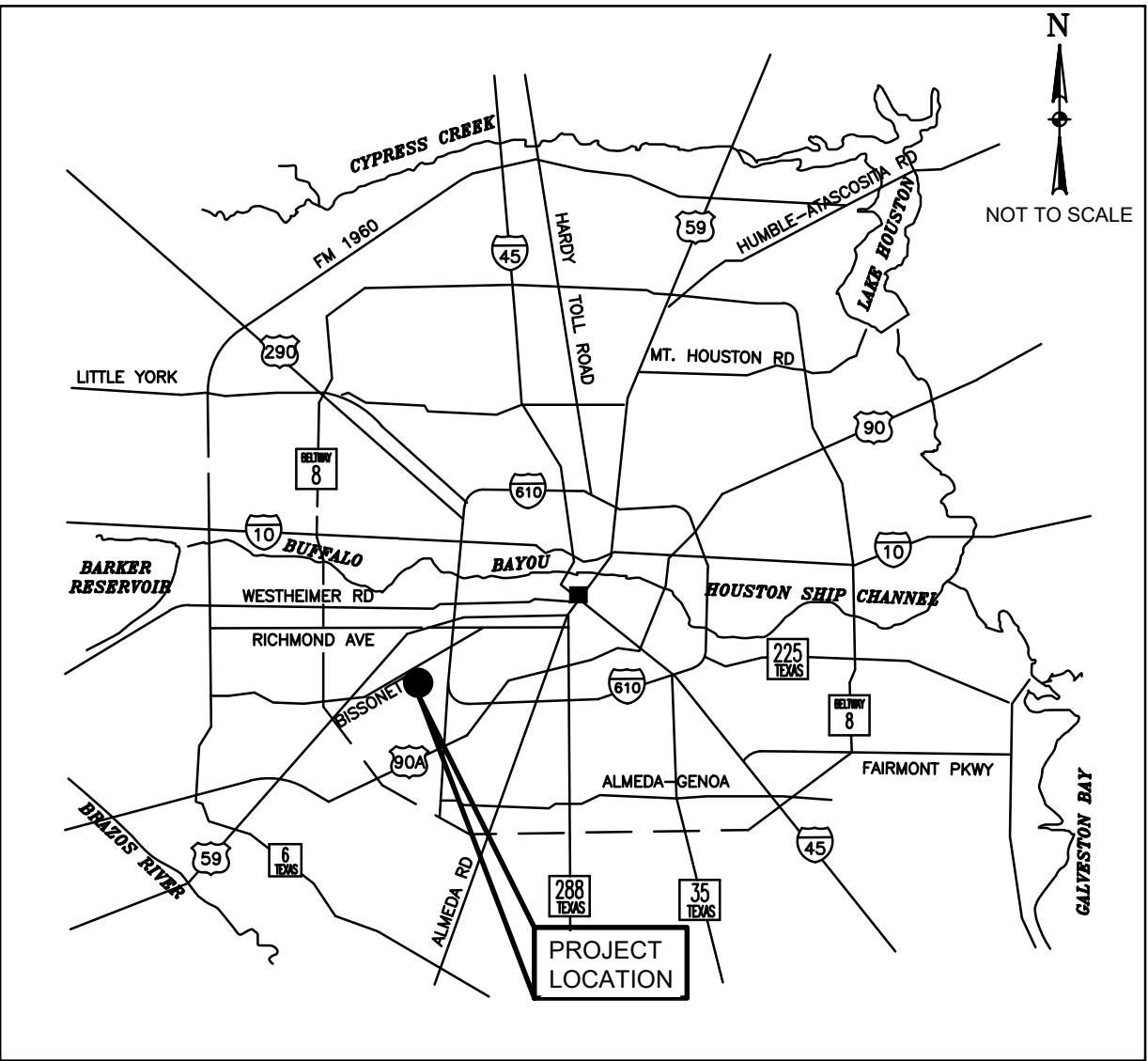


CITY OF HOUSTON  
HOUSTON PUBLIC WORKS  
SHARPSTOWN AREA DETENTION  
POND A

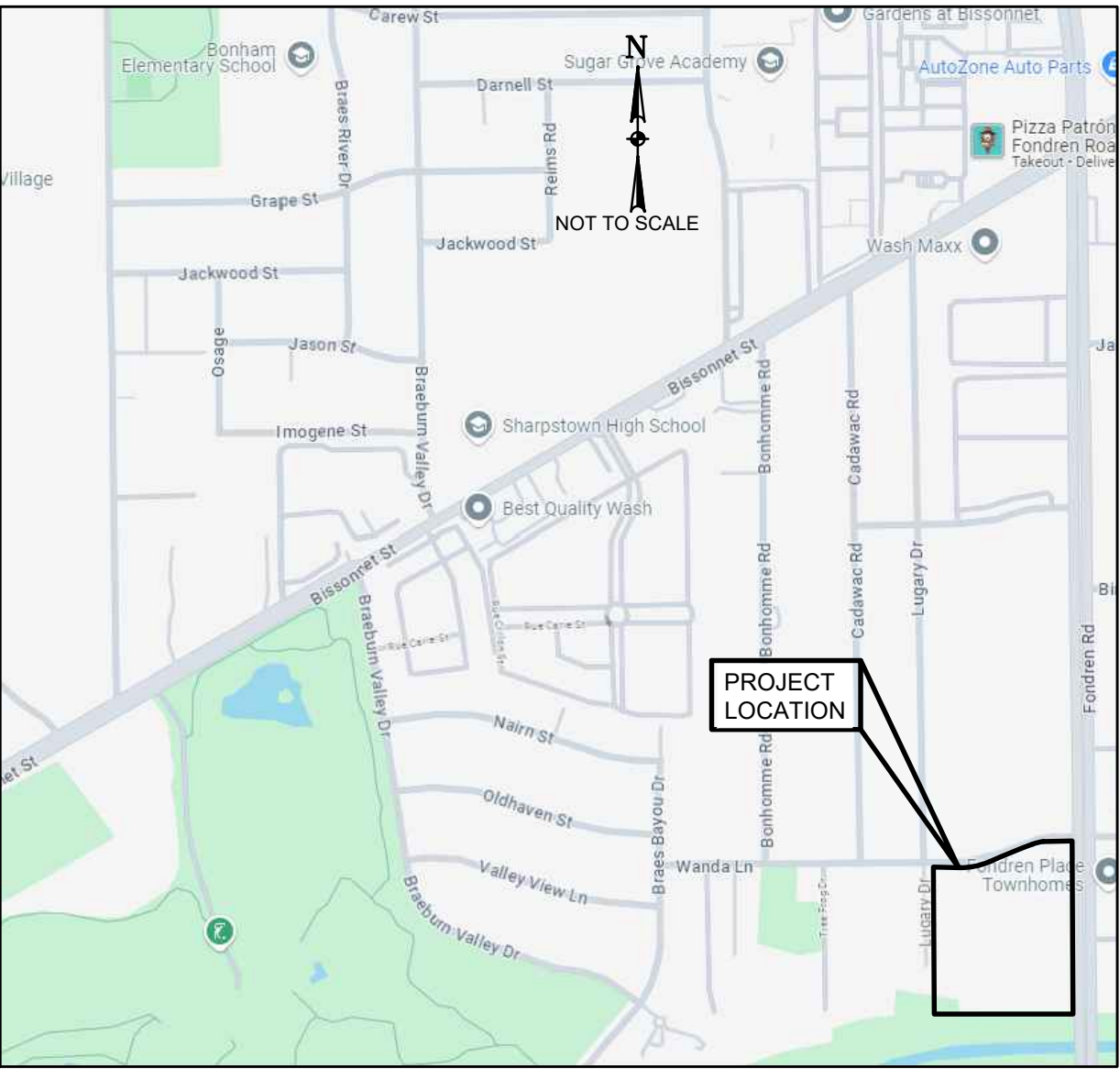
WBS NO. M-410040-001A-4



MAYOR  
JOHN WHITMIRE  
CONTROLLER  
CHRIS HOLLINS



LOCATION MAP



VICINITY MAP  
KEY MAP NO.: 530U  
CITY COUNCIL DISTRICT J

TDLR EABPR \_\_\_\_\_

HCFC D PROJECT ID #D100-00-00-Y020

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	

NO.	DATE	REVISION	APP.
<div>ENTECH</div> <div>CIVIL ENGINEERS, INC.</div> <div>15021 KATY FREEWAY, STE. 500</div> <div>HOUSTON, TX. 77094</div> <div>281-945-0069</div> <div>TX FIRM NUMBER: F-6932</div>		<div>THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF RODRIGO GUADARRAMA TEXAS REG. NO. 111437 October 17, 2025</div>	
SURVEYED BY: LANDTECH, INC. FB NO.		<div>IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES</div>	
<div></div> <div>PARKS-FORESTRY DEPT.</div>			
<div></div> <div>METRO</div>			
<div></div> <div>HOUSTON WATER</div>			
<div></div> <div>TRANSPORTATION &amp; DRAINAGE OPERATIONS</div>			
<div></div> <div>CAPITAL PROJECTS</div>		<div></div> <div>SURVEY</div>	
<div></div> <div>CITY ENGINEER</div> <div></div> <div>DATE</div>		<div>FOR CITY OF HOUSTON USE ONLY</div>	
<div></div> <div>DIRECTOR OF</div> <div>HOUSTON PUBLIC WORKS</div>			
<div></div> <div>DATE</div>			
<div></div> <div>SHEET NO 1 OF 42 SHEETS</div>			

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# SHEET INDEX

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DRAWING SCALE	
AS NOTED	
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HCFCD GENERAL NOTES:

- FENCES AND/OR OTHER ENCROACHMENTS IN THE HCFCD RIGHT-OF-WAY ARE NOT TO BE REMOVED UNLESS OTHERWISE STATED ON THE PLANS. IN CASES WHERE FENCE REMOVAL IS INDICATED ON THE PLANS, THE FENCE SHALL BE REMOVED AND PLACED NEATLY ON THE ADJACENT PROPERTY AT THE START OF CONSTRUCTION. WHERE THERE IS NOT A SEPARATE ITEM LISTED ON THE UNIT PRICE SCHEDULE, THE ENCROACHMENT REMOVAL IS INCIDENTAL TO SITE PREPARATION AND RESTORATION.
- DO NOT ENTER PRIVATE PROPERTY WITHOUT PROPER WRITTEN AUTHORIZATION FROM THE OWNER. PROVIDE COPY OF WRITTEN PERMISSION TO HCFCD.
- STRIP VEGETATION AND TOPSOIL AND STOCKPILE FOR REUSE ONSITE. MATERIAL FOUND UNACCEPTABLE BY THE ENGINEER WILL BE REMOVED AND PAID AS EXCAVATION AND OFFSITE DISPOSAL. NO SEPARATE MEASUREMENT AND PAYMENT WILL BE MADE FOR STRIPPING, STOCKPILING AND PLACING ON-SITE TOPSOIL. THE COST FOR THIS WORK WILL BE INCIDENTAL TO RELATED PAY ITEMS UNDER SPECIFICATION SECTION NUMBER 02315 LISTED ON THE UNIT PRICE SCHEDULE.
- RIPRAP AND GRANULAR FILL MATERIAL REMOVED DURING EXCAVATION, MEETING SPECIFICATION SECTION NUMBER 02378, SHALL BE REUSED AS DIRECTED BY THE ENGINEER. REUSED MATERIAL WILL BE MEASURED AND PAID FOR AS EXCAVATION AND ON-SITE FILL UNDER SPECIFICATION NUMBER 02315. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROCESSING, HANDLING, STOCKPILING, AND PLACING MATERIAL FOUND TO BE ACCEPTABLE FOR REUSE. UPON APPROVAL OF THE ENGINEER, DISPOSAL OF NONCONFORMING RIPRAP AND GRANULAR FILL MATERIAL WILL BE MEASURED AND PAID FOR AS REMOVE AND DISPOSE OF CONCRETE RUBBLE UNDER SPECIFICATION SECTION NUMBER 02120, MATERIAL DISPOSAL.
- THE LOCATION AND GRADE OF THE BACKSLOPE INTERCEPTOR STRUCTURES AND SWALES MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER AT THE TIME OF CONSTRUCTION. UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, THE BACKSLOPE INTERCEPTOR STRUCTURE SHALL BE SET AT A MAXIMUM DEPTH OF 2.5 FEET AND THE MINIMUM GRADE FOR BACKSLOPE SWALES SHALL BE 0.2%.
- ADJUST YARD DRAINS AS DIRECTED IN THE FIELD AT THE TIME OF CONSTRUCTION. PAYMENT WILL BE INCIDENTAL TO SITE PREPARATION AND RESTORATION.
- COMPLETED SECTIONS OF THE CHANNEL WILL BE TURNED OVER FOR VEGETATION ESTABLISHMENT IN MAXIMUM 1500 LINEAR FOOT SEGMENTS. CONTRACTOR MAY NOT DISTURB GREATER THAN 1500 LF OF CHANNEL AT A TIME.
- CLEAR AND REMOVE ALL SILT FROM CULVERTS, PIPES AND UNDER BRIDGES TO THE PROPOSED DESIGN GRADES TO PROVIDE POSITIVE FLOW.
- LENGTHS AND DIAMETERS REPRESENTED ON PLANS ARE APPROXIMATE. CONTRACTOR WILL BE RESPONSIBLE FOR FIELD VERIFICATION PRIOR TO ORDERING MATERIALS.
- ACTIVITIES THAT DISTURB BIRD HABITAT, INCLUDING BUT NOT LIMITED TO CLEARING, GRUBBING, AND IMPACTS TO STRUCTURES WHERE MIGRATORY BIRDS AND BALD EAGLES MIGHT NEST, REQUIRE A NEST HABITAT SURVEY. DO NOT PROCEED UNTIL HARRIS COUNTY FLOOD CONTROL DISTRICT HAS CONDUCTED A NEST HABITAT SURVEY TO VERIFY ACTIVE MIGRATORY BIRD NESTS AND BALD EAGLE NESTS ARE NOT PRESENT. THE HARRIS COUNTY FLOOD CONTROL DISTRICT MUST PROVIDE WRITTEN AUTHORIZATION TO PROCEED.
- WHEN BANK EROSION REPAIRS CALL FOR THE PLACEMENT OF 3"x5" GRANULAR FILL IN THE CHANNEL BOTTOM TO ESTABLISH A BASE FOR REBUILDING THE SLOPE. THE 3"x5" GRANULAR FILL SHALL BE LIMITED TO AN ELEVATION 6-INCHES ABOVE THE NORMAL WATER SURFACE ELEVATION LEVEL.
- THE CONTRACT CONTAINS UNIT ITEMS FOR THE ESTABLISHMENT OF BEST MANAGEMENT PRACTICES FOR STORM WATER QUALITY PURPOSES. WHEN NOT CALLED FOR IN THE PROJECT PLANS, COORDINATE THE NEED AND LOCATION OF THESE UNIT ITEMS WITH THE DISTRICT REPRESENTATIVE ON SITE PRIOR TO PLACEMENT. THESE UNIT ITEMS INCLUDE, BUT ARE NOT LIMITED TO, REINFORCED SILT FENCE FOR MATERIAL STOCKPILES, ANCHORED SODDING FOR DISTURBED EARTHEN AREAS OR AROUND CONCRETE AND CONCRETE INTERCEPTOR, AND STABILIZED CONSTRUCTION ACCESS FOR PROJECT SITE INGRESS/EGRESS.
- WHEN INCLUDED IN THE SCOPE OF WORK, THE PURPOSE OF DEEP PLOWING THE SLOPE OR BERM OF A CHANNEL IS TO BREAK UP THE DESICCATED SOILS AND TO ELIMINATE ANY VOIDS, OR RILLING CLOSE TO THE SURFACE OF THE SLOPE OR BERM. THE CONTRACTOR WILL DEEP PLOW THE SLOPE OR BERM TO A MINIMUM DEPTH OF 2 FEET IN AREAS CONTAINING VOIDS AND/OR RILLING. IN AREAS OF VOIDS ONLY, THE SURFACE FROM WHICH THE 2 FEET DEPTH IS MEASURED WILL BE THE LEVEL OF THE SURROUNDING UNDISTURBED SOIL. IN AREAS OF RILLING, THE RILLS WILL FIRST BE KNOCKED DOWN AND LEVELED OFF. THE 2 FEET DEPTH WILL THEN BE MEASURED FROM THIS NEW SURFACE. THE CONTRACTOR WILL DETERMINE THE MEANS AND METHODS FOR DEEP PLOWING.)
- TREES AND PLANTS LOCATED WITHIN A DESIGNATED TREE PROTECTION ZONE (TPZ) SHALL BE PRESERVED. REFER TO SPECIFICATION SECTION 01566 -- TREE AND PLANT PROTECTION, FOR DETAILED INFORMATION ON TREE AND PLANT PRESERVATION PRACTICES AND PROCEDURES INCLUDING, BUT NOT LIMITED TO, ROOT PRUNING, VEGETATION TRIMMING, FENCING AND OTHER PRESERVATION OPERATIONS.
- IF APPLICABLE, CONTRACTOR SHALL AVOID ANY WETLAND AREAS BEYOND THE LIMITS OF EXCAVATION AND CLEARING. AS THE FIRST WORK ITEM CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING FENCING OR OTHER MATERIAL TO IDENTIFY AND PROTECT THE IDENTIFIED WETLAND AREAS, UNLESS WETLANDS HAVE BEEN IDENTIFIED AND FENCED BY HCFCD PRIOR TO CONSTRUCTION AND CONTRACTOR HAS WRITTEN EVIDENCE OF SUCH.

UTILITY NOTES

CENTERPOINT ENERGY ID: 1406247323  
 CAUTION: UNDERGROUND GAS FACILITIES

THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

- WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 207-5463 OR (713-945-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
- WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
- WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
- FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-2111 OR (713) 207-4200.

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

CENTERPOINT ENERGY  
 WARNING: OVERHEAD ELECTRICAL FACILITIES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

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

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

ACTIVITIES ON/OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY

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

WARNING: UNDERGROUND ELECTRICAL UTILITIES

THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

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

AT&T TEXAS/SWBT FACILITIES LOG NO: 010824KTCF02

- 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.
- THE CONTRACTOR SHALL CALL 1-800-344-8377 (TEXAS 811) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
- 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.
- 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.
- 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.
- PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER ROOSEVELT LEE JR. AT (713)614-1983 OR E-MAIL HIM AT KR7896@ATT.COM, IF CABLE LOCATE REQUEST(S) ARE NOT COMPLETED FOR OUR AT&T TEXAS/SWBT FACILITIES.

<div> <div> <div>ENTECH</div> <div>CIVIL ENGINEERS, INC.</div> </div> <div> 15021 KATY FREEWAY, STE. 500  HOUSTON, TX. 77094  281-945-0069  TX FIRM NUMBER: F-6932 </div> </div>	THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF RODRIGO GUADARRAMA TEXAS REG. NO. 111437 OCTOBER 15, 2025
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CITY OF HOUSTON  
 HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION POND A

GENERAL NOTES (1 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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THE PROJECT PLANS ARE INTENDED AS A GUIDE. THE REPAIR AREA LIMITS WILL BE DETERMINED IN THE FIELD BY THE HCFCF REPRESENTATIVE. DUE TO THE DYNAMIC CONDITIONS IN THE FIELD, PROJECT SCOPE AND QUANTITIES MAY VARY FROM THE PLANS AND/OR CROSS SECTIONS. HCFCF RESERVES THE RIGHT TO ADJUST PLANS AND QUANTITIES AS NECESSARY. PROJECT SCOPE MAY BE ADJUSTED AS PRIORITIES CHANGE.

THE PURPOSE OF THE CHANNEL DESILT IS TO RESTORE POSITIVE DRAINAGE DURING LOW FLOW CONDITIONS. UNLESS SPECIFICALLY STATED OTHERWISE, IT IS NOT THE INTENT OF THE PROJECT TO DEEPEN THE CHANNEL BEYOND ITS ORIGINAL DESIGN CONFIGURATION. EXCAVATION OF SILT SHOULD NOT UNDERMINE THE TOE OF THE SLOPE.

THE INITIAL ISSUED FOR CONSTRUCTION PROJECT PLAN DETAILS AND SUBSEQUENT PROJECT PLANS ISSUED TO THE CONTRACT ARE INTENDED AS A GUIDE. THE EXACT PROJECT LIMITS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER PRIOR TO AND/OR AFTER THE START OF CONSTRUCTION ACTIVITIES. DUE TO THE DYNAMIC CONDITIONS ON SITE, PROJECT SCOPE AND QUANTITIES MAY VARY FROM THE PROJECT PLANS AND/OR CROSS SECTIONS. HCFCD RESERVES THE RIGHT TO ADJUST PROJECT PLANS AND CONTRACT QUANTITIES AS NECESSARY IN ACCORDANCE WITH THE CONTRACT. PROJECT PLANS MAY BE ADDED OR DELETED FROM THE CONTRACT AS PRIORITIES CHANGE. PROJECT ASSIGNMENTS TO CONSTRUCTION WILL BE PRIORITIZED/DETERMINED BY THE ENGINEER.


ALL RIPRAP CALLED FOR ON THE PROJECT PLANS SHALL BE PAID FOR UNDER THE APPROPRIATE CORRESPONDING UNIT ITEM BASED ON THE SPECIFIED GRADATION AND SHALL BE PAID FOR BY THE TON. WHERE THE PROJECT PLANS CALL FOR THE USE OF A WELL GRADED MIXTURE OF GRANULAR FILL, PAYMENT WILL BE MADE UNDER UNIT ITEM 2378-05, GRANULAR FILL, GRAVEL TO RIPRAP GRADATION NO. 2, AS DIRECTED BY THE ENGINEER.

THE UNIT ITEM ASSOCIATED WITH SPECIFICATION SECTION 02200, SITE PREPARATION AND RESTORATION WILL BE UTILIZED ON ALL PROJECTS ISSUED TO THE CONTRACT. THE SITE PREPARATION AND RESTORATION UNIT ITEM WILL BE PAID OUT THROUGH THE LIFE OF THE CONTRACT IN INCREMENTS BASED ON 5 PERCENT OF THE ENGINEERS ESTIMATE OF EACH PROJECT SITE ISSUED TO THE CONTRACT. PROJECTS ISSUED TO THE CONTRACT WHICH HAVE AN ENGINEER'S ESTIMATE OF LESS THAN \$100,000.00 WILL BE PAID A FLAT FEE OF \$5,000.00 FOR THE COST ASSOCIATED WITH UNIT ITEM 02200, SITE PREPARATION AND RESTORATION. FINAL PAYMENT WILL BE BASED ON ALL ACTUAL WORK INSTALLED. FOR ADDITIONAL INFORMATION SEE THE SPECIAL PROVISION TO SPECIFICATION 02200, SITE PREP AND RESTORATION.

THE TERM "LANDFILL" AS INCLUDED IN THE CONTRACT DOCUMENTS REFERS TO A DISPOSAL FACILITY THAT IS LICENSED/PERMITTED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ).

IN AREAS WHERE THE PROJECT PLANS CALL FOR THE PLACEMENT OF CONCRETE TO TRANSITION FROM ONE CALLED THICKNESS TO ANOTHER CALLED THICKNESS, PAYMENT FOR THE CONCRETE SHALL BE EVENLY SPLIT BETWEEN THE APPROPRIATELY ASSOCIATED TWO UNIT ITEMS.

ALL SPECIFICATION SECTION NUMBER 02462, STEEL SHEET PILING UNIT ITEMS SHALL BE BASED ON PZ 27 STEEL SHEET PILING.

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<p>GENERAL NOTES (2 OF 2)</p>			
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<p>SUPUN ILANGAMUDALIGE P.E.</p>			
<p>SHEET NO. 5 OF 42</p>			

## SANITARY SEWERS CONSTRUCTION NOTES

- ALL SEWERS SHALL BE SUBJECT TO A STANDARD EXFILTRATION TEST. TESTS ARE TO BE PERFORMED ON THE TOTAL FOOTAGE OF SEWER LINE INCLUDED IN THE PROJECT. REQUIREMENTS OF TEXAS ADMINISTRATIVE CODE, TITLE 30 CHAPTER 217, "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS" SHALL GOVERN WHERE CONFLICTS EXIST EXCEPT WHERE CITY REQUIREMENTS ARE MORE STRINGENT.
2. ALL MANHOLES ARE TO BE PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBERS 02082-01, 02082-02, 02082N-02, 02082-03, AND 02082N-03 UNLESS OTHERWISE NOTED. USE THE LATEST VERSION AS APPLICABLE.
3. SANITARY SEWER MANHOLES WILL HAVE BEDDING AND BACKFILL PER CITY OF HOUSTON STANDARD DETAILS, DRAWING NO. 02317-08 UNLESS OTHERWISE NOTED.
4. THE SANITARY SEWER PVC PIPE SHALL BE ASTM D 3034 TYPE PSM SDR 26 GRAVITY SEWER PIPE, ASTM D2241 SDR 26 PRESSURE RATED SEWER PIPE OR AWWA C-900 DR-18 GREEN PVC PRESSURE RATED SEWER PIPE BASED ON CONSTRUCTION CONDITION REQUIREMENT AND CONFORMING TO ASTM D1784 AND CITY OF HOUSTON STANDARD SPECIFICATION SECTION 02506 POLYVINYL CHLORIDE PIPE.
5. WHEN SS PRESSURE RATED PVC PIPE IS USED ON WATERLINE (WL) CROSSING UNDER CONDITION 1 OF COH IDN TABLE 7.3, THE SAME TYPE OF D2241 SDR 26 PVC PIPE OR C-900 GREEN DR-18 PVC GREEN PRESSURED TO BE UTILIZING IN-BETWEEN TWO SS MH'S. OR TO UTILIZE A DI TRANSITION ADAPTER FOR THE CONNECTING OF ASTM D-3034 PVC GRAVITY PIPE TO DI-OD AWWA C-900 PVC PIPE CENTERED AT WL WHEN CONNECTING TWO DIFFERENT TYPES OF PVC PIPES FOR SEWER CONSTRUCTION.
6. AWWA C-900 DR-18 PVC PIPE USES EITHER AWWA C900 DR-18 PVC FITTINGS OR DIP FITTINGS.
7. ALL SANITARY SEWER LINES UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL HAVE BEDDING PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBERS 02317-01, 02317-02, OR 02317-03 AS APPLICABLE, WITH 1 ½ SACK CEMENT/CY STABILIZED SAND BACKFILL UP TO THE BOTTOM OF THE PAVEMENT SUBGRADE. 100 PSI PERFORMANCE RESULTS ARE STILL REQUIRED.
8. ALL NEW SANITARY SEWERS CROSSING WATER LINES WITH A CLEARANCE BETWEEN 12 INCHES AND 9 FEET SHALL HAVE A MINIMUM OF ONE 18' JOINT OF DUCTILE IRON OR (GREEN) C900 PVC PIPE MEETING ASTM SPECIFICATION D2241 CENTERED ON WATER LINE. WHEN WATER LINE IS BELOW SANITARY SEWER, PROVIDE MINIMUM 2 FOOT SEPARATION.
9. CONTRACTOR SHALL PROVIDE A MINIMUM HORIZONTAL CLEARANCE OF 9' FEET BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.
10. SANITARY SEWER MANHOLE RIMS OUTSIDE OF PROPOSED PAVING WILL BE SET 3" - 6" ABOVE THE SURROUNDING LEVEL FINISHED GRADE AFTER PAVING WITH SLOPED BACKFILL ADDED FOR STORM WATER TO DRAIN AWAY FROM MANHOLE RIM.
11. IN WET STABLE TRENCH AREAS USE BEDDING PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBER 02317-02.
12. DEFLECTION TEST: DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID SEWER PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5% IF THE DEFLECTION TEST IS TO BE RUN USING A RIGID MANDREL, IT SHALL HAVE A DIAMETER EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE. THE TEST SHALL BE PERFORMED AS PER 30 TAC 217.57 LATEST AMENDMENT AND WITHOUT MECHANICAL PULLING DEVICES. NO BALL-TYPE MANDREL IS ALLOWED.
13. INFILTRATION, EXFILTRATION OR LOW-PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC, TITLE 30 217.57 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.
  - A. INFILTRATION OR EXFILTRATION TEST: TOTAL LEAKAGE AS DETERMINED BY A HYDROSTATIC HEAD TEST SHALL NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO (2) FEET.
  - B. LOW-PRESSURE AIR TEST: PERFORM TEST ACCORDING TO UNI-B-6-90 OR OTHER APPROPRIATE PROCEDURES. FOR SECTIONS OF PIPE LESS THAN 36" (INCH) AVERAGE INSIDE DIAMETER, THE MINIMUM ALLOWABLE TIME FOR PRESSURE DROP FROM 3.5 P.S.I.G. TO 2.5 P.S.I.G. SHALL BE AS FOLLOWS:

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

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

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

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

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


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

WHERE L = LENGTH OF LINE OF SAME PIPE SIZE IN FEET.

14. "SAN. S. E." INDICATES "SANITARY SEWER EASEMENT"

15. FOR SANITARY MANHOLE (MH) RIMS SET INSIDE OF OR @ CURB & GUTTER PAVEMENT AND/OR BELOW T.C., MH RIMS WILL BE SET FLUSHED WITH AN ABUTTING PAVED SURFACE. THE (VALCUN, NEENAH OR EQUAL) HEAVY DUTY BOLTED SOLID MH COVER SHALL BE PROPERLY (AND SECURELY) ATTACHED AND SEALED TO ITS COMPATIBLE GASKETED FRAME BY USING BOTH A NEOPRENE GASKET AND (AT LEAST) 4 COUNTER-SUNK HEX-HEAD COARSE THREADED 1/2"-13 UNC STAINLESS STEEL BOLTS. THE HEAVY DUTY FRAME MH COVER SHALL BE SOLID (NO AIR HOLES). SAID FRAME SHALL BE BOTH EMBEDDED INTO THE MH'S TOP ALSO SECURELY ANCHORED TO THE UNDERLYING MH STRUCTURE WITH EITHER SECURELY ATTACHED EMBEDDED ANCHOR BOLTS OR THE CONCRETE MH'S EXPOSED REBARS WELDED TO THE FRAME OR OTHER EQUALLY SECURED METHODS TO PREVENT MH COVER/FRAME BLOW-OFFS/EJECTIONS.

NO.	DATE	REVISION	APP.

		THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF RODRIGO GUADARRAMA TEXAS REG. NO. 111437 OCTOBER 15, 2025	
15021 KATY FREEWAY, STE. 500 HOUSTON, TX. 77094 281-945-0069 TX FIRM NUMBER: F-6932		IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES	
SURVEYED BY: LANDTECH, INC. FB NO. P-6331			
<h1 style="text-align: center;">CITY OF HOUSTON</h1> <p style="text-align: center;">HOUSTON PUBLIC WORKS</p>			
<h2 style="text-align: center;">SHARPSTOWN AREA DETENTION POND A</h2>			
<h2 style="text-align: center;">SANITARY SEWER CONSTRUCTION NOTES</h2>			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
M-410040-001A-4			
DRAWING SCALE			
AS NOTED			
CITY OF HOUSTON PM			
SUPUN ILANGAMUDALIGE P.E.			
SHEET NO.      6   OF 42			



## WATER CONSTRUCTION NOTES

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


## GRADING NOTES

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

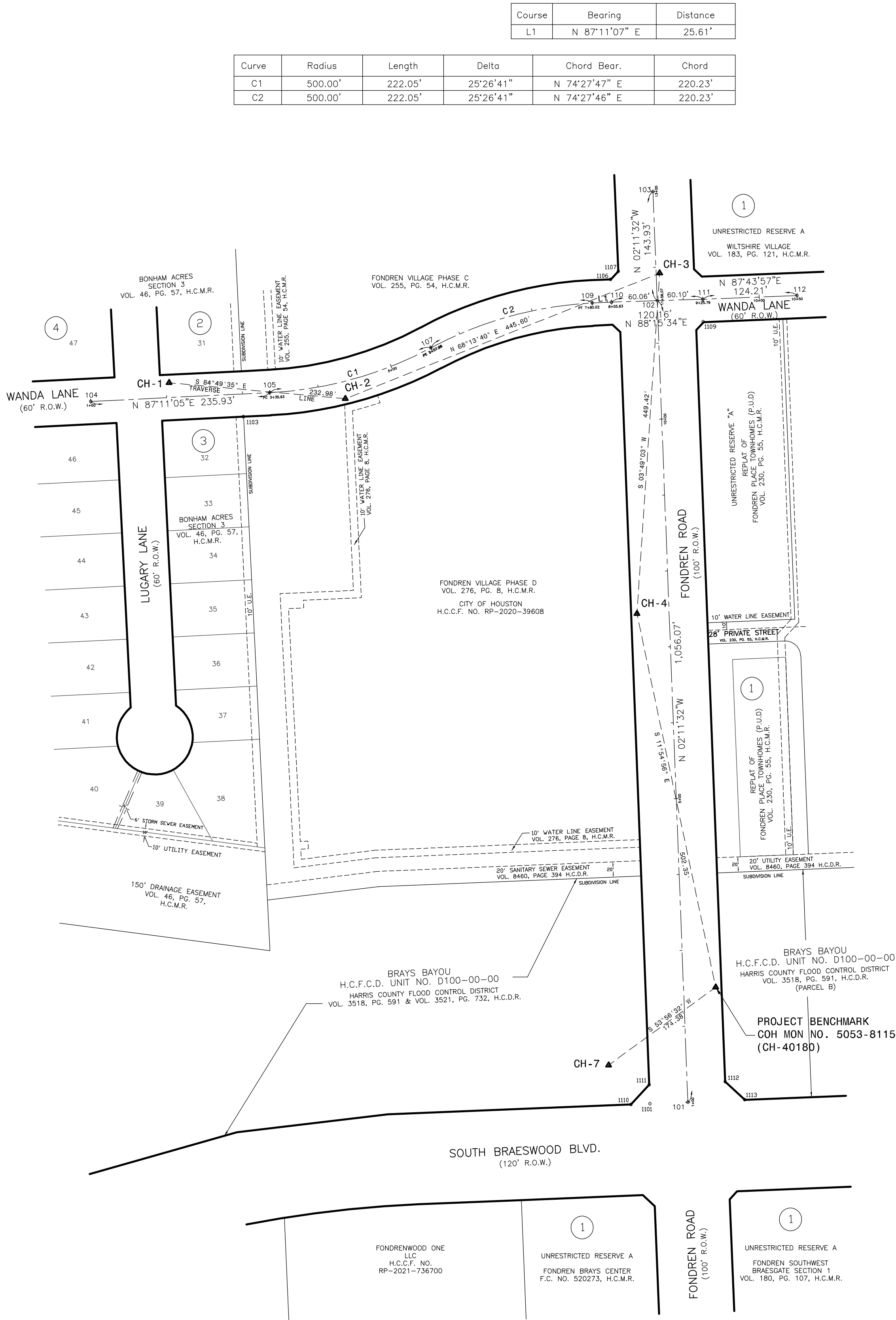
## STORM CONSTRUCTION NOTES

1. STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (C-76, CLASSIII), 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 SLOTTED EASEMENT SHALL BE R.C.P (C-76, CLASSIII) AND SHALL BE EMBEDDED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS. 02317-02, 02317-03, 02317-05, 02317-06, AND 02317-07 AS APPLICABLE.
3. ALL SEWER UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1-1/2 SACK CEMENT/C.Y. STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL.
4. ALL TRENCH BACKFILL SHALL BE IN 8" LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS IN EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMACTION TEST (ASTM D-698/AASHTO T99).
5. CIRCULAR AND ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINT CONFORMING TO ASTM C443 AND ASTM C877 RESPECTIVELY.
6. ALL STORM SEWER PIPES AND INLET LEADS SHALL BE 24" AND LARGER R.C.P. (C-76, CLASSIII).
7. ALL 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.

NO.	DATE	REVISION	APP.

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15021 KATY FREEWAY, STE. 500 HOUSTON, TX. 77094 281-945-0069 TX FIRM NUMBER: F-6932		IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES	
SURVEYED BY: LANDTECH, INC. FB NO. P-6331			
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<h2 style="text-align: center;">SHARPSTOWN AREA DETENTION POND A</h2>			
<h2 style="text-align: center;">WATER AND STORM GENERAL NOTES</h2>			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
M-410040-001A-4			
DRAWING SCALE			
AS NOTED			
CITY OF HOUSTON PM			
SUPUN ILANGAMUDALIGE P.E.			
SHEET NO.      7   OF   42			

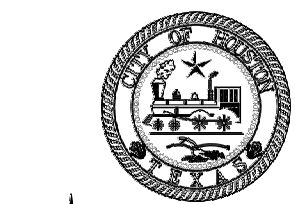




Course	Bearing	Distance
L1	N 87°11'07" E	25.61'

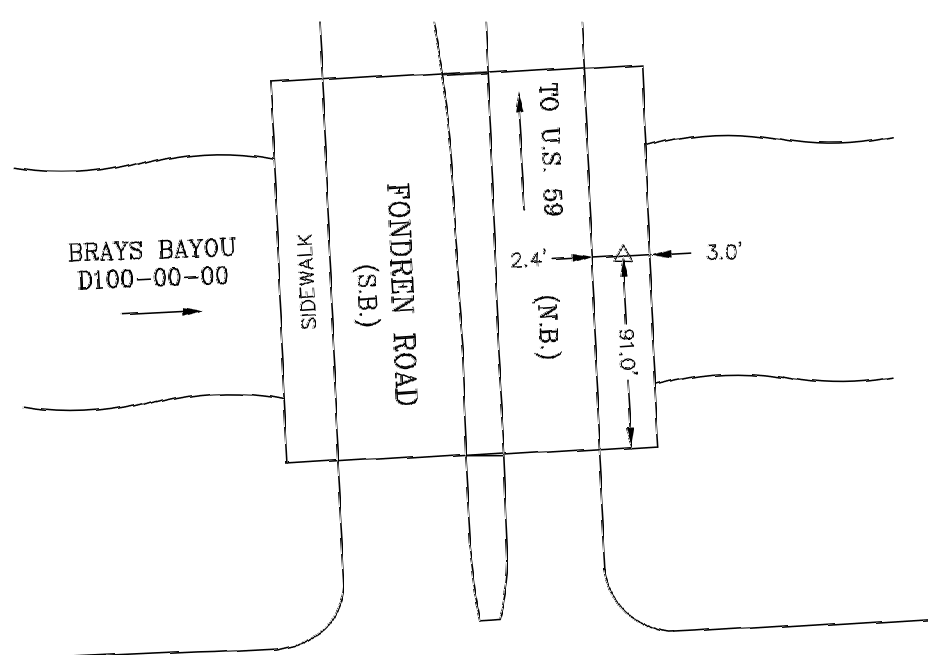
Curve	Radius	Length	Delta	Chord Bear.	Chord
C1	500.00'	222.05'	25°26'41"	N 74°27'47" E	220.23'
C2	500.00'	222.05'	25°26'41"	N 74°27'46" E	220.23'

CITY OF HOUSTON



N.T.S.

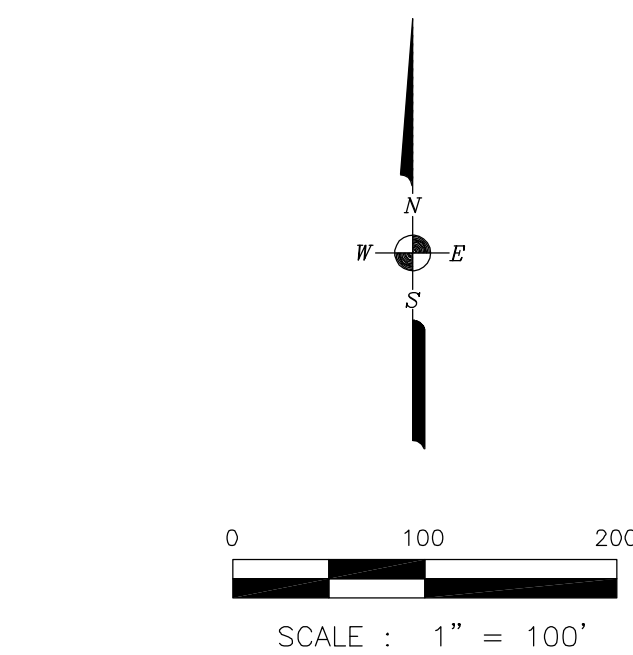
CITY SURVEY  
SITE CONTROL MONUMENT



Project WBS# M-410040-0001-3  
 Texas Coordinate System of 1983,  
 South Central Zone, U. S. Survey Feet  
 X= 3,077,021.80  
 Y= 13,809,959.41  
 Lat.= 29° 40' 34.34460" N  
 Lon.= 95° 30' 30.65712" W  
 Reference Frame Used: NAD 83 (2011) 2010.00 EPOCH  
 Vertical Adjustment used: NAVD 88  
 General Location: ON SIDEWALK OF BRIDGE AT FONDREN ROAD (N.B.) OVER BRAYS BAYOU, APPROX. 150 FEET NORTH OF SOUTH BRAESWOOD BOULEVARD.  
 Date Set: 6-4-2013 Type of Mark: BRASS DISK (HARRIS COUNTY FLOODPLAIN RM 040180)  
 3 Nearest project control points (bearings and distances stated below):  
 To Control Point # 5 (3/8" Irw/Landtech Cap): N 21°22'44" W 151.22'  
 To Control Point # 22 ("X" Out in Concrete): N 26°39'53" E 69.18'  
 To Control Point # 20 ("X" Out in Concrete): S 35°23'08" E 52.45'  
 NOTE:  
 1. Bearings are grid bearings.  
 2. Scale Factor = 0.9998802  
 3. Surface = Grid S.F.  
 Surveyed By: Landtech, Inc.  
 1315 W Sam Houston Parkway N, Suite 100  
 Houston, TX 77043  
 TBPELS Registration No. 10019100  
 City of Houston, Harris County, Texas



BRAEBURN GLEN AREA DRAINAGE & PAVING IMPROVEMENTS, DETENTION POND A - Survey Control Map Data						
Point ID	Station	Offset	Grid Northing	Grid Easting	Elevation	Description
FONDREN ROAD						
101	1+00.00	0.00	13,809,807.87	3,076,985.13		SET X IN CONC.
1110	1+00.08	-74.93	13,809,805.08	3,076,910.27		FND. 1/2" I.R.
1113	1+00.49	74.99	13,809,811.23	3,077,060.04		FND. 1/2" I.R.
1111	1+25.11	-49.95	13,809,831.04	3,076,934.27		FND. 1/2" I.R.
1112	1+25.43	49.98	13,809,835.18	3,077,034.11		FND. 1/2" I.R.
7	1+52.87	-102.36	13,809,856.78	3,076,880.85	58.39	CH-7 SET 5/8" I.R. w/LANDTECH CAP
40180	2+50.05	42.44	13,809,959.41	3,077,021.80	59.14	COH MON NO. 5053-8115
4	7+45.18	-42.40	13,810,450.87	3,076,918.09	56.00	CH-4 SET 5/8" I.R. w/LANDTECH CAP
1109	11+26.17	59.32	13,810,835.42	3,077,005.15		FND. 5/8" I.R.
111	11+55.59	60.10	13,810,864.86	3,077,004.81		SET X IN CONC.
102	11+56.07	0.00	13,810,863.03	3,076,944.75		SET X IN CONC.
109	11+56.26	-85.66	13,810,859.95	3,076,859.15		SET X IN CONC.
110	11+56.54	-60.06	13,810,861.21	3,076,884.72		SET X IN CONC.
1106	11+86.44	-60.32	13,810,891.08	3,076,883.32		FND. 5/8" I.R. w/MILLER SURVEY CO CAP
3	11+92.13	4.65	13,810,899.24	3,076,948.01	57.88	CH-3 SET 5/8" I.R. w/LANDTECH CAP
1107	11+96.79	-49.71	13,810,901.82	3,076,893.52		FND. 5/8" I.R.
103	13+00.00	0.00	13,811,006.84	3,076,939.24		SET 5/8" I.R. w/LANDTECH CAP
WANDA LANE						
104	1+00.00	0	13,810,730.40	3,076,199.22		SET CONC. NAIL
1	2+04.12	-19.5	13,810,754.98	3,076,302.24	58.08	CH-1 SET 5/8" I.R. w/LANDTECH CAP
1103	2+99.72	29.92	13,810,710.32	3,076,400.14		FND. 5/8" I.R.
105	3+35.93	0	13,810,741.98	3,076,434.84		SET X IN CONC.
2	4+31.18	22.33	13,810,733.98	3,076,534.25	58.27	CH-2 SET 5/8" I.R. w/LANDTECH CAP
107	5+57.98	0	13,810,800.97	3,076,646.99		SET X IN CONC.
109	7+80.02	0	13,810,859.95	3,076,859.15		SET X IN CONC.
110	8+05.63	0	13,810,861.21	3,076,884.72		SET X IN CONC.
1107	8+15.66	-40.33	13,810,901.82	3,076,893.52		FND. 5/8" I.R.
102	8+65.69	0	13,810,863.03	3,076,944.75		SET X IN CONC.
3	8+70.06	-36.09	13,810,899.24	3,076,948.01	57.88	CH-3 SET 5/8" I.R. w/LANDTECH CAP
1109	9+25.24	29.43	13,810,835.42	3,077,005.15		FND. 5/8" I.R.
111	9+25.79	0	13,810,864.86	3,077,004.81		SET X IN CONC.
112	10+50.00	0	13,810,869.77	3,077,128.91		SET X IN CONC.



