIMUM OF 10 FEET. EXCEPTIONS ONLY AS SPECIFIED BY THE ENGINEER WITH AUTHORIZATION FROM THE APPROVED CITY OF HOUSTON REPRESENTATIVE.
9. OVERHEAD STREET NAME SIGNS SHALL BE INSTALLED SUCH THAT THE BOTTOM OF THE SIGN IS NO LESS THAN 17 FEET ABOVE THE ROADWAY PAVEMENT OR NO LESS THAN 16 FEET ABOVE THE FINISHED GRADE BEYOND THE SHOULDER.
10. THE LOCATION OF EACH NEW POLE FOUNDATION, PULL BOX, CONTROLLER CABINET FOUNDATION, UPS CABINET FOUNDATION AND ELECTRIC SERVICE PEDESTAL FOUNDATION SHALL BE MARKED IN THE FIELD AS SHOWN ON THE PLANS. THE EXACT LOCATION SHALL BE APPROVED BY THE ENGINEER AND/OR THE APPROVED CITY OF HOUSTON REPRESENTATIVE PRIOR TO BEGINNING INSTALLATION OF THE FOUNDATION.
11. NO POLES SHALL BE LOCATED IN WHEELCHAIR RAMPS OR SUCH THAT THEY ARE AN OBSTRUCTION TO PEDESTRIANS OR WHEELCHAIRS.
12. THE TOP OF THE POLE FOUNDATION SHALL BE LEVELED WITH THE FINISHED GRADE. IF THE SLOPE OR SHOULDER DROPS OFF FROM FINISHED GRADE, THE CONTRACTOR SHALL GRADE AROUND POLE FOUNDATION. THE TOP OF THE FOUNDATION SHALL EXTEND NO MORE THAN 4 INCHES ABOVE SURROUNDING GRADE. GROUTING SHALL BE USED TO FILL ANY GAP BETWEEN THE POLE BASE AND FOUNDATION.
13. POLES SHALL BE LOCATED SUCH THAT ALL PORTIONS OF THE POLES AND ATTACHED EQUIPMENT HAVE CLEARANCES FROM OVERHEAD UTILITIES IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL UTILITY AND THE NATIONAL ELECTRICAL SAFETY CODE (NESC).
14. ALL CONCRETE USED FOR TRAFFIC SIGNAL POLE AND CABINET FOUNDATIONS SHALL BE CLASS "A" (REFER TO THE CITY OF HOUSTON SPECIFICATION FOR CONCRETE).
15. MAST ARM AND STRAIN POLES SHALL NOT BE INSTALLED ON THE FOUNDATIONS LESS THAN SEVEN DAYS AFTER THE PLACEMENT OF THE CONCRETE FOR THE FOUNDATION.
16. ANCHOR BOLTS FOR SIGNAL POLES SHALL BE SET SO THAT TWO ARE IN COMPRESSION AND TWO ARE IN TENSION. PRIOR TO THE INSTALLATION OF THE NUT, THE THREADS OF THE ANCHOR BOLT SHALL BE COATED WITH PIPE JOINT COMPOUND.
17. ALL UNDERGROUND CONSTRUCTION (CONDUIT, FOUNDATIONS AND PULL BOXES) FOR THE INTERSECTION SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF POLES, SIGNALS AND CABINETS. THE CONTRACTOR SHALL NOT PROCEED TO ABOVE GROUND WORK UNTIL THE ENGINEER AND/OR APPROVED CITY OF HOUSTON REPRESENTATIVE HAD CONFIRMED THAT THE MATERIALS FOR A COMPLETE INSTALLATION ARE AVAILABLE.
18. UNDERGROUND CONDUIT FOR SIGNAL CABLE SHALL BE EITHER RIGID STEEL, HOT-DIPPED GALVANIZED CONDUIT OR SCHEDULE 80 ELECTRICAL PVC CONDUIT OF THE DIAMETER SHOWN ON THE PLANS, UNLESS OTHERWISE NOTED. ALL COUPLINGS AND CONNECTIONS SHALL BE TIGHT AND WATERPROOF.
19. ALL ABOVE GROUND CONDUIT FOR SIGNAL CABLE AND INTERCONNECT MEDIA SHALL BE HOT DIPPED GALVANIZED STEEL RIGID METAL CONDUIT OF THE DIAMETERS SHOWN ON THE PLANS, UNLESS OTHERWISE NOTED. ALL COUPLINGS AND CONNECTIONS SHALL BE TIGHT AND WATERPROOF.
20. ONLY NEW CONDUIT AND CABLE SHALL BE INSTALLED.
21. CONDUIT INSTALLED UNDER EXISTING PAVED DRIVEWAYS, ROADWAYS OR SIDEWALKS, WHICH ARE NOT SCHEDULED TO BE RECONSTRUCTED AS PART OF THIS PROJECT, SHALL BE INSTALLED BY MEANS OF BORING. THE CONTRACTOR SHALL NOT CUT OPEN ANY STREET OR DRIVEWAY FOR CONDUIT INSTALLATION WITHOUT THE PRIOR APPROVAL OF THE ENGINEER AND/OR THE APPROVED CITY OF HOUSTON REPRESENTATIVE.
22. CONDUIT NOT PLACED UNDER PAVED DRIVEWAYS, ROADWAY PAVEMENT OR SIDEWALK MAY BE PLACED BY CUTTING A TRENCH, INSTALLING THE CONDUIT AND BACKFILLING. ANY TRENCHING FOR CONDUIT WIDER THAN THREE (3) INCHES SHALL BE RESODDED.
23. PULL BOXES SHALL NOT BE INSTALLED WITHIN CONCRETE CURB ACCESS RAMPS. IN ADDITION, ANY PULL BOXES INSTALLED BEHIND CURBS SHALL BE INSTALLED BETWEEN THE CURB AND THE PROPOSED / FUTURE SIDEWALK OR BEYOND THE PROPOSED / FUTURE SIDEWALK. AN EXCEPTION TO THIS NOTE WOULD BE PULL BOXES INSTALLED IN A MEDIAN. ANY PULL BOXES INSTALLED ALONG AN UNCURBED ROADWAY SHALL BE INSTALLED ADJACENT TO, BUT NOT WITHIN, THE SHOULDER. DRAINAGE AREAS SHOULD BE AVOIDED WHEN PLACING JUNCTION BOXES.
24. A 5/8 IN. X 10 FT. GROUND ROD SHALL BE INSTALLED IN ALL PULL BOXES. A GROUND ROD CLAMP SHALL BE FURNISHED FOR GROUNDING THE GROUND WIRE.
25. ALL CONDUITS SHALL BE CLEANED BY COMPRESSED AIR AND A PROPERLY SIZED CONDUIT PISTON OR MANDREL SHALL BE PULLED THROUGH THE CONDUIT PRIOR TO CABLE INSTALLATION.
26. WHEN PULLING TRAFFIC SIGNAL SYSTEM CABLES THROUGH CONDUIT, THE CABLES SHALL BE LUBRICATED WITH A LUBRICANT NORMALLY USED FOR THIS PURPOSE. ANY ABRASION TO ANY CONDUCTOR INSULATION WHICH OCCURS WHILE PULLING CABLE FOR THE TRAFFIC SIGNAL SYSTEM WILL BE CAUSE FOR THE IMMEDIATE REJECTION OF THE CABLE. IF THIS OCCURS, THE CONTRACTOR SHALL REMOVE AND REPLACE THE ENTIRE CABLE RUN AT THEIR EXPENSE.
27. A MINIMUM OF THREE (3) FEET OF EACH WIRE AND CABLE MEASURED FROM THE TOP OF THE PULL BOX SHALL BE LEFT IN EACH PULL BOX AND AT EACH POLE BASE.
28. ALL CABLES SHALL BE STRIPPED, FORMED AND TERMINATED IN A NEAT AND UNIFORM MANNER WHETHER IN THE SIGNAL HEAD OR CONTROLLER CABINET. ALL CABLE SHALL BE BROUGHT INTO THE TERMINAL HOUSING OF SIGNALS AND/OR CONTROLLER CABINETS AND A SUFFICIENT LENGTH OF CABLE SHALL BE LEFT SO THAT ALL TERMINAL CONNECTIONS MAY BE MADE WITHOUT THE NECESSITY OF SPLICING THE CABLE.
29. THE HIGH VOLTAGE CABLES SHOULD BE SEPARATED FROM THE LOW VOLTAGE CABLES EXCEPT IN ENCLOSURES.
30. NO LOOP DETECTOR SHALL BE CUT IN A PARALLEL EXPANSION JOINT. LOOPS CUT ACROSS EXPANSION JOINTS SHALL HAVE A SLACK IN THE CABLE FOR EXPANSION.
31. ALL VEHICLE ROADWAY DETECTION LOOP CABLES SHALL BE #14 AWG IMSA 51-5-1985 CABLE. LEAD-IN CABLES SHALL BE #16 AWG IMSA 50-2-1984 CABLE. NO SPLICES SHALL BE ALLOWED IN THE ROADWAY DETECTION LOOP CABLE EXCEPT AT THE PULL BOX ADJACENT TO LOOP. THE DETECTOR LEAD-IN CABLE SHALL NOT BE SPLICED.
32. DETECTION LOOP SAW CUTS SHALL BE FLUSHED WITH WATER UNDER PRESSURE AND THEN DRIED WITH AIR UNDER PRESSURE.
33. THERE SHALL BE NO SPLICING IN CONDUCTORS EXCEPT FOR THE NECESSARY SPLICE BETWEEN ROADWAY LOOP WIRE AND DETECTOR LEAD-IN CABLE IN THE PULL BOX ADJACENT TO THE DETECTOR. THESE SPLICES SHALL BE WATERPROOF AND SHALL BE IN COMPLIANCE WITH THE CITY OF HOUSTON STANDARD DRAWINGS FOR TRAFFIC SIGNAL CONSTRUCTION. THESE SPLICES SHALL BE MADE BY THE CONTRACTOR. DO NOT GROUND THE CABLE SHIELD AT THE PULL BOX.
34. TWO #10 AWG-XHHW CONDUCTORS SHALL BE INSTALLED FROM EACH LUMINAIRE TO THE SERVICE PEDESTAL, LEAVING THREE FEET OF SLACK FOR EACH CONDUCTOR (MEASURED FROM THE TOP OF THE PULL BOX) IN EACH PULL BOX. ROUTE FOUR CONDUCTORS TO THE LUMINAIRE WITH THE PHOTOELECTRIC CELL. AN IN-LINE FUSE SHALL BE INSTALLED FOR EACH LUMINAIRE IN THE ASSOCIATED PULL BOX.
35. THE EMERGENCY VEHICLE PRE-EMPTION SENSOR CABLE SHALL BE OPTICOM DETECTOR CABLE MODEL NO. 138. THE CABLE SHALL NOT BE SPLICED.
36. ALL VEHICLE AND PEDESTRIAN INDICATIONS SHALL BE LED.
37. THE CONTRACTOR SHALL BAG ALL NEWLY INSTALLED VEHICULAR AND/OR PEDESTRIAN TRAFFIC SIGNAL HEADS WITH BURLAP OR OTHER APPROVED MATERIAL UNTIL THE FINAL INSPECTION AND ACCEPTANCE BY THE CITY TRAFFIC ENGINEER AND/OR APPROVED CITY OF HOUSTON REPRESENTATIVE. THE BURLAP OR OTHER APPROVED MATERIAL/DEVICE SHALL COMPLIETELY COVER THE TRAFFIC SIGNAL HEAD AND SHALL OBSCURE THE VIEW OF THE TRAFFIC SIGNAL INDICATIONS SO THAT THEY CANNOT BE SEEN UNTIL THE TRAFFIC SIGNAL IS PLACED IN OPERATION. DURING CONSTRUCTION, THE TRAFFIC SIGNAL WILL BE DE-ENERGIZED WHILE NOT IN USE FOR TESTING.
38. THE TRAFFIC SIGNAL OPERATION AT EXISTING SIGNALIZED INTERSECTIONS SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE DURATION OF THE PROJECT.
39. ALL STRIPING AND PAVEMENT MARKINGS ARE TO BE DONE UNDER THIS CONTRACT AND SHALL BE IN PLACE PRIOR TO THE ACTIVATION OF THE TRAFFIC SIGNAL. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL STOP LINES PRIOR TO THE INSTALLATION OF LOOP DETECTORS.
40. ALL CROSSWALK MARKINGS SHALL BE 10-FT. WIDE, FROM INSIDE OF MARKINGS, FOLLOWING CITY OF HOUSTON STANDARD DETAILS
41. ALL CONSTRUCTION SIGNING AND CONSTRUCTION TRAFFIC CONTROL DEVICES SHALL BE IN CONFORMANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

PRIVATE UTILITY NOTES

CAUTION: SBC CABLES

1. THE LOCATION OF SBC 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 HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.
2. THE CONTRACTOR SHALL CALL 311 (PUBLIC UNDERGROUND UTILITY) OR 811 (PRIVATE UNDERGROUND UTILITY) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND UTILITY LINES FIELD LOCATED.
3. WHEN EXCAVATING WITHIN EIGHTEEN (18) INCHES OF THE INDICATED LOCATION OF SBC FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE SBC FACILITIES.
4. WHEN SBC FACILITIES ARE EXPOSED, THE CONTRACTOR SHALL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES, THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

CAUTION: UNDERGROUND GAS FACILITIES

1. LOCATIONS OF CENTERPOINT ENERGY GAS MAIN LINES (TO INCLUDE UNIT GAS TRANSMISSION AND/OR INDUSTRIAL GAS SUPPLY CORPORATION WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. THE CONTRACTOR SHALL CONTACT LONE STAR NOTIFICATION CENTER AT (713) 223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO MAIN AND SERVICE LINES FIELD LOCATED.
2. WHEN CENTERPOINT ENERGY GAS PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 967-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUESTS BEFORE EXCAVATION BEGINS.
3. WHEN EXCAVATING WITHIN EIGHTEEN (18) INCHES OF THE INDICATED LOCATION OF CENTERPOINT ENERGY GAS FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NONMECHANIZED EXCAVATION PROCEDURES.
4. WHEN CENTERPOINT ENERGY GAS FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
5. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRICAL FACILITIES

1. OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW SECTION 752, HEALTH & SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) 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 ELECTRIC AT (713) 207-7777.
2. CONTRACTOR TO NOTIFY LONE STAR NOTIFICATION CENTER AT (713) 223-4567, 48 HOURS BEFORE STARTING WORK IN STREET RIGHT-OF-WAY OR EASEMENTS.

RESPONSIBILITIES:

1. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE FOLLOWING EQUIPMENT AND MATERIALS AS SPECIFIED IN THE PLANS: STEEL POLE ANCHOR BOLTS (WITH NUTS AND WASHERS), CONCRETE POLE FOUNDATIONS WITH REINFORCEMENT (WHERE SPECIFIED), TRAFFIC SIGNAL CONTROLLER CABINET(S) WITH CONTROLLER(S) AND ALL AUXILIARY EQUIPMENT, CONTROLLER CABINET CONCRETE FOUNDATION(S), CONCRETE PULL BOXES, ELECTRICAL CONDUIT, GROUND RODS AND CONNECTORS, BARE BOND WIRE AND ALL OTHER CONDUCTORS, POLES, MAST ARMS, TRAFFIC SIGNALS AND MOUNTING ASSEMBLIES, PEDESTRIAN SIGNALS AND MOUNTING ASSEMBLIES, PEDESTRIAN PUSH BUTTON STATIONS WITH SIGNS, LUMINARIES, PHOTOCELLS, ELECTRIC SERVICE PEDESTAL(S) AND CONCRETE FOUNDATION(S), VIDEO DETECTION SYSTEM EQUIPMENT, VEHICLE DETECTION LOOPS, AND ALL OTHER APPURTENANCES NECESSARY FOR THE OPERATION OF THE TRAFFIC SIGNAL INSTALLATION(S), EXCEPT AS MODIFIED IN THE PLANS. (MODIFY THE LIST OF MATERIALS AS APPROPRIATE)
2. THE CITY OF HOUSTON WILL SUPPLY AND THE CONTRACTOR SHALL INSTALL THE FOLLOWING EQUIPMENT AND MATERIALS AS SPECIFIED IN THE PLANS: STEEL POLE ANCHOR BOLTS (WITH NUTS AND WASHERS), CONCRETE POLE FOUNDATIONS WITH REINFORCEMENT (WHERE SPECIFIED), TRAFFIC SIGNAL CONTROLLER CABINET(S) WITH CONTROLLER(S) AND ALL AUXILIARY EQUIPMENT, CONTROLLER CABINET CONCRETE FOUNDATION(S), CONCRETE PULL BOXES, ELECTRICAL CONDUIT, GROUND RODS AND CONNECTORS, BARE BOND WIRE AND ALL OTHER CONDUCTORS, POLES, MAST ARMS, TRAFFIC SIGNALS AND MOUNTING ASSEMBLIES, PEDESTRIAN SIGNALS AND MOUNTING ASSEMBLIES, PEDESTRIAN PUSH BUTTON STATIONS WITH SIGNS, LUMINARIES, PHOTOCELLS, ELECTRIC SERVICE PEDESTAL(S) AND CONCRETE FOUNDATION(S), VIDEO DETECTION SYSTEM EQUIPMENT, VEHICLE DETECTION LOOPS, AND ALL OTHER APPURTENANCES NECESSARY FOR THE OPERATION OF THE TRAFFIC SIGNAL INSTALLATION(S), EXCEPT AS MODIFIED IN THE PLANS. (MODIFY THE LIST OF MATERIALS AS APPROPRIATE)
3. THE CONTRACTOR SHALL DELIVER THE CONTROLLER CABINET(S) WITH THE CONTROLLER(S) AND AUXILIARY EQUIPMENT SPECIFIED IN THE PLANS TO THE CITY OF HOUSTON TRAFFIC OPERATIONS CENTER, 2200 PATTERSON STREET FOR TESTING, A MINIMUM OF THREE WEEKS PRIOR TO THE INSTALLATION(S) AT THE INTERSECTION(S). CONTACT THE TRAFFIC MAINTENANCE BRANCH AT LEAST 2 WORKING DAYS PRIOR TO THE DELIVERY OF THE CONTROLLER CABINET(S) TO THE CITY OF HOUSTON. THE CONTRACTOR SHALL PICK UP AND TRANSPORT THE CONTROLLER CABINET(S) FROM THE CITY OF HOUSTON TRAFFIC OPERATIONS CENTER TO THE INTERSECTION(S) AFTER CITY OF HOUSTON STAFF HAS TESTED THE EQUIPMENT AND APPROVED IT FOR INSTALLATION.
4. THE CONTRACTOR SHALL INSTALL EACH TRAFFIC CONTROLLER CABINET ON ITS FOUNDATION AND ROUTE ALL OF THE CONDUCTORS INTO THE CONTROLLER CABINET. CONDUCTORS SHALL BE TERMINATED IN THE CABINET BY THE CONTRACTOR UNDER THE OBSERVATION OF AN APPROVED CITY OF HOUSTON REPRESENTATIVE.
5. THE CONTRACTOR SHALL CAREFULLY DISASSEMBLE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL AND STREET LIGHTING EQUIPMENT THAT IS NOT TO REMAIN OR BE RELOCATED. ALL OF THE EQUIPMENT TO BE INSPECTED BY TRAFFIC OPERATIONS INSPECTOR TO IDENTIFY SALVAGE ITEMS. ITEMS TO BE SALVAGED SHALL BE RETURNED TO THE CITY OF HOUSTON TRAFFIC OPERATIONS CENTER, 2200 PATTERSON STREET, OR UPPER BRAES, 18211 WEST HOUSTONCENTER BLVD., AND UNLOADED BY THE CONTRACTOR. CONTACT THE TRAFFIC MAINTENANCE BRANCH AT LEAST 2 WORKING DAYS PRIOR TO RETURNING THE EQUIPMENT. ALL NON-SALVAGE ITEMS TO BE DELIVERED BY THE CONTRACTOR TO AN APPROVED CITY OF HOUSTON RECYCLE FACILITY.
6. THE CONTRACTOR SHALL SALVAGE AND REPLANT ANY LANDSCAPING VEGETATION THAT MAY BE DAMAGED BY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM AN APPROVED CITY OF HOUSTON REPRESENTATIVE BEFORE ANY PLANTS ARE MOVED.
7. THE CONTRACTOR SHALL REPAIR/RESTORE ANY LANDSCAPE IRRIGATION COMPONENTS DAMAGED BY CONSTRUCTION ACTIVITY TO THEIR ORIGINAL CONDITION.
8. THE LOCATION OF PUBLIC AND PRIVATE UTILITIES IS SHOWN IN AN APPROXIMATE LOCATION ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES TO UTILITIES THAT ARE THE RESULT OF HIS FAILURE TO EXACTLY LOCATE AND PRESERVE UNDERGROUND FACILITIES.

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

INDEX & GENERAL NOTES

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 2 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CADD\PLANS\14760-0021-CI-001-GENERAL.DWG, 3/25/2024 6:38 PM

GENERAL CONSTRUCTION NOTES

1. UNLESS OTHERWISE NOTED AND APPROVED ON DRAWINGS, CONSTRUCT CIVIL INFRASTRUCTURE IN ACCORDANCE WITH THE EFFECTIVE EDITION OF THE HOUSTON PUBLIC WORKS STANDARD CONSTRUCTION SPECIFICATIONS, STANDARD CONSTRUCTION DETAILS, AND SUPPLEMENTS, ADDENDA AND AMENDMENTS THERETO. THE LATEST EDITION OF THE ABOVE PUBLICATIONS CAN BE FOUND AT: HTTP://WWW.HOUSTONPERMITTINGCENTER.ORG/OFFICE-CITY-ENGINEER/DESIGN-AND-CONSTRUCTION-STANDARDS.
2. THE DESIGN MUST BE CONSISTENT WITH THE EFFECTIVE EDITION OF HOUSTON PUBLIC WORKS INFRASTRUCTURE DESIGN MANUAL AND TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY) REQUIREMENTS.
3. UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 713-223-4567/811 OR 800-344-8377 AND LONE STAR NOTIFICATION CENTER AT 800-669-8344 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION. UTILITIES MARKED WITHIN THE PUBLIC RIGHT OF WAY OR IN EASEMENTS SHALL COMPLY WITH TAC TITLE 16, PART 1, CHAPTER 18, RULE §18.6 AND THE AMERICAN PUBLIC WORKS ADMINISTRATION (APWA) UNIFORM COLOR CODE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE 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.
5. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, HOUSTON PUBLIC WORKS @ 832-394-9098 OR VIA FAX AT 832-395-4424 FOR INSPECTION AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
6. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER AND TO THE SATISFACTION OF THE OWNING AUTHORITY.
7. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
8. CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
9. CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD AS-BUILT CONDITIONS DURING CONSTRUCTION. THESE 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.

ADDITIONAL GENERAL CONSTRUCTION NOTES

17. THE CONTRACTOR SHALL RETURN ALL EXISTING FACILITIES TO EXISTING OR BETTER CONDITION UNLESS OTHERWISE NOTED AT NO ADDITIONAL COST TO THE OWNER.
18. CONTRACTOR TO FOLLOW CONSTRUCTION DETAILS IF DRAWINGS DEVIATE FROM CITY OF HOUSTON STANDARDS.
19. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY CITY OF HOUSTON, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN CITY OF HOUSTON ROAD RIGHTS-OF-WAY.

URBAN FORESTRY NOTES

1. CONTRACTOR AND PROJECT INSPECTOR TO MEET WITH PARKS DEPARTMENT / URBAN FORESTRY BEFORE STARTING CONSTRUCTION TO DISCUSS TREE PROTECTION AND REMOVAL. CONTACT URBAN FORESTRY AT (832)395-8459.

UTILITY NOTES

CAUTION: 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 PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND

OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 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.

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

CAUTION: UNDERGROUND ELECTRICAL FACILITIES
UNDERGROUND ELECTRICAL FACILITIES EXIST IN THE AREA OF THIS PROJECT. DO NOT BEGIN CONSTRUCTION UNTIL THESE FACILITIES HAVE BEEN LOCATED AND STAKED. TO HAVE THESE UNDERGROUND FACILITIES STAKED, CALL THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567, OR TOLL FREE AT 1-800-669-8344, AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION.

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

-WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 207-5463 OR (713) 945-8036 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

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

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

-FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-2111 OR (713) 207-4200.

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

AT&T TEXAS/SWBT FACILITIES

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL CALL 1-800-344-8377 (TEXAS 911) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.
4. WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES, THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.
5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.
6. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER KEVIN RAY AT (713) 614-1983 OR E-MAIL HIM AT KR7896@ATT.COM IF CABLE LOCATE REQUETS ARE NOT COMPLETED FOR OUR AT&T TEXAS/SWBT FACILITIES.

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.

STORM SEWER 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 OTHERWISE SHOWN ON THE DRAWINGS.
2. ALL STORM SEWER CONSTRUCTED IN SIDELOT EASMENT SHALL BE R.C.P (C-76, CLASSIII) AND SHALL BE EMBEDDED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS. 02317-02, 02317-03, 02317-05, 02317-06, AND 02317-07 AS APPLICABLE.
3. ALL SEWER UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1-1/2 SACK CEMENT/C.Y. STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL.
4. ALL TRENCH BACKFILL SHALL BE IN 8'LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS IN EACH LIFT, AND 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, CLASS III).
7. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES AND INLET LEADS ARE TO BE PLUGGED WITH 8"BRICK WALLS UNLESS OTHERWISE NOTED.
8. MINIMUM HORIZONTAL CLEARANCE BETWEEN ANY STORM PIPE AND BOX SHALL BE AT LEAST 48-INCHES FROM EXTERIOR OF THE STORM PIPE OR BOX TO THE EXTERIOR OF THE EXISTING OR PROPOSED PUBLIC OR PRIVATE UTILITY AND OTHER APPURTENANCES. MINIMUM VERTICAL CLEARANCE BETWEEN ANY STORM PIPE AND BOX SHALL BE AT LEAST 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 VALVE BOXES TO GRADE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING, AND RESTORING ANY BACK SLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF THIS WORK.
11. ALL DITCHES SHALL BE GRADED TO PROPOSED ELEVATIONS TO INSURE PROPER DRAINAGE. ALL OUTFALLS SHALL BE PROPERLY BACKFILLED AND COMPACTED. ALL DISTURBED AREA SHALL BE REGRADED, SEEDED, AND FERTILIZED.
12. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

SWPPP CONSTRUCTION NOTES

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

GRADING CONSTRUCTION NOTES

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

PAVING CONSTRUCTION NOTES

1. PAVEMENT SHALL BE IN ACCORDANCE WITH THE FOLLOWING CITY OF HOUSTON DOCUMENTS: "STANDARD CONSTRUCTION SPECIFICATIONS" AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATERLINES, STORM DRAINAGE AND STREET PAVING".
2. THE CONTRACTOR(S) SHALL NOTIFY CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORK AND ENGINEERING, OFFICE OF THE CITY ENGINEER, 48 HOURS PRIOR TO START OF WORK ON THIS PROJECT. TEL. NO. 832-394-9097, FAX NO. 832-395-4424.
3. ALL RETURNS SHALL HAVE A 25-FOOT RADIUS AT FACE OF CURB UNLESS OTHERWISE NOTED.
4. GUIDELINES SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE OBSERVED.
5. ALL INTERSECTIONS SHALL BE CONSTRUCTED WITH WHEELCHAIR RAMPS IN ACCORDANCE WITH THE GOVERNOR'S OFFICE OF TRAFFIC SAFETY MEMORANDUM DATED MAY 6, 1976. (HIGHWAY SAFETY ACT - 1973 SECTION 288). SEE CITY OF HOUSTON ACCESSIBLE COMPLIANT CURB RAMPS AND LANDINGS DETAIL. ALL WHEELCHAIR RAMPS SHALL COMPLY WITH CURRENT "THE AMERICANS WITH DISABILITIES ACT" (A.D.A..) SPECIFICATIONS. RAMPS TO BE COLORED WITH A COLOR TO BE DETERMINED BY THE ENGINEER CONFORMING TO ASTM-C979.
6. ALL FILL IN EXISTING OR PROPOSED CITY OF HOUSTON RIGHT-OF-WAY, INCLUDING BACKFRESSING BEHIND THE CURB, SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF EIGHT INCHES (8") OR LESS AND COMPACTED TO 95% OF MAXIMUM DENSITY AT -3% TO +5% MOISTURE CONTENT AS DETERMINED BY AASHTO TEST METHOD T-99.
7. ALL CONCRETE PAVEMENT TO BE 26 TO 42-FOOT B-B TWELVE (12) INCH REINFORCED CONCRETE WITH SIX (6) INCH REINFORCED CONCRETE CURBS, UNLESS OTHERWISE NOTED. CONCRETE MIX SHALL BE AS SPECIFIED.
8. PAVEMENT REINFORCEMENT FOR REINF. CONCRETE SHALL BE #5, GRADE 60 STEEL REBARS ON 16-INCH CENTERS FOR LONGITUDINAL STEEL AND ON 36-INCH CENTERS FOR TRANSVERSE STEEL. REINFORCEMENT SHALL BE PLACED ON CHAIRS SPACED 36" CENTER TO CENTER. BENT BARS SHALL BE GRADE 40.
9. REFER TO THE LATEST CITY OF HOUSTON PAVEMENT MARKING DETAILS.
10. SIDEWALK BULLNOSES CONSTRUCTED IN ESPLANADES SHALL BE SIX INCHES (6") THICK WITH SURFACE COLORED BLACK, WHEN CURBS ARE TEN FEET (10') AND LESS IN WIDTH FROM FACE-TO-FACE OF CURBS. FOR CONCRETE ROADWAYS, SURFACE SHALL BE COLORED BLACK. FOR ASPHALT ROADWAYS, SURFACE SHALL BE UNCOLORED.

TRAFFIC CONSTRUCTION NOTES

CONTRACTOR OR OWNER SHALL SUBMIT TRAFFIC CONTROL PLANS WITH THE MOBILITY PERMIT APPLICATION. THE PLANS SHALL BE DRAWN TO SCALE AND SEALED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS.

THE GENERAL NOTES THAT SHALL BE INCLUDED ON THE TRAFFIC CONTROL PLAN CAN BE FOUND IN CHAPTER 15 (15.12 TRAFFIC CONTROL PLAN) OF THE CITY OF HOUSTON'S (CITY) INFRASTRUCTURE DESIGN MANUAL (IDM). BELOW ARE SEVERAL KEY NOTES FROM THE IDM TO BE AWARE OF:

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) LATEST EDITION WITH REVISIONS DURING THE ENTIRE CONSTRUCTION PERIOD.
2. NO WORK SHALL BE PERFORMED IN RESIDENTIAL AREAS FROM 7:00PM TO 7:00AM.
3. CONTRACTOR SHALL MAINTAIN APPROVED NUMBER OF 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 COMPLAINT PEDESTRIAN ACCESS TO BUS STOPS AND ADEQUATE BUS ACCESS TO THE BUS STOP.
4. CONTRACTOR SHALL COVER OPEN PAVEMENT EXCAVATIONS FOR MINOR UTILITY WORK WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS, OPEN LANES FOR NORMAL TRAFFIC FLOW WHEN FEASIBLE.
5. CONTRACTOR SHALL SECURE ROADWAY/SIDEWALK/STREET/BICYCLE FACILITY PERMITS AS DESCRIBED IN CITY OF HOUSTON ORDINANCE, CHAPTER 40 - STREETS & SIDEWALKS, SECTION 40-361 FROM HOUSTON PERMITTING CENTER (MOBILITY PERMIT SECTION AT HTTPS://GEOHUB.HOUSTONTX.GOV) BEFORE IMPLEMENTING THE TRAFFIC CONTROL PLAN. THE APPLICATION MUST BE SUBMITTED AT LEAST TEN BUSINESS 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.
6. CONTRACTOR SHALL HAVE APPROVED TRAFFIC CONTROL PLAN AND PERMIT AT THE JOB SITE FOR INSPECTION AT ALL TIMES
7. 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 DRIVEWAY, UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM THE CITY OF HOUSTON.
8. ADDITIONAL OFF DUTY POLICE OFFICERS/FLAGGERS MAY BE REQUESTED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED AT THE DIRECTION OF THE CITY EVEN IF THEY ARE NOT SPECIFICALLY IDENTIFIED ON THE PROJECT PLANS.

METRO GENERAL NOTES

1. CONTRACTOR SHALL NOTIFY METRO AT 713-615-7119 TWO WEEKS PRIOR TO MOBILIZING TO THE PROJECT SITE TO COORDINATE IMPACTS TO BUS OPERATIONS DURING CONSTRUCTION.
2. CONTRACTOR SHALL CONTACT FACILITIES MAINTENANCE AT 713-615-6195 OR FACILITIESMAINTENANCE@RIDEMETRO.ORG 14 WORKING DAYS PRIOR TO PLANNED IMPACTS TO EXISTING METRO BUS STOPS TO SCHEDULE THE REMOVAL OF ANY BENCHES, WASTE RECEPTACLES, AND SIGNS AS REQUIRED.
3. CONTRACTOR SHALL NOTIFY METRO AT LEAST 72 HOURS PRIOR TO PLACEMENT OF CONCRETE SUBSLAB FOR PAVERS AT BUS STOP AND ALLOW METRO TO INSPECT THE SLAB FORM FOUNDATION PRIOR TO PLACEMENT OF CONCRETE.
4. CONTRACTOR SHALL COORDINATE WITH METRO, AS NECESSARY, FOR INSTALLATION OF VARIOUS FEATURES AT FINISHED BUS STOP LOCATIONS.
5. THERE ARE NOTICE, INSPECTION, AND TRAINING REQUIREMENTS ASSOCIATED WITH THIS WORK THAT ARE IN ADDITION TO THE GENERAL REQUIREMENTS. SEE METRO "ADJACENT CONSTRUCTION PROJECT MANUAL."
6. THE AUTHORITY SHALL BE RESPONSIBLE FOR DESIGN SUBMITTALS AS INDICATED IN SECTION 1.3C, 1.3D, AND 2.0 (EXCEPT 3.3I) OF THE "ADJACENT CONSTRUCTION PROJECT MANUAL." CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OTHER METRO SUBMITTALS AND APPROVALS.
7. METRO REQUIRES TRAINING FOR EVERYONE WORKING WITHIN THE SAFETY ZONE. THIS PROJECT INCLUDES WORK IN THE SAFETY ZONE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAINING.
8. THE DIRECT METRO POINT OF CONTACT FOR ANY CONSTRUCTION RELATED QUESTIONS, INCLUDING FLAGGING, IS JOSE CASTELLANOS AT 713-739-3727 OR JOSE.CASTELLANOS@RIDEMETRO.ORG.

ABBREVIATIONS

ASHP	ASPHALT
BLDG	BUILDING
CONC	CONCRETE
CJ	CONTROL JOINT
DIMS	DIMENSIONS
DIP	DUCTILE IRON PIPE
D/W OR DW	DRIVEWAY
DWG	DRAWING
EL OR ELEV	ELEVATION
EQ	EQUAL
ER	END OF RADIUS
EXIST OR EX	EXISTING
EJ OR EXP JT	EXPANSION JOINT
FH	FIRE HYDRANT
GALV	GALVANIZED
GM	GAS METER
GUT	GUTTER
GV	GAS VALVE
HP	HIGH PRESSURE GAS MAIN
INSTR	INSTRUCTION
IP	IRON PIPE
IP GM	INTERMEDIATE PRESSURE GAS MAIN
LT	LEFT
LT STD	LIGHT STANDARD
(M)	PER MH MAPPING
MAT SCHED	MATERIALS SCHEDULE
MFR	MANUFACTURER
MH	MANHOLE
NGS	NATIONAL GEOLOGICAL SURVEY
NIC	NOT IN CONTRACT
(NIR)	NOT IN RECORDS
NTS	NOT TO SCALE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
PGL	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
PL MKR	PIPELINE MARKER
PP	POWER POLE
PROP	PROPOSED
PVT	PRIVATE
PVMT	PAVEMENT
R	RADIUS
(R)	PER RECORDS
RE	REFERENCE
ROW	RIGHT-OF-WAY
RT	RIGHT
SAN SWR	SANITARY SEWER
SH	SPRINKLER HEAD
SHT	SHEET
SIM	SIMILAR
SP	SERVICE POLE
STA	STATION
STL	STEEL
STM SWR	STORM SEWER
SV	SPRINKLER VALVE
SW OR SW	SIDEWALK
TP	TOP OF PAVEMENT
TYP	TYPICAL
UG	UNDERGROUND
UNO OR U.N.O.	UNLESS NOTED OTHERWISE
WL	WATER LINE
WM	WATER METER
WV	WATER VALVE

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY

FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.

Engineer: VICTORIA M. MACALINO, P.E.

P.E. Serial No.: 142304

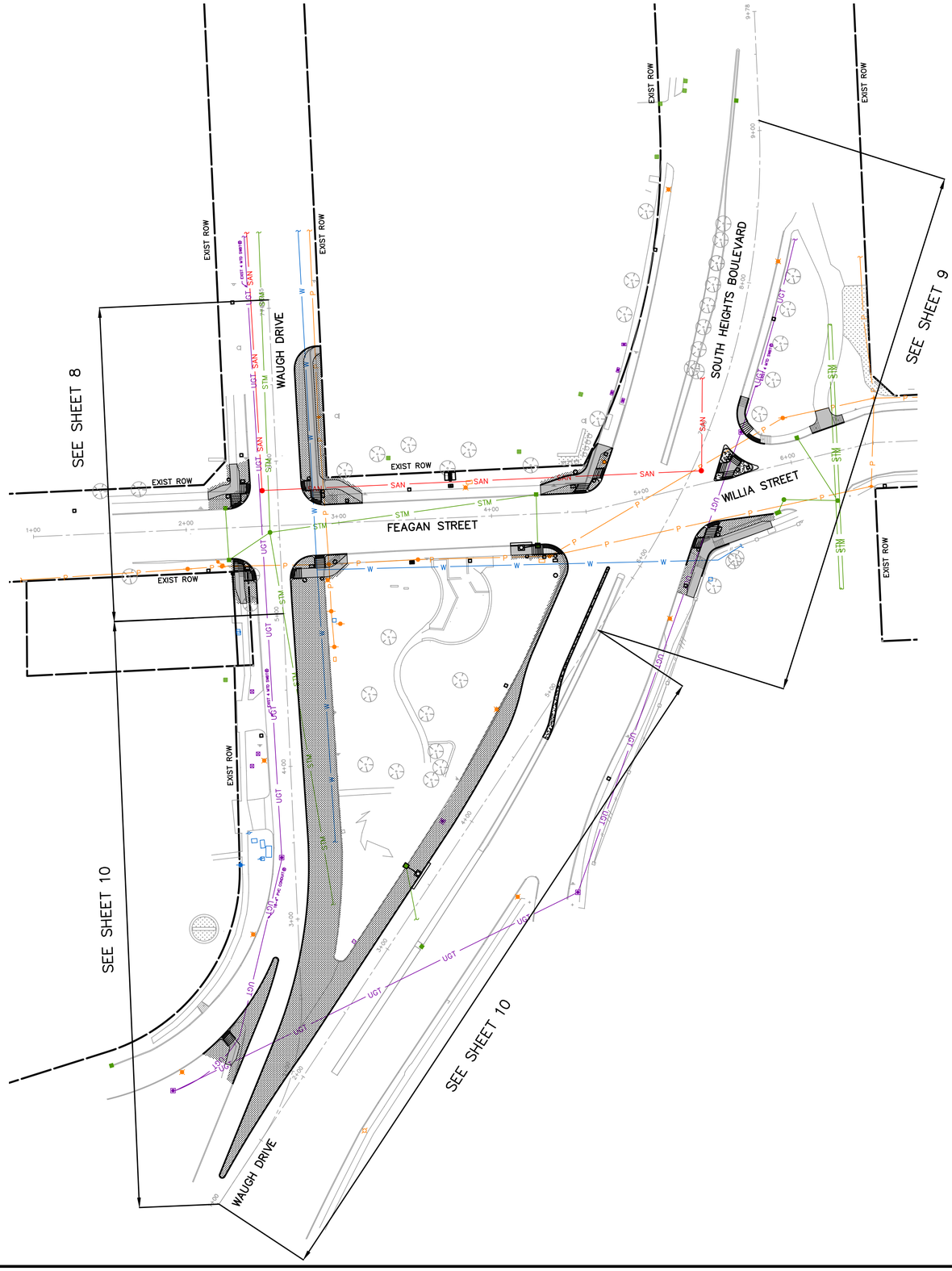
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

GENERAL NOTES

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912



0 10 20 40 80 120

SCALE: 1" = 40'

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY

1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY

Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 100461-00
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY

FB NO.

INTERIM REVIEW

Not intended for construction, bidding or permit purposes.

Engineer: VICTORIA M. MACALINO, P.E.

P.E. Serial No.: 142304

Date: MARCH 2024

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

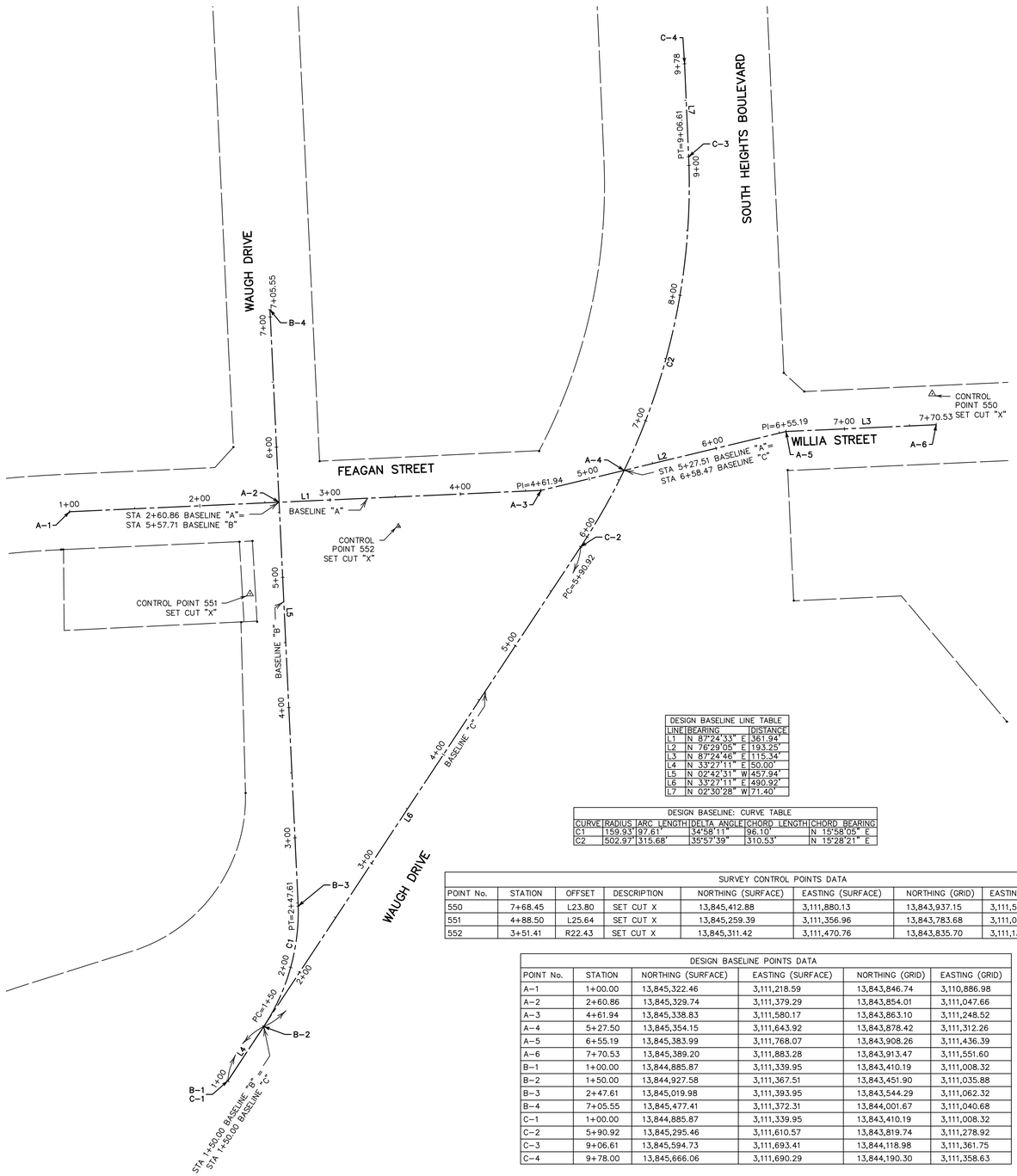
OVERALL LAYOUT

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 4 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-001-GENERAL.DWG, 3/25/2024 6:25 PM

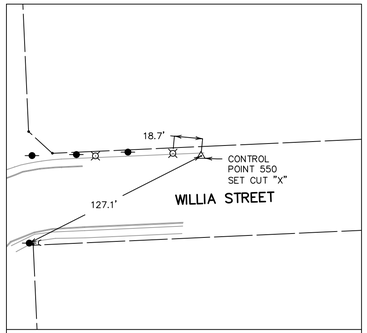


DESIGN BASELINE LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 87°24'33" E	361.94'
L2	N 76°29'05" E	193.25'
L3	N 87°24'46" E	115.34'
L4	N 33°27'11" E	50.00'
L5	N 02°42'31" W	457.94'
L6	N 33°27'11" E	490.92'
L7	N 02°30'28" W	71.40'

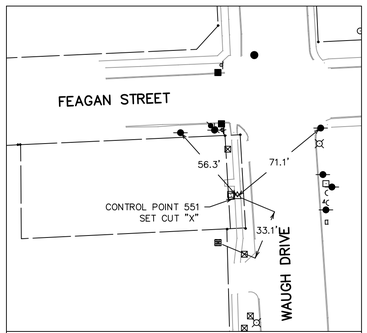
DESIGN BASELINE: CURVE TABLE					
CURVE	RADIUS	ARC LENGTH	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C1	159.93'	97.61'	34°58'11"	96.10'	N 15°58'05" E
C2	502.97'	315.68'	35°57'39"	310.53'	N 15°28'21" E

SURVEY CONTROL POINTS DATA								
POINT No.	STATION	OFFSET	DESCRIPTION	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)	ELEVATION
550	7+68.45	L23.80	SET CUT X	13,845,412.88	3,111,880.13	13,843,937.15	3,111,548.45	52.06
551	4+88.50	L25.64	SET CUT X	13,845,259.39	3,111,356.96	13,843,783.68	3,111,025.33	52.36
552	3+51.41	R22.43	SET CUT X	13,845,311.42	3,111,470.76	13,843,835.70	3,111,139.12	50.94

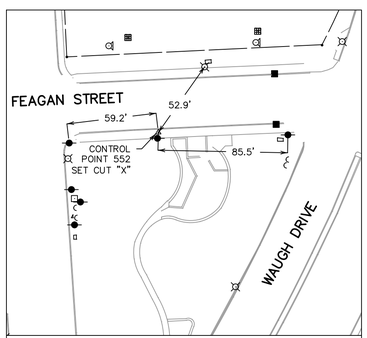
DESIGN BASELINE POINTS DATA					
POINT No.	STATION	NORTHING (SURFACE)	EASTING (SURFACE)	NORTHING (GRID)	EASTING (GRID)
A-1	1+00.00	13,845,322.46	3,111,218.59	13,843,846.74	3,110,886.98
A-2	2+60.86	13,845,329.74	3,111,379.29	13,843,854.01	3,111,047.66
A-3	4+61.94	13,845,338.83	3,111,580.17	13,843,863.10	3,111,248.52
A-4	5+27.50	13,845,354.15	3,111,643.92	13,843,878.42	3,111,312.26
A-5	6+55.19	13,845,383.99	3,111,768.07	13,843,908.26	3,111,436.39
A-6	7+70.53	13,845,389.20	3,111,883.28	13,843,913.47	3,111,551.60
B-1	1+00.00	13,844,885.87	3,111,339.95	13,843,410.19	3,111,008.32
B-2	1+50.00	13,844,927.58	3,111,367.51	13,843,451.90	3,111,035.88
B-3	2+47.61	13,845,019.98	3,111,393.95	13,843,544.29	3,111,062.32
B-4	7+05.55	13,845,477.41	3,111,372.31	13,844,001.67	3,111,040.68
C-1	1+00.00	13,844,885.87	3,111,339.95	13,843,410.19	3,111,008.32
C-2	5+90.92	13,845,295.46	3,111,610.57	13,843,819.74	3,111,278.92
C-3	9+06.61	13,845,594.73	3,111,693.41	13,844,118.98	3,111,361.75
C-4	9+78.00	13,845,666.06	3,111,690.29	13,844,190.30	3,111,358.63



CONTROL POINT 550



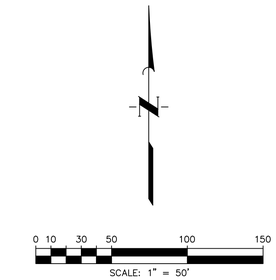
CONTROL POINT 551



CONTROL POINT 552

LEGEND

- TYPE "B" INLET
- CONTROL POINT
- ELECTRICAL CONTROL BOX
- FLUSH VALVE
- GRATE INLET
- GUY ANCHOR
- LIGHT POLE
- POWER POLE
- WATER METER
- DESIGN BASELINE
- A-x DESIGN BASELINE "A" POINT NUMBER
- B-x DESIGN BASELINE "B" POINT NUMBER
- C-x DESIGN BASELINE "C" POINT NUMBER



BENCHMARK:

Harris County Floodplain Reference Mark No. 210065 located on the east side of South Heights Boulevard on a bridge crossing Buffalo Bayou (W-100-00-00), approximately 600 feet south of the intersection of South Heights Boulevard and Memorial Drive Published elevation= 41.84 feet, NAVD 88, 2001 Adjustment.

GENERAL NOTES:

Bearings and coordinates shown hereon are based on the Texas Coordinate System of 1983, South Central Zone.

All distances and coordinates shown hereon are on SURFACE (unless otherwise noted) and may be converted to GRID using the combined scale factor of 0.9998934137.

NO.	DATE	REVISION	APP.

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Surveyor MATTHEW W. BRAZZEL, R.P.L.S
R.P.L.S. No: 6140
Date: MARCH 2024

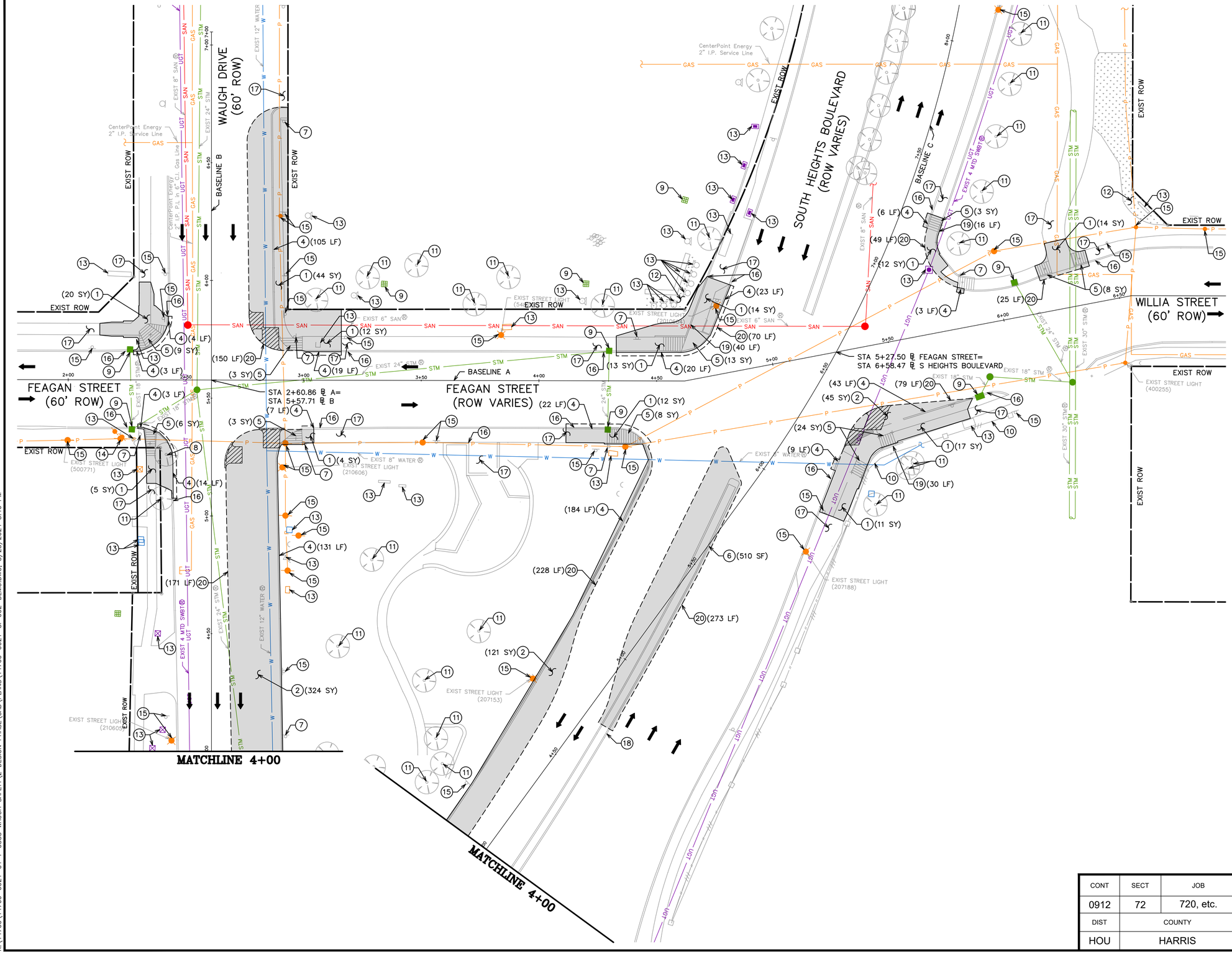
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SURVEY CONTROL MAP

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 5 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-008-SURVEY CONTROL.DWG, 3/25/2024 6:25 PM



LEGEND

- DEMOLITION AREA
- DIRECTION OF TRAVEL
- PROP FLEX BASE

GENERAL NOTES

A. SCOPE OF WORK INDICATED WITHIN SHADED AREA. EXISTING FEATURES OUTSIDE SHADED AREA TO REMAIN UNLESS NOTED OTHERWISE.
B. CONTRACTOR IS TO PROTECT THE FACE OF ALL EXISTING BUILDINGS AND STRUCTURES. DAMAGE TO BUILDING/STRUCTURE SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.
C. EXISTING PUBLIC UTILITY STRUCTURES (METER AND VALVE VAULTS, JUNCTION BOXES, CLEAN OUTS, FIRE HYDRANTS, ETC.) IN USE IN THE AREA OF DEMOLITION ARE TO BE PROTECTED AND REMAIN OPERATIONAL DURING DEMOLITION, UNLESS NOTED OTHERWISE. ELEVATION OF COVER OF UTILITY STRUCTURE IS TO BE ADJUSTED TO BE LEVEL WITH NEW PAVING. PRIVATE UTILITY MANHOLES ARE TO BE ADJUSTED BY OTHERS.
D. CONTRACTOR IS TO PROTECT ALL IRRIGATION SYSTEM COMPONENTS DURING DEMOLITION OPERATIONS UNLESS NOTED OTHERWISE. ANY IRRIGATION SYSTEM COMPONENTS DAMAGED AS A RESULT OF DEMOLITION OPERATIONS SHALL BE REPLACED TO SATISFACTION OF OWNER AT CONTRACTOR'S EXPENSE.
E. CONTRACTOR TO PROTECT ALL FACILITIES NOT SPECIFICALLY CALLED OUT FOR DEMOLITION.
F. CONTRACTOR NOT TO ENTER PRIVATE PROPERTY TO PERFORM PROTECTIONS UNTIL A RIGHT-OF-ENTRY FORM IS SECURED FROM THE PROPERTY OWNERS.

KEY NOTES

(1) REMOVE CONC SW
(2) REMOVE CONC PAVING AND BASE
(3) REMOVE GRAVEL, GRASS, AND/OR SOIL
(4) REMOVE CONC CURB/CURB AND GUTTER
(5) REMOVE CURB RAMP W/ OR W/OUT TRUNCATED DOME PAVERS
(6) REMOVE RAISED CONC PAD/ISLAND/MEDIAN W/ OR W/OUT PAVEMENT BASE
(7) REMOVE SIGN AND/OR POLE
(8) REMOVE EXIST TREE
(9) PROTECT EXIST INLET
(10) PROTECT EXIST FENCE
(11) PROTECT EXIST TREE
(12) PROTECT EXIST PLANTING AND IRRIGATION
(13) PROTECT EXIST STRUCTURE
(14) PROTECT EXIST FIRE HYDRANT
(15) PROTECT EXIST STREET LIGHT/TRAFFIC SIGN/POWER POLE
(16) PROTECT EXIST CURB/RETAINING WALL
(17) PROTECT EXIST SW/RAMP/DWY/METRO BUS STOP
(18) PROTECT RAISED CONC PAD/ISLAND/MEDIAN
(19) REMOVE EXIST RETAINING WALL
(20) LIMIT OF PAVING REMOVAL – SAWCUT

0 5 10 20 40 60
SCALE: 1" = 20'

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

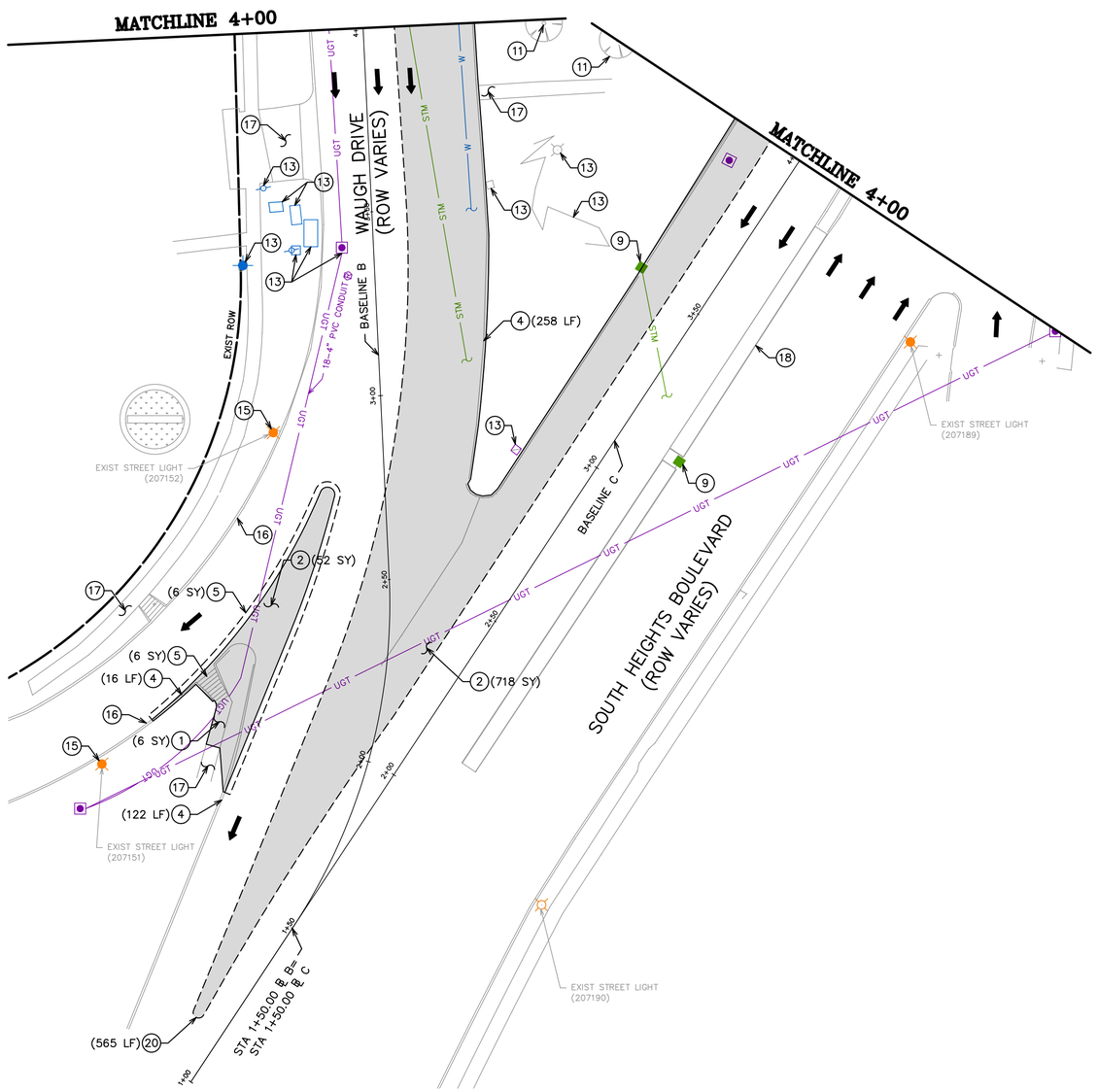
WAUGH DR AT FEAGAN ST & S. HEIGHTS BLVD AT FEGAN ST DEMOLITION PLAN

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 6 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-002-DEMO.DWG, 3/25/2024 5:46 PM



LEGEND

- DEMOLITION AREA
- DIRECTION OF TRAVEL
- PROP FLEX BASE

GENERAL NOTES

A. SCOPE OF WORK INDICATED WITHIN SHADED AREA. EXISTING FEATURES OUTSIDE SHADED AREA TO REMAIN UNLESS NOTED OTHERWISE.
B. CONTRACTOR IS TO PROTECT THE FACE OF ALL EXISTING BUILDINGS AND STRUCTURES. DAMAGE TO BUILDING/STRUCTURE SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.
C. EXISTING PUBLIC UTILITY STRUCTURES (METER AND VALVE VAULTS, JUNCTION BOXES, CLEAN OUTS, FIRE HYDRANTS, ETC.) IN USE IN THE AREA OF DEMOLITION ARE TO BE PROTECTED AND REMAIN OPERATIONAL DURING DEMOLITION, UNLESS NOTED OTHERWISE. ELEVATION OF COVER OF UTILITY STRUCTURE IS TO BE ADJUSTED TO BE LEVEL WITH NEW PAVING. PRIVATE UTILITY MANHOLES ARE TO BE ADJUSTED BY OTHERS.
D. CONTRACTOR IS TO PROTECT ALL IRRIGATION SYSTEM COMPONENTS DURING DEMOLITION OPERATIONS UNLESS NOTED OTHERWISE. ANY IRRIGATION SYSTEM COMPONENTS DAMAGED AS A RESULT OF DEMOLITION OPERATIONS SHALL BE REPLACED TO SATISFACTION OF OWNER AT CONTRACTOR'S EXPENSE.
E. CONTRACTOR TO PROTECT ALL FACILITIES NOT SPECIFICALLY CALLED OUT FOR DEMOLITION.
F. CONTRACTOR NOT TO ENTER PRIVATE PROPERTY TO PERFORM PROTECTIONS UNTIL A RIGHT-OF-ENTRY FORM IS SECURED FROM THE PROPERTY OWNERS.