NOTES:  
 1. ALL COORDINATES AND BEARINGS SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983/CORS (2011 ADJ.), EPOCH 2010.00. ALL COORDINATES ARE GRID VALUES AND CAN BE CONVERTED TO SURFACE BY DIVIDING BY THE COMBINED SCALE FACTOR OF 0.9998802.  
 2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88/GEOD18).  
 3. THE ELEVATION DIFFERENCE BETWEEN THE FLOODPLAIN REFERENCE MARK NO. 040200 PUBLISHED DATUM (NAVD88, 2001 ADJ.) AND THE PROJECT VERTICAL DATUM (NAVD88/GEOD18) IS 0.14 FEET.  
 PROJECT DATUM + 0.14 FEET = FLOODPLAIN DATUM  
 4. THIS IS NOT A BOUNDARY SURVEY.

PROJECT BENCHMARK:  
 CITY OF HOUSTON MONUMENT NO. 5053-8115, A BRASS DISK ON SIDEWALK OF BRIDGE AT FONDREN RD. (NORTH BOUND) OVER BRAYS BAYOU, APPROXIMATELY 150 FEET NORTH OF SOUTH BRAESWOOD BLVD.  
 ELEVATION = 59.14 FEET (NAVD88/GEOD18)

CONSULTANT: **LANDTECH**  
 1315 W Sam Houston Parkway N, Suite 100  
 Houston, Texas 77043  
 T: 713-861-7053  
 F: 713-861-4131  
 TBPELS No. 10019100

SEAL  
 FOR REVIEW ONLY  
 SEPTEMBER, 2024  
 HONG YANG  
 R.P.L.S. No. 6557  
 NOT FOR BIDDING OR CONSTRUCTION

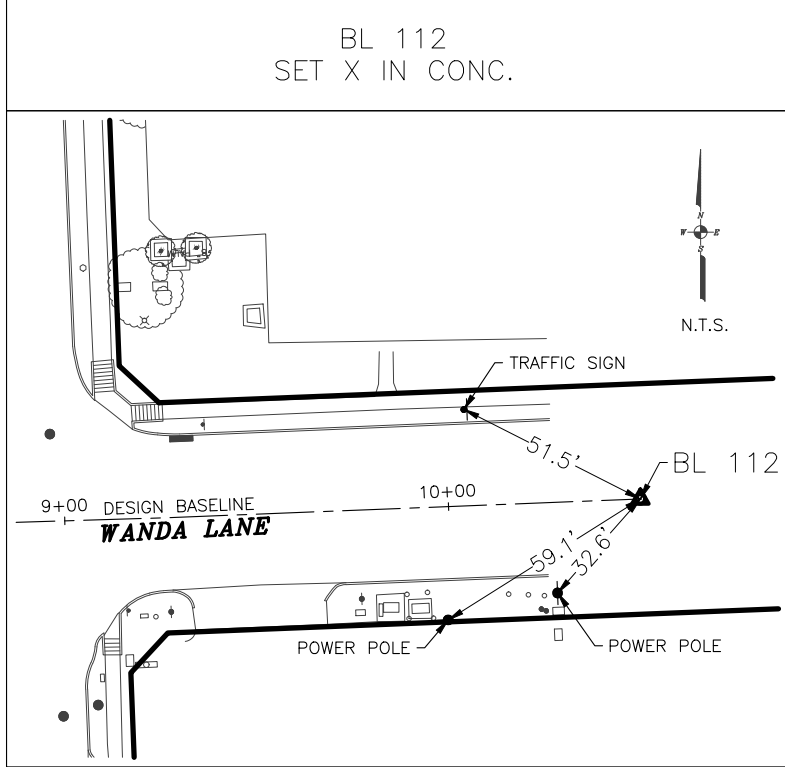
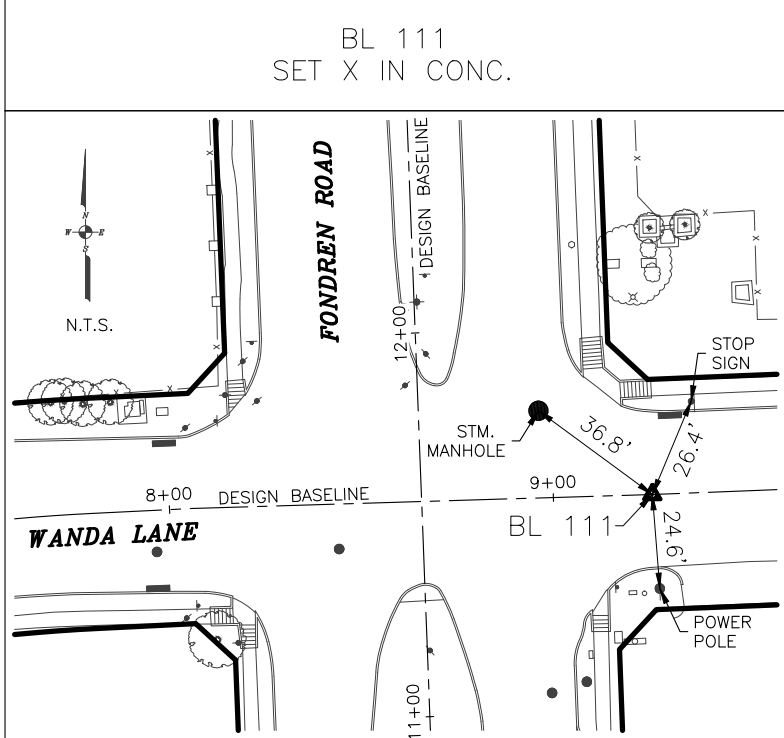
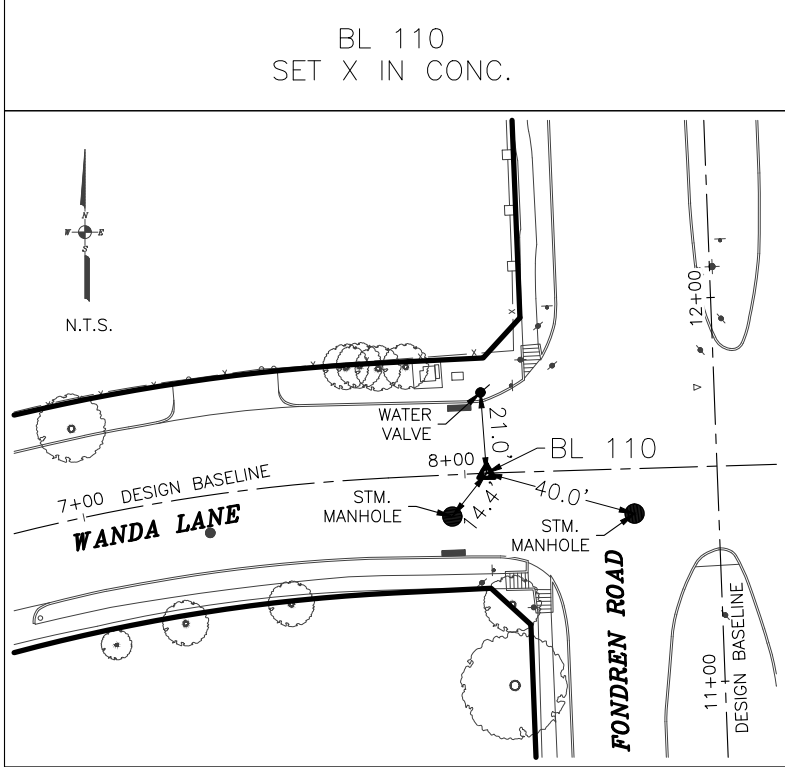
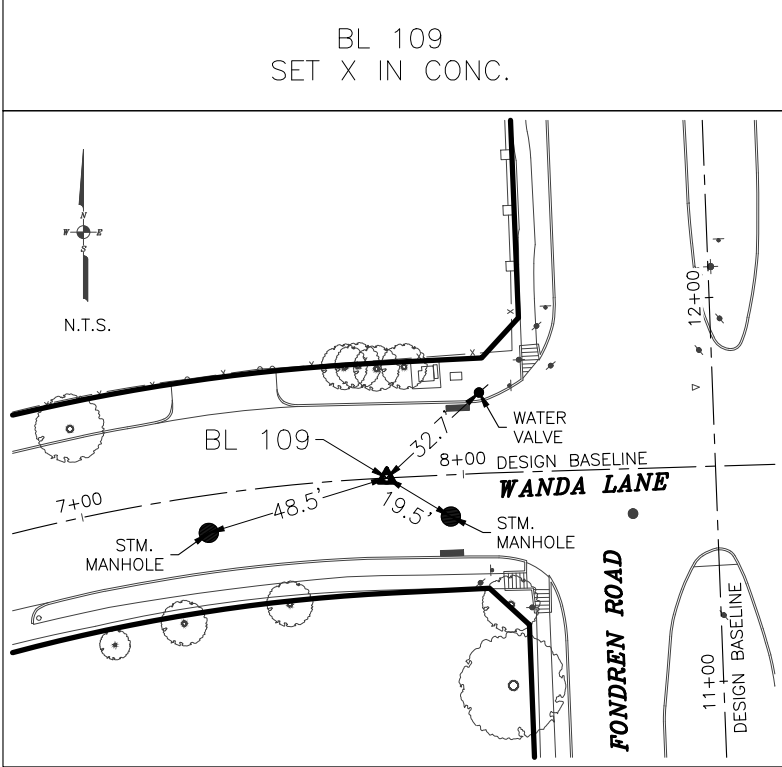
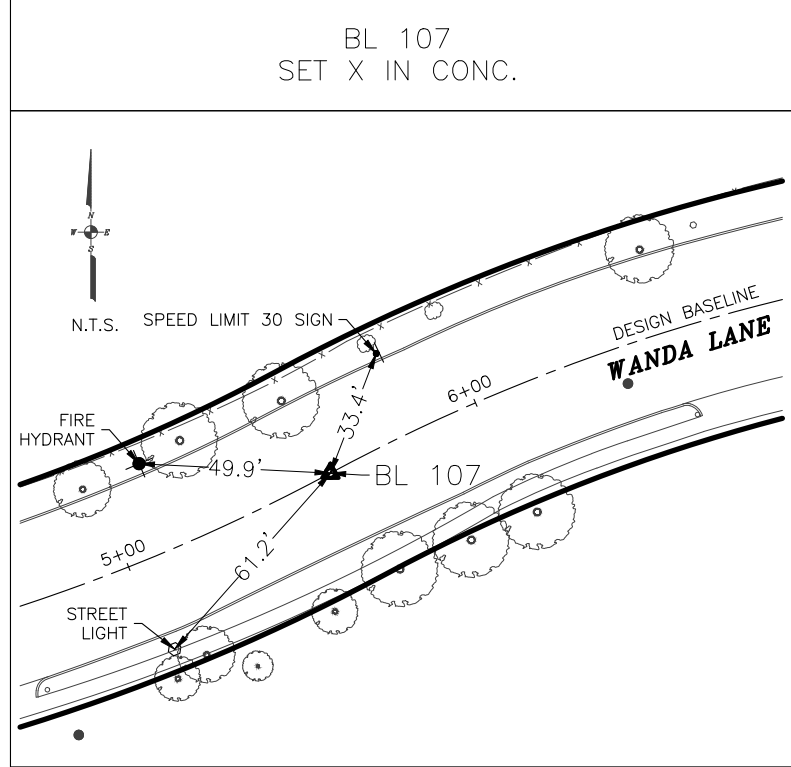
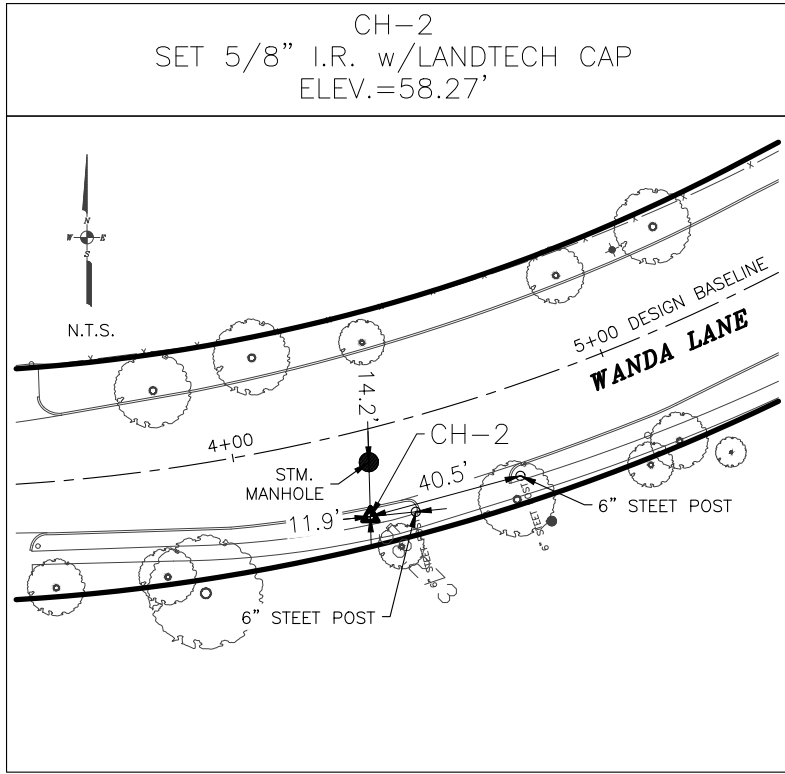
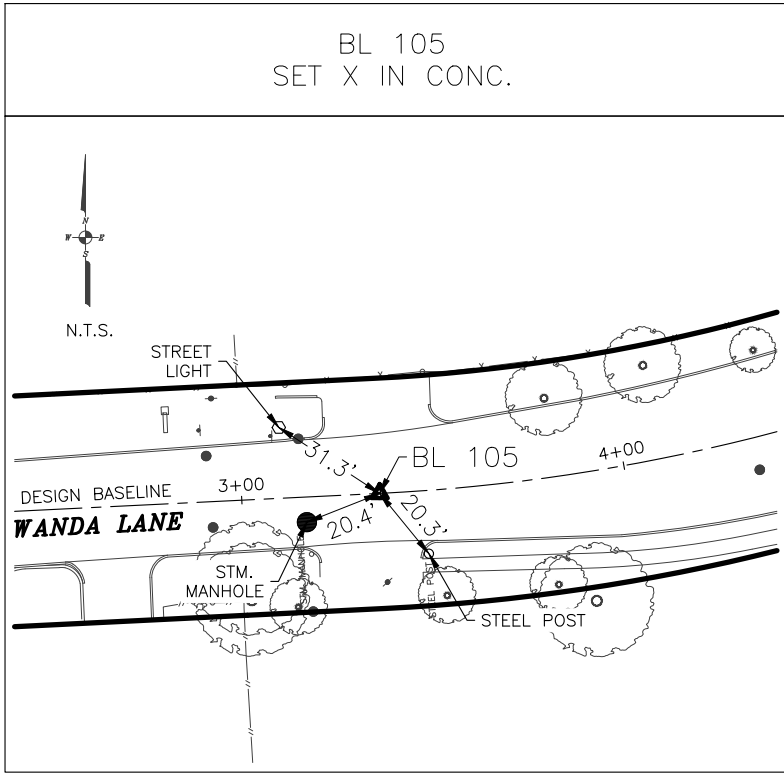
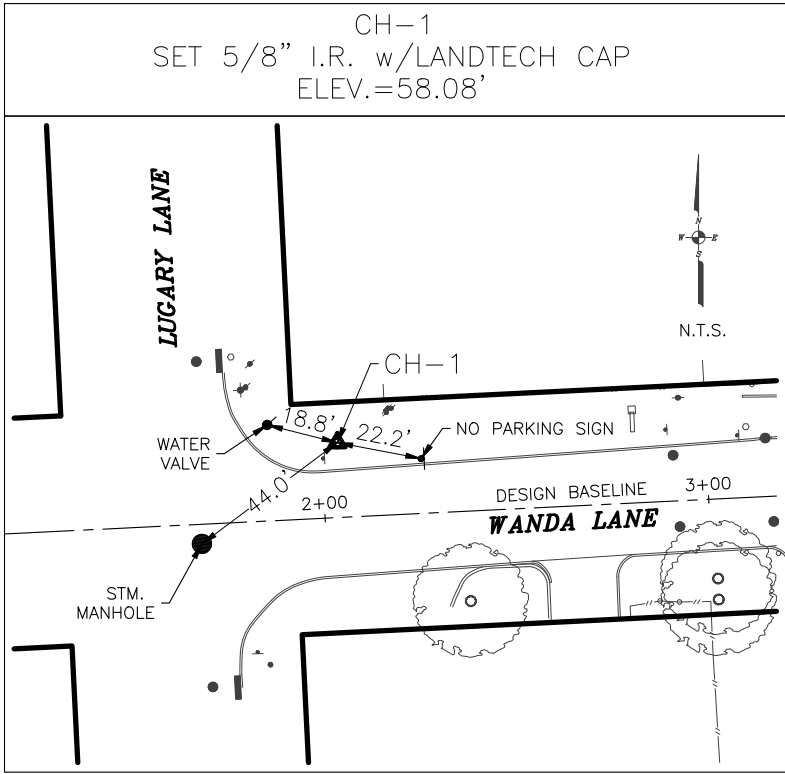
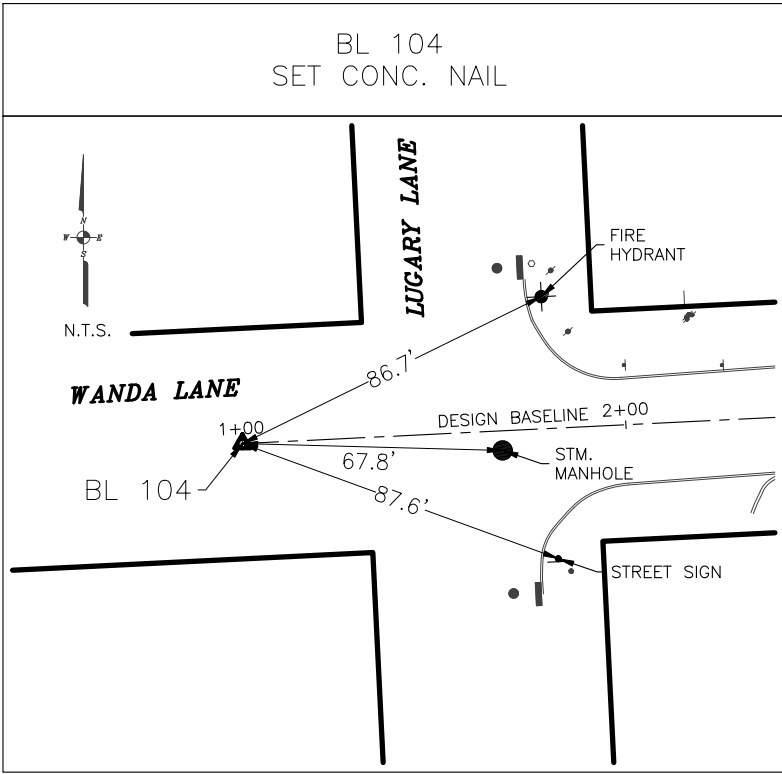
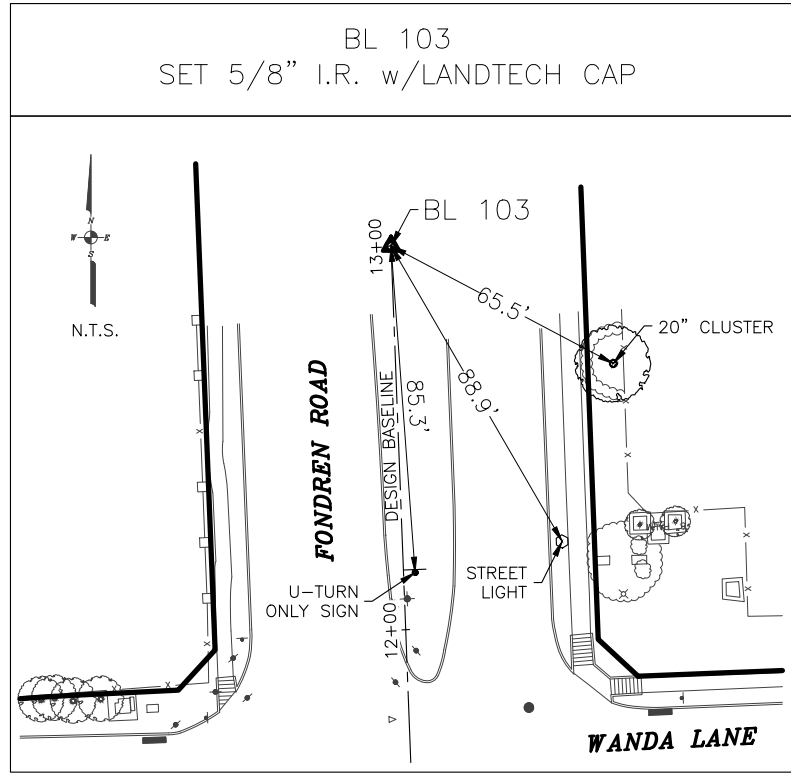
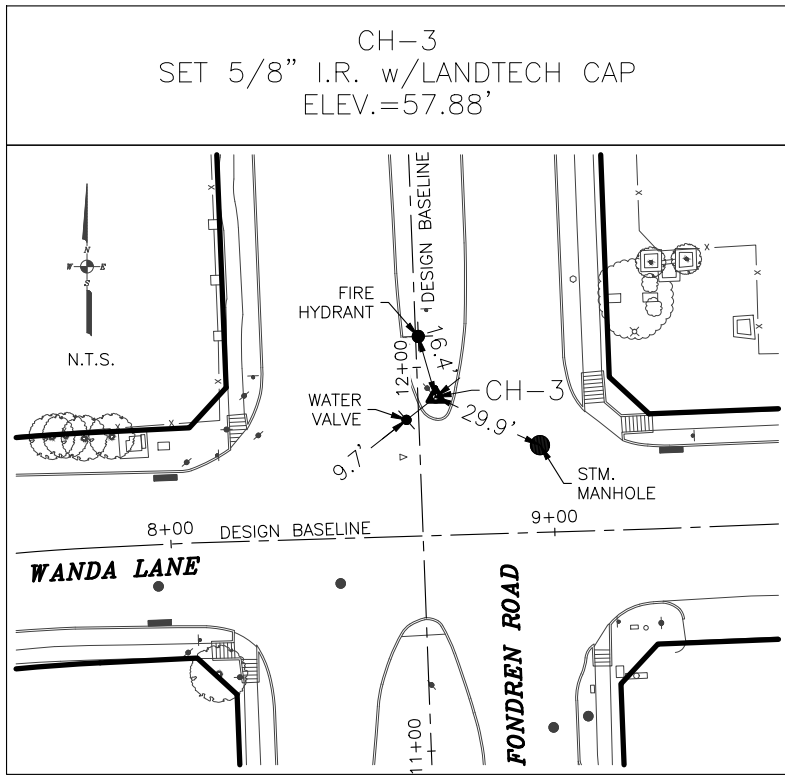
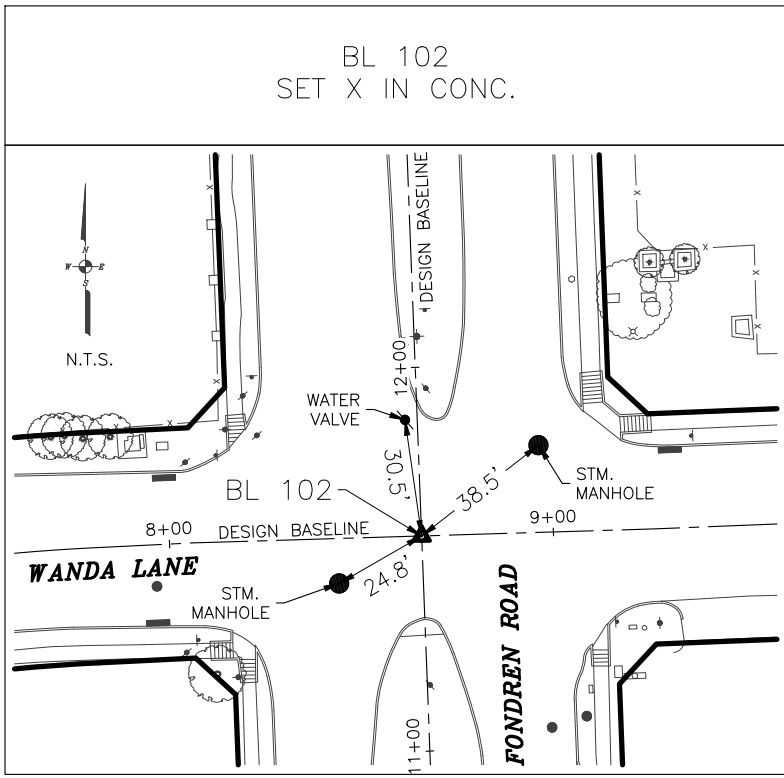
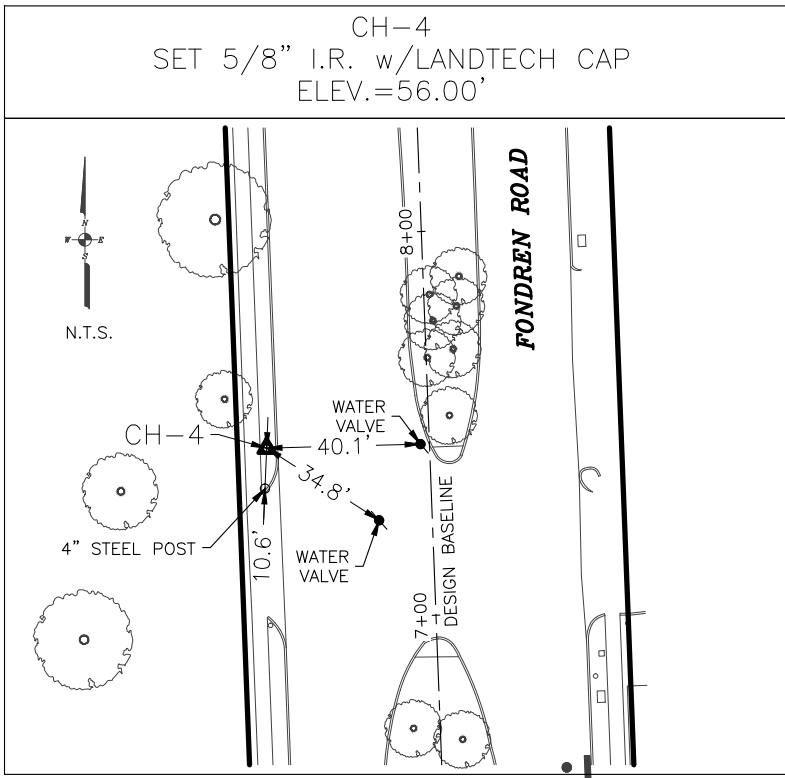
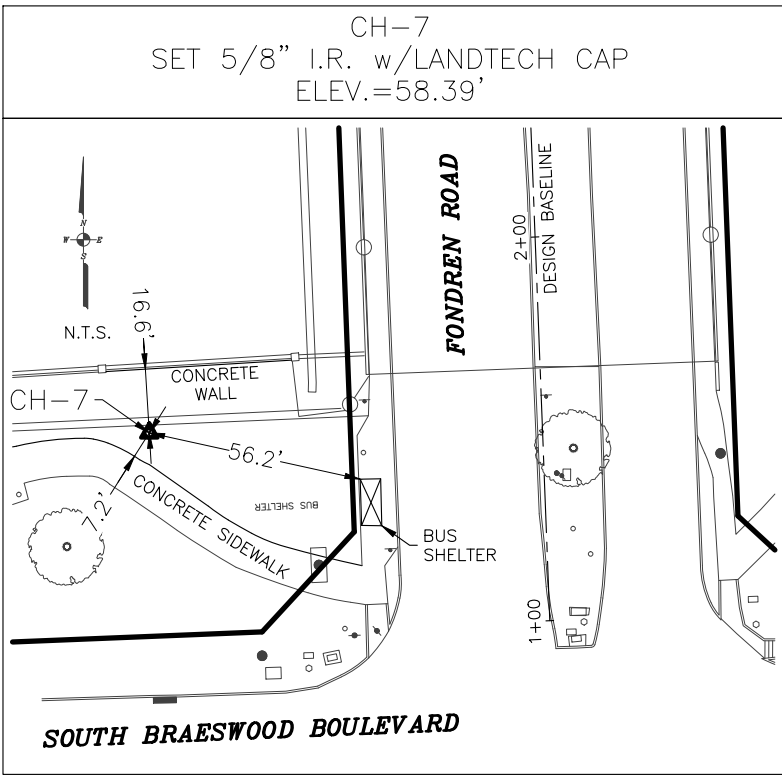
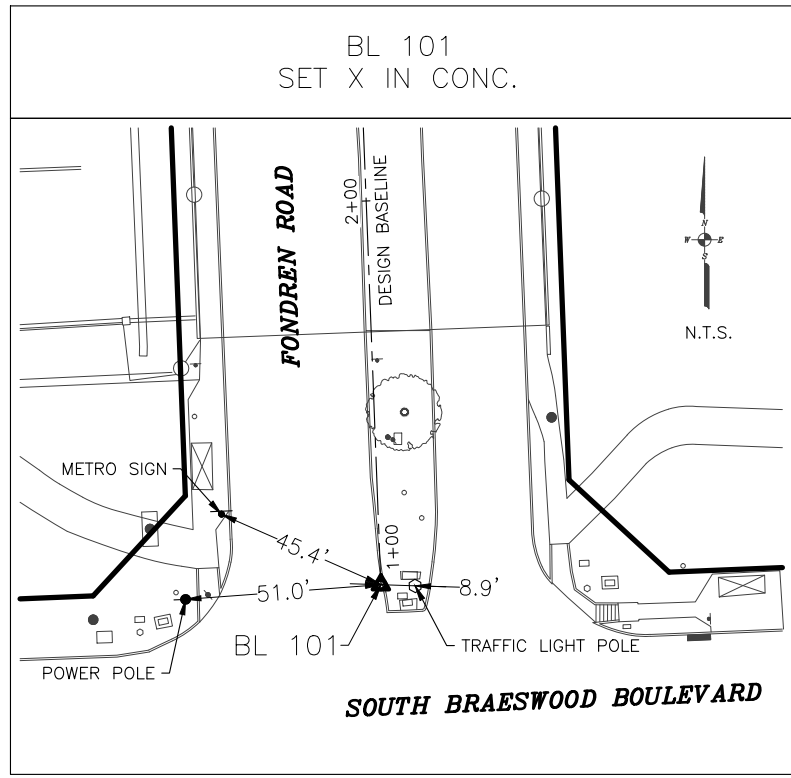
THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF JUAN OLIVAREZ  
 TEXAS REG. NO. 55474  
 June 12, 2025

IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES

CITY OF HOUSTON  
 HOUSTON PUBLIC WORKS  
 SHARPSTOWN AREA  
 DETENTION POND "A"  
 SURVEY CONTROL MAP  
 SHEET 1 OF 1

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RICHARD SMITH	
SHEET NO.	OF





NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983/CORS (2011 ADJ.), EPOCH 2010.00. ALL COORDINATES ARE GRID VALUES AND CAN BE CONVERTED TO SURFACE BY DIVIDING BY THE COMBINED SCALE FACTOR OF 0.9998802.
2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88/GEOID18).
3. THE ELEVATION DIFFERENCE BETWEEN THE FLOODPLAIN REFERENCE MARK NO. 040200 PUBLISHED DATUM (NAVD88, 2001 ADJ.) AND THE PROJECT VERTICAL DATUM (NAVD88/GEOID18) IS 0.14 FEET.  
PROJECT DATUM + 0.14 FEET = FLOODPLAIN DATUM
4. THIS IS NOT A BOUNDARY SURVEY.

PROJECT BENCHMARK:

CITY OF HOUSTON MONUMENT NO. 5053-8115, A BRASS DISK ON SIDEWALK OF BRIDGE AT FONDREN RD. (NORTH BOUND) OVER BRAYS BAYOU, APPROXIMATELY 150 FEET NORTH OF SOUTH BRAESWOOD BLVD.  
ELEVATION = 59.14 FEET (NAVD88/GEOID18)

CONSULTANT:

**LANDTECH**  
1315 W Sam Houston Parkway N, Suite 100  
Houston, Texas 77043  
T: 713-861-7068  
F: 713-861-4131  
TBPELS No. 10019100

SEAL



**ENTECH**  
CIVIL ENGINEERS, INC.  
15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX. FIRM NUMBER: F-6932  
SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

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JUAN OLIVAREZ  
TEXAS REG. NO. 55474  
June 12, 2025

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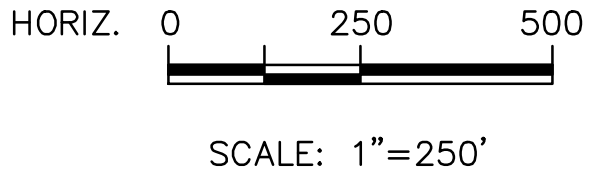
**CITY OF HOUSTON**  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA  
DETENTION POND "A"

SWING TIES  
SHEET 1 OF 1

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RICHARD SMITH	
SHEET NO. OF	





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 TEXAS REG. NO. 111437  
 OCTOBER 15, 2025  
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**CITY OF HOUSTON**  
 HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
 POND A

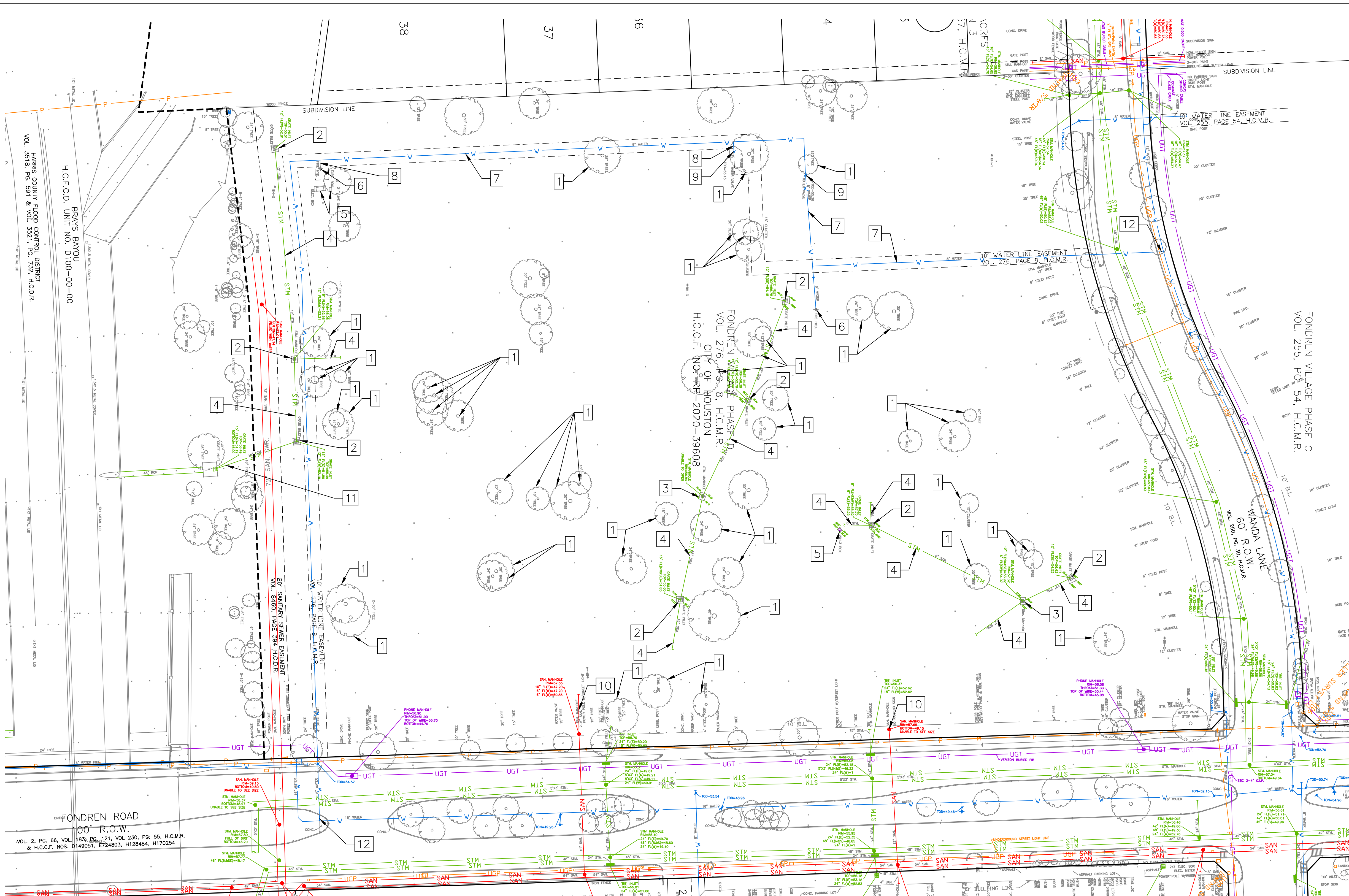
OVERALL LAYOUT

WBS NUMBER
M-410040-001A-4
DRAWING SCALE
AS NOTED
CITY OF HOUSTON PM
SUPUN ILANGAMUDALIGE P.E.
SHEET NO. 10 OF 42

FOR CITY OF HOUSTON USE ONLY

NO.	DATE	REVISION	APP.

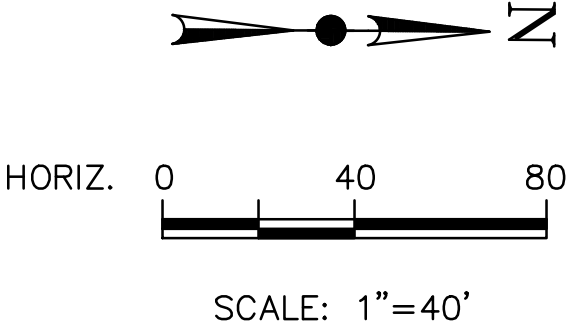




KEY NOTES:

- 1 REMOVE EXISTING TREE
- 2 REMOVE EXISTING INLET
- 3 REMOVE EXISTING MANHOLE
- 4 REMOVE EXISTING STORM SEWER
- 5 REMOVE ELECTRICAL BOX
- 6 REMOVE EXISTING FIRE HYDRANT

- 7 REMOVE EXISTING 8" WATERLINE WITHIN THE FOOTPRINT OF PROPOSED DETENTION POND
- 8 REMOVE EXISTING WATERLINE
- 9 REMOVE EXISTING WATER VALVE
- 10 CUT, PLUG AND REMOVE EXISTING SANITARY SEWERLINE @ MANHOLE
- 11 CUT, PLUG, AND REMOVE EXISTING STORM SEWER
- 12 CUT, PLUG AND ABANDON 8" WATERLINE



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

VERIFICATION OF PRIVATE UTILITY LINES

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

Date  
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This signature verifies existing underground facilities - not to be used for conflict verification)  
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Approved for AT&T underground conduit facilities only. Signature valid for one year.  
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281-945-0069  
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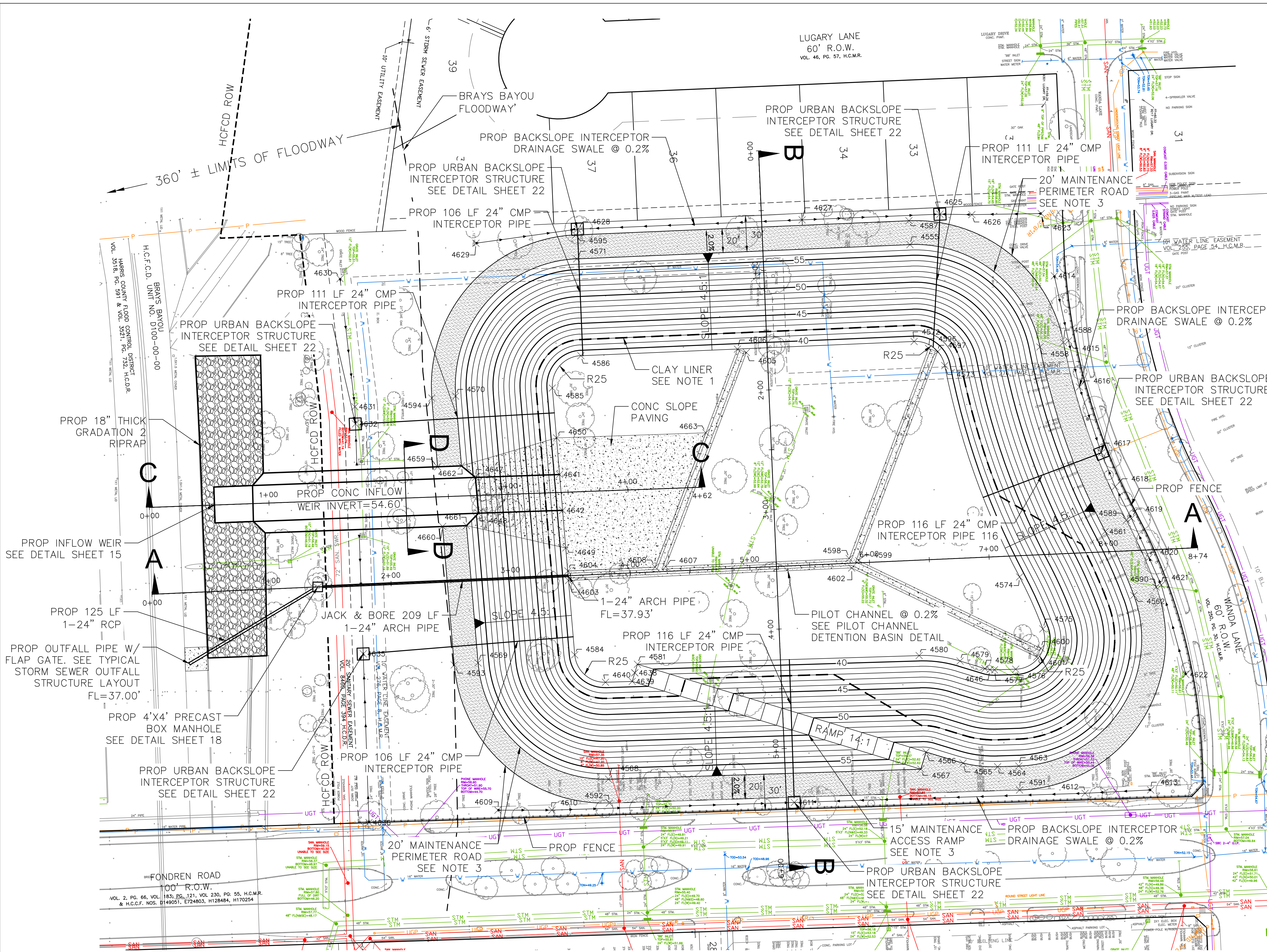
CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION POND A

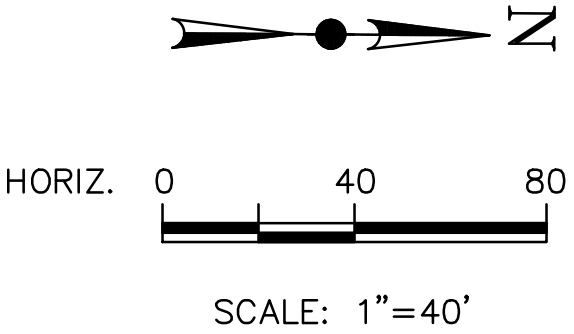
DETENTION POND DEMOLITION PLAN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 11 OF 42	





- NOTES:
1. DELINEATED AREA SHOWS WHERE 2' THICK CLAY LINER IS REQUIRED. SEE GEOTECH REPORT PREPARED BY AVILES ENGINEERING FOR CLAY LINER SPECIFICATION.
  2. MAINTENANCE ACCESS RAMP AND PERIMETER ROAD TO BE SURFACED WITH 6" RECYCLED CRUSHED CONC BASE OVER 8" CEMENT STABILIZED SAND (TYPICAL).
  3. THE DETENTION POND DRAW DOWN TIME IS 26 HOURS. SEE BRAEBURN GLEN DRAINAGE IMPROVEMENTS REPORT PREPARED BY ENTECH DATED MARCH 11, 2025.



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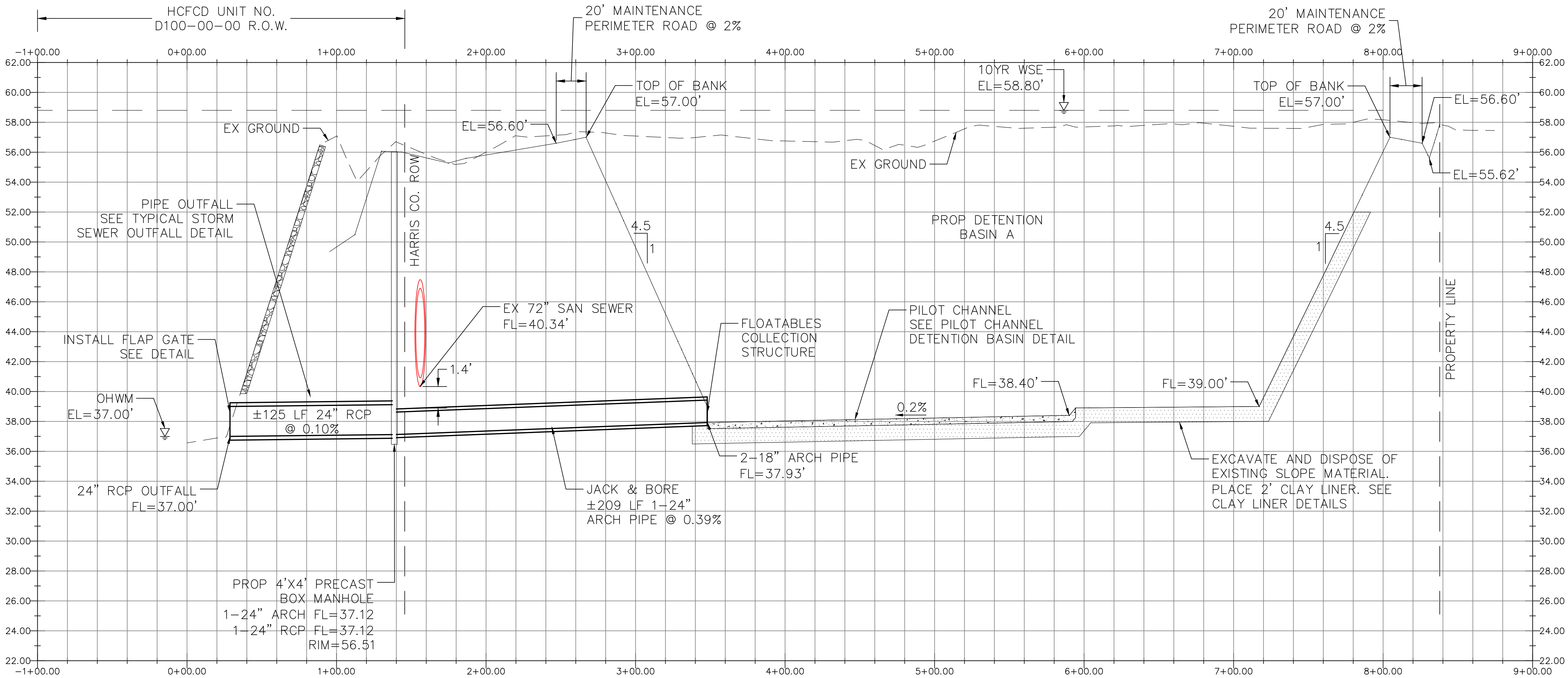
SHARPSTOWN AREA DETENTION POND A

DETENTION POND LAYOUT

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 12 OF 42	



FILE PATH: N:\0030-23-101\3 - Design\Plan Set\14 AUTOCAD SHEETS\PLAN & PROFILE\Detention Pond\CROSS SECTIONS.dwg PLOTTED: 10/17/2025 11:37 AM



SECTION A-A  
POND OUTFALL  
SCALE H: 1"=40', V: 1"=4'

DETENTION POND STORAGE VOLUME TABLE					
WATER SURFACE ELEVATION (FT)	WATER DEPTH (FT)	TOTAL WATER SUFRACE AREA (SF)	WATER VOLUME @1' DEEP (CF)	ACCUMULATIVE STORAGE VOLUME (CF)	ACCUMULATIVE STORAGE VOLUME (AC-FT)
54.6*	15.6	199,701	118,412	2,249,850	51.65
54	15	195,007	191,192	2,131,438	48.93
53	14	187,378	183,627	1,940,246	44.54
52	13	179,876	176,189	1,756,618	40.33
51	12	172,502	168,879	1,580,429	36.28
50	11	165,255	161,695	1,411,551	32.40
49	10	158,135	154,639	1,249,856	28.69
48	9	151,143	147,710	1,095,217	25.14
47	8	144,277	140,908	947,507	21.75
46	7	137,539	134,234	806,598	18.52
45	6	130,928	127,687	672,364	15.44
44	5	124,445	121,267	544,678	12.50
43	4	118,088	114,974	423,411	9.72
42	3	111,859	108,808	308,437	7.08
41	2	105,757	102,770	199,629	4.58
40	1	99,783	96,859	96,859	2.22
39	0	93,935	0	0	0.00

\* TOTAL POND VOLUME IS CALCULATED UP TO ELEVATION 54.6', CORRESPONDING TO THE WEIR INLET ELEVATION, WHICH IS CONSIDERED THE TOTAL STORAGE ELEVATION. THE TOP OF POND IS AT ELEVATION 57.0'.


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HOUSTON PUBLIC WORKS

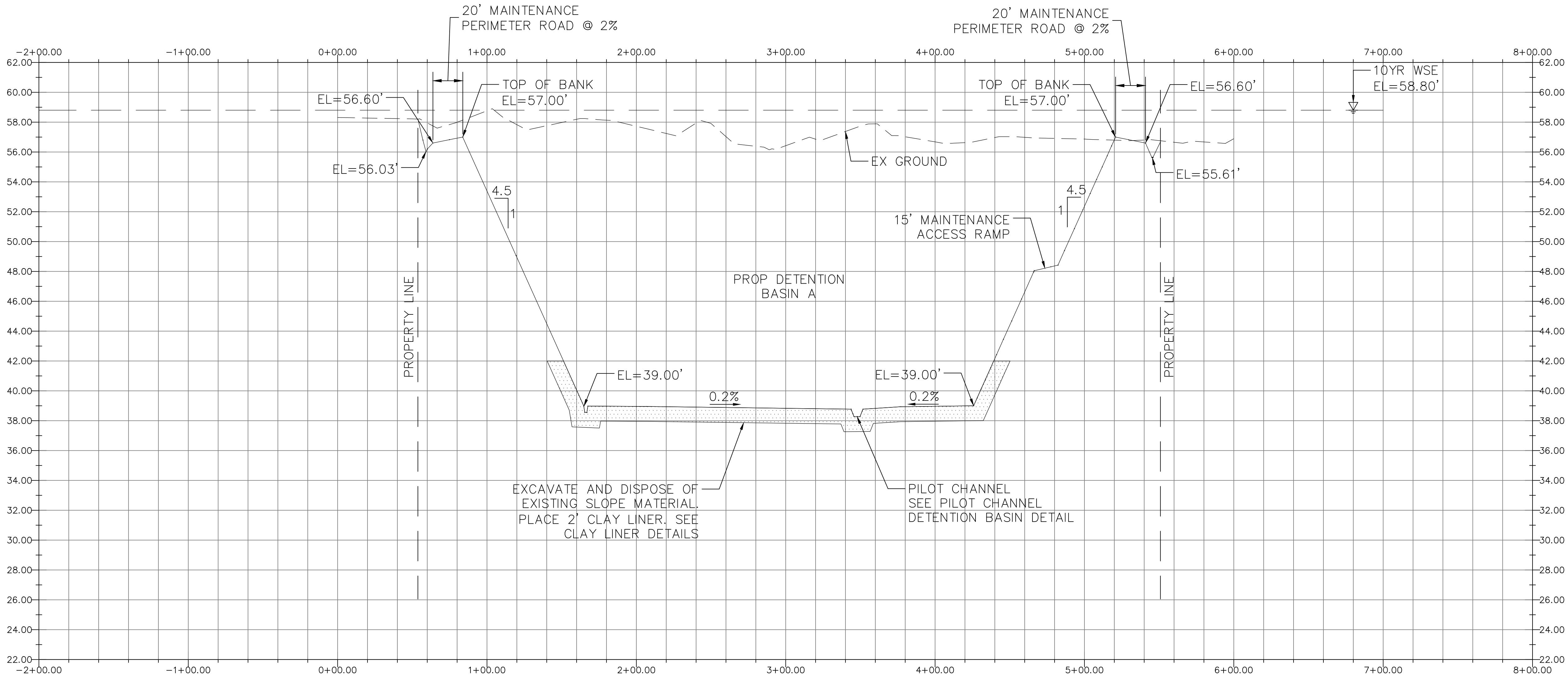
SHARPSTOWN AREA DETENTION  
POND A

POND OUTFALL  
SECTION A-A

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 13 OF 42	

FILE PATH: N:\0030-23-101\3 - Design\Plan Set\14 AUTOCAD SHEETS\PLAN & PROFILE\Detention Pond\DETENTION POND CROSS SECTIONS.dwg

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SECTION B-B  
POND W-E  
SCALE H: 1"=40', V: 1"=4'

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CITY OF HOUSTON  
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SHARPSTOWN AREA DETENTION  
POND A

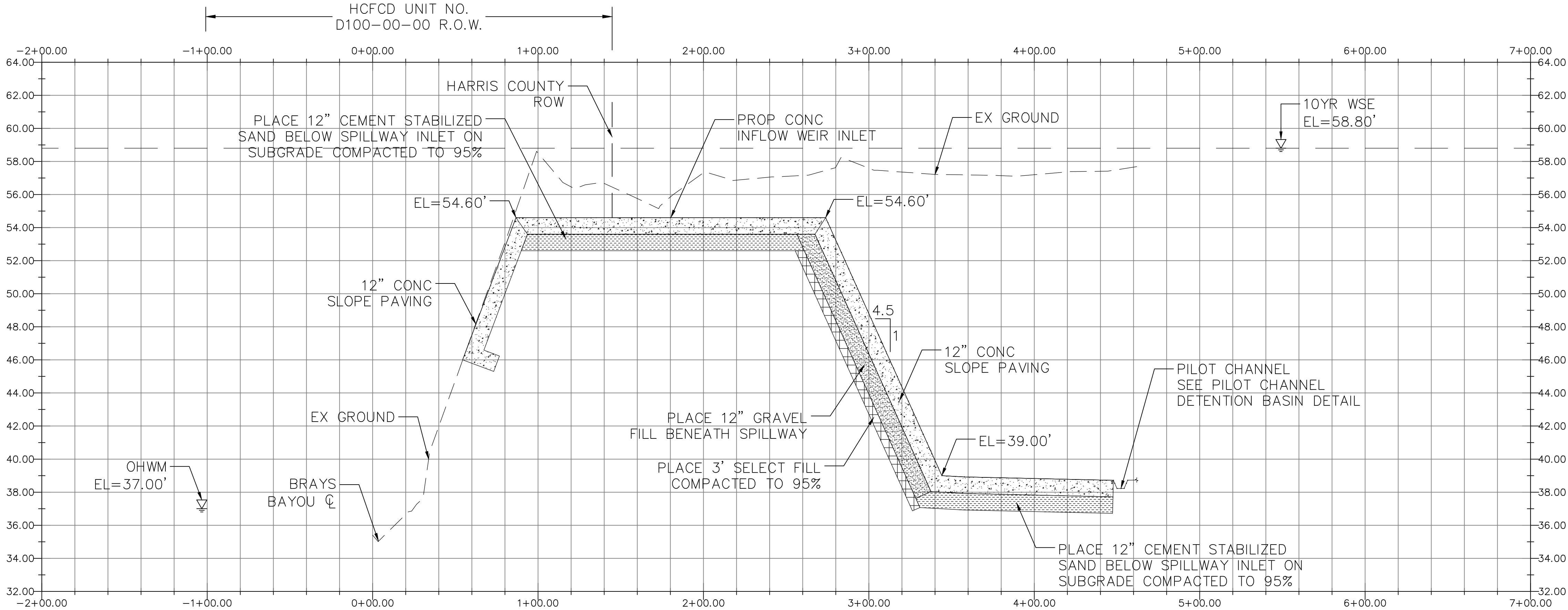
POND SECTION B-B

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M-410040-001A-4	
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AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 14 OF 42	

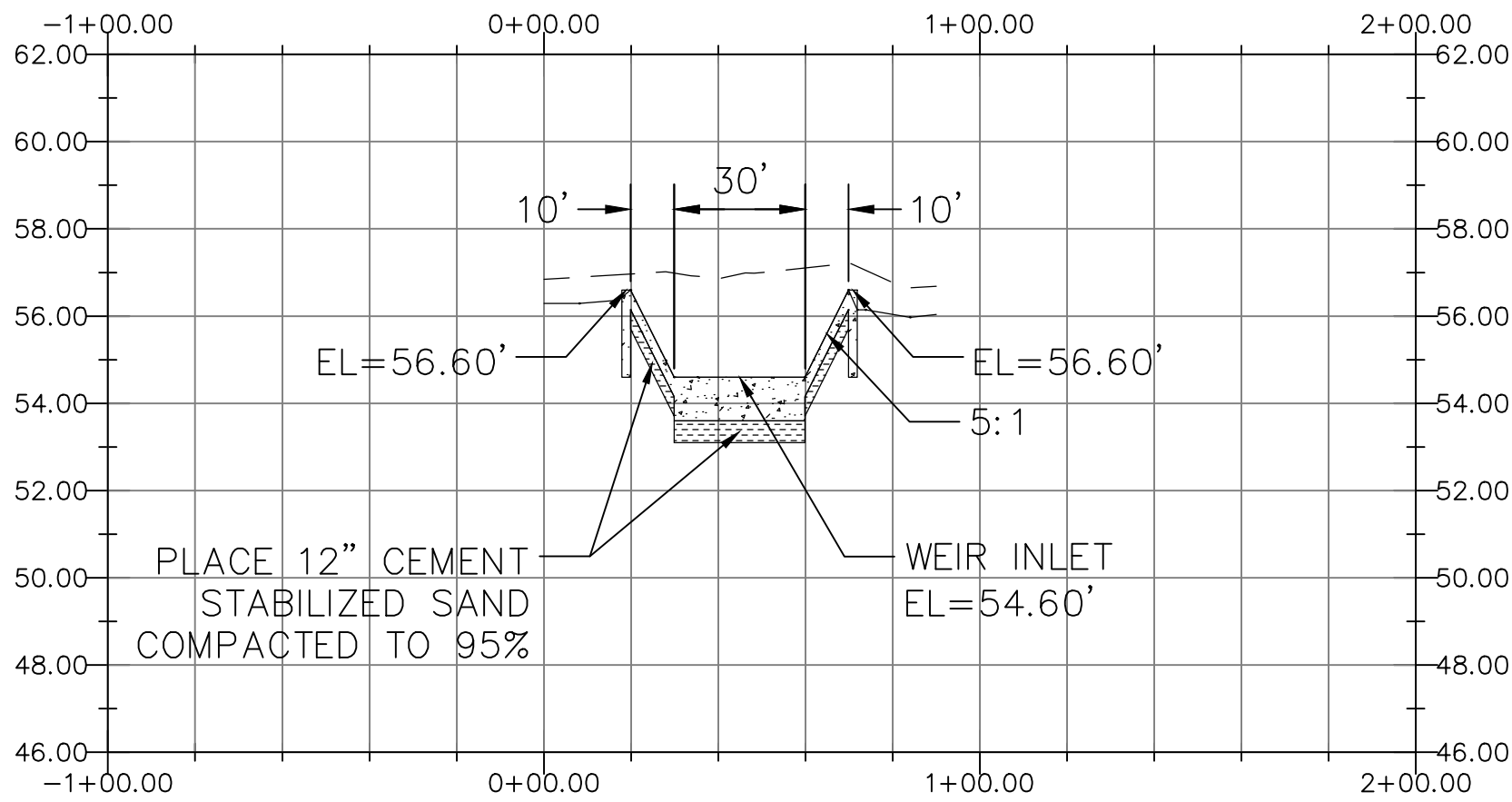


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HCFC UNIT NO. D100-00-00 R.O.W.



SECTION C-C  
POND INFLOW WEIR  
SCALE H: 1"=40', V: 1"=4'



SECTION D-D  
POND INFLOW WEIR CONCRETE APRON  
SCALE H: 1"=40', V: 1"=4'

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HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

POND INFLOW WEIR  
SECTIONS C-C & D-D

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DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 15 OF 42	

Point Table				
Point #	Elevation	Northing	Easting	Description
4555	57.00	13812238.17	3076805.30	PR
4558	57.00	13812347.26	3076890.11	PR
4561	57.00	13812402.85	3077044.03	PR
4562	57.00	13812427.01	3077097.15	PR
4563	57.00	13812331.88	3077240.46	PR
4564	57.00	13812314.18	3077241.14	PR
4565	57.00	13812285.27	3077238.26	PR
4566	57.00	13812254.32	3077229.21	PR
4567	57.00	13812250.05	3077243.59	PR
4568	57.00	13811989.26	3077253.58	PR
4569	57.00	13811879.64	3077157.20	PR
4570	57.00	13811859.49	3076934.27	PR
4571	57.00	13811959.87	3076818.98	PR
4572	39.00	13812242.15	3076886.20	PR
4573	39.00	13812267.88	3076906.20	PR
4574	39.00	13812331.51	3077082.38	PR
4575	39.00	13812351.22	3077125.72	PR
4576	39.00	13812328.78	3077159.52	PR

Point Table				
Point #	Elevation	Northing	Easting	Description
4577	39.00	13812311.08	3077160.20	PR
4578	39.00	13812303.00	3077159.18	PR
4579	39.00	13812282.19	3077153.00	PR
4580	39.00	13812248.06	3077148.67	PR
4581	39.00	13812012.77	3077157.41	PR
4584	39.00	13811960.31	3077149.91	PR
4585	39.00	13811940.17	3076927.04	PR
4586	39.00	13811963.85	3076899.88	PR
4587	56.60	13812237.19	3076785.32	PR
4588	56.60	13812366.86	3076886.14	PR
4589	56.60	13812420.47	3077034.56	PR
4590	56.60	13812445.73	3077090.10	PR
4591	56.60	13812332.65	3077260.45	PR
4592	56.60	13811990.03	3077273.56	PR
4593	56.60	13811859.72	3077159.00	PR
4594	56.60	13811839.57	3076936.06	PR
4595	56.60	13811958.89	3076799.00	PR
4596	39.00	13812254.27	3076891.92	PR
4597	39.00	13812261.78	3076894.70	PR
4598	38.90	13812189.15	3077067.90	PR

Point Table				
Point #	Elevation	Northing	Easting	Description
4599	38.90	13812197.01	3077069.71	PR
4600	39.00	13812349.73	3077141.97	PR
4601	39.00	13812346.31	3077149.21	PR
4602	38.90	13812191.18	3077075.81	PR
4603	38.43	13811954.72	3077087.84	PR
4604	38.43	13811954.16	3077079.86	PR
4605	38.97	13812102.12	3076896.33	PR
4606	38.97	13812094.62	3076893.55	PR
4607	38.58	13812035.74	3077075.71	PR
4608	38.58	13812027.04	3077076.15	PR
4609	56.10	13811896.97	3077280.11	PR
4610	56.01	13811942.13	3077279.75	PR
4611	55.60	13812144.55	3077272.07	PR
4612	56.09	13812387.35	3077262.86	PR
4613	56.20	13812442.19	3077259.69	PR
4614	56.10	13812358.94	3076830.62	PR
4615	55.99	13812371.14	3076884.75	PR
4616	55.91	13812380.44	3076923.32	PR
4617	55.79	13812399.09	3076978.23	PR
4618	55.73	13812410.90	3077006.43	PR

Point Table				
Point #	Elevation	Northing	Easting	Description
4619	55.67	13812424.62	3077032.84	PR
4620	55.60	13812439.57	3077065.69	PR
4621	55.55	13812449.91	3077088.39	PR
4622	55.71	13812470.94	3077163.11	PR
4623	56.04	13812347.63	3076778.62	PR
4625	55.87	13812263.03	3076779.67	PR
4626	55.92	13812289.69	3076779.88	PR
4627	56.10	13812147.95	3076785.16	PR
4628	55.72	13811960.34	3076794.10	PR
4629	55.90	13811875.65	3076806.41	PR
4630	55.66	13811762.32	3076836.77	PR
4631	0.00	13811775.37	3076943.73	PR
4632	55.86	13811775.95	3076958.08	PR
4635	55.36	13811783.70	3077150.16	PR
4636	0.00	13811789.38	3077291.20	PR
4638	39.00	13812010.63	3077164.59	PR
4639	39.00	13812008.49	3077171.78	PR
4640	39.00	13811986.16	3077172.64	PR
4641	39.00	13811946.69	3076999.24	PR
4642	39.00	13811949.40	3077029.16	PR

Point Table				
Point #	Elevation	Northing	Easting	Description
4646	39.00	13812307.26	3077160.05	PR
4647	54.60	13811876.47	3077002.10	PR
4648	54.60	13811879.17	3077032.02	PR
4649	39.00	13811952.24	3077060.62	PR
4650	39.00	13811943.93	3076968.68	PR
4659	56.60	13811844.76	3076993.47	PR
4660	56.60	13811849.27	3077043.33	PR
4661	57.00	13811869.27	3077042.47	PR
4662	57.00	13811864.77	3076992.62	PR
4663	38.82	13812068.70	3076963.60	PR

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281-945-0069  
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TEXAS REG. NO. 111437  
OCTOBER 15, 2025

SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

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CITY OF HOUSTON  
 HOUSTON PUBLIC WORKS

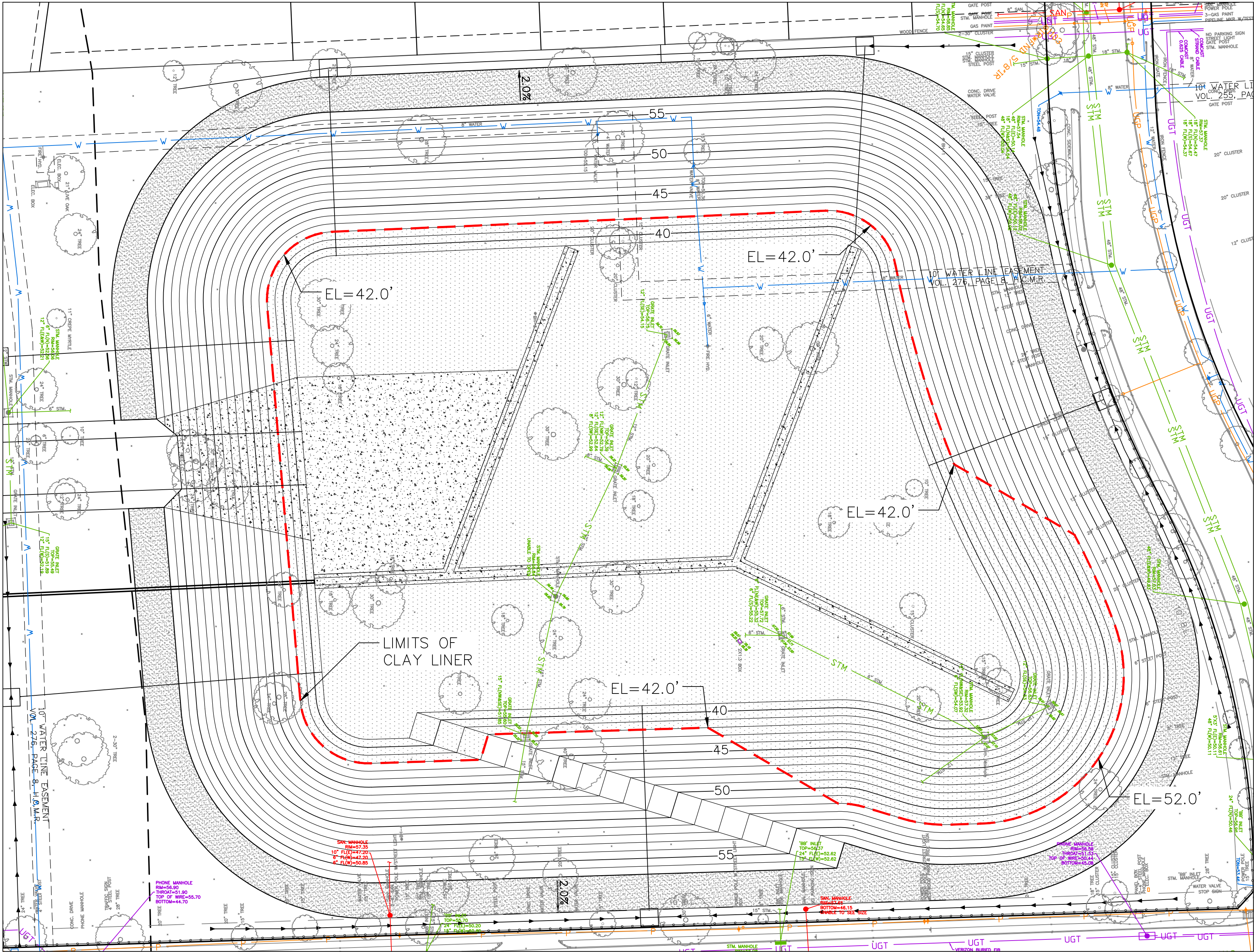
SHARPSTOWN AREA DETENTION  
 POND A

GRADING CONTROL POINT AND  
 CURVE TABLE

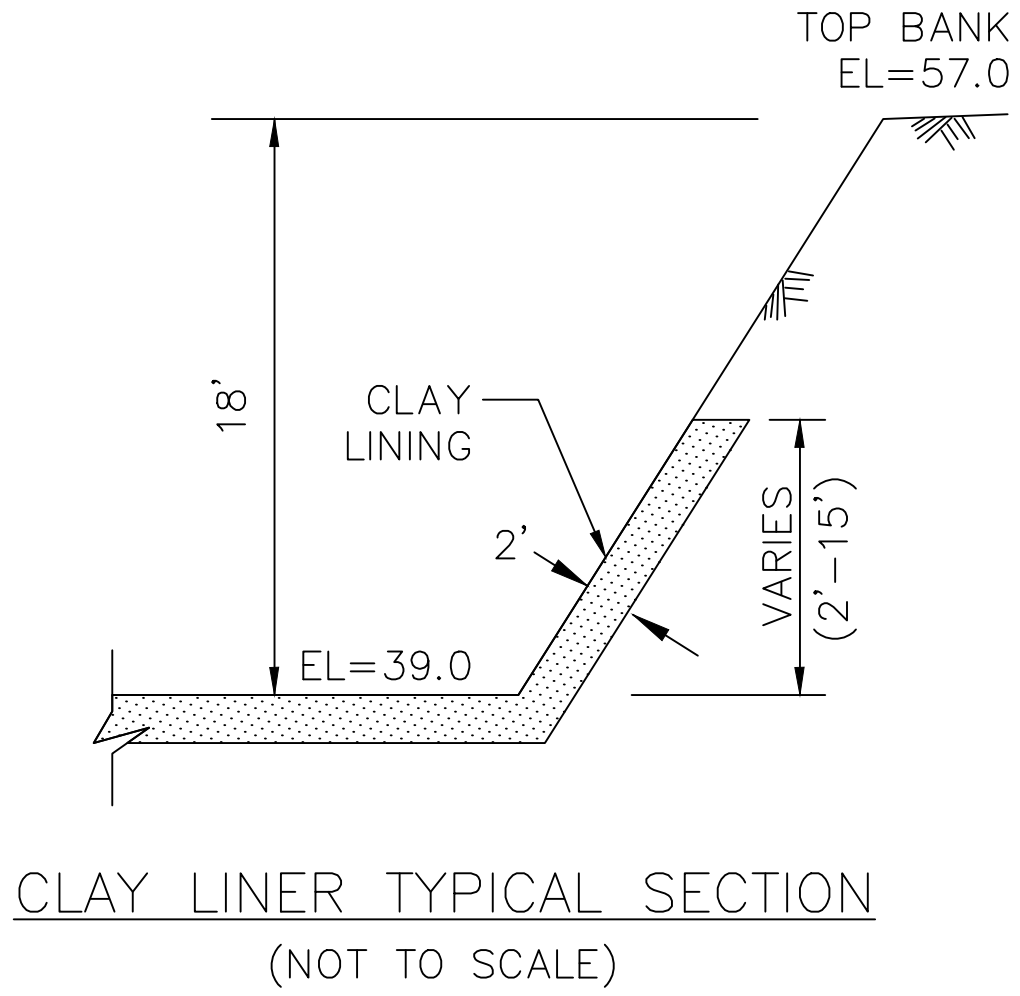
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SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 16 OF 42	

NO.	DATE	REVISION	APP.

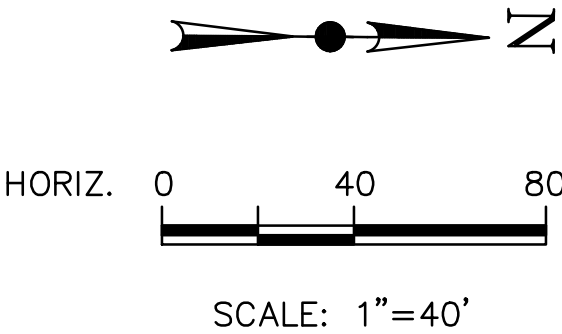




DETENTION POND "A" CLAY LINING LAYOUT  
(1"=40' FULL SIZE; 1"=80' HALF SIZE)



- NOTES:
1. DELINEATED AREA SHOWS WHERE 2' THICK CLAY LINER IS REQUIRED. SEE GEOTECH REPORT PREPARED BY AVILES ENGINEERING FOR CLAY LINER SPECIFICATIONS.



**ENTECH**  
CIVIL ENGINEERS, INC.  
15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX FIRM NUMBER: F-6932  
SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

THIS DOCUMENT IS  
RELEASED FOR PURPOSE  
OF INTERIM REVIEW UNDER  
THE AUTHORITY OF  
JUAN OLIVAREZ  
TEXAS REG. NO. 55474  
October 17, 2025

IT IS NOT TO BE USED  
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PURPOSES

**CITY OF HOUSTON**  
HOUSTON PUBLIC WORKS

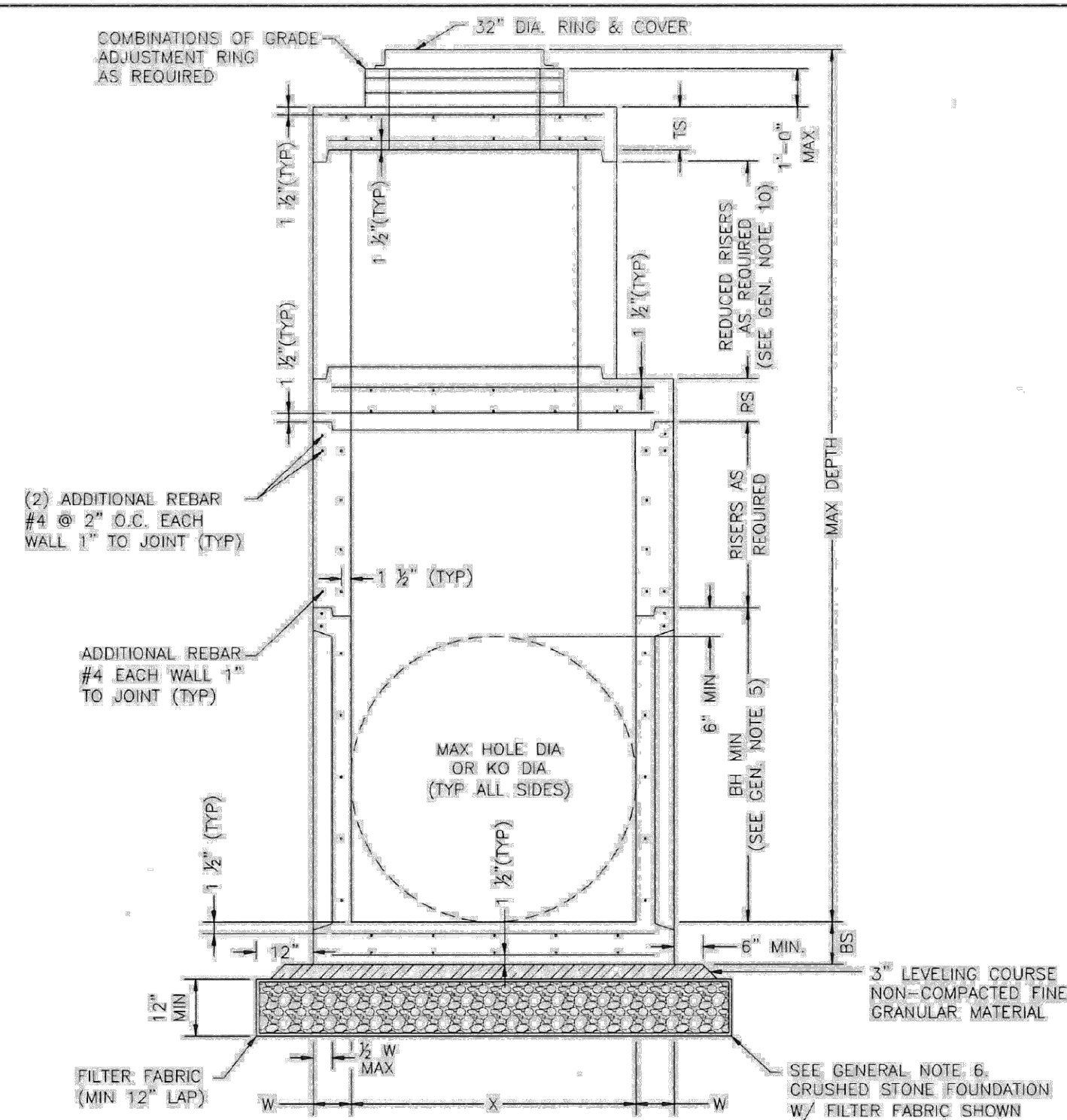
SHARPSTOWN AREA DETENTION  
POND A

CLAY LINING DETAILS

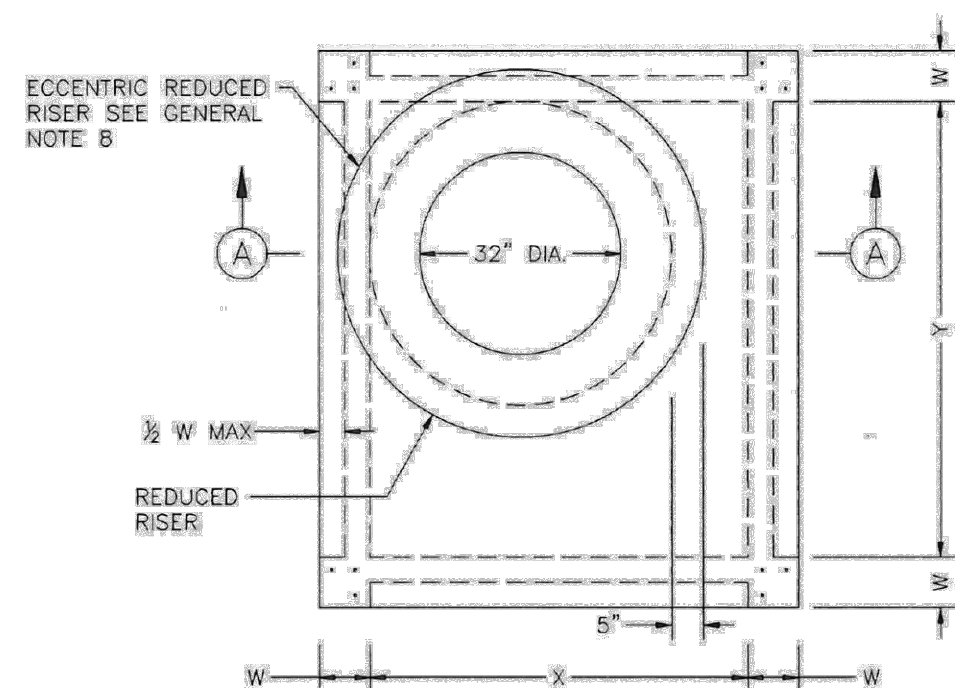
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 17 OF 41	

NO.	DATE	REVISION	APP.



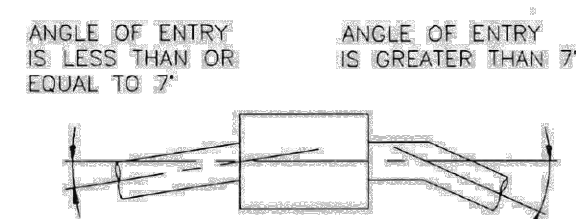


ELEVATION A-A  
FLAT SLAB TOP WITH SHIP  
LOOSE RING & COVER OPTION



PLAN VIEW A  
COVER NOT SHOWN

ECCENTRIC MANHOLE  
(PREFERRED CONFIGURATION)



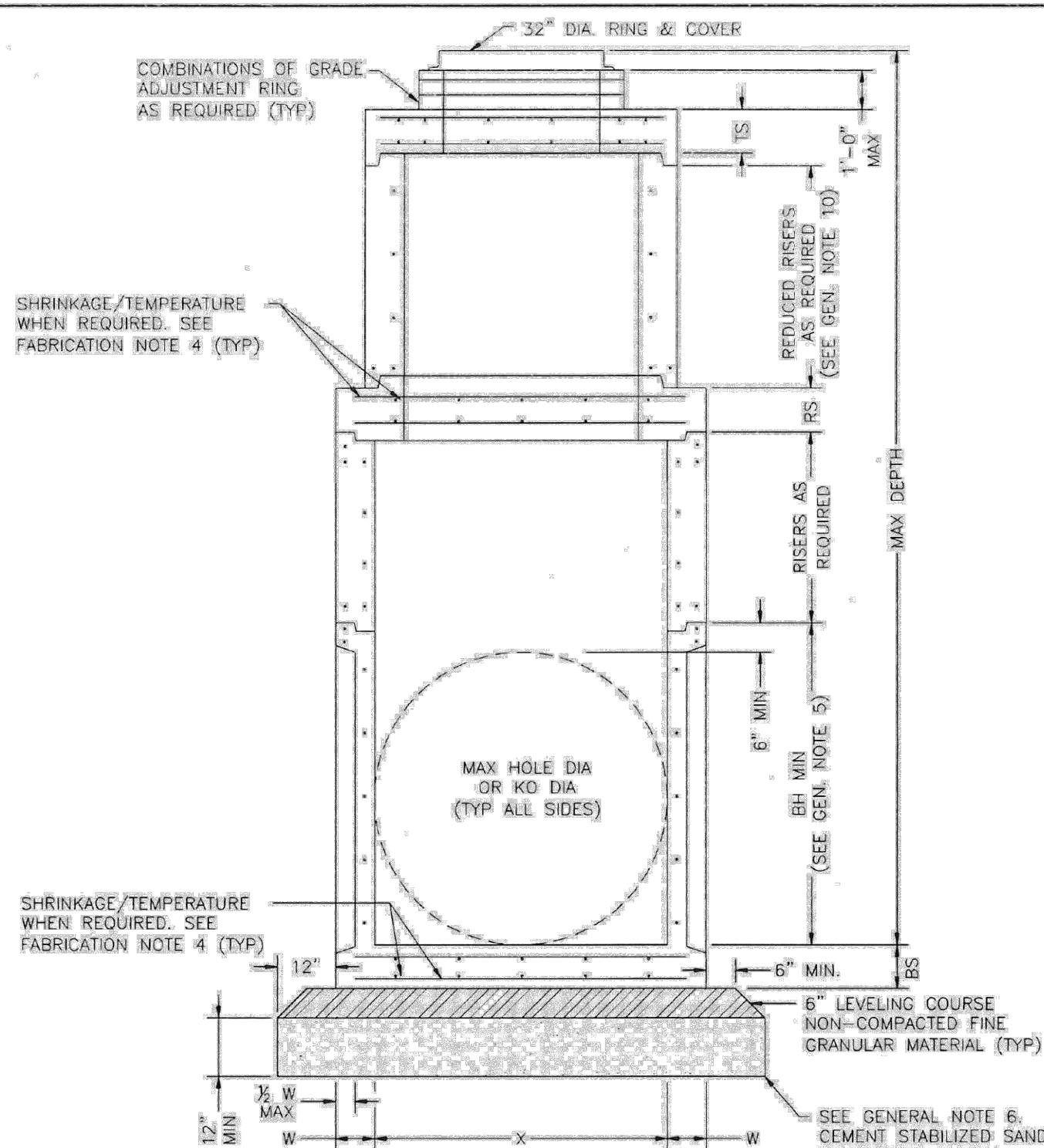
### PIPE CONNECTION DETAIL

CONNECT PIPES WITHIN 7" OF NORMAL TO PRECAST BASE WALL. IF NECESSARY, USE PIPE ELBOW OR CURVED APPROACH ALIGNMENT TO STAY WITHIN THIS LIMIT.

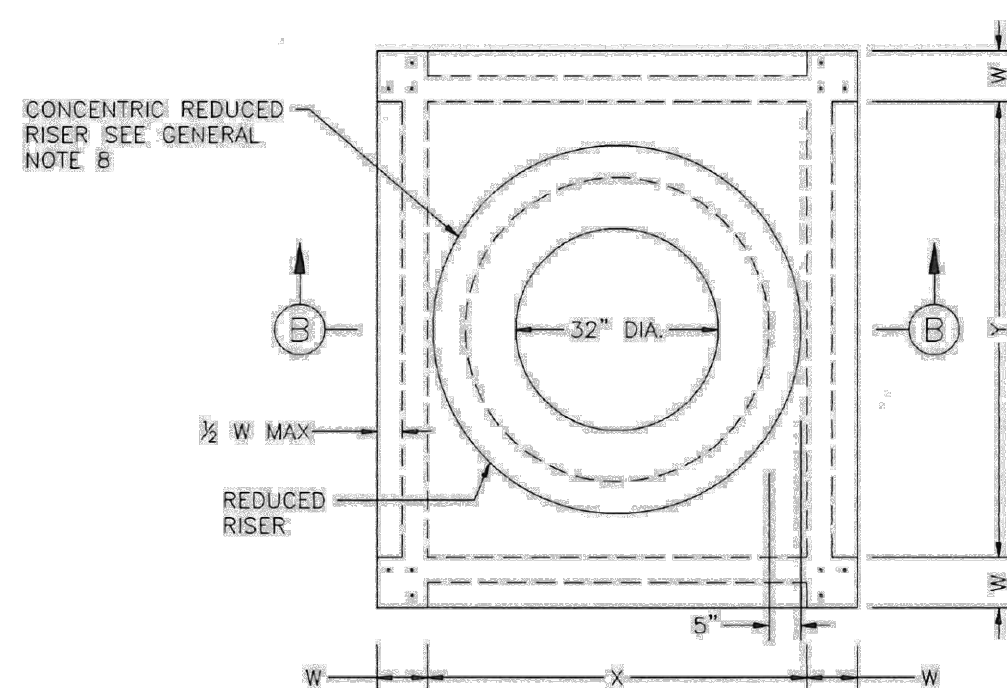
PRECAST BOX MANHOLE (PEM) MINIMUM REQUIREMENTS FOR 24 IN. TO 78 IN. INTERNAL DIA. STORM SEWER PIPES											
	SIZE	BASE SLAB THICKNESS	BASE UNIT OR RISER THICKNESS	REDUCED RISER DIA	REDUCING SLAB THICKNESS	TOP SLAB THICKNESS	MAX DEPTH TO TOP OF BASE SLAB	MIN HEIGHT (SEE GEN. NOTE 5)	MAX HOLE DIA (SEE FAB. NOTE 11)	MAX KO DIA (SEE FAB. NOTE 11)	
	X & Y FT.	BS IN.	W IN.	ID FT.*	RS IN.	TS IN.	MAX DEPTH FT.	BH MIN FT.	MAX HOLE DIA IN.	KO DIA IN.	
PEM	3X3	6	6	N/A	N/A	9	25	3.50	36	36	
	4X4	6	6	N/A	N/A	9	25	4.50	48	48	
	3X5	6	6	N/A	N/A	9	25	3.50	36/60	36/60	
	4X5	6	6	48 IN.	9	9	25	4.50	48/60	48/60	
	5X5	6	6	48 IN.	9	9	25	5.50	60	60	
	5X6	9	8	48 IN.	9	9	25	5.50	60/72	60/72	
	6X6	9	8	48 IN.	9	9	25	6.50	72	72	
	8X8	9	10	48 IN.	12	9	25	8.50	96	96	

TABLE 1 NOTES:

1. (†) ROUND MANHOLES ARE PREFERRED FOR THESE SIZES.
2. (\*) UNLESS OTHERWISE INDICATED.
3. TABLE IS VALID FOR UP TO 25 FT OF INSTALLATION DEPTH.