KEY NOTES

(1) REMOVE CONC SW
(2) REMOVE CONC PAVING AND BASE
(3) REMOVE GRAVEL, GRASS, AND/OR SOIL
(4) REMOVE CONC CURB/CURB AND GUTTER
(5) REMOVE CURB RAMP W/ OR W/OUT TRUNCATED DOME PAVERS
(6) REMOVE RAISED CONC PAD/ISLAND/MEDIAN W/ OR W/OUT PAVEMENT BASE
(7) REMOVE SIGN AND/OR POLE
(8) REMOVE EXIST TREE
(9) PROTECT EXIST INLET
(10) PROTECT EXIST FENCE
(11) PROTECT EXIST TREE
(12) PROTECT EXIST PLANTING AND IRRIGATION
(13) PROTECT EXIST STRUCTURE
(14) PROTECT EXIST FIRE HYDRANT
(15) PROTECT EXIST STREET LIGHT/TRAFFIC SIGN/POWER POLE
(16) PROTECT EXIST CURB/RETAINING WALL
(17) PROTECT EXIST SW/RAMP/DWY/METRO BUS STOP
(18) PROTECT RAISED CONC PAD/ISLAND/MEDIAN
(19) REMOVE EXIST RETAINING WALL
(20) LIMIT OF PAVING REMOVAL – SAWCUT

0 5 10 20 40 60
SCALE: 1" = 20'

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

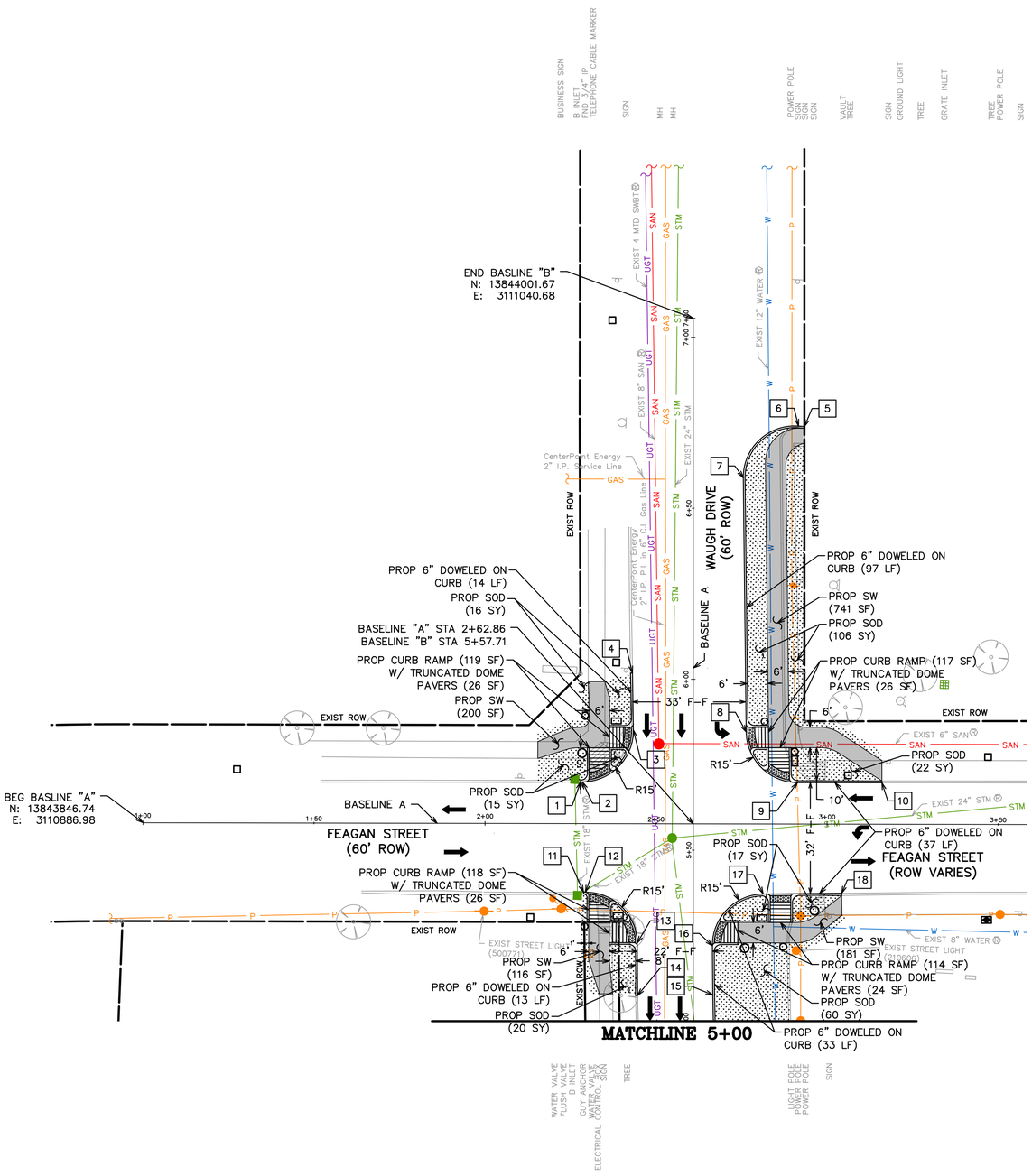
WAUGH DR AT S. HEIGHTS BLVD DEMOLITION PLAN

WAUGH SAFETY IMPROVEMENTS

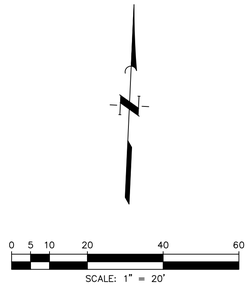
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 7 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-002-DEMO.DWG, 3/25/2024 5:46 PM



Point	Station	Offset
1	5+69.95	32.93' LT
2	5+69.96	32.46' LT
3	5+85.18	17.52' LT
4	6+01.79	17.77' LT
5	6+73.91	32.50 RT
6	6+74.02	30.78' RT
7	6+58.90	14.65' RT
8	5+84.60	15.50' RT
9	5+69.77	30.47' RT
10	5+69.74	55.17' RT
11	5+37.70	32.04' LT
12	5+37.71	31.50' LT
13	5+22.83	16.39' LT
14	5+07.52	16.26' LT
15	5+07.65	5.74' RT
16	5+22.05	5.62' RT
17	5+37.18	20.47' RT
18	5+37.41	43.42' RT



PAVING LEGEND

- PROP SIDEWALK
- PROP SOD TO MATCH EXIST
- PROP TRUNCATED DOMES
- (X) STATION AND OFFSET (SEE THIS SHEET)
- (A) MATCH EXISTING SW (SEE THIS SHEET)

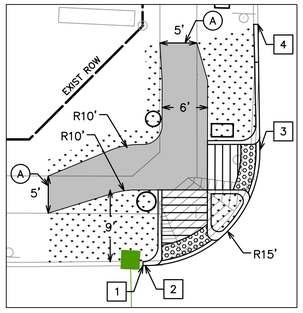
GENERAL NOTES

A. SCOPE OF WORK INDICATED WITHIN SHADED AREA. EXISTING FEATURES OUTSIDE SHADED AREA TO REMAIN UNLESS NOTED OTHERWISE.
B. CONTRACTOR IS TO PROTECT THE FACE OF ALL EXISTING BUILDINGS AND STRUCTURES. DAMAGE TO BUILDING/STRUCTURE SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.
C. EXISTING PUBLIC UTILITY STRUCTURES (METER AND VALVE VAULTS, JUNCTION BOXES, CLEAN OUTS, FIRE HYDRANTS, ETC.) IN USE IN THE AREA OF DEMOLITION ARE TO BE PROTECTED AND REMAIN OPERATIONAL DURING DEMOLITION, UNLESS NOTED OTHERWISE. ELEVATION OF COVER OF UTILITY STRUCTURE IS TO BE ADJUSTED TO BE LEVEL WITH NEW PAVING. PRIVATE UTILITY MANHOLES ARE TO BE ADJUSTED BY OTHERS.
D. STREET LIGHTS AND TRAFFIC SIGNALS TO REMAIN OPERATIONAL DURING CONSTRUCTION. INSTALL TEMPORARY SIGNALIZATION ACCORDING TO TEMPORARY SIGNAL PLAN.
E. CONTRACTOR IS TO PROTECT ALL IRRIGATION SYSTEM COMPONENTS DURING DEMOLITION OPERATIONS UNLESS NOTED OTHERWISE. ANY IRRIGATION SYSTEM COMPONENTS DAMAGED AS A RESULT OF DEMOLITION OPERATIONS SHALL BE REPLACED TO SATISFACTION OF OWNER AT CONTRACTOR'S EXPENSE.
F. CONTRACTOR TO PROTECT ALL FACILITIES NOT SPECIFICALLY CALLED OUT FOR DEMOLITION.
G. CONTRACTOR TO COORDINATE WITH CITY OF HOUSTON URBAN FORESTER AT (832)395-8459 PRIOR TO WORK BENEATH EXISTING MATURE TREES FOR ANY ADDITIONAL TREE PROTECTION REQUIREMENTS.

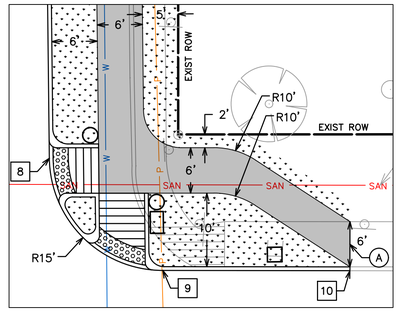
NO.	DATE	REVISION	APP.

NOTE: CORNER DETAILS ARE SHOWN AT 1:10 SCALE

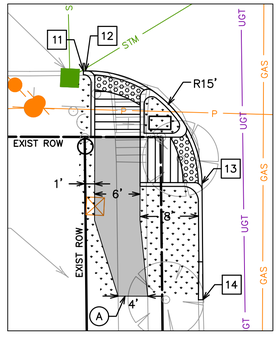
NORTHWEST CORNER



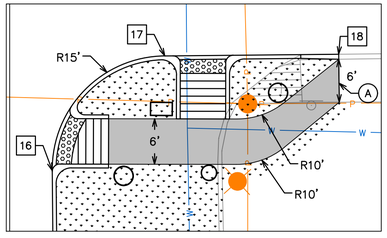
NORTHEAST CORNER



SOUTHWEST CORNER



SOUTHEAST CORNER



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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 100461-00
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR AT FEAGAN ST PAVING

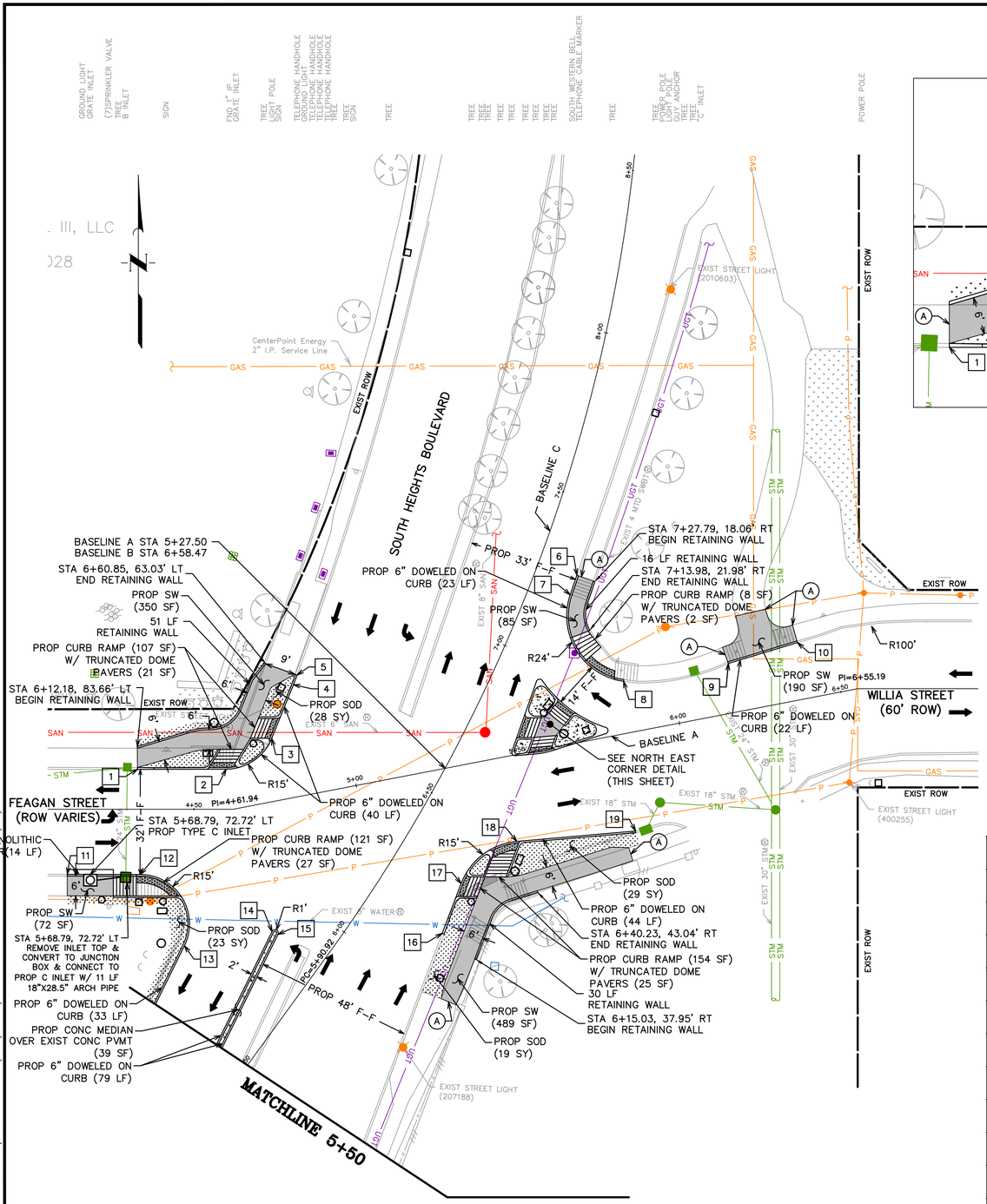
WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

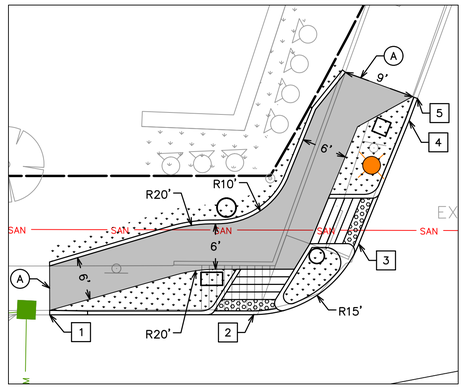
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 8 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-003-PAVING.DWG, 3/25/2024 5:47 PM

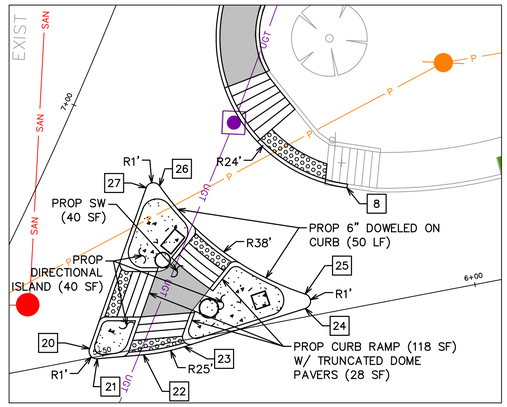
NOTE: CORNER DETAILS ARE SHOWN AT 1:10 SCALE



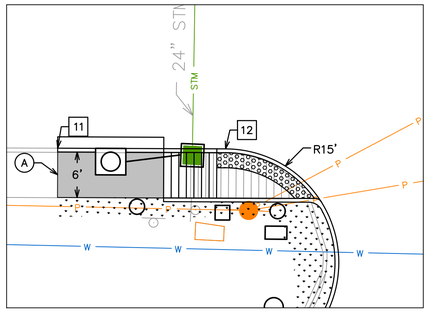
NORTHWEST CORNER



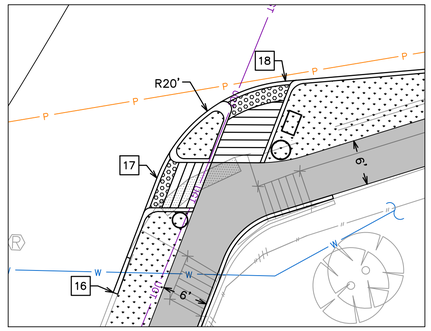
NORTHEAST CORNER



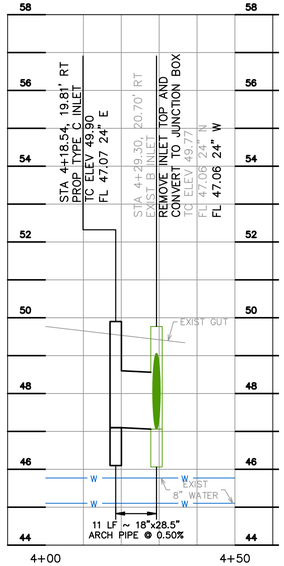
SOUTHWEST CORNER



SOUTHEAST CORNER



FEAGAN STREET 4+18.54



Point	Station	Offset
1	6+05.30	79.74' LT
2	6+22.54	57.30' LT
3	6+39.59	50.36' LT
4	6+59.02	52.60' LT
5	6+62.47	53.01' LT
6	7+27.65	12.25' RT
7	7+21.75	12.46' RT
8	7+04.19	37.41' RT
9	7+19.69	64.83' RT
10	7+31.31	82.20' RT
11	5+64.68	78.38' LT
12	5+77.68	60.44' LT
13	5+68.10	36.86' LT
14	5+87.23	17.85' RT
15	5+87.57	15.88' RT
16	6+15.99	24.93' RT
17	6+31.12	21.70' RT
18	6+49.80	29.83' RT
19	6+68.05	60.09' RT
20	6+72.25	15.62' RT
21	6+71.55	17.14' RT
22	6+74.65	22.35' RT
23	6+77.85	26.71' RT
24	6+88.59	38.90' RT
25	6+90.20	38.10' RT
26	6+94.92	14.69' RT
27	6+94.00	13.18' RT

PAVING LEGEND

- PROP SIDEWALK
- PROP SOD TO MATCH EXIST
- PROP TRUNCATED DOMES
- X — STATION AND OFFSET (SEE THIS SHEET)
- A — MATCH EXISTING SW (SEE THIS SHEET)

GENERAL NOTES

A. SCOPE OF WORK INDICATED WITHIN SHADED AREA. EXISTING FEATURES OUTSIDE SHADED AREA TO REMAIN UNLESS NOTED OTHERWISE.
B. CONTRACTOR IS TO PROTECT THE FACE OF ALL EXISTING BUILDINGS AND STRUCTURES. DAMAGE TO BUILDING/STRUCTURE SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.
C. EXISTING PUBLIC UTILITY STRUCTURES (METER AND VALVE VAULTS, JUNCTION BOXES, CLEAN OUTS, FIRE HYDRANTS, ETC.) IN USE IN THE AREA OF DEMOLITION ARE TO BE PROTECTED AND REMAIN OPERATIONAL DURING DEMOLITION, UNLESS NOTED OTHERWISE. ELEVATION OF COVER OF UTILITY STRUCTURE IS TO BE ADJUSTED TO BE LEVEL WITH NEW PAVING. PRIVATE UTILITY MANHOLES ARE TO BE ADJUSTED BY OTHERS.
D. STREET LIGHTS AND TRAFFIC SIGNALS TO REMAIN OPERATIONAL DURING CONSTRUCTION. INSTALL TEMPORARY SIGNALIZATION ACCORDING TO TEMPORARY SIGNAL PLAN.
E. CONTRACTOR IS TO PROTECT ALL IRRIGATION SYSTEM COMPONENTS DURING DEMOLITION OPERATIONS UNLESS NOTED OTHERWISE. ANY IRRIGATION SYSTEM COMPONENTS DAMAGED AS A RESULT OF DEMOLITION OPERATIONS SHALL BE REPLACED TO SATISFACTION OF OWNER AT CONTRACTOR'S EXPENSE.
F. CONTRACTOR TO PROTECT ALL FACILITIES NOT SPECIFICALLY CALLED OUT FOR DEMOLITION.
G. CONTRACTOR TO COORDINATE WITH CITY OF HOUSTON URBAN FORESTER AT (832)395-8459 PRIOR TO WORK BENEATH EXISTING MATURE TREES FOR ANY ADDITIONAL TREE PROTECTION REQUIREMENTS.

0 5 10 20 40 60
SCALE: 1" = 20'

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

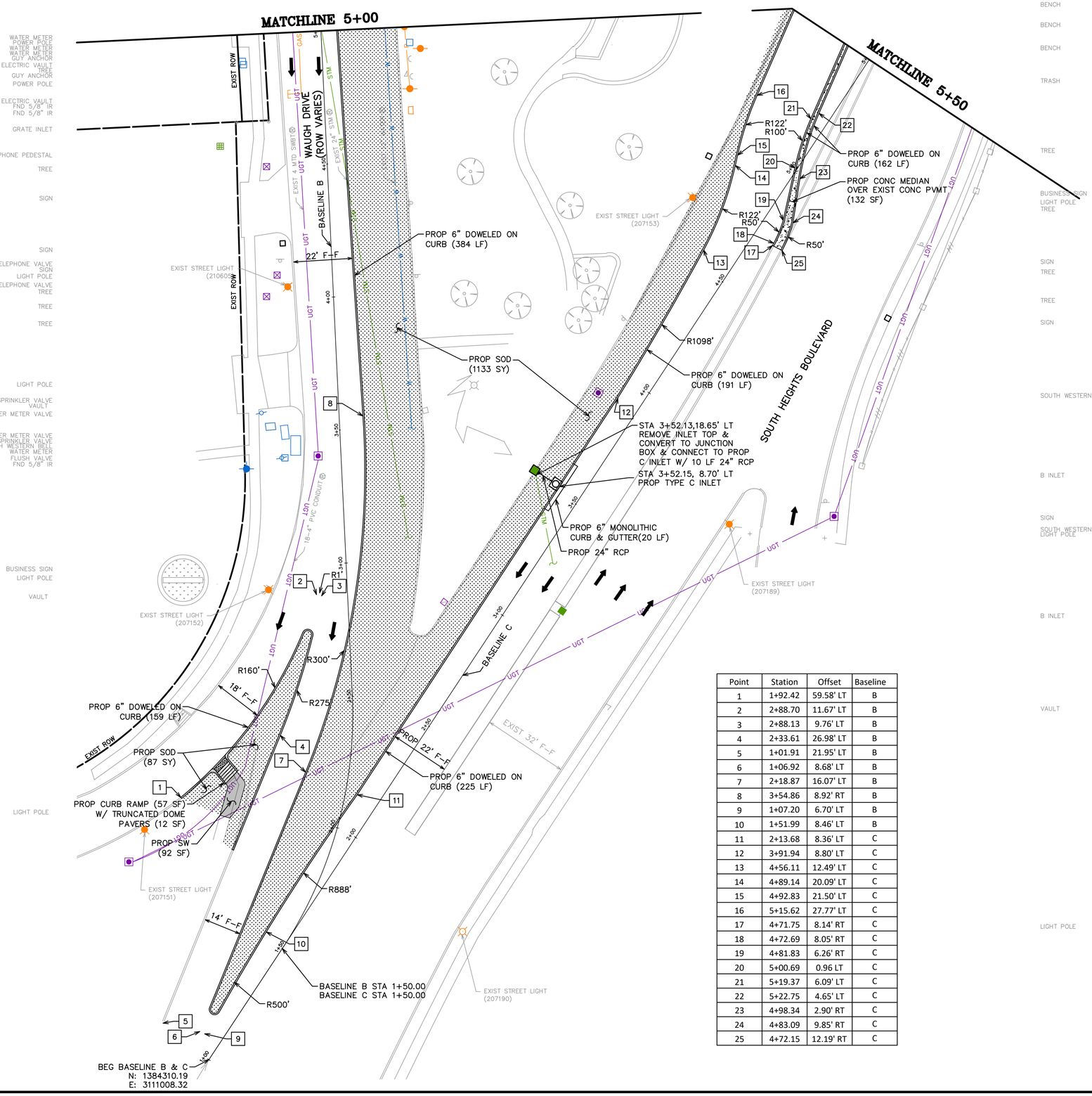
S. HEIGHTS BLVD AT FEAGAN ST PAVING

WAUGH SAFETY IMPROVEMENTS

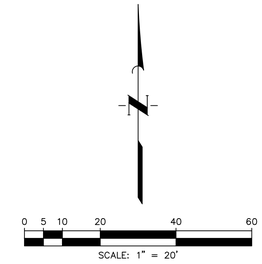
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 9 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-01-003-PAVING.DWG 5/25/2024 5:47 PM



Point	Station	Offset	Baseline
1	1+92.42	59.58' LT	B
2	2+88.70	11.67' LT	B
3	2+88.13	9.76' LT	B
4	2+33.61	26.98' LT	B
5	1+01.91	21.95' LT	B
6	1+06.92	8.68' LT	B
7	2+18.87	16.07' LT	B
8	3+54.86	8.92' RT	B
9	1+07.20	6.70' LT	B
10	1+51.99	8.46' LT	B
11	2+13.68	8.36' LT	C
12	3+91.94	8.80' LT	C
13	4+56.11	12.49' LT	C
14	4+89.14	20.09' LT	C
15	4+92.83	21.50' LT	C
16	5+15.62	27.77' LT	C
17	4+71.75	8.14' RT	C
18	4+72.69	8.05' RT	C
19	4+81.83	6.26' RT	C
20	5+00.69	0.96 LT	C
21	5+19.37	6.09' LT	C
22	5+22.75	4.65' LT	C
23	4+98.34	2.90' RT	C
24	4+83.09	9.85' RT	C
25	4+72.15	12.19' RT	C



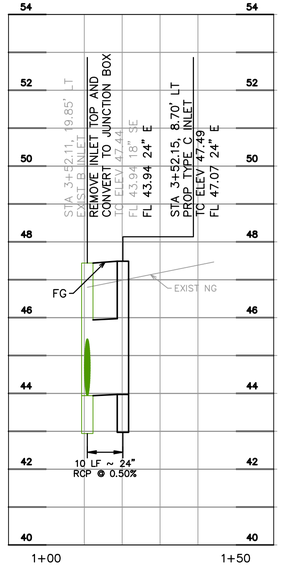
PAVING LEGEND

- PROP SIDEWALK
- PROP SOD TO MATCH EXIST
- PROP TRUNCATED DOMES
- X — STATION AND OFFSET (SEE THIS SHEET)
- A — MATCH EXISTING SW (SEE THIS SHEET)

GENERAL NOTES

A. SCOPE OF WORK INDICATED WITHIN SHADED AREA. EXISTING FEATURES OUTSIDE SHADED AREA TO REMAIN UNLESS NOTED OTHERWISE.
B. CONTRACTOR IS TO PROTECT THE FACE OF ALL EXISTING BUILDINGS AND STRUCTURES. DAMAGE TO BUILDING/STRUCTURE SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.
C. EXISTING PUBLIC UTILITY STRUCTURES (METER AND VALVE VAULTS, JUNCTION BOXES, CLEAN OUTS, FIRE HYDRANTS, ETC.) IN USE IN THE AREA OF DEMOLITION ARE TO BE PROTECTED AND REMAIN OPERATIONAL DURING DEMOLITION, UNLESS NOTED OTHERWISE. ELEVATION OF COVER OF UTILITY STRUCTURE IS TO BE ADJUSTED TO BE LEVEL WITH NEW PAVING. PRIVATE UTILITY MANHOLES ARE TO BE ADJUSTED BY OTHERS.
D. STREET LIGHTS AND TRAFFIC SIGNALS TO REMAIN OPERATIONAL DURING CONSTRUCTION. INSTALL TEMPORARY SIGNALIZATION ACCORDING TO TEMPORARY SIGNAL PLAN.
E. CONTRACTOR IS TO PROTECT ALL IRRIGATION SYSTEM COMPONENTS DURING DEMOLITION OPERATIONS UNLESS NOTED OTHERWISE. ANY IRRIGATION SYSTEM COMPONENTS DAMAGED AS A RESULT OF DEMOLITION OPERATIONS SHALL BE REPLACED TO SATISFACTION OF OWNER AT CONTRACTOR'S EXPENSE.
F. CONTRACTOR TO PROTECT ALL FACILITIES NOT SPECIFICALLY CALLED OUT FOR DEMOLITION.
G. CONTRACTOR TO COORDINATE WITH CITY OF HOUSTON URBAN FORESTER AT (832)395-8459 PRIOR TO WORK BENEATH EXISTING MATURE TREES FOR ANY ADDITIONAL TREE PROTECTION REQUIREMENTS.

S HEIGHTS BOULEVARD 3+52.15



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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR AT S. HEIGHTS BLVD PAVING

WAUGH SAFETY IMPROVEMENTS

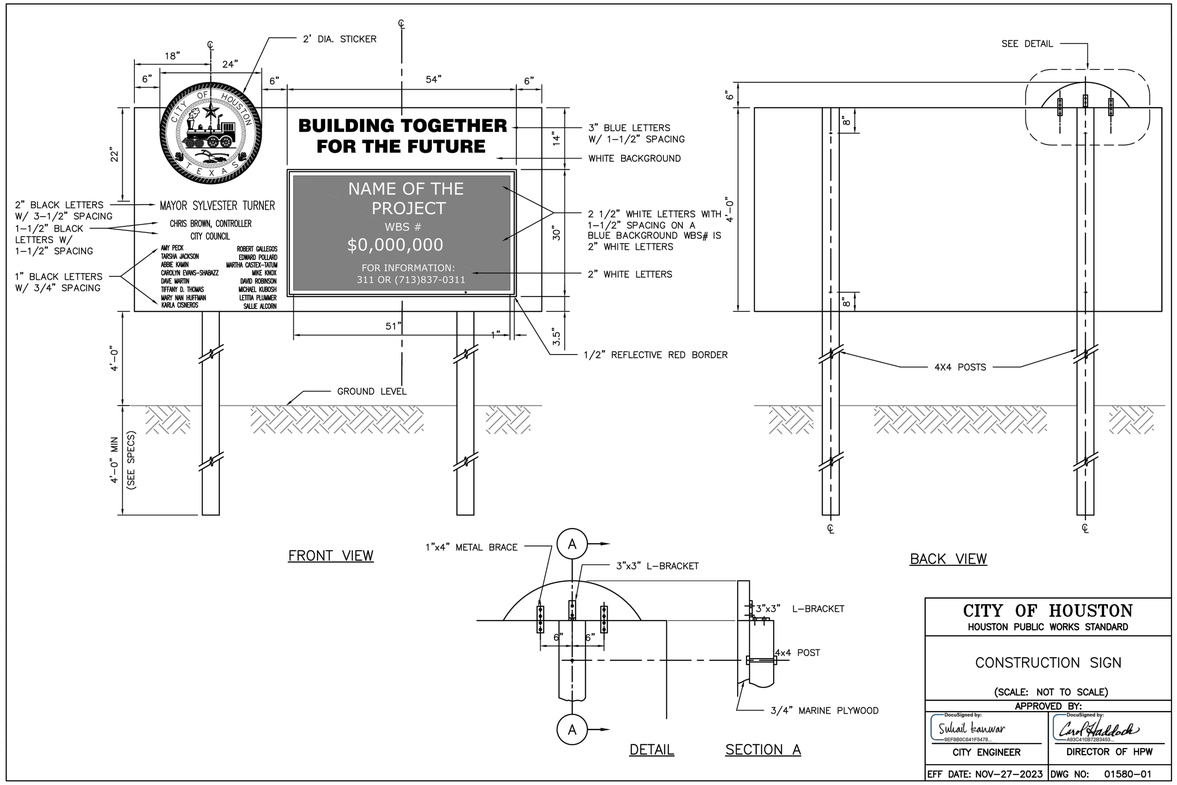
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 10 OF 72	

NO.	DATE	REVISION	APP.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-003-PAVING.DWG, 3/25/2024 5:47 PM

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



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

CITY OF HOUSTON HOUSTON PUBLIC WORKS STANDARD	
CONSTRUCTION SIGN (SCALE: NOT TO SCALE)	
APPROVED BY:	
DocuSigned by: Sukut Kanwar CITY ENGINEER	DocuSigned by: Carl Haddock DIRECTOR OF HPW
EFF DATE: NOV-27-2023	DWG NO: 01580-01

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

CONSTRUCTION SIGN DETAILS

WAUGH SAFETY IMPROVEMENTS

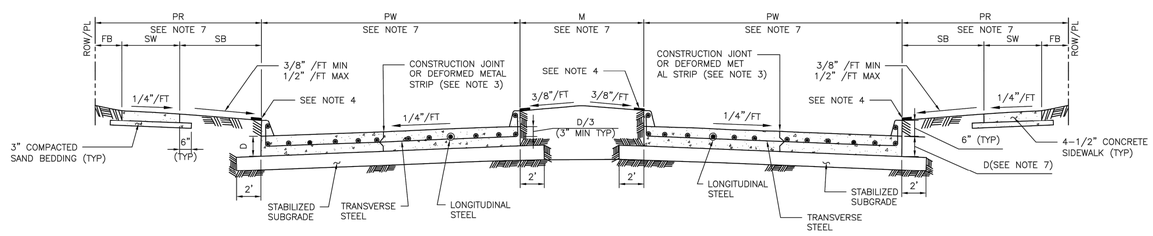
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 11 OF 72	

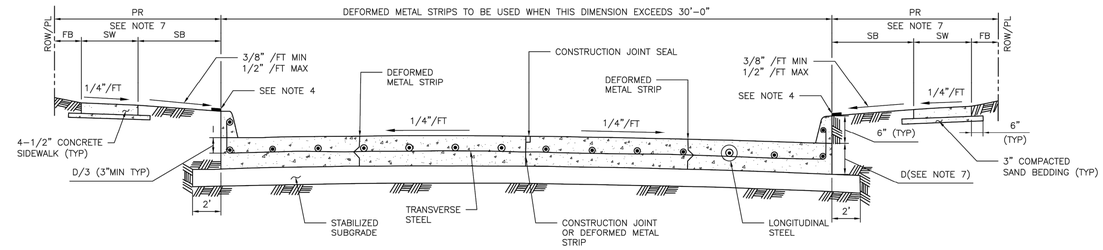
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

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.



TYPICAL DOUBLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS



TYPICAL SINGLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS

TABLE 1

REINFORCING STEEL BAR SIZES AND SPACINGS FOR VARIOUS PAVEMENT THICKNESSES (D) WITH: MAXIMUM TRANSVERSE CONTROL JOINT SPACING = 20'–0"
MAXIMUM EXPANSION JOINT SPACING = 80'–0"
fc' = 4,000 PSI/28 DAYS AND FY = 60,000 PSI

PAVEMENT THICKNESS "D" (IN)	PAVEMENT WIDTH "PW" (FT)	LONGITUDINAL STEEL									TRAVERSE STEEL		
		#4 BARS			#5 BARS			#6 BARS			#4 BARS	#5 BARS	#6 BARS
		NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	SPACING (IN)	SPACING (IN)	SPACING (IN)
6	28	17	20.50	4.00	–	–	–	–	–	–	36	–	–
7	25	17	18.25	4.00	–	–	–	–	–	–	36	–	–
7	35	24	18.00	3.00	–	–	–	–	–	–	36	–	–
7	36	25	17.75	3.00	–	–	–	–	–	–	36	–	–
7	37	25	18.25	3.00	–	–	–	–	–	–	36	–	–
7	41	28	18.00	3.00	–	–	–	–	–	–	36	–	–
7	45	31	17.75	3.75	–	–	–	–	–	–	36	–	–
8	25	20	15.50	2.75	13	24.50	3.0	–	–	–	36	36	–
8	34	27	15.50	2.50	17	25.00	4.0	–	–	–	36	36	–
8	35	27	16.00	2.00	18	24.25	4.0	–	–	–	36	36	–
8	36	28	15.75	3.25	18	25.00	3.0	–	–	–	30	36	–
8	44	24	15.75	4.00	22	24.75	4.0	–	–	–	30	36	–
8	45	35	15.75	2.25	23	24.25	3.0	–	–	–	30	36	–
9	25	22	14.00	3.00	14	22.50	4.0	–	–	–	36	36	–
9	34	31	13.50	2.00	19	22.25	3.5	–	–	–	30	36	–
9	35	31	13.75	3.75	20	21.75	3.5	–	–	–	30	36	–
9	36	32	13.75	3.00	21	21.25	3.5	–	–	–	30	36	–
9	44	39	13.75	2.75	25	21.75	3.0	–	–	–	24	36	–
9	45	39	14.00	4.00	26	21.25	4.5	–	–	–	24	36	–
10	25	24	12.75	3.50	17	18.25	4.0	–	–	–	36	36	36
10	34	33	12.50	4.00	21	20.00	4.0	–	–	–	30	36	36
10	35	34	12.50	3.75	23	18.75	4.0	–	–	–	30	36	36
10	36	35	12.50	3.50	24	18.50	3.0	–	–	–	30	36	36
10	44	44	12.00	4.00	29	18.50	4.5	–	–	–	24	36	36
10	45	44	12.50	3.00	29	19.00	3.0	–	–	–	24	36	36
11	25	27	11.25	3.00	17	18.25	4.0	12	26.75	3	36	36	36
11	34	36	11.50	2.75	24	17.50	2.5	17	25.00	4	24	36	36
11	35	37	11.50	3.00	24	18.00	3.0	17	25.75	4	24	36	36
11	36	40	11.00	2.00	25	17.75	3.0	17	26.50	4	24	36	36
11	44	48	11.125	2.50	30	18.00	3.0	21	26.00	4	24	36	36
11	45	49	11.125	3.00	31	17.75	4.0	22	25.50	3	24	36	36
12	25	–	–	–	19	16.25	4.0	13	24.50	3	36	36	36
12	34	–	–	–	26	16.00	4.0	18	23.50	4	24	36	36
12	35	–	–	–	26	16.50	4.0	19	23.00	3	24	36	36
12	36	–	–	–	27	16.25	4.5	20	22.25	4.5	24	36	36
12	44	–	–	–	33	16.25	4.0	24	22.50	5	24	30	36
12	45	–	–	–	35	15.75	3.0	25	22.25	3	24	30	36

MINIMUM LAP LENGTH (L):
A. # 4 BARS ; L = 22 INCHES
B. # 5 BARS ; L = 27 INCHES
C. # 6 BARS ; L = 32 INCHES

NOTES:

1. THE MAXIMUM WIDTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'–0".
2. ALL EARTHEN AREAS ARE TO BE HYDROMULCHED UNLESS SHOWN OTHERWISE ON DRAWINGS.
3. CONTRACTOR MAY SAW CUT IN LIEU OF DEFORMED METAL STRIP.
4. USE STRIP OF SOD GRASS TO PREVENT EROSION UNTIL STAND OF GRASS IS ESTABLISHED.
5. AN EQUAL OR LARGER AREA OF WELDED REINFORCEMENT BAR CONFORMING TO ASTM A497, MAY BE SUBSTITUTED FOR REBARS LISTED IN TABLE 1.
6. IF AVAILABLE ROW IS NOT SUFFICIENT TO ACCOMMODATE SIDEWALK WIDTH (SW) ACCORDING TO IDM REQUIREMENTS, ENGINEER SHALL OBTAIN A VARIANCE FROM THE CITY ENGINEER.
7. REFER TO CONTRACT DRAWINGS FOR PAVEMENT WIDTH (PW) AND PAVEMENT THICKNESS (D), MEDIAN (M), PEDESTRIAN REALM (PR), SIDEWALK (SW), FRONTAGE BUFFER (FB), AND SAFETY BUFFER (SB) WIDTHS.

NO.	DATE	REVISION	APP.

APPROVED BY: DocuSigned by: Sukat kanwar — CITY ENGINEER
APPROVED BY: DocuSigned by: tolling McMeen — CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock — DIRECTOR OF HOUSTON PUBLIC WORKS

EFF DATE: NOV–27–2023 | DWG NO: 02751–01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONCRETE PAVEMENT DETAILS

DRAWING SCALE
NOT TO SCALE

FOR CITY OF HOUSTON USE ONLY

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

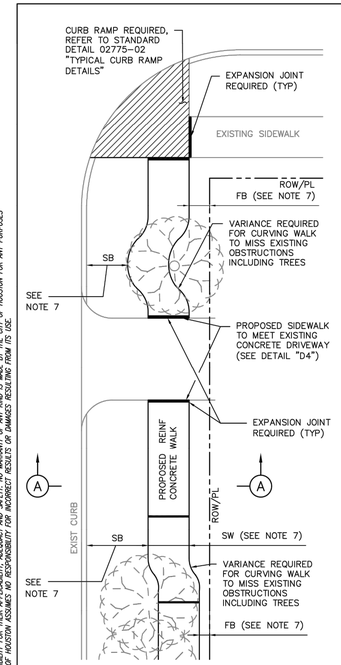
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 12 OF 72	

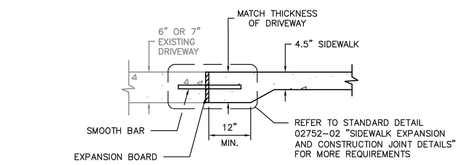
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CADD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5



PLAN VIEW

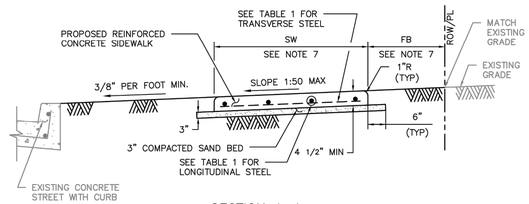


DETAIL D4
DRIVEWAY/SIDEWALK HEADER

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			TRANSVERSE STEEL #3 BARS SPACING (IN)
		#3 BARS			
		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.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

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

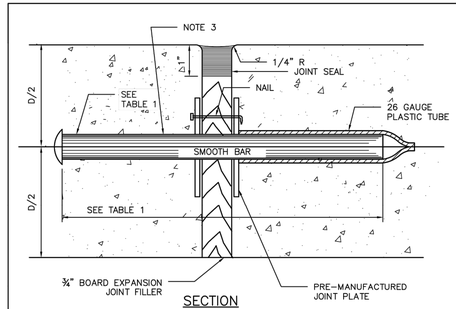
APPROVED BY:

DocuSigned by: Sukul Tanwar — CITY ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW
DocuSigned by: HANG NGUYEN — CITY TRAFFIC ENGINEER

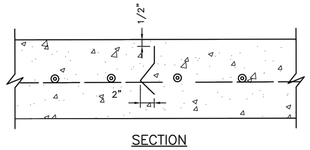
EFF DATE: NOV-27-2023 | DWG NO: 02775-01

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 INJURIES, DEATHS OR DAMAGES RESULTING FROM ITS USE.

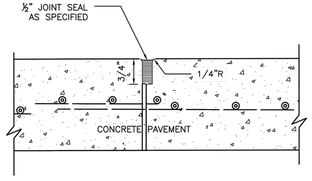
DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5



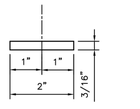
SECTION
DOWEL TYPE EXPANSION JOINT



SECTION
DEFORMED METAL STRIP



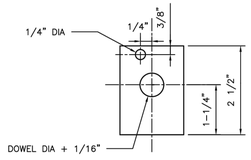
SECTION
CONSTRUCTION JOINT SEAL



PLAN VIEW
JOINT PLATE

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



ELEVATION VIEW
JOINT PLATE

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: Sukul Tanwar — CITY ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW
DocuSigned by: HANG NGUYEN — CITY TRAFFIC ENGINEER

EFF DATE: NOV-27-2023 | DWG NO: 02752-01

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

WAUGH SAFETY IMPROVEMENTS

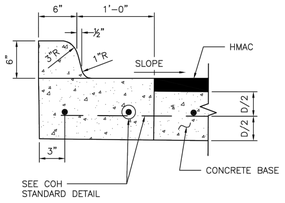
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 13 OF 72	

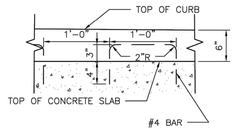
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B86D5

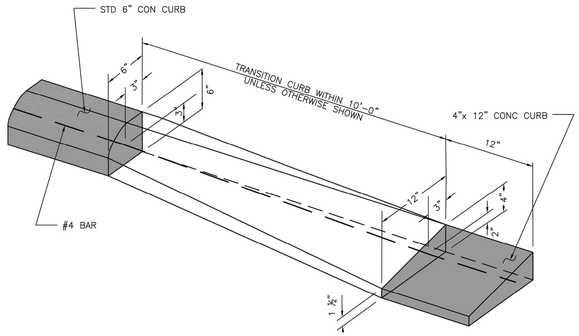
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR 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.



ESPLANADE CURB CONNECTED TO CONCRETE BASE

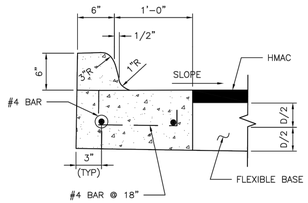


ALTERNATE CONCRETE CURB REINFORCEMENT

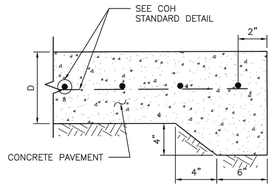


CURB TRANSITION

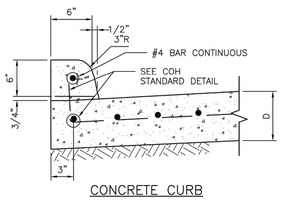
(SEE NOTES)



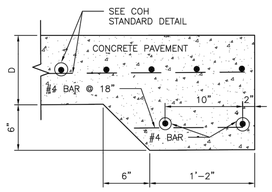
ESPLANADE CURB CONNECTED TO FLEXIBLE BASE



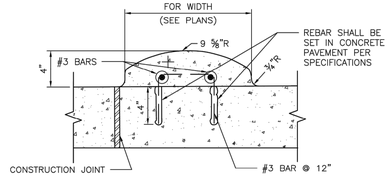
STANDARD CONCRETE PAVING HEADER



CONCRETE CURB

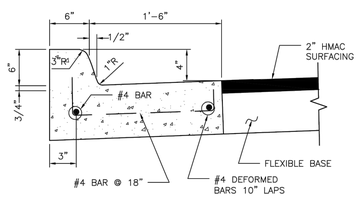


STANDARD RAILROAD HEADER

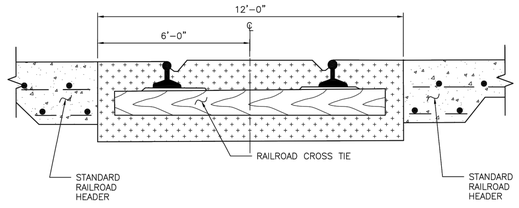


MOUNTABLE CURB

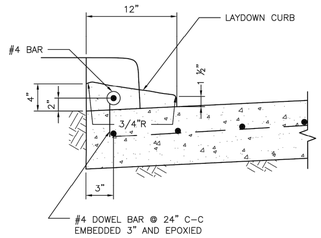
WHEN CONCRETE CURB IS TO BE PLACED EXISTING CONCRETE USE BASE #4 BAR @ 18x10" LONG, DOWELED AND SET IN EPOXY GROUT. SET #4 DOWEL BARS, 25" LONG AT 12" C–C WHEN PAVEMENT SECTION POURED.



MONOLITHIC CURB AND GUTTER

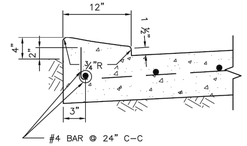


STANDARD RAILROAD CROSSING – SINGLE TRACK



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.

NO.	DATE	REVISION	APP.

APPROVED BY:	APPROVED BY:
DocuSigned by: Sulad Kanwar 9EF8B0C641F5478...	DocuSigned by: LETHING NGUYEN 95A2BEFDA7D84CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock A80CA10B72E5402...	
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

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

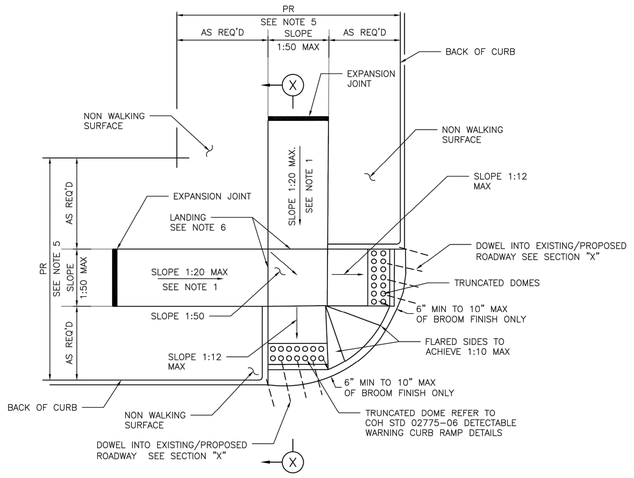
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 14 OF 72	

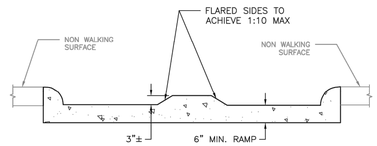
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

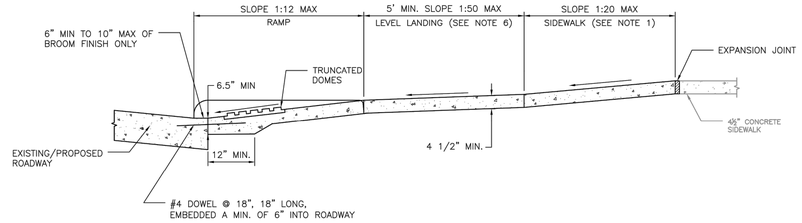
DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B86D5



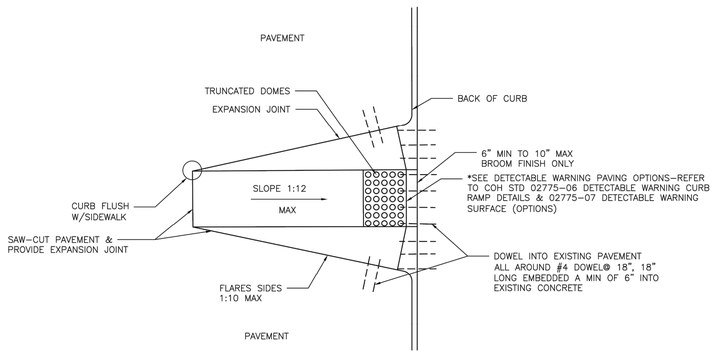
STREETS WITH NON– WALKING SURFACE BEHIND CURB
SEE NOTE–7



ELEVATION
LOOKING UP RAMP



SECTION X–X



CURB RAMP CONSTRUCTION FOR EXISTING PAVEMENT

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.

APPROVED BY:	APPROVED BY:
DocuSigned by: Sukat kanwar	DocuSigned by: tiffiNG MCMIKEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock	
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

DRAWING SCALE	FOR CITY OF HOUSTON USE ONLY
NOT TO SCALE	

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

WAUGH SAFETY IMPROVEMENTS

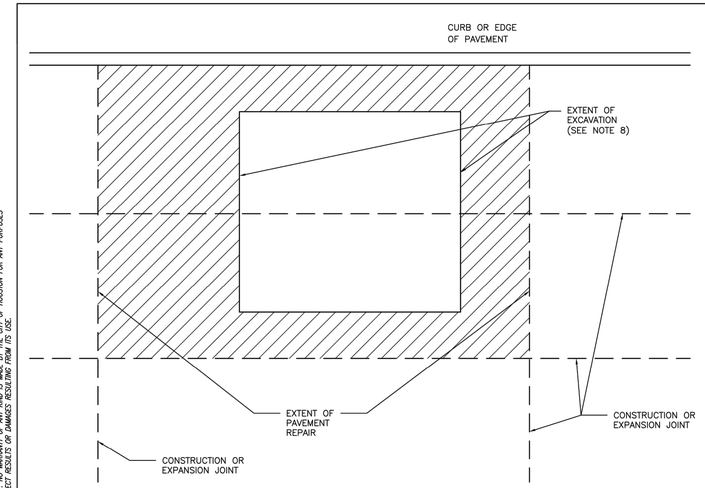
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 15 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

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



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: Sukul Kanwar — CITY ENGINEER
DocuSigned by: KHANG NGUYEN — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW

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

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 OR LIABILITY FOR ANY DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES OR LOSS OF PROFIT RESULTING FROM ANY USE.

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

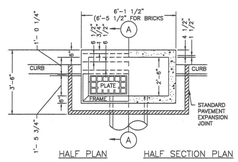
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 16 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

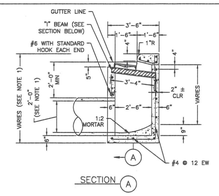
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

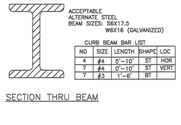
02632-04



GENERAL NOTES:

USE STANDARD CAST IRON FRAME & PLATES. LEAD SHALL LEAVE INLET AT LOCATION AND GRADE REQUIRED.





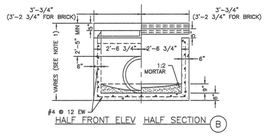
CURB BEAM BAR LIST

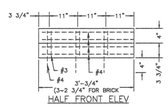
NO.	SIZE	LENGTH	SHAPE	LOC
4	#4	5'-10"	ST	HOR
5	#4	0'-10"	ST	VERT
7	#3	1'-6"	ST	

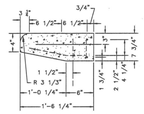
SECTION THRU BEAM

NOTES:

1. DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
2. CENTER REINFORCING IN SLAB AND WALLS. CENTER STEEL BEAM ON INLET AND CAST INTO WALLS AS SHOWN.
3. WHERE TOP OF CURB TO FLOWLINE IS GREATER THAN 8 FEET USE TYPE "C" INLET.





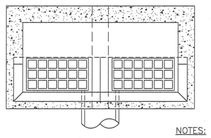


PRECAST CURB BEAM

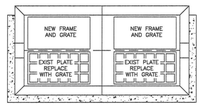
STORM SEWER TYPE "B-B" INLET
NTS

02632-05

STEP 1: EXIST TYPE "B" INLET

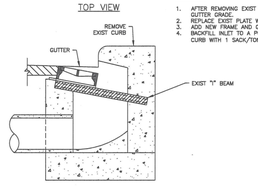


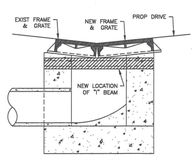
STEP 2:



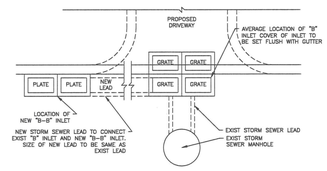
NOTES:

1. AFTER REMOVING EXIST CURB, RAISE EXIST FRAME TO GUTTER GRADE.
2. REPLACE EXIST PLATE WITH A GRATE.
3. ADD NEW FRAME AND GRATE NEXT TO EXIST FRAME.
4. BACKFILL INLET TO A POINT ONE FOOT BEHIND THE CURB WITH 1 SACK/TON CEMENT STABILIZED SAND.





STEP 3: CONSTRUCT NEW TYPE "B-B" INLET ON CURB RETURN OF PROPOSED DRIVEWAY



STORM SEWER TYPE "B" INLET RELOCATION
NTS

FIRM INFORMATION | ENGINEER'S SEAL

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STORM SEWER
02632-04 THROUGH 05

APPROVED BY: CITY ENGINEER
APPROVED BY: DEPUTY DIRECTOR
APPROVED BY: DIRECTOR

EFFECTIVE DATE: JUL-01-2019
FOR CITY OF HOUSTON USE ONLY

SHEET NO.

NO.	DATE	REVISION	APP.

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STORM SEWER DETAILS

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 17 OF 72	

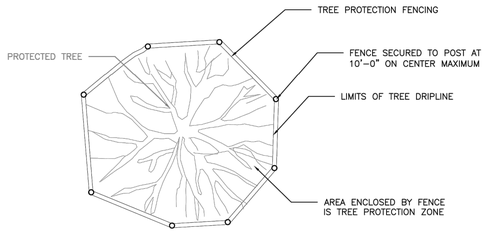
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

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

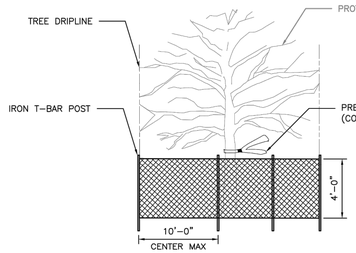
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR 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 OR INDEMNIFICATION FOR INCIDENTS OR DAMAGES RESULTING FROM ITS USE.