ELEVATION B-B  
FLAT SLAB TOP WITH SHIP  
LOOSE RING & COVER OPTION



PLAN VIEW B  
COVER NOT SHOWN

### CONCENTRIC MANHOLE (ALTERNATE CONFIGURATION)

FABRICATION NOTES:



1. PROVIDE CLASS "H" CONCRETE IN ACCORDANCE WITH TEXAS DEPARTMENT OF TRANSPORTATION ITEM #21 AND HAVING A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.
2. PROVIDE GRADE 60 REINFORCING BARS OR EQUIVALENT AREA OF WWR.
3. PROVIDE CURVED REINFORCING STEEL IN VERTICAL WALLS OF RISER AND CONE IN ACCORDANCE WITH ASTM C478.
4. PROVIDE THINDEST MINIMUM CONCRETE CLEAR COVER OF  $1\frac{1}{2}"$  TO REINFORCING STEEL ON RISER OR VERTICAL WALLS.
5. SLAB WITH A THICKNESS OF 8" OR GREATER REQUIRE SHRINKAGE AND TEMPERATURE REINFORCING STEEL. PROVIDE STEEL AREA  $\approx 0.11$  IN<sup>2</sup>/FT EACH WAY.
6. MANUFACTURE BASE AND RISERS TO NEAREST 3" INCREMENT.
7. DESIGN TONGUE AND GROOVE JOINTS FOR FULL CLOSURE ON BOTH SIDERS. MINIMUM SPIGOT DEPTH IS  $\frac{3}{4}"$ .
8. PROVIDE LIFTING DEVICES IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS.
9. PROVIDE CAST IRON SLID COVER, UNLESS NOTED OTHERWISE OTHERWISE IN THE PLANS.
10. MAXIMUM SPACING OF REINFORCEMENT IS 8".
11. AT MANUFACTURERS OPTION, PROVIDE CAST OR CORED HOLES OR THIN WALL PANELS (K) TO THE MAXIMUM DIA SHOWN FOR EACH. WHEN NO HOLES ARE SHOWN IN THE PLANS, IT IS ACCEPTABLE TO PROVIDE A WALL WITH NO SECTIONAL REDUCTION.
12. THREE DIFFERENT OPTIONS FOR CAPPING THE MANHOLE RISER NEAR THE FINISHED GRADE ARE ALLOWED. CONES CAN BE USED WHEN CONES ARE SUFFICIENT TO PROVIDE THE REQUIRED COVER. WALL AND RISER TO BE USED WHERE COVER IS LIMITED. REFER TO 02082-12 FOR OPTIONS.
13. BASES AND RISERS MAY HAVE CAST, CUT OR THIN WALL PANEL (K) THAT ARE ROUND AND DO NOT EXTEND INTO THE FLOOR, INTO WALLS, OR WITHIN 6" OF THE JOINT ABOVE OR BELOW.


INSTALLATION NOTES:

1. IF REQUIRED ELSEWHERE, INVERTS (BENCHING) TO BE PROVIDED BY CONTRACTOR. CONCRETE OR MORTAR USED FOR INVERT IS SUBSIDIARY TO MANHOLE. REFER TO CITY OF HOUSTON SPECIFICATION SECTION 02082 FOR INVERT (BENCHING) REQUIREMENTS.
2. SEAL TONGUE AND GROOVE JOINTS WITH PREFORMED OR BULK Mastic IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS. TONGUE AND GROOVE JOINTS MAY BE GROUED NO MORE THAN 1" BETWEEN EACH SECTION, OR 1/2" THE JOINT DEPTH, WHICHEVER IS GREATER.
3. DO NOT GROUT RUBBER GASKET JOINTS WITHOUT MANUFACTURER'S RECOMMENDATION.
4. FOR RIGID PIPE, CUT HOLE IN THIN WALL PANEL (KO) 4" MAX, 2" MIN LARGER THAN PIPE OD.
5. FOR FLEXIBLE PIPE, CONSULT BOOT/SEAL MANUFACTURER'S SPECIFICATION FOR PLACEMENT OF BOOT/SEAL AND HOLE SIZE. CENTER PIPE IN HOLE AND INSTALL BOOT/SEAL PER MANUFACTURER'S SPECIFICATION.
6. INITIAL INSTALLATION OF GRADE ADJUSTMENT RINGS IS LIMITED TO 1'-0" MAX AS SHOWN.
7. GRADE ADJUSTMENT RINGS MAY BE INCREASED TO 1'-6" MAX WHEN FUTURE CONSTRUCTION AFFECTS FINAL GRADE OF STRUCTURE. MAKE ADJUSTMENTS GREATER THAN 1'-6" WITH ADDITIONAL RINGS. ALL ADJUSTMENTS MAY BE MADE UP TO THE MAX DEPTH OF 2'-0". STRUCTURE MUST BE EVALUATED IF MAX DEPTH WILL BE EXCEEDED.

GENERAL NOTES:

1. SEE TABLE 1 FOR MINIMUM DESIGN REQUIREMENTS. CONCENTRIC RISER WITH RESPECT TO BASE (ALTERNATIVE CONFIGURATION) FALLS OUTSIDE THE SCOPE OF REQUIREMENTS PROVIDED. ENGINEER OF RECORD ACCEPTS RESPONSIBILITY FOR SAFETY AND ADEQUACY OF MANHOLE IF ALTERNATIVE CONFIGURATION IS USED.
2. DESIGNED ACCORDING TO ASTM C478 AND/OR ASTM C913.
3. PAYMENT FOR PRECAST MANHOLE PER SECTION 02082 "PRECAST CONCRETE MANHOLES."
4. PRECAST CONCRETS OF BASE SLAB, BASE UNIT, RISERS (AS REQUIRED), REDUCING SLABS (AS REQUIRED), AND REDUCED RISERS (AS REQUIRED).
5. MIN HEIGHT SHOWN FOR STOCK BASE UNITS. USE STOCK BASE UNITS WHENEVER PRACTICAL. SMALLER HEIGHT BASE UNITS CAN BE USED IN ANY INSTALLATION. MINIMUM HEIGHT FOR PRECAST CONCRETE IN THE PLANS, ABSOLUTE MINIMUM HEIGHT OF BASE UNITS IS 2'-6".
6. FOUNDATION/SUBGRADE TO BE DESIGNED BY ENGINEER AND MEET MINIMUM REQUIREMENTS ACCORDING TO SECTION 02082.
7. ALL STORM WATER MANHOLES ARE TO BE PRECAST CONCRETE, UNLESS OTHERWISE NOTED ELSEWHERE IN THE PLANS. (NOTED ELSEWHERE)
8. ECCENTRIC REDUCED RISER WITH RESPECT TO BASE IS THE PREFERRED MANHOLE CONFIGURATION. CONCENTRIC REDUCED RISER WITH RESPECT TO BASE MANHOLE CONFIGURATION IS AN ALTERNATIVE HEIGHT. THE ACCEPTED REDUCED RISER BASED ON THE CITY OF HOUSTON.
9. MANHOLE SIZE SHALL CONSIDER ENGINEERING ECONOMY. THIS DETAIL IS NOT APPLICABLE TO BOX MANHOLES LARGER THAN 8-FOOT BY 8-FOOT.
10. REFER TO STORM SEWER TYPE 'C' PRECAST ROUND MANHOLE DETAIL (02082-12) FOR REDUCED RISER DESIGN REQUIREMENTS.

<h1 style="text-align: center;">CITY OF HOUSTON</h1> <p style="text-align: center;">HOUSTON PUBLIC WORKS</p>	
<h2>STORM SEWER</h2> <h2>PRECAST BOX MANHOLE</h2> <p style="text-align: center;">(NOT TO SCALE)</p>	
APPROVED BY:  CITY ENGINEER	APPROVED BY:  DIRECTOR OF HOUSTON PUBLIC WORKS
EFF DATE: JUL-01-2021	DWG NO: 02082-13

 <p>15021 KATY FREEWAY, STE. 500 HOUSTON, TX. 77094 281-945-0069 TX FIRM NUMBER: F-6932</p>	<p>THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF RODRIGO GUADARRAMA TEXAS REG. NO. 111437 OCTOBER 15, 2025</p>
<p>SURVEYED BY: LANDTECH, INC. FB NO. P-6331</p>	<p>IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES</p>

CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

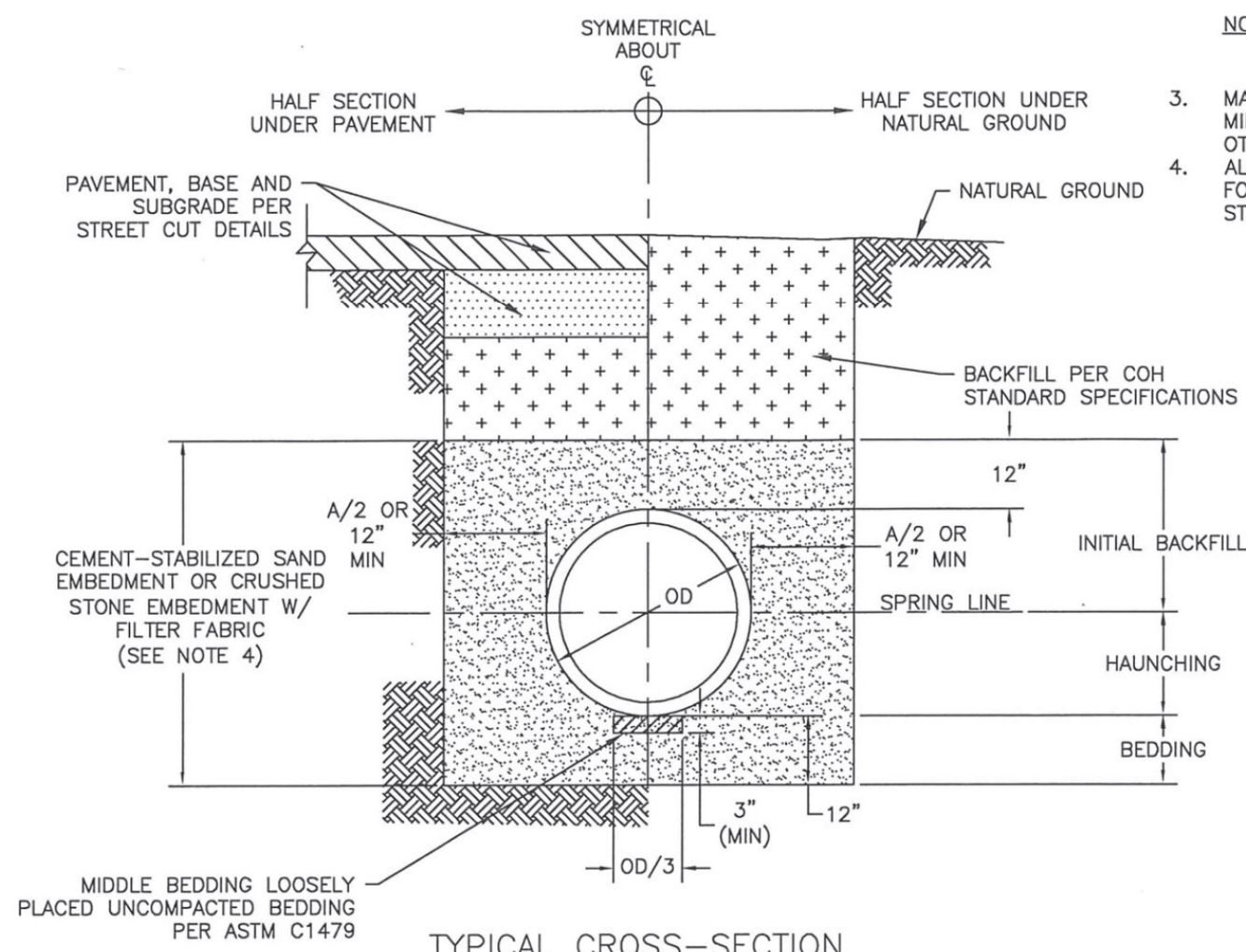
SHARPSTOWN AREA DETENTION  
POND A

# STORM SEWER PRECAST BOX MANHOLE

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 18 OF 42	



02317-03

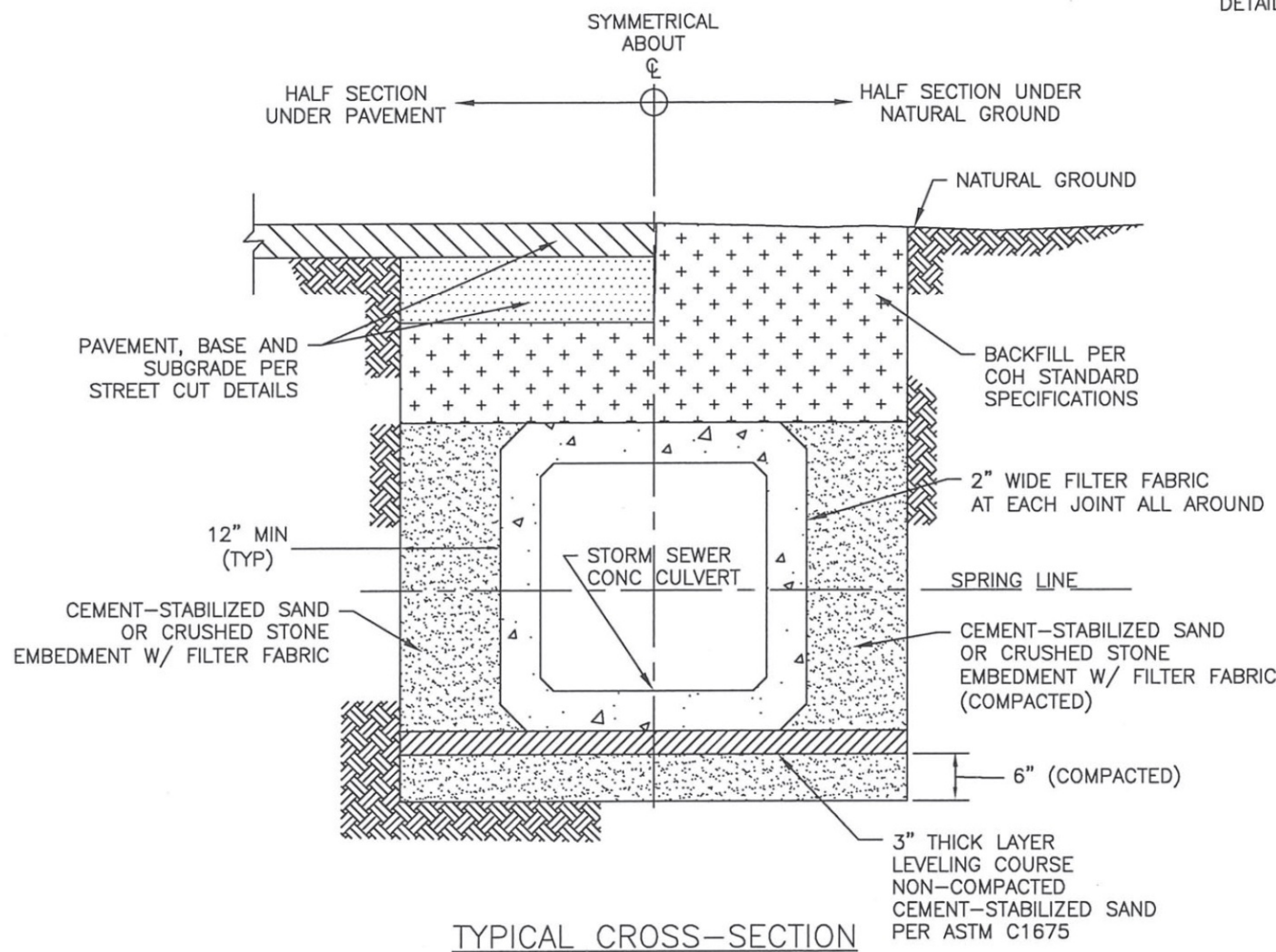


SANITARY OR STORM SEWER BEDDING AND BACKFILL  
FOR DRY STABLE TRENCH  
NTS

NOTES:

- THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS PER COH STANDARD. SEE COH STANDARD SPECIFICATION FOR REQUIREMENTS IN OTHER CONDITIONS.
- MIN. TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "A" FOR THE NOMINAL PIPE SIZE.
- NOMINAL PIPE SIZE  
18" TO 30" OVER 30" 36"  
"A" 24" 36"
- MAX. TRENCH WIDTH SHALL BE NOT GREATER THAN MIN. TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED. ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR FORCE MAINS MAY BE ALLOWED. SEE COH STANDARD SPECIFICATIONS.

02317-05

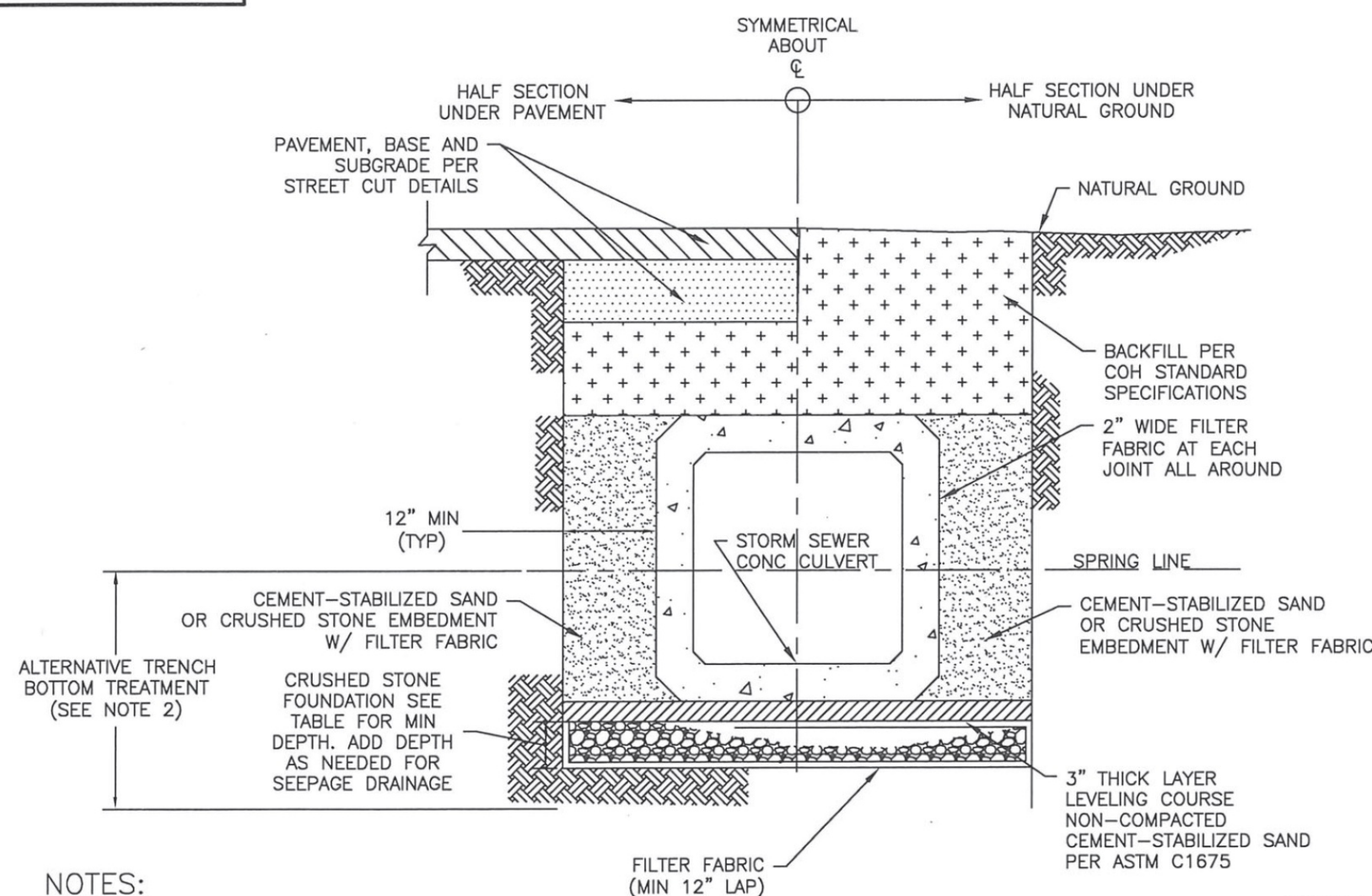


PRECAST CONCRETE BOX STORM SEWER  
BEDDING AND BACKFILL FOR DRY STABLE TRENCH  
NTS

NOTES:

- WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
- SUBGRADE AND PAVEMENT FOR STREET CUT DETAILS - 02351.

02317-06



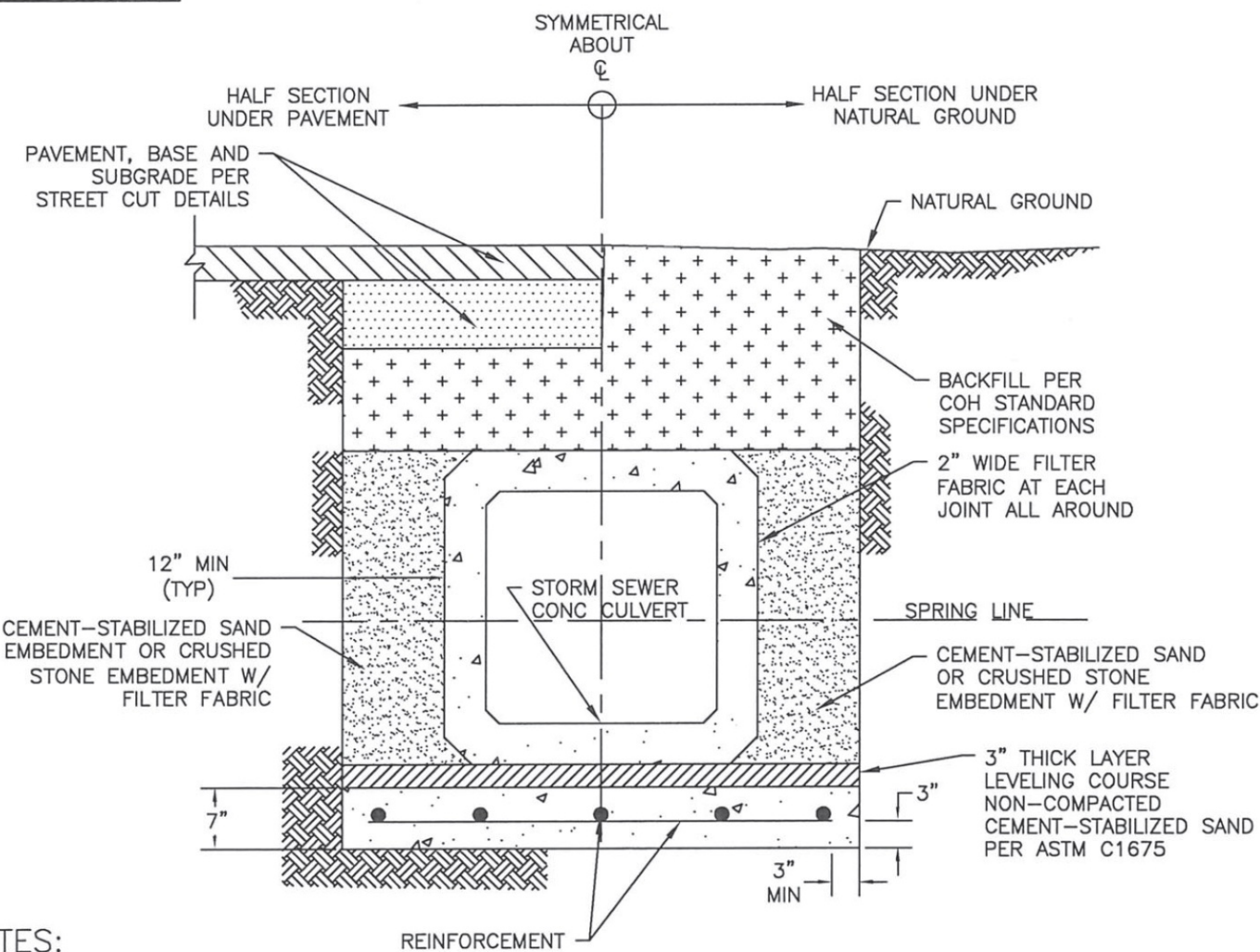
NOTES:

- WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
- ALTERNATIVE TRENCH BOTTOM TREATMENT MAY BE USED AS APPROVED BY THE CITY OF ENGINEERS AND AS PAID FOR IN THE PROPOSAL.

TABLE	
CULVERT SIZE (FT)	FOUNDATION DEPTH(INCHES)
3' X 2' TO 6' X 6'	12
6' X 6' AND LARGER	18

PRECAST CONCRETE BOX STORM SEWER  
BEDDING AND BACKFILL FOR WET STABLE TRENCH  
NTS

02317-07



NOTES:

- WHERE MULTIPLE BOX SEWER ARE USED IN THE SAME TRENCH, MIN. OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".
- REINFORCED CONCRETE SLAB PIPE BEDDING TO BE PLACED IN DRY TRENCH ONLY.
- CONCRETE IN SLAB TO REACH MIN COMPRESSIVE STRENGTH OF 1000 PSI BASED ON MAX DESIGN BEFORE PIPE IS LAID.
- PRECAST SEAL SLAB MAYBE USED AS APPROVED BY CITY ENGINEER.

PRECAST CONCRETE BOX STORM SEWER  
BEDDING AND BACKFILL WITH SEAL SLAB  
NTS

FIRM INFORMATION  
CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

STORM SEWER  
02317-03 THROUGH 07

APPROVED BY:

CITY ENGINEER

APPROVED BY:

DEPUTY DIRECTOR

APPROVED BY:

DIRECTOR

EFFECTIVE DATE: JUL-01-2019

FOR CITY OF HOUSTON USE ONLY

SHEET NO.

ENTECH

CIVIL ENGINEERS, INC.  
15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX FIRM NUMBER: F-6932  
SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

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RODRIGO GUADARRAMA  
TEXAS REG. NO. 111437  
OCTOBER 15, 2025

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PURPOSES

CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

STORM SEWER  
DETAILS (1 OF 2)

WBS NUMBER

M-410040-001A-4

DRAWING SCALE

AS NOTED

CITY OF HOUSTON PM

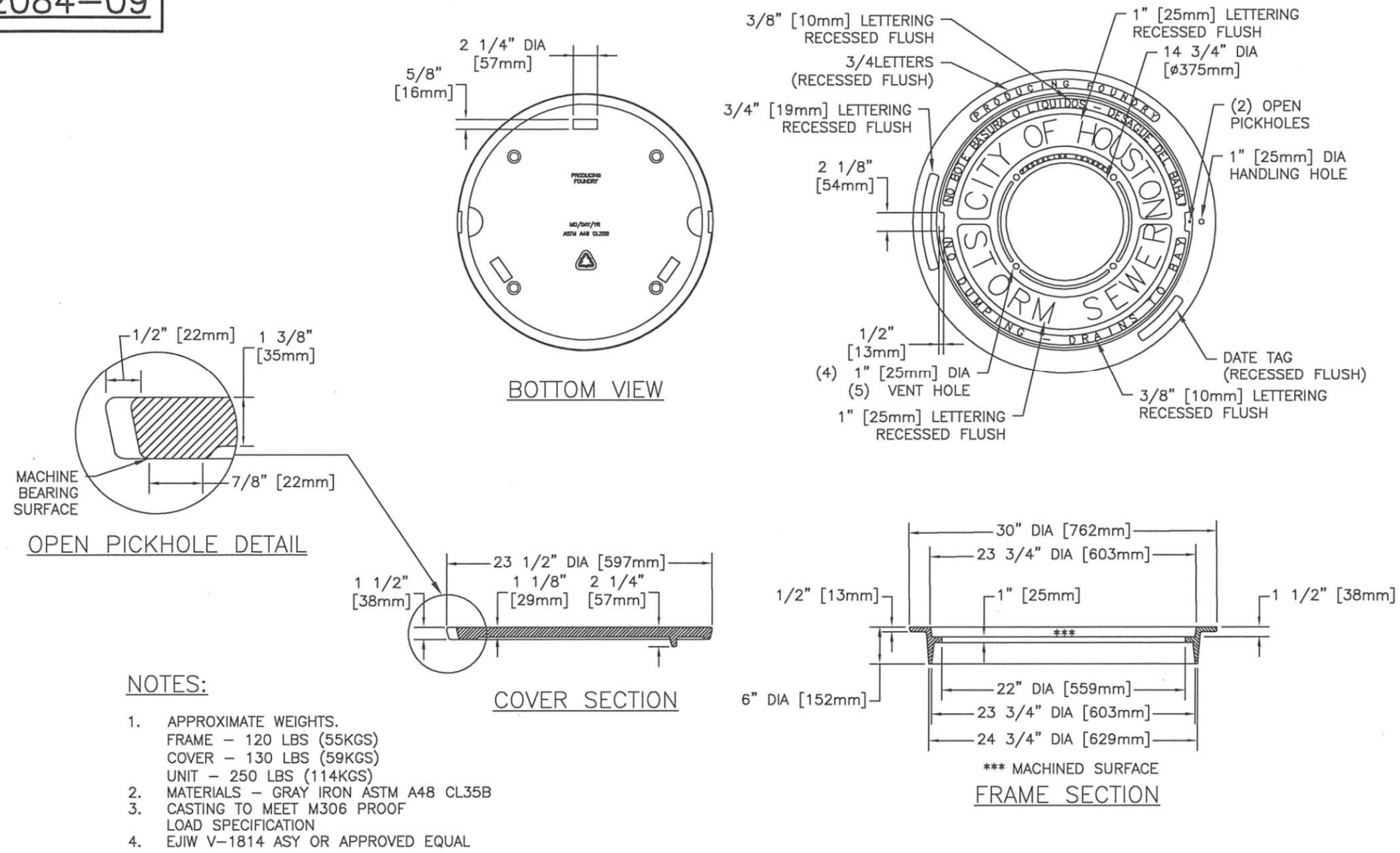
SUPUN ILANGAMUDALIGE P.E.

SHEET NO. 19 OF 42

FOR CITY OF HOUSTON USE ONLY

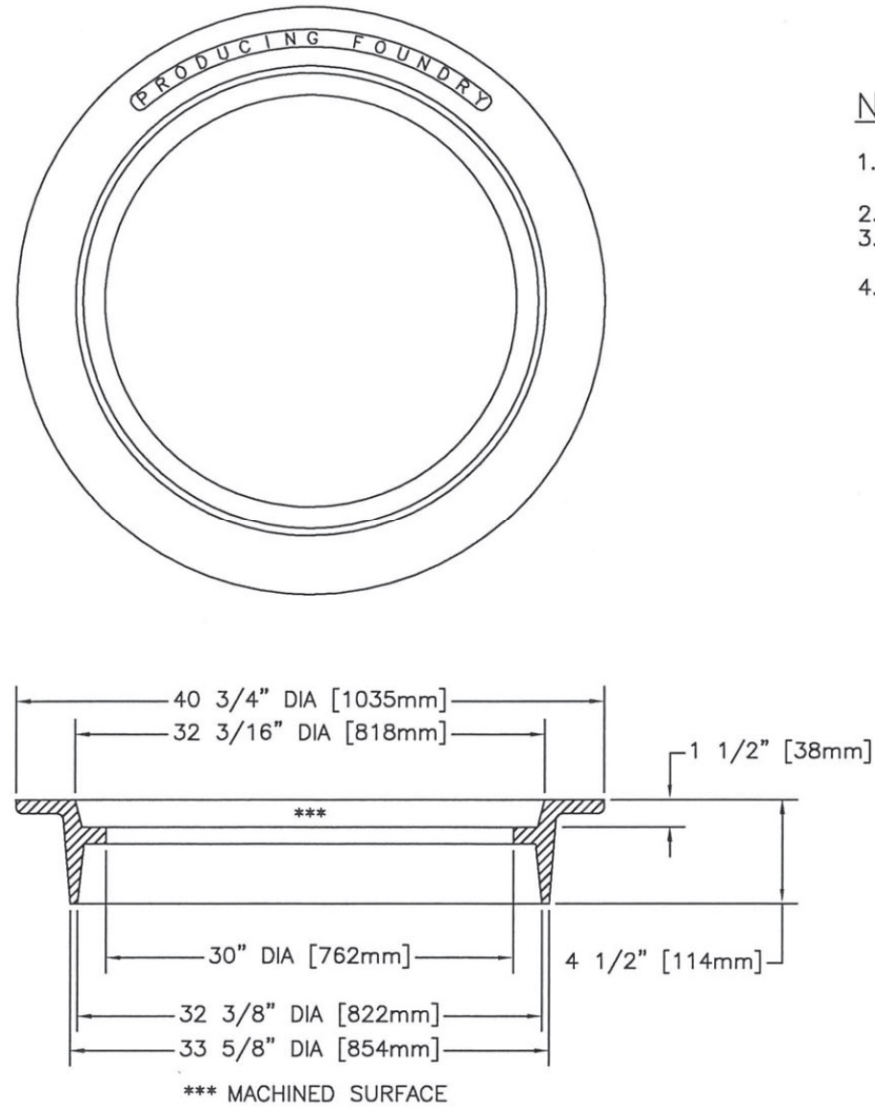


02084-09



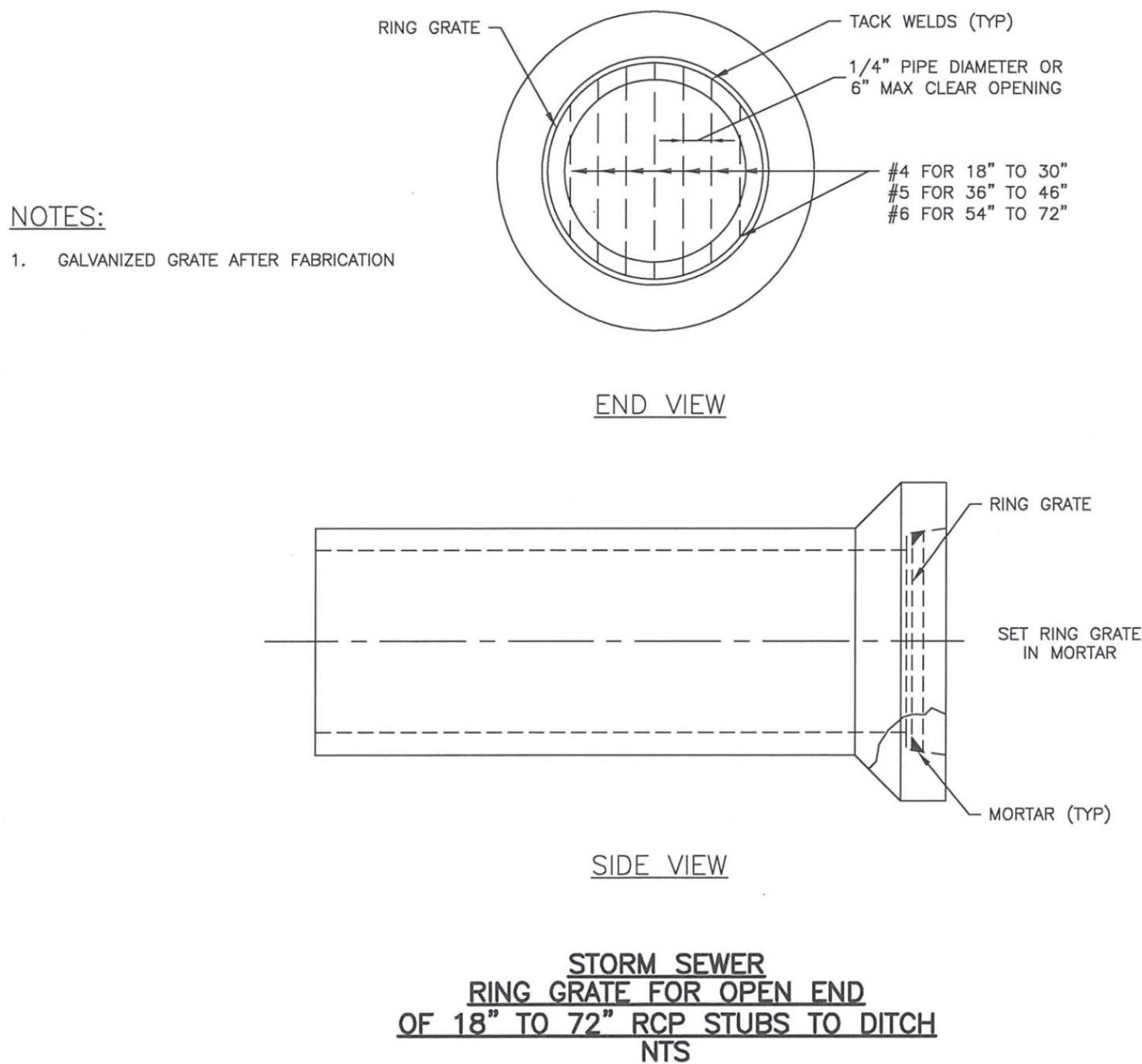
STORM SEWER TYPE "C-1, C-2, C-2A"  
AND "H-2" INLET FRAME AND COVER  
NTS

02084-10



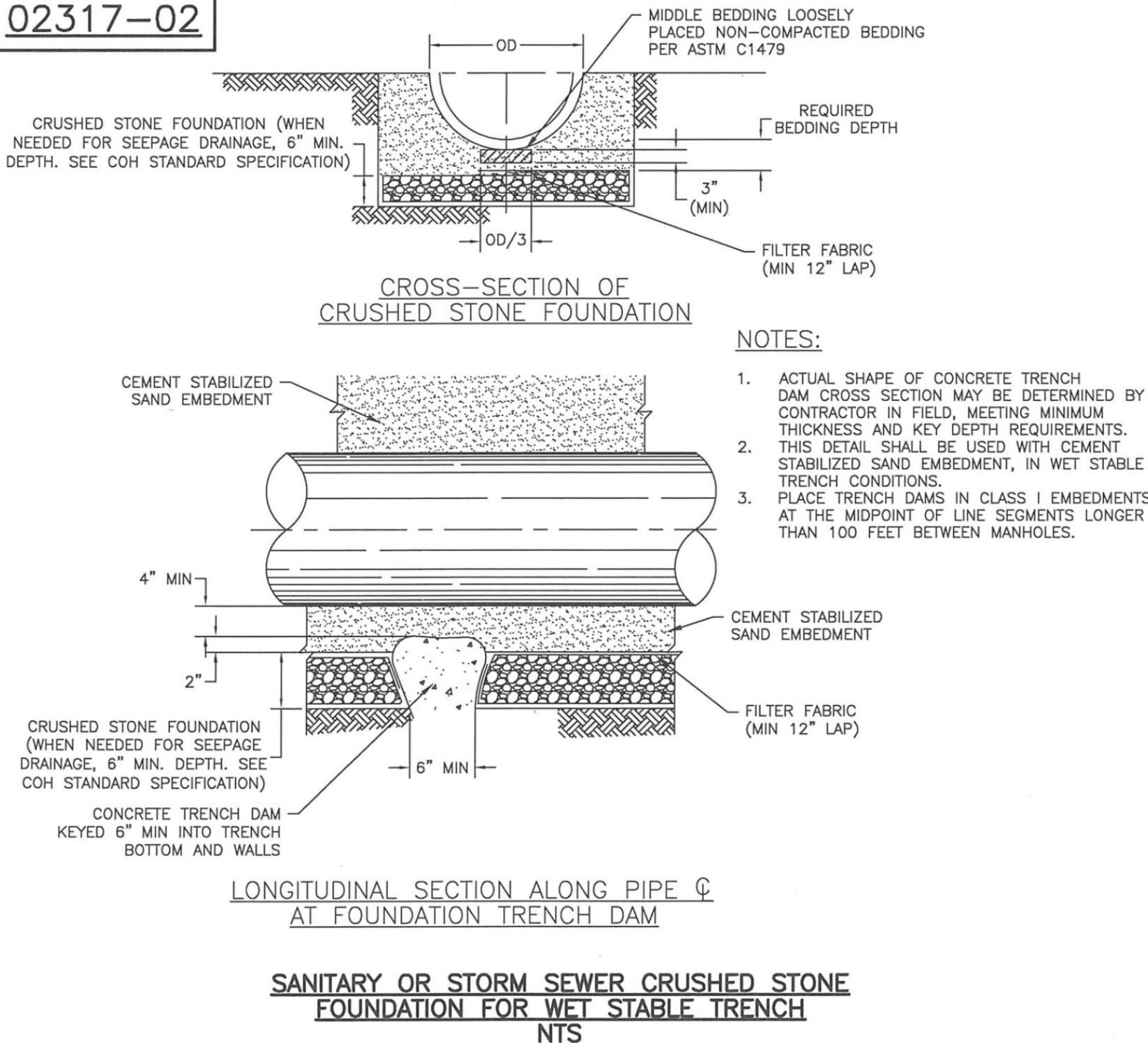
32" INVERTED MANHOLE FRAME  
NTS

02084-11



STORM SEWER  
RING GRATE FOR OPEN END  
OF 18" TO 72" RCP STUBS TO DITCH  
NTS

02317-02



SANITARY OR STORM SEWER CRUSHED STONE  
FOUNDATION FOR WET STABLE TRENCH  
NTS

- NOTES:
- APPROXIMATE WEIGHTS.  
FRAME - 190 LBS (86KGS)
  - MATERIALS - GRAY IRON ASTM A48 CL35B
  - CASTING TO MEET M306 PROOF  
LOAD SPECIFICATION
  - EJW V-1816 ASY OR APPROVED EQUAL

FIRM INFORMATION  
ENGINEER'S SEAL  
CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

STORM SEWER  
02084-09 THROUGH 11  
AND 02317-02

APPROVED BY: [Signature]  
CITY ENGINEER  
APPROVED BY: [Signature]  
DEPUTY DIRECTOR  
APPROVED BY: [Signature]  
DIRECTOR  
EFFECTIVE DATE: JUL-01-2019  
FOR CITY OF HOUSTON USE ONLY

SHEET NO.

**ENTECH**  
CIVIL ENGINEERS, INC.  
15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX FIRM NUMBER: F-6932  
SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

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OCTOBER 15, 2025

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CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

STORM SEWER  
DETAILS (2 OF 2)

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 20 OF 42	



**PLAN**

**HALF SECTION**

**DETAIL A**

BAR SIZE #	MINIMUM LAP - SPLICE LENGTHS
4	1 FT. 9 IN.
5	2 FT. 2 IN.
6	2 FT. 7 IN.
7	3 FT. 5 IN.
8	4 FT. 6 IN.
9	5 FT. 8 IN.
10	7 FT. 3 IN.

**TYPICAL TRAPEZOIDAL CHANNEL LINING**

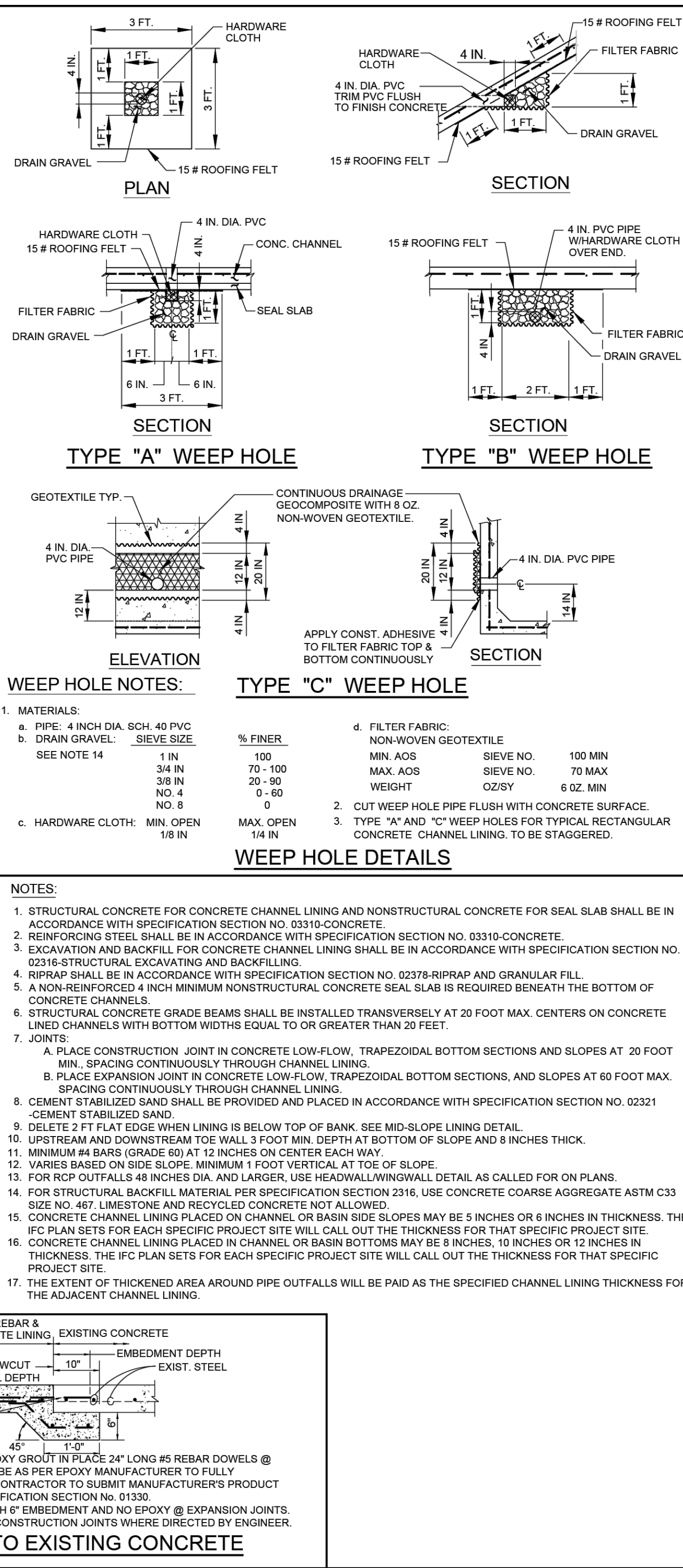
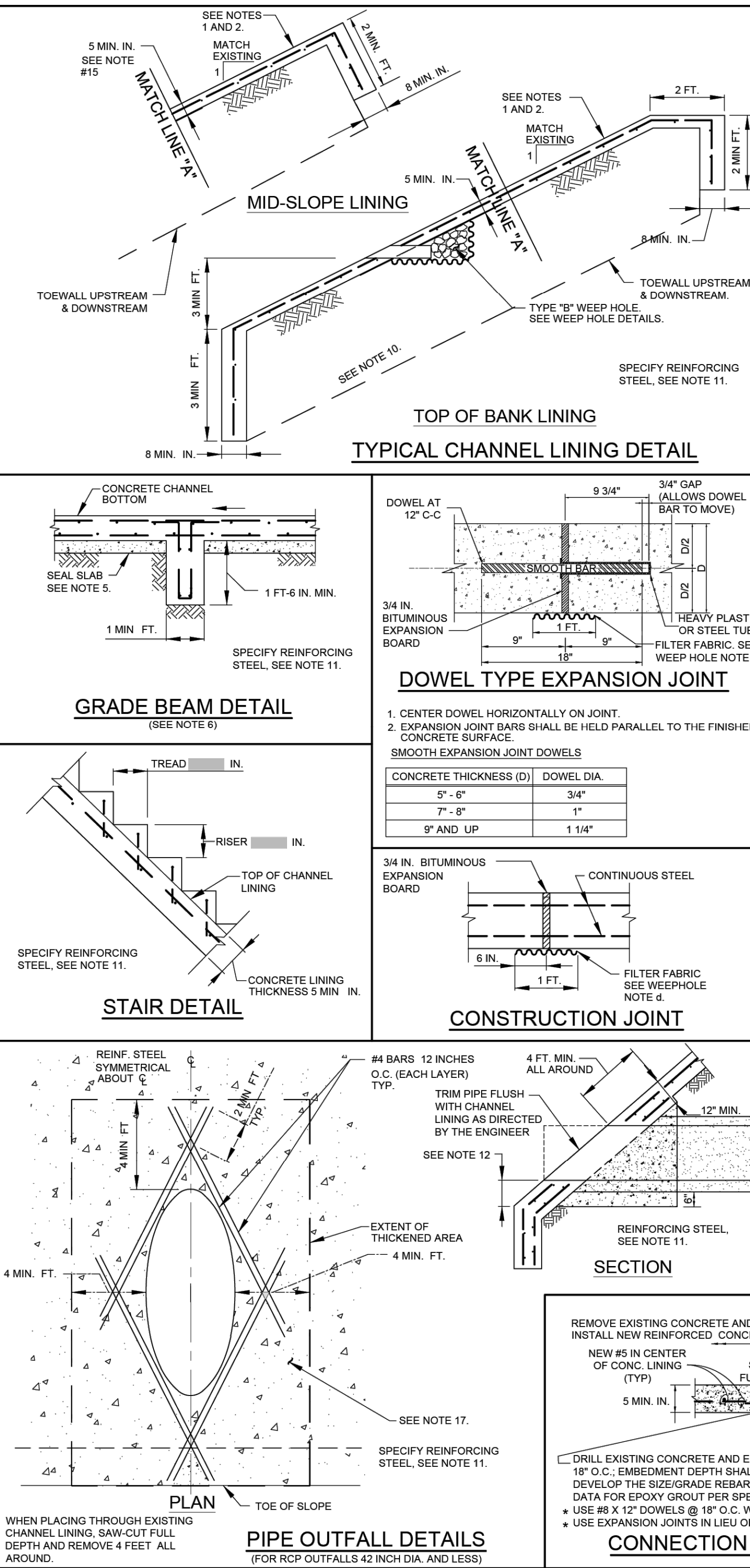
**HALF SECTION**


**DETAIL B**


BAR SIZE #	MINIMUM LAP - SPLICE LENGTHS
4	1 FT. 9 IN.
5	2 FT. 2 IN.
6	2 FT. 7 IN.
7	3 FT. 5 IN.
8	4 FT. 6 IN.
9	5 FT. 8 IN.
10	7 FT. 3 IN.

**TYPICAL RECTANGULAR CONCRETE CHANNEL LINING HALF SECTION**

**PIPE OUTFALL DETAIL**  
(FOR RCP OUTFALLS 42 INCH DIA. AND LESS)



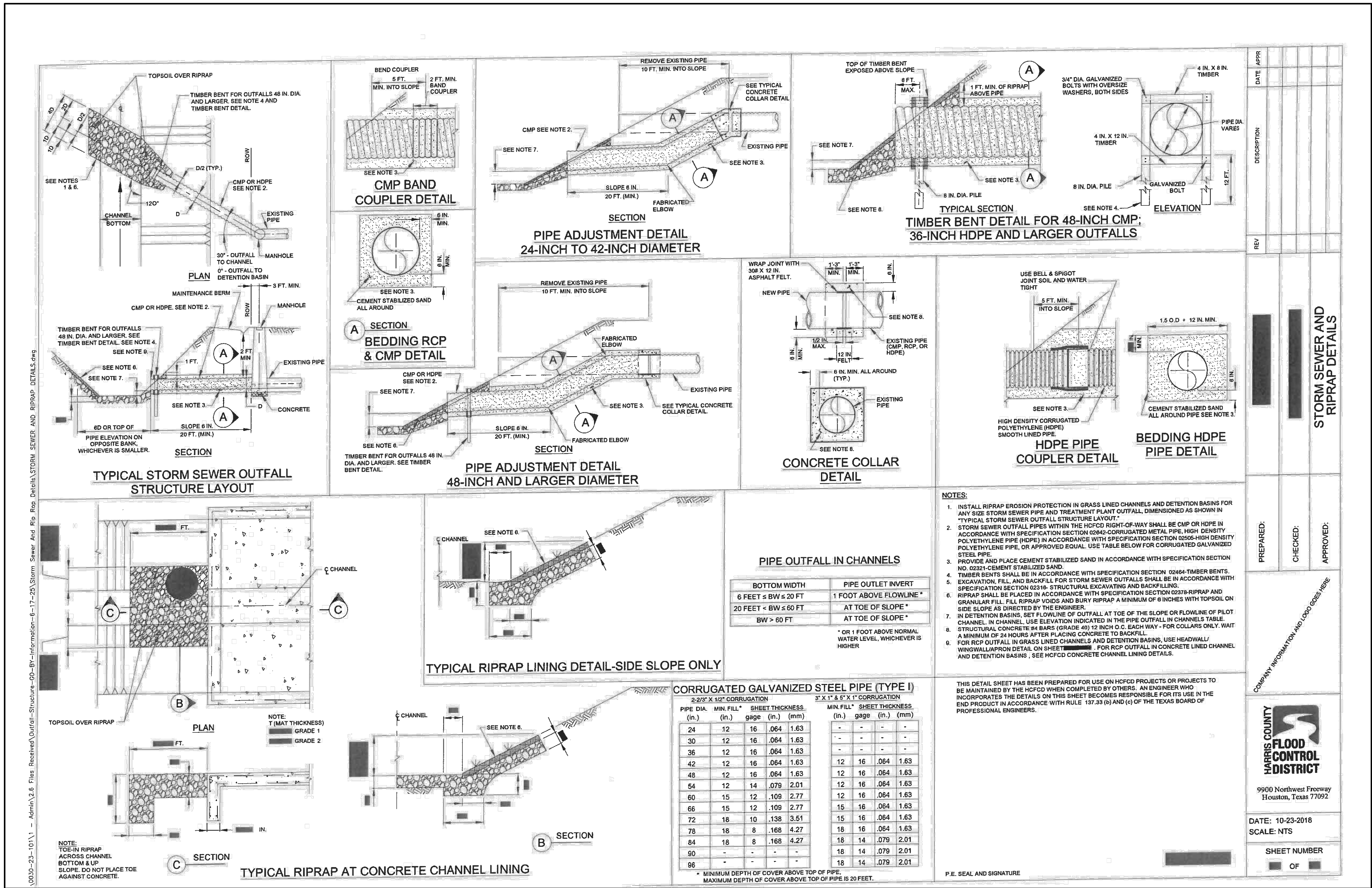
<div><div><div><b>HARRIS COUNTY</b> <b>FLOOD CONTROL DISTRICT</b></div></div><div>9900 Northwest Freeway Houston, Texas 77092</div></div> <div>DATE: SEPTEMBER 2024 SCALE: NTS</div> <div>SHEET NUMBER <b>6</b> OF <b>20</b></div>		PREPARED: KN	HCPCD PROJECT ID# Z100-00-00-X##	REV	DESCRIPTION	DATE	APPR
		CHECKED: JCS	CONCRETE CHANNEL LINING REPAIRS-NORTH				
		APPROVED: HS	CONCRETE CHANNEL LINING DETAILS				

 15021 KATY FREEWAY, STE. 500 HOUSTON, TX. 77094 281-945-0069 TX FIRM NUMBER: F-6932 SURVEYED BY: TECHINTCH, INC. FB NO. P-6331		THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF RODRIGO GUADARRAMA TEXAS REG. NO. 111437 OCTOBER 15, 2025  IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES	
<h1>CITY OF HOUSTON</h1> <p>HOUSTON PUBLIC WORKS</p>			
SHARPOSTOWN AREA DETENTION POND A			
CONCRETE CHANNEL LINING DETAILS			
WBS NUMBER		FOR CITY OF HOUSTON USE ONLY	
M-410040-001A-4			
DRAWING SCALE			
NOT TO SCALE			
CITY OF HOUSTON PM			
SUPUN ILANGAMUDALIGE P.E.			
SHEET NO. 21 OF 42			



WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
NOT TO SCALE	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 22 OF 42	





CIVIL ENGINEERS, INC.  
 15021 KATY FREEWAY, STE. 500  
 HOUSTON, TX. 77094  
 281-945-0069  
 TX FIRM NUMBER: F-6932

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CITY OF HOUSTON  
 HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION POND A

STORM SEWER & RIPRAP DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
NOT TO SCALE	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 23 OF 42	



# F-25 MEDIUM DUTY DRAINAGE GATE

- CAST IRON CONSTRUCTION
- AUTOMATIC OPERATION
- FULLY ADJUSTABLE HINGE LINKS
- 25 FOOT SEATING HEAD MAXIMUM

The Waterman Model F-25 Drainage Gate features a high strength, fully adjustable linkage, providing for sensitive adjustment of the flap cover after installation. The design of this gate prevents jamming and assures proper seating through the use of built-in safety stops and a 2½" to 5" seating angle.

Flatback and Spigotback models are available.

A choice of seat facings is available and includes machined or ground iron, bronze or neoprene cover gasket which is available with either iron or bronze mating frame seats.

The use of the Waterman neoprene cover seal provides a long life tight seal, which can be easily renewed. The heavy seal also provides a moderate cushioning of shock loads where some slamming may occur.

This model is **not** recommended for pump discharges where violent slamming can occur.

- Cast Iron Frame and Cover
- High Strength Ductile Iron or Steel Links
- Stainless Steel Studs, Bolts and Pins, Standard. Brass or Monel, Optional.
- Bronze Bushings, Standard. Permanently Lubricated Bronze or Teflon, Optional.
- Minimum 2½" Seating Angle, 24" Diameter and over.
- Minimum 5" Seating Angle, 21" Diameter and smaller.
- Optional 25 lb. and 125 lb. ANSI Flange Drilling.

CAST IRON SEAT - Standard. Used for moderate conditions where costs must be minimized.

BRASS SEAT - Optional. Used for corrosive conditions where long service is important.

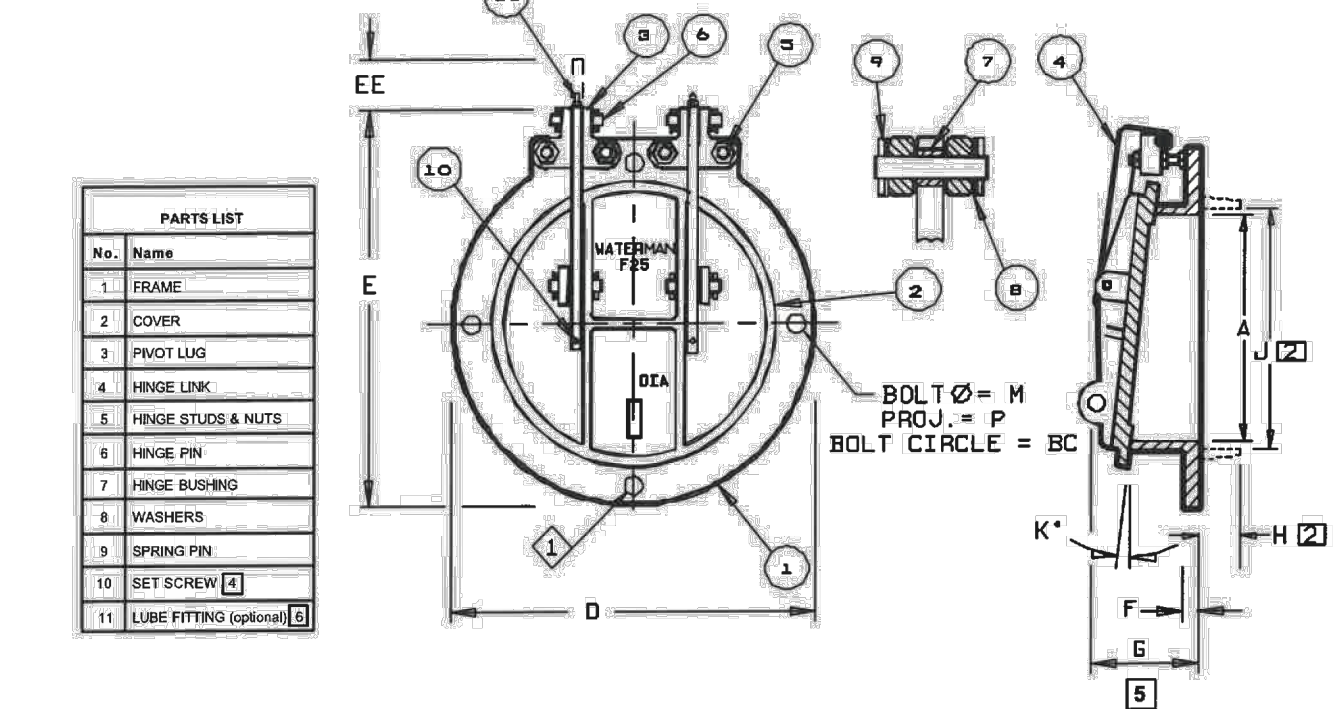
NEOPRENE SEAT (with iron or bronze) - Optional. Replaceable in flap cover. Cushions "slam" on closing and provides tighter seal.



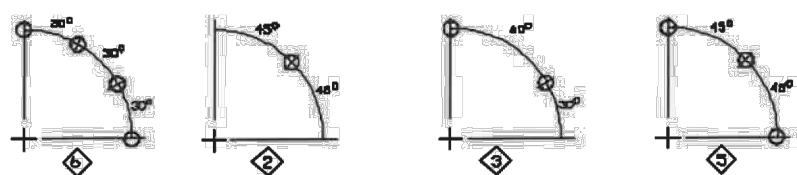
Model F-25f-Flatback  
Model F-25sb-Spigotback

PARTS LIST		
No.	Name	Qty.
1	FRAME	1
2	COVER	1
3	PIVOT LUG	2
4	HINGE LINK	2
5	HINGE STUD	4
6	HINGE NUT	12
7	HINGE PIN	4
8	HINGE BUSHING	4
9	WASHER	4
10	SPRING PIN	4
11	SET SCREW	2
12	WASHER	2

## F-25 DRAINAGE GATE



- 12 Bolt pattern per available on 42" & 48" only on request.
- Applies to spigotback gate only. Optional spigot shown in phantom.
- 25 lb. & 125 lb. Standard drilling available on request for all gates except 15" & 21".
- Except 4" & 6" gates
- If groud pad mounting is used add groud thickness to dimension.
- Not available on 4" and 6" gates - use permatube bushings.



GATE DIMENSIONS IN INCHES		4	6	8	10	12	14	15	16	18	20	21	24	30	36	42	48	54	60
BC	7½	9½	11½	14½	17	18½	20	21½	22½	25	25	28½	36	42½	49½	56	62½	69½	
D	9	11	13½	16	19	22½	22½	23½	25	27½	27½	32	38½	46	53	60½	68½	73	
E	9½	12	14½	16	19	22	25	24	28½	28	30	35	40½	46½	54½	66	72	78	
EE	1½	2	2½	2½	3	3½	3½	3	3½	3½	2½	3	3½	3½	4½	4½	6	6½	
F	½	½	½	½	½	1	1	½	½	½	½	½	1½	1½	1½	1½	1½	1½	
G	3½	5	5	6	6½	6	6½	6½	7	7	7½	8	8	9	8½	10	10	10	10½
H	2	2	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	3	3½
J	5	7	9	11	13	15	16	17	19	21	22	25	31	37	43½	49½	55½	61½	
K	5	5	6	5	5	5	5	5	5	5	5	5	2½	2½	2½	2½	2½	2½	
M	½	½	½	½	½	½	½	½	½	½	½	½	½	½	½	½	½	1	1½
P	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	3
No. of Bolts	4	4	4	8	6	6	6	6	6	8	8	8	8	8	8	12	12	12	12
Ø	2	1	1	3	3	3	3	3	3	5	5	3	5	5	3	3	6	6	

\* Degrees  
NOTE: FOR PRELIMINARY DESIGN PURPOSES ONLY  
DO NOT USE FOR INSTALLATION  
UNLESS PART OF CERTIFIED & APPROVED SUBMITTAL

## TYPICAL SPECIFICATIONS F-25 MEDIUM DUTY AUTOMATIC DRAINAGE (FLAP) (TIDE) GATES

**General**  
The drainage gate shall be designed to allow free outflow and prevent backflow for maximum seating heads up to 25 feet. Gates shall be Waterman Model F-25 or equal.

**Construction**  
The frame shall be cast iron of flatback or spigotback design, with machined seating surface inclined from vertical at minimum of 2½", to assure positive closure. For flatback gates mounted to thimbles or flanges, the gate flange shall be machined and drilled to match.

The cover shall be cast iron, cast in one piece, with reinforcing ribs, designed to withstand the seating head specified. An integral cast on lifting eye shall be provided for manual operation.

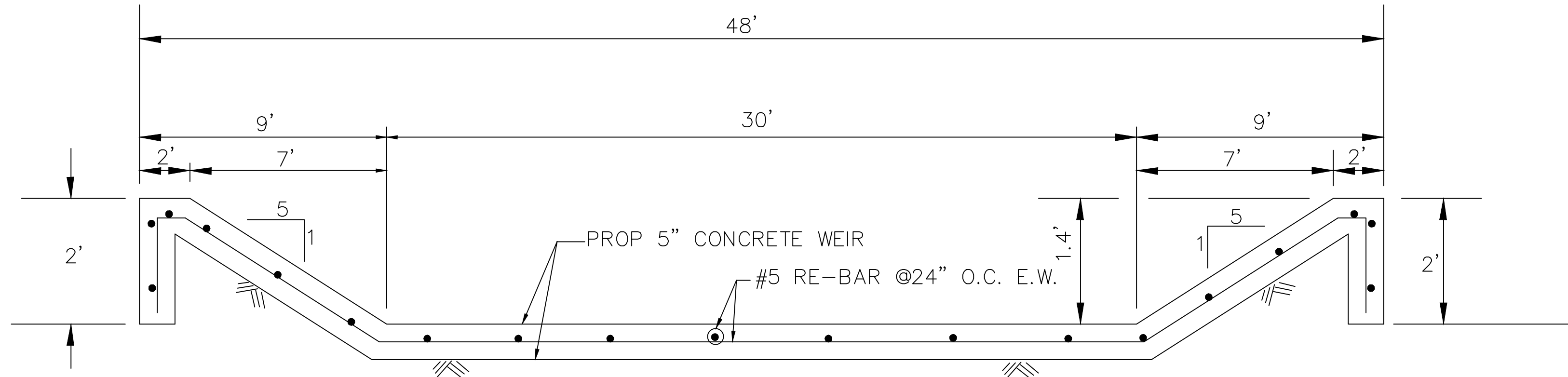
Seating surfaces for frame and cover shall be:  
(bronze on seat and cover) (machined iron on frame, neoprene on cover) (bronze on frame, neoprene on cover)

All machined seats shall have a minimum 63 microinch finish.

The gate shall be provided with adjustable, double pivoted hinge links so designed to permit complete seating, full opening, and with stops or other arrangement to prevent cover from rotating sufficiently to become wedged in the open position. Pivot lugs mounted to frame shall be adjustable to allow adjustment of hinge links without having to remove cover from gate. The hinge links shall be bronze-bushed, structural steel (or high strength ductile iron, cast manganese bronze, or wrought stainless steel). All assembly hardware shall be type 18-8 stainless steel.

**Finish**  
All cast iron shall be painted with manufacturer's standard shopcoat paint (or special paint). Structural steel hinge links shall be galvanized. All bronze and stainless steel parts do not require further finish.

**Materials**  
Frame and Cover - Cast Iron per ASTM A-126, Class B.  
Pivot Lug - Ductile Iron per ASTM A-536, Gr. 65-45-12.  
Hinge Link - Structural Steel per ASTM A-36, galvanized per ASTM A-123.  
Bronze Bushings and Washers - Commercial Bronze.  
Assembly Hardware and Pins - 18-8 Stainless Steel (Type 304).



SECTION B-B  
(NOT TO SCALE)

15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX FIRM NUMBER: F-6932

THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF RODRIGO GUADARRAMA TEXAS REG. NO. 111437 OCTOBER 15, 2025

IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES

## CITY OF HOUSTON HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION POND A

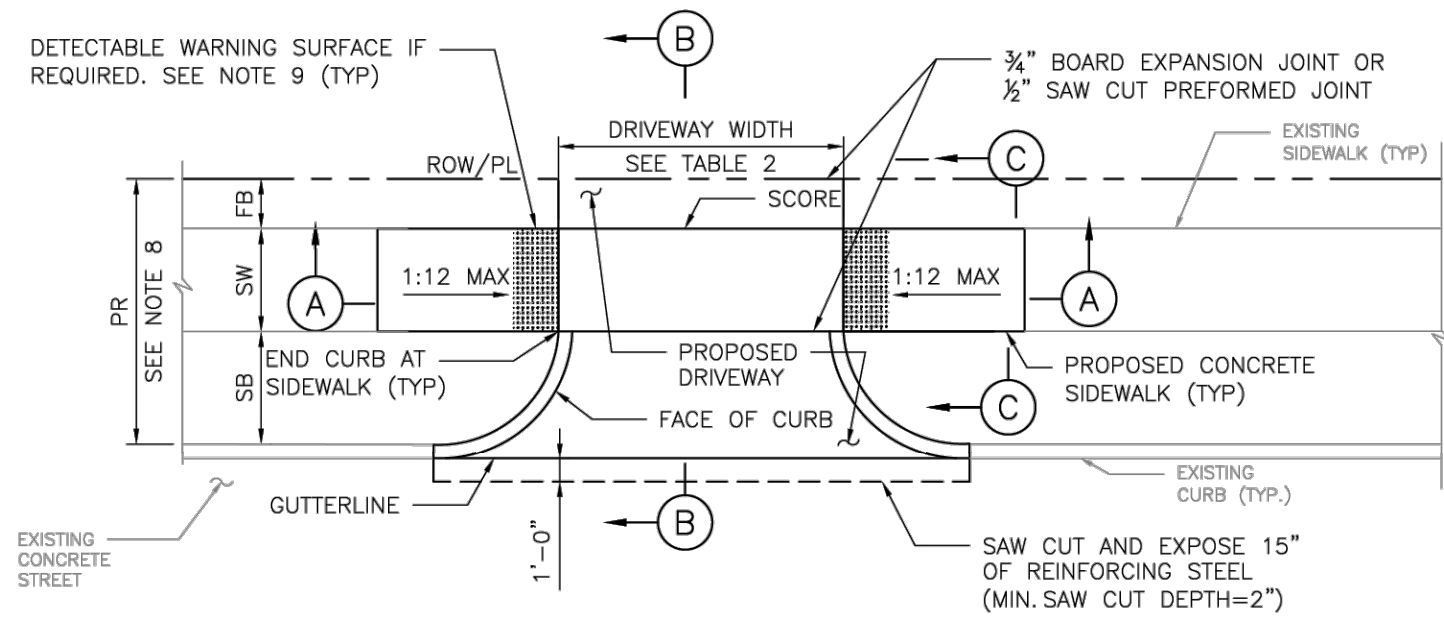
MISCELLANEOUS DETAILS

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 24 OF 42	

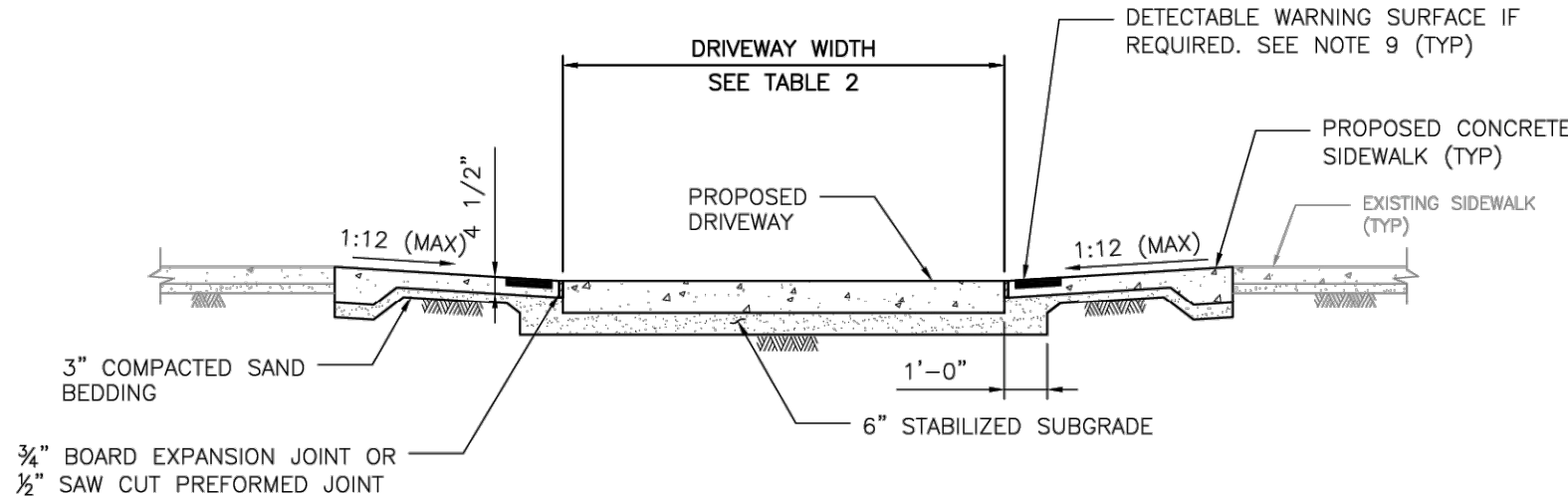


DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. THE DESIGN REQUIREMENTS ON THIS STANDARD DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY CONCERNS ASSOCIATED WITH THEIR USE. THE ENGINEER OF RECORD (EOR) IS TO REVIEW THESE DESIGN REQUIREMENTS AND BY AUTHORIZING THEIR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

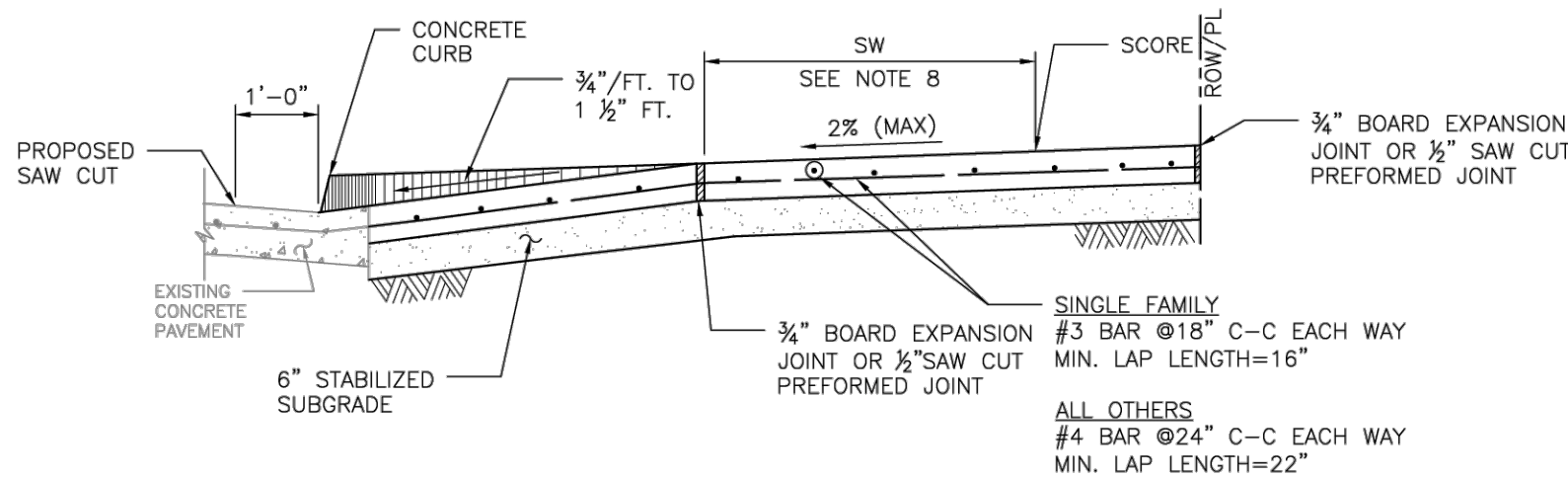
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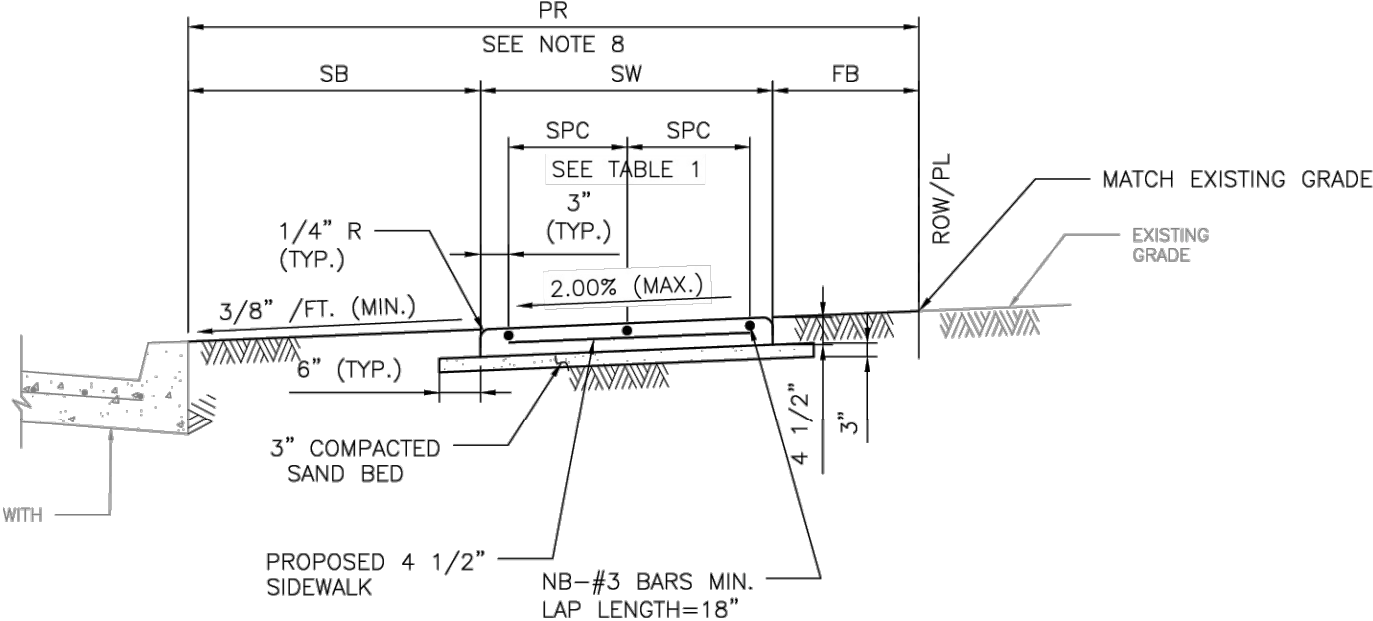
PLAN VIEW  
DRIVEWAY



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



SECTION B-B  
TYPICAL DRIVEWAY SECTION



SECTION C-C  
TYPICAL SIDEWALK SECTION

TABLE 1

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

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

TABLE 2

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

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

NOTES:

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

APPROVED BY:  Suleat Hanwar CITY ENGINEER	APPROVED BY:  Haring Nauhen CITY TRAFFIC ENGINEER
--	--

APPROVED BY:  Carl Haddock DIRECTOR OF HOUSTON PUBLIC WORKS
--

EFF DATE: NOV-27-2023	DWG NO: 02754-01B
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CITY OF HOUSTON  
HOUSTON PUBLIC WORKS STANDARD

DRIVEWAY DETAIL WITH 6"  
CURBED STREETS

	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
NOT TO SCALE	

**ENTECH**  
CIVIL ENGINEERS, INC.  
15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX FIRM NUMBER: F-6932  
SURVEYED BY: LANDECH, INC.  
FB NO. P-6331

THIS DOCUMENT IS  
RELEASED FOR PURPOSE  
OF INTERIM REVIEW UNDER  
THE AUTHORITY OF  
RODRIGO GUADARRAMA  
TEXAS REG. NO. 111437  
OCTOBER 15, 2025

IT IS NOT TO BE USED  
FOR CONSTRUCTION  
PURPOSES

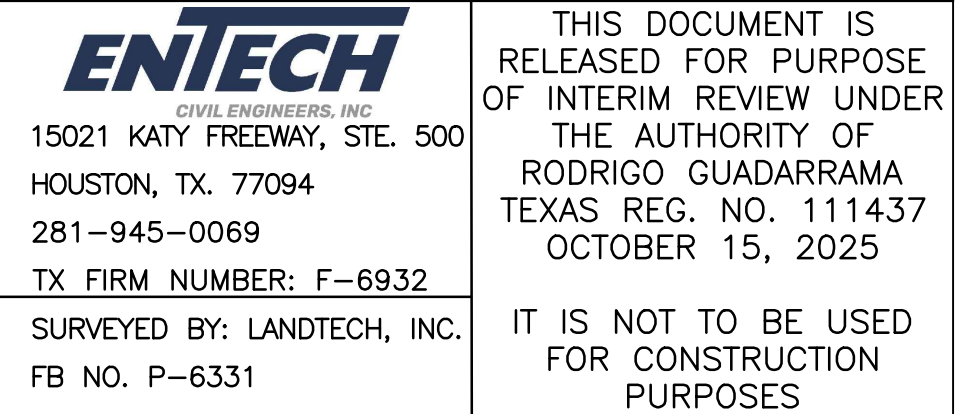
CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

DRIVEWAY DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 25 OF 42	

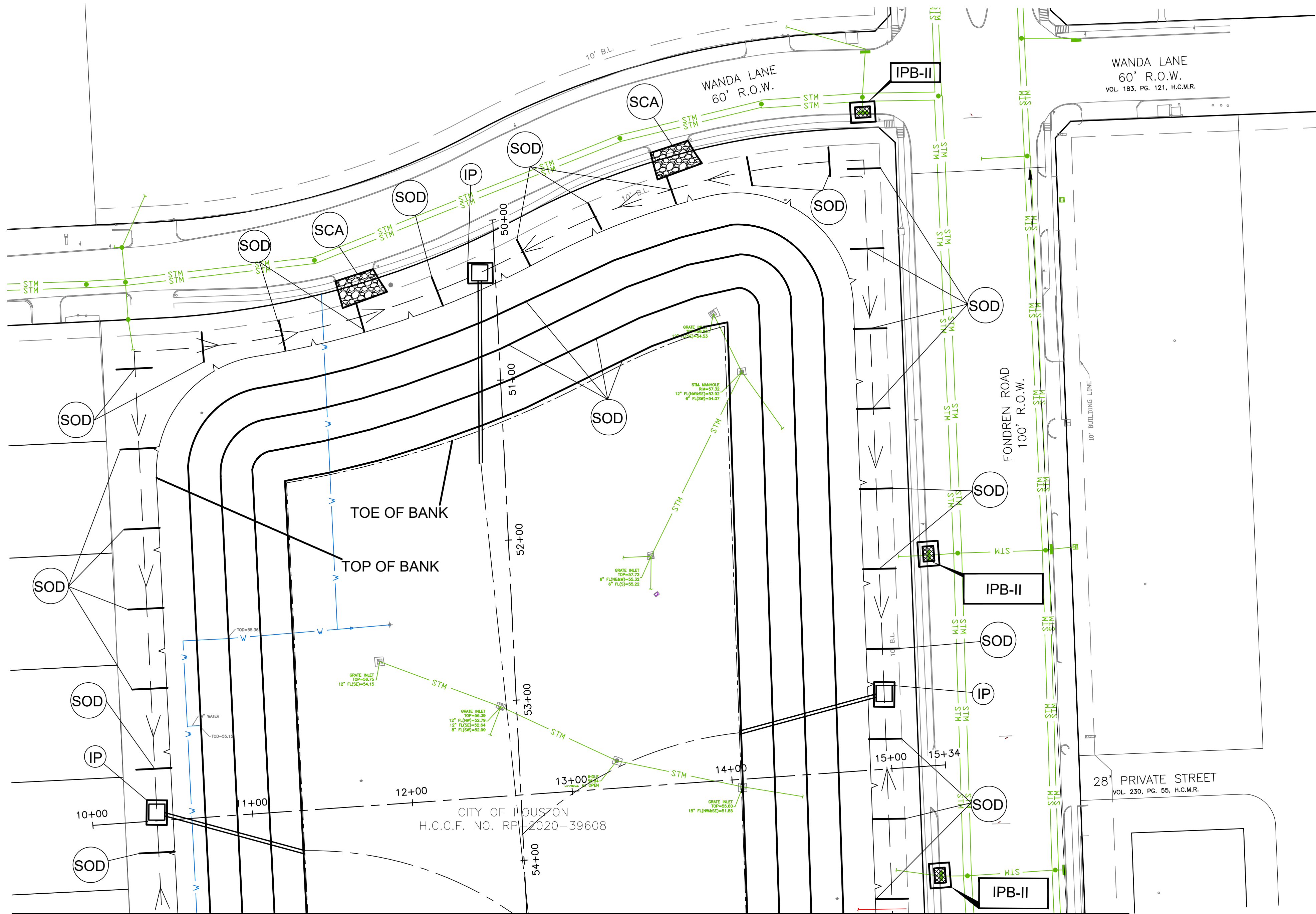




### CONSTRUCTION SIGN DETAIL

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE P.E.	
SHEET NO. 26 OF 42	





MATCH LINE A-A

NOTE

1. INSTALLATION OF STORM POLLUTION PREVENTION STRUCTURES FOR BACKSLOPE SWALES MUST BE COMPLETE BEFORE CONSTRUCTION OPERATIONS TAKE PLACE. (CLEARING AND GRUBBING OPERATIONS MAY TAKE PLACE CONCURRENTLY WITH THE INSTALLATION OF POLLUTION PREVENTION STRUCTURES)
2. STORM POLLUTION PREVENTION STRUCTURES SHOWN WILL REMAIN IN PLACE UNTIL ENGINEER ACCEPTS CONSTRUCTION IS COMPLETED. CERTAIN CIRCUMSTANCES MAY REQUIRE STORM POLLUTION PREVENTION MEASURES TO REMAIN IN PLACE UNTIL SITE HAS BEEN PERMANENTLY STABILIZED WITH VEGETATION. CONCRETE PAVING, RIPRAP, OR ARTICULATED CONCRETE BLOCK.
3. ONLY TYPICAL EROSION AND SEDIMENTATION CONTROL STRUCTURES AND LOCATIONS ARE SHOWN. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS OF TPDES CONSTRUCTION GENERAL PERMIT. IF WASHING IS DONE AT CONSTRUCTION ACCESS POINT, CONTRACTOR WILL INSTALL SEDIMENT TRAPS TO CONTROL WASH WATER SEDIMENT. COST OF SEDIMENT TRAPS ARE INCIDENTAL TO STABILIZED CONSTRUCTION ACCESS.
4. OFF-SITE TRACKING OF SEDIMENT SHALL BE MINIMIZED. SEDIMENT TRACKED OFF-SITE SHALL BE REMOVED IMMEDIATELY AND DISPOSED OF BY CONTRACTOR AT HIS EXPENSE AT AN APPROVED LOCATION.
5. REINFORCED SILT FENCE SHALL BE USED AROUND ALL STOCKPILES. DISTURBED AREAS, AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION AND HAVE THE POTENTIAL FOR STORM POLLUTION ENTERING THE DRAINAGE SYSTEM.
6. INSTALL SOD AROUND THE BACKSLOPE INTERCEPTOR, ACROSS THE SWALES AND ALONG THE SLOPES OF THE CHANNEL.
7. SCAs NEED TO BE PROVIDED AT ALL ACCESS POINTS. ALTERNATE ACCESS POINTS NEED TO BE APPROVED BY THE HCFCD ENGINEER.