NOTES:

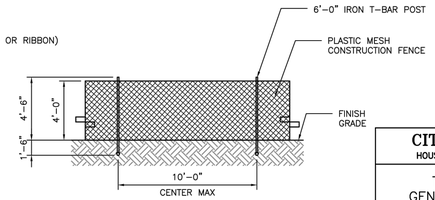
FENCE LOCATION MAY BE ADJUSTED TO ACTUAL SITE CONDITIONS.



PLAN VIEW
TREE PROTECTION FENCING DETAIL



FRONT VIEW
TREE PROTECTION FENCING DETAIL



DETAIL B–4
PROTECTIVE PLASTIC MESH FENCE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION
GENERAL REQUIREMENTS

(SCALE: NOT TO SCALE)

APPROVED BY:

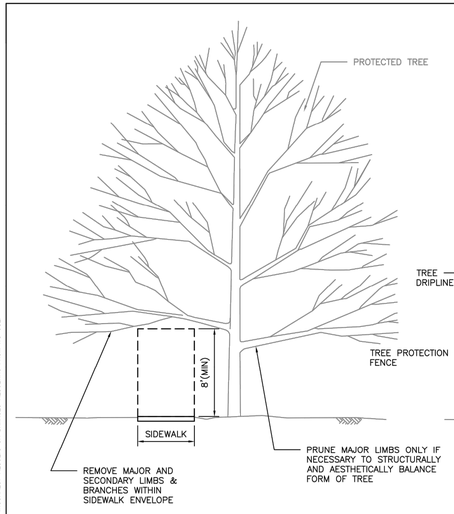
DocuSigned by: Suhail Kanwar — CITY ENGINEER	DocuSigned by: Carl Haddock — DIRECTOR OF HPW
EFF DATE: NOV–27–2023	DWG NO: 01562–01

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

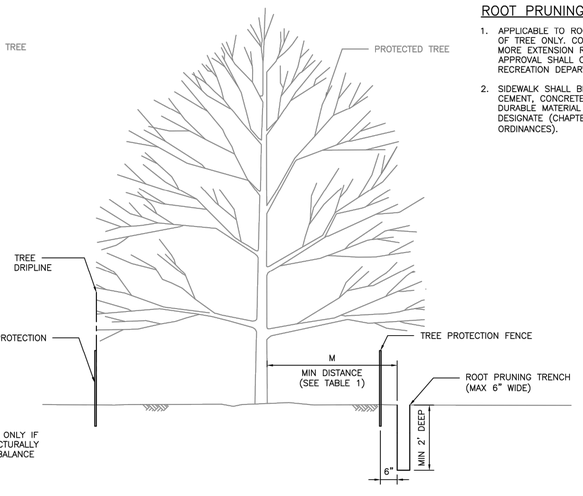
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR 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 OR INDEMNIFICATION FOR INCIDENTS OR DAMAGES RESULTING FROM ITS USE.

ROOT PRUNING NOTE:

1. APPLICABLE TO ROOT PRUNING ON ONE SIDE OF TREE ONLY. CONSULT CITY ARBORIST FOR MORE EXTENSION ROOT PRUNING. FINAL APPROVAL SHALL COME FROM PARKS AND RECREATION DEPARTMENT.
2. SIDEWALK SHALL BE CONSTRUCTED OF EITHER CEMENT, CONCRETE, ASPHALT OR OTHER DURABLE MATERIAL AS THE COUNCIL MAY DESIGNATE (CHAPTER 40–91, CODE OF ORDINANCES).



TREE PRUNING



ROOT PRUNING DETAIL

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION
TREE AND ROOT PRUNING

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail Kanwar — CITY ENGINEER	DocuSigned by: Carl Haddock — DIRECTOR OF HPW
EFF DATE: NOV–27–2023	DWG NO: 01562–02

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TREE PROTECTION DETAILS

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 18 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

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

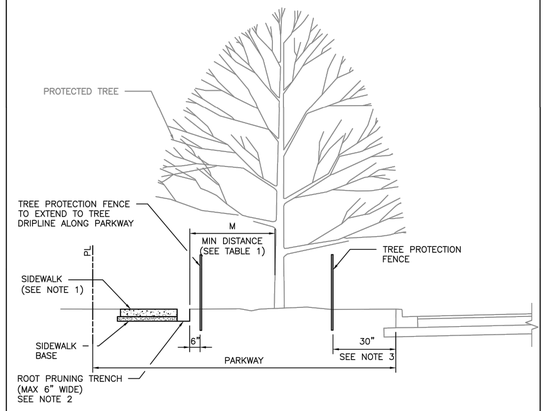


TABLE 1 "M" DISTANCE TABLE	
TREE TRUNK DIA. (IN)	*MINIMUM DISTANCE 'M'
< 6"	3 FEET
6" ≤ DIA. ≤ 20"	0.75 FEET PER DIA.–INCH
> 20"	CONSULT CITY ARBORIST

*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.

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

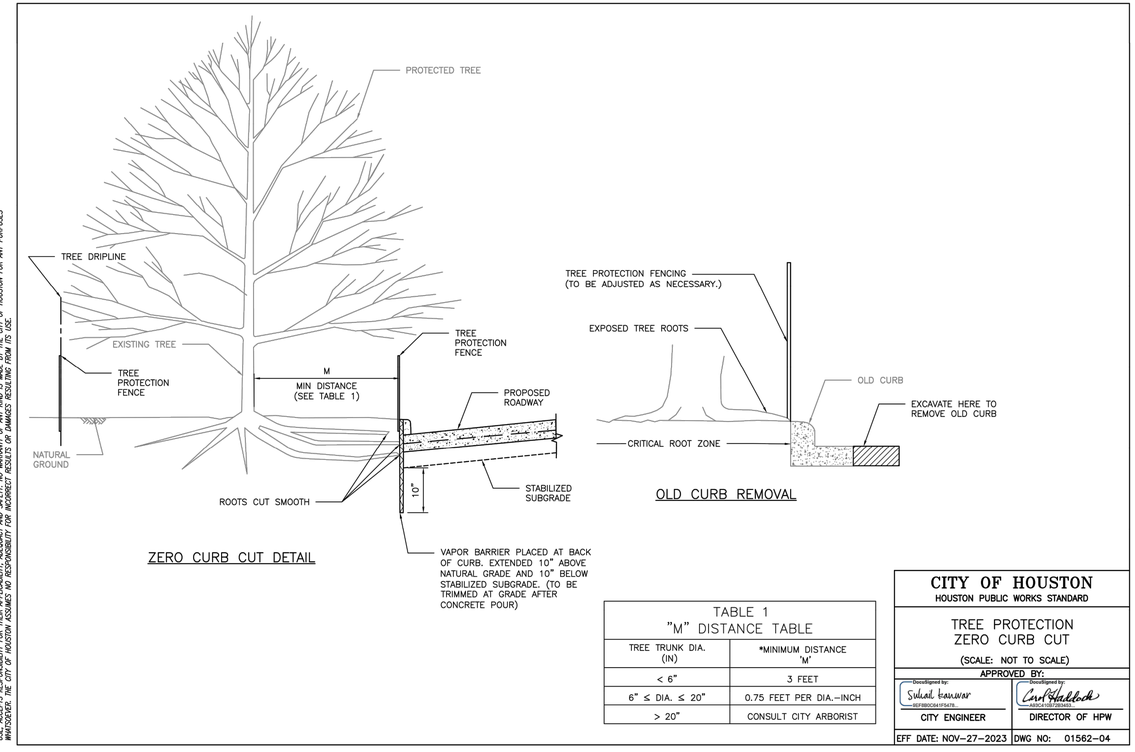
CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION/
IN SIDEWALK REPAIRS
IN PARKWAY AREAS

(SCALE: NOT TO SCALE)

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

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



ZERO CURB CUT DETAIL

OLD CURB REMOVAL

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

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TREE PROTECTION
ZERO CURB CUT

(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 01562–04

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

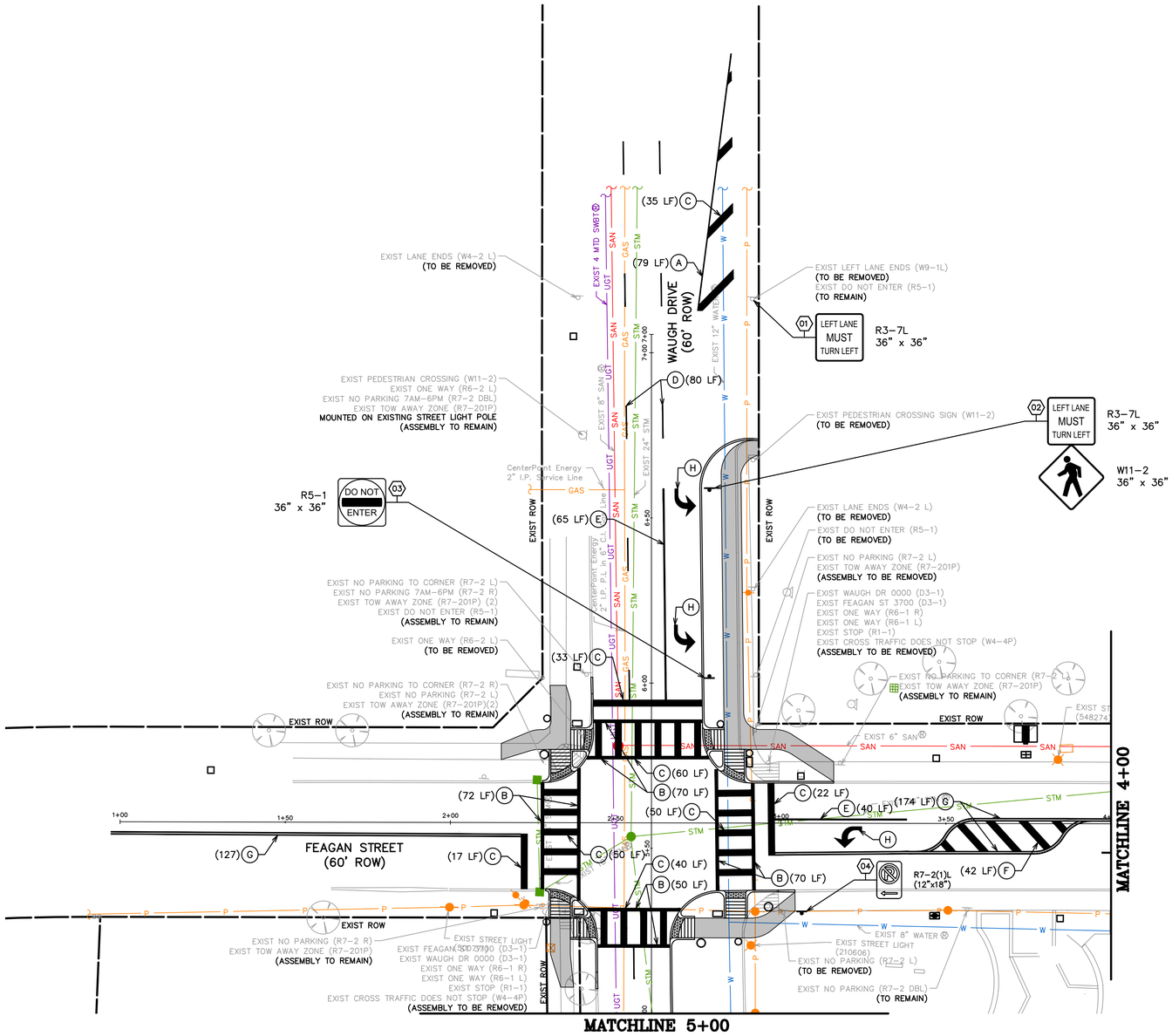
TREE PROTECTION DETAILS

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 19 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM



PAVEMENT MARKING LEGEND

- (A) WS4
- (B) WS12
- (C) WS24
- (D) WB4-R40
- (E) WS6-R20
- (F) YS24
- (G) YDS4-A40/A40
- (H) WS LEFT TURN ARROW
- (J) WS RIGHT TURN ARROW
- (K) WS WORD

NO.	DATE	REVISION	APP.

0 5 10 20 40 60

SCALE: 1" = 20'

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR AT FEAGAN ST PAVEMENT MARKING & SIGNAGE

WAUGH SAFETY IMPROVEMENTS

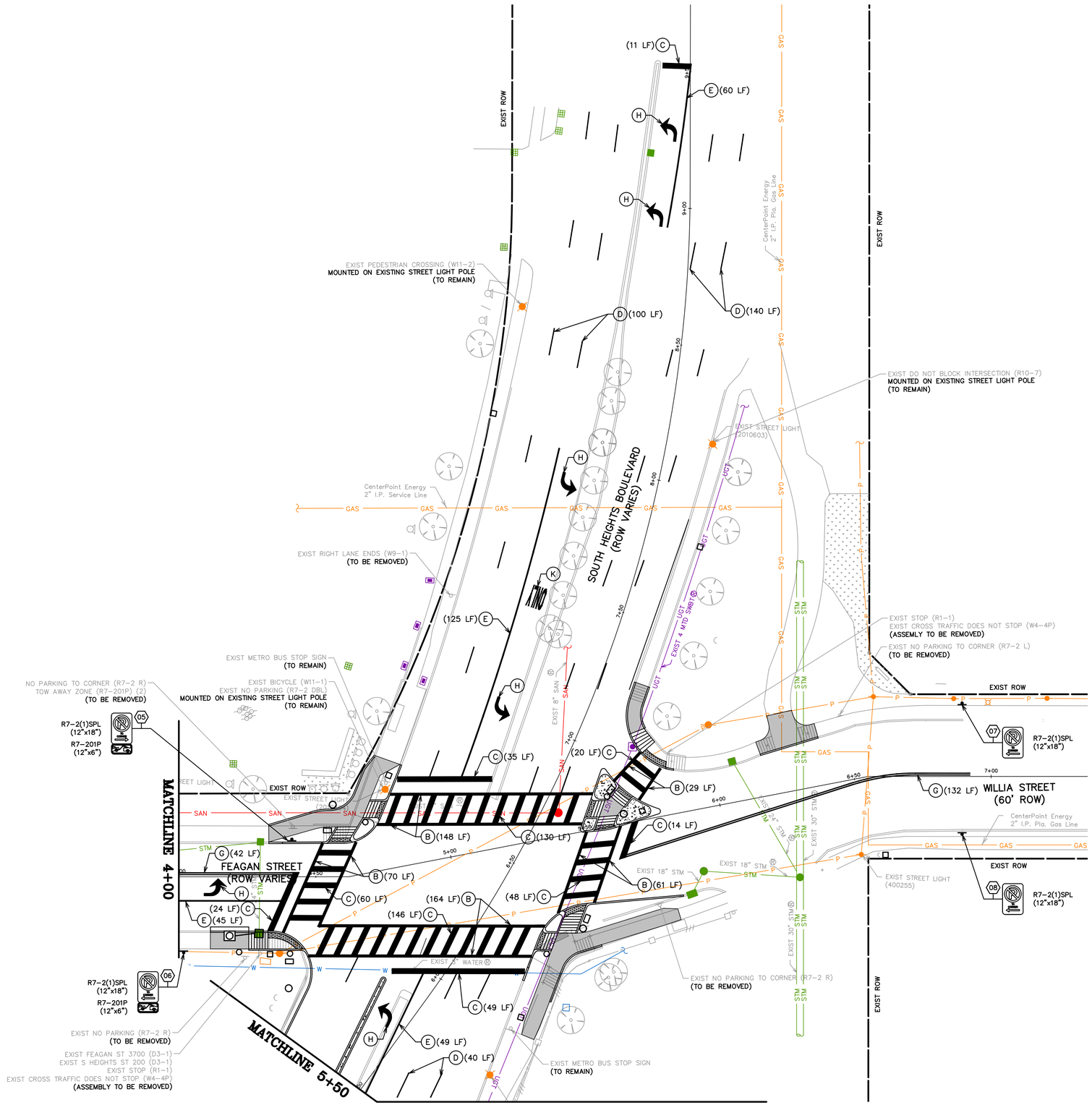
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 20 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-005-PAVEMENT MARKING.DWG, 3/25/2024 5:47 PM

PAVEMENT MARKING LEGEND

- (A) WS4
- (B) WS12
- (C) WS24
- (D) WB4-R40
- (E) WS6-R20
- (F) YS24
- (G) YDS4-A40/A40
- (H) WS LEFT TURN ARROW
- (J) WS RIGHT TURN ARROW
- (K) WS WORD

NO.	DATE	REVISION	APP.



0 5 10 20 40 60

SCALE: 1" = 20'

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY

1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY

Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY

FB NO.

INTERIM REVIEW

Not intended for construction, bidding or permit purposes.

Engineer: VICTORIA M. MACALINO, P.E.

P.E. Serial No.: 142304

Date: MARCH 2024

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

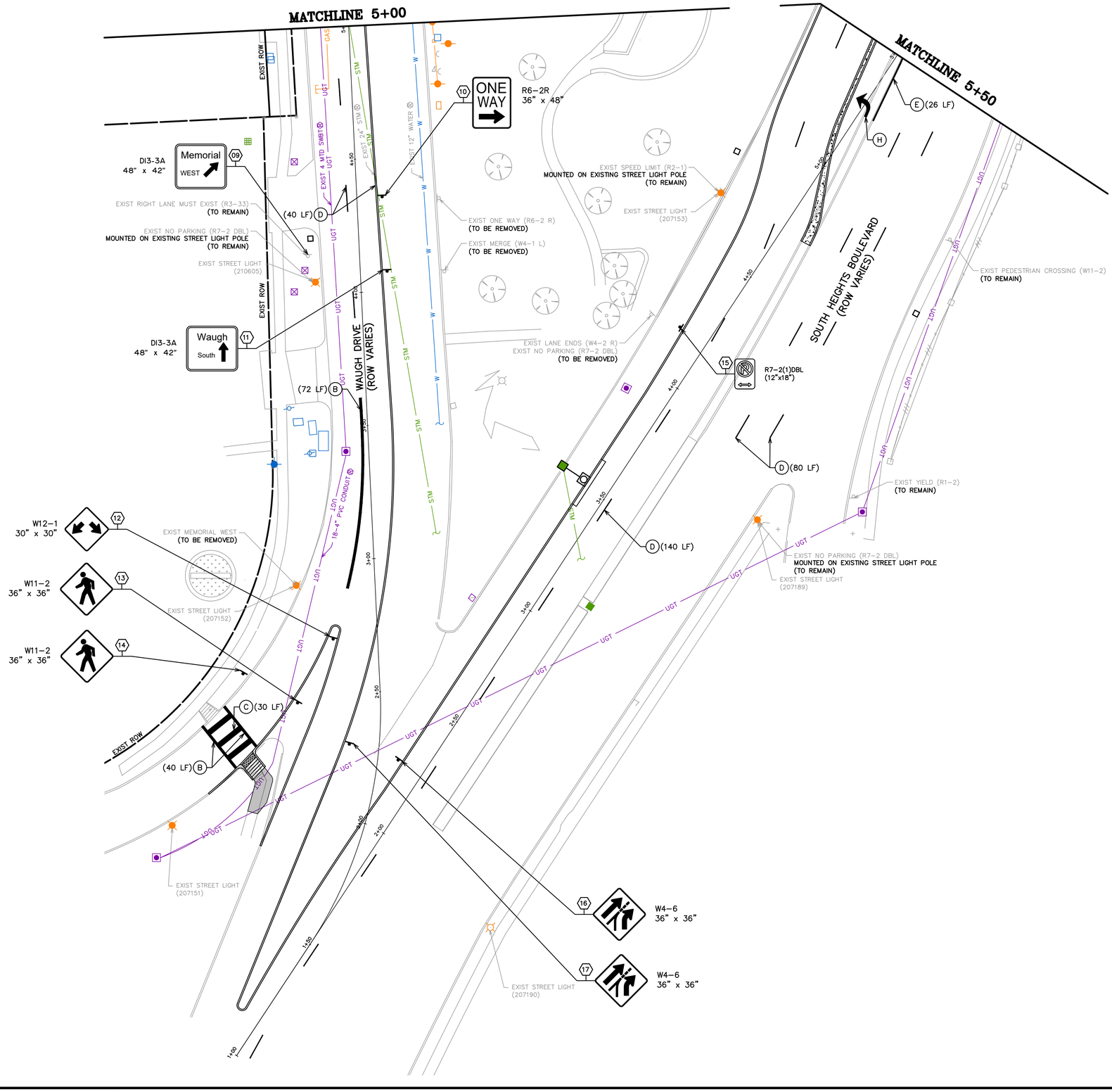
S. HEIGHTS BLVD AT FEAGAN ST PAVEMENT MARKING & SIGNAGE

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 21 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-005-PAVEMENT MARKING.DWG, 3/25/2024 5:47 PM



PAVEMENT MARKING LEGEND

- (A) WS4
- (B) WS12
- (C) WS24
- (D) WB4-R40
- (E) WS6-R20
- (F) YS24
- (G) YDS4-A40/A40
- (H) WS LEFT TURN ARROW
- (J) WS RIGHT TURN ARROW
- (K) WS WORD

NO.	DATE	REVISION	APP.

0 5 10 20 40 60

SCALE: 1" = 20'

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY

1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY

Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.

Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR AT S. HEIGHTS BLVD PAVEMENT MARKING & SIGNAGE

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER
N-T05000-0012-7
DRAWING SCALE
AS NOTED
CITY OF HOUSTON POC
TOMS MATHEW
SHEET NO. 22 OF 72

FOR CITY OF HOUSTON USE ONLY

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-01-005-PAVEMENT MARKING.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

DESCRIPTION AND APPLICATION OF PAVEMENT MARKING LINES

LINE SERIES	COLOR	DESCRIPTION	WIDTH (INCHES)	TYPICAL APPLICATIONS
WB	WHITE	BROKEN (10' STRIPE W/30' GAP)	4"	LANE LINES BETWEEN TRAVEL LANES IN THE SAME DIRECTION WHERE CHANGING OF LANES IS PERMITTED.
WS	WHITE	SOLID	4"	EDGE LINES TO DELINEATE THE RIGHT EDGE OF THE ROADWAY.
			6"	LEFT EDGE OF BICYCLE LANE AND LANE LINES BETWEEN TRAVEL LANES IN THE SAME DIRECTION WHERE CHANGING OF LANES IS DISCOURAGED.
			12"	PERPENDICULAR CROSSWALK LINES.
			24"	STOP BARS AT INTERSECTIONS (SIGNALIZED AND UNSIGNALIZED).
				HATCHING AT HIGH VISIBILITY CROSSWALKS.
			12", 24"	DIAGONAL HATCHING USED IN GORES BETWEEN SAME DIRECTION OF TRAVEL LANES.
WG	WHITE	GUIDE (2' STRIPE W/6' GAP)	6"	GUIDE LINES THROUGH INTERSECTIONS.
				TAPER LINES FOR TURN LANES.
				GUIDE LINES FOR BICYCLE LANES.
YS	YELLOW	SOLID	4"	EDGE LINES TO DELINEATE THE LEFT EDGE OF A DIVIDED ROADWAY, A ONE-WAY ROAD, OR RAMP.
			6"	BIDIRECTIONAL BICYCLE LANE PAVEMENT MARKING.
			12", 24"	DIAGONAL HATCHING USED IN GORES BETWEEN OPPOSING DIRECTION OF TRAVEL LANES.
YDS	YELLOW	DOUBLE SOLID	4" – (4") – 4" (GAP)	CENTERLINE THAT SEPARATES OPPOSING TRAVEL LANES AND DELINEATION OF MEDIAN ISLANDS.
YDB	YELLOW	DOUBLE BROKEN	4" – (4") – 4" (GAP)	DEFINES THE EDGES OF CENTER REVERSIBLE LANES THAT ARE USED AS TWLTLS DURING INTERMITTENT PERIODS.
YB	YELLOW	BROKEN (10' STRIPE W/30' GAP)	4"	SEPARATES TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS OF TRAVEL.
YB (BIKE)	YELLOW	BROKEN (3' STRIPE W/9' GAP)	4"	SEPARATES BICYCLE TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS OF TRAVEL.
YSB	YELLOW	SOLID & BROKEN BROKEN (10' STRIPE W/30' GAP)	4" – (4") – 4" (GAP)	SEPARATES TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN ONE DIRECTION AND PROHIBITED IN THE OPPOSITE DIRECTION.
				USED FOR EDGE OF TWO-WAY LEFT TURN LANES (TWLTL).
BICYCLE GREEN	GREEN	SOLID COLORED PAVEMENT	VARIES	PED/BIKE CROSSING
				VEHICLE / BIKE/ CONFLICT AREA
YIELD LINE	WHITE	TRIANGLE	16" x 24"	MID-BLOCK CROSSING.

DESCRIPTION AND APPLICATION OF REFLECTIVE RAISED PAVEMENT MARKERS (RPM)

RRPM TYPES	COLOR	COH SPEC. SEC. 02764 EQUIVALENT	DESCRIPTION
C	CLEAR	TYPE I-C	APPROACH FACE THAT REFLECTS WHITE LIGHT, AND THE OTHER SIDE DOES NOT REFLECT.
R	CLEAR & RED	TYPE II-C-R	APPROACH FACE THAT REFLECTS WHITE LIGHT, AND THE OTHER SIDE REFLECTS RED LIGHT.
A	AMBER & AMBER	TYPE II-A-A	APPROACH FACE AND THE OTHER SIDE BOTH REFLECT AMBER LIGHT.

LINE STYLE DESIGNATION : YSB4 – A40/A40

- YSB4: COLOR
- YSB4: PATTERN
- YSB4: WIDTH OF STRIPE
- A40/A40: RPM SPACING
- A40/A40: RPM TYPE
- A40/A40: RPM SPACING
- A40/A40: RPM TYPE

GENERAL PAVEMENT MARKING NOTES:

1. PRIOR TO START OF CONSTRUCTION, ALL EXISTING PAVEMENT MARKINGS WITHIN THE AREA OF CONSTRUCTION SHALL BE INVENTORIED AND DOCUMENTED JOINTLY BY THE CITY INSPECTOR AND THE CONTRACTOR. THIS DOCUMENT WILL BE JOINTLY SIGNED BY BOTH PARTIES REFLECTING ALL EXISTING PAVEMENT MARKINGS AND LANE CONFIGURATIONS WILL BE DUPLICATED AGAIN. THIS REVIEW CAN BE DONE IN CONJUNCTION WITH SIGN INVENTORY. THE CONTRACTOR IS HELD ACCOUNTABLE FOR EXISTING AND TEMPORARY CONSTRUCTION PAVEMENT MARKINGS THROUGHOUT THE PROJECT AND AT THE PROJECT'S COMPLETION.
2. ALL PAVEMENT MARKINGS SHALL CONFORM TO CITY OF HOUSTON STANDARDS AND SPECIFICATIONS AND GENERAL GUIDELINES OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
3. THE PERMANENT PAVEMENT MARKINGS MAY BE MODIFIED AS DIRECTED BY THE CITY TRAFFIC ENGINEER.
4. THE DESIGN SPEED FOR THE ROAD IS: _____. THE POSTED SPEED LIMIT IS: _____.
5. ALL LANE DIMENSIONS ARE FROM CENTER OF LANE LINE, CENTER OF DOUBLE LANE LINE, FACE OF CURB, OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
6. THE PAVEMENT MARKING DRAWINGS ARE SCHEMATIC ONLY. THE CONTRACTOR SHALL FOLLOW ALL DIMENSIONS, DETAILS, AND STANDARDS WHEN INSTALLING PAVEMENT MARKINGS AND SYMBOLS.
7. THE FINAL LONGITUDINAL STRIPINGS SHALL BE 60 MIL (0.060") THICK HOT-SPRAYED THERMOPLASTIC PLACED OVER THE TEMPORARY STRIPING WITHIN 14 TO 30 CALENDAR DAYS AFTER COMPLETION OF THE FINAL PAVEMENT SURFACE, OR AS DIRECTED BY THE CITY TRAFFIC ENGINEER. ALL OTHER PAVEMENT MARKINGS SHALL BE APPLIED AT THE SAME TIME. TEMPORARY STRIPING SHALL BE WATER BASED PAINT.
8. ALL FINAL TRANSVERSE MARKINGS SHALL BE 90 MIL (0.090") HOT-SPRAYED THERMOPLASTIC. ALL PAVEMENT ARROWS AND LEGENDS SHALL ALSO BE 90 MIL (0.090") HOT-SPRAYED THERMOPLASTIC. PREFORMED THERMOPLASTIC APPLICATIONS MAY BE USED IF ONLY APPROVED BY THE CITY TRAFFIC ENGINEER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LAYOUT AND INSTALLATION OF PAVEMENT MARKINGS OF FINAL SURFACE COURSE FOLLOWING CONTROL POINTS THAT HAVE BEEN SET NO MORE THAN 50 FEET APART ALONG THE LINES TO BE IMPLEMENTED. IN TANGENT SECTIONS OF A ROAD WHERE THE PAVEMENT MARKING PATTERN DOES NOT CHANGE, CONTROL POINTS CAN BE SET AT 200 FEET SPACING. THE LAYOUT AND INSPECTION OF ALL PAVEMENT MARKINGS SHALL BE APPROVED BY CITY OF HOUSTON REPRESENTATIVE PRIOR TO THE APPLICATION OF MATERIALS.
10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE FINAL SURFACE COURSE IS PLACED SO THAT THE STRIPING IS OFFSET NO MORE THAN ONE FOOT CLEAR OF THE CONSTRUCTION JOINT, UNLESS OTHERWISE DIRECTED BY THE CITY TRAFFIC ENGINEER.
11. ALL RAISED PAVEMENT MARKERS (RPMS) SHALL BE INSTALLED SO THAT THE REFLECTIVE FACE OF EACH MARKER IS FACING THE DIRECTION OF TRAFFIC AND IS PERPENDICULAR TO THE DIRECTION OF TRAFFIC FLOW. TYPE C PAVEMENT MARKERS SHALL BE INSTALLED SO THAT THE CLEAR FACE OF EACH MARKER IS FACING THE APPROACHING TRAFFIC FLOW AND PERPENDICULAR TO THE DIRECTION OF TRAFFIC FLOW.
12. ALL REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED IN ACCORDANCE TO CITY OF HOUSTON STANDARD SPECIFICATION 02762. APPLYING OVER EXISTING PAVEMENT MARKINGS DOES NOT CONSTITUTE AS APPROVED OBLITERATION METHOD.
13. THE ENGINEER OF RECORD SHALL BE REQUIRED TO PRODUCE AS-BUILT OF PAVEMENT MARKING PLANS WITHIN 30 DAYS AFTER COMPLETION OF PAVEMENT MARKING IMPLEMENTATION.
14. BLUE RPMS MAY BE PLACED ADJACENT TO FIRE HYDRANTS WITH THE APPROVAL OF THE CITY TRAFFIC ENGINEER.
15. FOR ALL CONSTRUCTION, ALL PAVEMENT MARKINGS AND SIGNING SHALL BE INSTALLED AND SHALL BE PAID BY THE PROJECT OWNER/DEVELOPER.
16. FINAL INSPECTION AND ACCEPTANCE OF PAVEMENT MARKINGS SHALL BE PERFORMED BY TRANSPORTATION & DRAINAGE OPERATION REPRESENTATIVE (713-803-3054).

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 9CF8B0C661F947B...	DocuSigned by: KHANG NGUYEN 95A285FDA708ef30...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Ellinger Haddock A60C4105F2B3464...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02760-01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PAVEMENT MARKINGS GENERAL NOTES AND LEGENDS

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

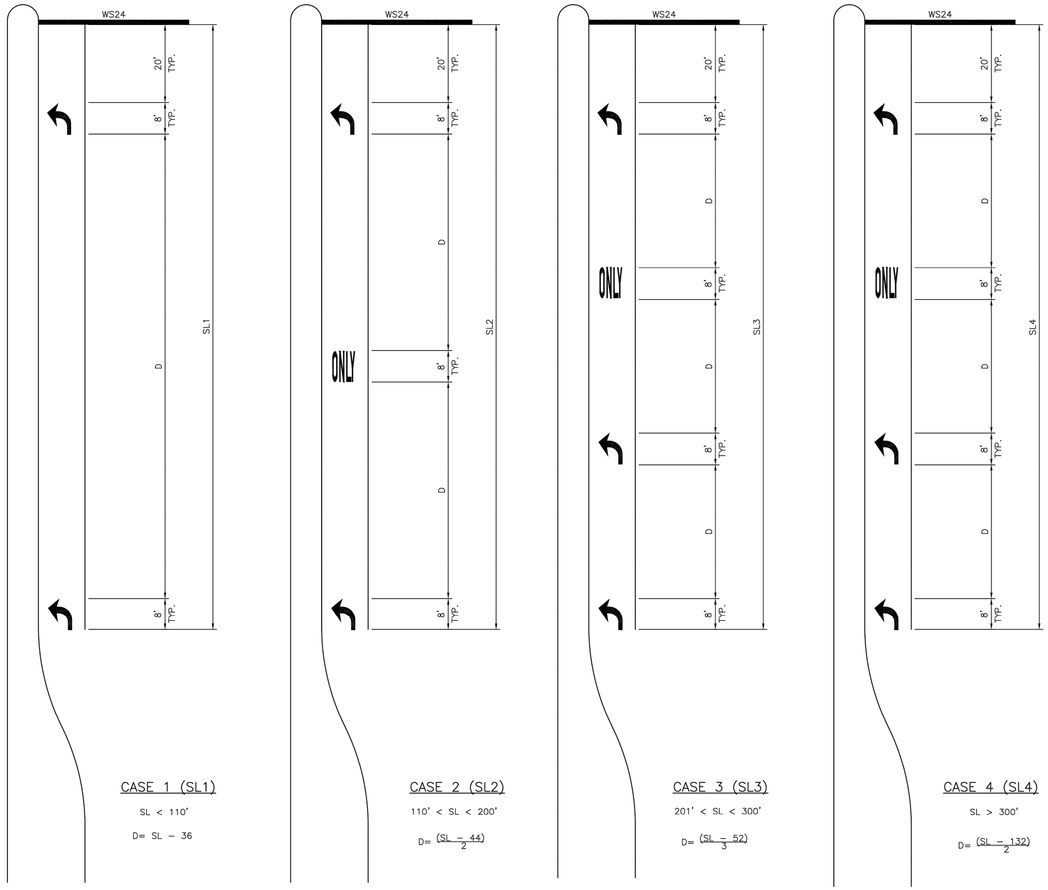
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 23 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5



KEY (FOR TURN LANES ONLY):

SL – STORAGE LENGTH (FEET)

D – DISTANCE BETWEEN ARROWS AND/OR WORDS (FEET)

GENERAL NOTES:

1. ALL CASES AND DETAILS ALSO APPLY TO RIGHT–TURN LANES.
2. FOR DUAL–TURN LANES, DIMENSIONS SHALL BE THE SAME FOR EACH LANE.
3. SL DIMENSION IS FROM BACK OF STOP LINE TO END OF TURN LANE.
   NOTE: DO NOT INCLUDE TAPER LENGTH.
4. PAVEMENT ARROWS AND "ONLY" LEGEND MARKINGS ARE TYPICALLY USED AT ALL SIGNALIZED INTERSECTIONS AND AT ALL UNSIGNALIZED INTERSECTIONS THAT HAVE TURN LANES.
5. MINIMUM SL= 100'. SL MAY BE LESS THAN 100 FEET ONLY BY APPROVAL OF THE CITY TRAFFIC ENGINEER.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 82F8B0C841F9478...	DocuSigned by: Hailing Nguyen 93A3EF0A7B9643...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock A9DC41087383403...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02760–02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

LEFT/RIGHT–TURN "ONLY" AND ARROW SPACING

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE

NOT TO SCALE

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY

FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.

Engineer: VICTORIA M. MACALINO, P.E.

P.E. Serial No.: 142304

Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 24 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122281-CF05-457B-9A65-2650F40B66D5



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:	APPROVED BY:
DocuSigned by: Suhail Kauwar — 352FBB0C641F947B...	DocuSigned by: KHANG NGUYEN — 95A28EFDA708ACD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock — A65C61697283465...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02760-03

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STANDARD PAVEMENT MARKING – (WORDS)

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

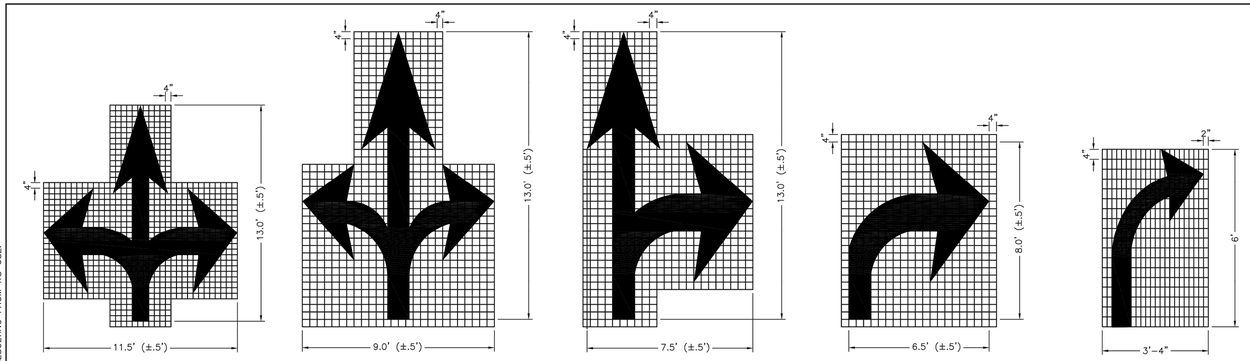
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 25 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122281-CF05-457B-9A65-2650F40B66D5



NOTES FOR PAVEMENT MARKINGS "SYMBOLS" AND "ARROWS":

1. MINIMUM 8 FOOT WHITE MARKINGS SHALL BE USED, UNLESS OTHERWISE NOTED. IF MESSAGE CONSISTS OF MORE THAN ONE WORD, IT SHOULD BE PLACED WITH FIRST WORD NEAREST THE DRIVER.
2. THESE DETAILS ARE STANDARD SIZE FOR NORMAL INSTALLATION; SIZES MAY BE REDUCED APPROXIMATELY ONE–THIRD DEPENDING ON CONDITIONS. SPECIAL PERMISSION NEEDED BY CITY TRAFFIC ENGINEER FOR REDUCTION BELOW ONE–THIRD OF STANDARD SIZES.
3. THE LONGITUDINAL SPACE BETWEEN MARKINGS SHOULD BE 30 FEET, OR AS INDICATED ON THE PLANS.
4. MARKINGS CONSIDERED APPROPRIATE FOR USE WHEN WARRANTED INCLUDE THE FOLLOWING:

   A. REGULATOR
      STOP
      RIGHT (LEFT) TURN ONLY, SYMBOL ARROWS.

   B. WARNING
      STOP AHEAD
      SIGNAL AHEAD
      SCHOOL
      SCHOOL X–ING
      PED X–ING
      R X R (SEE SHEET 02760–08 DETAILS
      OTHER WORDS OR SYMBOLS MAY BE NECESSARY UNDER CERTAIN CONDITIONS. SPECIAL PERMISSION NEEDED BY CITY TRAFFIC ENGINEER FOR SPECIAL CONDITIONS.

5. UNCONTROLLED USE OF PAVEMENT MARKINGS CAN RESULT IN DRIVER CONFUSION. WORD AND SYMBOL MARKINGS SHOULD BE NO MORE THAN THREE LINES.
6. THE WORD "STOP" SHALL NOT BE USED ON THE PAVEMENT UNLESS ACCOMPANIED BY A STOP LINE AND STOP SIGN. THE WORD "STOP" SHALL NOT BE PLACED ON THE PAVEMENT IN ADVANCE TO A STOP LINE, UNLESS EVERY VEHICLE IS REQUIRED TO STOP AT ALL TIMES (ALL–WAY STOP).
7. PAVEMENT MARKINGS SHOULD GENERALLY BE NO MORE THAN ONE LANE IN WIDTH, WITH SCHOOL MESSAGES BEING THE EXCEPTION. FOR DETAILS OF SCHOOL AND SCHOOL CROSSING PAVEMENT MARKINGS, REFER TO PART VII OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
8. SPACING BETWEEN STANDARD SIZE LETTERS SHOULD BE 4 INCHES (MIN). THE WIDTH OF NON–STANDARD SIZE LETTERS MAY VARY DEPENDING ON THE WIDTH OF THE TRAVEL LANES. APPROVAL BY CITY TRAFFIC ENGINEER. SPECIAL PERMISSION NEEDED FOR NON–STANDARD SIZE "LETTER" AND/OR "ARROWS".
9. LANE–USE ARROW MARKINGS MAY BE USED TO CONVEY EITHER GUIDANCE OR MANDATORY MESSAGES. SINGLE TURN ARROWS USED TO CONVEY A MANDATORY MOVEMENT MUST BE ACCOMPANIED STANDARD SIGNS AND THE PAVEMENT MARKING WORD "ONLY".
10. PAVEMENT MARKINGS ARE TO BE LOCATED AS SPECIFIED IN THE DESIGN PLANS.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 902FBB0C661F0478...	DocuSigned by: KHANG NGUYEN 95A2EEFDA75B4C0...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Ellinger Haddock A55C4100F2B0454...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02760–04

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STANDARD PAVEMENT MARKING – SYMBOLS

DRAWING SCALE	FOR CITY OF HOUSTON USE ONLY
NOT TO SCALE	

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.

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 26 OF 72	

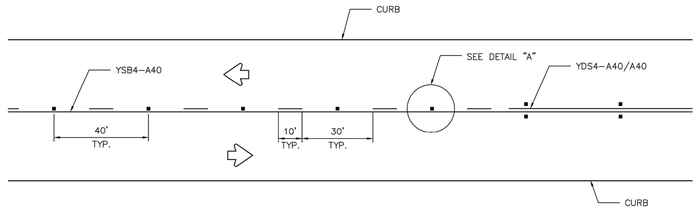
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B86D5

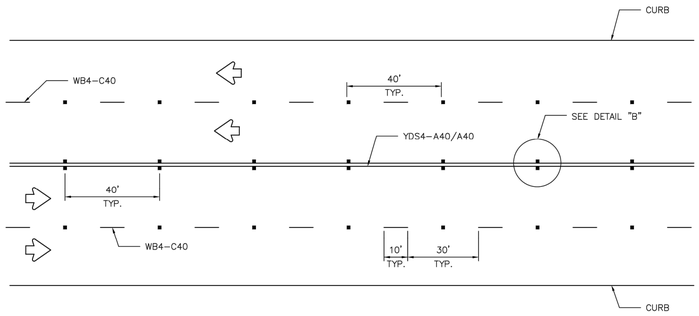
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. IT IS THE RESPONSIBILITY OF THE ENGINEER, OR REGISTERED ENGINEER IN RESPONSIBLE CHARGE, TO REVIEW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

CENTERLINE & FOR ALL TWO LANE STREETS WITH PASSING ZONE

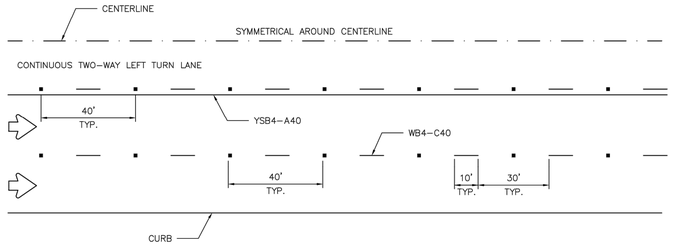


CENTERLINE & LANE LINES FOR FOUR LANE TWO–WAY STREETS

RRPM TYPE C, CLEAR FACE TOWARD NORMAL TRAFFIC, SHALL BE PLACED ON 40–FOOT CENTERS.

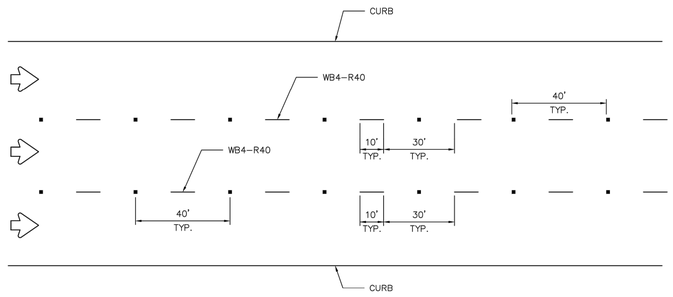


CENTERLINE & LANE LINES FOR TWO–WAY LEFT TURN LANE



LANE LINES FOR ONE–WAY MULTILANE STREET

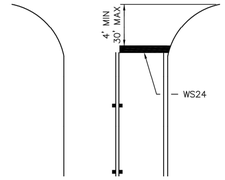
RRPM TYPE R SHALL HAVE CLEAR FACE TOWARD NORMAL TRAFFIC AND RED FACE TOWARD WRONG–WAY TRAFFIC.



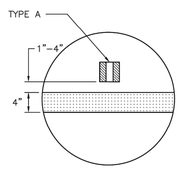
GENERAL NOTES:

1. EDGELINE ADJACENT TO CURB AND GUTTER IS NOT REQUIRED IN ALL CASES, HOWEVER SHALL BE PLACED AS DIRECTED BY CITY TRAFFIC ENGINEER.
2. THE TRAVELED WAY INCLUDES ONLY THAT PORTION OF THE ROADWAY USED FOR VEHICULAR TRAVEL AND NOT THE PARKING LANES, SIDEWALKS, BERMS AND SHOULDERS. THE TRAVELED WAYS SHALL BE MEASURED FROM THE INSIDE OF EDGELINE TO INSIDE OF EDGELINE OF A TWO LANE ROADWAY.
3. ALL RAISED PAVEMENT MARKERS PLACED IN BROKEN LINES SHALL BE PLACED IN LINE WITH AND MIDWAY BETWEEN THE STRIPES.
4. ON CONCRETE PAVEMENTS THE RAISED PAVEMENT MARKERS SHOULD BE PLACED TO ONE SIDE OF THE LONGITUDINAL JOINTS.
5. ALL PAVEMENT MARKING MATERIAL SHALL MEET THE REQUIRED MATERIAL SPECIFICATIONS AS SPECIFIED BY CITY OF HOUSTON STANDARD SPECIFICATIONS.

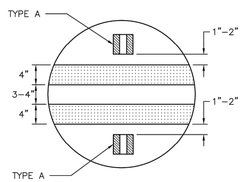
GUIDE FOR PLACEMENT OF STOP LINES & CENTERLINE



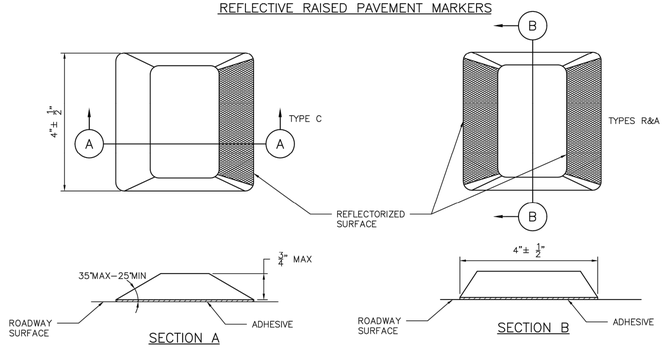
DETAIL "A"



DETAIL "B"



REFLECTIVE RAISED PAVEMENT MARKERS



APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 9EFB80C641F5478...	DocuSigned by: HANG NGUYEN 55A20EFDA7B84CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock 4ADC41DB1B4A4...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02760–05

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 27 OF 72	

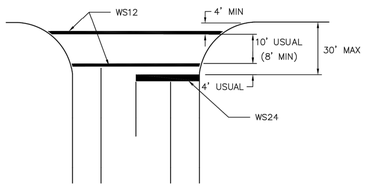
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

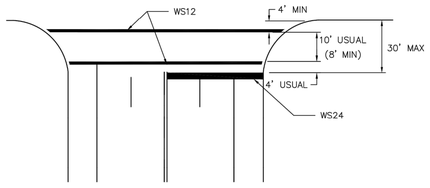
DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

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.

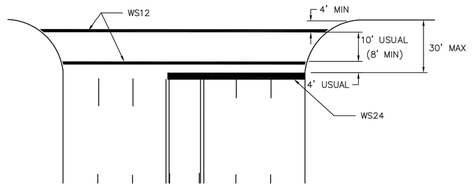
TWO LANES WITH SHOULDERS



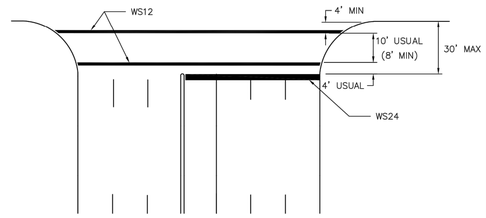
FOUR LANES WITH SHOULDERS



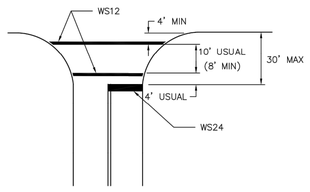
MULTI – LANES



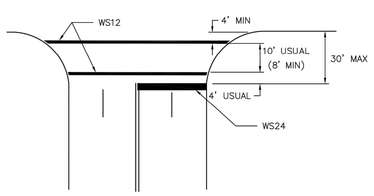
MULTI – LANE WITH MEDIAN



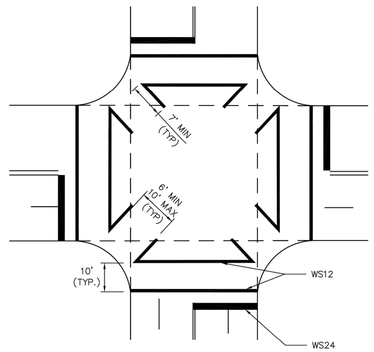
TWO LANES



FOUR LANES



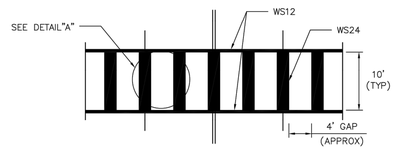
EXCLUSIVE PEDESTRIAN PHASE



NOTES:

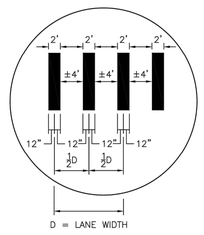
1. CROSSWALKS AND STOP LINES SHALL BE WHITE.
2. "D" IS EQUAL TO ONE HALF THE WIDTH OF TRAVEL LANE.

HIGH VISIBILITY CROSSWALK DETAIL



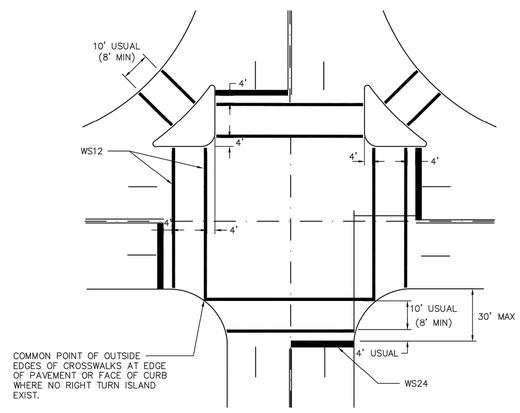
TYPICALLY USED AT SIGNALIZED AND NON-SIGNALIZED CROSSINGS ON COLLECTOR AND ARTERIAL ROADWAYS AND AT LOCATIONS REQUIRING EXTRA EMPHASIS.

DETAIL "A"



D = LANE WIDTH

INTERSECTION WITH RIGHT – TURN ISLANDS



COMMON POINT OF OUTSIDE EDGES OF CROSSWALKS AT EDGE OF PAVEMENT OR FACE OF CURB WHERE NO RIGHT TURN ISLAND EXIST.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 952FB80C041F5478...	DocuSigned by: kHANG NGUYEN 95A20EFDA75B4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock A80CA15B72B34A3...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02760-12

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL CROSSWALK DETAILS

DRAWING SCALE	FOR CITY OF HOUSTON USE ONLY
NOT TO SCALE	

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

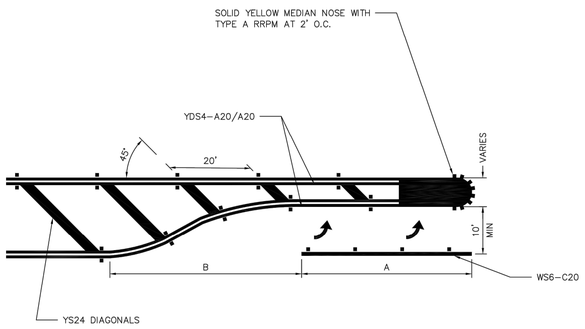
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 28 OF 72	

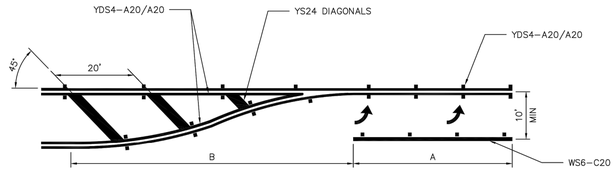
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

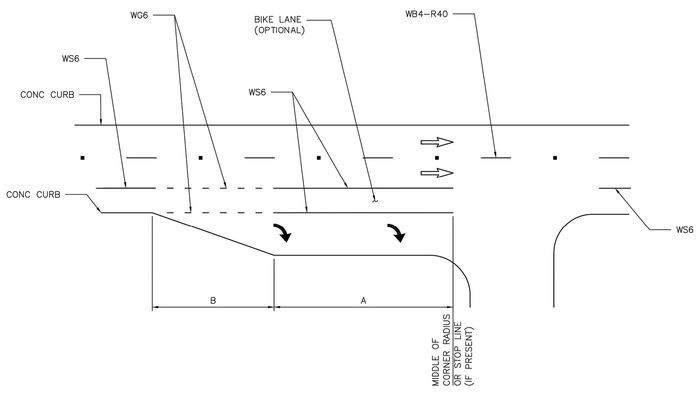
DocuSign Envelope ID: 9B122281-CF05-457B-9A65-2650F40B66D5

PAINTED MEDIAN LEFT TURN BAY DETAILS





UNSIGNALIZED RIGHT-TURN LANE



GENERAL NOTES:

1. STORAGE LENGTHS LONGER THAN THE MINIMUMS LISTED ON THIS DRAWING MAY BE DETERMINED USING TRAFFIC ENGINEERING ANALYSIS OR APPROXIMATE CALCULATIONS.
2. FOR THE PLACEMENT OF PAVEMENT ARROWS AND WORDS REFER TO 02760-02 – LEFT/RIGHT TURN "ONLY" AND ARROW SPACING.
3. REFER TO APPLICABLE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT-TURN & RIGHT-TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKINGS.
4. REFER TO BICYCLE LANE PAVEMENT MARKINGS STANDARD FOR TYPE AND PLACEMENT.

LEFT TURN BAY NOTES:

1. LEFT TURN BAY DIMENSIONS
   A = 150' MINIMUM AT INTERSECTION OF TWO (2) MAJOR STREETS WHEN PRACTICAL.
   = 100' MINIMUM AT ALL OTHER INTERSECTIONS.

   B = 100' MINIMUM ON STRAIGHT ROADWAYS.
   *TAPER LENGTH MAY BE SHORTER IF IT IS ON A HORIZONTAL CURVE TO THE LEFT.
   *TAPER LENGTH MAY BE LONGER IF CURVE IS TO THE RIGHT.
2. DIMENSIONS SHALL BE ADJUSTED AS DETERMINED BY CITY OF HOUSTON TRAFFIC ENGINEER.
3. REFER TO CITY OF HOUSTON INFRASTRUCTURE DESIGN MANUAL (FIGURE 10.8) FOR DETAILS.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanawar 62F8B0C847F5478...	DocuSigned by: Hilding Nguyen 93A2EEF2A7B94CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock A5DC4105F2B3403...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02760-14

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

LEFT TURN LANE &
RIGHT TURN LANE DESIGN

SHEET 02 OF 02

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

NO.	DATE	REVISION	APP.

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.

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

SURVEYED BY: QUIDDITY
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

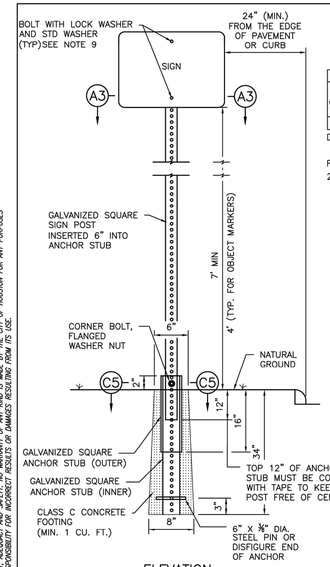
SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 29 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

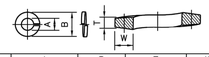
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6



ELEVATION

TYPICAL GROUND SIGN INSTALLATION PERFORATED SQUARE METAL TUBING

TABLE A	
GALVANIZED SQUARE SIGN POST (PERFORATED)	1-3/4"x-1-3/4" (14 GAUGE)
GALVANIZED SQUARE ANCHOR STUB (PREFORATAED) (INNER)	2"x2"x36" (14 GAUGE)
GALVANIZED SQUARE ANCHOR STUB (PERFORATED) (OUTER)	2 1/4" x 2 1/4" x 18" (14 GAUGE)



NOMINAL WASHER SIZE	A INSIDE DIAMETER MAX	A INSIDE DIAMETER MIN	B OUTSIDE DIAMETER MAX	T MEAN SECTION (THICKNESS)	W SECTION WIDTH
5/16"	0.332"	0.314"	0.583"	0.078"	0.125"

DIMENSIONS: ASME B18.21.1
MATERIAL: ALLOY STEEL PER ASME B18.21.1
FINISH: MECHANICAL ZINC PER ASTM B695, CLASS 5, TYPE 2 (YELLOW)

5/16" SPLIT LOCK WASHER, HIGH ALLOY MECHANICAL DEPOSITED YELLOW SINK



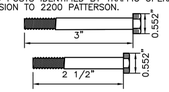
SIZE	C THICKNESS MAX	C THICKNESS MIN	A WIDTH ACROSS FLATS MAX	A WIDTH ACROSS FLATS MIN	D HEX HEIGHT MIN
0.313"	0.359"	0.329"	0.502"	0.489"	0.250"

DIMENSIONS: ASME B18.16.6
MATERIAL: CARBON STEEL, GRADE 8 PER ASME B18.16.6, NYLON ⅝
THREAD REQUIREMENTS: ASME B1.1 UNC & UNF CLASS 2B

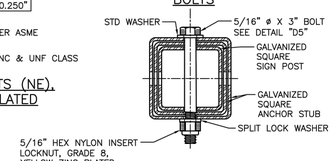
HEX NYLON INSERT LOCKNUTS (NE), GRADE 8, YELLOW ZINC PLATED

NOTES:

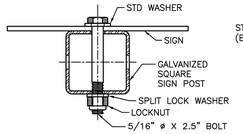
1. THE EXISTING SIGNS LOCATED ON PUBLIC CONSTRUCTION SITE ARE THE PROPERTY OF THE CITY OF HOUSTON. THROUGHOUT THE PERIOD OF THE CONTRACT, THE CONTRACTOR SHALL PROTECT THESE SIGNS SUCH THAT THEY ARE NOT DAMAGED IN THE COURSE OF CONSTRUCTION ACTIVITY. SUCH PROTECTION SHALL INCLUDE THE PERIOD AFTER SIGNS ARE REMOVED FROM INSTALLATION AND STORED BY THE CONTRACTOR OR DELIVERED TO THE TRAFFIC OPERATIONS CENTER (2200 PATTERSON). THE GENERAL TRAFFIC SUPERINTENDENT (832-395-6771) MUST BE NOTIFIED 48 HOURS IN ADVANCE PRIOR TO DELIVERY.
2. AFTER SIGNS ARE REMOVED FROM INSTALLATION AND ARE BEING STORED BY THE CONTRACTOR, THE CONTRACTOR SHALL CONTACT THE TRAFFIC OPERATIONS DIVISION OF HOUSTON PUBLIC WORKS (832-395-6771) AND ARRANGE FOR A CONVENIENT TIME TO DELIVER ONLY CITY SIGNS AND POSTS IDENTIFIED BY TRAFFIC OPERATIONS DIVISION TO 2200 PATTERSON.
3. PRIOR TO THE START OF CONSTRUCTION, ALL EXISTING SIGNS WITHIN THE AREA OF CONSTRUCTION WILL BE INVENTORIED AND DOCUMENTED JOINTLY BY THE CITY INSPECTOR AND THE CONTRACTOR. THIS DOCUMENT WILL BE JOINTLY SIGNED BY BOTH PARTIES REFLECTING THE SIGN TYPE, SIGN SIZE, SIGN CONDITION, SIGN LOCATION, REFLECTIVITY ADEQUACY, ETC. THE CONTRACTOR IS HELD ACCOUNTABLE FOR THESE SIGNS THROUGHOUT THE PROJECT AND AT THE PROJECTS COMPLETION.
4. ALL GROUND MOUNTED STOP SIGNS, WARNING SIGNS, AND OTHER REGULATORY SIGNS SHALL USE AT A MINIMUM HIGH INTENSITY PRISMATIC REFLECTIVE SHEETING.
5. ALL OVERHEAD SIGNS SHALL USE DIAMOND GRADE REFLECTIVE SHEETING.
6. ALL OTHER SIGNS SHALL USE SUPER ENGINEER GRADE SHEETING.
7. ALL BLANKS TO BE INSTALLED SHALL BE ALUMINUM ALLOY 6061-T-6 OR 5052-H38 IN ACCORDANCE WITH ASTM B209.
8. ALL HOLES SHALL BE ¾" DIAMETER DRILLED OR PUNCHED AS SHOWN ON EACH BLANK DETAIL AND SHALL BE FREE OF BURRS AND / OR ROUGH EDGES. WHERE NON-STANDARD ORIENTATION OF SIGN IS USED, ENLARGE HOLE IN SIGN POST AT SIGN CONNECTION NOT GREATER THAN 11/16" IN DIAMETER.
9. BOLT SIZE REQUIREMENTS FOR SIGN CONNECTION:
   9.1. STANDARD ORIENTATION = 5/16" DIA X 2 1/2" BOLT
   9.2. NON STANDARD ORIENTATION = 5/16" DIA X 3" BOLT
10. SIGN BLANK CORNERS TO BE ROUNDED AS SHOWN ON EACH DETAIL ON SHEET 01554-06.
11. ALL SIGN BLANKS ARE TO BE ETCHED, DEGREASED, AND HAVE A COATING MEETING THE REQUIREMENTS OF ASTM B449, CLASS 2, OR ASTM B921, CLASS 2. PRIOR TO APPLICATION OF LEGENDS.
12. ALL SIGNS SHALL BE MANUFACTURED AND INSTALLED IN CONFORMANCE TO THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND STANDARD HIGHWAY SIGNS LATEST EDITION.