LEGEND

- IPB-I INLET PROTECTION BARRIER STAGE I
- IPB-II INLET PROTECTION BARRIER STAGE II
- SCA STABILIZED CONSTRUCTION ACCESS
- IP INTERCEPTOR STRUCTURE & INLET PROTECTION
- SOD SODDING
- FD-2 ROCK FILTER DAM
- FLOW DIRECTION
- FLOATING TURBIDITY CURTAINS

**ISANI**  
civil \ design \ engineers  
10448 Westoffice Drive  
Houston, Texas 77042  
P 713 747 2399  
F 713 748 3748  
TBPE Firm Reg. #4575

INTERIM REVIEW ONLY  
DOCUMENT INCOMPLETE,  
NOT INTENDED FOR PERMIT,  
BIDDING OR CONSTRUCTION  
ENGINEER: RAHUL B. MENON, P.E.  
P.E. Reg No: 130533  
DATE: JUNE 2023

SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

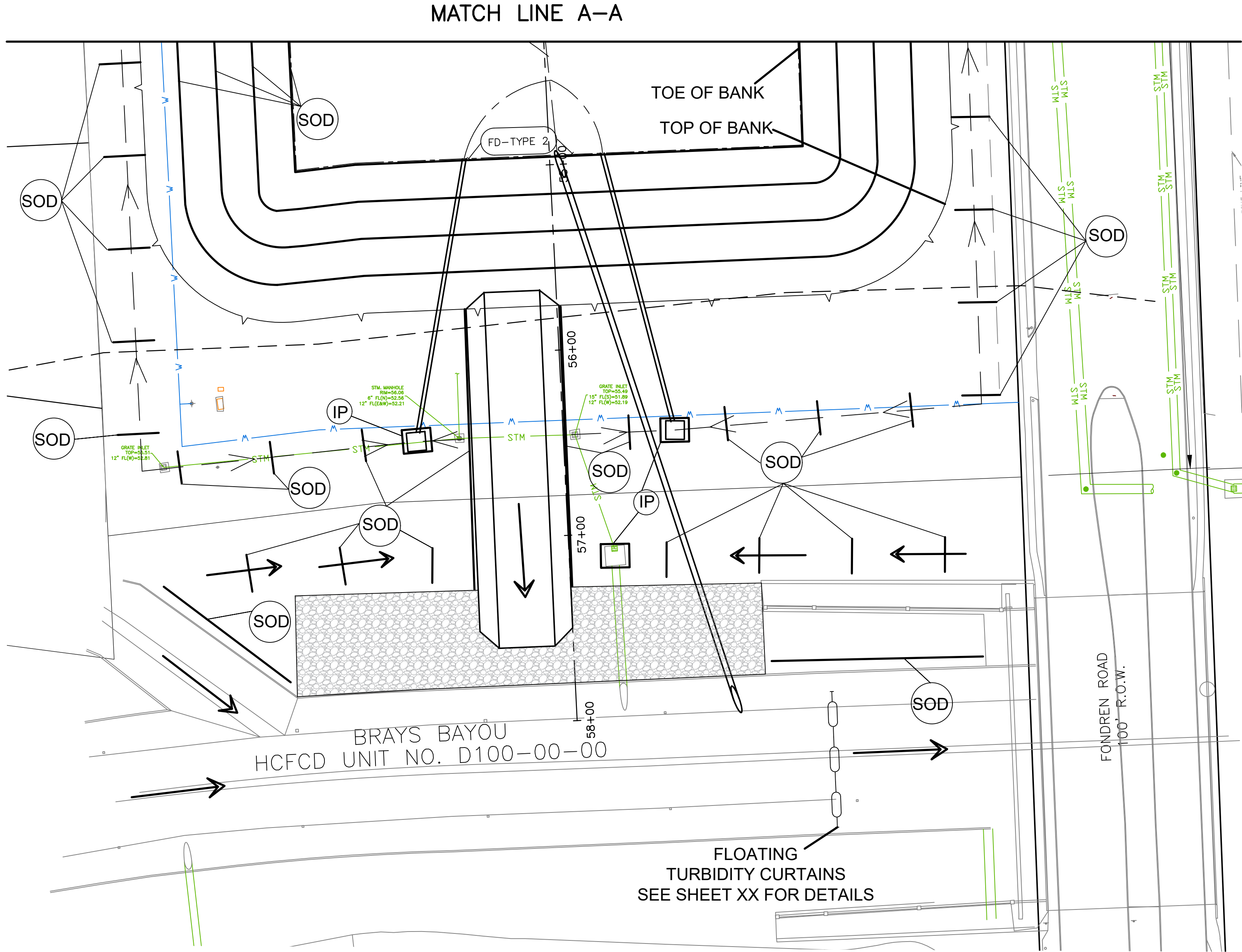
STORMWATER POLLUTION  
PREVENTION PLAN LAYOUT  
SHEET 1 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 27 OF 42	



NOTE

- INSTALLATION OF STORM POLLUTION PREVENTION STRUCTURES FOR BACKSLOPE SWALES MUST BE COMPLETE BEFORE CONSTRUCTION OPERATIONS TAKE PLACE. (CLEARING AND GRUBBING OPERATIONS MAY TAKE PLACE CONCURRENTLY WITH THE INSTALLATION OF POLLUTION PREVENTION STRUCTURES)
- STORM POLLUTION PREVENTION STRUCTURES SHOWN WILL REMAIN IN PLACE UNTIL ENGINEER ACCEPTS CONSTRUCTION IS COMPLETED. CERTAIN CIRCUMSTANCES MAY REQUIRE STORM POLLUTION PREVENTION MEASURES TO REMAIN IN PLACE UNTIL SITE HAS BEEN PERMANENTLY STABILIZED WITH VEGETATION. CONCRETE PAVING, RIPRAP, OR ARTICULATED CONCRETE BLOCK.
- ONLY TYPICAL EROSION AND SEDIMENTATION CONTROL STRUCTURES AND LOCATIONS ARE SHOWN. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS OF TPDES CONSTRUCTION GENERAL PERMIT. IF WASHING IS DONE AT CONSTRUCTION ACCESS POINT, CONTRACTOR WILL INSTALL SEDIMENT TRAPS TO CONTROL WASH WATER SEDIMENT. COST OF SEDIMENT TRAPS ARE INCIDENTAL TO STABILIZED CONSTRUCTION ACCESS.
- OFF-SITE TRACKING OF SEDIMENT SHALL BE MINIMIZED. SEDIMENT TRACKED OFF-SITE SHALL BE REMOVED IMMEDIATELY AND DISPOSED OF BY CONTRACTOR AT HIS EXPENSE AT AN APPROVED LOCATION.
- REINFORCED SILT FENCE SHALL BE USED AROUND ALL STOCKPILES, DISTURBED AREAS, AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION AND HAVE THE POTENTIAL FOR STORM POLLUTION ENTERING THE DRAINAGE SYSTEM.
- INSTALL SOD AROUND THE BACKSLOPE INTERCEPTOR, ACROSS THE SWALES AND ALONG THE SLOPES OF THE CHANNEL.
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LEGEND

- IPB-I** INLET PROTECTION BARRIER STAGE I
- IPB-II** INLET PROTECTION BARRIER STAGE II
- SCA** STABILIZED CONSTRUCTION ACCESS
- IP** INTERCEPTOR STRUCTURE & INLET PROTECTION
- SOD** SODDING
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civil \ design \ engineers  
 10448 Westoffice Drive  
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 ENGINEER: RAHUL B. MENON, P.E.  
 P.E. Reg No: 130533  
 DATE: JUNE 2023

SURVEYED BY: LANDTECH, INC.  
 FB NO. P-6331

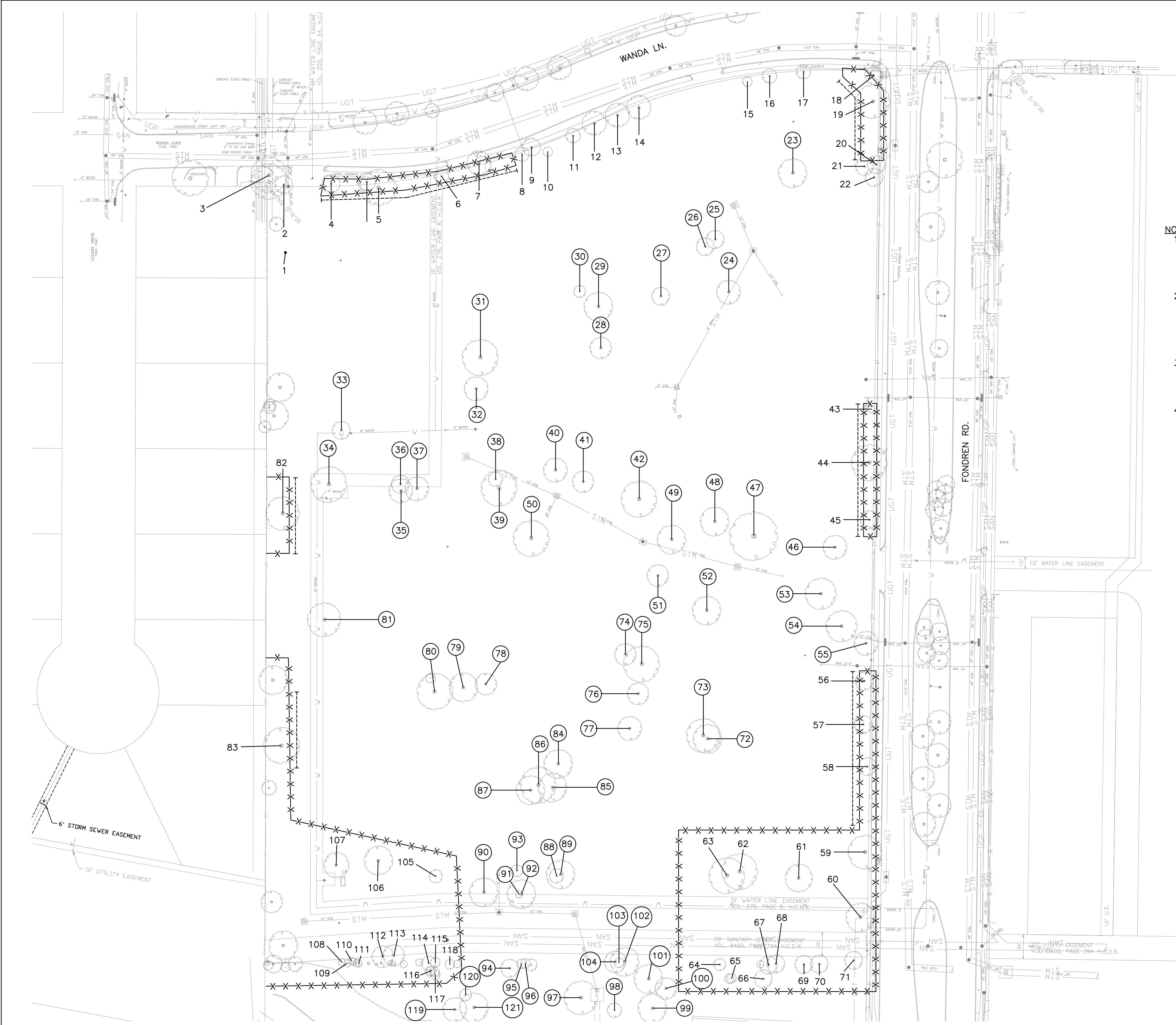
**CITY OF HOUSTON**  
 HOUSTON PUBLIC WORKS

**SHARPSTOWN AREA DETENTION POND A**

STORMWATER POLLUTION PREVENTION PLAN LAYOUT  
 SHEET 2 OF 2

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 28 OF 42	





- NOTE:**
- 1.THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JUNE 2025. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915.
  - 2.CN KOEHL URBAN FORESTRY, INC. HAS NOT BEEN CONTRACTED TO COMPLETE ANY TREE RISK ASSESSMENTS ON THIS PROJECT—THIS TTP INCLUDES PROTECTION MEASURES FOR SPECIES OF TREES PROTECTED BY APPLICABLE ORDINANCE ONLY. CN KOEHL URBAN FORESTRY, INC. DOES NOT GUARANTEE CONDITION OR STRUCTURAL INTEGRITY OF ANY TREE LOCATED ON OR ADJACENT TO THIS PROJECT.
  - 3.IN AREAS WHERE INDIVIDUAL TREES HAVE NOT BEEN TIED IN BY SURVEY, APPROXIMATE LOCATION IS INDICATED ON TPP WITH A DOT AND TREE NUMBER. ACCURACY OF REPRESENTED LOCATION IS NOT GUARANTEED BY CN KOEHL URBAN FORESTRY, INC.
  - 4.THE CONTRACTOR'S ARBORIST WILL MARK LOCATIONS OF TREES TO BE PLANTED AND OBTAIN APPROVAL BY CITY ENGINEER AND CITY FORESTER BEFORE PURCHASING OR EXCAVATING PLANTING HOLE OF EACH TREE.

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

**Urban Forestry, Inc.**

210 Stone Bush Ct. • Katy, Texas 77493

281-391-0022 ckoehl@koehlurbanforestry.com

APPROVED:

CIVIL ENGINEERS, INC.

15021 KATY FREEWAY, STE. 500

HOUSTON, TX. 77094

281-945-0069

TX FIRM NUMBER: F-6932

SURVEYED BY: LANDTECH, INC.

FB NO. P-6331

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION POND A

TREE PROTECTION PLAN

SHEET 1 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 29 OF 42	



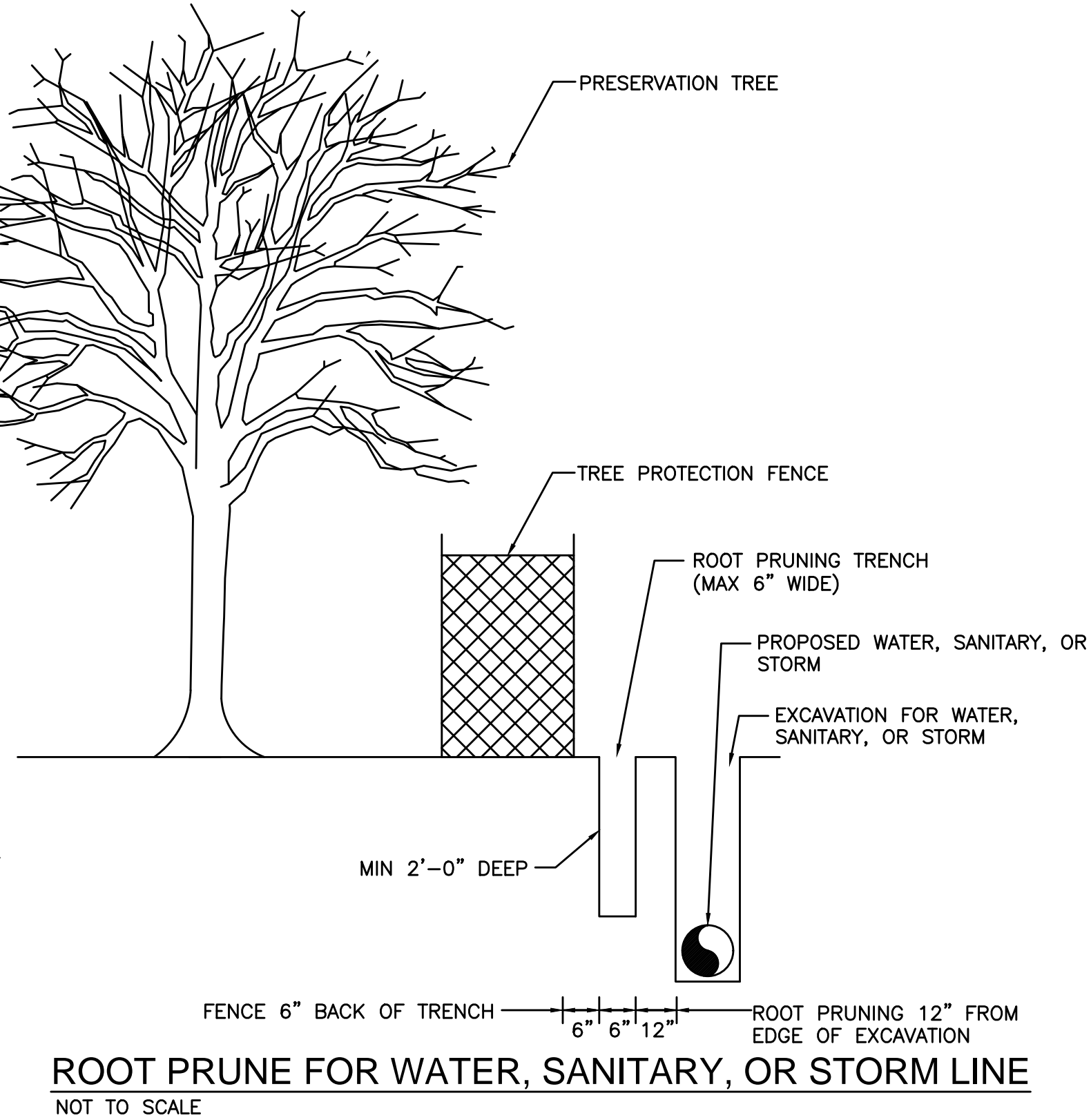
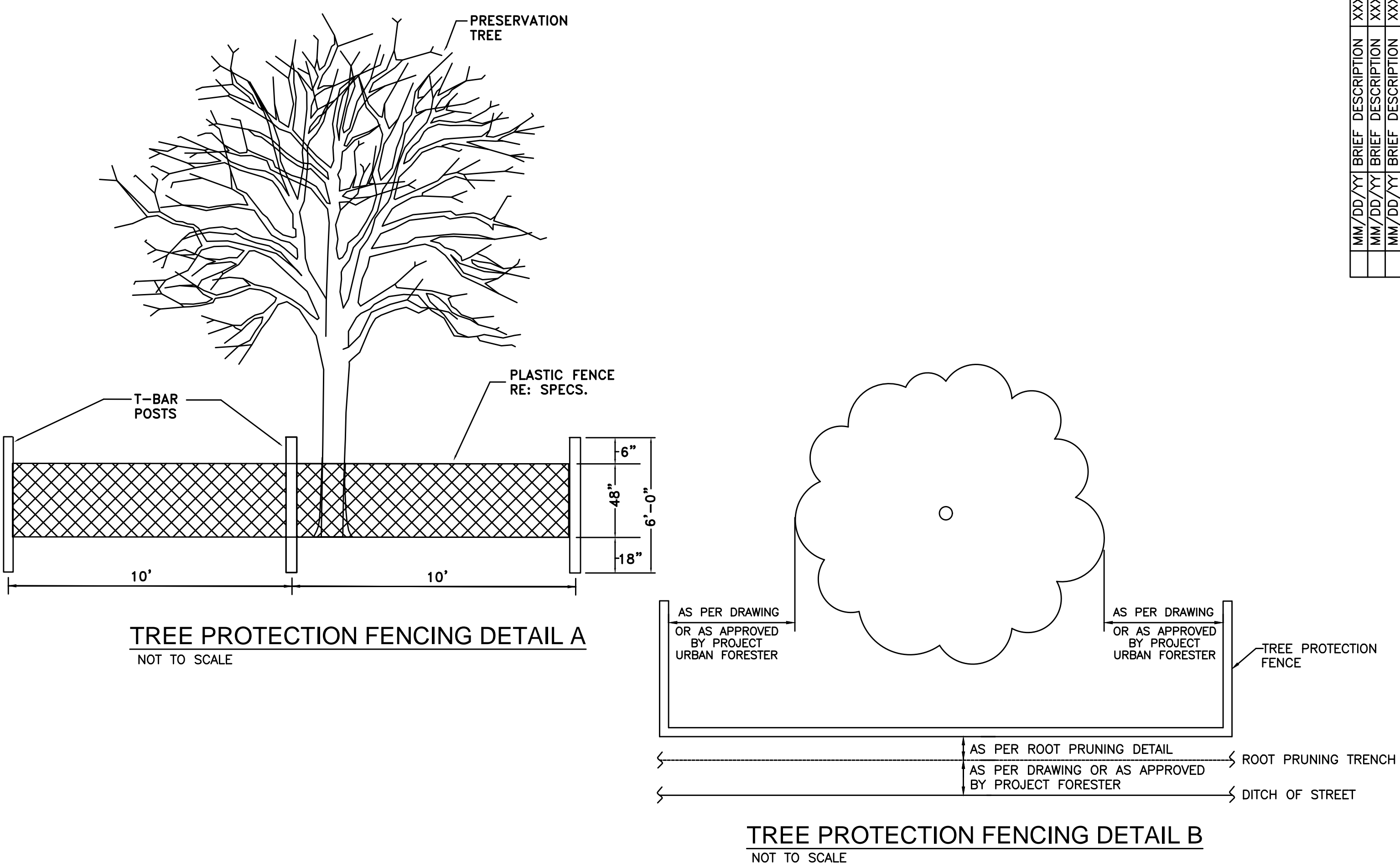
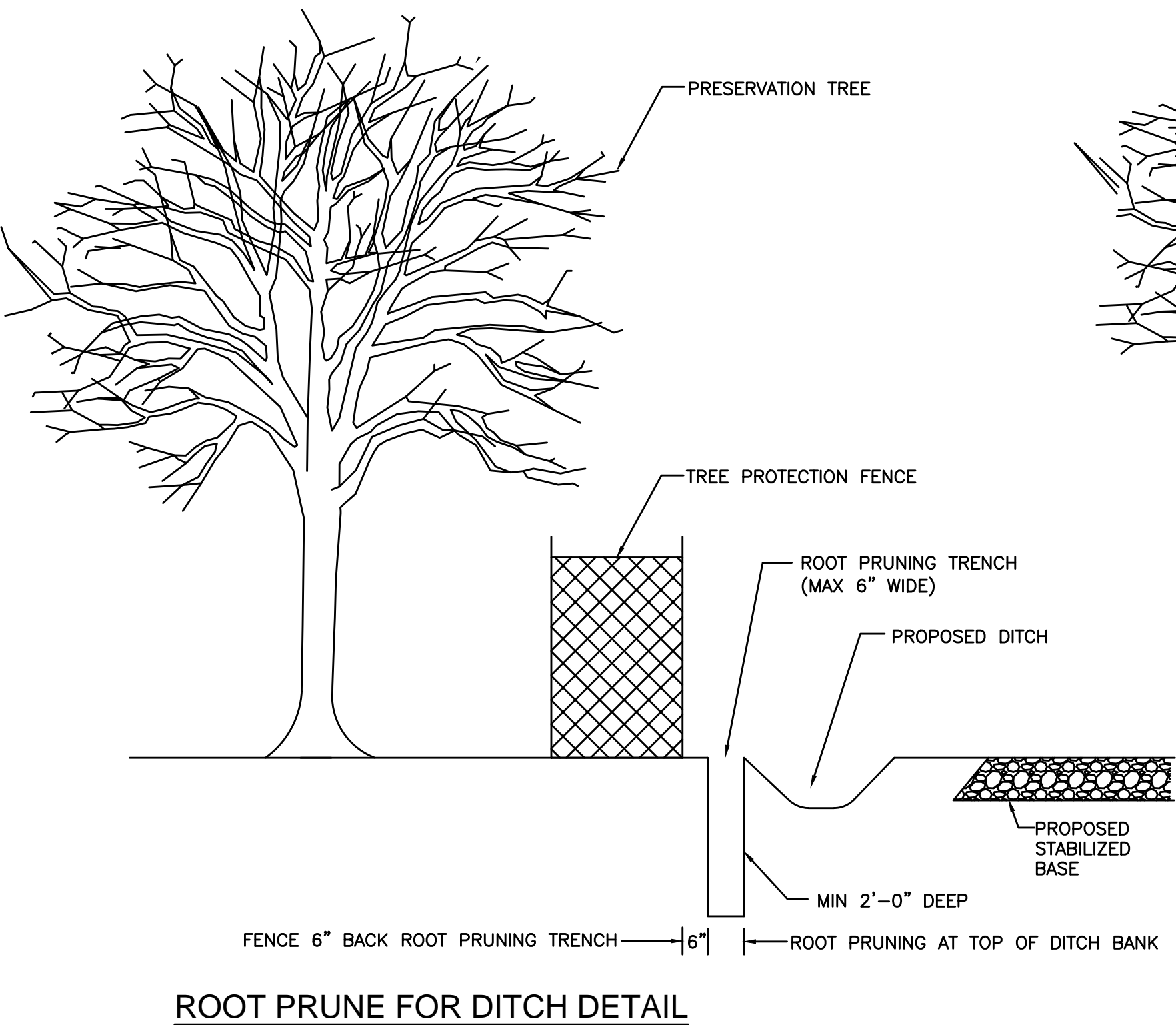




Tree Removal List			
Tree No.	Location	Description	Replacement requirement
23	9100 Fondren Road	22" Arizona Ash	0
24	9100 Fondren Road	15" Bradford Pear	0
25	9100 Fondren Road	10" Holly	0
26	9100 Fondren Road	9" Holly	0
27	9100 Fondren Road	8" Arizona Ash	0
28	9100 Fondren Road	21" Cedar Elm	0
29	9100 Fondren Road	25" Arizona Ash	0
30	9100 Fondren Road	12" Arizona Ash	0
31	9100 Fondren Road	39" Arizona Ash	0
32	9100 Fondren Road	24" Arizona Ash	0
33	9100 Fondren Road	21" Cedar Elm	0
34	9100 Fondren Road	34" Live Oak	0
35	9100 Fondren Road	14" Crepe Myrtle	0
36	9100 Fondren Road	14" Crepe Myrtle	0
37	9100 Fondren Road	14" Crepe Myrtle	0
38	9100 Fondren Road	17" Water Oak	0
39	9100 Fondren Road	28" Live Oak	0
40	9100 Fondren Road	21" Arizona Ash	0
41	9100 Fondren Road	13" Cedar Elm	0
42	9100 Fondren Road	31" Live Oak	0
46	9100 Fondren Road	21" Live Oak	0
47	9100 Fondren Road	39" Live Oak	0
48	9100 Fondren Road	21" Arizona Ash	0
49	9100 Fondren Road	28" Live Oak	0
50	9100 Fondren Road	43" Live Oak	0
51	9100 Fondren Road	38" Live Oak	0
52	9100 Fondren Road	27" Live Oak	0
53	9100 Fondren Road	34" Live Oak	0
54	9100 Fondren Road	38" Cottonwood	0
55	9100 Fondren Road	24" Live Oak	0
72	9100 Fondren Road	20" Green Ash	0
73	9100 Fondren Road	25" Green Ash	0
74	9100 Fondren Road	25" Arizona Ash	0
75	9100 Fondren Road	34" Arizona Ash	0
76	9100 Fondren Road	23" Arizona Ash	0
77	9100 Fondren Road	25" Green Ash	0
78	9100 Fondren Road	24" Arizona Ash	0
79	9100 Fondren Road	28" Arizona Ash	0
80	9100 Fondren Road	32" Arizona Ash	0
81	9100 Fondren Road	33" Live Oak	0
84	9100 Fondren Road	23" Arizona Ash	0
85	9100 Fondren Road	31" Arizona Ash	0
86	9100 Fondren Road	35" Arizona Ash	0
87	9100 Fondren Road	22" Arizona Ash	0
88	9100 Fondren Road	14" Cedar Elm	0
89	9100 Fondren Road	31" Willow Oak	0
90	9100 Fondren Road	22" Live Oak	0
91	9100 Fondren Road	9" Cedar Elm	0
92	9100 Fondren Road	25" Live Oak	0
93	9100 Fondren Road	11" Cedar Elm	0
94	9100 Fondren Road	16" Sugarberry	0
95	9100 Fondren Road	13" Sugarberry	0
96	9100 Fondren Road	11" Sugarberry	0
97	9100 Fondren Road	18" Sugarberry	0
98	9100 Fondren Road	9" Sugarberry	0
99	9100 Fondren Road	17" Arizona Ash	0
100	9100 Fondren Road	14" Arizona Ash	0
101	9100 Fondren Road	13" Arizona Ash	0
102	9100 Fondren Road	18" Arizona Ash	0
103	9100 Fondren Road	12" Sugarberry	0
104	9100 Fondren Road	11" Sugarberry	0
119	9100 Fondren Road	17" Arizona Ash	0
120	9100 Fondren Road	9" Arizona Ash	0
121	9100 Fondren Road	11" Arizona Ash	0
TOTAL REPLACEMENT INCHES REQUIRED			0

Tree Replacement List			
Quantity	Caliper Size	Species	Container/Tree Spade size
TOTAL REPLACEMENT INCHES INCLUDED IN PLAN			0
NOTE: Tree replacement locations are not shown on plans. Contractor must coordinate with City of Houston Urban Forestry and Houston Public Works prior to PURCHASING trees. This project may not have adequate room for all required replacement trees without creating regulatory sign or traffic/pedestrian visibility issues. Number of trees and planting locations will be determined by City of Houston Urban Forestry in construction phase. Trees that are planted are to be maintained and watered for 2 years following planting per standard spec 02915. Timing of planting may be delayed in periods of drought with mandatory water restrictions in place-timing to be coordinated with City of Houston Urban Forestry. Trees in esplanade groupings to be planted in common bed with 4" of hardwood mulch between trees.			
Trees are to be maintained and watered for 2 years following planting per standard spec 02915. Timing of planting may be delayed in periods of drought with mandatory water restrictions in place-timing to be coordinated with City of Houston Forestry.			
Tree replacement locations shall comply with Houston Public Works spec sections 02811, 02911, 02912, 02915, 02921 & 02922. In general trees along sides of street right of ways shall be no closer than 3' to back of curb or 20' from another tree. Trees in medians shall be no closer than 6' back of curb, 75' from an intersection, 50' to a median cut, or 20' from another tree. Contractor to coordinate locations with City Forestry and HPW prior to PURCHASING trees. All replacement trees called out on plans may not be planted on project relative to coordination with listed parties.			
Cash Allowance Due Parks from HPW for Balance of Mitigation Not Planted on Project			
	Required Mitigation total	Mitigation rate/inch	
0-5.99"	\$	297.98	\$ -
6-11.99"		496.64	\$ -
12" +		662.19	\$ -
TOTAL REQUIRED MITIGATION FEE			\$ -

Arboriculturally Significant Tree List		
Tree No.	Location	Description
5	9100 Fondren Road	37" Arizona Ash
19	9100 Fondren Road	37" Live Oak
29	9100 Fondren Road	25" Arizona Ash
31	9100 Fondren Road	39" Arizona Ash
32	9100 Fondren Road	24" Arizona Ash
34	9100 Fondren Road	34" Live Oak
39	9100 Fondren Road	28" Live Oak
42	9100 Fondren Road	31" Live Oak
44	9100 Fondren Road	26" Live Oak
47	9100 Fondren Road	35" Live Oak
49	9100 Fondren Road	28" Live Oak
50	9100 Fondren Road	43" Live Oak
51	9100 Fondren Road	38" Live Oak
52	9100 Fondren Road	27" Live Oak
53	9100 Fondren Road	34" Live Oak
54	9100 Fondren Road	38" Cottonwood
55	9100 Fondren Road	24" Live Oak
59	9100 Fondren Road	25" Live Oak
60	9100 Fondren Road	26" Live Oak
62	9100 Fondren Road	28" Arizona Ash
63	9100 Fondren Road	28" Arizona Ash
73	9100 Fondren Road	25" Green Ash
74	9100 Fondren Road	25" Arizona Ash
75	9100 Fondren Road	34" Arizona Ash
77	9100 Fondren Road	25" Green Ash
78	9100 Fondren Road	24" Arizona Ash
79	9100 Fondren Road	28" Arizona Ash
80	9100 Fondren Road	32" Arizona Ash
81	9100 Fondren Road	33" Live Oak
82	9100 Fondren Road	27" Live Oak
83	9100 Fondren Road	25" Live Oak
85	9100 Fondren Road	31" Arizona Ash
86	9100 Fondren Road	35" Arizona Ash
89	9100 Fondren Road	31" Willow Oak
92	9100 Fondren Road	25" Live Oak
Trees Identified by City of Houston Forestry/Parks & Recreation Department as Arboriculturally Significant are identified here and/or in treatment schedule included on TPP sheets. Arboriculturally Significant trees are to be pruned under direct supervision of City of Houston Forestry. Minimal pruning will be allowed for construction equipment access, and in some cases no pruning will be allowed. Contractor must review conditions around and/or under the canopy of Arboriculturally Significant trees and consider restrictions when preparing cost estimate and planning construction equipment that will be necessary to accomplish design installation with minimal to no tree pruning.		



C.N. Koehl

Urban Forestry, Inc.

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APPROVED:

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CIVIL ENGINEERS, INC.

15021 KATY FREEWAY, STE. 500

HOUSTON, TX. 77094

281-945-0069

TX FIRM NUMBER: F-6932

SURVEYED BY: LANDTECH, INC.

FB NO. P-6331

CITY OF HOUSTON

HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION POND A

TREE PROTECTION PLAN

SHEET 3 OF 3

WBS NUMBER

M-410040-001A-3

DRAWING SCALE

AS NOTED

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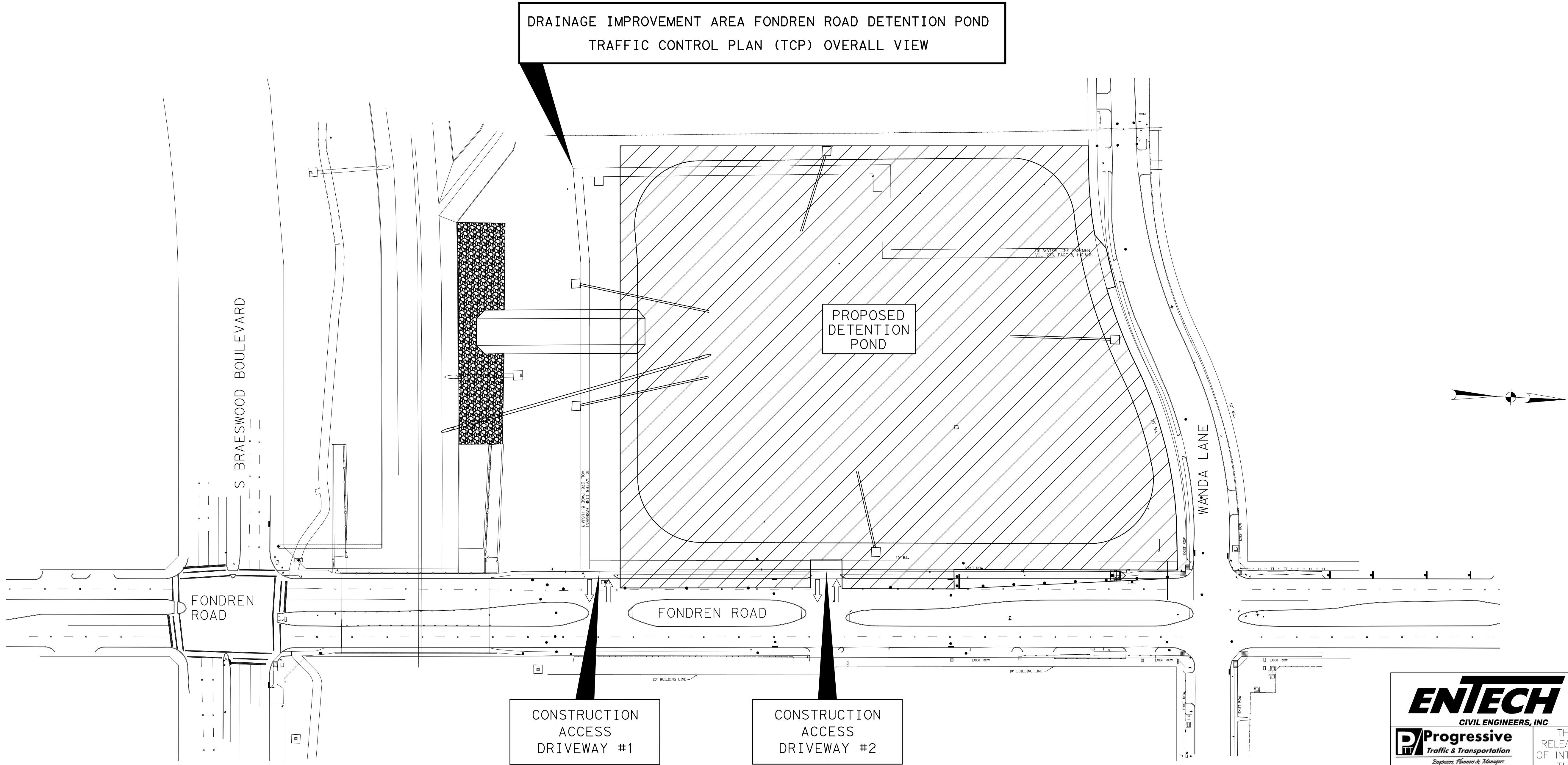
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MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX
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		APP.



**TCP GENERAL NOTES:**

1. THE CONTRACTOR SHALL INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
2. NO CONSTRUCTION IS ALLOWED BETWEEN 4PM AND 9AM MONDAY THROUGH SUNDAY.
3. THE CONTRACTOR SHALL MAINTAIN ALL BUSINESS & RESIDENTIAL DRIVEWAYS, TRAFFIC CONTROL DEVICES, STREET NAME SIGNS, STOP SIGNS, WARNING SIGNS, TEMPORARY AND EXISTING SIGNS DURING THE ENTIRE PERIOD OF CONSTRUCTION. EXISTING SIGN OR STRIPING IN CONFLICT WITH TEMPORARY TRAFFIC CONTROL SIGNS SHALL BE COVERED OR REMOVED.
4. CONTRACTOR TO ENSURE PROPER DRAINAGE TO EXISTING DRAINAGE DITCHES AT ALL TIMES.
5. WHERE PROJECT REQUIREMENTS ARE NOT FULLY SATISFIED BY THE DETAILS SHOWN HEREIN, THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (THE MOST RECENT EDITION) SHALL GOVERN.
6. ALL TEMPORARY SIGNS AND PAVEMENT MARKINGS INSTALLED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE T.M.U.T.C.D., UNLESS SPECIFICALLY DIRECTED BY THE CITY AUTHORIZED OFFICIAL/ENGINEER.
7. THE CONTRACTOR SHALL PROVIDE CERTIFIED FLAGGERS OR AN OFF DUTY POLICE OFFICER TO DIRECT TRAFFIC. THIS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR TAKING ANY ADDITIONAL MEASURES OR PROVIDING PERSONNEL NECESSARY TO PROTECT THE WORK AND THE PUBLIC.

8. CONTRACTOR SHALL ENSURE THAT ALL BARRICADES, SIGNS, CHANNELIZING DEVICES, WARNING LIGHTS, AND TRAFFIC CONTROL DEVICES ARE MAINTAINED IN A CLEAN FUNCTIONAL CONDITION AT ALL TIMES.
9. ALL SIGNS, WARNING DEVICES, AND BARRICADES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR, INCLUDING ACTS OF VANDALISM OR ACCIDENTS.
10. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY AND EXISTING PAVEMENT MARKINGS IN GOOD CONDITION THROUGHOUT THE DURATION OF THE CONTRACT.
11. THE CONTRACTOR SHALL MAINTAIN BARRICADES AND SAFETY FENCES AT EACH SITE WHERE PEDESTRIAN TRAFFIC IS EVIDENT.
12. THE CONTRACTOR SHALL CONDUCT HIS OPERATION IN A MANNER SUCH THAT TRUCKS AND OTHER CONSTRUCTION VEHICLES DO NOT CREATE A DIRT NUISANCE OR SAFETY HAZARD IN ANY PUBLIC OR PRIVATE STREET.
13. ALL BARRICADES, SIGNS, STRIPING, CHANNELIZING DEVICES, AND ALL EQUIPMENT INCIDENTALS, AND ALL LABOR REQUIRED FOR TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR TRAFFIC HANDLING.
14. THE CONTRACTOR IS RESONSIBLE FOR MAINTAINING THE EXISTING SIDEWALK AND/OR PROVIDING A TEMPORARY SIDEWALK.

**CONSTRUCTION SEQUENCE:**

**PROPOSED DETENTION POND CONSTRUCTION ALONG FONDREN ROAD**

1. INSTALL THE PROPOSED ADVANCE CONSTRUCTION WARNING SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLAN (TCP) SHEETS.
2. THE PROJECT STARTS AT APROXIMATELY 340-FT NORTH OF THE SIGNALIZED INTERSECTION OF FONDREN ROAD AT S BRAESWOOD BOULEVARD AND IS ACTIVE THROUGH THE INTERSECTION OF FONDREN ROAD AT WANDA LANE.
3. CONTRACTOR SHALL BLOCK THE OUTSIDE LANE ALONG THE SOUTHBOUND FONDREN ROAD AND ALLOW THE INSIDE LANE FOR SOUTHBOUND FONDREN ROAD THROUGH TRAFFIC.
4. THE CONSTRUCTION WORK ZONE WILL OCCUPY THE OUTSIDE SOUTHBOUND OF FONDREN ROAD. CONSTRUCTION VEHICLES AND EQUIPMENT SHALL ACCESS THE WORK ZONE VIA THE EXISTING ACCESS DRIVEWAYS ALONG SOUTHBOUND FONDREN ROAD, IDENTIFIED AS CONSTRUCTION ACCESS DRIVEWAY #1 AND #2 RESPECTIVELY ON SHEET 2 OF 2.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING COORDINATION WITH THE HOUSTON METRO FOR ALL AFFECTED BUS ROUTES THROUGH ALL PHASES OF CONSTRUCTION.



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SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

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THE AUTHORITY OF  
MOHAMMAD IRFAN  
TEXAS REG. NO. 89333  
SEPTEMBER 25, 2025

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PURPOSES

**CITY OF HOUSTON**  
HOUSTON PUBLIC WORKS

**SHARPSTOWN AREA DETENTION  
POND A**

**TRAFFIC CONTROL PLAN (TCP)  
FONDREN ROAD  
OVERALL PLAN VIEW**

**SHEET 1 OF 1**

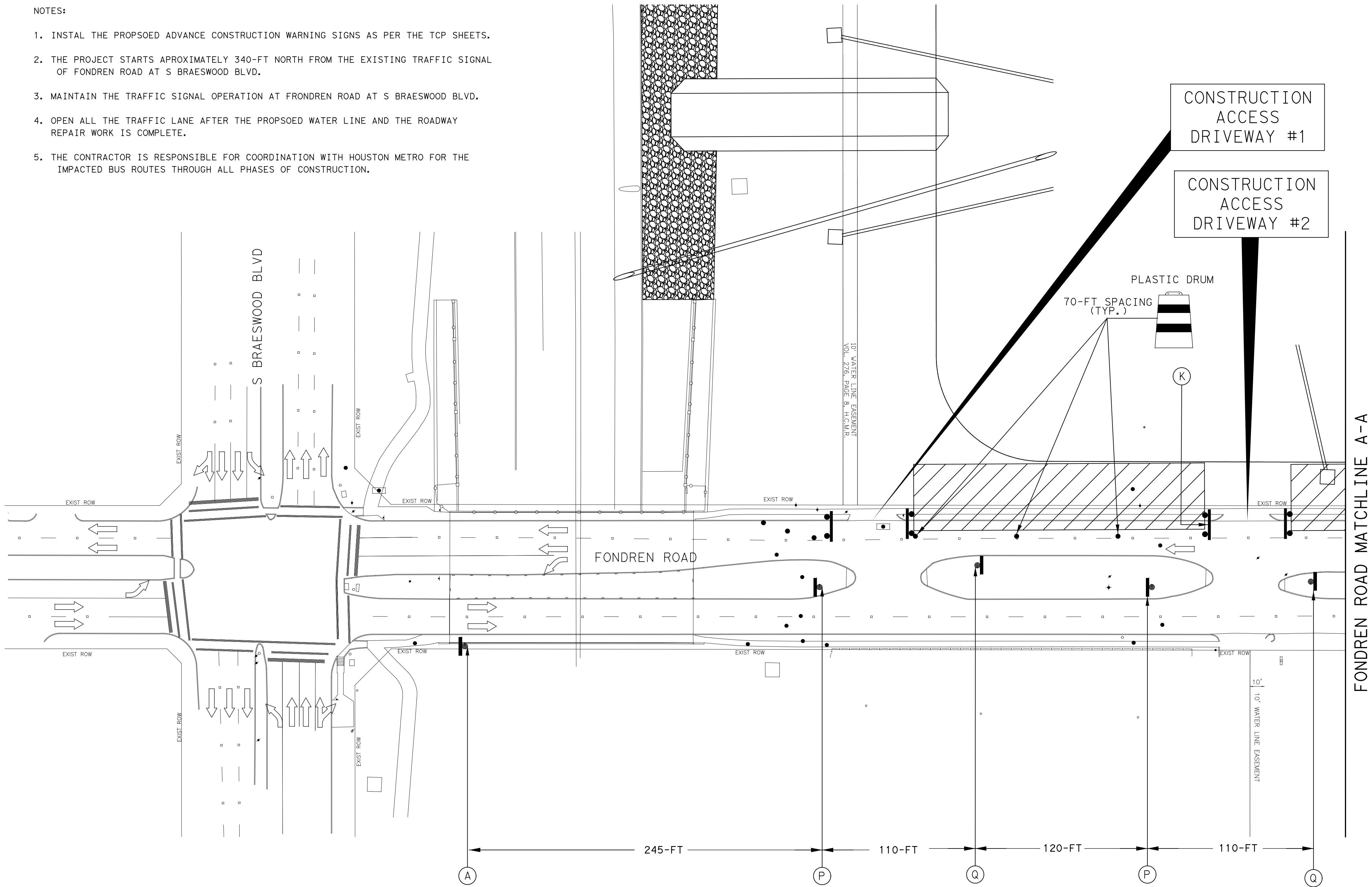
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SHEET NO. 32 OF 42

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NOTES:

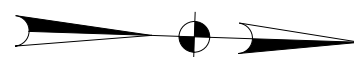
1. INSTAL THE PROPSOED ADVANCE CONSTRUCTION WARNING SIGNS AS PER THE TCP SHEETS.
2. THE PROJECT STARTS APROXIMATELY 340-FT NORTH FROM THE EXISTING TRAFFIC SIGNAL OF FONDREN ROAD AT S BRAESWOOD BLVD.
3. MAINTAIN THE TRAFFIC SIGNAL OPERATION AT FRONDREN ROAD AT S BRAESWOOD BLVD.
4. OPEN ALL THE TRAFFIC LANE AFTER THE PROPSOED WATER LINE AND THE ROADWAY REPAIR WORK IS COMPLETE.
5. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH HOUSTON METRO FOR THE IMPACTED BUS ROUTES THROUGH ALL PHASES OF CONSTRUCTION.



TCP LEGEND:

- CONSTRUCTION AREA
- TY III TRAFFIC BARRIER
- TEMP. GROUND MOUNTED SIGNS
- PLASTIC DRUM
- 36-INCH TRAFFIC CONTROL DELINEATOR
- FLASHING ARROW PANEL
- CERTIFIED FLAGGER/OFF-DUTY OFFICER
- DIRECTION OF TRAVEL

TYPICAL SIGN SPACING & TAPER LENGTH				
Fondren Road Posted Speed (mph)	Sign Spacing (X)	Min. Desirable Taper Length (LF)		
		10' Offset	11' Offset	12' Offset
35	160'	205'	225'	245'



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PURPOSES

**CITY OF HOUSTON**  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A  
FONDREN ROAD  
DETENTION POND  
TRAFFIC CONTROL PLAN (TCP)

SHEET 1 OF 2

FOR CITY OF HOUSTON USE ONLY

WBS NUMBER

M-410040-001A-3

DRAWING SCALE

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CITY OF HOUSTON PM

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SHEET NO. 33 OF 42

<b>(A)</b> ORANGE FLAG (TYPICAL) ROAD WORK AHEAD CW20-1D (36x36)	<b>(B)</b> FONDREN RD M4-12T (VAR X 12)	<b>(C)</b> DETOUR ↑ M4-9S (30x24)	<b>(D)</b> DETOUR → M4-9R (30x24)	<b>(E)</b> DETOUR ← M4-9L (30x24)	<b>(F)</b> END ROAD WORK G20-2a (36 X 18)	<b>(G)</b> R3-2 (24x24)	<b>(H)</b> R3-1 (24x24)	<b>(J)</b> DO NOT ENTER R5-1 (30x30)	<b>(K)</b> ROAD CLOSED R11-2 (48x30)	<b>(L)</b> ORANGE FLAG (TYPICAL) ROAD CLOSED AHEAD CW20-3D (36x36)	<b>(M)</b> RIGHT LANE CLOSED AHEAD CW20-5DR (36x36)	<b>(N)</b> LEFT LANE CLOSED AHEAD CW20-5DL (36x36)	<b>(P)</b> TRUCKS ENTERING ROADWAY CW27-1T (48x48) CW16-5PL (24x18)	<b>(Q)</b> TRUCKS ENTERING ROADWAY CW27-1T (48x48) CW16-5PR (24x18)
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MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX
NO.	DATE	REVISION
		APP.

GENERAL NOTES

- 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.
- ALL SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM THE LATEST VERSION OF THE TMUTCD.
- 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.
- NO WORK SHALL BE PERFORMED IN RESIDENTIAL AREAS FROM 7:00 PM TO 7:00 AM.
- 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.
- CONTRACTOR SHALL MAINTAIN TRAFFIC LANES AND DETOURS ACCORDING TO TRAFFIC CONTROL PLANS DURING WORKING HOURS.
- 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.
- 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.
- CONTRACTOR SHALL SECURE LANE/SIDEWALK/BICYCLE FACILITY CLOSURE PERMITS FROM OFFICE OF CITY ENGINEER (MOBILITY PERMIT SECTION AT <https://geotubb.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.
- CONTRACTOR SHALL HAVE APPROVED TRAFFIC CONTROL PLAN AND PERMIT AT THE JOB SITE FOR INSPECTION AT ALL TIMES.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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 MARKINGS OR SIGNING DAMAGE DURING CONSTRUCTION OPERATIONS, INCLUDING RAISED PAVEMENT MARKERS (RPMs).
- 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.
- 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.
- SPILLAGE RESULTING FROM HAULING OPERATIONS ALONG OR ACROSS ANY PUBLIC TRAVELED WAY SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
- 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.
- 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.
- THE CONTRACTOR SHALL REPLACE WITHIN 72 HOURS, ALL TRAFFIC SIGNAL LOOP DETECTORS DAMAGED DURING CONSTRUCTION.
- 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.
- APPROVED TRAFFIC CONTROL PLAN SHALL BE IN PLACE BEFORE STARTING ANY EXCAVATION.
- 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.
- WATER FILLED BARRIERS MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S REQUIREMENTS AND ROUTINELY INSPECTED FOR DEFECTS.
- IF WATER FILLED BARRIER IS PROVIDED, USE ENVIRONMENTALLY SAFE ANTI-FREEZING AGENT IN THE WATER WHEN IT IS AVAILABLE PER MANUFACTURER SPECIFICATIONS AND RECOVER AGENT WHEN THE BARRIER IS DRAINED.

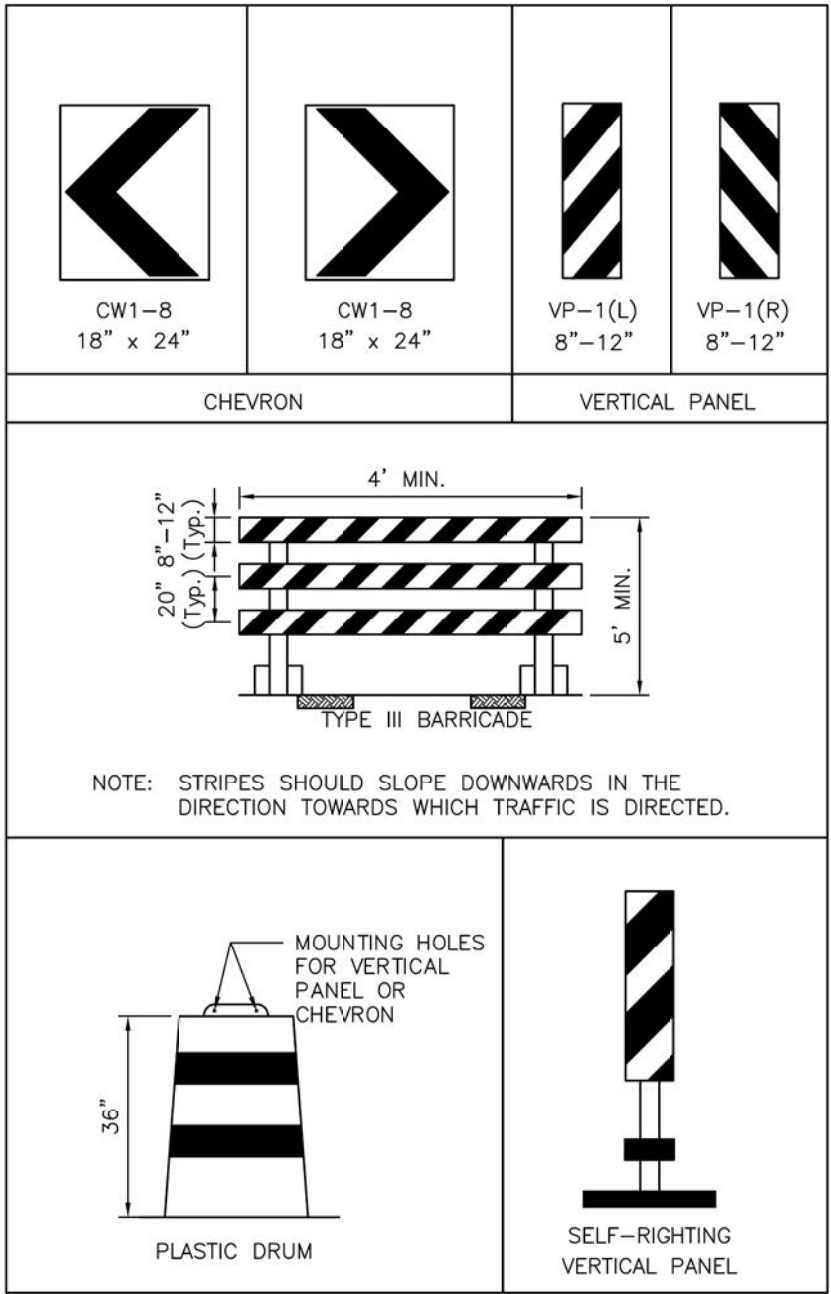
- DISPOSE OF WATER AND AGENT PROPERLY. DO NOT DRAIN WATER FILLED BARRIER INTO OR ACROSS AN EXISTING TRAVEL LANE.
- PROVIDE BARRIER UNITS THAT ARE CAPABLE OF BEING LIFTED AND MOVED WHEN FILLED IF DRAINING IS NOT POSSIBLE.
- PROVIDE WATER FILLED BARRIER THAT ACTS AS ITS OWN FREE STANDING, NON-REDIRECTIVE END TREATMENT.
- 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.
- 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

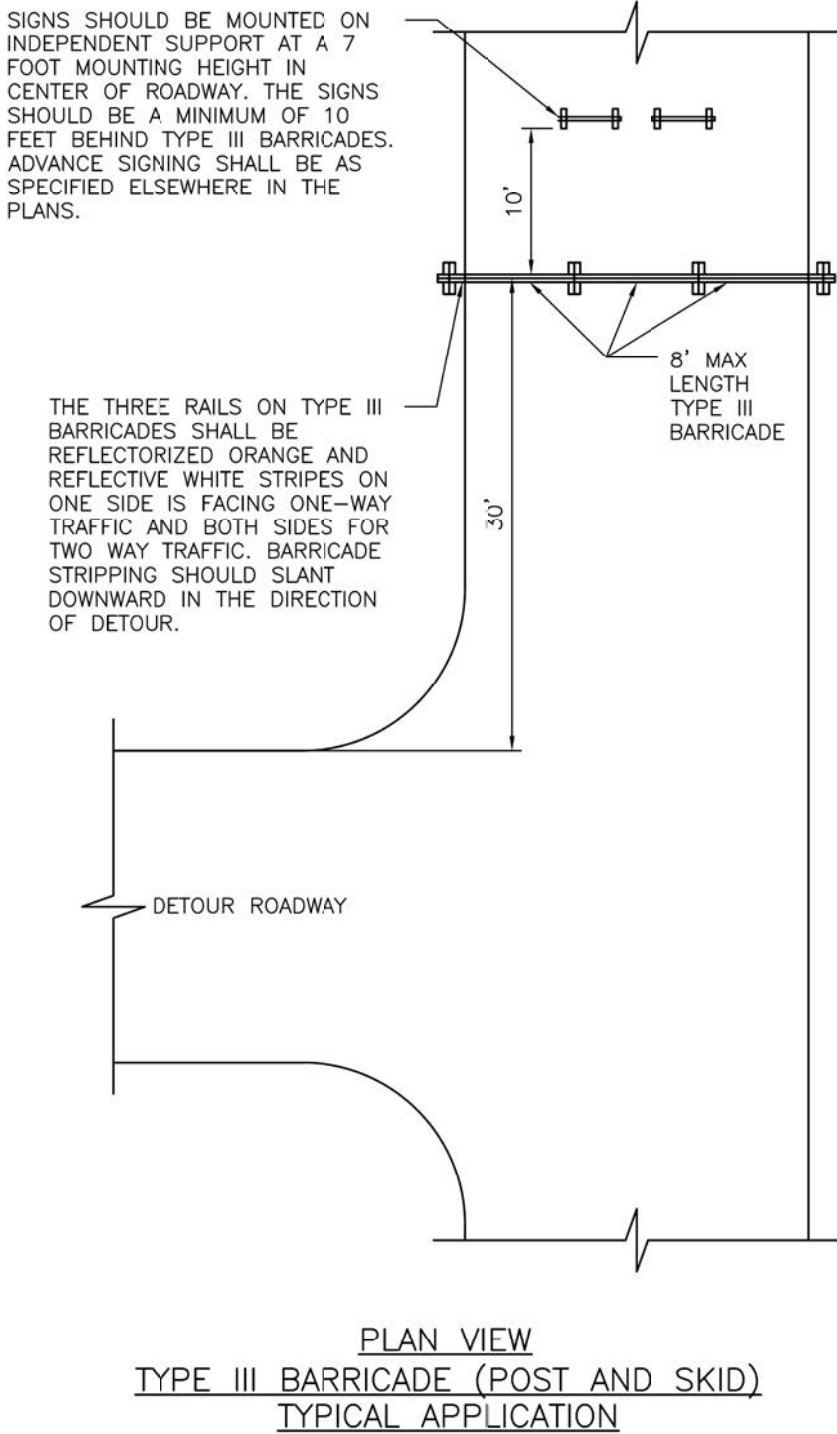
- PLASTIC DRUMS ON MERGING TAPER @ 30' C - C WITH CHEVRON SIGN @ 60' C - C AND WARNING LIGHTS FOR OVERNIGHT CLOSURE.
- PLASTIC DRUMS ON DOWNSTREAM TAPER @ 30' C - C (RETURN TAPER AND BARRICADE ARE OPTIONAL AND DIVIDED ROADWAY SECTION)
- PLASTIC DRUMS ON RADI @ 35' C -C.
- PLASTIC DRUMS ON TANGENT @ 35' C - C WITH VERTICAL PANEL AT 70' C - C AND APPROVED WARNING LIGHT @ 70' C - C (FOR OVERNIGHT CLOSURE).
- 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).
- 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.
- PLASTIC DRUMS W/GUARD RAIL MOUNTED.
- 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.
- SPACING SHOWN ON TRAFFIC CONTROL SHALL SUPERSEDE THE ABOVE SPACING.
- 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

APPROVED BY: Decalsigned by: <i>Sulaiman binwar</i> 0273860346175476	APPROVED BY: Decalsigned by: <i>HAIRING NAUFEN</i> 0542361047584031
CITY ENGINEER	CITY TRAFFIC ENGINEER
APPROVED BY: Decalsigned by: <i>Carroll Hall</i> 0401111111111111	
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	

**ENTECH**  
CIVIL ENGINEERS, INC.

**Progressive**  
Traffic & Transportation  
*Engineers, Planners & Managers*

16360 Park Ten Place, Suite 106  
Houston, Texas, 77064  
281-206-7495  
281-206-7494 FX

F-6932  
15021 Katy Freeway,  
Suite 500  
Houston, Texas, 77094  
281-945-0069 PH  
281-945-0061 FX

THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF MOHAMMAD IRFAN TEXAS REG. NO. 89333 SEPTEMBER 25, 2025

SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

CITY OF HOUSTON  
HOUSTON PUBLIC WORKS




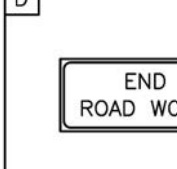
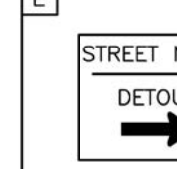
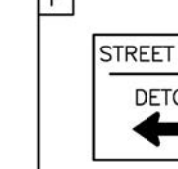
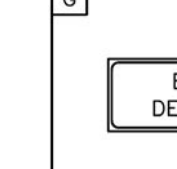
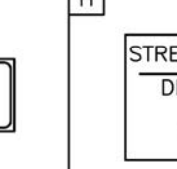


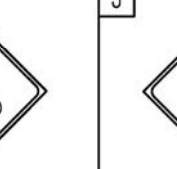

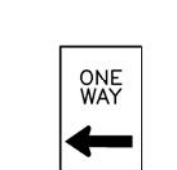
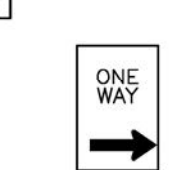
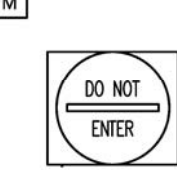
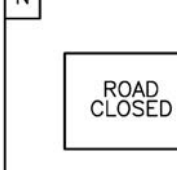
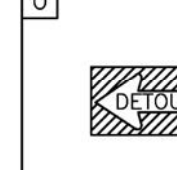
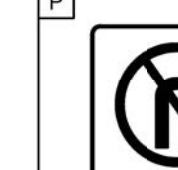

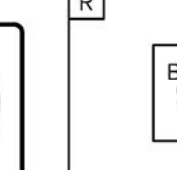
SHARPSTOWN AREA DETENTION POND A

TRAFFIC CONTROL PLAN  
STANDARD DETAILS  
SHEET 1 OF 3









WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 35 OF 42	



MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX
MM/DD/YY	BRIEF DESCRIPTION	XXX
NO.	DATE	APP.

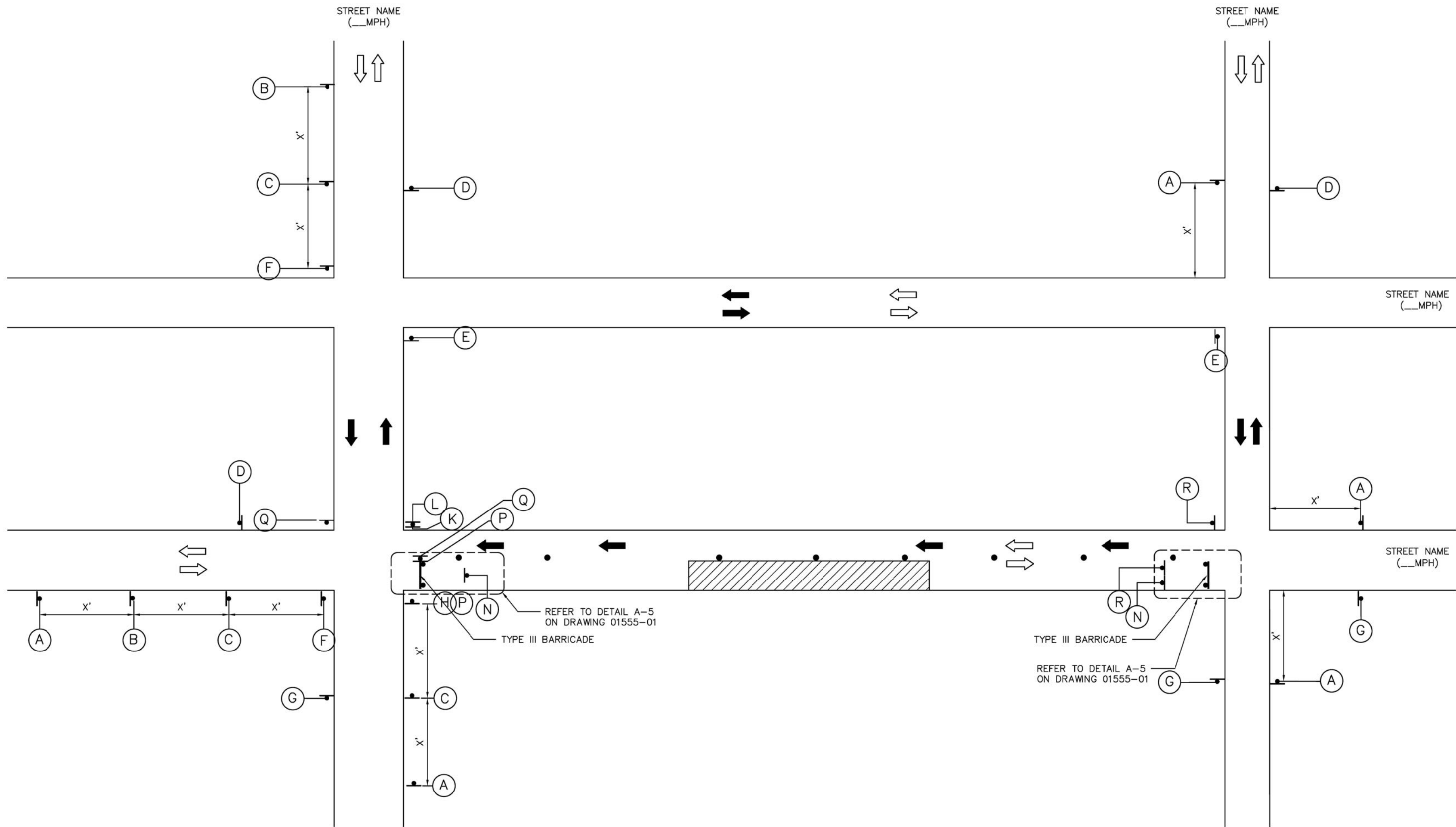
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K	 R6-2(L)	L	 R6-2(R)	M	 R5-1	N	 R11-2	O	 M4-10(L)	P	 R3-1	Q	 R3-2	R	 R6-6				

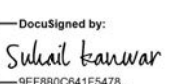
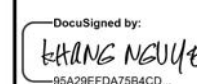
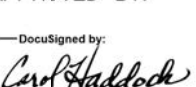
LEGEND:


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

NOTES:

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



APPROVED BY:  CITY ENGINEER	APPROVED BY:  CITY TRAFFIC ENGINEER
APPROVED BY:  DIRECTOR OF HOUSTON PUBLIC WORKS	
EFF DATE: NOV-27-2023	DWG NO: 01555-05
CITY OF HOUSTON HOUSTON PUBLIC WORKS STANDARD	
TCP TYPICAL DETOUR ROUTING WITH ONE LANE CLOSURE (ONE BLOCK)	
FOR CITY OF HOUSTON USE ONLY	
DRAWING SCALE	
NOT TO SCALE	



F-6932  
15021 Katy Freeway,  
Suite 500  
Houston, Texas, 77094  
281-945-0069 PH  
281-945-0061 FX

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OF INTERIM REVIEW UNDER  
THE AUTHORITY OF  
MOHAMMAD IRFAN  
TEXAS REG. NO. 89333  
SEPTEMBER 25, 2025

IT IS NOT TO BE USED  
FOR CONSTRUCTION  
PURPOSES

**CITY OF HOUSTON**  
HOUSTON PUBLIC WORKS

**SHARPSTOWN AREA DETENTION  
POND A**

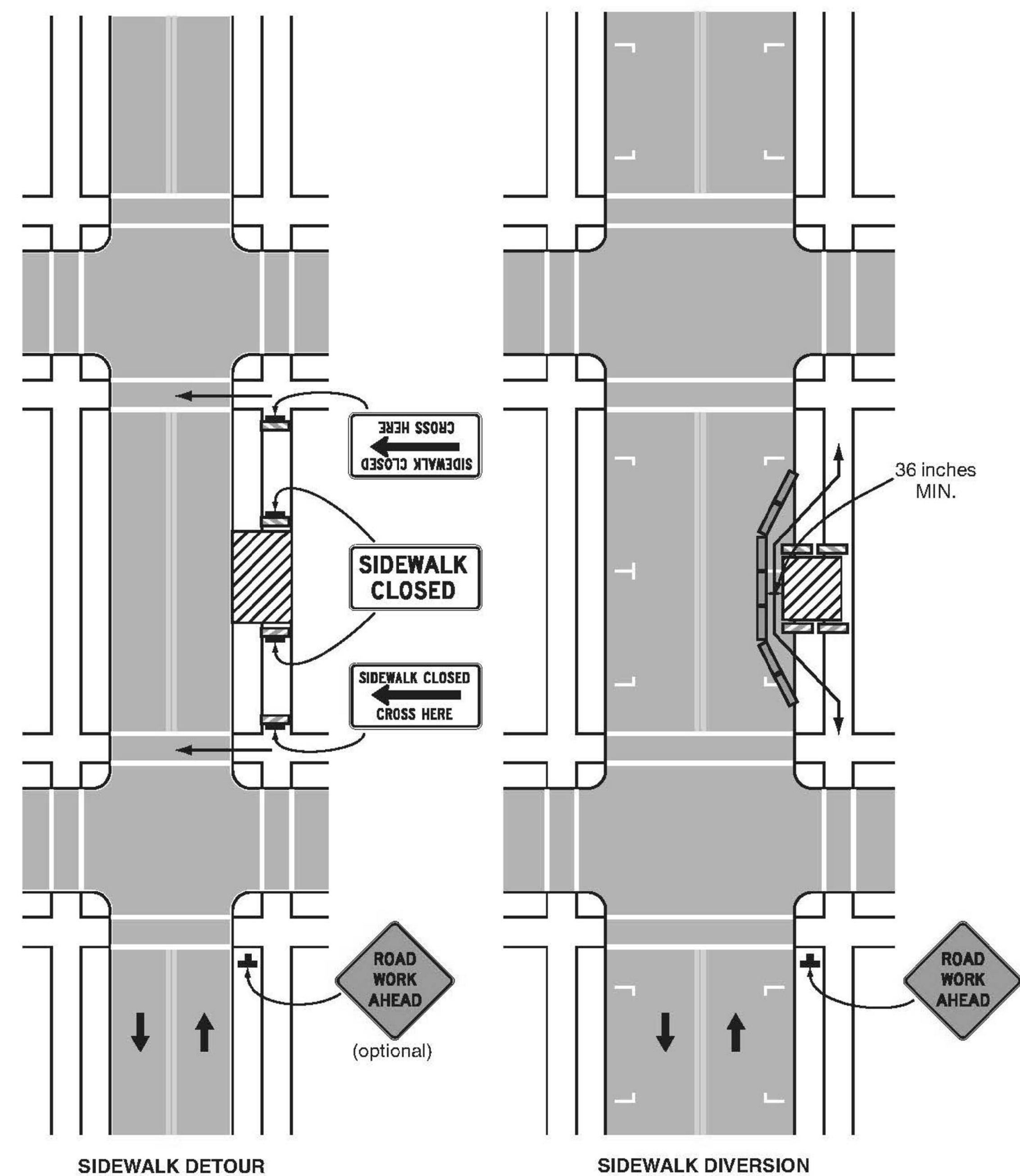
TRAFFIC CONTROL PLAN  
STANDARD DETAILS

SHEET 2 OF 3

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 36 OF 42	

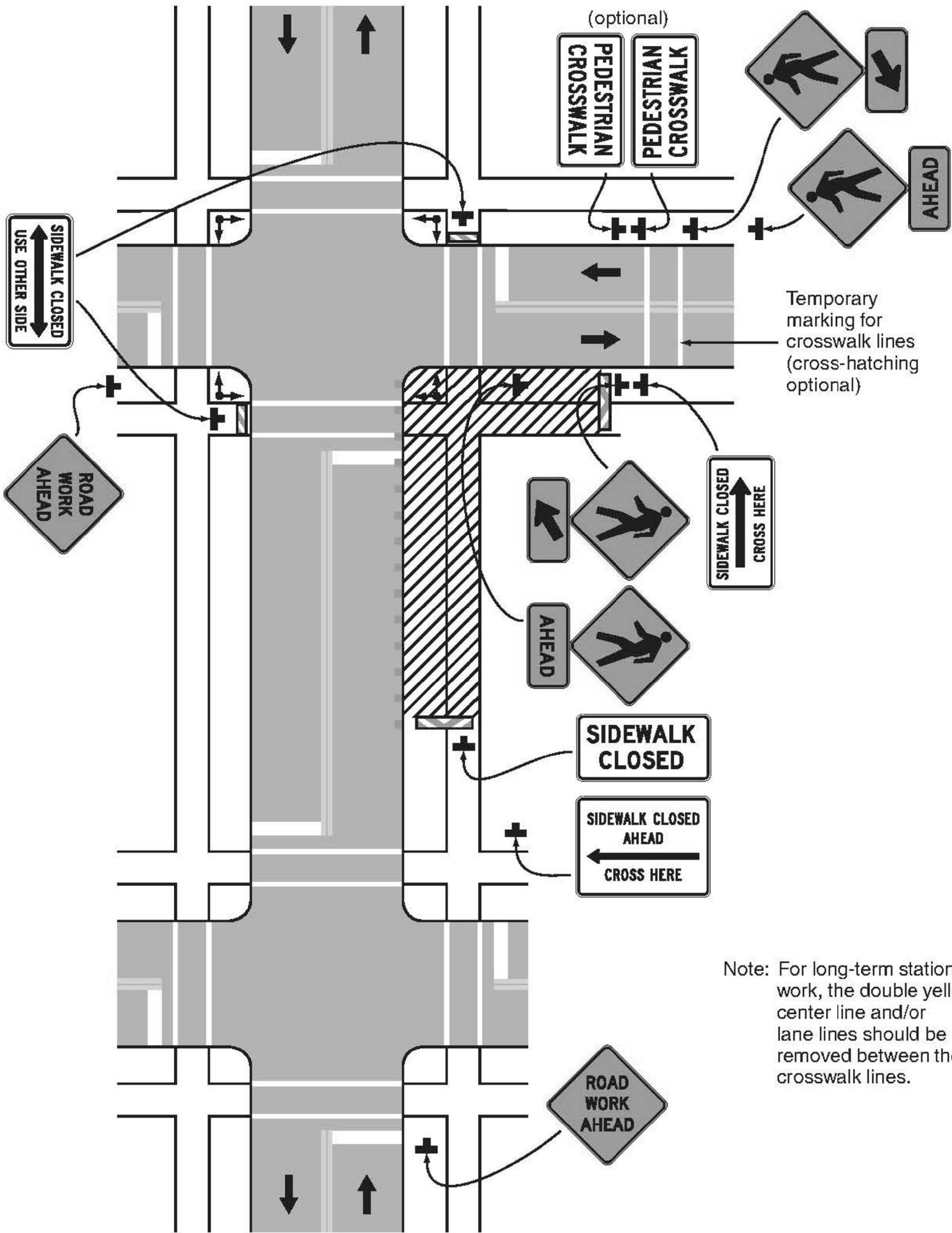


Figure 6H-28. Sidewalk Detour or Diversion (TA-28)



Typical Application 28

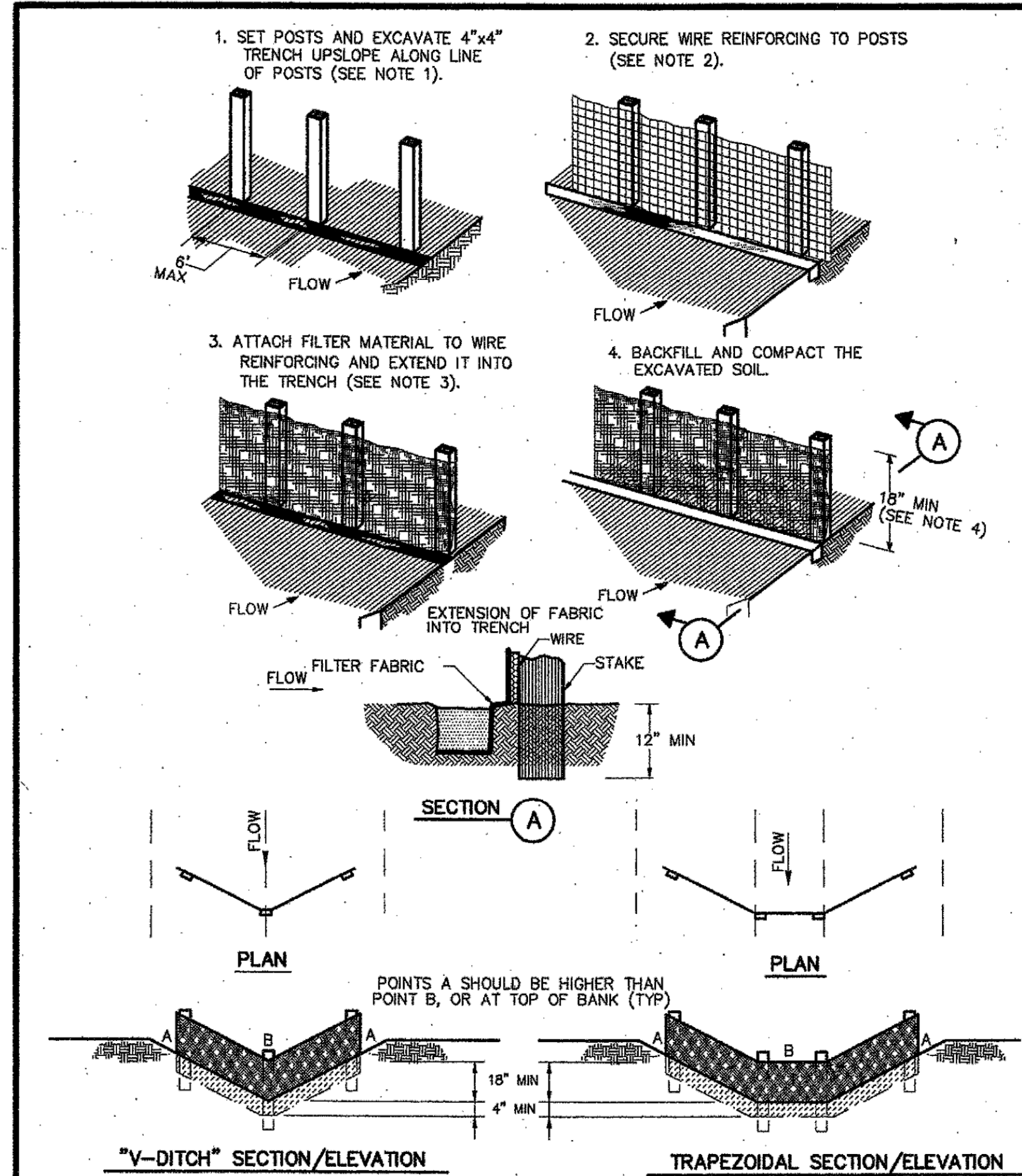
Figure 6H-29. Crosswalk Closures and Pedestrian Detours (TA-29)



Typical Application 29

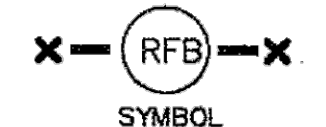
<b>ENTECH</b> CIVIL ENGINEERS, INC.		F-6932 15021 Katy Freeway, Suite 500 Houston, Texas 77094 281-945-0069 PH 281-945-0061 FX
<b>Progressive</b> Traffic & Transportation <i>Engineers, Planners &amp; Managers</i>		THIS DOCUMENT IS RELEASED FOR PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF MOHAMMAD IRFAN TEXAS REG. NO. 89333 SEPTEMBER 25, 2025
TBPE FIRM REGISTRATION #F-9492 16360 Park Ten Place, Suite 106 Houston, Texas 77064 281-206-7495 281-206-7494 FX		IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES
SURVEYED BY: LANDTECH, INC. FB NO. P-6331		
<b>CITY OF HOUSTON</b> HOUSTON PUBLIC WORKS		
SHARPSTOWN AREA DETENTION POND A		
TRAFFIC CONTROL PLAN STANDARD DETAILS SHEET 3 OF 3		
WBS NUMBER	FOR CITY OF HOUSTON USE ONLY	
M-410040-001A-3		
DRAWING SCALE		
AS NOTED		
CITY OF HOUSTON PM		
SUPUN ILANGAMUDALIGE		
SHEET NO. 37 OF 42		



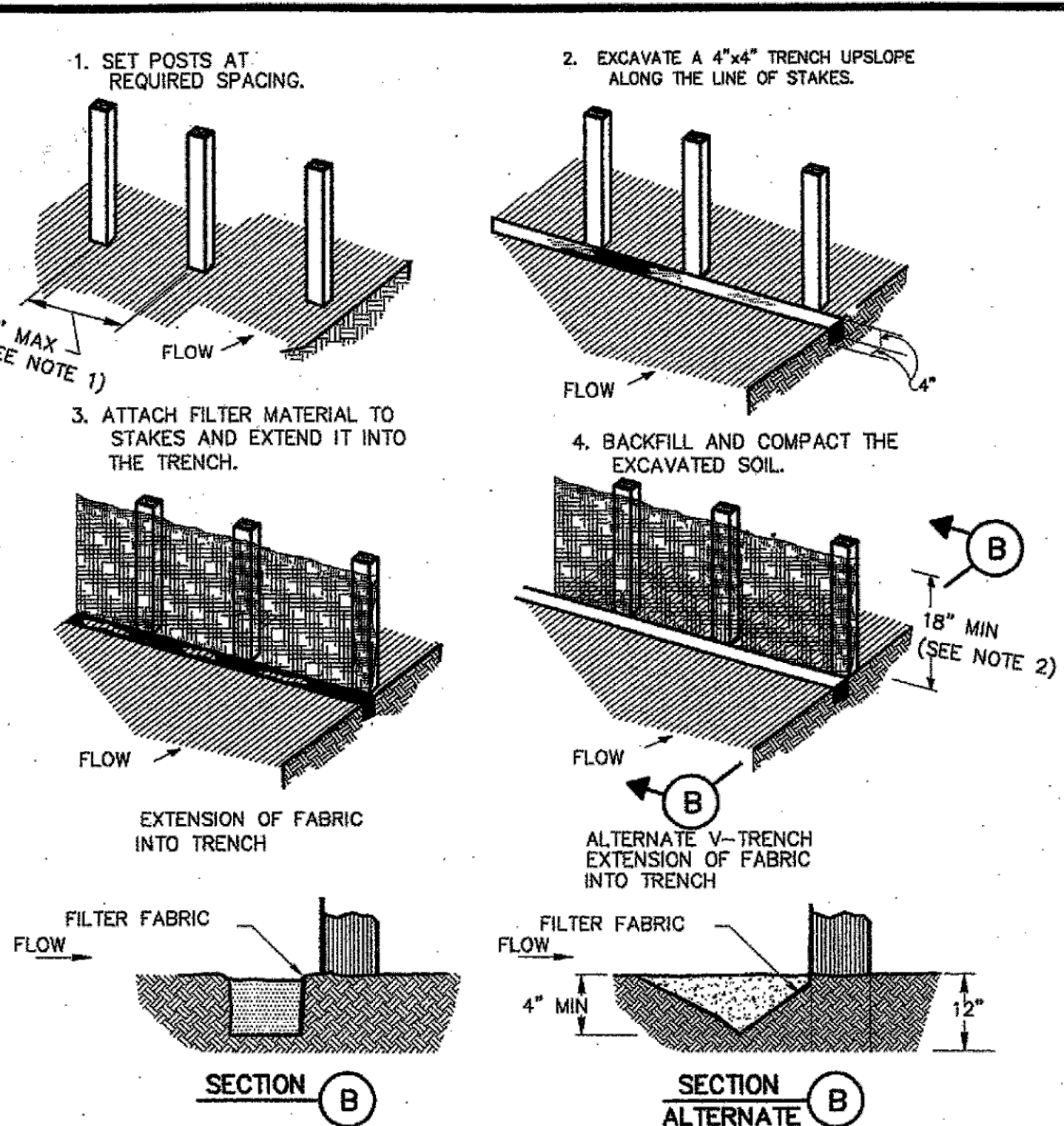
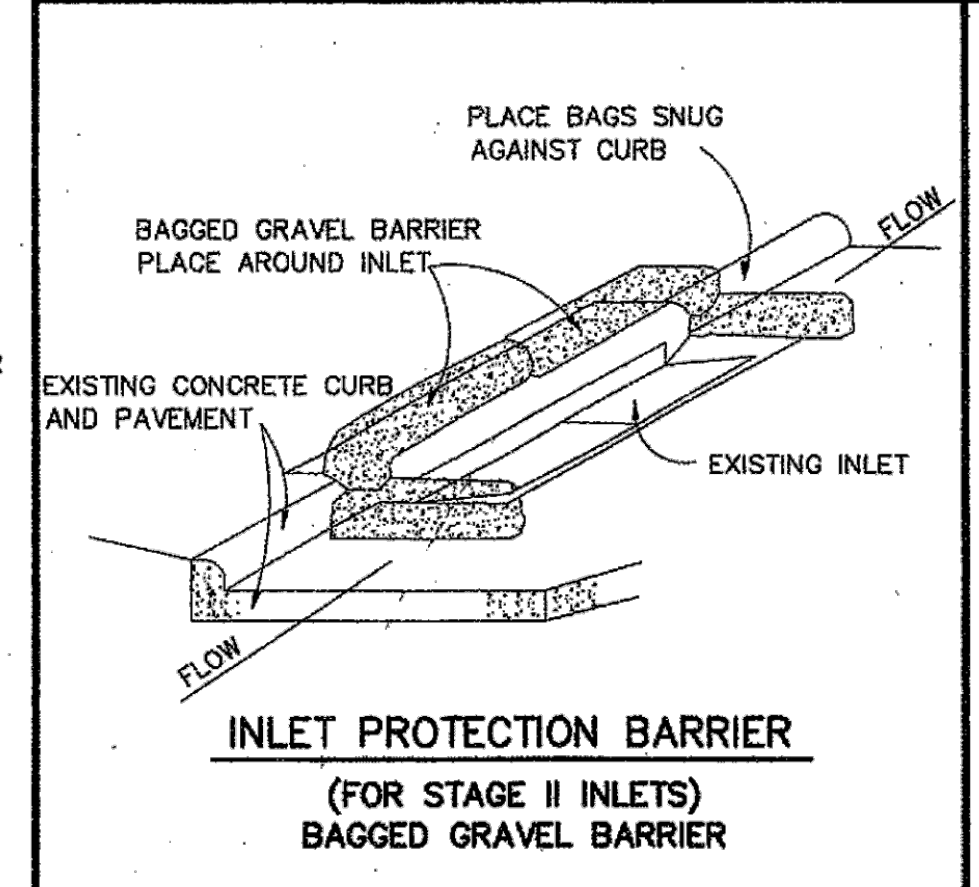


**CONSTRUCTION NOTES:**

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.