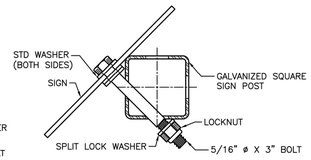
SECTION D5 BOLTS



SECTION C5 CORNER BOLT



STANDARD ORIENTATION



NON-STANDARD ORIENTATION

SECTION A3: SIGN CONNECTION DETAILS

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

GENERAL NOTES AND GROUND MOUNTING SIGN
(SCALE: NOT TO SCALE)

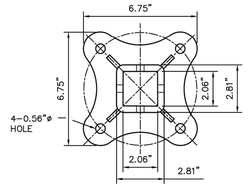
APPROVED BY:

DocuSigned by: Suhail Kanwar — CITY ENGINEER
DocuSigned by: Hung Nguyen — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haldeck — DIRECTOR OF HPW

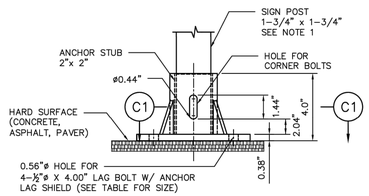
EFF DATE: NOV-27-2023 | DWG NO: 01554-01

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

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



TOP VIEW



SIDE VIEW

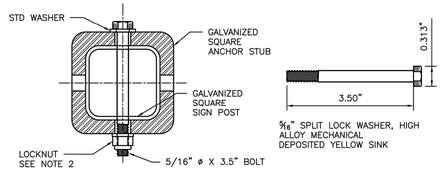
TYPICAL HARD SURFACE INSTALLATION GALVANIZED SIGN BASE

NOTES:

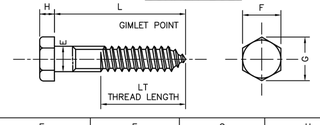
1. REFER TO COH STD DWG 01554-01 FOR SIGN AND POST REQUIREMENTS.
2. REFER TO DETAIL "C5" ON COH STD DWG 01554-01 FOR NUT AND BOLT REQUIREMENTS.

BASE PLATE NOTES:

1. MATERIAL: ASTM A-536 GRADE 65-45-12 DUCTILE IRON
2. HOT DIP GALVANIZE PER ASTM A-153
3. ALL DIMENSIONS ARE IN INCHES



SECTION C1 CORNER BOLT



DIAMETER	E BODY DIAMETER MAX	E BODY DIAMETER MIN	F WIDTH ACROSS FLATS MAX	F WIDTH ACROSS FLATS MIN	G WIDTH ACRSS CORNERS MAX	G WIDTH ACRSS CORNERS MIN	H HEIGHT MAX	H HEIGHT MIN	L LENGTH	LT THREAD LENGTH
1/2"	0.515"	0.482"	0.750"	0.725"	0.866"	0.826"	0.364"	0.302"	4.00"	3.84"

MATERIAL:PER A307 GRADE A
COATING: HOT DIP ZINC PER ASTM F2329 OR IN ACCORDANCE WITH CLASS C OF ASTM A153 AND CLASS D FOR ⅜" DIAMETER AND LESS

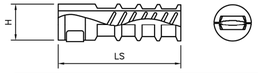
4" HEX LAG SCREWS, HOT DIPPED GALVANIZED



SAE FLAT WASHERS									
SIZE	ID BASIC	ID TOLERANCE PLUS	ID TOLERANCE MINUS	OD BASIC	OD TOLERANCE PLUS	OD TOLERANCE MINUS	THICKNESS - TH BASIC	THICKNESS - TH MAX	THICKNESS - TH MIN
1/2"	0.531	0.015"	0.005"	1.062"	0.030"	0.007"	0.95"	0.121"	0.74"

DIMENSIONS: ASME B18.21.1, TYPE A PLAIN WASHERS
MATERIAL: CARBON STEEL
FINISH: Fe/Zn 3AT PER ASTM F1941

1/2" FLAT WASHERS, LOW CARBON, SAE, ZINC PLATED



TH LAG THREAD SIZE	LS LENGTH OF SHIELD NOMINAL	H DRILLED HOLE SIZE	L BOLT LENGTH REQ
1/2"	3.00"	0.75"	4.00"

ANCHOR LAG SHIELD - ZINC ALLOY

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

SIGN BASE HARD SURFACE MOUNTING DETAILS
(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Suhail Kanwar — CITY ENGINEER
DocuSigned by: Hung Nguyen — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haldeck — DIRECTOR OF HPW

EFF DATE: NOV-27-2023 | DWG NO: 01554-02

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

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIGNAGE AND PAVEMENT MARKING DETAILS

WAUGH SAFETY IMPROVEMENTS

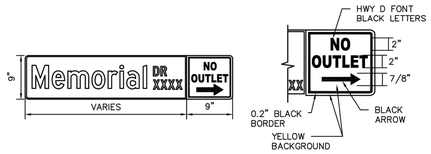
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 30 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

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

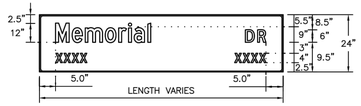
POST MOUNTED STREET NAME SIGN W/ NO OUTLET SIGN



D3 – POST MOUNTED STREET NAME SIGN



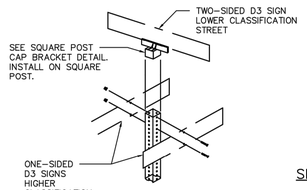
OVERHEAD STREET NAME SIGN DETAIL



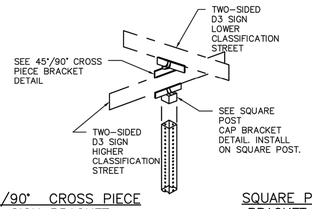
D3 – STREET NAME SIGN

	POST–MOUNTED SIGN	OVERHEAD SIGN
HEIGHT	9"	24"
LENGTH	30" MIN 48" MAX 6" INCREMENTS OF LENGTH	10" MAX 2' INCREMENT OF LENGTH
THICKNESS	0.125"	0.080"
SUBSTREATE	ALLUMINUM ALLOY, 5052–H38 (ASTM B–209)	
SIGN FACE MATERIALS	GREEN FILM OVER DIAMOND GRADE VIP SHEETING	
LEGENDS AND SYMBOLS	HIGHWAY GOTHIC SERIES D (USUAL) HIGHWAY GOTHIC SERIES C OR B FOR MAXIMUM LENGTH SIGN BLACK	
COLOR	LETTERS–WHITE REFLECTIVE BORDER–WHITE REFLECTIVE BACKGROUND–GREEN REFLECTIVE	

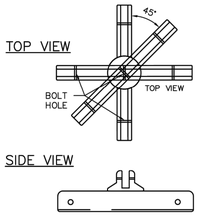
D3 SIGNS GREATER THAN 42" PLATES IN LENGTH



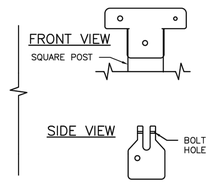
D3 SIGNS LESS THAN OR EQUAL TO 42" PLATES IN LENGTH



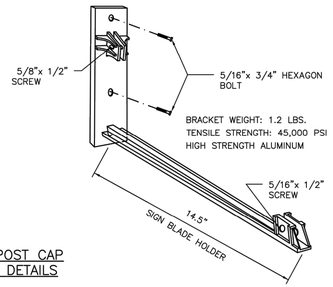
45°/90° CROSS PIECE SIGN BRACKET



SQUARE POST CAP BRACKET DETAILS



SIGNAL POLE MOUNTING DETAIL



NOTES:

1. TYPICAL SIGN PLATE SHOULD BE 30" MAX.
2. LONGER SIGN PLATE MUST BE APPROVED BY THE CITY TRAFFIC ENGINEER.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET NAME SIGN AND SIGN MOUNTING

(SCALE: NOT TO SCALE)

APPROVED BY:

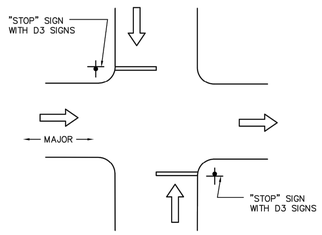
DocuSigned by: Sukul Tanwar — CITY ENGINEER
DocuSigned by: Hung Nguyen — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 01554–03

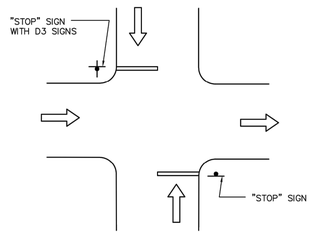
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR 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 INJURIES, RESULTS OR DAMAGES RESULTING FROM ITS USE.

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

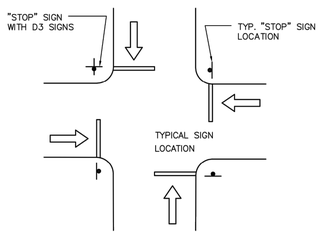
TYPICAL SIGN PLACEMENT



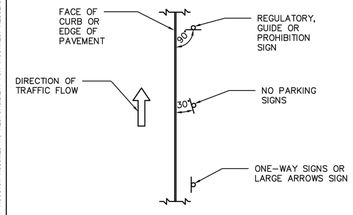
TWO–WAY STOP
AND ONE–WAY OPERATION
ON MAJOR/LOCAL INTERSECTION



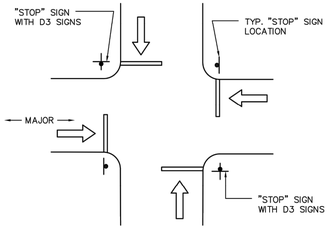
TWO–WAY STOP
AND ONE–WAY OPERATION
ON LOCAL/LOCAL INTERSECTION



FOUR–WAY STOP CONTROL
ON LOCAL/LOCAL INTERSECTION



MAST ARM INSTALLATION
REFER TO TRAFFIC SIGNAL DETAILS
FOR ADDITIONAL INFORMATION.



FOUR–WAY STOP CONTROL
ON MAJOR/LOCAL INTERSECTION

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL SIGN PLACEMENT

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Sukul Tanwar — CITY ENGINEER
DocuSigned by: Hung Nguyen — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 01554–07

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 INJURIES, RESULTS OR DAMAGES RESULTING FROM ITS USE.

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

WAUGH SAFETY IMPROVEMENTS

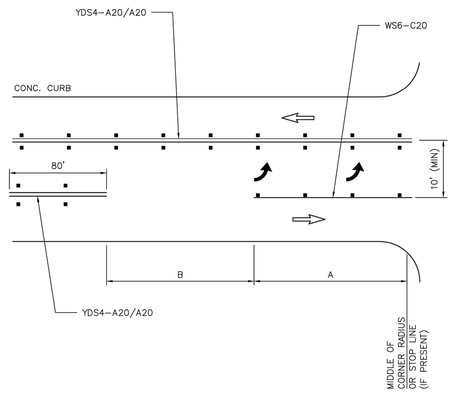
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 31 OF 72	

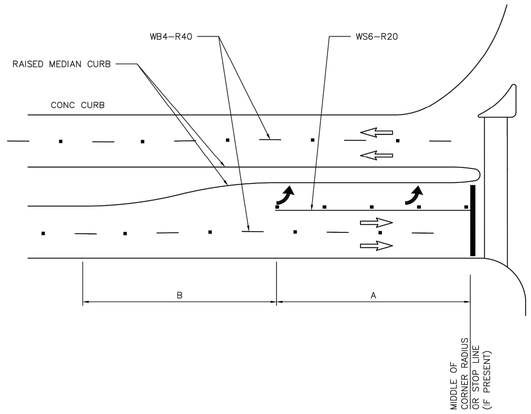
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

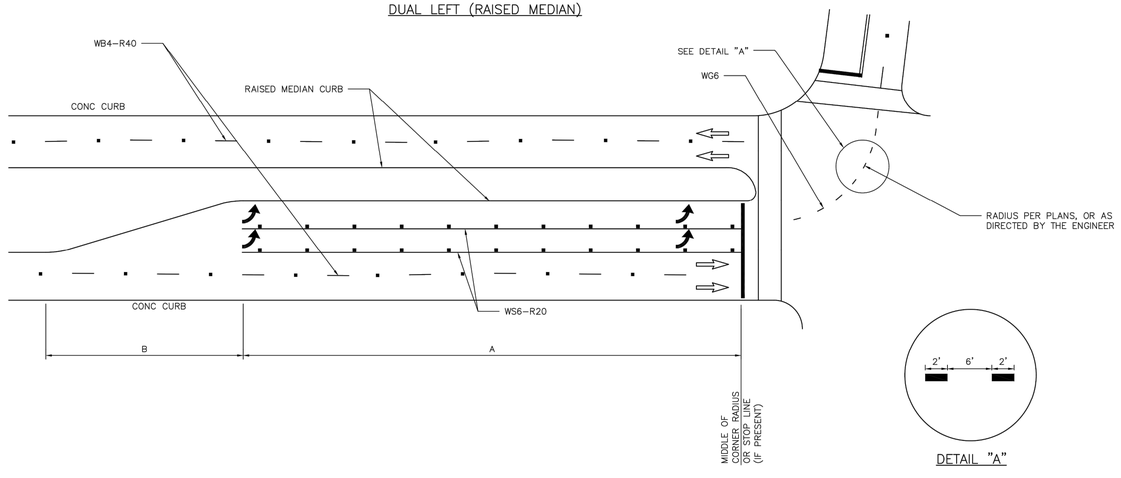
LEFT–TURN LANE



LEFT–TURN LANE (RAISED MEDIAN)



DUAL LEFT (RAISED MEDIAN)



DETAIL "A"

GENERAL NOTES:

1. THE DIMENSIONS GIVEN FOR DUAL LEFT (RAISED MEDIAN) ON THIS SHEET ARE ALSO APPLICABLE FOR DUAL RIGHT–TURN LANES.
2. STORAGE LENGTHS LONGER THAN THE MINIMUMS LISTED ON THIS DRAWING MAY BE DETERMINED USING TRAFFIC ENGINEERING ANALYSIS.
3. FOR THE PLACEMENT OF PAVEMENT ARROWS AND WORDS REFER TO 02760–02 – LEFT/RIGHT TURN "ONLY" AND ARROW SPACING.
4. REFER TO APPLICABLE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT– TURN & RIGHT–TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKINGS.
5. REFER TO BICYCLE LANE PAVEMENT MARKINGS STANDARD FOR TYPE AND PLACEMENT.

LEFT TURN BAY NOTES:

1. LEFT TURN BAY DIMENSIONS
   A = 150' MINIMUM AT INTERSECTION OF TWO (2) MAJOR STREETS WHEN PRACTICAL.
   = 100' MINIMUM AT ALL OTHER INTERSECTIONS.

   B = 100' MINIMUM ON STRAIGHT ROADWAYS.
   *TAPER LENGTH MAY BE SHORTER IF IT IS ON A HORIZONTAL CURVE TO THE LEFT.
   *TAPER LENGTH MAY BE LONGER IF CURVE IS TO THE RIGHT.
2. DIMENSIONS SHALL BE ADJUSTED AS DETERMINED BY CITY OF HOUSTON TRAFFIC ENGINEER.
3. REFER TO CITY OF HOUSTON INFRASTRUCTURE DESIGN MANUAL (FIGURE 10.8) FOR DETAILS.

APPROVED BY:	APPROVED BY:
DocuSigned by: Sulad Kauwar 62F8B0C847F5475...	DocuSigned by: Keisha McKinnon 83A2EEF2A7B94CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock A6DC410B72B3403...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02760–13

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

LEFT–TURN LANE & RIGHT–TURN LANE DESIGN

SHEET 01 OF 02

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

SURVEYED BY: QUIDDITY
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

PAVING DETAILS

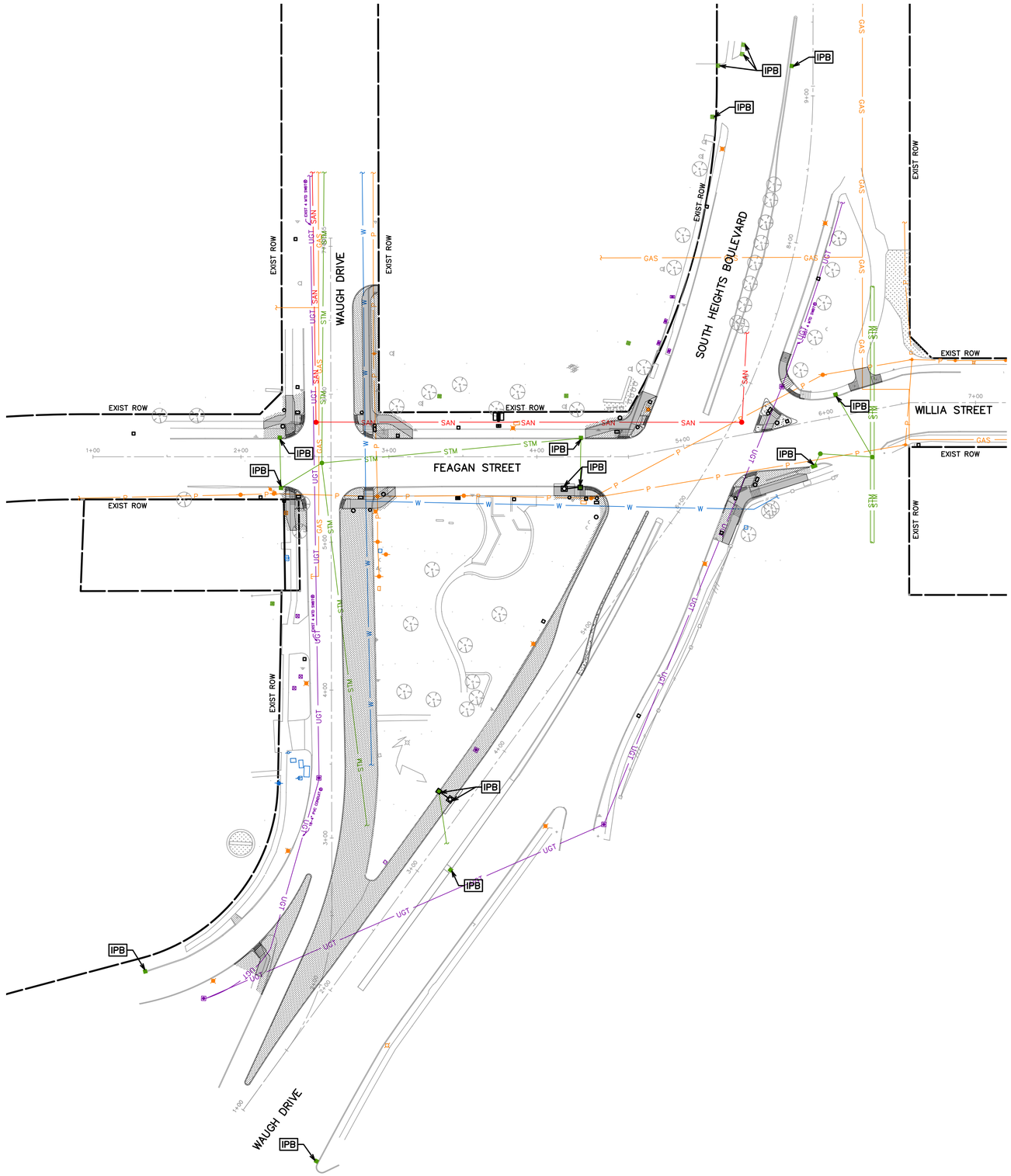
WAUGH SAFETY IMPROVEMENTS

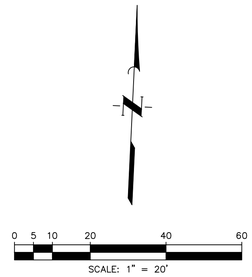
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 32 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-004-DETAILS.DWG, 3/25/2024 5:47 PM





LEGEND

- IPB — INLET PROTECTION BARRIERS
- RFB — REINFORCED FABRIC BARRIER
- SC — STABILIZED CONSTRUCTION ENTRANCE/EXIT

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

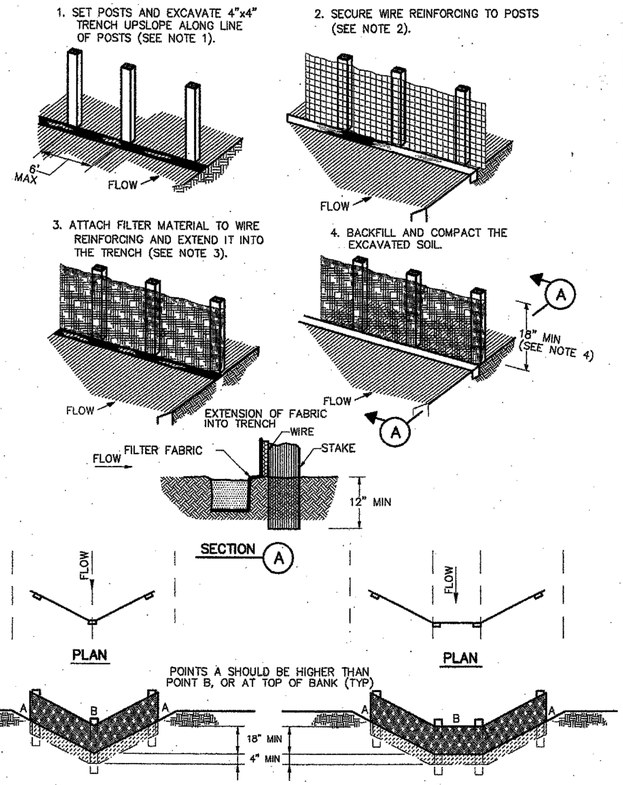
STORM WATER POLLUTION PREVENTION PLAN

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 33 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-007-SWPPP.DWG, 3/25/2024 5:48 PM

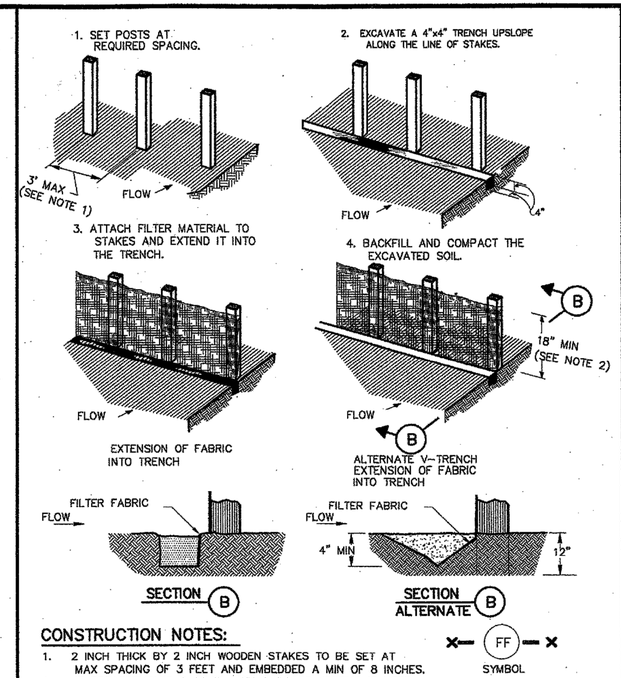


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE REINFORCING TO BE FASTENED SECURELY TO BARRIER POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE REINFORCING, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
6. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

RFB — SYMBOL

REINFORCED FILTER FABRIC BARRIER

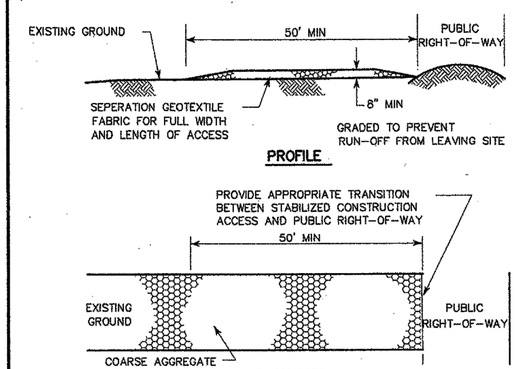


CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED BARRIER WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC BARRIER SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
4. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

FF — SYMBOL

FILTER FABRIC BARRIER

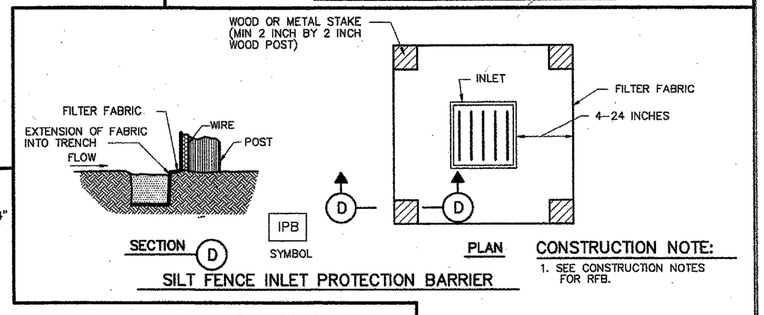


CONSTRUCTION NOTES:

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

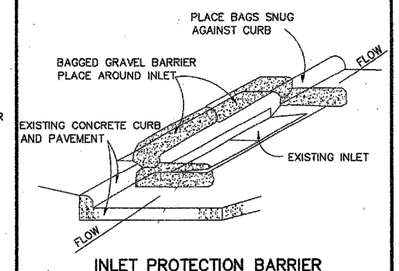
SC — SYMBOL

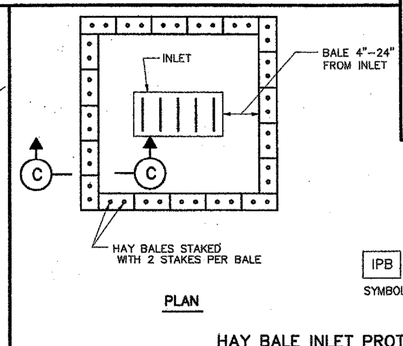
STABILIZED CONSTRUCTION ACCESS



CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.





CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS

(NOT TO SCALE)

APPROVED — CITY ENGINEER
APPROVED — DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010
DWG NO: 01571-01

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

STORM WATER POLLUTION PREVENTION PLAN DETAILS

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 34 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-007-SWPPP.DWG, 3/25/2024 5:48 PM

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.

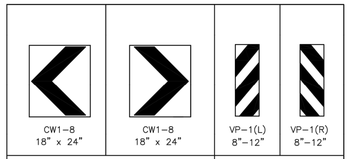
J. SPACING MAY BE ADJUSTED TO PROVIDE DRIVEWAYS, INTERSECTIONS AND /OR MEDIAN OPENINGS.

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

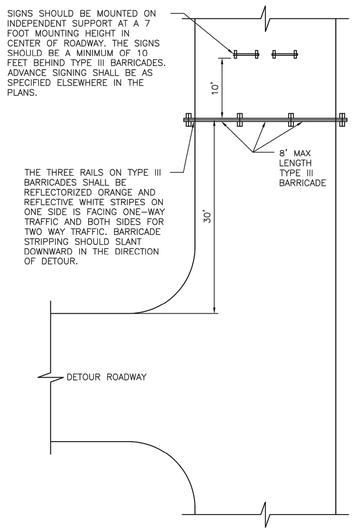
POSTED SPEED (MPH)	DISTANCE "D" (FEET)
30	200
35	250
40	305
45	360
50	425
55	495



CHANNELIZATION AND BARRICADES

LEGEND:

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



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

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 152F880C6841F5478...	DocuSigned by: Hailing Nguyen 95A2B3F0A75B4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock 9A5CA16B13B34E5...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 01555–01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP NOTES CHANNELIZING DEVICES AND BARRICADES

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TCP DETAIL

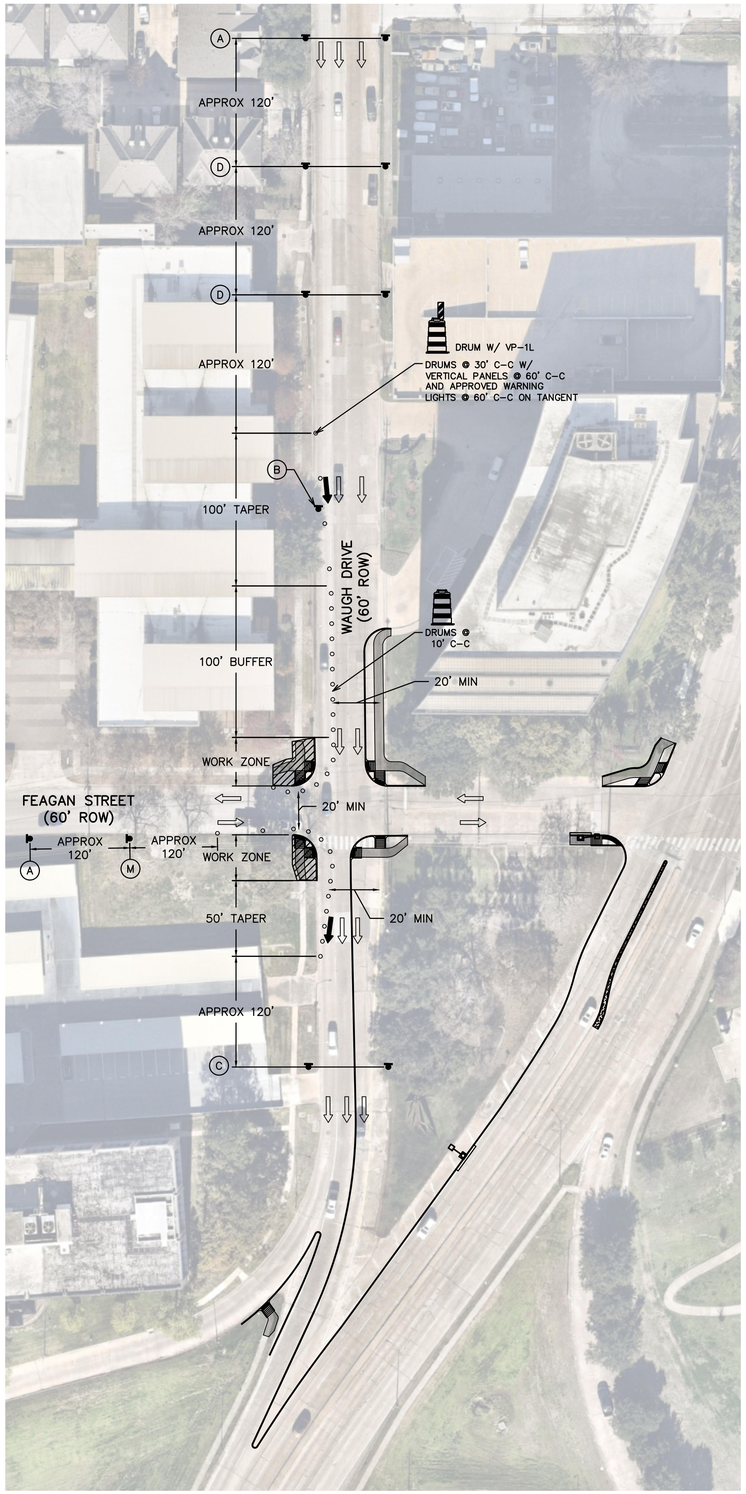
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 35 OF 72	

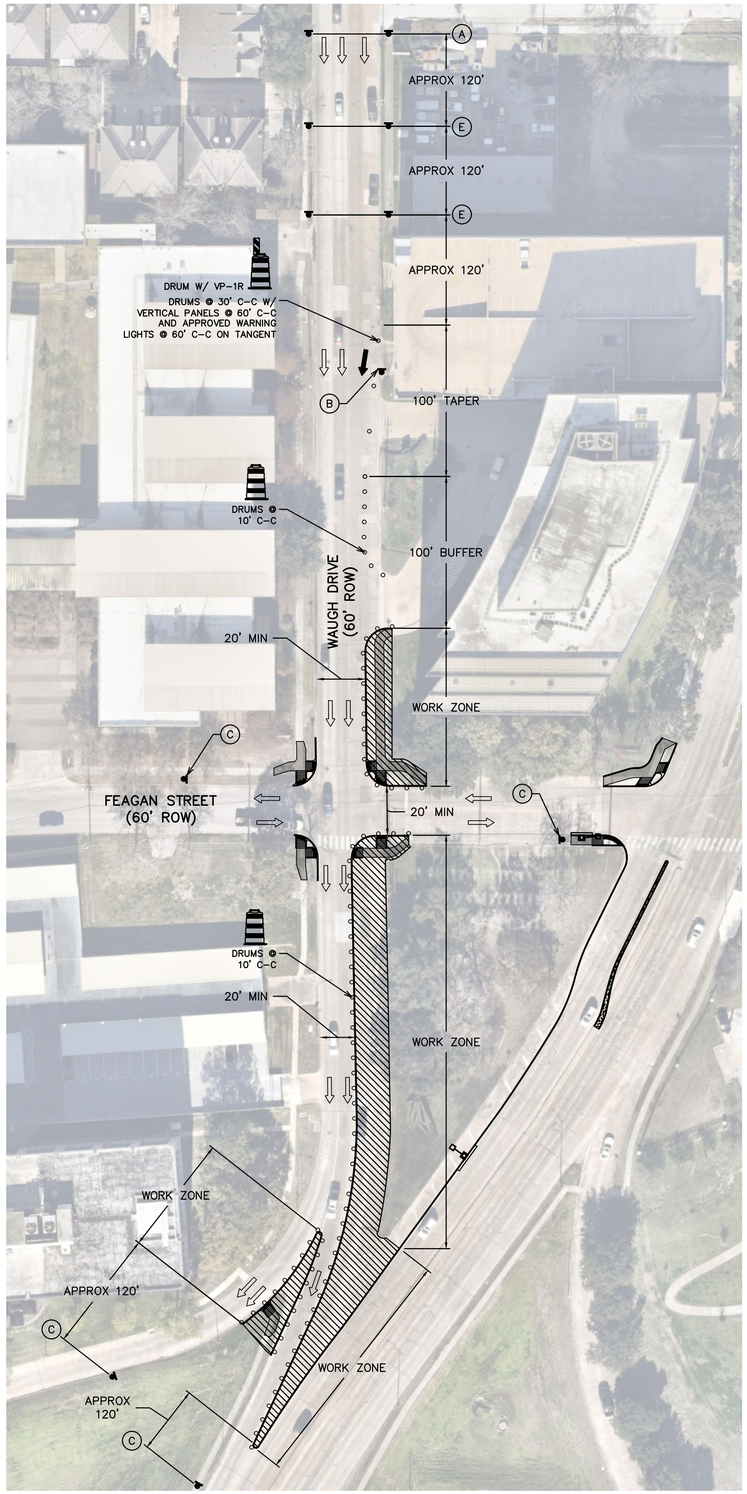
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-006-TCP.DWG, 3/25/2024 6:37 PM



WAUGH AT FEAGAN STREET (WAUGH WEST CORNER WORK)



WAUGH AT FEAGAN STREET (WAUGH EAST CORNER WORK)

0 10 30 50 100 150

SCALE: 1" = 50'

AERIAL IMAGERY IS FOR REFERENCE ONLY AND MAY NOT LINE UP EXACTLY WITH FEATURES SHOWN

LEGEND

- CONSTRUCTION AREA A
- CONSTRUCTION AREA B
- EXIST TRAFFIC DIRECTION
- PROP TRAFFIC DIRECTION

TEMPORARY PAVEMENT MARKING LEGEND

① 4" TEMPORARY CONSTRUCTION (REMOVE) PAVEMENT MARKING (WHITE BROKEN)

POSTED SPEED LIMIT 35 MPH

GENERAL NOTES

1. WORK SHALL BE LIMITED TO ONE SIDE OF YALE STREET AT A TIME. CONSTRUCTION OF BOTH CORNERS SHALL NOT BE CONCURRENT.

TEMPORARY SIGNAGE LEGEND

- A — ROAD WORK AHEAD — CW20-1 ROAD WORK AHEAD
- B — FLASHING ARROW BOARD
- C — END ROAD WORK — G20-2 END ROAD WORK
- D — RIGHT LANE CLOSED AHEAD — CW20-5AR RIGHT LANE CLOSED; CW16-3 AHEAD
- E — LEFT LANE CLOSED AHEAD — CW20-5AL LEFT LANE CLOSED; CW16-3 AHEAD
- F — RIGHT LANE MUST TURN RIGHT — R3-7R RIGHT LANE MUST TURN RIGHT
- G — R3-1 NO RIGHT TURN
- H — W6-3 TWO WAY TRAFFIC
- J — R3-2 NO LEFT TURN
- K — ONE LANE ROAD — CW20-4 ONE LANE ROAD
- L — ROAD CLOSED — R11-23 ROAD CLOSED
- M — ROAD NARROWS AHEAD — W5-1 ROAD NARROWS; CW16-3 AHEAD
- N — DO NOT ENTER — R5-1 DO NOT ENTER
- P — W20-7 FLAGGER SYMBOL

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

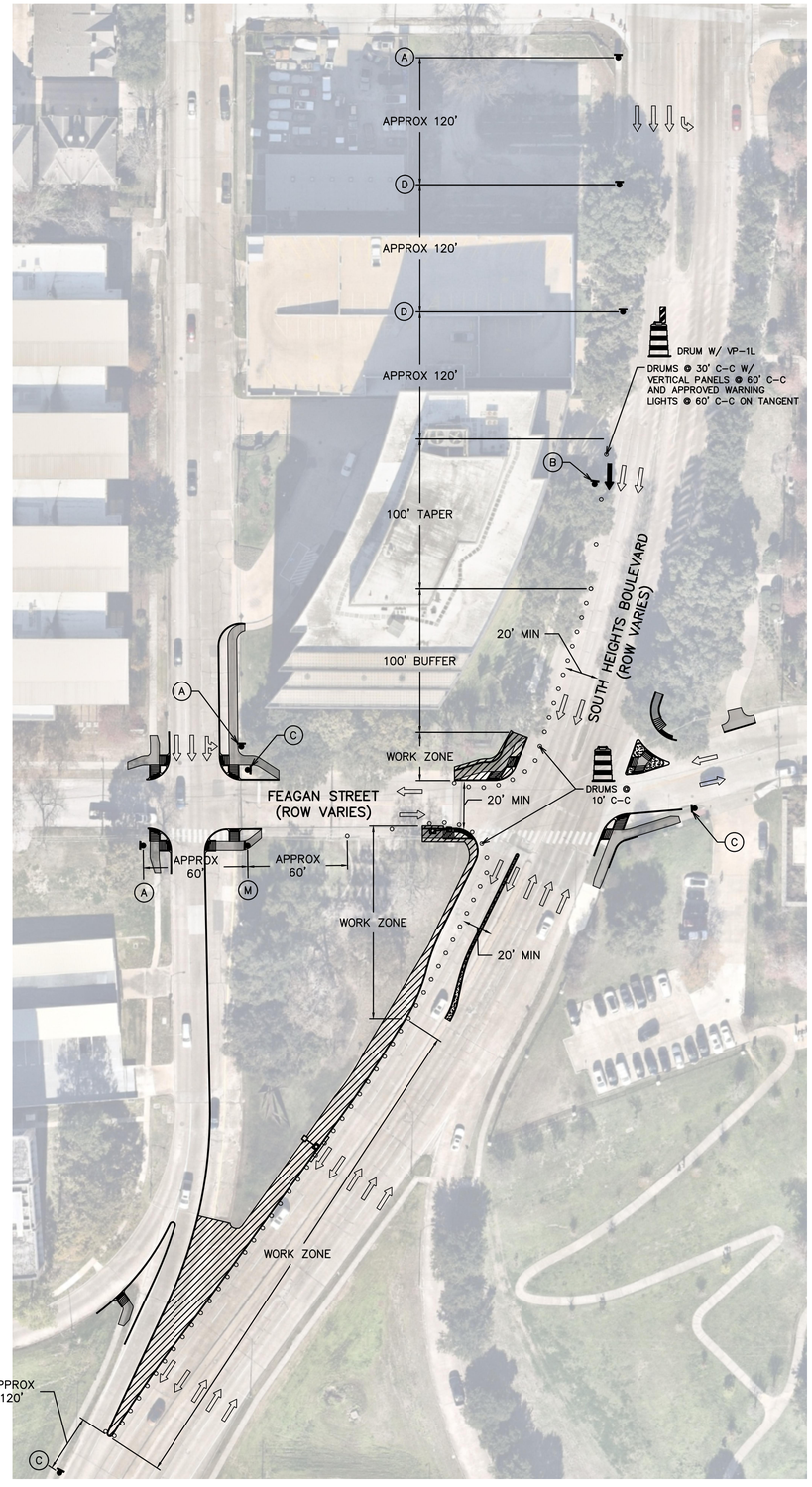
WAUGH DR AT FEAGAN ST TRAFFIC CONTROL PLAN

WAUGH SAFETY IMPROVEMENTS

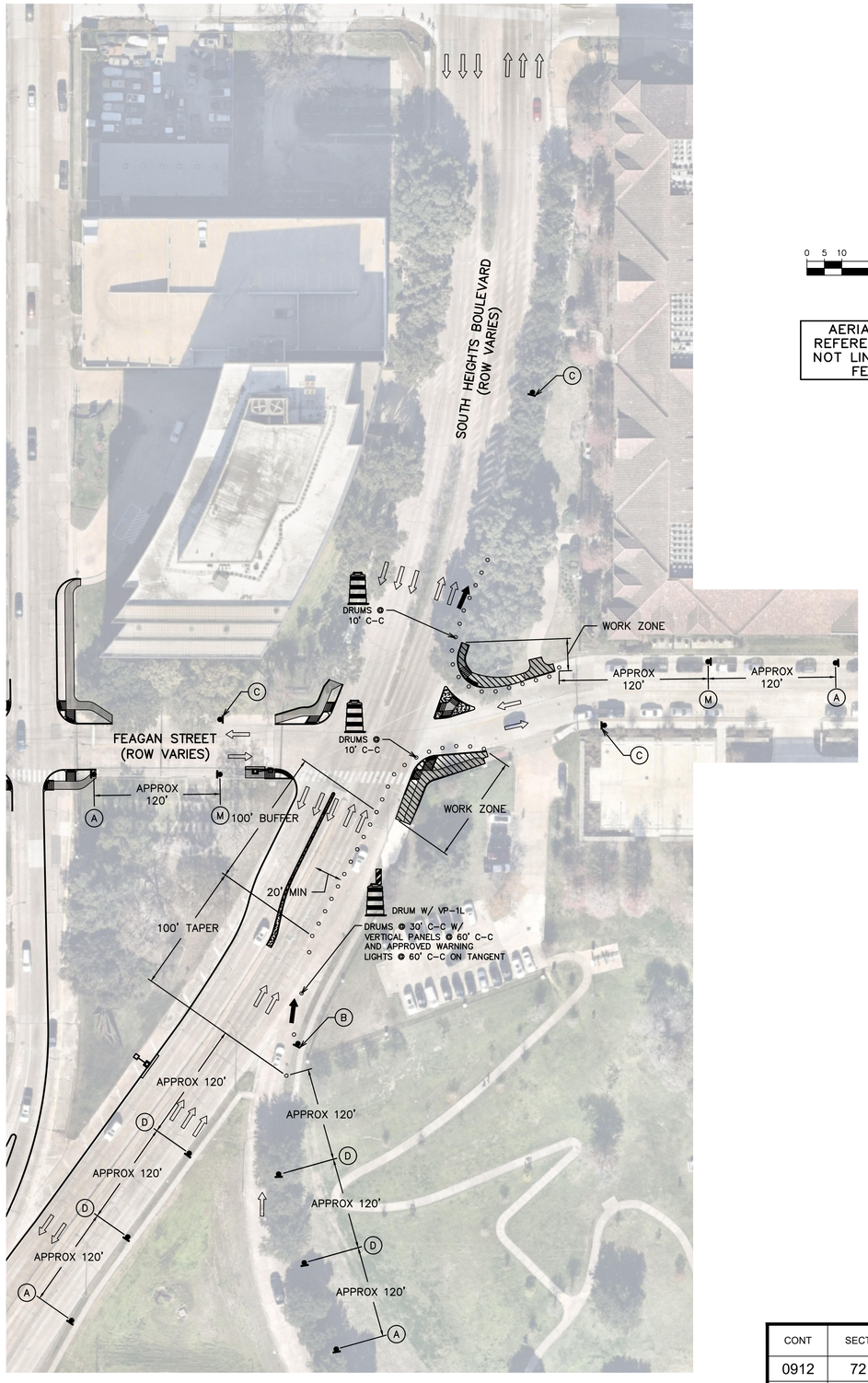
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 36 OF 72	

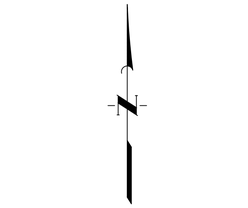
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-006-TCP.DWG, 3/25/2024 6:37 PM



SOUTH HEIGHTS AT FEAGAN STREET (SOUTH HEIGHTS WEST CORNER WORK)



SOUTH HEIGHTS AT FEAGAN STREET (SOUTH HEIGHTS EAST CORNER WORK)



AERIAL IMAGERY IS FOR REFERENCE ONLY AND MAY NOT LINE UP EXACTLY WITH FEATURES SHOWN

LEGEND

- CONSTRUCTION AREA A
- CONSTRUCTION AREA B
- EXIST TRAFFIC DIRECTION
- PROP TRAFFIC DIRECTION

TEMPORARY PAVEMENT MARKING LEGEND

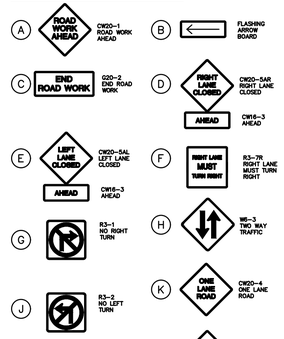
① 4" TEMPORARY CONSTRUCTION (REMOVE) PAVEMENT MARKING (WHITE BROKEN)

POSTED SPEED LIMIT 35 MPH

GENERAL NOTES

1. WORK SHALL BE LIMITED TO ONE SIDE OF YALE STREET AT A TIME. CONSTRUCTION OF BOTH CORNERS SHALL NOT BE CONCURRENT.

TEMPORARY SIGNAGE LEGEND



NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY

1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY

Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

S. HEIGHTS BLVD AT FEAGAN ST TRAFFIC CONTROL PLAN

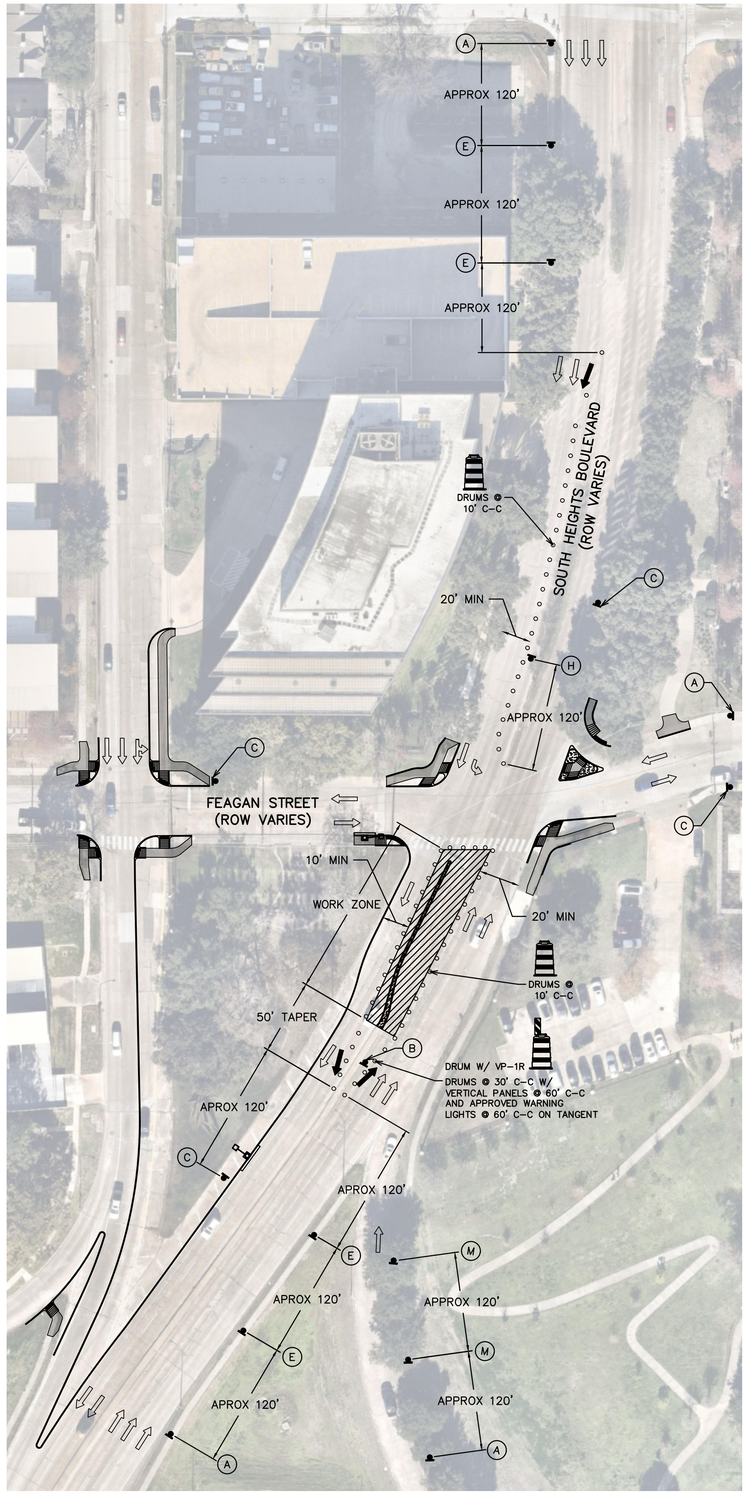
WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

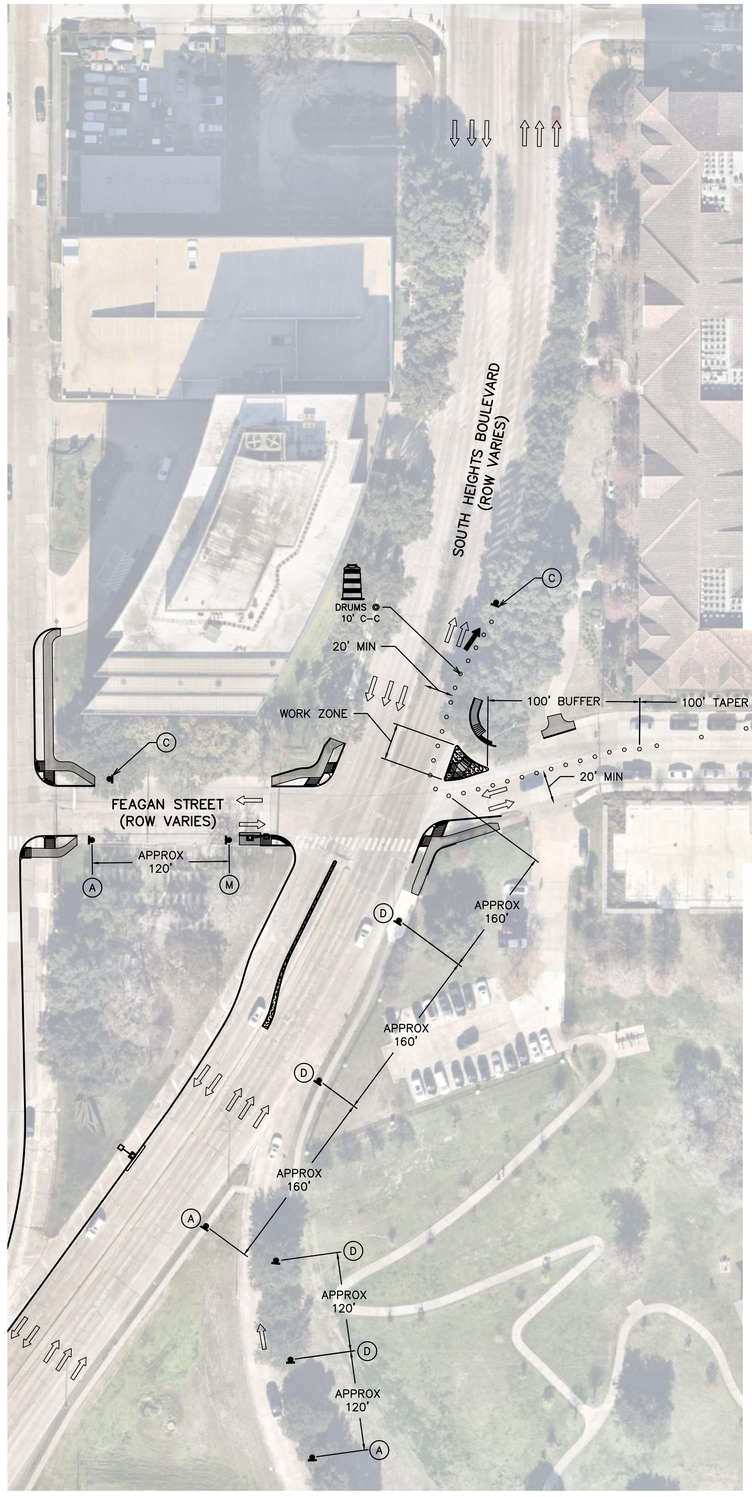
WBS NUMBER
N-T05000-0012-7
DRAWING SCALE
AS NOTED
CITY OF HOUSTON POC
TOMS MATHEW
SHEET NO. 37 OF 72

FOR CITY OF HOUSTON USE ONLY

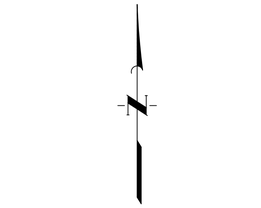
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-01-006-TCP.DWG, 3/25/2024 6:37 PM



SOUTH HEIGHTS AT FEAGAN STREET (MEDIAN WORK)



SOUTH HEIGHTS AT FEAGAN STREET (DIRECTIONAL ISLAND WORK)



AERIAL IMAGERY IS FOR REFERENCE ONLY AND MAY NOT LINE UP EXACTLY WITH FEATURES SHOWN

LEGEND

- CONSTRUCTION AREA A
- CONSTRUCTION AREA B
- EXIST TRAFFIC DIRECTION
- PROP TRAFFIC DIRECTION

TEMPORARY PAVEMENT MARKING LEGEND

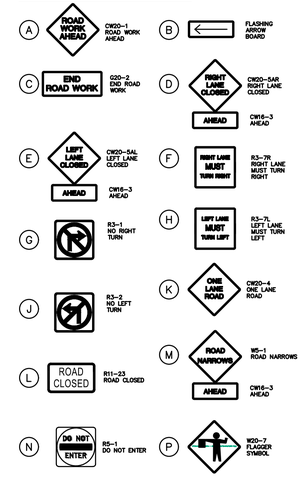
① 4" TEMPORARY CONSTRUCTION (REMOVE) PAVEMENT MARKING (WHITE BROKEN)

POSTED SPEED LIMIT 35 MPH

GENERAL NOTES

1. WORK SHALL BE LIMITED TO ONE SIDE OF YALE STREET AT A TIME. CONSTRUCTION OF BOTH CORNERS SHALL NOT BE CONCURRENT.

TEMPORARY SIGNAGE LEGEND



NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

S. HEIGHTS BLVD AT FEAGAN ST MEDIAN WORK TRAFFIC CONTROL PLAN

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

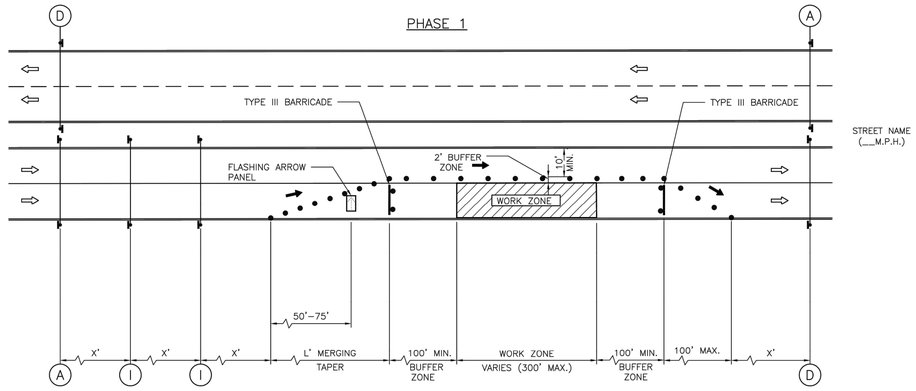
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 38 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-006-TCP.DWG, 3/25/2024 6:37 PM

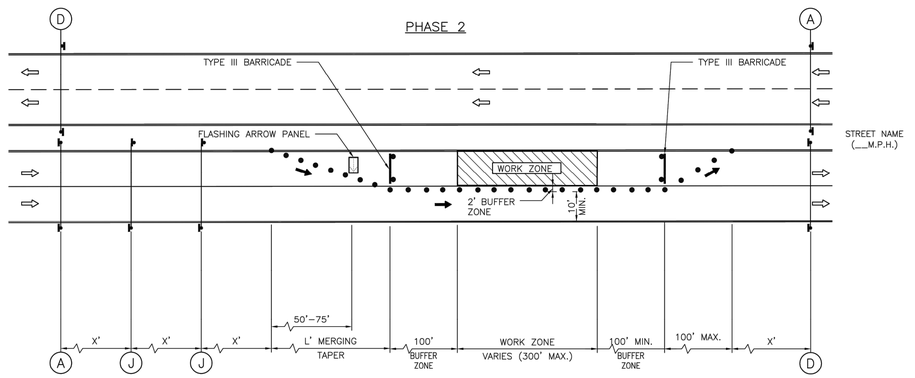
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6

A	D	I	J
ROAD WORK AHEAD	END ROAD WORK	RIGHT LANE CLOSED	LEFT LANE CLOSED
CW20-1	G20-2	AHEAD CW20-5(2) CW16-3	AHEAD CW20-5(1) CW16-3

PHASE 1



PHASE 2



LEGEND:

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

NOTES:

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

APPROVED BY:	APPROVED BY:
DocuSigned by: Sukut Kanwar 8EFBB0C841F5478...	DocuSigned by: LIHONG NGUYEN 95A28EFDA7B94CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock ABCA1BB1B0A4EL...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 01555-04

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TCP ONE LANE CLOSURE
PHASE 1 & 2

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

REVISION	DATE	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TCP DETAIL

WAUGH SAFETY IMPROVEMENTS

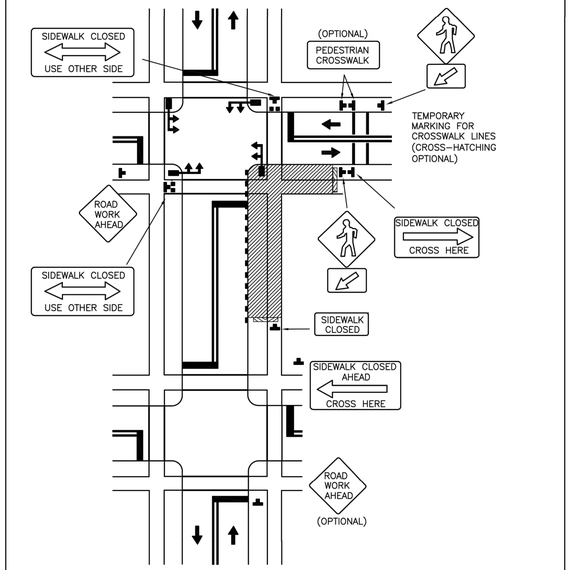
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 39 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-006-TCP.DWG, 3/25/2024 6:37 PM

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



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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CROSSWALK CLOSURES AND PEDESTRIAN DETOURS

(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	CITY TRAFFIC ENGINEER	DIRECTOR OF HPW	EFF DATE: NOV-27-2023	DWG NO: 01555-16
DocuSigned by: Sukai Tanvar	DocuSigned by: KHANG NGUYEN	DocuSigned by: Carl Haldeb		

NO.	DATE	REVISION	APP.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: VICTORIA M. MACALINO, P.E.
P.E. Serial No.: 142304
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIDEWALK CLOSURE DETAIL

WAUGH SAFETY IMPROVEMENTS

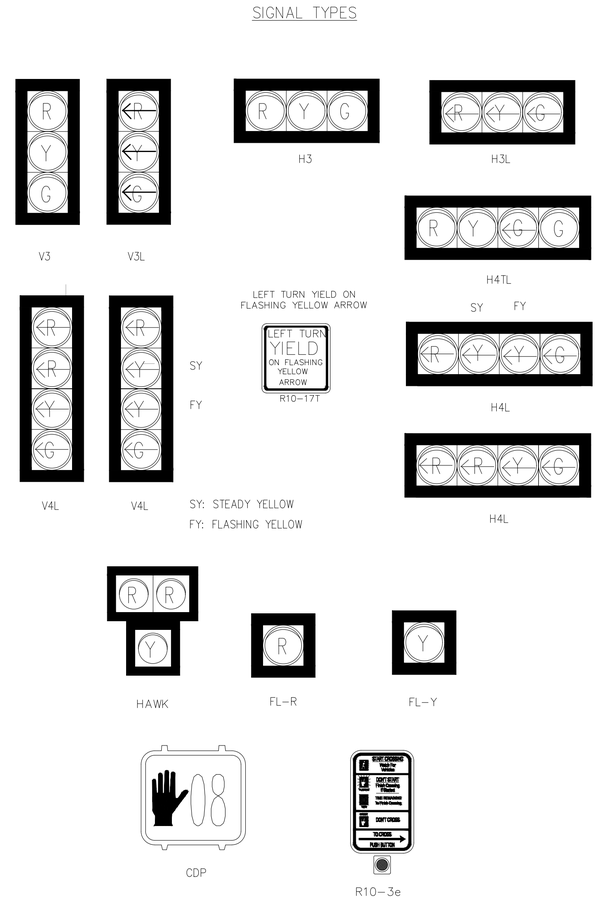
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 40 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\PLANS\14760-0021-CI-006-TCP.DWG, 3/25/2024 6:37 PM

	NEW	EXISTING
TRAFFIC SIGNAL POLE	○	◌
PEDESTAL POLE	○	◌
POLE W/MAST ARM	○———	◌- - - - - - - - - - - - - - - - - -
VEHICLE SIGNAL HEAD	▼	▽
VEHICLE SIGNAL HEAD W/BACK PLATE	▼	▽
PEDESTRIAN SIGNAL HEAD	⊣▭	⊣▭
PEDESTRIAN PUSH BUTTON	⊣▭	⊣▭
PULL BOX – TYPE A	◇	◇
PULL BOX – TYPE B	▭	⌐ ¬
PULL BOX – TYPE C	▭▭	⌐ ¬
PULL BOX – TYPE B W/EXTENSION	⊠	⊠
CONDUIT	- - -	———
VIDEO DETECTION CAMERA	▭◁	▭◁
PRE-EMPT SENSOR	⚷	⚷
LUMINAIRE	⊗	⊗
LUMINAIRE W/PHOTO CELL	⊗	⊗
CONTROLLER CABINET W/ UPS	▮▯	▮▯
METERED POWER PEDESTAL	◆	◆
POLE MOUNTED METER	●◤	◌◥
FIBER OPTIC CONDUIT	—FO—	—FO—
MAST ARM SIGN	⊥	⊥
LOOP DETECTOR	◇	◇
SPP RADIO	⊠	⊠
WiMAX ANTENNA	●	○
RADAR DETECTOR	●	●
CCTV CAMERA	◉	◉

SIGNAL TYPES



TRAFFIC CONTROL GENERAL NOTE:

1. USE ONLY NON-RIGID MATERIAL ON PLASTIC DRUMS.

TRAFFIC SIGNAL HEADS NOTE:

ALL VEHICLE TRAFFIC SIGNAL
HEAD TYPES HAVE 12-INCH LED LENSES

NOTE:

1. THE CONTRACTOR SHALL UTILIZE THE 2023 CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING – TRAFFIC OPERATIONS DIVISION TRAFFIC SIGNAL DETAILS (02465 SERIES, 12582 SERIES, 02893 SERIES, 16700, 16710, 16727, 16737, 16738, 16742), AS WELL AS CONTROLLER AND CABINET SPECIFICATION #16730 AND 16731, UPS SPECIFICATION #16732, GPS SPECIFICATION # 16785, 2023 SIGN POST AND SIGN DETAILS (01554 SERIES), 2023 PAVEMENT MARKING DETAILS (02760 SERIES), AND 2023 TCP DETAILS (01555 SERIES).
2. THESE STANDARD DETAILS ARE AVAILABLE FROM THE CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING TRAFFIC OPERATIONS DIVISION, OR BY GOING TO THE CITY OF HOUSTON WEBSITE LINK BELOW:

–HTTPS://WWW.HOUSTONPERMITTINGCENTER.ORG/OFFICE-CITY-ENGINEER/DESIGN-AND-CONSTRUCTION-STANDARDS

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL
HARWARE LEGEND

WAUGH SAFETY IMPROVEMENTS

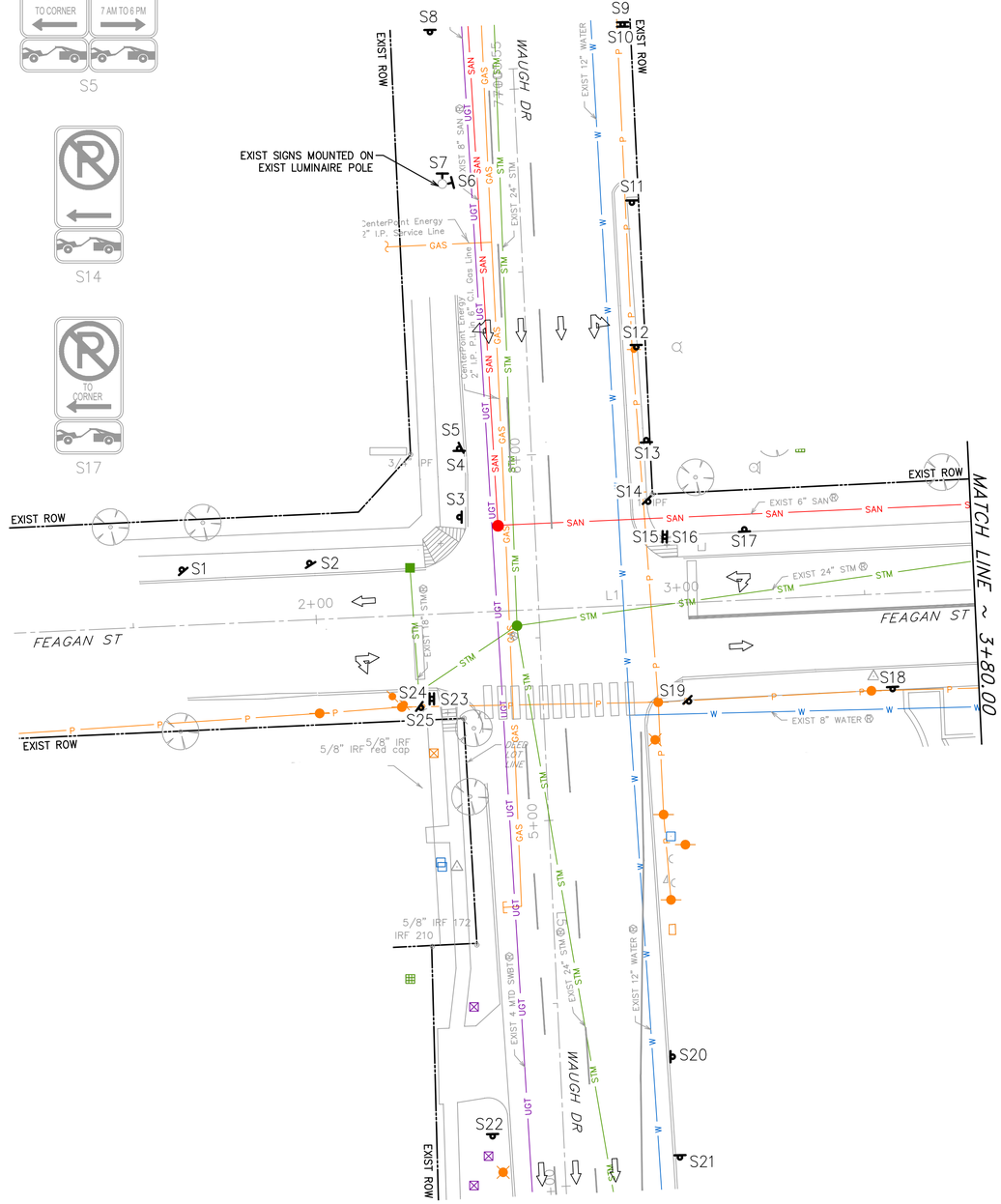
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 41 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_DWG, 3/25/2024 4:09 PM

EXISTING GROUND MOUNTED SIGN LEGEND





LEGEND

- STREET LIGHT
- GROUND MOUNTED SIGN
- POLE MOUNTED SIGN
- LANE ASSIGNMENT ARROW

UTILITY LEGEND

- W — EXIST WATER LINE
- STM — EXIST STORM SEWER LINE
- P — EXIST OVERHEAD POWER LINE
- GAS — EXIST GASLINE
- UGT — EXIST UNDERGROUND TELEPHONE LINE
- SAN — EXIST SANITARY SEWER LINE

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR/S HEIGHTS BLVD AT FEAGAN ST EXISTING LAYOUT

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

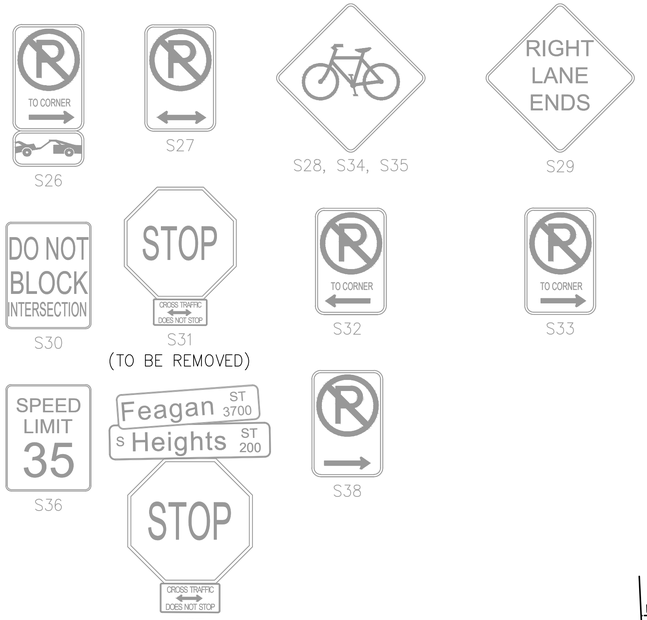
WBS NUMBER
N-T05000-0012-7
DRAWING SCALE
AS NOTED
CITY OF HOUSTON POC
TOMS MATHEW
SHEET NO. 42 OF 72

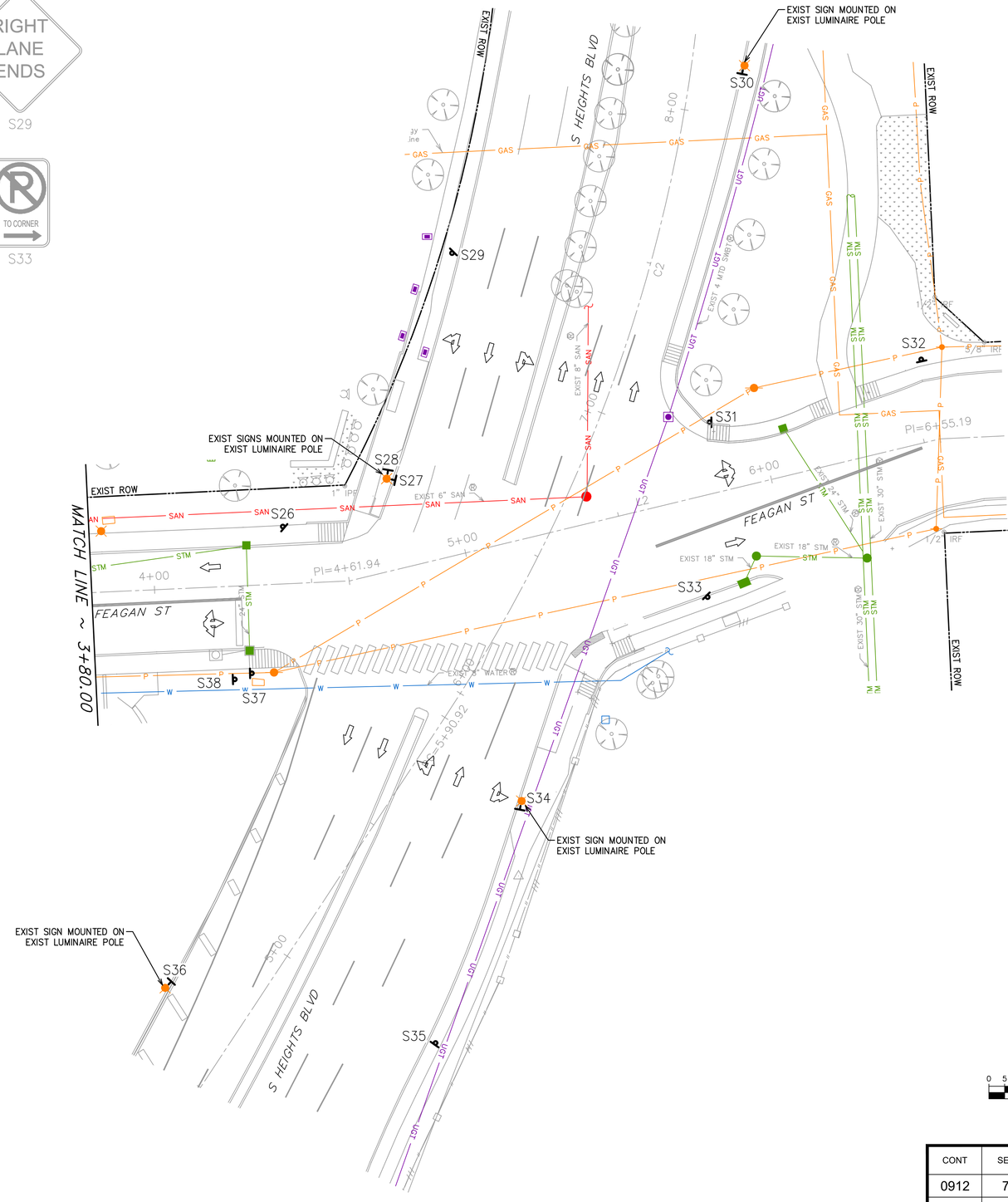
FOR CITY OF HOUSTON USE ONLY

SCALE: 1" = 20'

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_.DWG, 3/25/2024 4:09 PM

EXISTING GROUND MOUNTED SIGN LEGEND





LEGEND

- STREET LIGHT
- GROUND MOUNTED SIGN
- POLE MOUNTED SIGN
- LANE ASSIGNMENT ARROW

UTILITY LEGEND

W	EXIST WATER LINE
STM	EXIST STORM SEWER LINE
P	EXIST OVERHEAD POWER LINE
GAS	EXIST GASLINE
UGT	EXIST UNDERGROUND TELEPHONE LINE
SAN	EXIST SANITARY SEWER LINE

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

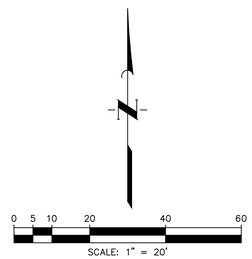
Approved for AT&T underground conduit facilities only.
Signature valid for one year.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024



CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR/S HEIGHTS BLVD AT FEAGAN ST EXISTING LAYOUT

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 43 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_DWG, 3/25/2024 4:09 PM

S1 = STREET NAME "Waugh Dr", BLOCK NUMBER 0000
S2 = STREET NAME "Waugh Dr", BLOCK NUMBER 0000
S3 = STREET NAME "Feagan St", BLOCK NUMBER 3700 & 3800
S4 = R10-12 (30"x36") SIGN, "LEFT TURN YIELD ON GREEN BALL"
S5 = R6-2L (24"x30") SIGN, "ONE WAY"
S6 = R6-2R (24"x30") SIGN, "ONE WAY"

COMMUNICATION SYSTEM NOTE:

1. ALL INTELLIGENT TRANSPORTATION SYSTEMS (ITS) INFRASTRUCTURE MUST BE FIELD VERIFIED AND INCLUDED ON ALL DESIGN PLANS. ITS INFRASTRUCTURE INCLUDES, BUT NOT LIMITED TO, FIBER OPTIC CABLE, COPPER, ETHERNET SWITCHES, WIMAX, BLUETOOTH EQUIPMENT, CCTV CAMERAS, ETC. A FIELD HARDENED MANAGED ETHERNET SWITCH MUST BE INCLUDED FOR ANY NEW OR MODIFIED SIGNALIZED INTERSECTION(S). CONTACT TRAFFIC OPERATIONS DIVISION/ITS SECTION FOR COMPATIBILITY QUESTIONS WITH CITY OF HOUSTON COMMUNICATION INFRASTRUCTURE.

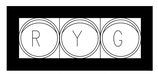
CENTERPOINT OVERHEAD POWER LINES:

1. CONTRACTOR IS MADE AWARE THAT THE OVERHEAD POWER LINES WILL BE IN CONFLICT WITH SIGNAL POLES WITH LUMINAIRE ARMS. CONTRACTOR MUST COORDINATE AND NOTIFY CPE TO REMOVE/ADJUST THEIR FACILITIES TWELVE (12) WEEKS IN ADVANCE OF ANY CONSTRUCTION ACTIVITIES ON PROPOSED SIGNALS.

PROPOSED STREET NAME SIGNS



PROPOSED TRAFFIC SIGNAL HEADS



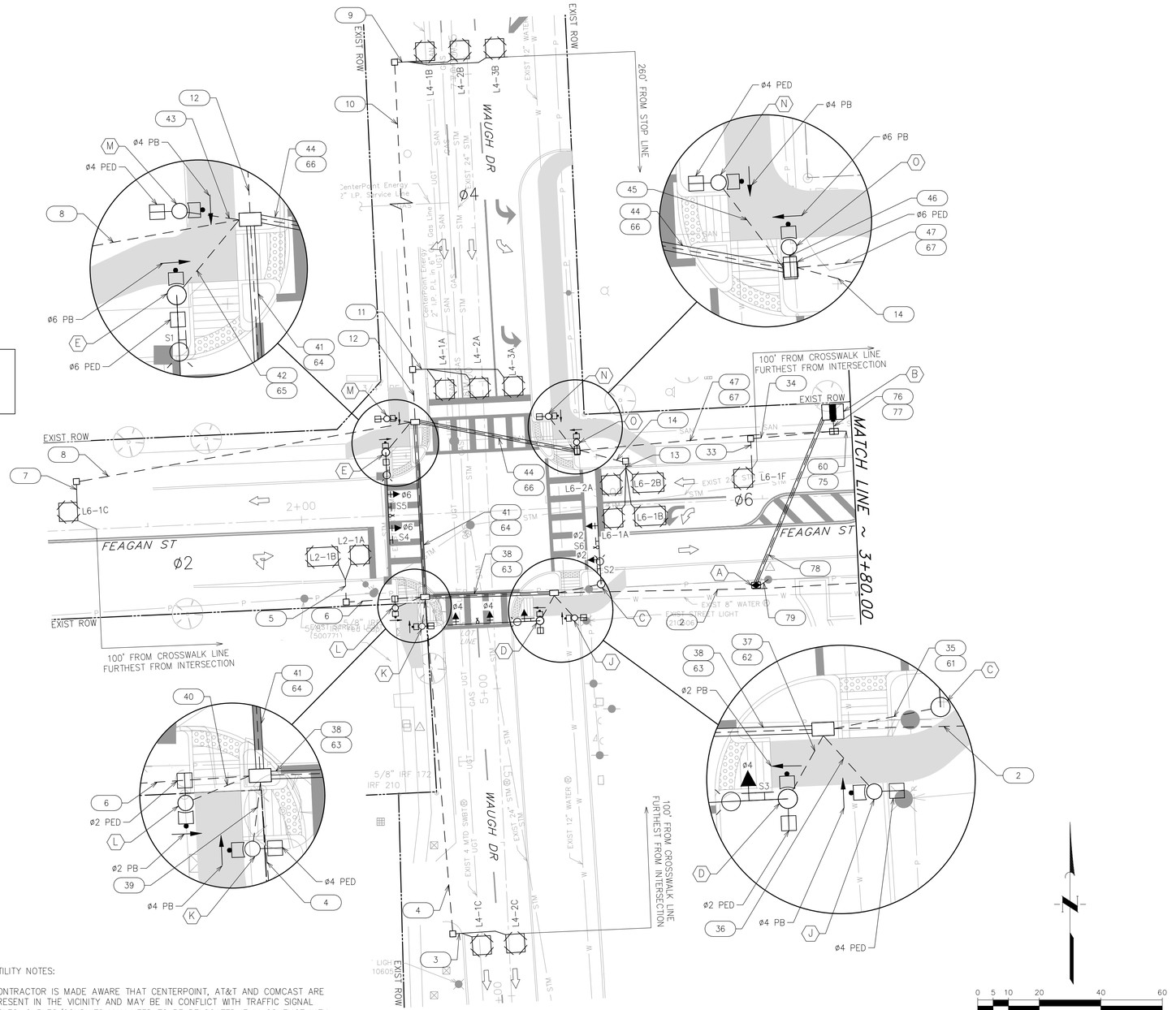
NEMA PHASING DIAGRAM

1 N/A	2	3 N/A	4
5 N/A	6	7 N/A	8 N/A

TRAFFIC PHASE
PEDESTRIAN PHASE

POSTED SPEED LIMIT

WAUGH DR = 35 MPH
FEAGAN ST = 30 MPH



SCALE: 1" = 20'

STOP LINE AND DETECTOR LOCATIONS		
ITEM BY DIRECTION	STATION WAUGH DR	OFFSET
WESTBOUND		
STOP LINE @ GUTTER	5+69.65	36.17' RT
STOP LINE @ CENTERLINE	5+47.83	36.42' RT
PHASE 6 PRESENCE LOOP		
L6-1A LEADING EDGE (6'X6')	5+53.54	CENTERED IN LANE
L6-1B LEADING EDGE (6'X10')	10' FROM STOP BAR	CENTERED IN LANE
L6-2A LEADING EDGE (6'X6')	5+64.50	CENTERED IN LANE
L6-2B LEADING EDGE (6'X10)	10' FROM STOP BAR	CENTERED IN LANE
PHASE 6 PULSE LOOP		
L6-1C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
L6-1F LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
EASTBOUND		
STOP LINE @ GUTTER	5+37.70	38.53' LT
STOP LINE @ CENTERLINE	5+54.41	38.49' LT
PHASE 2 PRESENCE LOOP		
L2-1A LEADING EDGE (6'X6')	5+45.53	CENTERED IN LANE
L2-1B LEADING EDGE (6'X10')	10' FROM STOP BAR	CENTERED IN LANE
SOUTHBOUND		
STOP LINE @ GUTTER (RT)	5+93.95	15.38' RT
STOP LINE @ GUTTER (LT)	5+93.95	17.65' LT
PHASE 4 CALL LOOP		
L4-1A LEADING EDGE (6'X6')	5+94.95	CENTERED IN LANE
L4-2A LEADING EDGE (6'X6')	5+94.95	CENTERED IN LANE
L4-3A LEADING EDGE (6'X6')	5+94.95	CENTERED IN LANE
L4-1B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
L4-2B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
L4-3B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
PHASE 4 PULSE LOOP		
L4-1C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
L4-2C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE

UTILITY NOTES:

CONTRACTOR IS MADE AWARE THAT CENTERPOINT, AT&T AND COMCAST ARE PRESENT IN THE VICINITY AND MAY BE IN CONFLICT WITH TRAFFIC SIGNAL POLES. CABLES/CONDUITS MAY NEED TO BE RELOCATED IF IN CONFLICT WITH TRAFFIC SIGNAL POLE.

SPECIAL NOTES:

1. THE CONTRACTOR SHALL MAINTAIN ALL SIGNAL POLES 4' HORIZONTAL AND 6" VERTICAL CLEARANCE FROM WATERLINE.

2. CONFIRM FINAL PLACEMENT OF PULLBOXES WITH CONSTRUCTION MANAGER.

3. CELLULAR MODEM, BLUETOOTH READER, AND ANTENNA TO BE INSTALLED PER COMMUNICATION INSTALLATION DETAILS.

LEGEND

- PEDESTAL POLE
- POLE W/MAST ARM
- LUMINAIRE
- VEHICLE SIGNAL HEAD W/BACK PLATE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PULL BOX – TYPE A
- PULL BOX – TYPE B
- PULL BOX – TYPE C
- CONDUIT
- CONDUIT (BORED)
- PRE-EMPT SENSOR
- CONTROLLER CABINET W/ UPS
- METERED POWER PEDESTAL
- MAST ARM SIGN
- SAW-CUT LOOP DETECTOR
- LANE ASSIGNMENT ARROW

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR/S HEIGHTS BLVD AT FEAGAN ST TRAFFIC SIGNAL PLAN

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 44 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_DWG, 3/25/2024 4:09 PM

S7 = STREET NAME "S Heights Blvd", BLOCK NUMBER 200
S8 = STREET NAME "Feagan St", BLOCK NUMBER 3700
S9 = STREET NAME "S Heights Blvd", BLOCK NUMBER 200
S10 = STREET NAME "Feagan St", BLOCK NUMBER 3700
S11 = R10-12 (30"x36") SIGN, "LEFT TURN YIELD ON GREEN BALL"
S12 = R10-17T (36"X42") SIGN, "LEFT TURN YIELD ON FLASHING YELLOW ARROW"
S13 = R10-17T (36"X42") SIGN, "LEFT TURN YIELD ON FLASHING YELLOW ARROW"
S14 = R10-12 (30"x36") SIGN, "LEFT TURN YIELD ON GREEN BALL"
S15 = R10-17T (36"X42") SIGN, "LEFT TURN YIELD ON FLASHING YELLOW ARROW"
S16 = R10-17T (36"X42") SIGN, "LEFT TURN YIELD ON FLASHING YELLOW ARROW"

COMMUNICATION SYSTEM NOTE:

1. ALL INTELLIGENT TRANSPORTATION SYSTEMS (ITS) INFRASTRUCTURE MUST BE FIELD VERIFIED AND INCLUDED ON ALL DESIGN PLANS. ITS INFRASTRUCTURE INCLUDES, BUT NOT LIMITED TO, FIBER OPTIC CABLE, COPPER, ETHERNET SWITCHES, WIMAX, BLUETOOTH EQUIPMENT, CCTV CAMERAS, ETC. A FIELD HARDENED MANAGED ETHERNET SWITCH MUST BE INCLUDED FOR ANY NEW OR MODIFIED SIGNALIZED INTERSECTION(S). CONTACT TRAFFIC OPERATIONS DIVISION/ITS SECTION FOR COMPATIBILITY QUESTIONS WITH CITY OF HOUSTON COMMUNICATION INFRASTRUCTURE.

CENTERPOINT OVERHEAD POWER LINES:

1. CONTRACTOR IS MADE AWARE THAT THE OVERHEAD POWER LINES WILL BE IN CONFLICT WITH SIGNAL POLES WITH LUMINAIRE ARMS. CONTRACTOR MUST COORDINATE AND NOTIFY CPE TO REMOVE/ADJUST THEIR FACILITIES TWELVE (12) WEEKS IN ADVANCE OF ANY CONSTRUCTION ACTIVITIES ON PROPOSED SIGNALS.

PROPOSED STREET NAME SIGNS

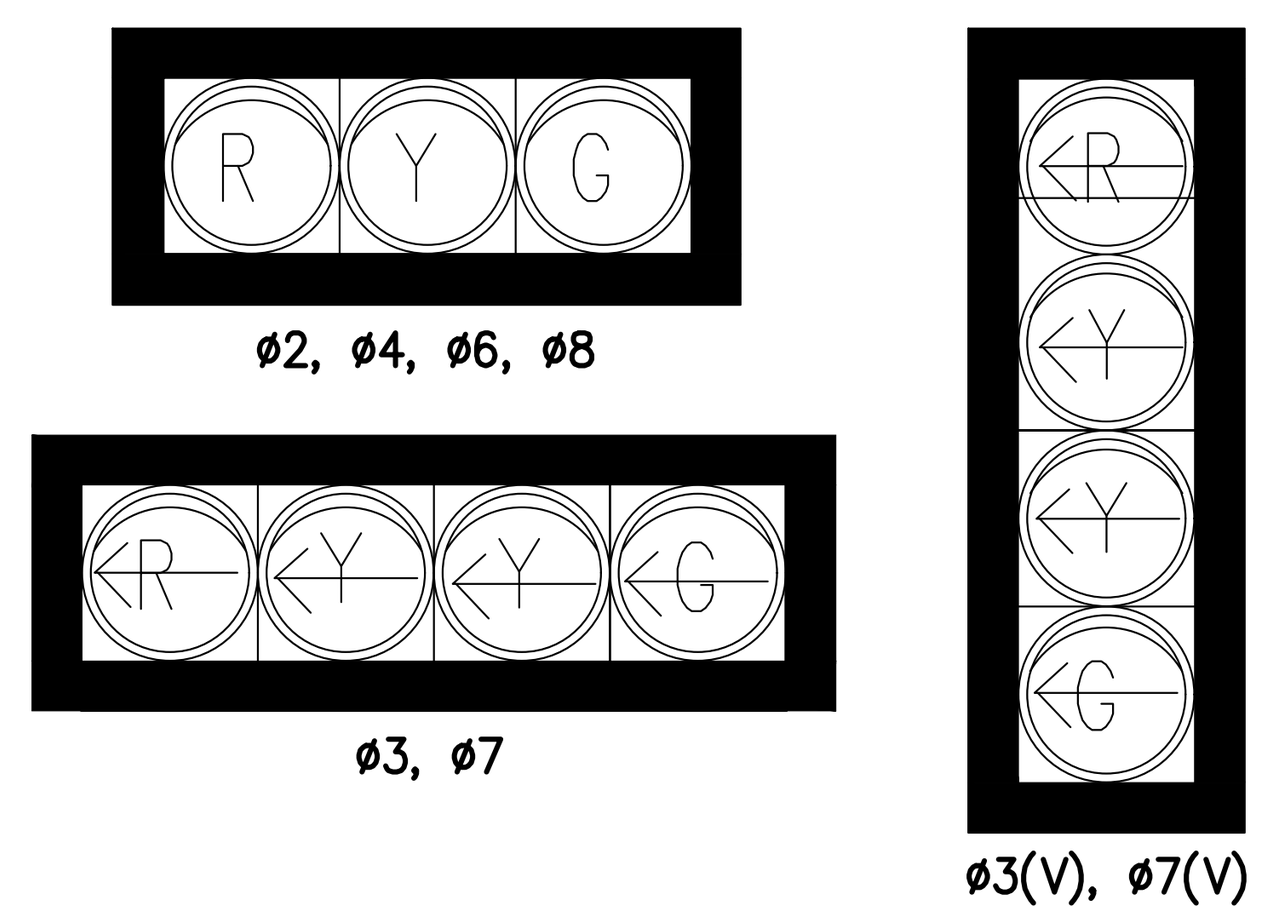
S Heights BLVD 200

S8, S10

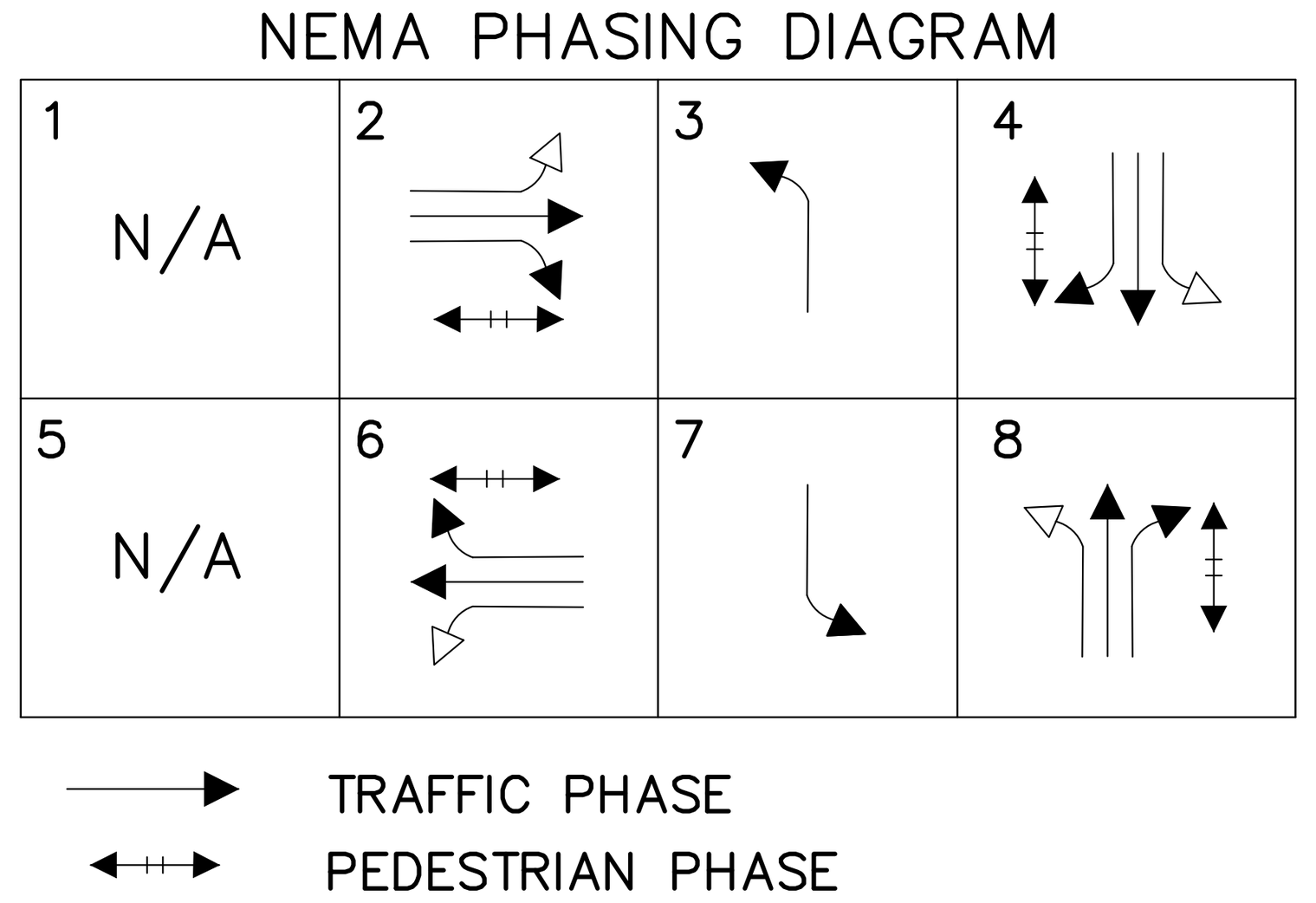
Feagan ST 3700

S9, S11

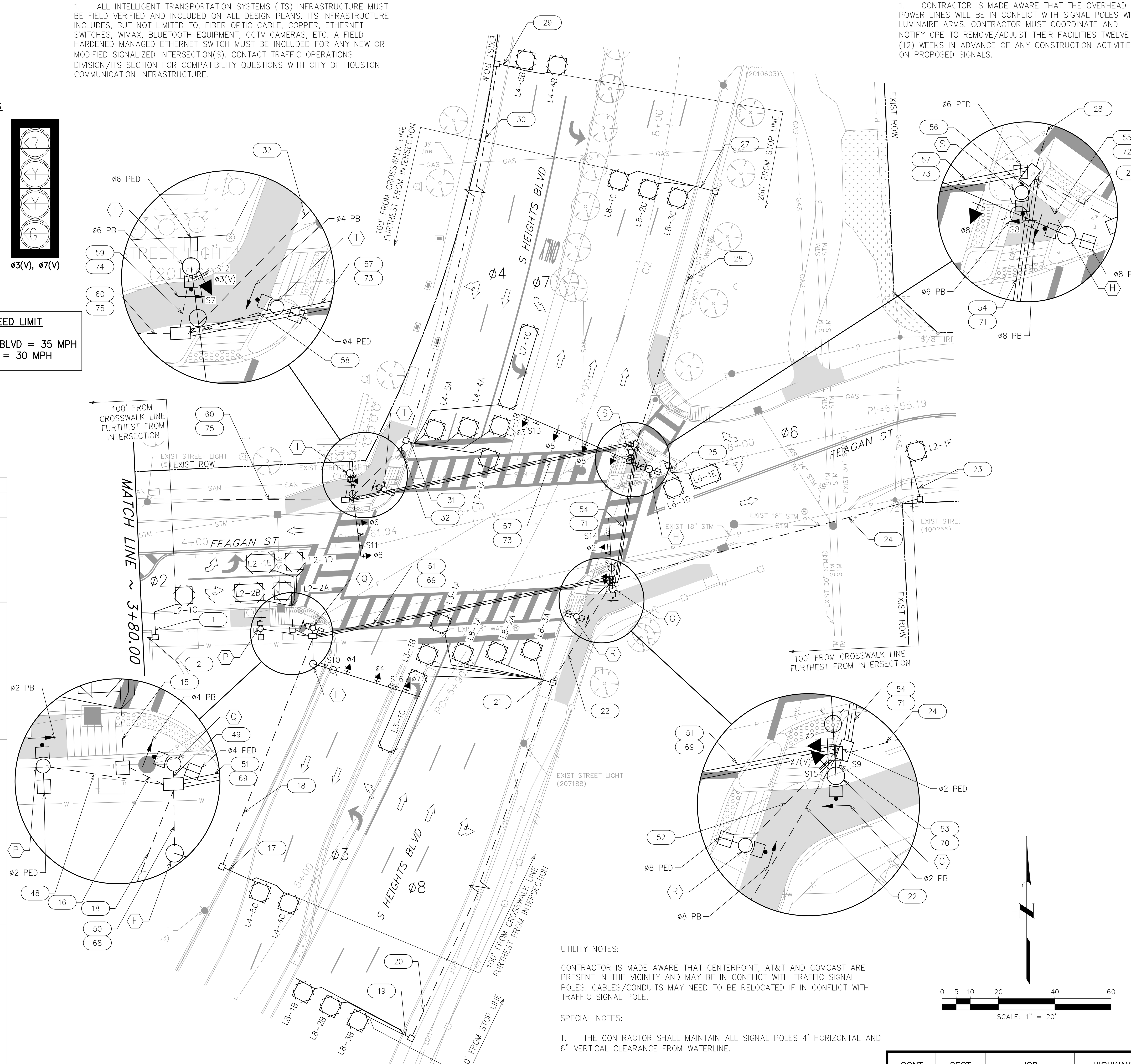
PROPOSED TRAFFIC SIGNAL HEADS



NEMA PHASING DIAGRAM



POSTED SPEED LIMIT
S HEIGHTS BLVD = 35 MPH
FEAGAN ST = 30 MPH



LEGEND

- PEDESTAL POLE
- POLE W/MAST ARM
- LUMINAIRE
- VEHICLE SIGNAL HEAD W/BACK PLATE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PULL BOX – TYPE A
- PULL BOX – TYPE B
- PULL BOX – TYPE C
- CONDUIT
- CONDUIT (BORED)
- PRE-EMPT SENSOR
- CONTROLLER CABINET W/ UPS
- METERED POWER PEDESTAL
- MAST ARM SIGN
- SAW-CUT LOOP DETECTOR
- LANE ASSIGNMENT ARROW

REVISION			
NO.	DATE	REVISION	APP.

STOP LINE AND DETECTOR LOCATIONS

ITEM BY DIRECTION	STATION S HEIGHTS BLVD	OFFSET
WESTBOUND		
STOP LINE @ GUTTER	6+82.87	32.38' RT
STOP LINE @ CENTERLINE	6+69.61	34.21' RT
PHASE 6 PRESENCE LOOP		
L6-1D LEADING EDGE (6'X6')	6+78.91	CENTERED IN LANE
L6-1E LEADING EDGE (6'X10')	10' FROM STOP BAR	CENTERED IN LANE
EASTBOUND		
STOP LINE @ GUTTER	5+77.50	60.67' LT
STOP LINE @ CENTERLINE	6+1.89	65.52' LT
PHASE 2 PRESENCE LOOP		
L2-1D LEADING EDGE (6'X6')	5+93.53	CENTERED IN LANE
L2-1E LEADING EDGE (6'X10)	10' FROM STOP BAR	CENTERED IN LANE
L2-2A LEADING EDGE (6'X6')	5+81.91	CENTERED IN LANE
L2-2B LEADING EDGE (6'X10)	10' FROM STOP BAR	CENTERED IN LANE
PHASE 2 PULSE LOOP		
L2-1C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
L2-1F LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
SOUTHBOUND		
STOP LINE @ GUTTER	6+56.56	51.99' LT
STOP LINE @ CENTERLINE	6+73.92	21.34' LT
PHASE 4 PRESENCE LOOP		
L4-4A LEADING EDGE (6'X6')	6+67.86	CENTERED IN LANE
L4-5A LEADING EDGE (6'X6')	6+61.79	CENTERED IN LANE
L4-4B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
L4-5B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
PHASE 4 PULSE LOOP		
L4-4C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
L4-5C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
PHASE 7 PRESENCE LOOP		
L7-1A LEADING EDGE (6'X6')	4' IN FRONT OF STOP BAR	CENTERED IN LANE
L7-1B LEADING EDGE (6'X6')	6+73.40	CENTERED IN LANE
L7-1C LEADING EDGE (6'X30')	10' FROM STOP BAR	CENTERED IN LANE
NORTHBOUND		
STOP LINE @ GUTTER	6+18.95	23.88' RT
STOP LINE @ CENTERLINE	5+91.82	16.25' LT
PHASE 8 PRESENCE LOOP		
L8-1A LEADING EDGE (6'X6')	5+99.83	CENTERED IN LANE
L8-2A LEADING EDGE (6'X6')	6+6.58	CENTERED IN LANE
L8-3A LEADING EDGE (6'X6')	6+13.50	CENTERED IN LANE
L8-1B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
L8-2B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
L8-3B LEADING EDGE (6'X6')	260' FROM STOP BAR	CENTERED IN LANE
PHASE 8 PULSE LOOP		
L8-1C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
L8-2C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
L8-3C LEADING EDGE (6'X6')	100' FROM CROSSWALK	CENTERED IN LANE
PHASE 3 PRESENCE LOOP		
L3-1A LEADING EDGE (6'X6')	4' IN FRONT OF STOP BAR	CENTERED IN LANE
L3-1B LEADING EDGE (6'X6')	5+92.48	CENTERED IN LANE
L3-1C LEADING EDGE (6'X30')	10' FROM STOP BAR	CENTERED IN LANE

UTILITY NOTES:

CONTRACTOR IS MADE AWARE THAT CENTERPOINT, AT&T AND COMCAST ARE PRESENT IN THE VICINITY AND MAY BE IN CONFLICT WITH TRAFFIC SIGNAL POLES. CABLES/CONDUITS MAY NEED TO BE RELOCATED IF IN CONFLICT WITH TRAFFIC SIGNAL POLE.

SPECIAL NOTES:

1. THE CONTRACTOR SHALL MAINTAIN ALL SIGNAL POLES 4' HORIZONTAL AND 6" VERTICAL CLEARANCE FROM WATERLINE.

2. CONFIRM FINAL PLACEMENT OF PULLBOXES WITH CONSTRUCTION MANAGER.

3. CELLULAR MODEM, BLUETOOTH READER, AND ANTENNA TO BE INSTALLED PER COMMUNICATION INSTALLATION DETAILS.

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

WAUGH DR/S HEIGHTS BLVD AT FEAGAN ST TRAFFIC SIGNAL PLAN

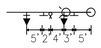
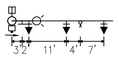
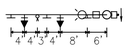
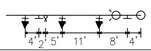
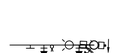
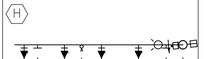
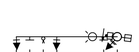
WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 45 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_.DWG, 3/25/2024 4:09 PM

POLE SCHEDULE

POLE NUMBER	POLE TYPE	MAST ARM SIGNALS				LUMINAIRE TYPE	PED PB TYPE/SIGN	REMARKS	LOCATION	STANDARDS
		SIGNAL	LUMINAIRE	MOUNTING	FACE					
Ⓒ 	TYPE 1	25'	N.T.S. 15'	2 – ASTROBRAC	2 – H3	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	–	PRE-EMPT SENSOR SIGNS: S2 = STREET NAME S6 = R6-2R (24"x30")	POLE C: STA 5+32.33, 35.4' RT WAUGH DRIVE ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓓ 	TYPE 1	30'	N.T.S. 15'	3 – ASTROBRAC 1 – SIDE OF POLE	3 – H3 1 – CDP	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	POLARA NAVIGATOR R10-3E (R)	PRE-EMPT SENSOR SIGNS: S3 = STREET NAME	POLE D: STA 5+21.35, 15.0' RT WAUGH DRIVE ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓔ 	TYPE 1	30'	N.T.S. 15'	2 – ASTROBRAC 1 – SIDE OF POLE	2 – H3 1 – CDP	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	POLARA NAVIGATOR R10-3E (L)	PRE-EMPT SENSOR SIGNS: S1 = STREET NAME S4 = R10-12 (30"x36") S5 = R6-2L (24"X30")	POLE E: STA 5+78.40, 32.5' LT WAUGH DRIVE ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓕ 	TYPE 2	40'	N.T.S. 15'	3 – ASTROBRAC	2 – H3 1 – H4LF	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	–	PRE-EMPT SENSOR SIGNS: S10 = STREET NAME S16 = R10-17T (36"x42")	POLE F: STA 5+64.58, 43.0' LT S HEIGHTS BLVD ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓖ 	TYPE 1	25'	N.T.S. 15'	2 – ASTROBRAC 2 – SIDE OF POLE	2 – H3 1 – V4LF 1 – CDP	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	POLARA NAVIGATOR R10-3E (L)	PRE-EMPT SENSOR SIGNS: S9 = STREET NAME S14 = R10-12 (30"x36") S15 = R10-17T (36"x42")	POLE G: STA 6+42.09, 33.8' RT S HEIGHTS BLVD ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓗ 	TYPE 2	50'	N.T.S. 15'	4 – ASTROBRAC 1 – SIDE OF POLE	3 – H3 1 – H4LF 1 – CDP	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	POLARA NAVIGATOR R10-3E (R)	PRE-EMPT SENSOR SIGNS: S8 = STREET NAME S13 = R10-17T (36"x42")	POLE H: STA 6+83.51, 27.4' RT S HEIGHTS BLVD ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓘ 	TYPE 1	30'	N.T.S. 15'	2 – ASTROBRAC 2 – SIDE OF POLE	2 – H3 1 – V4LF 1 – CDP	106 WATT SYSTEM MAX. LED COBRA LUMINAIRE	POLARA NAVIGATOR R10-3E (R)	PRE-EMPT SENSOR SIGNS: S7 = STREET NAME S11 = R10-12 (30"x36") S12 = R10-17T (36"x42")	POLE I: STA 6+31.82, 67.8' LT S HEIGHTS BLVD ℄	01554-11 02465-01 02582-01 02582-02 02582-03 02893-01
Ⓙ 	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (L)	–	POLE J: STA 5+21.76, 26.3' RT WAUGH DRIVE ℄	02465-02 02582-01 02893-01
Ⓚ	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (L)	–	POLE K: STA 5+21.36, 23.4' LT WAUGH DRIVE ℄	02465-02 02582-01 02893-01
Ⓛ	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (R)	–	POLE L: STA 5+27.74, 31.8' LT WAUGH DRIVE ℄	02465-02 02582-01 02893-01
Ⓜ	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (L)	–	POLE M: STA 5+89.31, 31.6' LT WAUGH DRIVE ℄	02465-02 02582-01 02893-01
Ⓝ	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (L)	–	POLE N: STA 5+87.62, 20.9' RT WAUGH DRIVE ℄	02465-02 02582-01 02893-01
Ⓞ	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (R)	–	POLE O: STA 5+78.80, 29.7' RT WAUGH DRIVE ℄	02465-02 02582-01 02893-01
Ⓟ	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10-3E (L)	–	POLE P: STA 5+64.62, 65.4' LT S HEIGHTS BLVD ℄	02465-02 02582-01 02893-01

NOTES:

1. ALL SIGNAL HEADS WILL BE 12" WITH LOUVERED BACK PLATES AND YELLOW HOUSING.

2. ALL TRAFFIC SIGNAL POLES, LUMINAIRE ARMS, AND MAST ARMS SHALL BE POWDER COATED MATTE BLACK.

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23293 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR/ S HEIGHTS BLVD AT FEAGAN ST TRAFFIC SIGNAL POLE SCHEDULE

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 46 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_.DWG, 3/25/2024 4:09 PM

POLE SCHEDULE

POLE NUMBER	POLE TYPE	MAST ARM		SIGNALS		LUMINAIRE TYPE	PED PB TYPE/SIGN	REMARKS	LOCATION	STANDARDS
		SIGNAL	LUMINAIRE	MOUNTING	FACE					
Q	POLE Q	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10–3E (L)	–	POLE Q: STA 5+75.09, 50.1' LT S HEIGHTS BLVD ℄	02465–02 02582–01 02893–01
R	POLE R	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10–3E (R)	–	POLE R: STA 6+28.14, 27.2' RT S HEIGHTS BLVD ℄	02465–02 02582–01 02893–01
S	POLE S	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10–3E (L)	–	POLE S: STA 6+86.49, 19.2' RT S HEIGHTS BLVD ℄	02465–02 02582–01 02893–01
T	POLE T	PED POLE 15'	–	–	1 – SIDE OF POLE	1 – CDP	–	POLARA NAVIGATOR R10–3E (R)	–	POLE T: STA 6+35.88, 54.3' LT S HEIGHTS BLVD ℄	02465–02 02582–01 02893–01

TRAFFIC SIGNAL CONTROLLER

CABINET	TYPE	CONTROLLER	AUX. CONTROL	REMARKS	LOCATION	STANDARDS
A	METERED PEDESTAL SERVICE UL TYPE 3R	METERED PEDESTAL SERVICE WITH ONE 30 AMP AND ONE 60 AMP BREAKER AND PHOTOCELL	–	PROVIDE METER SOCKET WINDOW 4" H X 6" W POWER SOURCE: CENTERPOINT PROVIDE STREET LIGHTING PHOTO CELL ON TRAFFIC SIGNAL SERVICE PANEL	STA 5+29.55, 85.7' RT (TO CENTER OF METER) WAUGH DRIVE ℄	02893–02
B	TYPE 340 ITS W/ POLYMER BASE (2' HEIGHT) STANDARD SPECIFICATION 16730–03	2070 LX CONTROLLER UNIT WITH 2070–1C CPU MODULE W/ GPS SERIAL COMMUNICATIONS MODULE AND UPS SYSTEM	–	1 APCC–M APCC 4 CHANNEL OUTPUTS 1 EX–240 EXPANSION CARD 4 CHANNEL 1 APCC–SPP APCC SERIAL PORT PROTOCOL (DIGITAL RADIO) 1 APCC–ACC–1 APCC ACCESSORY, ISOLATOR 1 KIT–MTG/MOUNTING KIT STANDARD SPECIFICATION 16730 & 16731 UNINTERRUPTIBLE POWER SUPPLY STANDARD SPECIFICATION 16732 FIELD HARDENED ETHERNET SWITCH (SIX COPPER PORTS AND TWO FIBER OPTIC PORTS) STANDARD SPECIFICATION 16733 CELLULAR MODEM, BLUETOOTH READER, AND ANTENNA GPS SERIAL COMMUNICATIONS MODULE STANDARD SPECIFICATION 16785	STA 5+84.66, 113.27' RT (TO CENTER OF CAB.) WAUGH DRIVE ℄	16730–03

NOTES:

1. ALL SIGNAL HEADS WILL BE 12" WITH LOUVERED BACK PLATES AND YELLOW HOUSING.

2. ALL TRAFFIC SIGNAL POLES, LUMINAIRE ARMS, AND MAST ARMS SHALL BE POWDER COATED MATTE BLACK.

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

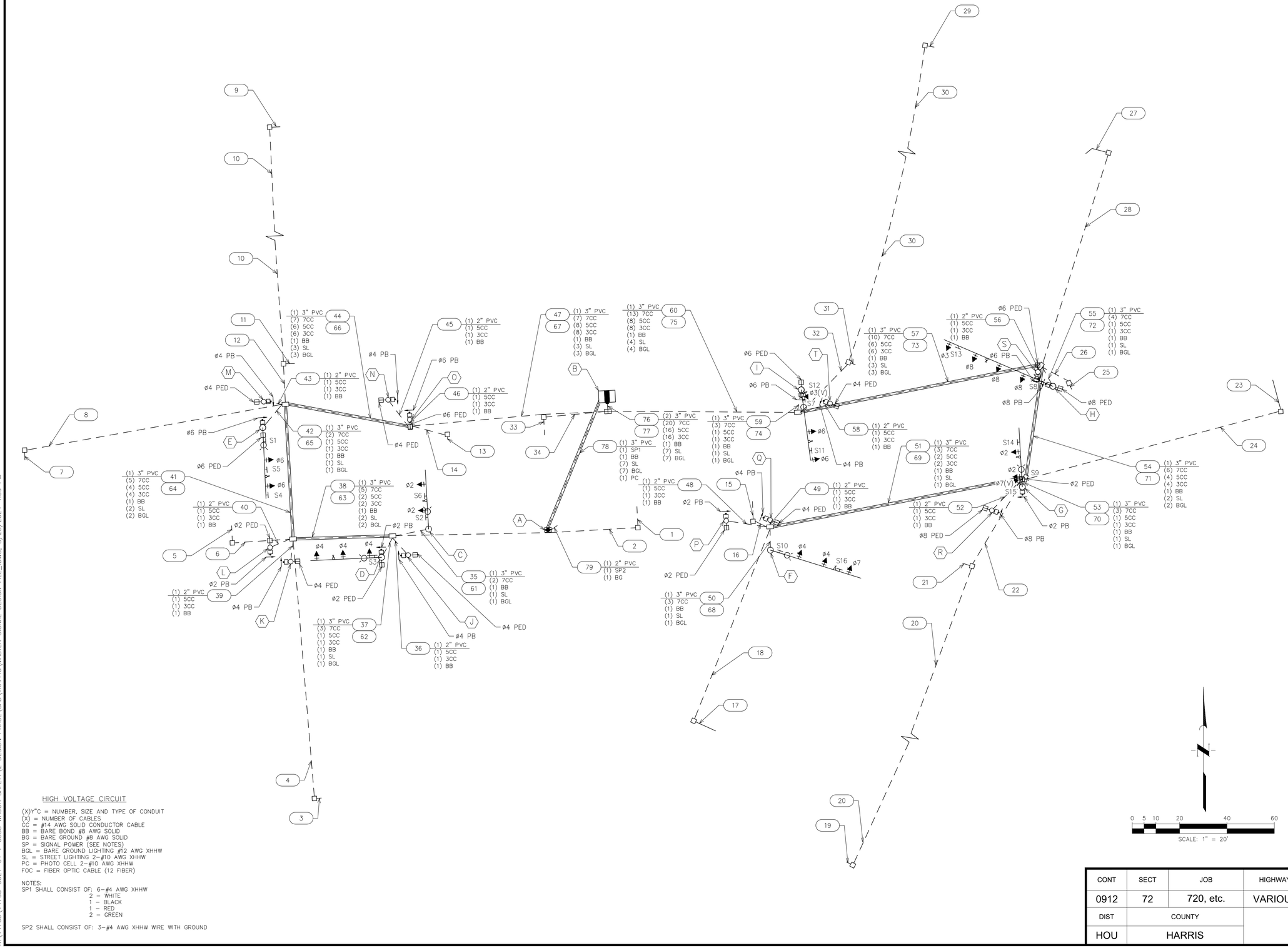
WAUGH DR/ S HEIGHTS BLVD
AT FEAGAN ST
TRAFFIC SIGNAL POLE
SCHEDULE

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 47 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_ DWG, 3/25/2024 4:09 PM



HIGH VOLTAGE CIRCUIT

(X)Y"C = NUMBER, SIZE AND TYPE OF CONDUIT
(X) = NUMBER OF CABLES
CC = #14 AWG SOLID CONDUCTOR CABLE
BB = BARE BOND #8 AWG SOLID
BG = BARE GROUND #8 AWG SOLID
SP = SIGNAL POWER (SEE NOTES)
BGL = BARE GROUND LIGHTING #12 AWG XHHW
SL = STREET LIGHTING 2-#10 AWG XHHW
PC = PHOTO CELL 2-#10 AWG XHHW
FOC = FIBER OPTIC CABLE (12 FIBER)

NOTES:
SP1 SHALL CONSIST OF: 6-#4 AWG XHHW
2 - WHITE
1 - BLACK
1 - RED
2 - GREEN

SP2 SHALL CONSIST OF: 3-#4 AWG XHHW WIRE WITH GROUND

LEGEND

- PEDESTAL POLE
- POLE W/MAST ARM
- LUMINAIRE
- VEHICLE SIGNAL HEAD W/BACK PLATE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PULL BOX - TYPE A
- PULL BOX - TYPE B
- PULL BOX - TYPE C
- CONDUIT
- CONDUIT (BORED)
- PRE-EMPT SENSOR
- CONTROLLER CABINET W/ UPS
- METERED POWER PEDESTAL
- MAST ARM SIGN
- SAW-CUT LOOP DETECTOR
- LANE ASSIGNMENT ARROW

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR/ S HEIGHTS BLVD AT FEAGAN ST CABLE SCHEDULE

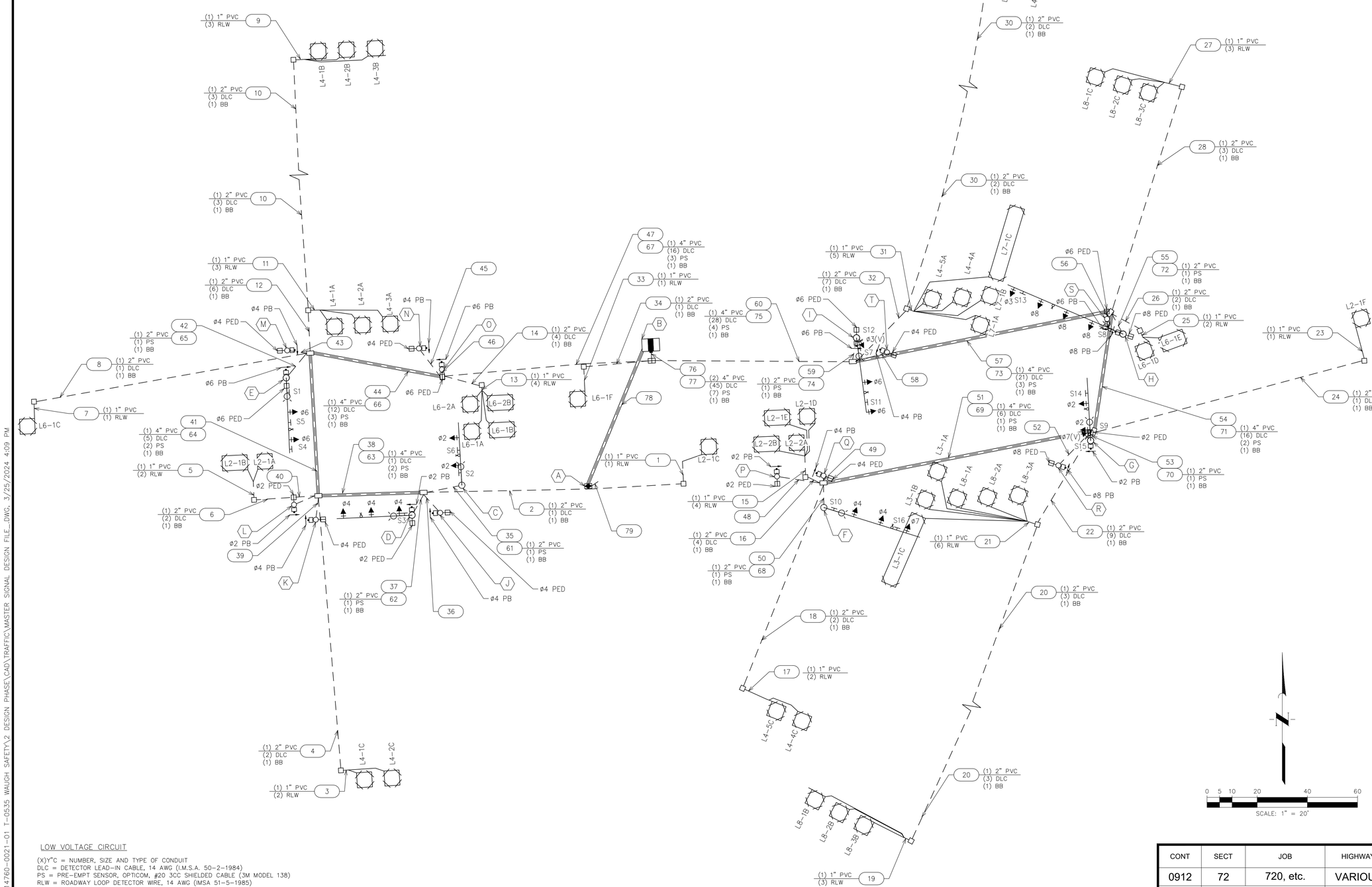
WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 48 OF 72	

0 5 10 20 40 60
SCALE: 1" = 20'

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_DWG, 3/25/2024 4:09 PM



LEGEND

- PEDESTAL POLE
- POLE W/MAST ARM
- LUMINAIRE
- VEHICLE SIGNAL HEAD W/BACK PLATE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PULL BOX – TYPE A
- PULL BOX – TYPE B
- PULL BOX – TYPE C
- CONDUIT
- CONDUIT (BORED)
- PRE–EMPT SENSOR
- CONTROLLER CABINET W/ UPS
- METERED POWER PEDESTAL
- MAST ARM SIGN
- SAW–CUT LOOP DETECTOR
- LANE ASSIGNMENT ARROW

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WAUGH DR/ S HEIGHTS BLVD AT FEAGAN ST CABLE SCHEDULE

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 49 OF 72	

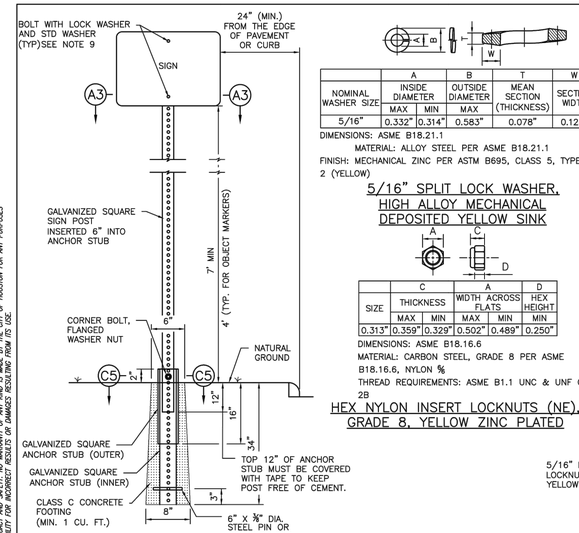
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

LOW VOLTAGE CIRCUIT

(X)Y"C = NUMBER, SIZE AND TYPE OF CONDUIT
DLC = DETECTOR LEAD–IN CABLE, 14 AWG (I.M.S.A. 50–2–1984)
PS = PRE–EMPT SENSOR, OPTICOM, #20 3CC SHIELDED CABLE (3M MODEL 138)
RLW = ROADWAY LOOP DETECTOR WIRE, 14 AWG (IMSA 51–5–1985)
BB = BARE BOND #8 AWG SOLID

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\MASTER SIGNAL DESIGN FILE_DWG, 3/25/2024 4:09 PM

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



ELEVATION

TYPICAL GROUND SIGN INSTALLATION PERFORATED SQUARE METAL TUBING

TABLE A	
GALVANIZED SQUARE SIGN POST (PERFORATED)	1-3/4"x-1-3/4" (14 GAUGE)
GALVANIZED SQUARE ANCHOR STUB (PREFORATAED) (INNER)	2"x2"x36" (14 GAUGE)
GALVANIZED SQUARE ANCHOR STUB (PERFORATED) (OUTER)	2 1/4" x 2 1/4" x 18" (14 GAUGE)

NOMINAL WASHER SIZE	A INSIDE DIAMETER MAX	A INSIDE DIAMETER MIN	B OUTSIDE DIAMETER MAX	T MEAN SECTION (THICKNESS)	W SECTION WIDTH
5/16"	0.332"	0.314"	0.583"	0.078"	0.125"

DIMENSIONS: ASME B18.21.1
MATERIAL: ALLOY STEEL PER ASME B18.21.1
FINISH: MECHANICAL ZINC PER ASTM B695, CLASS 5, TYPE 2 (YELLOW)

5/16" SPLIT LOCK WASHER, HIGH ALLOY MECHANICAL DEPOSITED YELLOW SINK

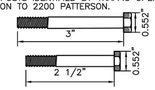
SIZE	C THICKNESS MAX	C THICKNESS MIN	A WIDTH ACROSS FLATS MAX	A WIDTH ACROSS FLATS MIN	D HEX HEIGHT MIN
0.313"	0.359"	0.329"	0.502"	0.489"	0.250"

DIMENSIONS: ASME B18.16.6
MATERIAL: CARBON STEEL, GRADE 8 PER ASME B18.16.6, NYLON 6/6
THREAD REQUIREMENTS: ASME B1.1 UNC & UNF CLASS 2B

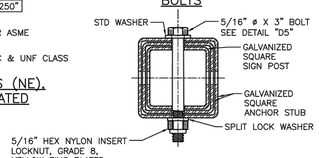
HEX NYLON INSERT LOCKNUTS (NE), GRADE 8, YELLOW ZINC PLATED

NOTES:

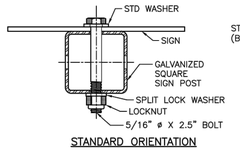
1. THE EXISTING SIGNS LOCATED ON PUBLIC CONSTRUCTION SITE ARE THE PROPERTY OF THE CITY OF HOUSTON. THROUGHOUT THE PERIOD OF THE CONTRACT, THE CONTRACTOR SHALL PROTECT THESE SIGNS SUCH THAT THEY ARE NOT DAMAGED IN THE COURSE OF CONSTRUCTION ACTIVITY. SUCH PROTECTION SHALL INCLUDE THE PERIOD AFTER SIGNS ARE REMOVED FROM INSTALLATION AND STORED BY THE CONTRACTOR OR DELIVERED TO THE TRAFFIC OPERATIONS CENTER (2200 PATTERSON). THE GENERAL TRAFFIC SUPERINTENDENT (832-395-6771) MUST BE NOTIFIED 48 HOURS IN ADVANCE PRIOR TO DELIVERY.
2. AFTER SIGNS ARE REMOVED FROM INSTALLATION AND ARE BEING STORED BY THE CONTRACTOR, THE CONTRACTOR SHALL CONTACT THE TRAFFIC OPERATIONS DIVISION OF HOUSTON PUBLIC WORKS (832-395-6771) AND ARRANGE FOR A CONVENIENT TIME TO DELIVER ONLY CITY SIGNS AND POSTS IDENTIFIED BY TRAFFIC OPERATIONS DIVISION TO 2200 PATTERSON.
3. PRIOR TO THE START OF CONSTRUCTION, ALL EXISTING SIGNS WITHIN THE AREA OF CONSTRUCTION WILL BE INVENTORIED AND DOCUMENTED JOINTLY BY THE CITY INSPECTOR AND THE CONTRACTOR. THIS DOCUMENT WILL BE JOINTLY SIGNED BY BOTH PARTIES REFLECTING THE SIGN TYPE, SIGN SIZE, SIGN CONDITION, SIGN LOCATION, REFLECTIVITY ADEQUACY, ETC. THE CONTRACTOR IS HELD ACCOUNTABLE FOR THESE SIGNS THROUGHOUT THE PROJECT AND AT THE PROJECTS COMPLETION.
4. ALL GROUND MOUNTED STOP SIGNS, WARNING SIGNS, AND OTHER REGULATORY SIGNS SHALL USE AT A MINIMUM HIGH INTENSITY PRISMATIC REFLECTIVE SHEETING.
5. ALL OVERHEAD SIGNS SHALL USE DIAMOND GRADE REFLECTIVE SHEETING.
6. ALL OTHER SIGNS SHALL USE SUPER ENGINEER GRADE SHEETING.
7. ALL BLANKS TO BE INSTALLED SHALL BE ALUMINUM ALLOY 6061-T-6 OR 5052-H38 IN ACCORDANCE WITH ASTM B209.
8. ALL HOLES SHALL BE 3/8" DIAMETER DRILLED OR PUNCHED AS SHOWN ON EACH BLANK DETAIL AND SHALL BE FREE OF BURRS AND / OR ROUGH EDGES. WHERE NON-STANDARD ORIENTATION OF SIGN IS USED, ENLARGE HOLE IN SIGN POST AT SIGN CONNECTION NOT GREATER THAN 11/16" IN DIAMETER.
9. BOLT SIZE REQUIREMENTS FOR SIGN CONNECTION:
   9.1. STANDARD ORIENTATION = 5/16" DIA X 2 1/2" BOLT
   9.2. NON STANDARD ORIENTATION = 5/16" DIA X 3" BOLT
10. SIGN BLANK CORNERS TO BE ROUNDED AS SHOWN ON EACH DETAIL ON SHEET 01554-06.
11. ALL SIGN BLANKS ARE TO BE ETCHED, DEGREASED, AND HAVE A COATING MEETING THE REQUIREMENTS OF ASTM B449, CLASS 2, OR ASTM B921, CLASS 2. PRIOR TO APPLICATION OF LEGENDS.
12. ALL SIGNS SHALL BE MANUFACTURED AND INSTALLED IN CONFORMANCE TO THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND STANDARD HIGHWAY SIGNS LATEST EDITION.



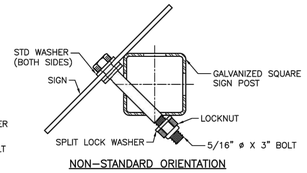
SECTION D5 BOLTS



SECTION C5 CORNER BOLT



STANDARD ORIENTATION



NON-STANDARD ORIENTATION

SECTION A3: SIGN CONNECTION DETAILS

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

GENERAL NOTES AND GROUND MOUNTING SIGN

(SCALE: NOT TO SCALE)

APPROVED BY:

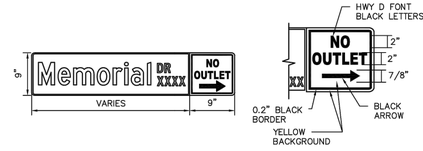
DocuSigned by: Sulat Kanwar — CITY ENGINEER
DocuSigned by: KHANG NGUYEN — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV-27-2023 | DWG NO: 01554-01

DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE USERS 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 ASSUMES RESPONSIBILITY FOR PROPER DESIGN AND SAFETY OF THE DESIGN. ANY REVISIONS TO THIS STANDARD MADE BY THE EOR SHALL BE MARKED AS SUCH AND SEALED BY THE EOR. THE CITY OF HOUSTON (COH) ASSUMES NO RESPONSIBILITY FOR ACTS OF OMISSIONS ON THE PART OF THE EOR. THE EOR IS REQUIRED TO INDEMNIFY AND HOLD HARMLESS THE COH FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE DESIGN OR PREPARATION OF ANY PLANS BASED ON THIS STANDARD. THE EOR IS RESPONSIBLE FOR ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR, EVEN IF THE PLANS CONTAIN INFORMATION REQUIRED BY THIS STANDARD. THE EOR'S RESPONSIBILITY FOR ERRORS AND OMISSIONS IN THE PLANS IS NOT LIMITED TO THE CORRECTION OF ERRORS AND OMISSIONS IDENTIFIED DURING THE REVIEW OF THE PLANS BY THE COH. THE EOR SHALL BE RESPONSIBLE FOR ERRORS AND OMISSIONS IN THE PLANS THAT WERE NOT CORRECTED DURING REVIEW BY THE COH, EVEN IF CONSTRUCTION IS COMPLETED. THE EOR SHALL BE LIABLE FOR COSTS INCURRED BY THE COH AND OTHERS DUE TO ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR. THE EOR SHALL BE RESPONSIBLE FOR COSTS INCURRED BY THE COH AND OTHERS TO CORRECT ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR. THE EOR SHALL BE LIABLE FOR ADDITIONAL COSTS INCURRED BY THE COH AND OTHERS DUE TO ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR.

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

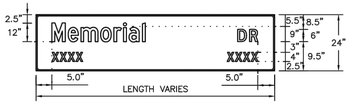
POST MOUNTED STREET NAME SIGN W/ NO OUTLET SIGN



D3 – POST MOUNTED STREET NAME SIGN



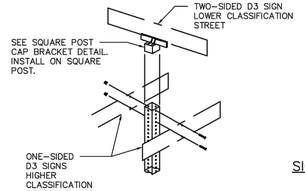
OVERHEAD STREET NAME SIGN DETAIL



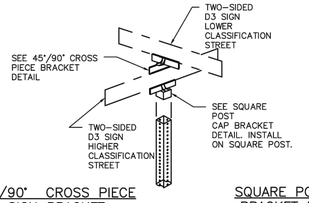
D3 – STREET NAME SIGN

	POST-MOUNTED SIGN	OVERHEAD SIGN
HEIGHT	9"	24"
LENGTH	30" MIN 48" MAX 6" INCREMENTS OF LENGTH	10" MAX 2' INCREMENT OF LENGTH
THICKNESS	0.125"	0.080"
SUBSTREATE	ALLUMINUM ALLOY, 5052-H38 (ASTM B-209)	
SIGN FACE MATERIALS	GREEN FILM OVER DIAMOND GRADE VIP SHEETING	
LEGENDS AND SYMBOLS	HIGHWAY GOTHIC SERIES D (USUAL) HIGHWAY GOTHIC SERIES C OR B FOR MAXIMUM LENGTH SIGN BLACK	
COLOR	LETTERS-WHITE REFLECTIVE BORDER-WHITE REFLECTIVE BACKGROUND-GREEN REFLECTIVE	

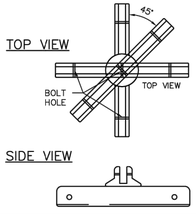
D3 SIGNS GREATER THAN 42" PLATES IN LENGTH



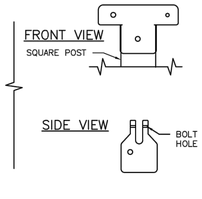
D3 SIGNS LESS THAN OR EQUAL TO 42" PLATES IN LENGTH



45°/90° CROSS PIECE SIGN BRACKET



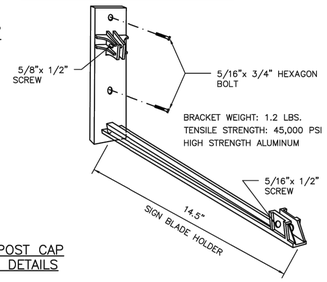
SQUARE POST CAP BRACKET DETAILS



NOTES:

1. TYPICAL SIGN PLATE SHOULD BE 30" MAX.
2. LONGER SIGN PLATE MUST BE APPROVED BY THE CITY TRAFFIC ENGINEER.

SIGNAL POLE MOUNTING DETAIL



CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

STREET NAME SIGN AND SIGN MOUNTING

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Sulat Kanwar — CITY ENGINEER
DocuSigned by: KHANG NGUYEN — CITY TRAFFIC ENGINEER
DocuSigned by: Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV-27-2023 | DWG NO: 01554-03

DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE USERS 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 ASSUMES RESPONSIBILITY FOR PROPER DESIGN AND SAFETY OF THE DESIGN. ANY REVISIONS TO THIS STANDARD MADE BY THE EOR SHALL BE MARKED AS SUCH AND SEALED BY THE EOR. THE CITY OF HOUSTON (COH) ASSUMES NO RESPONSIBILITY FOR ACTS OF OMISSIONS ON THE PART OF THE EOR. THE EOR IS REQUIRED TO INDEMNIFY AND HOLD HARMLESS THE COH FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE DESIGN OR PREPARATION OF ANY PLANS BASED ON THIS STANDARD. THE EOR IS RESPONSIBLE FOR ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR, EVEN IF THE PLANS CONTAIN INFORMATION REQUIRED BY THIS STANDARD. THE EOR'S RESPONSIBILITY FOR ERRORS AND OMISSIONS IN THE PLANS IS NOT LIMITED TO THE CORRECTION OF ERRORS AND OMISSIONS IDENTIFIED DURING THE REVIEW OF THE PLANS BY THE COH. THE EOR SHALL BE RESPONSIBLE FOR ERRORS AND OMISSIONS IN THE PLANS THAT WERE NOT CORRECTED DURING REVIEW BY THE COH, EVEN IF CONSTRUCTION IS COMPLETED. THE EOR SHALL BE LIABLE FOR COSTS INCURRED BY THE COH AND OTHERS DUE TO ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR. THE EOR SHALL BE LIABLE FOR ADDITIONAL COSTS INCURRED BY THE COH AND OTHERS DUE TO ERRORS AND OMISSIONS IN THE PLANS PREPARED BY THE EOR.

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 1 OF 23

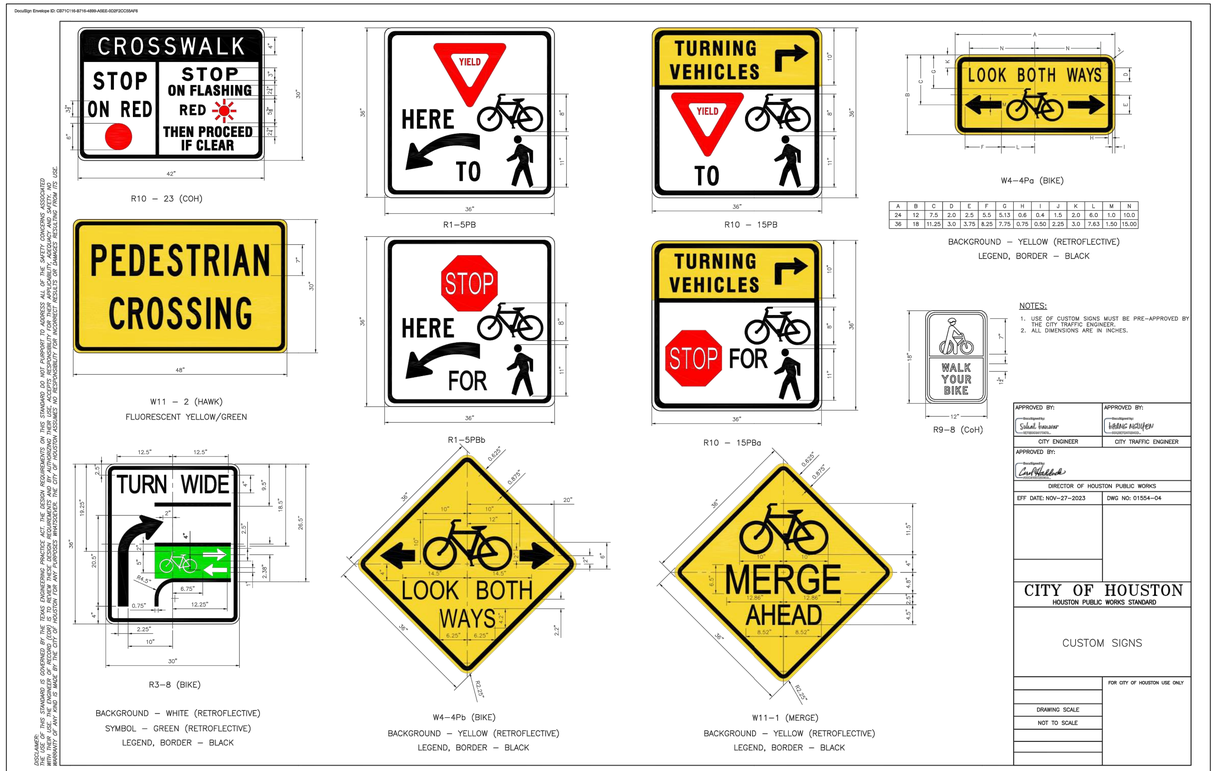
WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 50 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

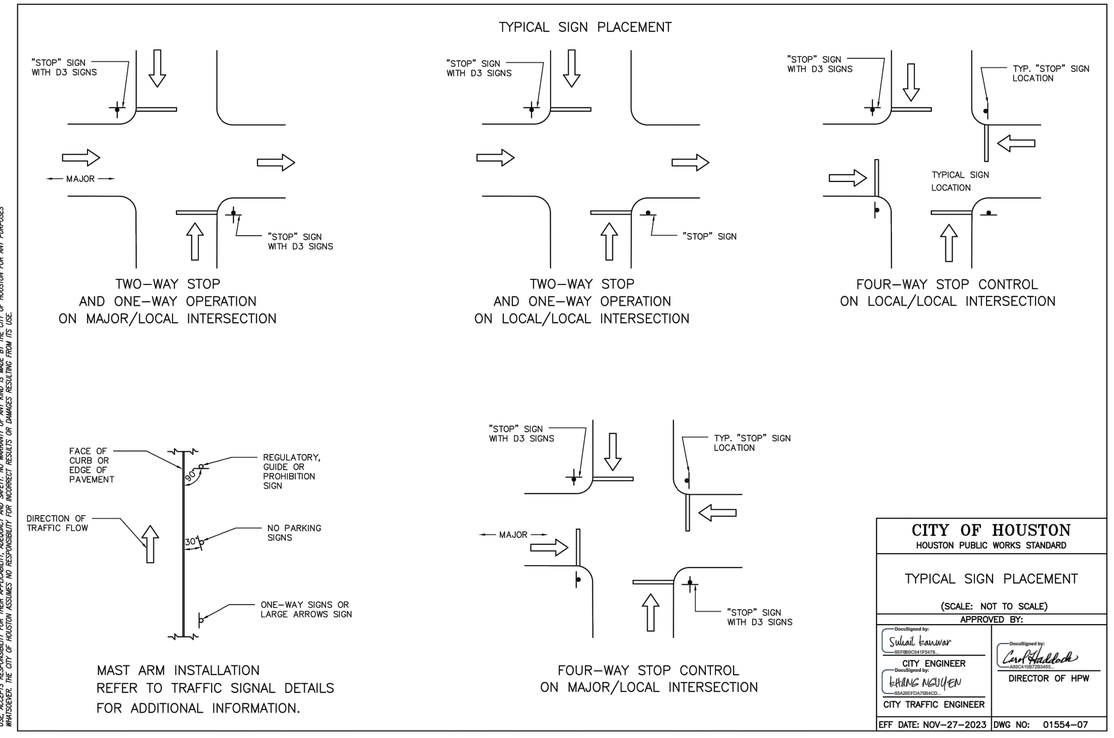
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6



A	B	C	D	E	F	G	H	I	J	K	L	M	N
24	12	7.5	2.0	2.5	5.5	5.13	0.6	0.4	1.5	2.0	6.0	1.0	10.0
36	18	11.25	3.0	3.75	8.25	7.75	0.75	0.50	2.25	3.0	7.63	1.50	15.00

DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE USEFR ASSUMES ALL OF THE RISK ASSOCIATED WITH THE USE OF THIS STANDARD. THE USER AGREES TO INDEMNIFY AND HOLD THE CITY OF HOUSTON HARMLESS FROM ANY AND ALL LIABILITY ARISING FROM THE USE. THE USER ASSUMES ALL RESPONSIBILITY FOR THE APPLICATION OF THIS STANDARD. THE USER 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.

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



DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE USERON REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE USER ASSUMES ALL RISK ASSOCIATED WITH THE USE OF THIS STANDARD. THE USER AGREES TO INDEMNIFY AND HOLD THE CITY OF HOUSTON HARMLESS FROM ANY AND ALL LIABILITY ARISING FROM THE USE. THE USER ASSUMES ALL RESPONSIBILITY FOR THE APPLICATION OF THIS STANDARD. THE USER ACCEPTS RESPONSIBILITY FOR THEIR APPLICABILITY, ADEQUACY AND SAFETY. NO WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL SIGN PLACEMENT

(SCALE: NOT TO SCALE)

APPROVED BY:
Sukul Tanuwar — CITY ENGINEER
HANG NGUYEN — CITY TRAFFIC ENGINEER
Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 01554–07

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 2 OF 23

WAUGH SAFETY IMPROVEMENTS

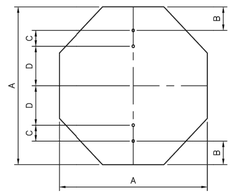
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 51 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

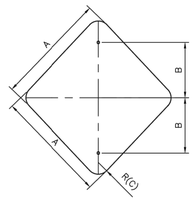
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6

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 FOR EACH PROJECT IS RESPONSIBLE FOR ADDRESSING SITE SPECIFIC CONDITIONS AND FOR THE SAFETY AND ADEQUACY OF THE DESIGN FOR EACH PROJECT. USE OF THIS STANDARD BY ANY PERSON OR ENTITY IS AT THEIR SOLE RISK AND WITHOUT LIABILITY TO THE CITY OF HOUSTON. ANY MODIFICATION OF THIS STANDARD WILL REMOVE THE SEAL OF THE ENGINEER WHO SEALED THE DRAWINGS. THE CITY OF HOUSTON MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND TO ANY PERSON OR ENTITY OF ANY DESIGN OR DRAWING PRODUCED FROM THIS STANDARD. ANY USE OF THIS STANDARD IS MADE BY THE USER WITHOUT ANY WARRANTY BY THE CITY OF HOUSTON AS TO ITS SUITABILITY OR FITNESS FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



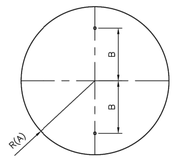
OCTAGONAL

A	B	C	D	T
24	3	3	12	0.08
36	3	3	24	0.08



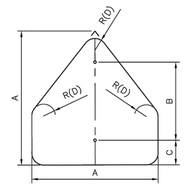
DIAMOND

A	B	C	T
24	12	1 1/2	0.08
30	15	1 1/2	0.08
36	18	1 1/2	0.08



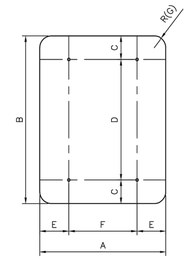
CIRCLE

A	B	T
15	15	0.08
18	12	0.08



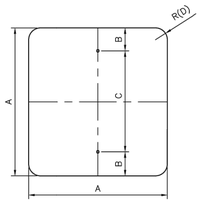
PENTAGON (SCHOOL)

A	B	C	D	T
36	24	3	1 1/2	0.08



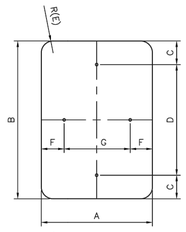
VERTICAL RECTANGLE

A	B	C	D	E	F	G	T
36	48	6	36	6	24	1 1/2	0.08
48	60	6	48	9	30	1 1/2	0.08
18	30	3	24	–	–	1 1/2	0.08



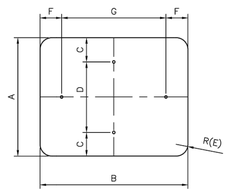
SQUARE (A)

A	B	C	D	T
18	3	12	1 1/2	0.08
24	3	18	1 1/2	0.08
36	3	30	1 1/2	0.08



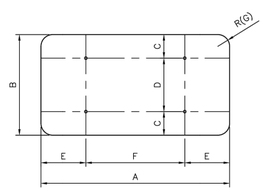
VERTICAL/HORIZONTAL RECTANGLE

A	B	C	D	E	F	G	T
12	18	1 1/2	15	1 1/2	1 1/2	9	0.08
12	36	3	30	1 1/2	1 1/2	9	0.08
18	24	3	18	1 1/2	1 1/2	15	0.08
24	30	3	24	1 1/2	3	18	0.08
24	36	3	30	1 1/2	3	18	0.08
24	48	3	36	1 1/2	3	18	0.08
30	36	3	30	1 1/2	3	24	0.08



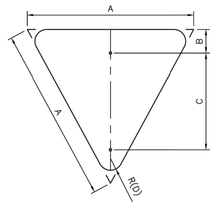
HORIZONTAL/VERTICAL RECTANGLE

A	B	C	D	E	F	G	T
12	6	–	–	1 1/2	1	4	0.08
18	6	–	–	1 1/2	1	4	0.08
12	9	1	10	1 1/2	–	–	0.08
24	12	1 1/2	9	1 1/2	2	8	0.08
24	18	3	12	1 1/2	2	14	0.08
30	24	3	18	1 1/2	3	18	0.08
36	12	1 1/2	9	1 1/2	2	8	0.08



HORIZONTAL RECTANGLE

A	B	C	D	E	F	G	T
36	24	3	18	6	24	1 1/2	0.08
48	24	3	18	9	30	1 1/2	0.08
48	36	6	24	9	30	1 1/2	0.08
60	24	3	18	12	36	1 1/2	0.08
60	36	6	24	12	36	1 1/2	0.08



EQUILATERAL TRIANGLE

A	B	C	D	T
36	3	21	1 1/2	0.08

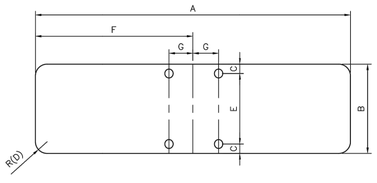


TABLE – D3 SIGNS (BRACKETS)

A	B	C	D	E	F	G	T
30	9	5/16	1 1/2	8 3/8	15	1 3/4	0.125
36	9	5/16	1 1/2	8 3/8	18	1 3/4	0.125
42	9	5/16	1 1/2	8 3/8	21	1 3/4	0.125
48	9	5/16	1 1/2	8 3/8	24	1 3/4	0.125

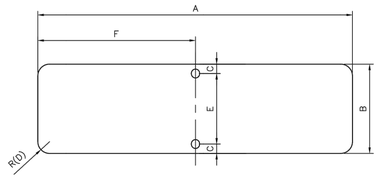


TABLE – D3 SIGNS

A	B	C	D	E	F	T
30	9	1 1/2	1 1/2	6	15	0.125
36	9	1 1/2	1 1/2	6	18	0.125
42	9	1 1/2	1 1/2	6	21	0.125
48	9	1 1/2	1 1/2	6	24	0.125

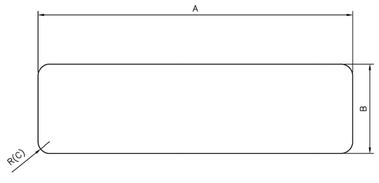
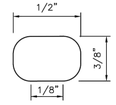


TABLE – D1 SIGNS

A	B	C	T
60	24	1 1/2	0.08
72	24	1 1/2	0.08
84	24	1 1/2	0.08
96	24	1 1/2	0.08

NOTES:

1. A 30" LONG OR GREATER PLATE SHALL BE USED WHEN A "NO OUTLET" SUPPLEMENT IS REQUIRED.
2. THE CITY OF HOUSTON "STOP" AND "YIELD" SIGNS SHALL BE A MINIMUM 36". SPECIAL PERMISSION FROM THE CITY TRAFFIC ENGINEER IS REQUIRED FOR LESS THAN 36" SIGNS.
3. ALL PUNCHED HOLES ARE 3/8"x 1/2" OVAL.
4. ALL CORNER RADII ARE 1 1/2".
5. ALL DIMENSIONS ARE IN INCHES.
6. T = THICKNESS



APPROVED BY:	APPROVED BY:
DocuSigned by: Sukat kunwar — 8EF8B0CB491F4FB...	DocuSigned by: LETANG NGUYEN — 89A2B7E7D79B4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Hallock — A82C4155712834D3...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 01554–06

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

GROUND MOUNTED SIGN SIZES

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 3 OF 23

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 52 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

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

REGULATORY SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
STOP	R1-1	36x36
YIELD	R1-2	36x36x36
ALL WAY PLAQUE	R1-3P	18x6
YIELD HERE TO PEDISTRIANS	R1-5a	36x48
EXCEPT RIGHT TURN (PLAQUE)	R1-10P(1)	24x18
EXCEPT BUSES (PLAQUE)	R1-10P(2)	24x18
SPEED LIMIT	R2-1	30x36
MINIMUM SPEED LIMIT (PLAQUE)	R2-4P	24x30
NO RIGHT TURNS	R3-1	36x36
NO LEFT TURNS	R3-2	36x36
NO U-TURNS	R3-4	36x36
LEFT/RIGHT TURN ONLY	R3-5	30x36
THRU ONLY	R3-5a	30x36
LEFT TURN/THRU	R3-6	30x36
LEFT/RIGHT LANE MUST TURN LEFT/RIGHT	R3-7	36x36
ADVANCE INTERSECTION LANE CONTROL (VARIES)	R3-8	VARIESx30
TWO-WAY LEFT TURN ONLY (OVERHEAD)	R3-9a	30x36
TWO-WAY LEFT TURN LANE (POST MOUNTED)	R3-9b	24x36
BEGIN	R3-9cP	30x12
END	R3-9dP	30x12
REVERSIBLE LANE CONTROL (SYMBOL)	R3-9e	108x48
REVERSIBLE LANE CONTROL (POST MOUNTED)	R3-9f	36x54
ADVANCE REVERSIBLE LANE CONTROL TRANSITION	R3-9g,9h	108x36
END REVERSIBLE LANE	R3-9i	108x48
BIKE LANE	R3-17	24x18
SLOWER TRAFFIC KEEP RIGHT	R4-3	24x30
BEGIN RIGHT TURN LANE YIELD TO BIKES	R4-4	36x30
KEEP RIGHT	R4-7	24x30
KEEP LEFT	R4-8	24x30
DO NOT DRIVE ON SHOULDER	R4-17	24x30
DO NOT PASS ON SHOULDER	R4-18	24x30
DO NOT ENTER	R5-1	36x36
WRONG WAY	R5-1a	42x30
NO TRUCKS (SYMBOL)	R5-2(1)	24x24
NO THRU TRUCKS (TEXT)	R5-2(2)	24x30
ONE WAY (LONG)	R6-1	54x18
ONE WAY	R6-2	30x36
ROUNDABOUT DIRECTIONAL (2 CHEVRONS)	R6-4	30x24
ROUNDABOUT CIRCULATION (PLAQUE)	R6-5P	30x30
BEGIN ONE WAY	R6-6	30x36
END ONE WAY	R6-7	30x36
PARKING RESTRICTION (ARROW)	R7-2(1)	12x18
PARKING RESTRICTION (TO CORNER)	R7-2(2)	12x18
PARKING RESTRICTION (BUS ZONE)	R7-2(3)	12x18

REGULATORY SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
PARKING RESTRICTION (VALET ZONE)	R7-2(4)	12x18
PARKING RESTRICTION (PEAK PERIOD)	R7-2(5)	12x18
PARKING RESTRICTION (EMERGENCY VEH. ONLY)	R7-2(6)	12x18
PARKING RESTRICTION (TAXI ZONE)	R7-2(7)	12x18
PARKING RESTRICTION (NO STOPPING OR STANDING)	R7-2(8)	12x18
PARKING RESTRICTION (JITNEY STOP)	R7-2(9)	12x18
PARKING RESTRICTION (PED-CAB ZONE)	R7-2(10)	12x18
PARKING RESTRICTION (LIMO ZONE)	R7-2(11)	12x18
PARKING RESTRICTION (COMMERCIAL VEH. ZONE)	R7-2(12)	12x18
PARKING RESTRICTION (FED/CITY AUTHORIZED VEH. ONLY)	R7-2(13)	12x18
PARKING RESTRICTION (U.S. MARSHAL PARKING ONLY)	R7-2(14)	12x18
PARKING RESTRICTION (EMERGENCY)	R7-2(15)	12x18
PARKING TIME LIMIT (VARIES)	R7-108	12x18
HANDICAPPED PARKING	R7-8T	12x18
TOW AWAY ZONE (PLAQUE)	R7-201P	12x6
PARKING METER (COH)	R7-110	12x18
ON TRACKS (PLAQUE)	R8-3eP	24x18
CROSS ONLY AT CROSSWALKS (SYMBOL)	R9-2	12x18
NO PEDESTRIAN CROSSING (SYMBOL)	R9-3	18x18
NO PEDESTRIAN CROSSING	R9-3a	12x18
PEDESTRIAN CROSSING	R9-8	36x18
SIDEWALK CLOSED	R9-9	24x12
SIDEWALK CLOSED-USE OTHER SIDE	R9-10	24x12
SIDEWALK CLOSED CROSS HERE	R9-11a	24x12
PUSH BUTTON FOR PEDESTRIAN CROSSING	R10-3e	9x15
LEFT ON GREEN ARROW ONLY	R10-5	30x36
STOP HERE ON RED	R10-6	24x36
DO NOT BLOCK INTERSECTION	R10-7	24x30
LEFT/RIGHT TURN SIGNAL	R10-10	30x36
NO TURN ON ROAD (TEXT)	R10-11a	36x48
LEFT TURN YIELD ON GREEN	R10-12	30x36
CROSSWALK, STOP ON RED	R10-23	24x30
KEEP OFF MEDIAN	R11-1	24x30
ROAD CLOSED	R11-2	48x30
ROAD CLOSED LOCAL TRAFFIC ONLY	R11-3a	60x30
BRIDGE OUT LOCAL TRAFFIC ONLY	R11-3b	60x30
ROAD CLOSED TO THRU TRAFFIC	R11-4	60x30
WEIGHT LIMIT XX TONS	R12-1	24x30
AXLE WEIGHT LIMIT XX TONS/LBS	R12-2	24x30
NO TRUCKS OVER XX TONS/LBS EMPTY WEIGHT	R12-3	24x36
WEIGHT LIMIT XX TONS PER AXLE XX TONS GROSS	R12-4	36x24
LOAD ZONED BRIDGE	R12aT	VARIESx36
TRUCK ROUTE	R14-1	24x18
GRADE CROSSING (CROSSBUCK)	R15-1	48x9
NUMBER OF TRACKS (PLAQUE)	R15-2P	27x18

REGULATORY SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
RIGHT ANGLE TURN	CW1-1	36X36
HORIZONTAL CURVE	CW1-2	36X36
REVERSE RIGHT ANGLE TURNS	CW1-3	36X36
REVERSE HORIZONTAL CURVES	CW1-4	36X36
REVERSE CURVE (2 LANES)	CW1-4b	36X36
REVERSE CURVE (MORE THAN 2 LANES)	CW1-4c	36X36
ONE-DIRECTION LARGE ARROW	CW1-6	48X24
UPWARD SLOPING ARROW	CW1-6aT	36X36
CHEVRON	CW1-8	18X24
STOP AHEAD	CW3-1	36X36
SIGNAL AHEAD	CW3-3	36X36
BE PREPARED TO STOP	CW3-4	36X36
ROAD NARROWS	CW5-1	36X36
NARROW BRIDGE	CW5-2	36X36
TWO-WAY TRAFFIC FLOW	CW6-3	36X36
TWO-WAY TRAFFIC	CW6-4	12X18
BUMP	CW8-1	36X36
DIP	CW8-2	36X36
SOFT SHOULDER	CW8-4	36X36
TRUCK CROSSING	CW8-6	36X36
ROUGH ROAD	CW8-8	36X36
UNEVEN LANES	CW8-11	36X36
LEFT LANE ENDS	CW9-1(1)	36X36
RIGHT LANE ENDS	CW9-1(2)	36X36
DOUBLE ARROW	CW12-1	30X30
ADVISORY SPEED (PLAQUE)	CW13-1P	24X24
XX FEET (PLAQUE)	CW16-2P	24X18
AHEAD (PLAQUE)	CW16-3	24X12
ROAD WORK AHEAD	CW20-1	36X36
DETOUR AHEAD	CW20-2	36X36
ROAD CLOSED AHEAD	CW20-3	36X36
ONE LANE ROAD	CW20-4	36X36
LEFT LANE CLOSED	CW20-5(1)	36X36
RIGHT LANE CLOSED	CW20-5(2)	36X36
FLAGGER (SYMBOL)	CW20-7	36X36
NARROW LANES AHEAD	CW20-8T	36X36
SHOULDER WORK AHEAD	CW21-5	36X36
UTILITY WORK AHEAD	CW21-7	36X36
DOUBLE REVERSE CURVE (1 LANE)	CW24-1	36X36
DOUBLE REVERSE CURVE (2 LANE)	CW24-1a	36X36
DOUBLE REVERSE CURVE (3 LANE)	CW24-1b	36X36
END ROAD WORK	G20-2	36X18
DETOUR WITH ARROWS	M4-9	30X24
END DETOUR	M4-8a	24X18
PEDESTRIAN DETOUR	M4-9b	30X24
DETOUR	M4-10	48X18

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 IS RESPONSIBLE FOR THE DESIGN OF TRAFFIC CONTROL PLANS USING THIS STANDARD AND FOR ADDRESSING SITE SPECIFIC CONDITIONS NOT COVERED BY THIS STANDARD. ANY MODIFICATIONS MADE TO THIS STANDARD BY OTHER THAN THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
THE USE OF THIS STANDARD BY ANY PARTY OTHER THAN THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER, THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR ANY DAMAGES RESULTING FROM SUCH USE. NO WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER.

APPROVED BY: DocuSigned by: Suhail Tanwar — CITY ENGINEER

APPROVED BY: DocuSigned by: HANG NGUYEN — CITY TRAFFIC ENGINEER

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

EFF DATE: NOV-27-2023 | DWG NO: 01554-08

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL CITY OF HOUSTON SIGNS

SHEET 1 OF 2

DRAWING SCALE
NOT TO SCALE

FOR CITY OF HOUSTON USE ONLY

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 4 OF 23

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 53 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

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

WARNING SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
RIGHT ANGLE TURN CURVE	W1-1	30x30
RIGHT ANGLE TURN WITH SPEED LIMIT	W1-1a	36x36
HORIZONTAL CURVE	W1-2	30x30
HORIZONTAL CURVE WITH SPEED LIMIT	W1-2a	36x36
REVERSE RIGHT ANGLE TURN	W1-3	30x30
REVERSE HORIZONTAL CURVE	W1-4	30x30
WINDING ROAD	W1-5	30x30
ONE DIRECTION LARGE ARROW	W1-6	48x24
TWO DIRECTION LARGE ARROW	W1-7	48x24
CHEVRON ALIGNMNET	W1-8	18x24
HAIRPIN CURVE	W1-11	30x30
TRUCK ROLLOVER	W1-13	36x36
CROSS ROAD	W2-1	30x30
SIDE STREET T-INTERSECTION (SYMBOL)	W2-2	30x30
T- INTERSECTION (SYMBOL)	W2-4	30x30
Y- INTERSECTION (SYMBOL)	W2-5	30x30
ROUNDABOUT (SYMBOL)	W2-6	30x30
STOP AHEAD	W3-1	30x30
SIGNAL AHEAD	W3-3	30x30
REDUCED SPEED LIMIT AHEAD	W3-5	36x36
MERGE	W4-1	36x36
LANE ENDS	W4-2	36x36
ADDED LANE	W4-3	36x36
CROSS TRAFFIC DOES NOT STOP (PLAQUE)	W4-4P	24x12
ROAD NARROWS	W5-1	36x36
NARROW BRIDGE	W5-2	36x36
DIVIDED HIGHWAY	W6-1	36x36
DIVIDED HIGHWAY ENDS	W6-2	36x36
TWO WAY TRAFFIC (SYMBOL)	W6-3	36x36
BUMP	W8-1	30x30
DIP	W8-2	30x30
PAVEMENT ENDS	W8-3	36x36
SOFT SHOULDER	W8-4	36x36
TRUCK CROSSING	W8-6	36x36
LOOSE GRAVEL	W8-7	36x36
ROUGH ROAD	W8-8	36x36
UNEVEN LANES	W8-11	36x36
WATCH FOR ICE ON BRIDGE	W8-13T	36x36
SHOULDER DROP-OFF (SYMBOL)	W8-17	30x30
SHOULDER DROP-OFF (PLAQUE)	W8-17P	24x18

WARNING SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
FLOOD GAUGE	W8-19	12X72
NO SHOULDER	W8-23	36x36
SHOULDER ENDS	W8-25	36x36
LEFT LANE ENDS	W9-1(1)	36x36
RIGHT LANE ENDS	W9-1(2)	36x36
LANE ENDS MERGE LEFT	W9-2(1)	36x36
LANE ENDS MERGE RIGHT	W9-2(2)	36x36
GRADE CROSSING ADVANCE WARNING	W10-1	30 DIA
NO TRAIN HORN	W10-9	36x36
NO TRAIN HORN (PLAQUE)	W10-9P	30x24
BICYCLE	W11-1	30x30
PEDESTRIAN	W11-2	36x36
EMERGENGY VEHICLE	W11-8	30x30
HANDICAPPED	W11-9	30x30
TRUCK	W11-10	30x30
EMERGENGY SIGNAL AHEAD (PLAQUE)	W11-12P	36x30
BICYCLE/PEDESTRIAN	W11-15	30x30
TRAIL CROSSING (PLAQUE)	W11-15P	24x18
DOUBLE ARROW	W12-1	30x30
LOW CLEARANCE WITH ARROWS	W12-2	36x36
LOW CLEARANCE	W12-2a	78x24
LOADED ZONED BRIDGE	W12-5T	36x36
ADVISORY SPEED (PLAQUE)	W13-1P	18x18
NO OUTLET	W14-2	24x24
NO OUTLET WITH ARROW	W14-2a	36x6
SHARE THE ROAD (PLAQUE)	W16-1P	18x24
XX FEET (PLAQUE)	W16-2P	24x18
NEXT XX FEET (PLAQUE)	W16-4P	30x24
SUPPLEMENTAL LEFT ARROW (PLAQUE)	W16-5P(1)	24x18
SUPPLEMENTAL RIGHT ARROW (PLAQUE)	W16-5P(2)	24x18
DIAGONAL ARROW (PLAQUE)	W16-7P	24x12
AHEAD (PLAQUE)	W16-9P	24x12
WHEN FLASHING (PLAQUE)	W16-13P	24x18
ROUNDABOUT (PLAQUE)	W16-17	24x12
SPEED HUMP	W17-1	30x30
TYPE 3 OBJECT MARKER (LEFT)	OM3-L	12x36
TYPE 3 OBJECT MARKER (RIGHT)	OM3-R	12x36
TYPE 3 OBJECT MARKER (CENTER)	OM3-C	12x36
TYPE 4 OBJECT MARKER	OM4-1	18x18

BICYCLE SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
STOP	R1-1	18x18
STREET NAME	D3-1	VARIESx6
YIELD	R1-2	18x18x18
TO REQUEST GREEN WAIT ON SYMBOL	R10-22	12x18
YIELD TO PEDESTRIAN	R9-6	18x18
NO PARKING BIKE LANE	R7-9	12x18
BIKE ROUTE	D11-1	24x18
BIKE ROUTE TO DOWNTOWN	D11-1c	24x18
BIKE SIGN AUXILARY SIGNS	M4-1, M4-14	12x6
BICYCLE ROUTE ROUTE ARROW SIGNS	M5-1,2; M6-1,2,3,4,5,6,7	12x9
WALK YOUR BIKE (CUSTOM SIGN)	R9-8 CoH	12x18
YIELD TO PED/BIKE (CUSTOM SIGN)	R1-5PB	36x36
TURNING VEHICLES YIELD TO PED/BIKE (CUSTOM SIGN)	R10-15PB	36x36
STOP FOR PED/BIKE (CUSTOM SIGN)	R1-5PBb	36x36
TURNING VEHICLES STOP FOR PED/BIKE (CUSTOM SIGN)	R10-15PBa	36x36
CROSSWALK STOP ON RED (CUSTOM SIGN)	R10-23 (CoH)	42x30
PEDESTRAIN CROSSING (CUSTOM SIGN)	W11-2 (HAWK)	48x30
LOOK BOTH WAYS (CUSTOM SIGN)	W4-4Pa (BIKE) W4-4Pb (BIKE)	VARIES
TURN WIDE (CUSTOM SIGN)	R3-8 (BIKE)	30x36
BIKE MERGE AHEAD (CUSTOM SIGN)	W11-1 (MERGE)	36x36

SCHOOL SIGNS		
SIGN	SIGN DESIGNATION	SIZE (IN.)
SCHOOL	S1-1(FYG)	36x36
X:XX TO X:XX AM AND PM (PLAQUE)	S4-1P	24x10
SCHOOL (PLAQUE)	S4-3P(FYG)	24x8
WHEN FLASHING (PLAQUE)	S4-4P	24x10
REDUCED SCHOOL SPEED LIMIT AHEAD	S4-5a(FYG)	36x36
SCHOOL SPEED LIMIT XX WHEN FLASHING	S5-1(FYG)	24x48
END SCHOOL ZONE	S5-2	24x30
END SCHOOL ZONE (PLAQUE)	S5-2aTP	24x10
CELL PHONE USE PROHIBITED	S7-1T	24x18
TURN ARROW (PLAQUE)	SW16-5P(FYG)	24x12
ADVANCE TURN ARROW (PLAQUE)	SW16-6P(FYG)	24x12
DIAGONAL ARROW (PLAQUE)	SW16-7P(FYG)	24x12
AHEAD (PLAQUE)	S16-9P(FYG)	24x12
FYG- FLUORESCENT YELLOW-GREEN BACKGROUND COLOR		

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. ANY DESIGN DECISION MADE BY A USER OF THIS STANDARD IS THE RESPONSIBILITY OF THE USER. ANY RELIANCE ON THIS STANDARD IS AT THE USER'S SOLE RISK. NEITHER THE CITY OF HOUSTON NOR ANY OF ITS EMPLOYEES MAKES ANY 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:	APPROVED BY:
DocuSigned by: Suhail Tanwar — SEF8B0C641F5476...	DocuSigned by: KHANG NGUYEN — 95A28EFDA7B94CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock — 5DDC41557B5A4E4...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 01554-09

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL CITY OF HOUSTON SIGNS

SHEET 2 OF 2

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 5 OF 23

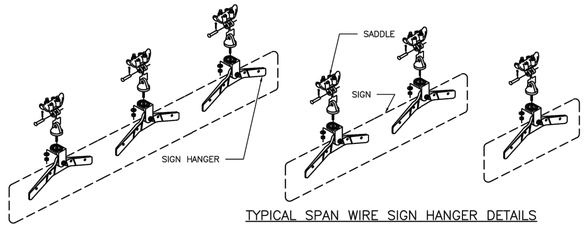
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 54 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

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

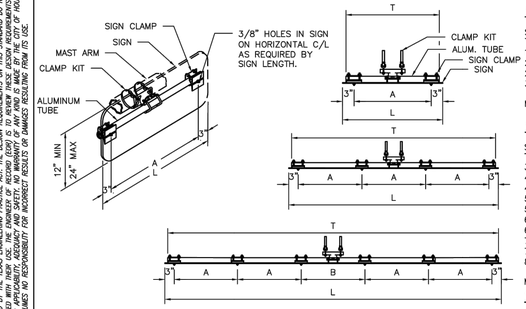


TYPICAL SPAN WIRE SIGN HANGER DETAILS



NOTES:

1. CONTRACTOR SHALL USE PELCO PARTS OR AN APPROVED EQUAL.
2. CONTRACTOR SHALL FURNISH ALL HARDWARE FOR A COMPLETE INSTALLATION.
3. THE 90 DEGREE SPAN WIRE CLAMPS (SADDLES) ARE ATTACHED TO TETHERS (SWAY CABLES).
4. CONTRACTOR SHALL FURNISH ONE (1) ADJUSTABLE FREE SWINGING SIGN HANGER PER STREET NAME SIGN SMALLER THAN 3'–0". SIGNS 3'–0" TO 6'–0" REQUIRE TWO (2) HANGERS. SIGNS LARGER THAN 6'–0" REQUIRE THREE (3) HANGERS.
5. SEE SIGN MOUNTING SERIES FOR STREET NAME SIGN DETAILS.



TYPICAL MAST ARM SIGN MOUNT DETAILS

SIGNS (1'–6" TO 3'–0" LONG)

SIGN LENGTH (L)	TUBE LENGTH (T)	A
1'–6"	16"	12"
2'–0"	22"	18"
2'–6"	28"	24"
3'–0"	34"	30"

MAXIMUM SIGN HEIGHT: 48"

SIGNS (3'–6" TO 8'–0" LONG)

SIGN LENGTH (L)	TUBE LENGTH (T)	A
3'–6"	40"	12"
4'–0"	46"	14"
4'–6"	52"	16"
5'–0"	58"	18"
5'–6"	64"	20"
6'–0"	70"	22"
6'–6"	76"	24"
7'–0"	82"	26"
7'–6"	88"	28"
8'–0"	94"	30"

MAXIMUM SIGN HEIGHT: 24"

SIGNS (8'–6" TO 10'–0" LONG)

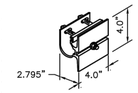
SIGN LENGTH (L)	TUBE LENGTH (T)	A	B
8'–6"	100"	19"	20"
9'–0"	106"	20"	22"
9'–6"	112"	21"	24"
10'–0"	118"	22"	26"

MAXIMUM SIGN HEIGHT: 16"

SIGN SQUARE FOOTAGE NOT TO EXCEED ROTATIONAL RESISTANCE CAPACITY DEFINED BY MOUNTING HARDWARE MANUFACTURER.



GUSSETED TUBE CROSS SECTION



SIGN CLAMP DETAIL

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

OVERHEAD STREET NAME SIGN MOUNTING DETAILS

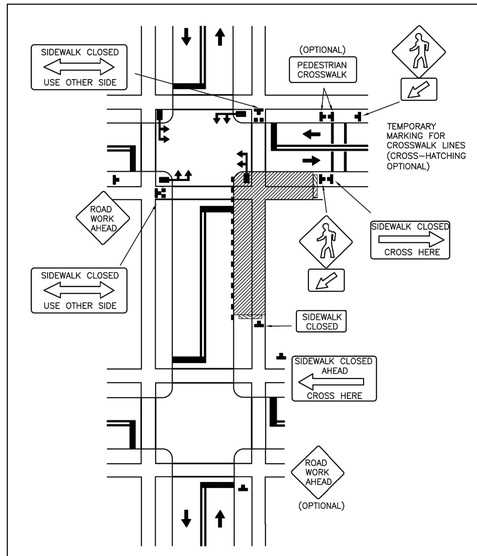
(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	CITY TRAFFIC ENGINEER	DIRECTOR OF HPW
DocuSigned by: Sukul Tanwar	DocuSigned by: KHANG NGUYEN	DocuSigned by: Carl Haddock

EFF DATE: NOV–27–2023 | DWG NO: 01554–11

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



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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CROSSWALK CLOSURES AND PEDESTRIAN DETOURS

(SCALE: NOT TO SCALE)

APPROVED BY:

CITY ENGINEER	CITY TRAFFIC ENGINEER	DIRECTOR OF HPW
DocuSigned by: Sukul Tanwar	DocuSigned by: KHANG NGUYEN	DocuSigned by: Carl Haddock

EFF DATE: NOV–27–2023 | DWG NO: 01555–16

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 6 OF 23

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 55 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

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

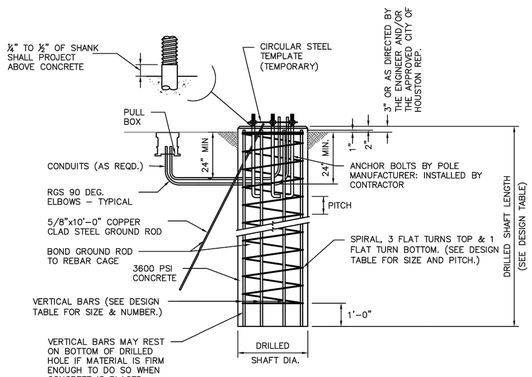
FOUDATION DESIGN TABLE									
POLE MARK	DRILLED SHAFT DIA.	REINFORCING STEEL		DRILLED SHAFT LENGTH FT.	BOLT CIRCLE DIA.	FOUNDATION DESIGN LOADS (1)			TYPICAL APPLICATION
		VERT. BARS	SPIRAL & PITCH			MOMENT K-FT.	SHEAR KIPS	TORQUE K-FT.	
HOU 1	30"	8-#9 BAR	#3 BAR @9"	14'-0"	18"	72.2	3.4	51.9	MAST ARM ASSEMBLY (25'-35') IN COHESIVE SOILS
HOU 2	30"	8-#9 BAR	#3 BAR @9"	18'-0"	18"	89.9	4.0	98.0	MAST ARM ASSEMBLY (40'-55') IN COHESIVE SOILS MAST ARM ASSEMBLY (25'-55') IN NON-COHESIVE SOILS

FOUNDATION DESIGN TABLE NOTES:

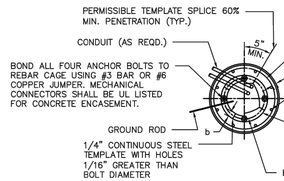
(1) FOUNDATION DESIGN LOADS ARE THE ALLOWABLE MOMENTS, SHEARS AND TORQUES AT THE TOP OF THE FOUNDATION.

(2) CONSTRUCT IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATION SECTION 02465, "DRILLED SHAFT FOUNDATIONS".

(3) FOUNDATION DESIGN IS BASED UPON AN UNDRAINED SHEAR STRENGTH OF 1500 PSF FOR COHESIVE SOILS AND A TEXAS CONE PENETROMETER MINIMUM OF 10 BLOWS/FOOT IN NON-COHESIVE SOILS. WHERE COHESIVE AND NON-COHESIVE LAYERS EXIST WITHIN THE SPECIFIED SHAFT LENGTH, THE NON-COHESIVE SOILS SHALL GOVERN. LOWER SOIL PARAMETERS WILL REQUIRE A SPECIAL DESIGN.



FOUNDATION DETAILS



TOP VIEW

NOTE:

1. b = MINIMUM STEEL TEMPLATE WIDTH EQUAL TO TWO TIMES ANCHOR BOLT DIAMETER.
2. STEEL TEMPLATE MAY BE OF CONTINUOUS WIDTH OR SEGMENTED WIDTH.
3. SEE FOUNDATION DESIGN TABLE FOR BOLT CIRCLE DIAMETER.
4. BOLTS SHOULD BE CHECKED FOR PLUMB AFTER CONCRETE IS POURED AND BEFORE INITIAL SET.

GENERAL NOTES:

1. DESIGN IS FOR CITY OF HOUSTON STANDARD TRAFFIC SIGNAL MAST ARM SUPPORT STRUCTURES BY VALMONT INDUSTRIES, INC.
2. DESIGN CONFORMS TO 2001 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" AND INTERIM REVISIONS THERETO FOR A 90 MPH WIND ZONE WITH A 1.3 GUST FACTOR AND ACI "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-02).
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
4. CONCRETE SHALL BE 6 SACK, 3600 PSI.
5. ALL ANCHOR BOLTS SHALL BE GALVANIZED THE ENTIRE LENGTH OF BOLT. EXPOSED NUTS AND WASHERS SHALL ALSO BE GALVANIZED.

INSTALLATION PROCEDURE

THREADS OF ANCHOR BOLTS SHALL BE COATED WITH PIPE JOINT COMPOUND PRIOR TO INSTALLATION OF UPPER NUTS WHEN ERECTING POLE. AFTER POLE IS PLUMBED AND IN PERMANENT ALIGNMENT, THE EXPOSED THREADS OF PAINTED BOLTS SHALL BE CLEANED AND AN ADDITIONAL COATING OF ZINC-RICH PAINT APPLIED TO SEAL THE BOLT THREAD-NUT JOINT.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

DRILLED SHAFT FOUNDATIONS

(SCALE: NOT TO SCALE)

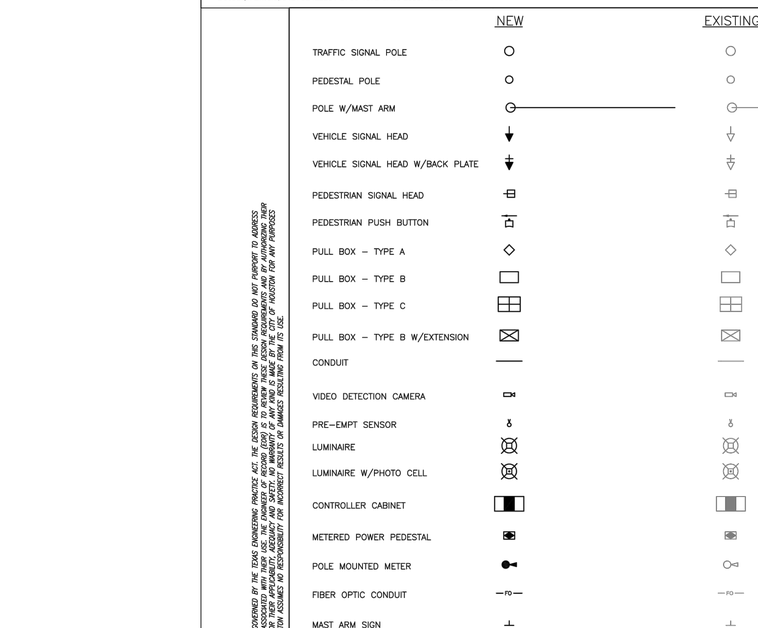
APPROVED BY:

Designed by: Sukat Kanwar — CITY ENGINEER
Designed by: KHANG NGUYEN — CITY TRAFFIC ENGINEER
Designed by: Carl Hallbach — DIRECTOR OF HPW

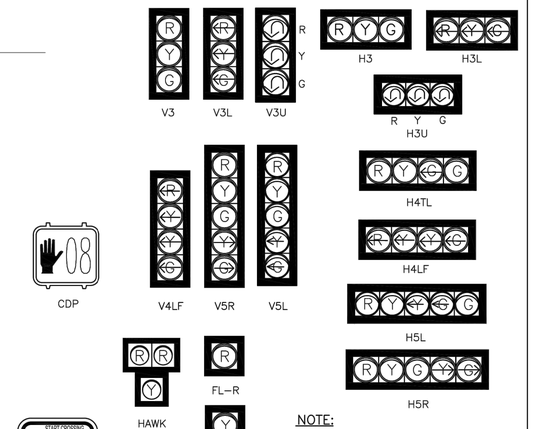
EFF DATE: NOV-27-2023 | DWG NO: 02465-01

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 ADDRESS SITE SPECIFIC CONDITIONS AND SHALL ASSUME ALL RESPONSIBILITY FOR ANY MODIFICATIONS MADE TO THESE REQUIREMENTS. THE CITY OF HOUSTON (COH) IS NOT RESPONSIBLE FOR ANY DESIGN PERFORMED BY THE EOR. THE USE OF THIS STANDARD BY ANY PERSON, ENTITY OR AGENCY OTHER THAN THE COH IS AT THE SOLE RISK OF THE USER AND THE USER'S EMPLOYER. THE USER AGREES TO INDEMNIFY AND HOLD HARMLESS THE COH, ITS OFFICIALS AND EMPLOYEES FROM ANY AND ALL CLAIMS, LOSSES, DAMAGES, CAUSES OF ACTION, SUITS AND LIABILITY OF EVERY KIND, INCLUDING ALL EXPENSES OF LITIGATION, COURT COSTS AND ATTORNEY'S FEES, FOR INJURY OR DEATH TO ANY PERSON, OR INJURY TO ANY PROPERTY, RECEIVED OR SUSTAINED BY ANY PERSON OR PERSONS OR PROPERTY ARISING OUT OF, OR OCCASIONED BY, DIRECTLY OR INDIRECTLY, THE PERFORMANCE OF THE USER OR THE USER'S EMPLOYER UNDER THIS STANDARD, WHETHER OR NOT IT IS CAUSED IN PART BY A PARTY INDEMNIFIED HEREUNDER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5



SIGNAL TYPES



NOTE:

ALL TRAFFIC SIGNAL HEAD TYPES HAVE 12-INCH LENSES.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

HARDWARE LEGENDS

(SCALE: NOT TO SCALE)

APPROVED BY:

Designed by: Sukat Kanwar — CITY ENGINEER
Designed by: KHANG NGUYEN — CITY TRAFFIC ENGINEER
Designed by: Carl Hallbach — DIRECTOR OF HPW

EFF DATE: NOV-27-2023 | DWG NO: 02893-01

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 7 OF 23

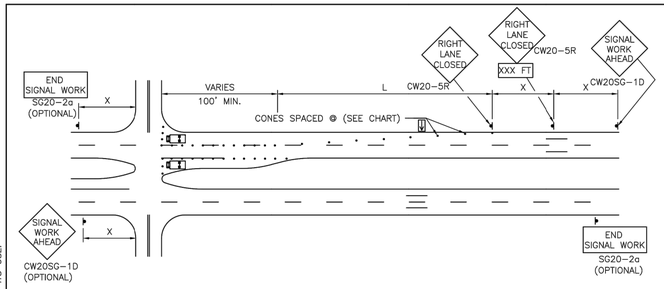
WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

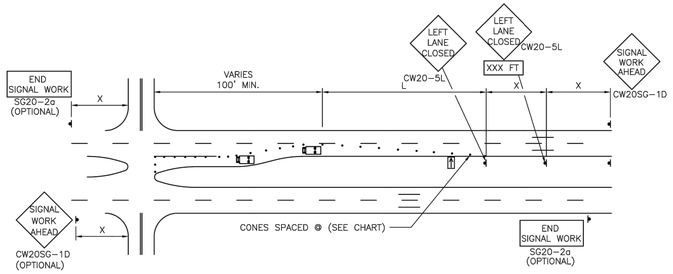
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 56 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

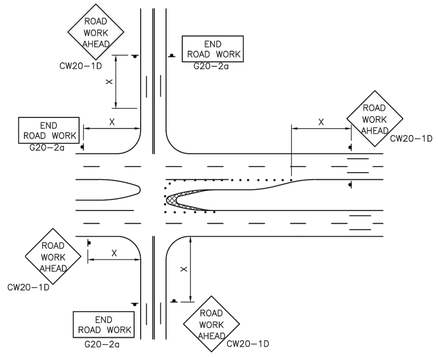
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6

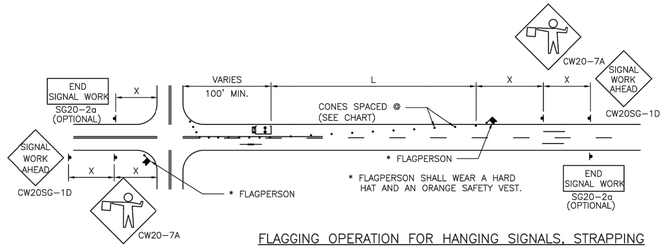


ONE LANE CLOSURE W/ RIGHT LANE AND/OR LEFT TURN LANE CLOSED

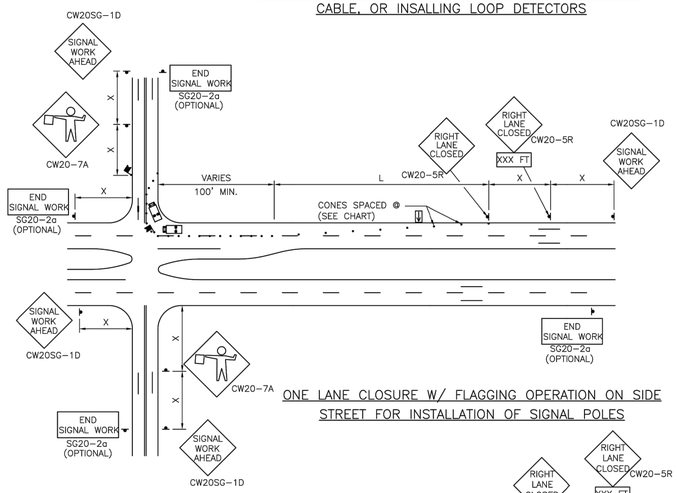


ONE LANE CLOSURE W/ LEFT LANE AND/OR LEFT TURN LANE CLOSED

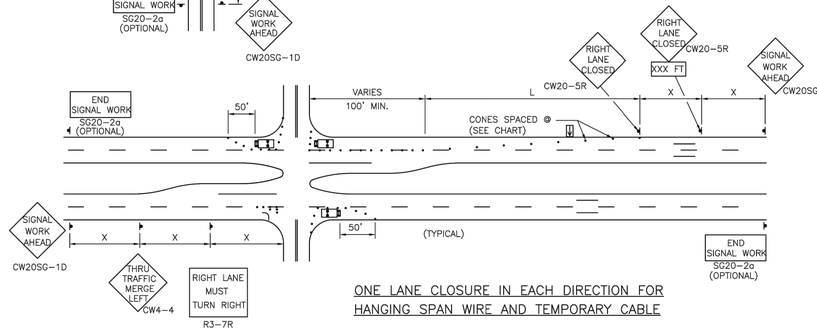




FLAGGING OPERATION FOR HANGING SIGNALS, STRAPPING CABLE, OR INSALLING LOOP DETECTORS



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



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

TYPICAL TRANSITION LENGTHS

SUGGESTED MAXIMUM SPACING OF DEVICES

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

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

NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.
2. THE MINIMUM LANE WIDTH ALLOWED IS 10 FEET. THE MINIMUM BUFFER ZONE BETWEEN THE WORK ZONE AND ADJACENT TRAFFIC IS 2 FEET.
3. FLORESCENT ORANGE SHALL BE THE BACKGROUND COLOR ON ALL WORK ZONE SIGNS.
4. THE CONTRACTOR SHALL REMOVE ADVANCE SIGNS WHEN NO CONSTRUCTION OPERATIONS ARE UNDERWAY.
5. OBSTRUCTIONS OR HAZARDS AT THE WORK AREA SHALL BE CLEARLY MARKED AND DELINEATED AT ALL TIMES.
6. ALL HOLES, TRENCHES OR OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY LIGHTS OR OTHER PROTECTIVE DEVICES.
7. TRENCHES SHALL BE COVERED OR SURROUNDED WITH ORANGE PLASTIC CONSTRUCTION FENCE AS DIRECTED BY THE ENGINEER.
8. FLAGGER AND FCW20-7a SIGN MAY BE REQUIRED ACCORDING TO FIELD CONDITIONS.
9. VEHICLES PARKED IN ROADWAY SHALL BE EQUIPPED WITH TWO STROBES.

LEGEND:

HEAVY WORK VEHICLE

FLASHING ARROW PANEL

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar	DocuSigned by: LIEMG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 01555–13

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TRAFFIC CONTROL PLAN FOR SIGNAL CONSTRUCTION

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 8 OF 23

WAUGH SAFETY IMPROVEMENTS

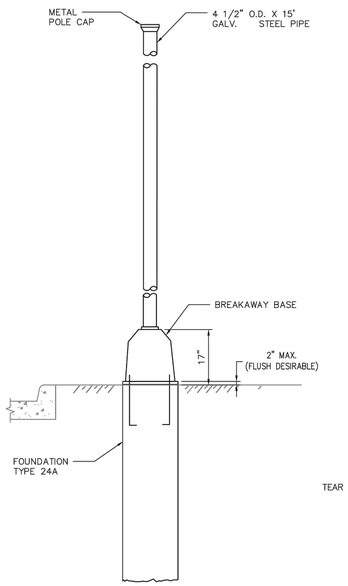
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 57 OF 72	

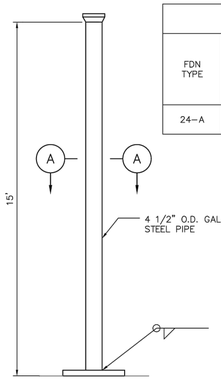
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ADOPT SAFE DESIGN PRACTICES AT LOCATIONS WHERE THESE STANDARDS ARE APPLICABLE. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON SHALL NOT BE HELD LIABLE FOR ANY DAMAGES RESULTING FROM THE USE OF THIS STANDARD.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

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

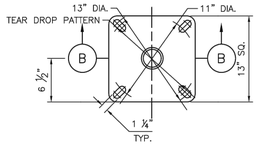




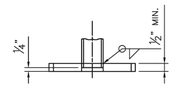
PEDESTAL POLE

FOUNDATION DESIGN TABLE										
FDN TYPE	DRILLED SHAFT DIA.	REINFORCING STEEL		DRILLED SHAFT LENGTH FT	ANCHOR BOLT DESIGN (SEE NOTE 5)				FOUNDATION DESIGN LOAD (SEE NOTE 6)	
		VERT. BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER 10 BLOWS/ FT	ANCHOR BOLT DIA.	FY (KSI)	BOLT CIR. DIA.	ANCHOR TYPE	MOMENT K-FT	SHEAR KIPS
24-A	24"	4-#5 BARS	#2 BAR AT 12"	6	3/4"	36	*13"	1	10	1

* 10 1/2" B.C. FOR PUSH BUTTON POLE



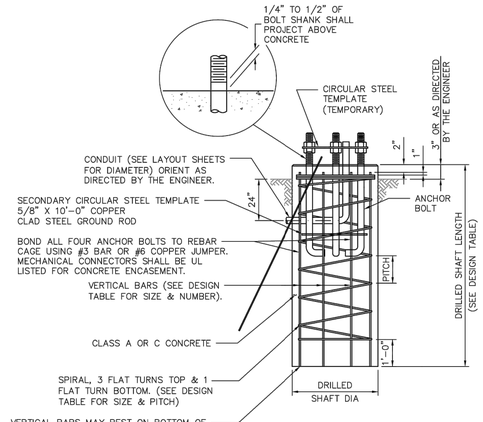
SECTION A-A



SECTION B-B

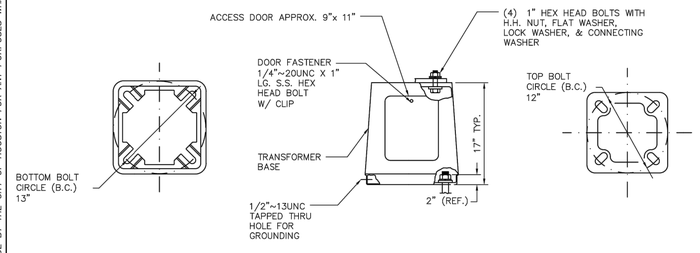
ANCHOR BOLT & TEMPLATE SIZES						
BOLT DIA. IN.	**BOLT LENGTH	TOP THREAD	BOTT. THREAD	BOLT CIRCLE	R_2	R_1
3/4"	1'-6"	3"	–	13"	7 1/8"	5 5/8"

** MIN DIMENSIONS GIVEN, LONGER BOLTS ARE ACCEPTABLE.



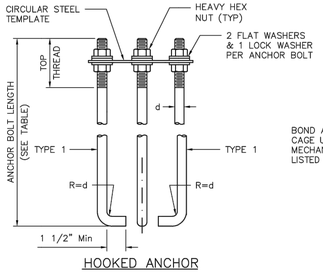
ELEVATION

FOUNDATION DETAILS

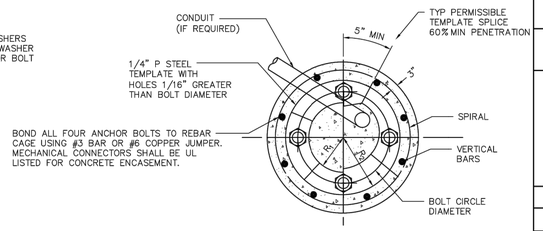


BOTTOM PLAN ELEVATION TOP PLAN

BREAKAWAY BASE DETAILS



HOOKED ANCHOR
(TYPE 1)



R_1 MAY EQUAL R_2 IF PLATE IS WELDED OF 3 OR MORE SEGMENTS.

TOP VIEW

GENERAL NOTES

1. DESIGN CONFORMS TO 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS AND INTERIM REVISIONS THERETO.
2. CONCRETE SHALL BE CLASS A OR C.
3. THREADS FOR ANCHOR BOLTS AND NUTS SHALL BE ROLLED OR CUT THREADS OF UNIFIED NATIONAL COARSE THREAD SERIES EXCEPT FOR A193B7 BOLTS WHICH SHALL HAVE 8 PITCH THREAD SERIES. BOLTS AND NUTS SHALL HAVE CLASS 2A AND 2B FIT TOLERANCES. GALVANIZED NUTS SHALL BE TAPPED AFTER GALVANIZING.
4. ANCHOR BOLTS THAT ARE 1" IN DIAMETER OR LESS SHALL CONFORM TO ASTM A36. GALVANIZE ALL ANCHOR BOLTS UNLESS OTHERWISE NOTED. EXPOSED NUTS SHALL BE GALVANIZED OR COATED WITH ZINC-RICH PAINT. WASHERS SHALL BE GALVANIZED. TEMPLATES AND EMBEDED NUTS NEED NOT BE GALVANIZED.
5. ANCHOR BOLT DESIGN DEVELOPS THE FOUNDATION CAPACITY GIVEN UNDER FOUNDATION DESIGN LOADS.
6. FOUNDATION DESIGN LOADS ARE THE ALLOWABLE MOMENTS AND SHEARS AT THE BASE OF THE STRUCTURE.
7. ANCHOR BOLT ASSEMBLY INSTALLATION PROCEDURE

7.1. THREADS OF ANCHOR BOLTS SHALL BE COATED WITH PIPE JOINT COMPOUND PRIOR TO INSTALLATION OF UPPER NUTS WHEN ERECTING POLE. AFTER POLE IS PLUMBED AND IN PERMANENT ALIGNMENT, THE EXPOSED THREADS OF PAINTED BOLTS SHALL BE CLEANED AND AN ADDITIONAL COATING OF ZINC-RICH PAINT APPLIED TO SEAL THE BOLT THREAD-NUT JOINT.

8. DETAILS DEPICTED ON THIS SHEET SHOW A TYPICAL PEDESTAL POLE ASSEMBLY WITH A DRILLED SHAFT FOUNDATION.
9. USE 24 IN. DRILLED SHAFT FOUNDATION AS SHOWN.
10. PROVIDE BREAKAWAY FUSE HOLDER WITH DOUBLE-POLE HOUSING. ENSURE FUSE HOLDER IS POLARIZED, WATER-RESISTANT, UL RECOGNIZED, AND RATED FOR 30A MAXIMUM CURRENT CAPACITY AT 600V OR LESS. PROVIDE BREAKAWAY FUSE HOLDER FROM MANUFACTURERS PRE-QUALIFIED BY TXDOT TRAFFIC OPERATIONS DIVISION. SEE https: //www.txdot.gov/business/resources/materials/material-producer-list.html FOR LIST OF PRE-QUALIFIED MANUFACTURERS. CATEGORY IS "ROADWAY ILLUMINATION AND ELECTRICAL SUPPLIES." PROVIDE 10 AMP TIME DELAY FUSES.
11. POLE SHAFT SHALL BE ONE PIECE. ALUMINUM CONDUIT WILL NOT DEVELOP THE NECESSARY STRENGTH AND WILL NOT BE ALLOWED. IN HIGH WINDS, USE A POLE AND BASE COLLAR ASSEMBLY TO ADD STRENGTH AND PREVENT LOOSENING ON CONNECTION.
12. PER MANUFACTURER'S RECOMMENDATIONS, ENGAGE ALL THREADS ON THE PEDESTAL POLE BASE AND PIPE UNLESS THE PIPE IS FULLY SEATED INTO BASE.
13. PROVIDE NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTORS FOR BREAKAWAY POLES (BUSSMANN HET, LITTELFUSE LET, FERRAZ-SHAWMUT FEBN, OR APPROVED EQUAL).
14. PROVIDE SIGNAL HEADS AND MOUNTING AS SHOWN ELSEWHERE ON THE PLANS.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar	DocuSigned by: LHANG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Stockbauer	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02465-02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PEDESTAL/PUSHBUTTON POLE DRILLED SHAFT FOUNDATION

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 9 OF 23

WAUGH SAFETY IMPROVEMENTS

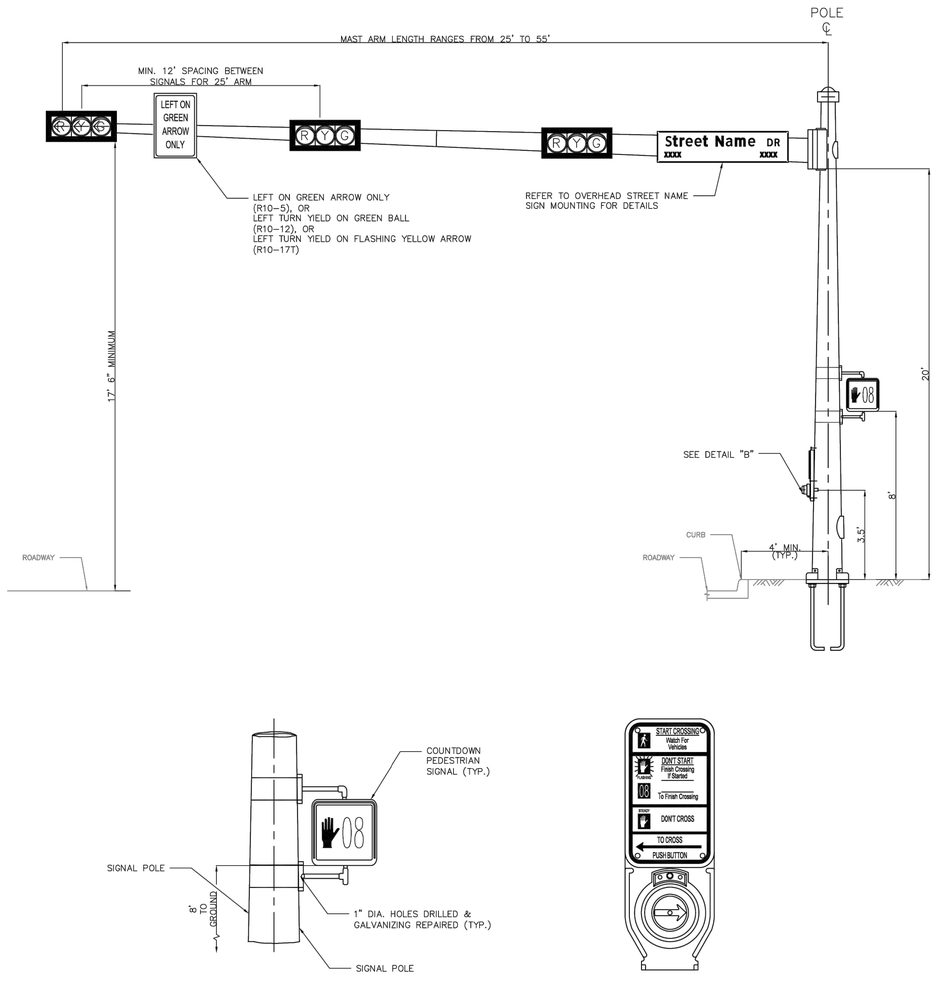
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 58 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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. ANY DESIGN DECISION MADE BY THE ENGINEER SHALL BE BASED ON HIS OR HER KNOWLEDGE OF THE PARTICULAR SITE CONDITIONS TO BE ENCOUNTERED. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE. WITH THE USE OF THIS STANDARD, THE ENGINEER ASSUMES FULL RESPONSIBILITY FOR ANY AND ALL LOSSES OR DAMAGES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR ANY INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE. WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

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

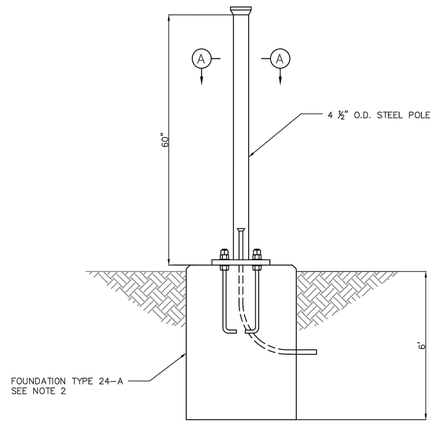


DETAIL "A"

TYPICAL PEDESTRIAN SIGNAL HEAD ON TRAFFIC POLE

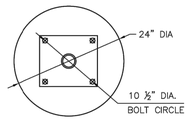
DETAIL "B"

2-WIRE POLARA NAVIGATOR PUSH BUTTON STATION WITH R10-3e SIGN

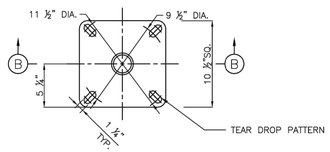


ELEVATION VIEW

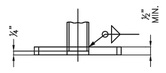
PEDESTRIAN PUSH BUTTON POLE



FOUNDATION PLAN



SECTION A-A



SECTION B-B

NOTE:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS STATED ON CITY OF HOUSTON STANDARD DETAIL 02465-02 "PEDESTAL/PUSH BUTTON POLE DRILLED SHAFT FOUNDATION".
2. REFER TO CITY OF HOUSTON STANDARD DETAIL 02465-02 "PEDESTAL/PUSHBITTON POLE DRILLED SHAFT FOUNDATION" FOR ANCHOR BOLT DETAILS.

APPROVED BY:	APPROVED BY:
DocuSigned by: Sukat Kanwar	DocuSigned by: LUONG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 02582-01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TYPICAL MAST ARM/POLE FIXTURE CONFIGURATION

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 10 OF 23

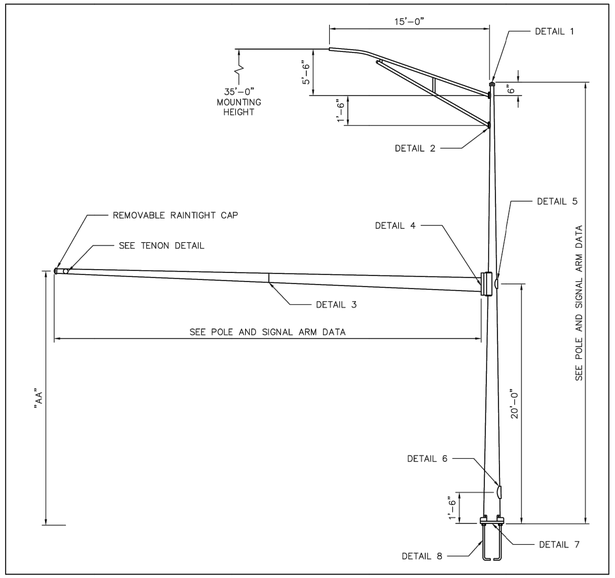
WAUGH SAFETY IMPROVEMENTS

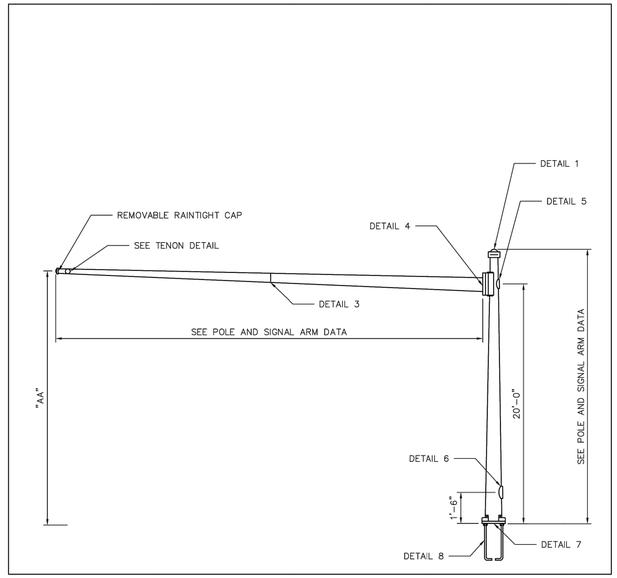
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 59 OF 72	

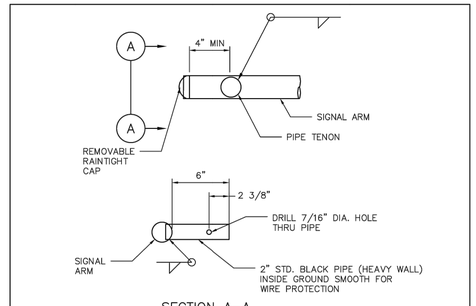
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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 FOR EACH PROJECT IS RESPONSIBLE FOR ADDRESSING ALL SAFETY AND DESIGN CONCERNS FOR EACH SITE AND ADAPTING THE DESIGN REQUIREMENTS ON THIS STANDARD TO SITE SPECIFIC CONDITIONS. USE OF THIS STANDARD IS AT THE SOLE RISK OF THE USER AND THAT USER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS THE CITY OF HOUSTON FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, ARISING OUT OF THE USE OF THIS STANDARD. THE CITY OF HOUSTON MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHATSOEVER WITH REGARD TO THIS STANDARD. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

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







SECTION A–A

TENON DETAIL

ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. ARMS SHALL BE VISUALLY INSPECTED IN 5 TO 20 MPH WIND CONDITIONS AFTER SIGNAL HEAD INSTALLATION AND, IF VERTICAL MOVEMENTS WITH A TOTAL EXCURSION (MAXIMUM POSITIVE TO MAXIMUM NEGATIVE) OF MORE THAN APPROXIMATELY 8 INCHES ARE OBSERVED AT ARM TIP, DAMPING DEVICES OR OTHER MEANS SHALL BE FITTED TO THE ARM(S). THE NECESSARY DAMPING DEVICE(S) OR OTHER REMEDIAL MEASURES SHALL BE AS RECOMMENDED BY THE CONTRACTOR. EXCESSIVE VIBRATIONS SHALL NOT BE ALLOWED TO CONTINUE FOR MORE THAN 2 DAYS.

VIBRATION DISCLAIMER

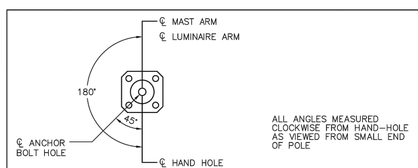
POLE AND MAST ARM DATA

DESIGNATION KEY			POLE TUBE						POLE BASE				ANCHOR BOLT				SIGNAL ARM TUBE				
POLE SERIES	POLE TYPE	SIGNAL ARM SPAN (FT)	BASE DIA. (IN)	TOP DIA. (IN) WITH LUM ARM	TOP DIA. (IN) WITHOUT LUM ARM	LENGTH (FT) WITH LUM ARM	LENGTH (FT) WITHOUT LUM ARM	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "L" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	SPAN (FT)	TIP HEIGHT "AA" (FT)
HOU	1	25	13.00	8.80	10.00	30.00	21.50	3	19.00	18.00	2.25	2.50	2.25	89.00	7.00	9.00	8.00	3.50	7	25.00	20.2
		30															9.00	4.80	7	30.00	20.3
		35															10.00	5.10	7	35.00	20.3
HOU	2	40	13.00	8.80	10.00	30.00	21.50	0.375									10.50	4.90	7	40.00	20.3
		45															10.14	3.84	3	45.00	20.4
		50															11.00	4.00	3	50.00	20.4
		55															11.50	4.16	DET 3	55.00	20.5

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFT – 3 GAUGE	A595 GR.A	55	MAST ARM CONN. BOLTS	F3125 GR A325*	
POLE SHAFT – 0.375"	A572 GR.55	55	LUM. ARM CONN. BOLTS	SAE GR.5	36
MAST ARM SHAFT	A595 GR.A	55	ANCHOR BOLTS	F1554 GR.55	55
LUMINAIRE ARM SHAFT	2" SCH. 80 PIPE		GALVANIZING	A123 & A153	
ARM ATTACHMENT PLATE	A36	36			
BASEPLATE	A36	36			

*LUBRICATE IN FIELD IF NECESSARY IN LIEU OF THE REQUIREMENTS IN F3125 GR.A325.



RADIAL INDEX

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanawar	DocuSigned by: LHUNG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02582–02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TRAFFIC SIGNAL STRUCTURES

SHEET 01 OF 02

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 11 OF 23

WAUGH SAFETY IMPROVEMENTS

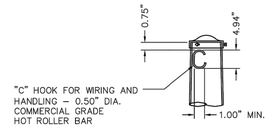
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 60 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

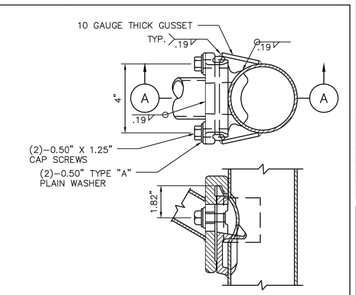
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH ITS USE. ANY PERSON MAKING USE OF THIS STANDARD IS RESPONSIBLE FOR CONSULTING WITH THE ENGINEER OF RECORD FOR THE PROJECT TO DETERMINE THE APPROPRIATENESS OF THE STANDARD FOR ANY SPECIFIC APPLICATION. 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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

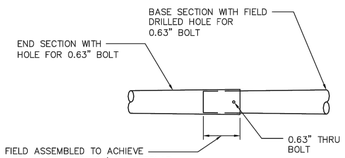
DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF6



DETAIL 1 | POLE TOP

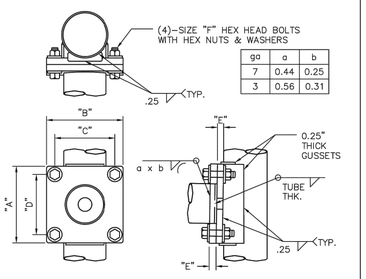


DETAIL 2 | LUMINAIRE ARM ATTACHMENT



ITEM	BASE SECTION		END SECTION	
	LENGTH	GAUGE	LENGTH	GAUGE
55.00'	26.42'	3	30.71'	7

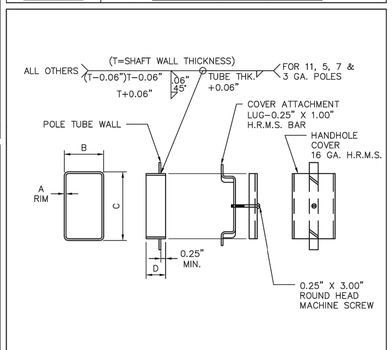
DETAIL 3 | SIGNAL ARM SLIP JOINT



ga	a	b
7	0.44	0.25
3	0.56	0.31

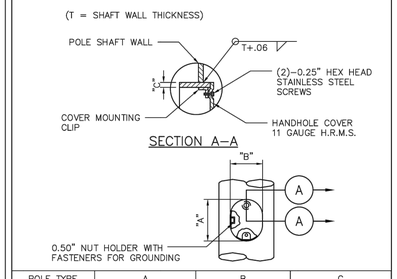
POLE TYPE	"A"	"B"	"C"	"D"	"E"	"F"
1	17.75"	17.75"	14.50"	14.50"	1.50"	1.25" X 4.50"
2	18.75"	18.75"	15.00"	15.00"	1.75"	1.50" X 5.25"

DETAIL 4 | SIGNAL ARM ATTACHMENT



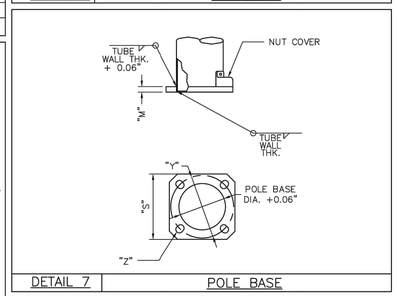
POLE TYPE	A	B	C	D
1	7 GA.	3.00"	5.00"	1.50"
2	0.50"	4.00"	6.00"	2.50"

DETAIL 5 | HANDHOLE



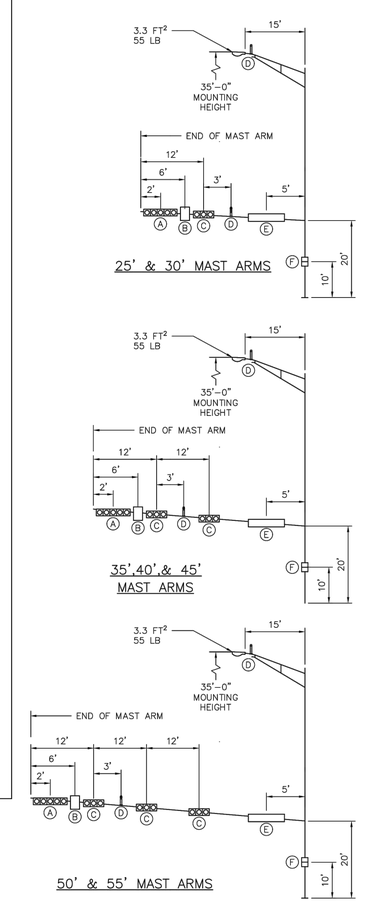
POLE TYPE	A	B	C
1	7.56"	5.19"	0.280"
2	7.31"	5.63"	0.432"

DETAIL 6 | HANDHOLE



DETAIL 7 | POLE BASE

DETAIL 8 | ANCHOR BOLT



DESIGN NOTE:

DESIGNS ARE BASED ON THE LOADING CHART SHOWN ON THIS DRAWING AND ARE IN ACCORDANCE WITH MATERIALS AND ALLOWABLE STRESS REQUIREMENTS OF THE 1994 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" FOR A 90 MPH WIND ZONE WITH A 1.3 GUST FACTOR.

DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)
Ⓐ	12"–5 SEC. SIGNAL WITH BACKPLATES	13.33	96
Ⓑ	30" X 36" SIGNAL ARM MOUNTED SIGN	7.50	15
Ⓒ	12"–3 SEC. SIGNAL WITH BACKPLATES	8.67	53
Ⓓ	VIVDS CAMERA	1.00	15
Ⓔ	24" X 72" STREET NAME SIGN	12.00	30
Ⓕ	PEDESTRIAN SIGNAL	4.00	40

MAXIMUM LOADING INFORMATION

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar	DocuSigned by: LHANG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02582–03

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TRAFFIC SIGNAL STRUCTURES

SHEET 02 OF 02

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

REVISION	DATE	NO.	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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 12 OF 23

WAUGH SAFETY IMPROVEMENTS

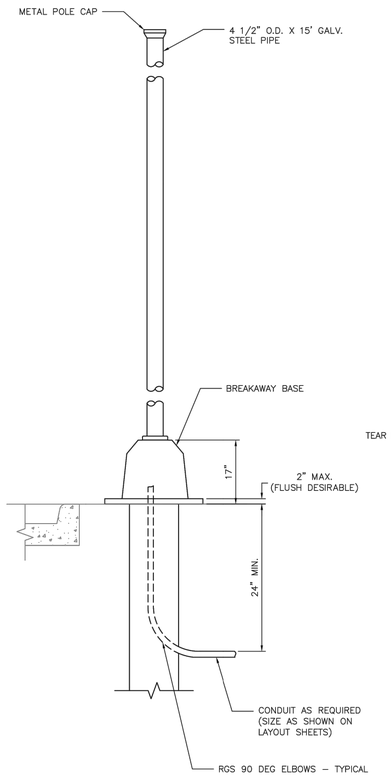
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 61 OF 72	

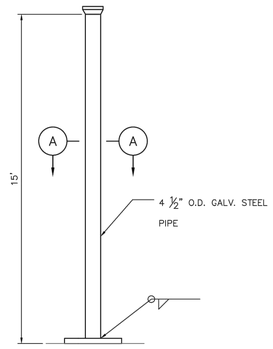
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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. IT IS THE RESPONSIBILITY OF THE DESIGNER TO ADOPT SAFE DESIGN AND CONSTRUCTION PROCEDURES AND TO ENSURE THAT THE PROJECT IS CONSTRUCTED IN A SAFE MANNER. NEITHER THE PREPARER OF THIS STANDARD NOR ANY OTHER PERSON INVOLVED IN ITS PREPARATION OR DISTRIBUTION MAKES ANY 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.

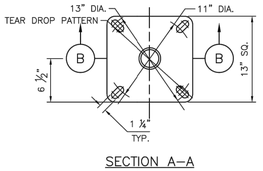
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: CB71C116-B716-4899-A5EE-0D2F2CC55AF8

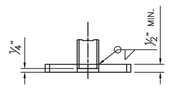




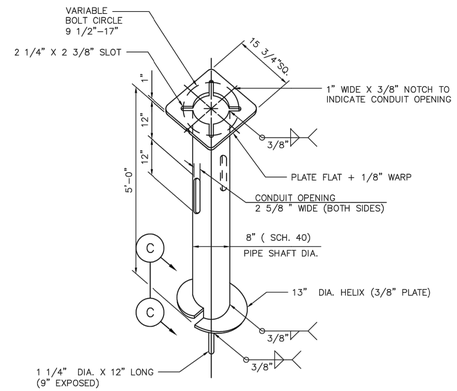
PEDESTAL POLE



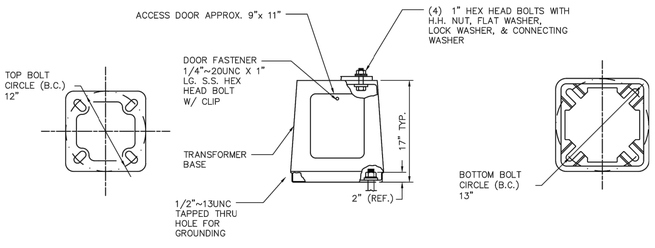
SECTION A–A



SECTION B–B

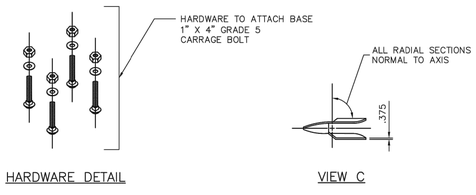


SCREW ANCHOR FOUNDATION DETAIL

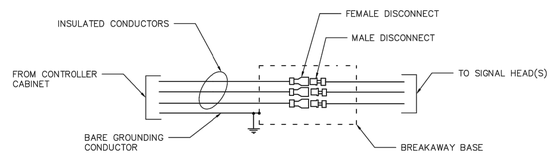


TOP PLAN ELEVATION BOTTOM PLAN

BREAKAWAY BASE DETAILS



HARDWARE DETAIL VIEW C



BREAKAWAY IN–LINE FUSE HOLDERS

NOTES:

1. DETAILS DEPICTED ON THIS SHEET SHOW A TYPICAL PEDESTAL POLE ASSEMBLY WITH SCREW–IN ANCHOR FOUNDATION TO BE UTILIZED FOR SCHOOL ZONE FLASHERS ONLY.
2. THE PEDESTAL POLE ASSEMBLY DEPICTED ON THIS SHEET IS DESIGNED FOR SIGNAL HEADS WHERE ELECTRICAL POWER IS NEEDED WITH A BREAKAWAY POLE.
3. PROVIDE BREAKAWAY FUSE HOLDER WITH DOUBLE–POLE HOUSING. ENSURE FUSE HOLDER IS POLARIZED, WATER–RESISTANT, UL RECOGNIZED, AND RATED FOR 30A MAXIMUM CURRENT CAPACITY AT 600V OR LESS. PROVIDE BREAKAWAY FUSE HOLDER FROM MANUFACTURERS PRE–QUALIFIED BY TXDOT TRAFFIC OPERATIONS DIVISION. SEE https://www.txdot.gov/business/resources/materials/material–producer–list.html FOR LIST OF PRE–QUALIFIED MANUFACTURERS. CATEGORY IS ROADWAY ILLUMINATION AND ELECTRICAL SUPPLIES. PROVIDE 10 AMP TIME DELAY FUSES.
4. UNLESS OTHERWISE SHOWN ON THE PLANS, PROVIDE POLE SHAFT AND BREAKAWAY BASE IN ACCORDANCE WITH THE REQUIREMENTS LISTED IN TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) STANDARD SPECIFICATION ITEM "PEDESTAL POLE ASSEMBLIES".
5. SEE TxDOT SPECIAL SPECIFICATION 4923 (SS 4923),"SCREW–IN TYPE ANCHOR FOUNDATIONS" FOR FURTHER REQUIREMENTS.
6. PROVIDE SIGNAL HEADS AND MOUNTING AS SHOWN ELSEWHERE ON THE PLANS.
7. CONDUIT IN FOUNDATION AND WITHIN 6 IN. OF FOUNDATION IS SUBSIDIARY TO STANDARD SPECIFICATION ITEM, "PEDESTAL POLE ASSEMBLIES".
8. POLE SHAFT SHALL BE ONE PIECE. ALUMINUM CONDUIT WILL NOT DEVELOP THE NECESSARY STRENGTH AND WILL NOT BE ALLOWED. IN HIGH WINDS, USE A POLE AND BASE COLLAR ASSEMBLY TO ADD STRENGTH AND PREVENT LOOSENING ON CONNECTION.
9. PER MANUFACTURER'S RECOMMENDATIONS, ENGAGE ALL THREADS ON THE PEDESTAL POLE BASE AND PIPE UNLESS THE PIPE IS FULLY SEATED INTO BASE.
10. PROVIDE NON–FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTORS FOR BREAKAWAY POLES.(BUSSMANN HET, LITTELFUSE LET, FERRAZ–SHAWMUT FEBN, OR APPROVED EQUAL).

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Faruqui — 85F7B80C0413F3A2B...	DocuSigned by: Hang Nguyen — 95A3B5FDA7B54CB...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock — A50CA1B0B72B3485...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02582–04

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PEDESTAL POLE WITH SCREW–IN ANCHOR FOUNDATION
(FOR SCHOOL ZONE FLASHERS ONLY)

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713–850–9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F–23290 & 100461–00
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 13 OF 23

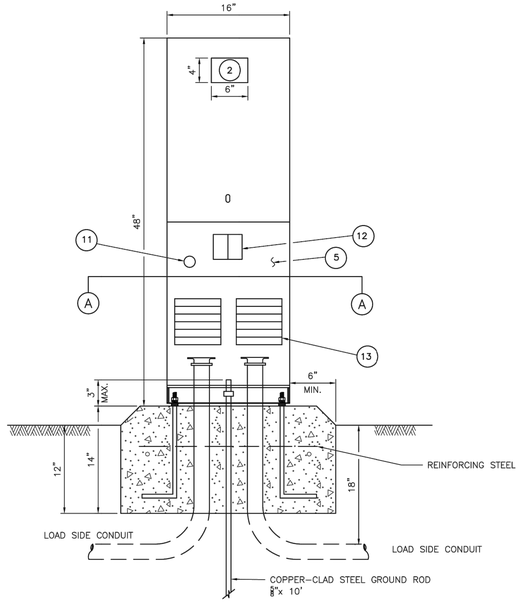
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N–T05000–0012–7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 62 OF 72	

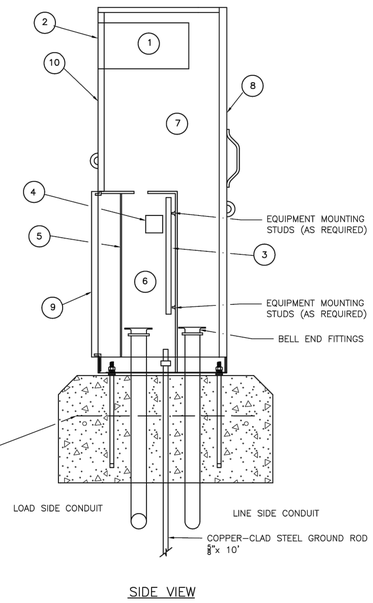
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ADOPT APPROPRIATE SAFETY AND DESIGN PRACTICES AS NECESSARY. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE. WITH THE USE OF THIS STANDARD, THE USER ACCEPTS ANY AND ALL LIABILITY ARISING OUT OF SUCH USE. NEITHER THE CITY OF HOUSTON NOR ANY OFFICIAL OR EMPLOYEE MAKES A WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B86D5



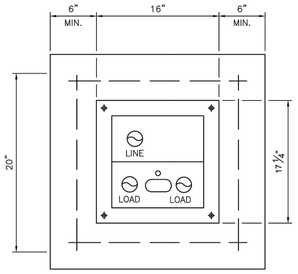
FRONT VIEW



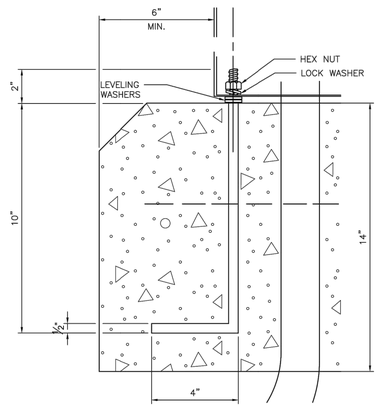
SIDE VIEW

NOTE: ELLS IN FOUNDATION ARE RIGID METAL, SIZE CALLED FOR ON THE PLANS. EXTENSION CONDUITS FROM THESE ELLS MAY BE PVC, PROVIDED ENDS OF RIGID METAL CONDUITS ARE MORE THAN 2 IN. BELOW TOP OF CONCRETE FOUNDATION. WHERE EXTENSION CONDUITS ARE METAL, GROUNDING BUSHING MUST BE INSTALLED AND A BONDING JUMPER PROPERLY TERMINATED.

TY C SHOWN, TY A SIMILAR EXCEPT THAT TY A SHALL HAVE INDIVIDUAL CIRCUIT BREAKERS MOUNTED ON AN EQUIPMENT MOUNTING PANEL. CB HANDLES SHALL PROTRUDE THROUGH HINGED DEADFRONT TRIM.



SECTION A–A



ANCHOR BOLT DETAIL

GENERAL NOTES:

1. THE PEDESTAL SERVICE SHALL BE UL TYPE 3R, AND SHALL BE CONSTRUCTED OF A MINIMUM OF 12 GAUGE STAINLESS STEEL OR ALUMINUM AS REQUIRED. STAINLESS STEEL SHALL NOT BE PAINTED. FOR ALUMINUM, THE FINISH SHALL BE AN ELECTROSTATIC APPLIED POLY–URETHANE BAKED ON POWDER, LIGHT GREEN IN COLOR, OR COLOR AS SHOWN ELSEWHERE AND AS APPROVED BY THE ENGINEER. THE FRONT OF THE INTERIOR DEAD FRONT TRIM SHALL BE PERMANENTLY LABELED, "DANGER HIGH VOLTAGE" WITH OSHA STYLE LABEL. THE EXTERIOR OF THE PEDESTAL SERVICE DOOR SHALL BE PERMANENTLY LABELED WITH A PLACARD AS TO ITS USE (I.E. ROADWAY LIGHTING, TRAFFIC SIGNALS, ETC.). PLACARD SHALL BE NEAT AND PROFESSIONAL IN APPEARANCE. LETTERING SHALL BE 1" MINIMUM HEIGHT.
2. UTILITY ACCESS DOOR SHALL HAVE STAINLESS STEEL PIANO HINGE AND PROVISIONS FOR PADLOCKING.
3. PEDESTAL DOOR SHALL HAVE STAINLESS STEEL PIANO HINGE AND STAINLESS STEEL LATCH WITH PROVISIONS FOR PADLOCKING.
4. METER ACCESS SHALL BE HINGED AND CAPABLE OF PADLOCKING.
5. ALL MOUNTING HARDWARE AND INSTALLATION DETAILS OF SERVICES SHALL BE IN ACCORDANCE WITH UTILITY COMPANY SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE LOCAL UTILITY COMPANY AND OBTAINING THEIR APPROVAL OF PEDESTAL DETAILS PRIOR TO MAKING SUBMITTAL TO THE CITY AND PRIOR TO CONSTRUCTING THE ELECTRICAL PEDESTAL SERVICE. ANY CHANGES REQUIRED BY THE UTILITY COMPANY SHALL BE NOTED ON THE SUBMITTALS.
6. METER SOCKET SHALL BE A MINIMUM OF 100 AMP RATING AND SHALL COMPLY WITH THE LOCAL UTILITY REQUIREMENTS.
7. PHOTOELECTRIC CONTROL SHALL MEET THE REQUIREMENTS AS SHOWN ON ED(5). SHIELD TO CONTROL STRAY LIGHT IS ALLOWABLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER OPERATION OF THE PHOTO–ELECTRIC CONTROL. THE CONTRACTOR SHALL MOVE AND/OR ADJUST OR SHIELD THE PHOTOCELL FROM STRAY OR AMBIENT NIGHTTIME LIGHT OR SHALL MAKE ANY OTHER ADJUSTMENTS REQUIRED FOR PROPER OPERATION. THE PHOTOCELL SHALL FACE NORTH WHEN PRACTICABLE. UNLESS OTHERWISE SHOWN ON THE PLANS, THE PHOTOCELL SHALL TURN ON THE ILLUMINATION SYSTEM AT 1.0 +(–) 0.5 FOOTCANDLE AND TURN OFF THE ILLUMINATION SYSTEM AT TWO FOOTCANDLES HIGHER THAN TURN ON.
8. THE CONTROL STATION (H–O–A SWITCH) SHALL BE AS SHOWN ON TxDOT STANDARD ED(5) EXCEPT THAT H–O–A SWITCH OPERATING HANDLE SHALL PROTRUDE THROUGH HINGED DEADFRONT TRIM AND NEMA 1 ENCLOSURE WILL NOT BE REQUIRED.
9. CONCRETE FOR PEDESTAL SERVICE FOUNDATION SHALL BE CLASS A OR C , AND SHALL BE IN ACCORDANCE WITH TxDOT ITEM 420, "CONCRETE STRUCTURES", EXCEPT THAT CONCRETE WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED INCIDENTAL.
10. REINFORCING STEEL SHALL BE #4 REBAR IN ACCORDANCE WITH TxDOT ITEM 440, "REINFORCING STEEL".
11. ANCHOR BOLTS SHALL BE A36M55 IN ACCORDANCE WITH ITEM 449, "ANCHOR BOLTS". ANCHOR BOLTS SHALL BE ½ INCH X 12 INCHES X 4 INCHES (DIA. X LENGTH X HOOK LENGTH).
12. ALL CONDUIT AND CONDUCTORS ATTACHED TO THE PEDESTAL SERVICE AND WITHIN 12 INCHES OF THE PEDESTAL SERVICE WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIARY TO THE PEDESTAL SERVICE. ALL SERVICE CONDUIT AND CONDUCTORS FROM THE UTILITY COMPANY TRANSFORMER TO A POINT 12 INCHES FROM THE THE PEDESTAL SERVICE SHALL BE PAID FOR SEPARATELY. SERVICE CONDUIT SHALL BE THE SIZE AND TYPE AS SHOWN IN THE ELECTRICAL SERVICE DATA.
13. DIMENSIONS MAY VARY TO ACCOMODATE REQUIRED EQUIPMENT, UTILITY COMPANY REQUIREMENTS, OR MANUFACTURER'S STANDARD EQUIPMENT DIMENSIONS. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, SIX (6) COPIES OF BROCHURES AND/OR DRAWINGS OF THE PEDESTAL SERVICE TO BE SUPPLIED, INCLUDING ACTUAL DIMENSIONS, AND A PAINT COLOR SAMPLE.
14. A SEPARATE ENCLOSURE AS SHOWN ON TxDOT STANDARD ED(4) OR ED(5) FOR PHOTOCELL SHALL NOT BE USED FOR PEDESTAL SERVICES. PHOTOCELL SHALL BE INSTALLED AS SHOWN HERE.
15. THE PEDESTAL DOOR SHALL HAVE A MECHANICALLY ATTACHED DATA POCKET ON THE INSIDE. POCKET SHALL BE EITHER METAL OR THERMOPLASTIC AND SHALL MEASURE AT LEAST 12 INCHES BY 12 INCHES. THE CONTRACTOR SHALL PREPARE AND SUBMIT A SCHEMATIC DRAWING UNIQUE TO AN INDIVIDUAL SERVICE. THE APPROVED DRAWING SHALL BE LAMINATED AND PLACED IN THE DOCUMENT POCKET OF THE SERVICE AT THE TIME OF SHIPMENT TO THE JOB SITE. ALL APPLICABLE WIRING DIAGRAMS AND PLAN SHEET LAYOUTS FOR ALL EQUIPMENT AND BRANCH BREAKER CIRCUITS SUPPLIED BY THAT SERVICE SHALL ALSO BE LAMINATED AND PLACED IN THE DOCUMENT POCKET PRIOR TO SHIPPING.
16. GROUND ROD CLAMP TO BE UL LISTED FOR DIRECT BURIAL. ALL NON–CONDUCTIVE COATING TO BE REMOVED FROM GROUND ROD WIRE TO BE #6 AWG SOLID COPPER. METAL CONDUIT ELLS TO HAVE GROUNDING BUSHING AND BONDING JUMPERS CORRECTLY INSTALLED.
17. ALL CONDUITS ENTERING ENCLOSURES FROM UNDERGROUND MUST BE SEALED. SILICONE SHALL NOT BE ALLOWED.
18. ALL CONDUCTORS SHALL BE MEGGED AND PULL TESTED. TRAFFIC SIGNAL CABLE NOT TO BE MEGGED AFTER CONNECTION, AS ELECTRONICS WILL BE DAMAGED.
19. TOP OF CONCRETE FOUNDATION TO BE FINISHED IN A NEAT AND WORKMAN LIKE MANNER. IF LEVELING WASHERS ARE USED, NO MORE THAN ½ IN. HEIGHT SHALL BE USED AT ANY ONE CORNER. MAXIMUM DIP OR RISE IN FOUNDATION IS NOT TO EXCEED ⅛ IN PER FOOT. WHEN PROPERLY INSTALLED, TOP OF SERVICE ENCLOSURE SHALL READ LEVEL FRONT TO BACK AND SIDE TO SIDE WITHIN ¼ IN. ROCKING OR MOVEMENT OF THE SERVICE ENCLOSURE SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE STATE.
20. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL NOT BE ALLOWED ON PS TYPE SERVICES.

LEGEND:

1. METER SOCKET, (WHEN REQUIRED)
2. METER SOCKET 4" x 6" PLEXIGLASS WINDOW INSTALLED IN THE LID.
3. EQUIPMENT MOUNTING PANEL
4. PHOTO ELECTRIC CONTROL WINDOW, (WHEN REQUIRED)
5. HINGED DEADFRONT TRIM
6. LOAD SIDE CONDUIT AREA
7. LINE SIDE CONDUIT AREA
8. UTILITY ACCESS DOOR, WITH HANDLE
9. PEDESTAL DOOR
10. HINGED METER ACCESS
11. CONTROL STATION (H–O–A SWITCH)
12. MAIN DISCONNECT
13. BRANCH CIRCUIT BREAKERS

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 80F8B9C9A1F5478...	DocuSigned by: HIEN NGUYEN 95A2BEFDA75B4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock 4B5CA16B1E0E4A3...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02893–02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

SURVEYED BY: QUIDDITY
FB NO.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 14 OF 23

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 63 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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 ITS USE. IT IS THE RESPONSIBILITY OF THE ENGINEER USING THIS STANDARD TO ESTABLISH APPROPRIATE SAFETY AND HEALTH POLICIES AND PROGRAMS AND DETERMINE THE APPLICABILITY OF REGULATORY LIMITATIONS BEFORE USE. THE ENGINEER USING THIS STANDARD IS RESPONSIBLE FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
WITH THIS USE, THE OWNER AGREES TO HOLD HARMLESS AND INDEMNIFY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR ANY WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER.

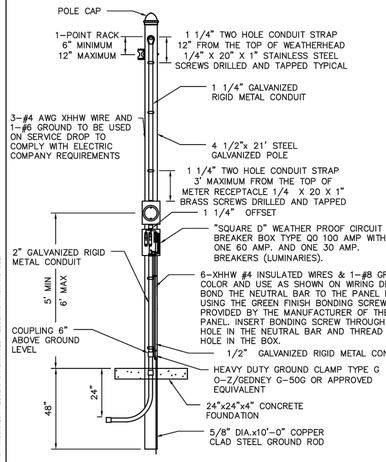
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

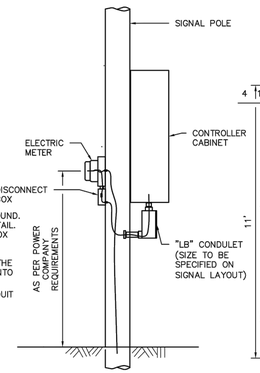
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR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

NOTES:

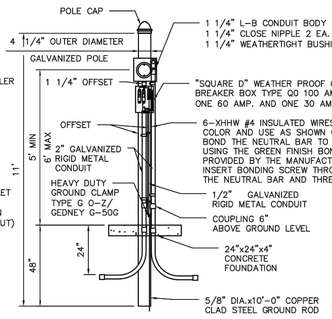
1. CLEARANCE FOR SERVICE ENTRANCE AND DROP CONDUCTORS 12 FT ABOVE FINISHED GRADE, SIDEWALKS, RESIDENTIAL DRIVEWAYS OR AREAS WHERE TRUCK TRAFFIC IS NOT ENCOUNTERED TRUCKS SHALL BE DEFINED AS ANY VEHICLE EXCEEDING 8 FT IN HEIGHT.
2. 18 FT. OVER NON-RESIDENTIAL DRIVEWAYS, PARKING LOTS, ALLEYS AND OTHER AREAS SUBJECT TO TRUCK TRAFFIC 22 FT. OVER PUBLIC STREETS AND ROADS.



METER POLE ASSEMBLY (AERIAL SERVICE)



POLE MOUNTED CONTROLLER & ELECTRIC METER DETAIL



METER POLE ASSEMBLY (UNDERGROUND SERVICE)

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

METER LOOP

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Sukut Kanwar — CITY ENGINEER	DocuSigned by: Carl Haddock — DIRECTOR OF HPW
DocuSigned by: HAING NGUYEN — CITY TRAFFIC ENGINEER	

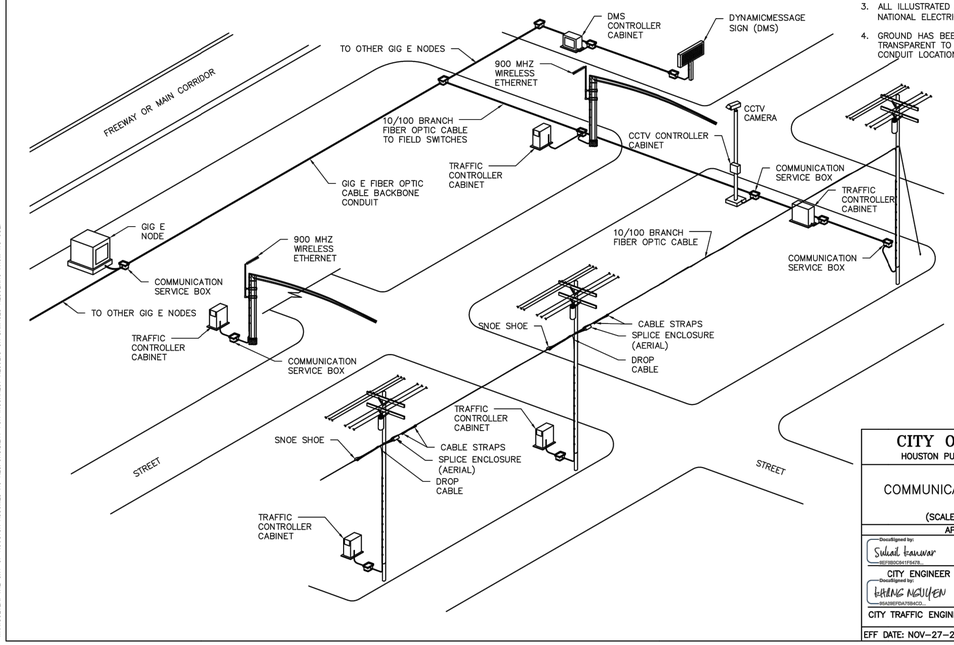
EFF DATE: NOV-27-2023 | DWG NO: 02893-03

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

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 APPLICATION. ANY MODIFICATIONS MADE BY THE EOR SHALL BE SIGNED AND SEALED BY THE EOR. THE CITY OF HOUSTON MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, AS TO THE ACCURACY OR SUITABILITY OF THESE DESIGN REQUIREMENTS FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

NOTES:

1. GIG E SYSTEM COMPONENT SCHEMATIC OVERVIEW.
2. ROAD REPRESENTATION IS NOT TO SCALE.
3. ALL ILLUSTRATED AERIAL CLEARANCES ARE PER NATIONAL ELECTRICAL CODE (N.E.C.)
4. GROUND HAS BEEN ILLUSTRATED AS TRANSPARENT TO VIEW SERVICE BOX & CONDUIT LOCATION.



CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

COMMUNICATIONS OVERVIEW

(SCALE: NOT TO SCALE)

APPROVED BY:

DocuSigned by: Sukut Kanwar — CITY ENGINEER	DocuSigned by: Carl Haddock — DIRECTOR OF HPW
DocuSigned by: HAING NGUYEN — CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 | DWG NO: 16700-01

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY

FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 15 OF 23

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

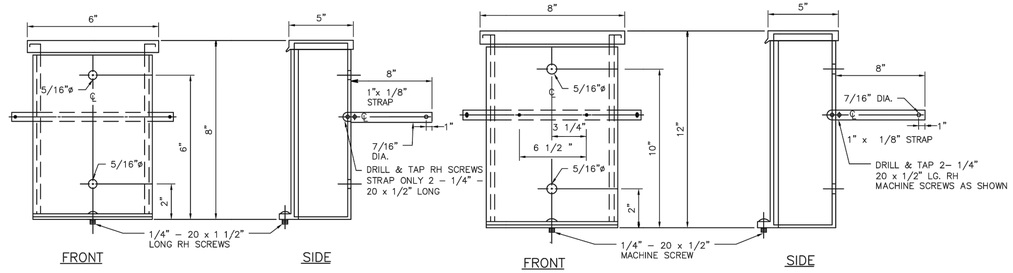
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 64 OF 72	

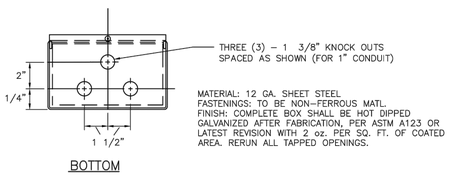
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

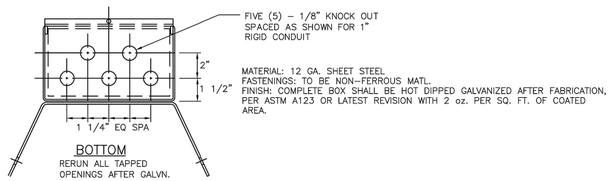
NOTES:

CONTRACTOR SHALL TRIM TREES AND APPLY WOOD PRESERVATIVE AS DIRECTED BY ENGINEER AND/OR APPROVED CITY OF HOUSTON REPRESENTATIVE.

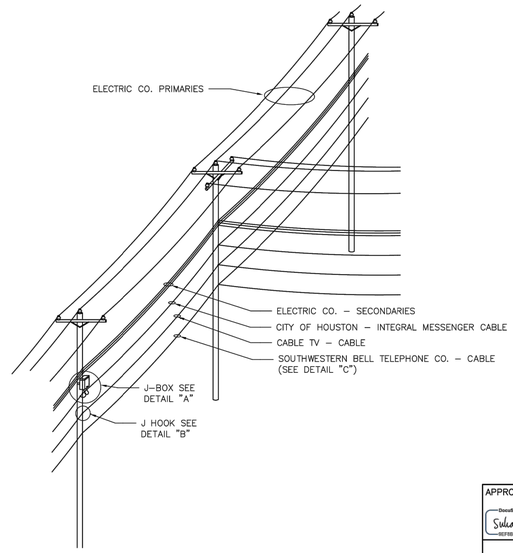


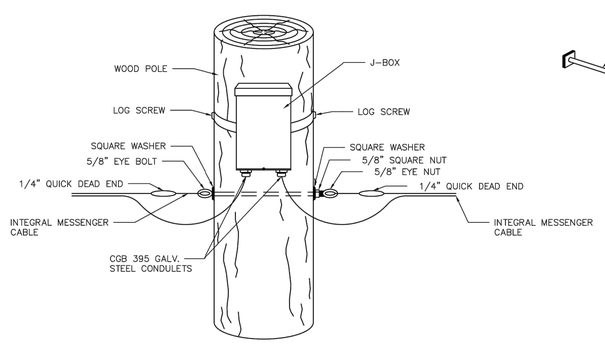


RAINTIGHT JUNCTION BOX
8" X 6" X 5" O.A. DIM.
3 – 1 /8" BOTTOM K.O.

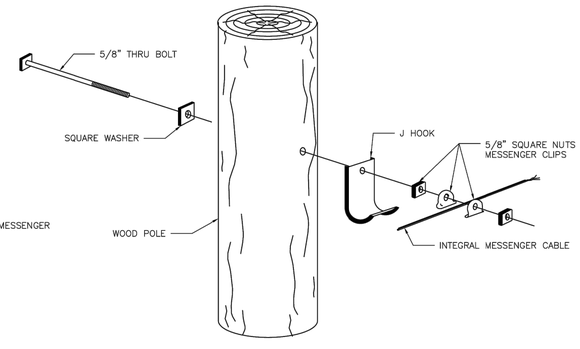


RAINTIGHT JUNCTION BOX
8" X 5" X 12" O.A. DIM.
5 – 1 3/8" BOTTOM K.O.

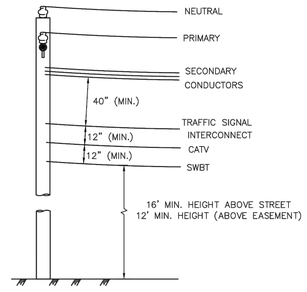




DETAIL A



DETAIL B



DETAIL C

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 8EF8B9C941F5478...	DocuSigned by: KHANG NGUYEN 89A28EF5A7B94C0...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock A60C41EF2E6A4E5...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02893–04

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

HARDWARE INTERCONNECT DETAILS

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 16 OF 23

WAUGH SAFETY IMPROVEMENTS

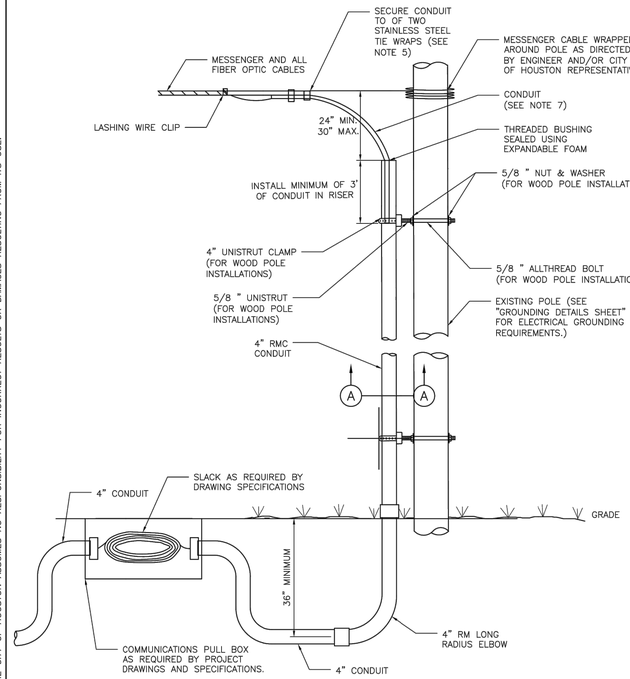
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 65 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

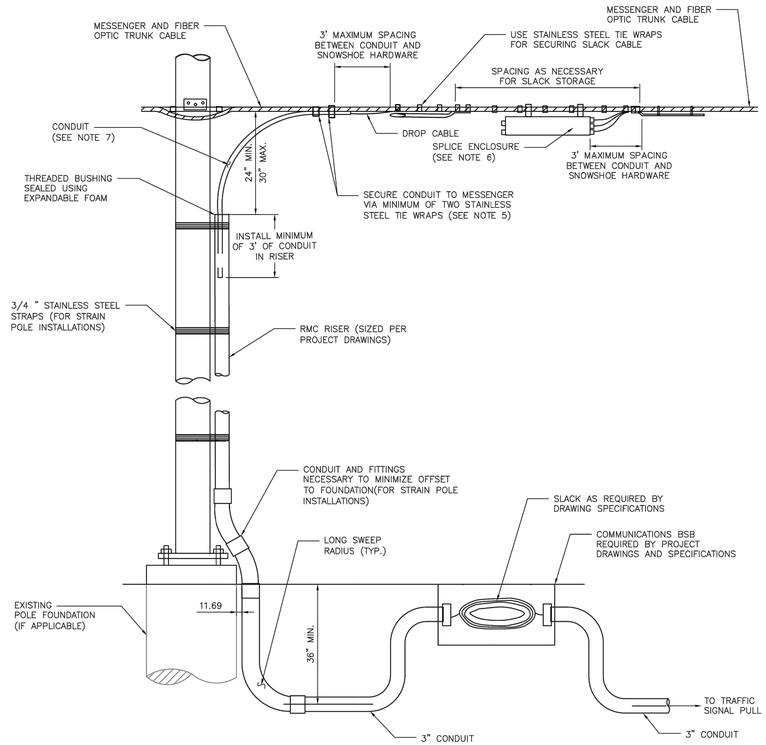
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ADOPT SAFE AND SUITABLE DESIGNS AS DICTATED BY THE PROJECT REQUIREMENTS. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS 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.

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

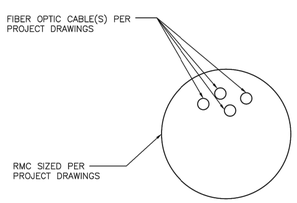
DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B86D5



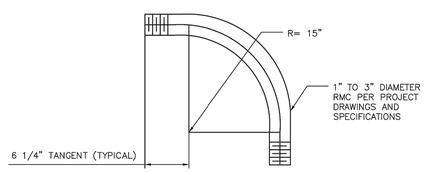
TYPICAL RIGID RISER ASSEMBLY
FOR TRUNK FIBER
AERIAL TO UNDERGROUND TRANSITIONS



TYPICAL RIGID RISER ASSEMBLY
FOR FIBER OPTIC DROP CABLE INSTALLATION



SECTION A–A



LONG RADIUS ELBOW DETAIL

NOTES:

1. THIS DETAIL SHALL BE UTILIZED WHERE APPLICABLE FOR ALL AERIAL SLACK STORAGE, AERIAL TO UNDERGROUND TRUNK CABLE TRANSITIONS, AND AERIAL SPLICING ACTIVITIES FOR TRUNK AND DROP CABLE INSTALLATIONS.
2. CABLE STORAGE AND MANAGEMENT WITHIN FIELD CABINETS SHALL BE PERFORMED BY SECURING FIBER OPTIC CABLE SLACK AND CONNECTORS IN THE TOP OF THE CABINETS.
3. MINIMUM BEND RADII FOR ALL CONDUIT AND CONDUIT FITTINGS SHALL CONFORM TO THE REQUIREMENTS ESTABLISHED IN THE "LONG RADIUS ELBOW DETAIL" DRAWING.
4. SLACK CABLE STORAGE REQUIREMENTS SHALL BE IN ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS. SNOWSHOE HARDWARE UTILIZED SHALL BE MOORE OPTIRACK PART# MFSR24–HCK OR APPROVED EQUAL.
5. ALL TRUNK CABLE NOT DESIGNATED FOR SLACK STORAGE OR SPLICING ACTIVITIES SHALL BE OVERLASHED TO THE MESSENGER CABLE. ALL OTHER CABLE SHALL BE ATTACHED AERIALLY USING STAINLESS STEEL TIE WRAPS (PANDUIT PART# MLT 4H–LP OR APPROVED EQUAL).
6. SPLICE ENCLOSURES USED SHALL BE PART# 3M 2178 LS, L, OR LL AS NECESSARY TO ACCOMMODATE CABLES TO BE SPLICED. ALL CABLES SHALL ENTER THE ENCLOSURE FROM THE SAME END AND SHALL BE SPLICED IN BUTT CONFIGURATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER AND/OR THE APPROVED CITY OF HOUSTON REPRESENTATIVE.
7. TWO CONDUITS MAY BE REQUIRED BY THE PROJECT DRAWINGS.
8. NO SPLICE CLOSURES OR SLACK STORAGE SHALL BE LOCATED OVER PUBLIC OR PRIVATE TRAVEL WAYS.
9. ALL REQUIRED HARDWARE AND CONDUIT SHALL BE GALVANIZED.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar 92F8B90C841F5478...	DocuSigned by: LETHENG NGUYEN 95A28EFDA76B4CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carl Haddock 4B5C67B8F3B5466...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 02893–05

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

TRUNK FIBER AERIAL TO UNDERGROUND TRANSITIONS

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 17 OF 23

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 66 OF 72	

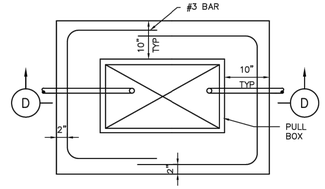
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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 ITS USE. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ADDRESS THE SAFETY CONCERNS ASSOCIATED WITH THE USE OF THIS STANDARD IN EACH APPLICATION. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR

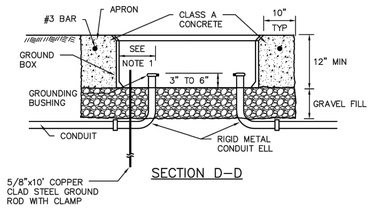
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

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 HIGH QUALITY, ACCURACY AND SAFETY. NO WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY GOODS, SERVICES OR DRAWINGS, THE CITY OF HOUSTON SHALL NOT BE RESPONSIBLE OR LIABLE IN ANY WAY FOR CLAIMS OR DAMAGES RESULTING FROM ITS USE FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON SHALL NOT BE RESPONSIBLE OR LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE, MODIFICATION OR REUSE OF THESE DRAWINGS BY ANY PERSON OR ENTITY FOR ANY PURPOSE OR PROJECT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE CITY OF HOUSTON AND ANY UNAUTHORIZED USE SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE CITY OF HOUSTON. ACCEPTANCE AND/OR USE OF THESE DRAWINGS BY ANY PERSON OR ENTITY FOR ANY PURPOSE CONSTITUTES AGREEMENT TO THE FOREGOING.



PLAN VIEW

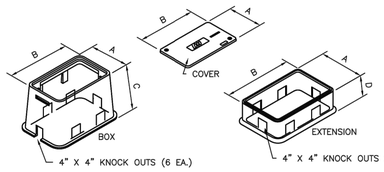


SECTION D–D

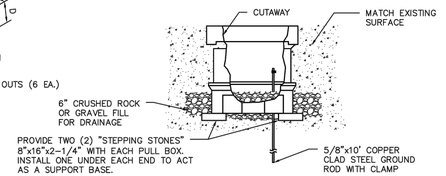
APRON FOR PULL BOXES

NOTES:

1. FINAL POSITION OF END OF CONDUIT SHALL NOT EXCEED ONE–HALF THE DISTANCE TO THE SIDE OF BOX OPPOSITE THE CONDUIT ENTRY.
2. PLACE GRAVEL "UNDER" THE BOX, NOT "IN" THE BOX. GRAVEL SHOULD NOT ENCROACH ON THE INTERIOR VOLUME OF THE BOX.
3. INSTALL BUSHING ON THE UPPER END OF ALL ELLS.
4. PROVIDE A 5/8" GROUND ROD IN ALL PULL BOXES AND CONNECT IT TO ANY AND ALL EQUIPMENT GROUNDING CONDUCTORS USING A LISTED CONNECTOR.
5. MAINTAIN SUFFICIENT SPACE BETWEEN ALL CONDUITS SO AS TO ALLOW FOR PROPER INSTALLATION OF BUSHINGS.
6. ALL CONDUITS SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
7. ALL CONDUITS INSTALLED IN THE GROUND BOX SHALL BE SEALED AFTER COMPLETION OF CONDUCTOR INSTALLATION AND ANY REQUIRED PULL TESTS. SILICONE SHALL NOT BE USED AS THE SEALANT.



NOMINAL DIMENSIONS FOR TRAFFIC SIGNAL PULL BOXES				
TYPE	A	B	C	D
DETECTOR TYPE A	13"	18"	24"	12"
TRAFFIC SIGNAL TYPE B	17"	30"	24"	12"
COMMUNICATION TYPE C	26"	38"	24"	12"



SIDE VIEW
ELECTRICAL PULL BOX ASSEMBLY

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

PULL BOXES

(SCALE: NOT TO SCALE)

APPROVED BY:

Suhail Kanawar — CITY ENGINEER

Eldridge Nguyen — CITY TRAFFIC ENGINEER

Carl Haddock — DIRECTOR OF HPW

EFF DATE: NOV–27–2023 | DWG NO: 16710–01

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 18 OF 23

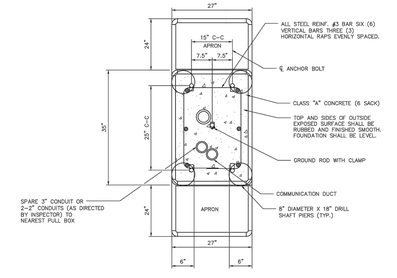
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 67 OF 72	

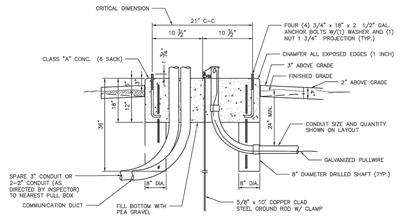
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

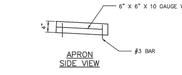
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR USE, ACCEPTS RESPONSIBILITY FOR HIGH QUALITY, ACCURACY AND SAFETY. NO WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY GOODS, SERVICES OR DRAWINGS, THE CITY OF HOUSTON SHALL NOT BE RESPONSIBLE OR LIABLE IN ANY WAY FOR CLAIMS OR DAMAGES RESULTING FROM ITS USE FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON SHALL NOT BE RESPONSIBLE OR LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE, MODIFICATION OR REUSE OF THESE DRAWINGS BY ANY PERSON OR ENTITY FOR ANY PURPOSE OR PROJECT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE CITY OF HOUSTON AND ANY UNAUTHORIZED USE SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE CITY OF HOUSTON. ACCEPTANCE AND/OR USE OF THESE DRAWINGS BY ANY PERSON OR ENTITY FOR ANY PURPOSE CONSTITUTES AGREEMENT TO THE FOREGOING.



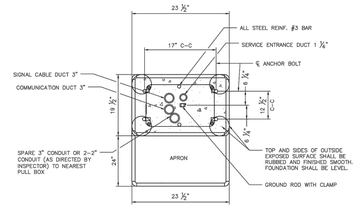
342–HOUSING 1 DETAIL
TOP VIEW



342–HOUSING 1 DETAIL
SIDE VIEW



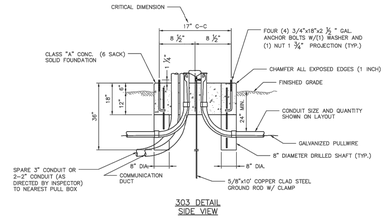
APRON
SIDE VIEW



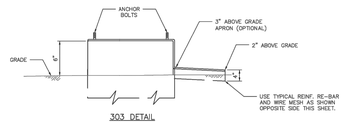
303 DETAIL

NOTES:

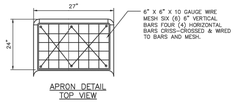
1. ALL CONDUIT ELBOWS TO BE RGS



303 DETAIL
SIDE VIEW



303 DETAIL



APRON DETAIL
TOP VIEW

APPROVED BY:	APPROVED BY:
Suhail Kanawar — CITY ENGINEER	Eldridge Nguyen — CITY TRAFFIC ENGINEER
APPROVED BY: Carl Haddock — DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO. 16730–01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONTROLLER FOUNDATIONS

SHEET 01 OF 03

FOR CITY OF HOUSTON USE ONLY

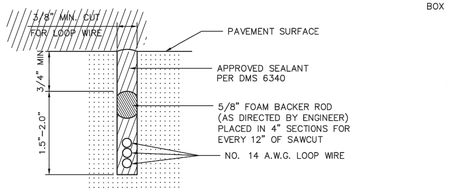
DRAWING SCALE

NOT TO SCALE

K:\14760\14760–0021–01 T–0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

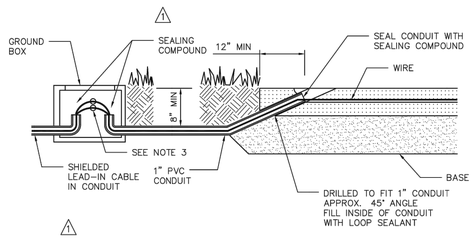
DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

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 ITS USE. ANY PERSON MAKING USE OF THIS STANDARD IN THE DESIGN OR CONSTRUCTION OF A PROJECT WITHIN THE CITY OF HOUSTON JURISDICTION IS RESPONSIBLE FOR USING REASONABLE SKILL AND JUDGMENT IN ADAPTING THE STANDARD FOR THE CONDITIONS SURROUNDING THAT PROJECT. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
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.

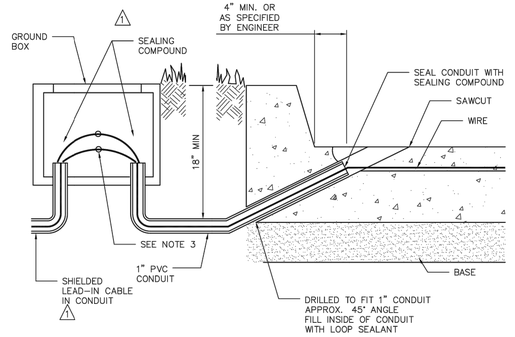


LOOP SAW CUT CROSS-SECTION

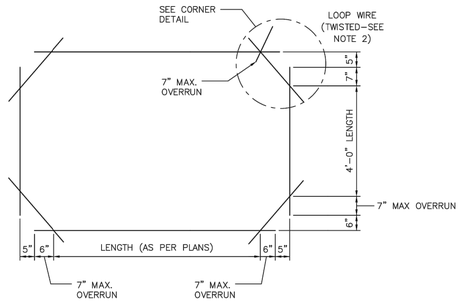
* SAWCUTS IN BRIDGE DECKS ARE TYPICALLY 1" DEPTH MAXIMUM
SAWCUTS IN BRIDGE DECKS AND ACROSS EXPANSION JOINTS
SHALL BE AS APPROVED BY ENGINEER



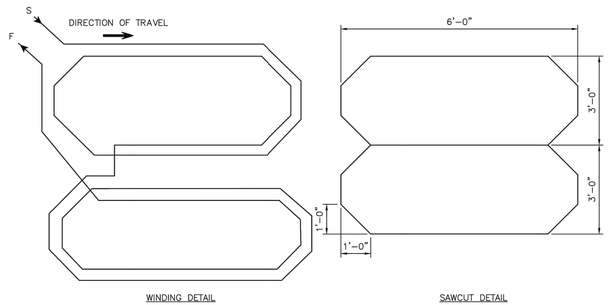
TYPICAL LEAD IN CONFIGURATION
(WITHOUT CURBING)



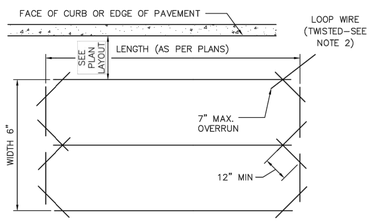
TYPICAL LEAD IN CONFIGURATION
(WITH CURBING)



RECTANGULAR

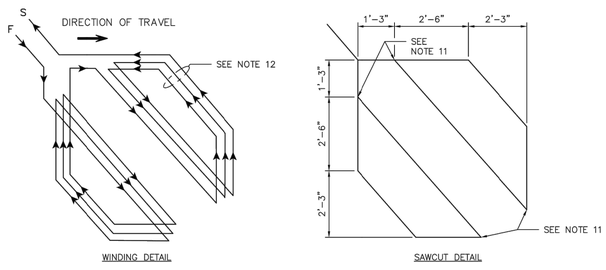


QUADRUPOLE (Q) TYPE LOOP DETECTOR CONFIGURATION



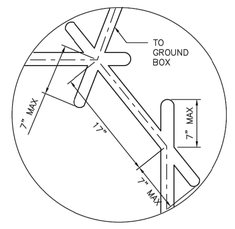
QUADRAPOLE

TYPICAL VEHICULAR LOOP DETECTOR LAYOUT
(AS SPECIFIED IN PLANS)

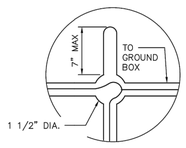


DIAGONAL SLASHED (D) TYPE LOOP DETECTOR CONFIGURATION

TYPICAL BICYCLE LOOP DETECTOR LAYOUT
(AS SPECIFIED IN PLANS. SEE PAVEMENT MARKINGS DETAILS FOR LOCATION RELATIVE TO BICYCLE SYMBOL)



RECTANGULAR & HEXIGON LOOP
SAWCUT CORNER DETAIL
7" OVERRUN BASED ON
24" DIAMETER SAW BLADE



RECTANGULAR & HEXIGON LOOP (ALT.)
DRILLED CORNER DETAIL

TYPICAL CORNER DETAILS

GENERAL NOTES:

1. THE PAVEMENT CUT IS TO BE MADE WITH A CONCRETE SAW TO NEAT LINES AND LOOSE MATERIAL REMOVED. THE CUT SHALL BE CLEAN AND DRY WHEN THE WIRE AND SEALING COMPOUND IS PLACED.
2. LOOP WIRE SHALL BE 14 AWG STRANDED TYPE XHHW. WIRE FROM THE LOOP TO THE GROUND BOX SHALL BE TWISTED A MINIMUM OF 5 TURNS PER FOOT. NO SPLICES SHALL BE PERMITTED IN THE LOOP OR IN THE RUN TO THE GROUND BOX.
3. THE HOME RUN CABLE FROM THE PULL BOX TO THE CONTROLLER SHALL BE IMSA 50-2 SHIELDED CABLE AND SHALL BE SOLDERED TO THE LOOP WIRE. THE SOLDER JOINTS SHALL BE SEALED WITH SCOTCHCAST OR OTHER METHOD ACCEPTABLE TO THE ENGINEER. THE SHIELD SHALL BE GROUNDED ONLY AT THE CONTROLLER END. LOOP HOME RUN CABLE SHALL BE TWO CONDUCTOR 14 AWG SHIELDED, TYPE XHHW.
4. ALL WIRE PLACED IN THE SAW CUT SHALL BE SEALED BY FULLY ENCAPSULATING IT IN A SEALANT ACCEPTABLE TO THE ENGINEER. SEALING COMPOUND SHALL BE IN ACCORDANCE WITH DMS 6340.
5. THE LOOP LOCATION, CONFIGURATION AND NUMBER OF TURNS SHALL BE AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RECOMMENDED NUMBER OF TURNS FOR LOOP DETECTORS

LOOPS PERIMETER SIZE (FT.)	NUMBER OF TURNS	APPROXIMATE LOOP SIZES INCLUDED
24' or Less	3 or 4	5' x 5', 6' x 6'
25' - 110'	2 or 3	6' x 10', 6' x 45'
110' or More	1 or 2	6' x 50' or Longer

6. A SEPARATE SAW CUT SHALL BE MADE FROM EACH LOOP TO THE EDGE OF PAVEMENT OR AS SPECIFIED BY THE ENGINEER.
7. SPLICES BETWEEN THE LOOP LEAD-IN CABLE AND LOOP DETECTOR SHALL BE MADE ONLY IN THE GROUND BOX NEAR THE LOOP IT IS SERVING.
8. CIRCULAR LOOPS MAY USE PREWOUND LOOPS ENCASED IN CONTINUOUS PVC TUBING. SAWCUT WIDTH MAY BE ADJUSTED TO ACCOMMODATE TUBING.
9. THE LEAD-IN WIRE IN THE CIRCULAR LOOP SHALL BE COILED AT THE 3 INCH DRILLED CORNER TO REDUCE BENDING STRESS.
10. LOOP DUCT MAY BE USED AS SPECIFIED BY ENGINEER. FOR ADDITIONAL INFORMATION REFER TO "TEXAS TRAFFIC SIGNAL DETECTOR" MANUAL, TTI REPORT 1163-1.
11. ROUND CORNERS OF ACUTE ANGLES TO PREVENT DAMAGE TO CONDUCTORS.
12. INSTALL 3 TURNS WHEN ONLY ONE TYPE D LOOP IS ON A SINGLE CHANNEL. INSTALL 5 TURNS WHEN ONE TYPE D IS CONNECTED W/3-6'X6' LOOPS ON. A SINGLE CHANNEL.

APPROVED BY:	APPROVED BY:
DocuSigned by: Suhail Kanwar	DocuSigned by: LETHENG NGUYEN
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 16727-01

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

LOOP DETECTOR
INSTALLATION DETAILS

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

REVISION	NO.	DATE	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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 19 OF 23

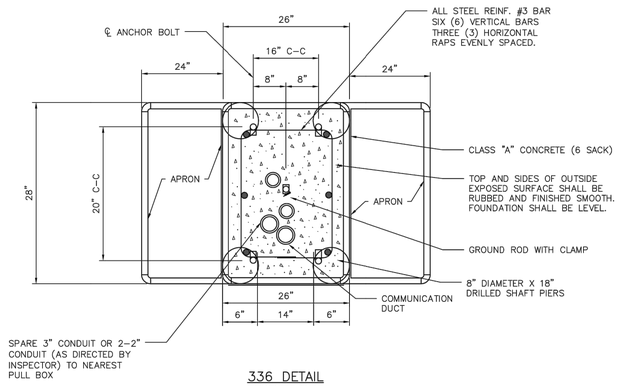
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 68 OF 72	

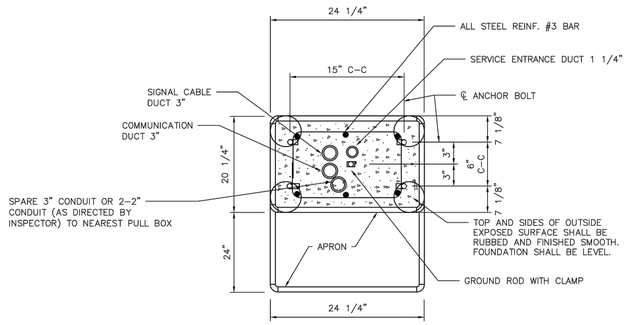
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5



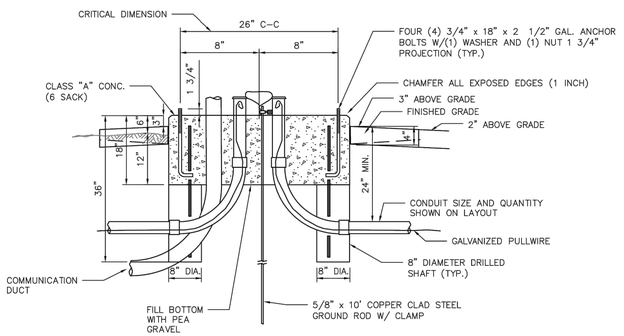
336 DETAIL
TOP VIEW



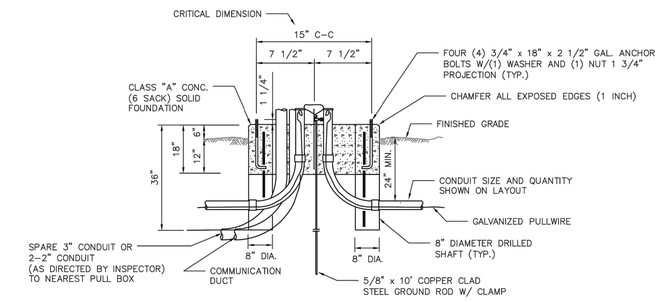
MODEL ITS 346 AND ATC 356i DETAIL
TOP VIEW

NOTES:

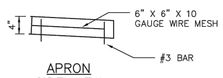
1. APRON TO BE INSTALLED IF NEEDED.



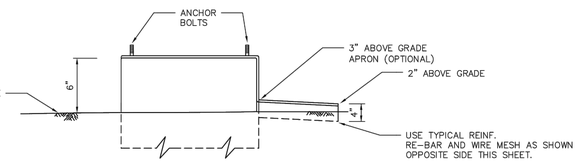
336 DETAIL
SIDE VIEW



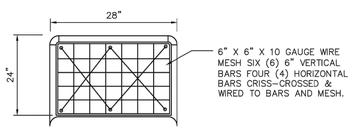
MODEL ITS 346 AND ATC 356i DETAIL
SIDE VIEW



APRON
SIDE VIEW



MODEL ITS 346 AND ATC 356i DETAIL



APRON DETAIL
TOP VIEW

APPROVED BY:	APPROVED BY:
DocuSigned by: Sulaal Tanwar — 85F7B80C0415A3A...	DocuSigned by: HENG NGUYEN — 8A43BEFDA7B84CD...
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: DocuSigned by: Carol Haddock — A92C4108573D4B3...	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 16730–02

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONTROLLER FOUNDATIONS

SHEET 02 OF 03

DRAWING SCALE	FOR CITY OF HOUSTON USE ONLY
NOT TO SCALE	

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 100461-00
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 20 OF 23

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 69 OF 72	

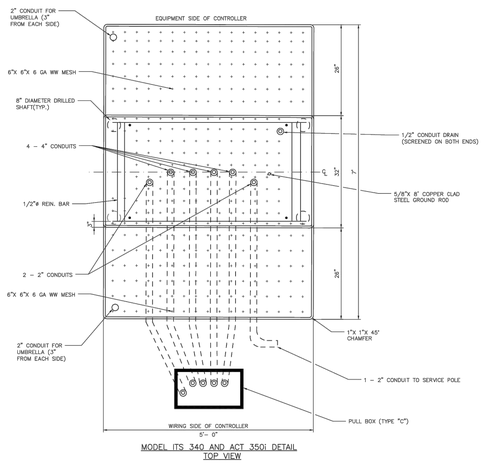
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ADOPT SAFE AND SOUND PRACTICE THAT ARE APPROPRIATE FOR THE SPECIFIC APPLICATION. NEITHER THE PREPARER OF THIS STANDARD NOR THE CITY OF HOUSTON ASSUMES ANY RESPONSIBILITY FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
WARRANTY OF ANY KIND IS MADE BY THE CITY OF HOUSTON FOR ANY PURPOSES WHATSOEVER. THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR

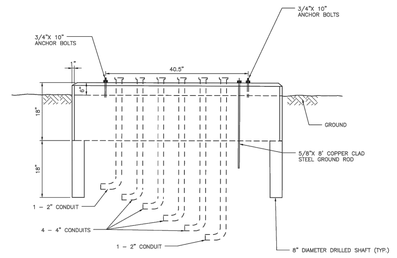
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

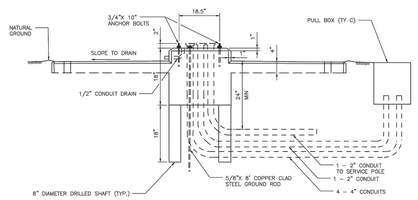
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE CITY OF HOUSTON'S ENGINEERING STANDARDS AND CRITERIA ARE INTENDED TO ADDRESS THE MINIMUM REQUIREMENTS FOR THE DESIGN OF CITY OF HOUSTON INFRASTRUCTURE. THE USER OF THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE DESIGNER OF RECORD (DOR) IS TO REVIEW THOSE 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 OR LIABILITY FOR DRAWINGS, DETAILS OR DRAWINGS FOLLOWING THEM IN USE.



MODEL ITS 340 AND ACT 350i DETAIL
TOP VIEW



MODEL ITS 340 AND 350i DETAIL
FRONT VIEW



MODEL ITS 340 AND 350i DETAIL
SIDE VIEW

NOTES:

1. ALL CONCRETE TO BE IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATION SECTION 0310.
2. SET THE TOP OF THE STEP OF THE CONTROLLER FOUNDATION NO LOWER THAN THE LEVEL OF THE PAVEMENT SURFACE. ANY NECESSARY ADJUSTMENT SHALL BE APPROVED BY THE ENGINEER.
3. CENTER THE CABINET ON THE FOUNDATION.
4. THE FOUNDATION SHALL BE SUPPORTED BY UNDISTURBED SOIL OR BY SOIL THAT HAS BEEN COMPACTED TO 90% PROCTOR DENSITY IN 6" LIFTS.
5. ALL CONDUIT ELBOWS TO BE RGS.

APPROVED BY:	APPROVED BY:
Docusigned by: Sukul Iswaran	Docusigned by: Hung Nguyen
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: Docusigned by: Carl Haddock	
DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV–27–2023	DWG NO: 16730–03

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

CONTROLLER FOUNDATIONS

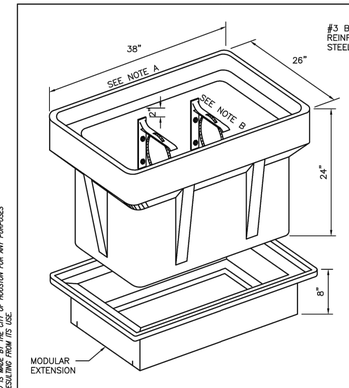
SHEET 3 OF 3

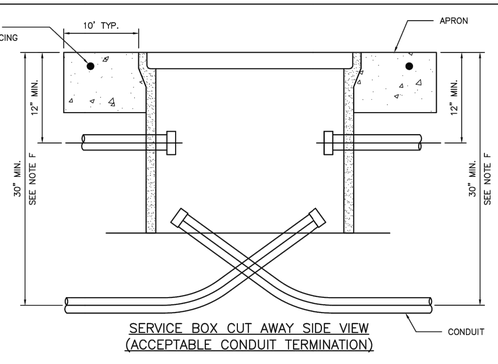
FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
NOT TO SCALE

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE CITY OF HOUSTON'S ENGINEERING STANDARDS AND CRITERIA ARE INTENDED TO ADDRESS THE MINIMUM REQUIREMENTS FOR THE DESIGN OF CITY OF HOUSTON INFRASTRUCTURE. THE USER OF THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE DESIGNER OF RECORD (DOR) IS TO REVIEW THOSE 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 OR LIABILITY FOR DRAWINGS, DETAILS OR DRAWINGS FOLLOWING THEM IN USE.





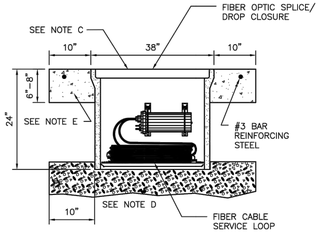
SERVICE BOX CUT AWAY SIDE VIEW
(ACCEPTABLE CONDUIT TERMINATION)

LEGEND

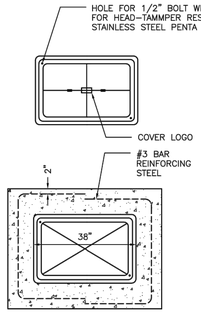
A. SPLICE CLOSURE BRACKET PROVIDES MINIMUM LID CLEARANCE OF 2" AND SUPPORTS FIBER OPTIC SPLICE CLOSURE(8" DIA. X 24" LONG AT 18 LBS).
B. NYLON TIES
C. HEAVY DUTY REMOVABLE LID WITH LOCKING PROVISIONS, PROVIDING 15,000 LB. OVER 10" SQUARE STATIC LOAD SUPPORT.
D. 6" TO 8" OF GROUND OR CRUSHED ROCK BED FOR DRAINAGE.
E. CONCRETE APRON; 3,000 PSI AS REQUIRED FOR THE LOCATION.(DRIVE, SIDEWALK, PARKING LOT OR AREAS OF LIGHT TRAFFIC).
F. CONDUIT BURIAL DEPTH SHALL BE 30" MIN. OR 12" (+/–2") MEASURED TO THE CENTERLINE OF THE CONDUIT.

NOTE:

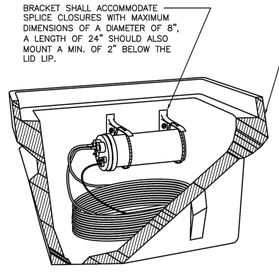
THE CROSS SECTION VIEW OF BOX IN ORDER TO VIEW DROP CLOSURE AND CABLE CONTAINED WITHIN.



CROSS SECTION VIEW
INSTALLED COMMUNICATION
SERVICE BOX DETAIL



TOP VIEW
COMMUNICATION SERVICE BOX DETAIL



CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

COMMUNICATIONS SERVICE BOX DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:	
Docusigned by: Sukul Iswaran — CITY ENGINEER	Docusigned by: Carl Haddock — DIRECTOR OF HPW
Docusigned by: Hung Nguyen — CITY TRAFFIC ENGINEER	
EFF DATE: NOV–27–2023	DWG NO: 16737–01

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 21 OF 23

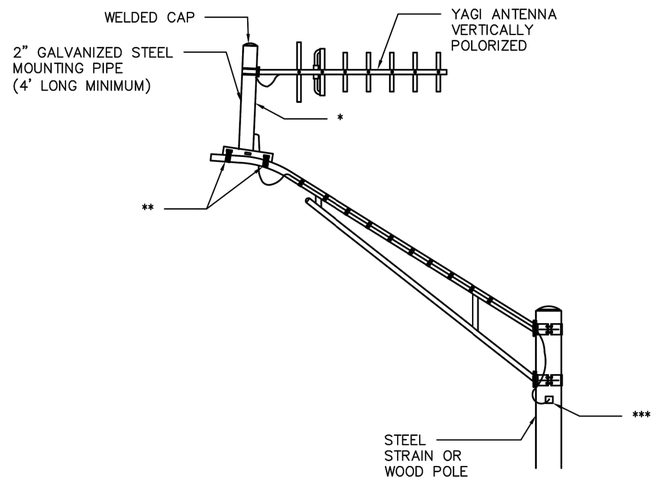
WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 70 OF 72	

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

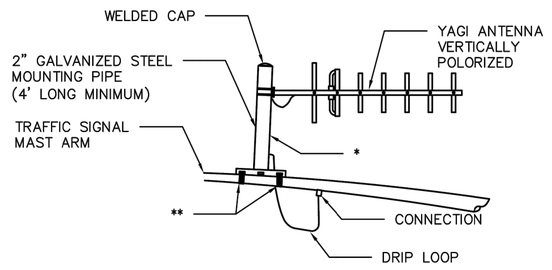


LUMINAIRE ARM MOUNT

* 4.0' PIPE EXTENSION WHEN MOUNTED ON TRAFFIC SIGNAL MAST ARM OR LUMINAIRE ARM.

** 5/8" (MIN.) STAINLESS STEEL BANDING 2 PLACES MIN.

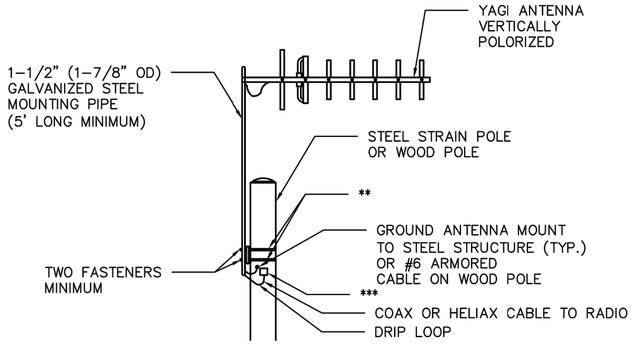
*** ENTRY INTO STEEL POLE OR CONDUIT WEATHERHEAD ON WOOD POLE



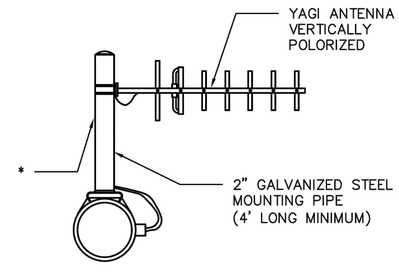
MAST ARM MOUNT

NOTES:

1. MOUNT ANTENNAS TO PROVIDE THE HIGHEST LEVEL OF RELIABILITY BETWEEN SENDING AND RECEIVING UNITS.
2. PERFORM A PATH STUDY TO DETERMINE EXACT MOUNTING LOCATION OF ANTENNAS BY RADIO SUPPLIER.
3. INSTALL ANTENNAS AS DETAILED OR AS DIRECTED BY THE SPREAD SPECTRUM RADIO SUPPLIER.
4. FURNISH MOUNTING BRACKETS FOR ANTENNAS ATTACHED TO VERTICAL PIPE AS RECOMMENDED BY SPREAD SPECTRUM RADIO SUPPLIER.
5. UNLESS NOTED, USE 5/8" STAINLESS STEEL BANDING MATERIAL TO INSTALL ANTENNA MOUNTS.
6. PROVIDE WATER TIGHT CABLE ENTRY AND EXIT POINTS IN THE TRAFFIC SIGNAL MAST ARM AND/OR POLES.
7. FOR SPREAD SPECTRUM COAX OR HELIAX CABLE ATTACHED TO LUMINAIRE ARM, PROVIDE UV STABILIZED TIE–WRAP THAT IS APPROVED FOR OUTDOOR USE.



POLE MOUNT



SIDE VIEW



BAND MOUNT BRACKET DETAIL

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

ANTENNA MOUNTING DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:

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

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

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

EFF DATE: NOV–27–2023 | DWG NO: 16738–01

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 22 OF 23

WAUGH SAFETY IMPROVEMENTS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 71 OF 72	

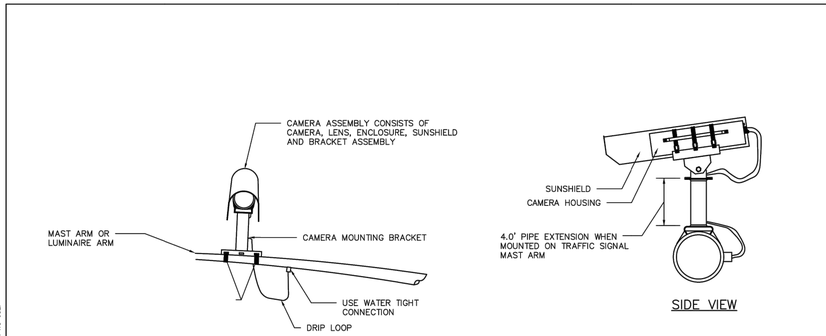
CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

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.

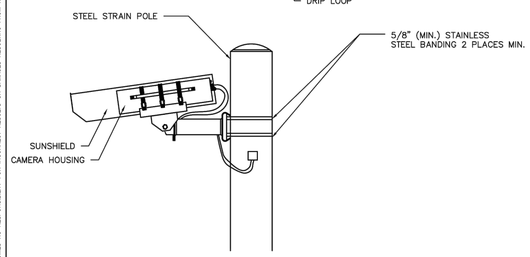
K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM

DocuSign Envelope ID: 9B122261-CF05-457B-9A65-2650F40B66D5

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 HIS/HERSEAL AND SIGNATURE ASSUMES RESPONSIBILITY FOR THE PROPER DESIGN AND SAFETY OF THE DESIGN INCLUDED IN THE CONSTRUCTION DOCUMENTS. IN ADDITION, THE EOR IS RESPONSIBLE FOR ADDRESSING ANY SITE SPECIFIC DESIGN ISSUES NOT ADDRESSED BY THIS STANDARD. WHATSOEVER, THE CITY OF HOUSTON ASSUMES NO RESPONSIBILITY FOR ACCIDENTS, DAMAGES OR LOSSES RESULTING FROM THE USE OF THIS STANDARD.



SIDE VIEW



POLE MOUNT



BAND MOUNT BRACKET DETAIL

NOTES:

1. VIDEO DETECTION PROCESSOR UNIT SHALL BE INSTALLED INSIDE CONTROLLER CABINET.
2. VIDEO DETECTION CAMERA & BRACKET SHALL BE INSTALLED AS DETAILED OR AS DIRECTED BY THE VIDEO DETECTION SUPPLIER.
3. CAMERAS SHALL BE MOUNTED AS FAR OVER THE ROADWAY AS POSSIBLE.
4. 5/8" (MIN.) STAINLESS STEEL BANDING MATERIAL SHALL BE USED TO INSTALL CAMERA MOUNTS.
5. WHEN AIMING CAMERA, HORIZON SHALL NOT BE VISIBLE IN THE FIELD OF VIEW.
6. CAMERA ENCLOSURE ASSEMBLY SHALL BE ROTATABLE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.
7. ALL CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES SHALL BE WATER TIGHT.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

VIDEO CAMERA MOUNTING DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:

Signed by: Salad Kaiwar — CITY ENGINEER	Signed by: Carl Haddock — DIRECTOR OF HPW
Signed by: Hung Nguyen — CITY TRAFFIC ENGINEER	

EFF DATE: NOV-27-2023 | DWG NO: 16742-01

NO.	DATE	REVISION	APP.

Fiber Optic Cable Installation - Material List		
Item	*Description*	*Quantity*
1	Fiber Optic Cable	1
2	Single Fiber Distribution Unit with SC connector	1
3	Shelf mounting on DIN rail	2
4	Fiber cable jumper	4
5	Ethernet cable	LF
6	Managed Field Hardened Ehternet Switch (1)	1
7	Meraki Router (2)	1
8	Battery Backup Unit	1
9	Bluetooth reader (2) and antenna	1

Cellular Modem Installation - Material List		
Item	*Description*	*Quantity*
1	Managed Field Hardened Ehternet Switch (1)	1
2	Meraki Router (2)	1
3	Bluetooth reader (2) and antenna	1
4	Battery Backup Unit	1
5	Ethernet cable	LF
6	Shelf mounting on DIN rail	2

Note:
(1) - Managed Field Hardened Ethernet switch shall be compatible with existing COH ITS infrastructure. Contractor shall be responsible for all compatibility testing and providing results to COH ITS Section. Proposed equipment different from the current standard. Contact COH ITS Section (713.881.3000) for more information.
(2) - Bluetooth reader, Router and Air-card shall be provided by COH ITS Section.

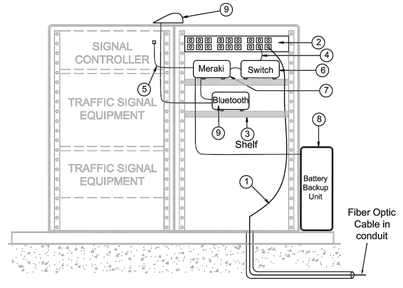
Note:

All existing and propose Intelligent Transportation Systems (ITS) infrastructure must be field verified and included on all design plans. ITS Infrastructure includes, but not limited to, fiber optic cable, copper cable, Ethernet switches, Bluetooth equipment, CCTV cameras, Dynamic Message Sign, midblock counter, etc. Any interruption of ITS operations requires City of Houston Transportation and Drainage Operations/ITS section approval at a minimum of one (1) week in advance. Contact City's ITS Section for questions regarding ITS infrastructure, communication equipment and interruption approval request at 713-881-3000.

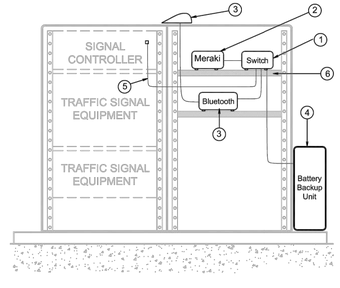
For a modified or reconstructed signalized intersection, all existing ITS infrastructure must be shown on design plan and kept operational during construction. If there is no existing ITS communication devices, new devices shall be installed and included in the design. If there is existing ITS communication devices, all devices shall be relocated to proposed cabinet with the exceptions of switches and fiber distribution unit, if applicable. All ITS infrastructure shall be designed and installed as outlined in the Communication details. Contact City's ITS section for compatibility questions with City of Houston communication infrastructure.

For a proposed/new signalized intersection, new ITS communication infrastructure and Communication Details must be included in the design plans. All ITS communication devices shall be furnished and installed by the contractor with the exceptions of Bluetooth reader, Router and Air-card (Cellular card). The proposed ITS equipment must meet the latest City of Houston specifications and design details. Please contact the City's ITS section for equipment specific questions and/or Communication Details at 713.881.3000.

Fiber Optic Cable Installation Detail



Cellular Installation Detail



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

Communication Installation Details

FILE: Communication Installation.dwg
GFS NO.
DATE: 01-26-2021
SCALE: NTS
CITY OF/HOUSTON P.N.:
P.M.:
SHEET NO. 1 OF 1

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.

MEMORIAL HEIGHTS REDEVELOPMENT AUTHORITY
1980 Post Oak Blvd., Suite 1380
Houston, Texas 77056
713-850-9000

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. Nos. F-23290 & 10046100
6330 West Loop South, Suite 150, Bellaire, TX 77401
713.777.5337

SURVEYED BY: QUIDDITY
FB NO.

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: TYLER H. COWSER, P.E.
P.E. Serial No.: 147989
Date: MARCH 2024

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TRAFFIC SIGNAL DETAILS

SHEET 23 OF 23

WAUGH SAFETY IMPROVEMENTS

CONT	SECT	JOB	HIGHWAY
0912	72	720, etc.	VARIOUS
DIST	COUNTY		
HOU	HARRIS		

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
N-T05000-0012-7	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON POC	
TOMS MATHEW	
SHEET NO. 72 OF 72	

K:\14760\14760-0021-01 T-0535 WAUGH SAFETY\2 DESIGN PHASE\CAD\TRAFFIC\TRAFFIC STANDARDS.DWG, 3/25/2024 3:03 PM