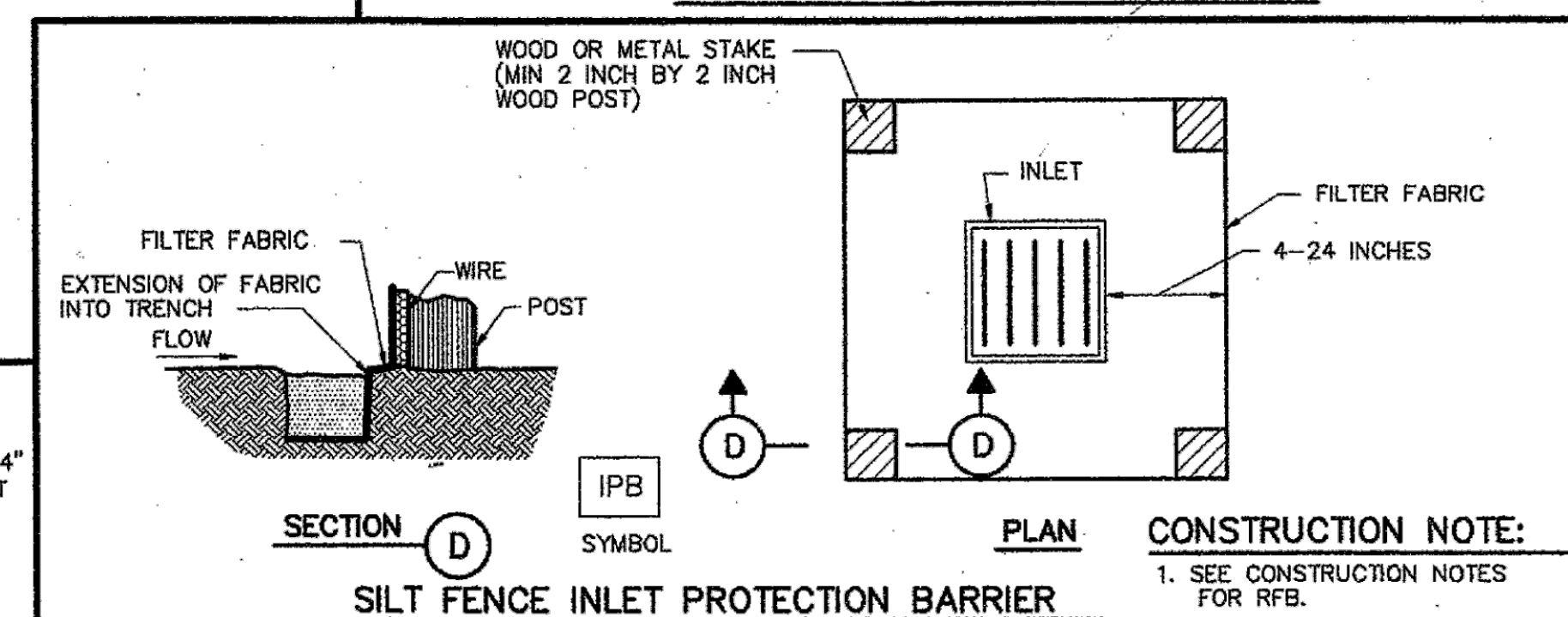
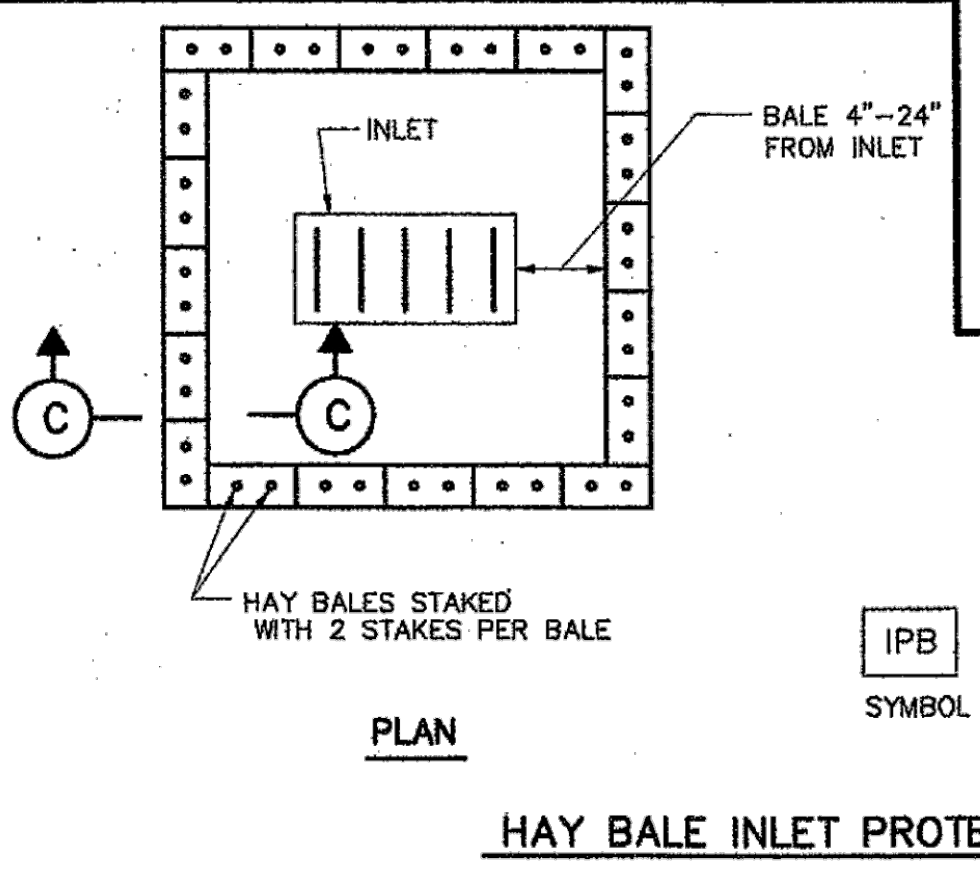
**REINFORCED FILTER FABRIC BARRIER**



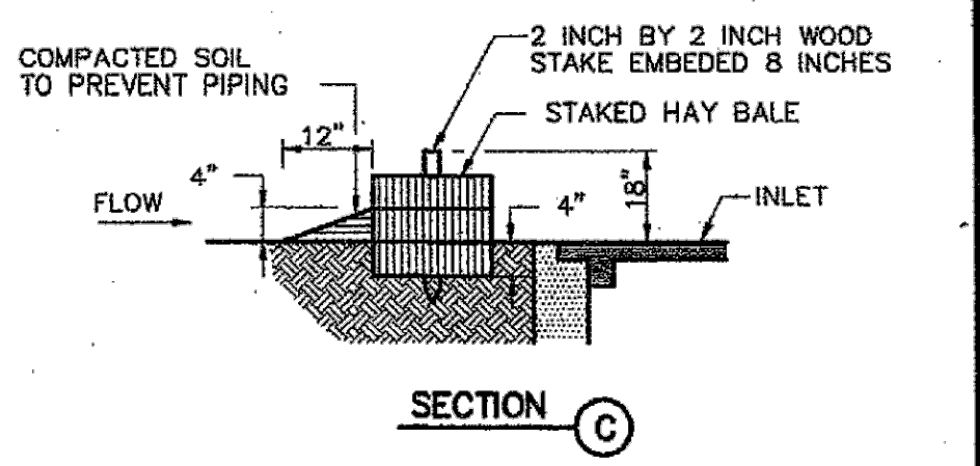
**CONSTRUCTION NOTES:**

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 6 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.

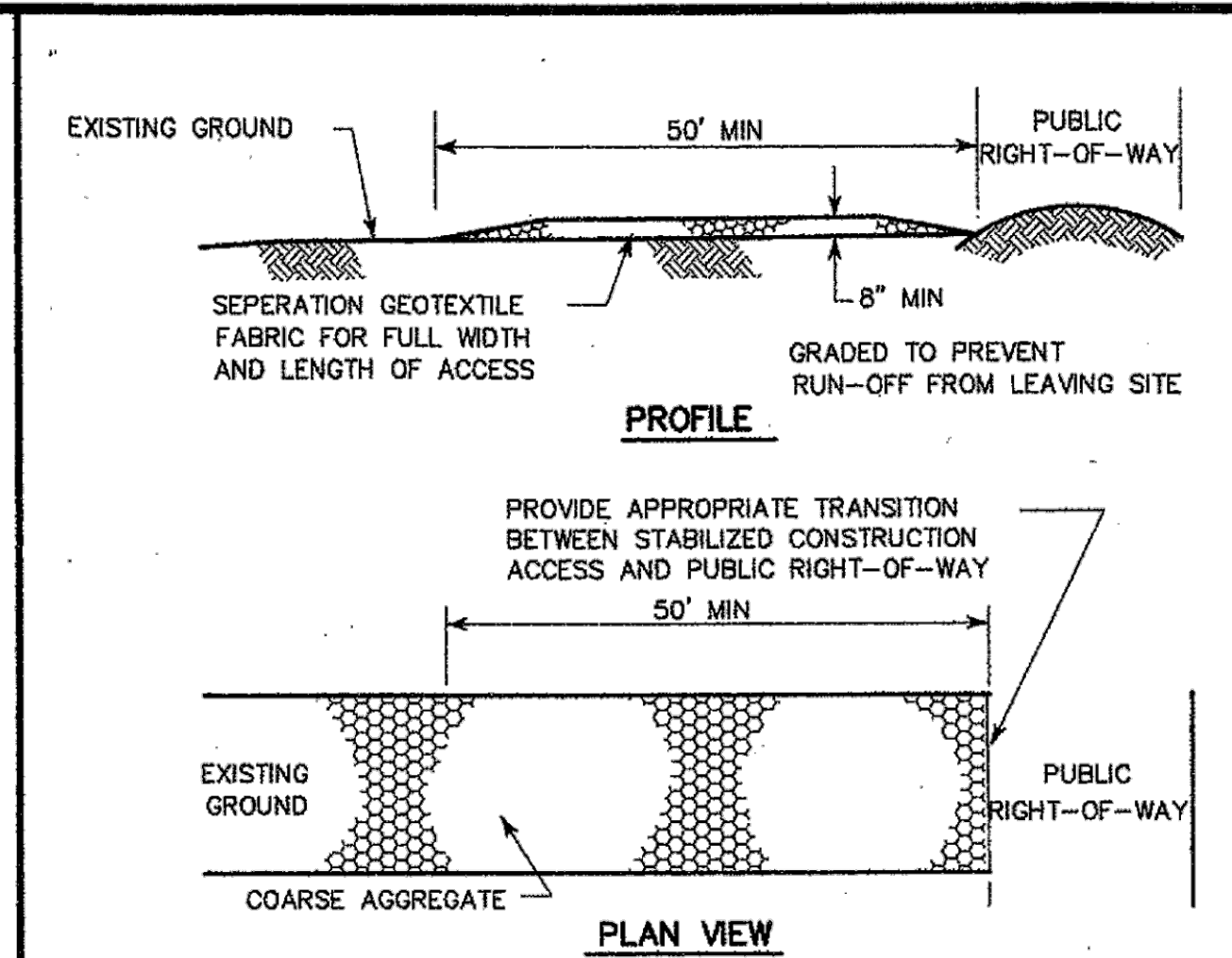
**FILTER FABRIC BARRIER**



- CONSTRUCTION NOTE:**
1. SEE CONSTRUCTION NOTES FOR RFB.

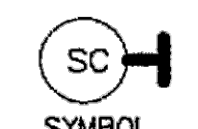


**HAY BALE INLET PROTECTION BARRIER**



**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.



**STABILIZED CONSTRUCTION ACCESS**

**CITY OF HOUSTON**  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

**STORM WATER POLLUTION PREVENTION PLAN DETAILS**  
(NOT TO SCALE)

APPROVED: [Signature] CITY ENGINEER

APPROVED: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING

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

**ISANI**  
civil design engineers  
10448 Westoffice Drive  
Houston, Texas 77042  
P 713 747 2399  
F 713 748 3748  
TBPE Firm Reg. #4575

SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

INTERIM REVIEW ONLY  
DOCUMENT INCOMPLETE,  
NOT INTENDED FOR PERMIT,  
BIDDING OR CONSTRUCTION  
ENGINEER: RAHUL B. MENON, P.E.  
P.E. Reg. No: 130533  
DATE: JUNE 2023

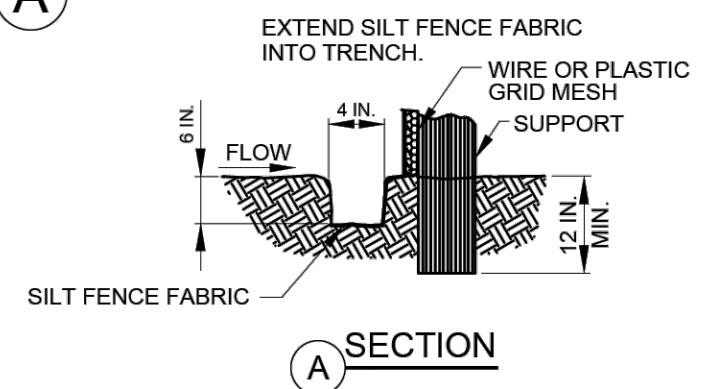
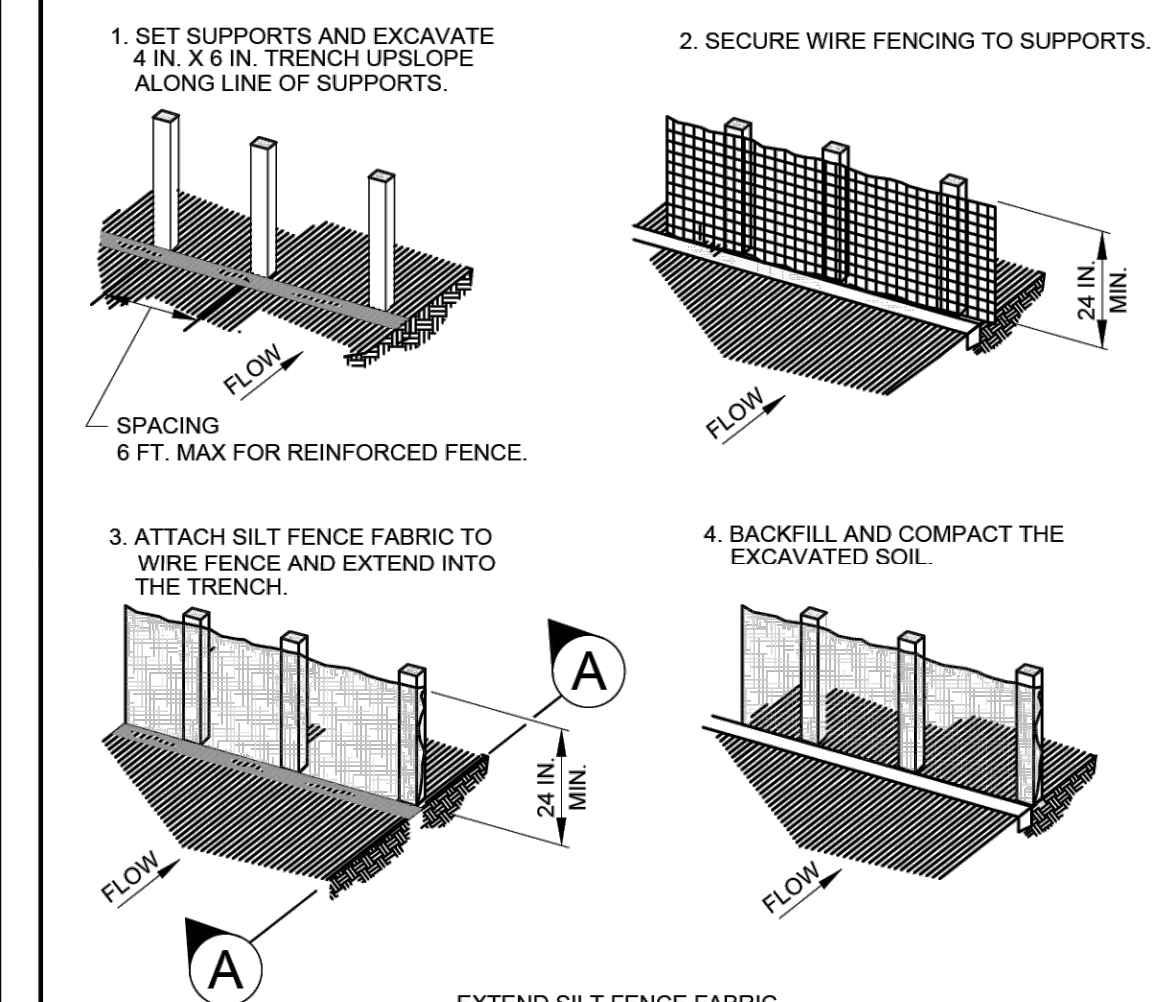
**CITY OF HOUSTON**  
HOUSTON PUBLIC WORKS

**SHARPSTOWN AREA DETENTION POND A**


**STORMWATER POLLUTION PREVENTION PLAN DETAILS**  
CITY OF HOUSTON

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
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DRAWING SCALE	
NTS	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 38 OF 42	

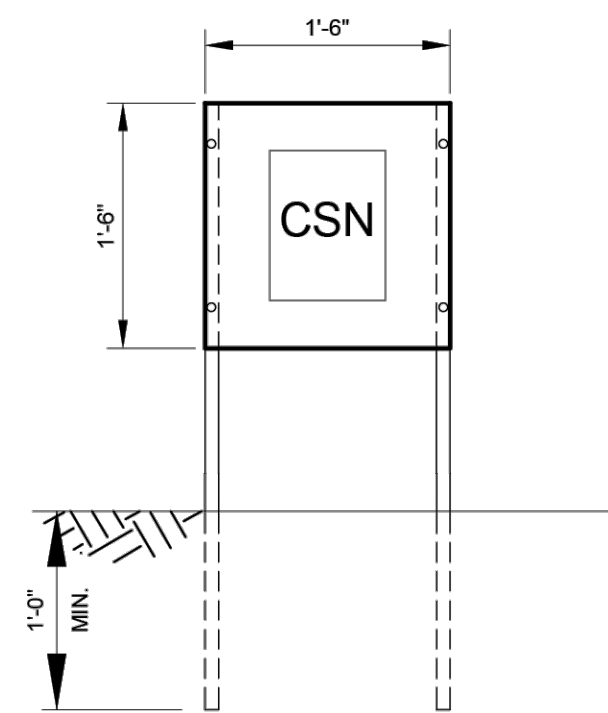




**NOTE:**  
1. SEE SPECIFICATION SECTION NO. 02361-SILT FENCES


 REINFORCED SILT FENCE  
 SYMBOL

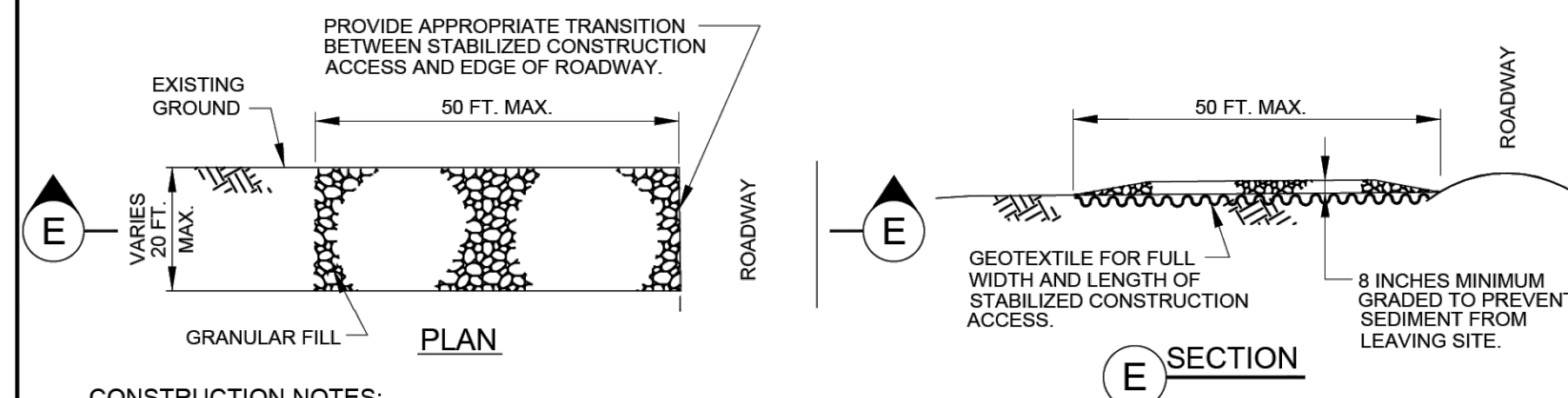
## REINFORCED SILT FENCE



**NOTE:**  
CONSTRUCT IN ACCORDANCE WITH  
HCFCD SPECIFICATION SECTION  
01580 - PROJECT SIGNS.

CSN HOLDER

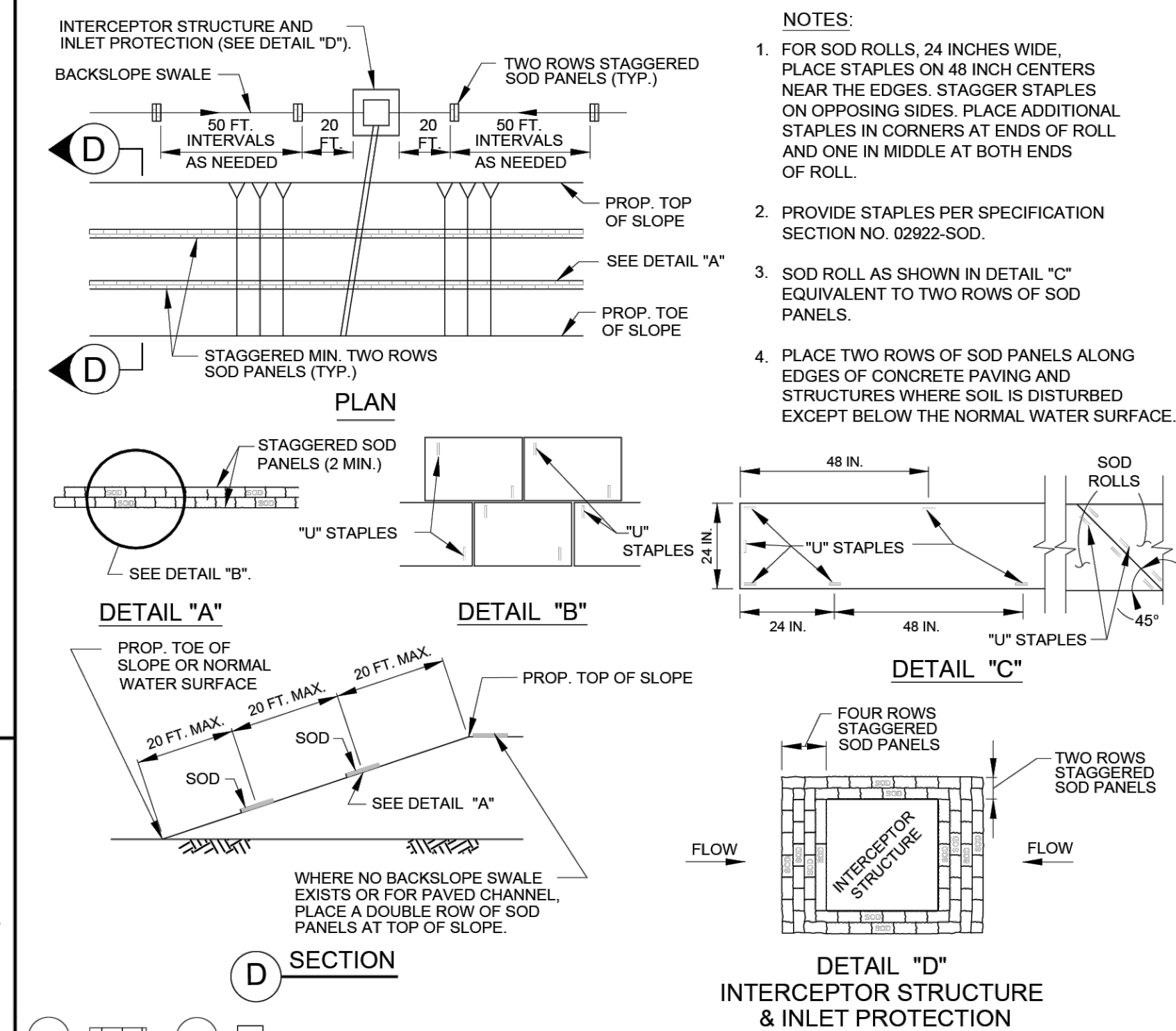
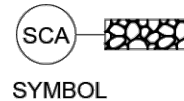
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**CONSTRUCTION NOTES:**

1. SEE SPECIFICATION SECTION NO. 02365-STABILIZED CONSTRUCTION ACCESS

## STABILIZED CONSTRUCTION ACCESS



**NOTES:**

- FOR SOD ROLLS, 24 INCHES WIDE, PLACE STAPLES ON 48 INCH CENTERS NEAR THE EDGES. STAGGER STAPLES ON OPPOSING SIDES, PLACE ADDITIONAL STAPLES IN CORNERS AT ENDS OF ROLL AND ONE IN MIDDLE AT BOTH ENDS OF ROLL.
- PROVIDE STAPLES PER SPECIFICATION SECTION NO. 02922-SOD.
- SOD ROLL AS SHOWN IN DETAIL "C" EQUIVALENT TO TWO ROWS OF SOD PANELS.
- PLACE TWO ROWS OF SOD PANELS ALONG EDGES OF CONCRETE PAVING AND STRUCTURES WHERE SOIL IS DISTURBED EXCEPT BELOW THE NORMAL WATER SURFACE.

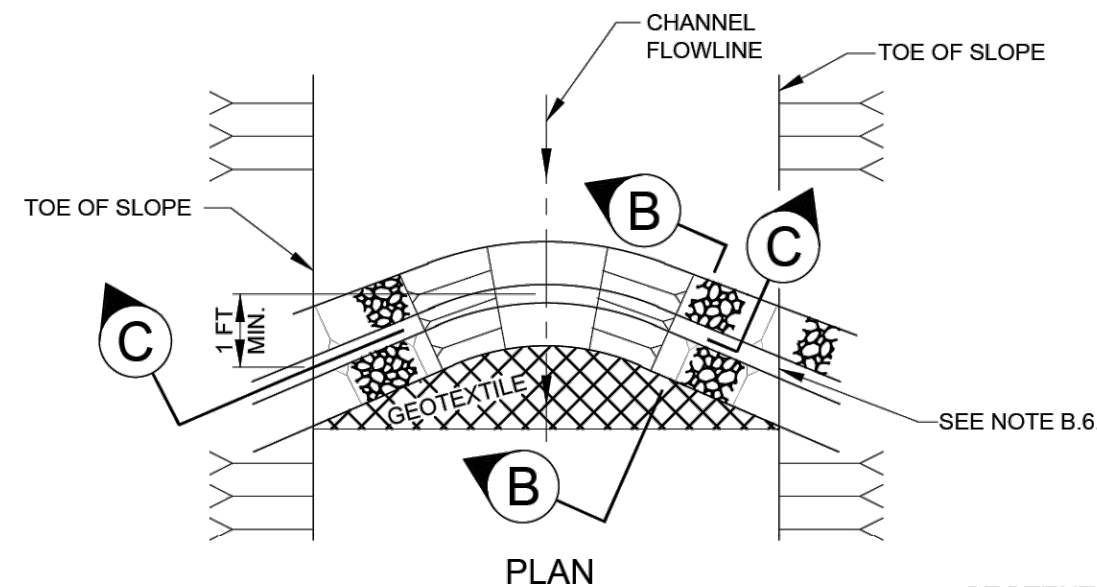
## SODDING

FILTER DAM NOTES:

- A. TYPES OF FILTER DAMS
1. TYPE 1 - NOT USED BY HCFOCD
  2. TYPE 2 (REINFORCED).
    - a. HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
    - b. TOP WIDTH - 2 FEET (MINIMUM).
    - c. SLOPES - 2:1 (MAXIMUM).
  3. TYPE 3 - NOT USED BY HCFOCD
  4. TYPE 4 (GABION)
    - a. HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
    - b. TOP WIDTH - 2 FEET (MINIMUM).
  5. TYPE 5. AS SHOWN ON THE PLANS.
- B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.
1. TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
  2. GRANULAR FILL:
    - a. PLACE ON MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
    - b. 3-5 INCHES FOR ROCK FILTER DAM TYPES 2, AND 4.REFER TO GRANULAR FILL IN SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
  3. WIRE MESH: FOLD AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURE TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.
  4. IN STREAMS, SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
  5. SEE SPECIFICATION SECTION NO. 02364-FILTER DAMS.
  6. EMBED ONE FOOT MINIMUM INTO SLOPE AND AT SLOPE RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA.

THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON HCFC D PROJECTS OR PROJECTS TO BE MAINTAINED BY THE HCFC D WHEN COMPLETED BY OTHERS. AN ENGINEER WHO INCORPORATES THE DETAILS ON THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (b) AND (c) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.

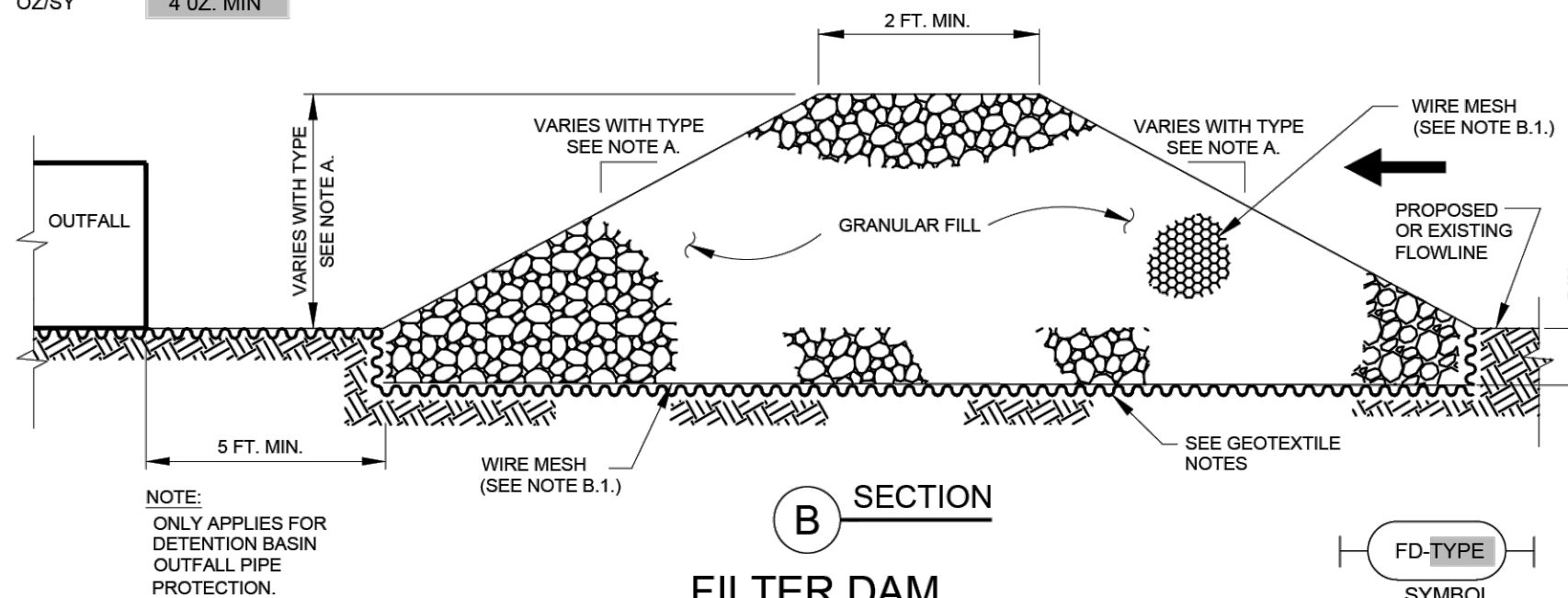
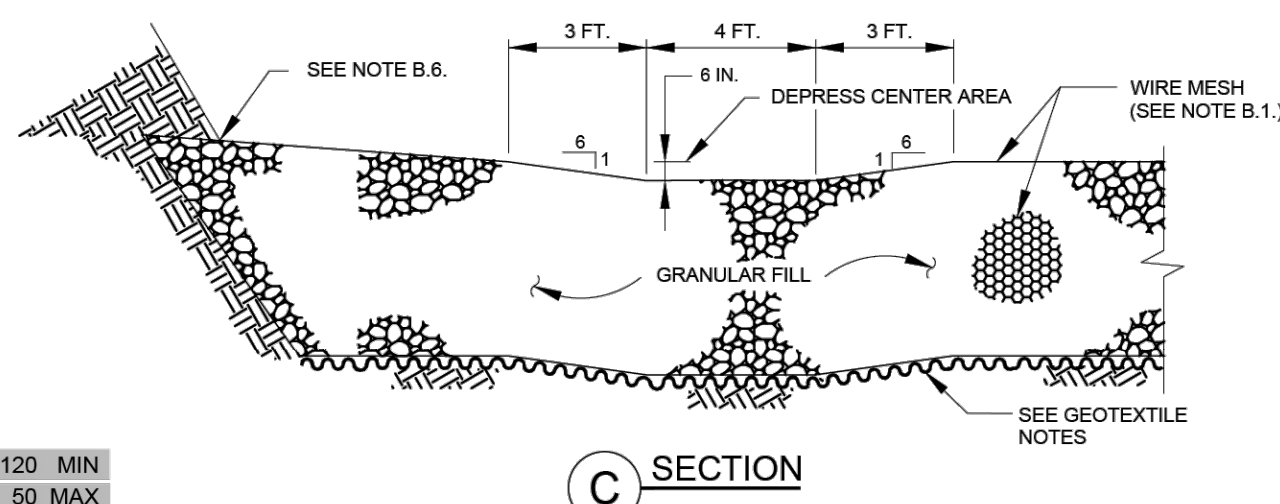
ENGINEER - CONFIRM  
CHANGE, OR FILL IN.



### IN-CHANNEL FILTER DAM

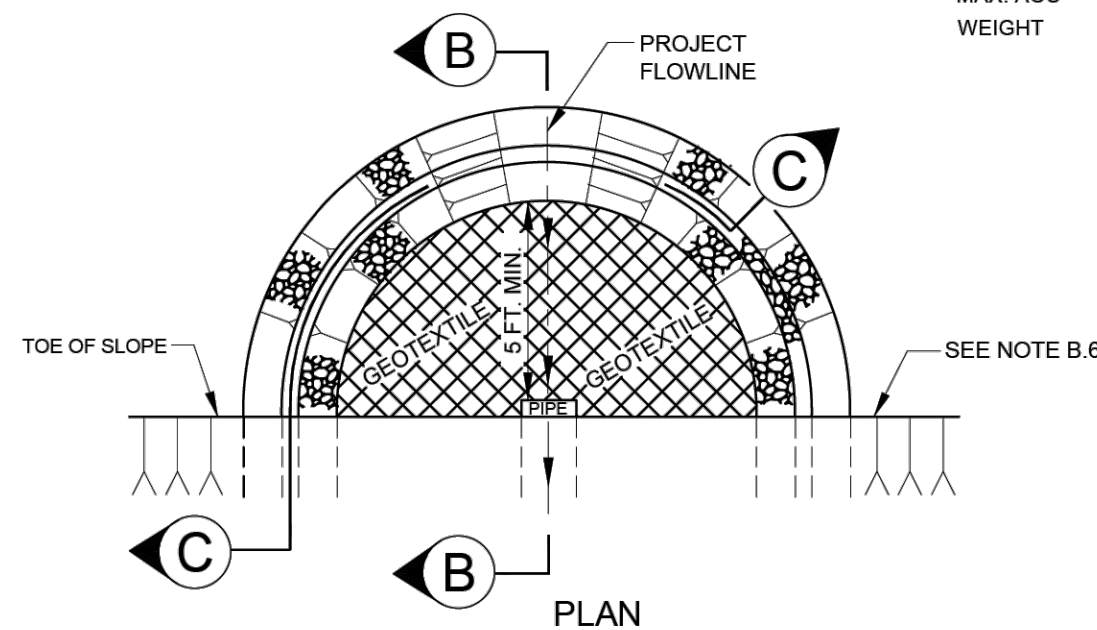
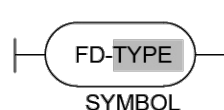
GEOTEXTILE NOTES:

MIN. AOS	SIEVE NO.	120 MIN
MAX. AOS	SIEVE NO.	50 MAX
WEIGHT	OZ/SY	4 OZ. MIN





**NOTE:**  
ONLY APPLIES FOR  
DETENTION BASIN  
OUTFALL PIPE  
PROTECTION.

## FILTER DAM



### FILTER DAM AT DETENTION BASIN OUTFALL PIPE

 <p><b>HARRIS COUNTY FLOOD CONTROL DISTRICT</b></p> <p>9900 Northwest Freeway Houston, Texas 77092</p>		<p>COMMITTEE INFORMATION AND LOGS GOES HERE</p>		<p>PREPARED:</p>	<p>PROJECT ID#</p>	<p>REV</p>	<p>DESCRIPTION</p>	<p>DATE</p>	<p>APPR</p>
				<p>CHECKED:</p>	<p>PROJECT TITLE</p>				
				<p>APPROVED:</p>	<p>STORMWATER POLLUTION PREVENTION DETAILS</p>				
<p>DATE: 10-23-2018</p> <p>SCALE: NTS</p>									
<p>SHEET NUMBER</p> <p>OF</p>									

 <p>civil • design • engineers</p> <p>Westoffice Drive Houston, Texas 77042</p> <p>P 713 747 2399 F 713 748 3748</p> <p>TBPE Firm Reg. #4575</p>	<p><u>INTERIM REVIEW ONLY</u></p> <p>DOCUMENT INCOMPLETE; NOT INTENDED FOR PERMIT, BIDDING OR CONSTRUCTION</p> <p>ENGINEER: RAHUL B. MENON, P.E.</p> <p>P.E. Reg No: 130533</p> <p>DATE: JUNE 2025</p>
<p>SURVEYED BY: LANDTECH, INC.</p> <p>FB NO. P-6331</p>	

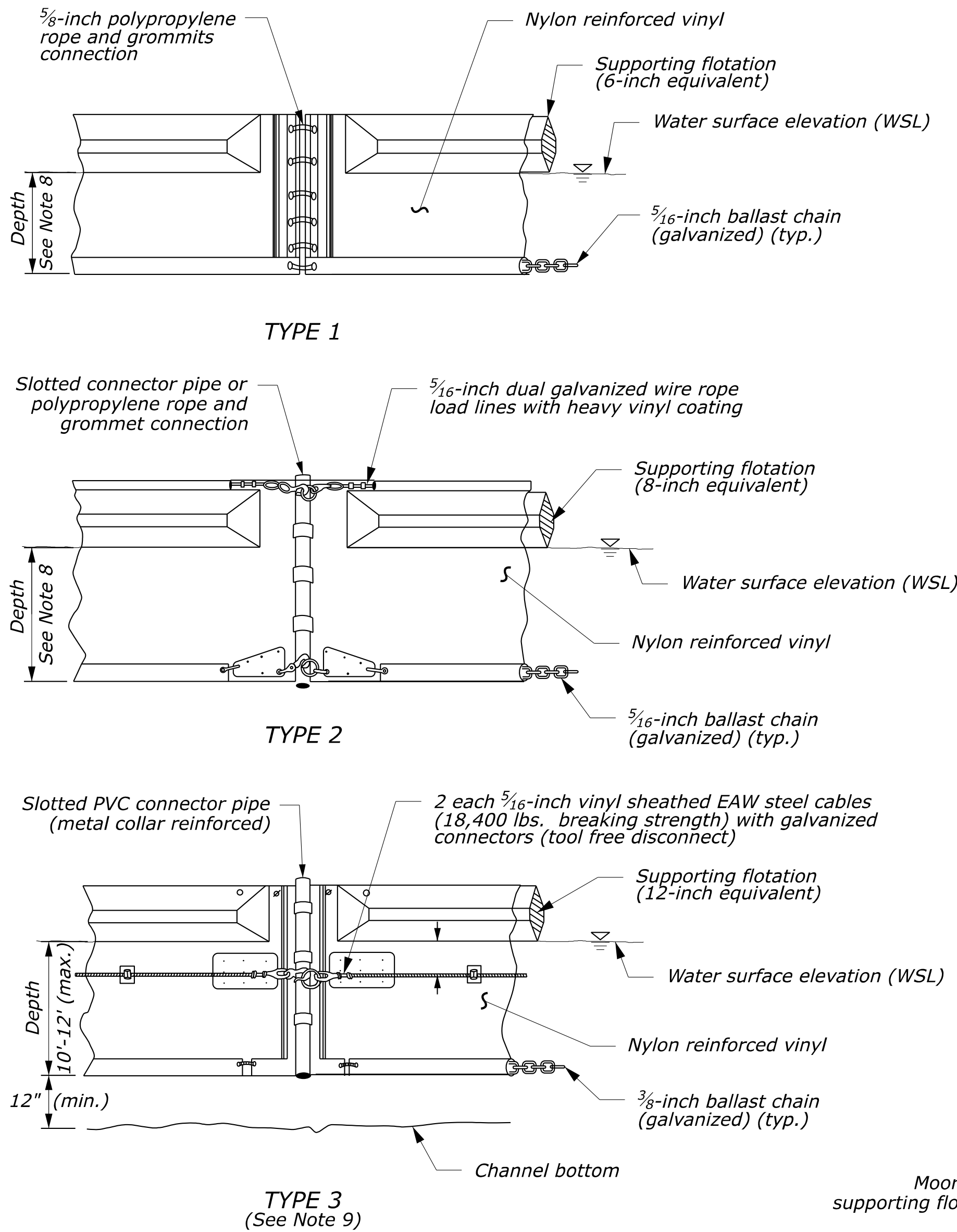
CITY OF HOUSTON  
HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

# STORMWATER POLLUTION PREVENTION PLAN DETAILS HARRIS COUNTY FLOOD CONTROL DISTRICT

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
NTS	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 39 OF 42	

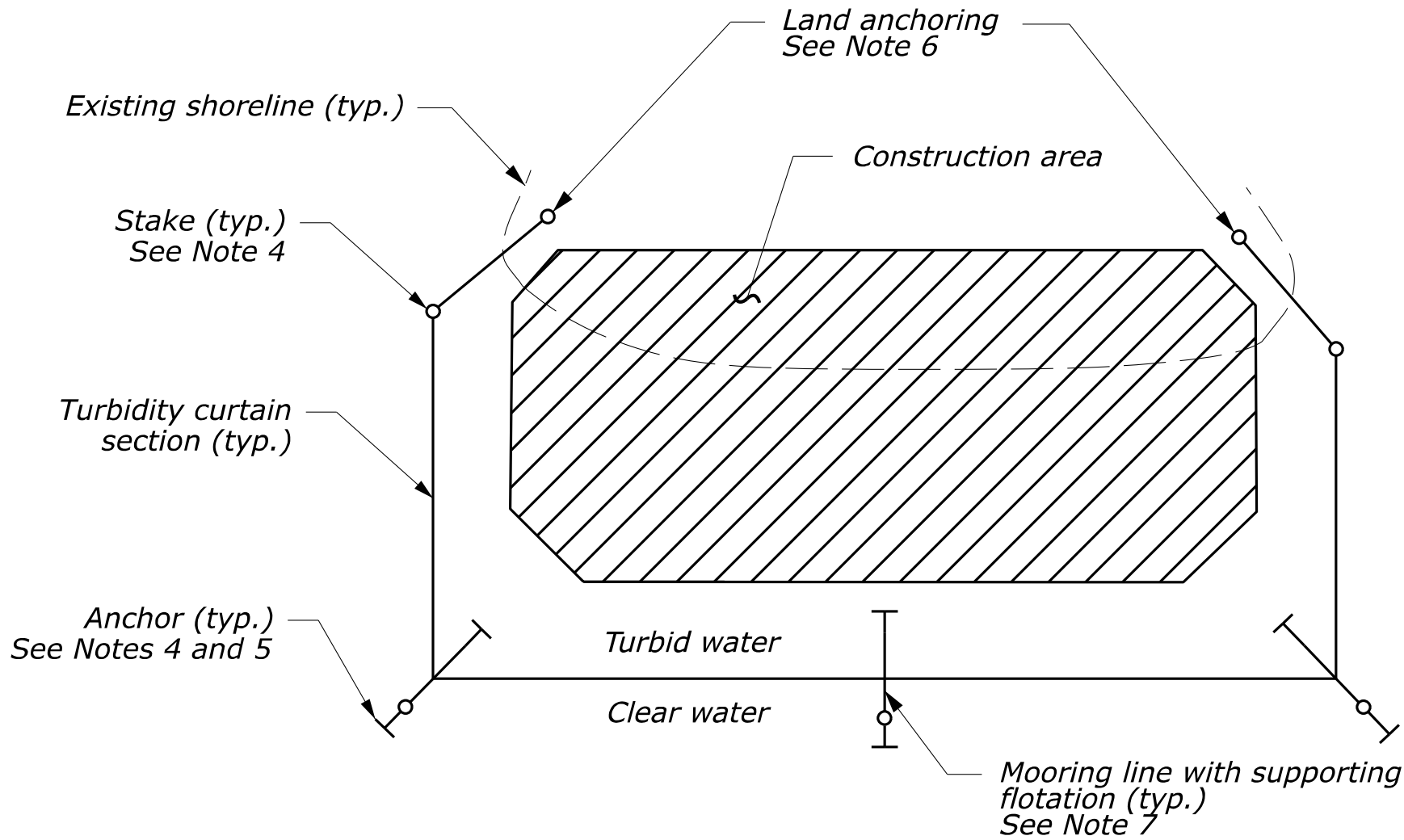




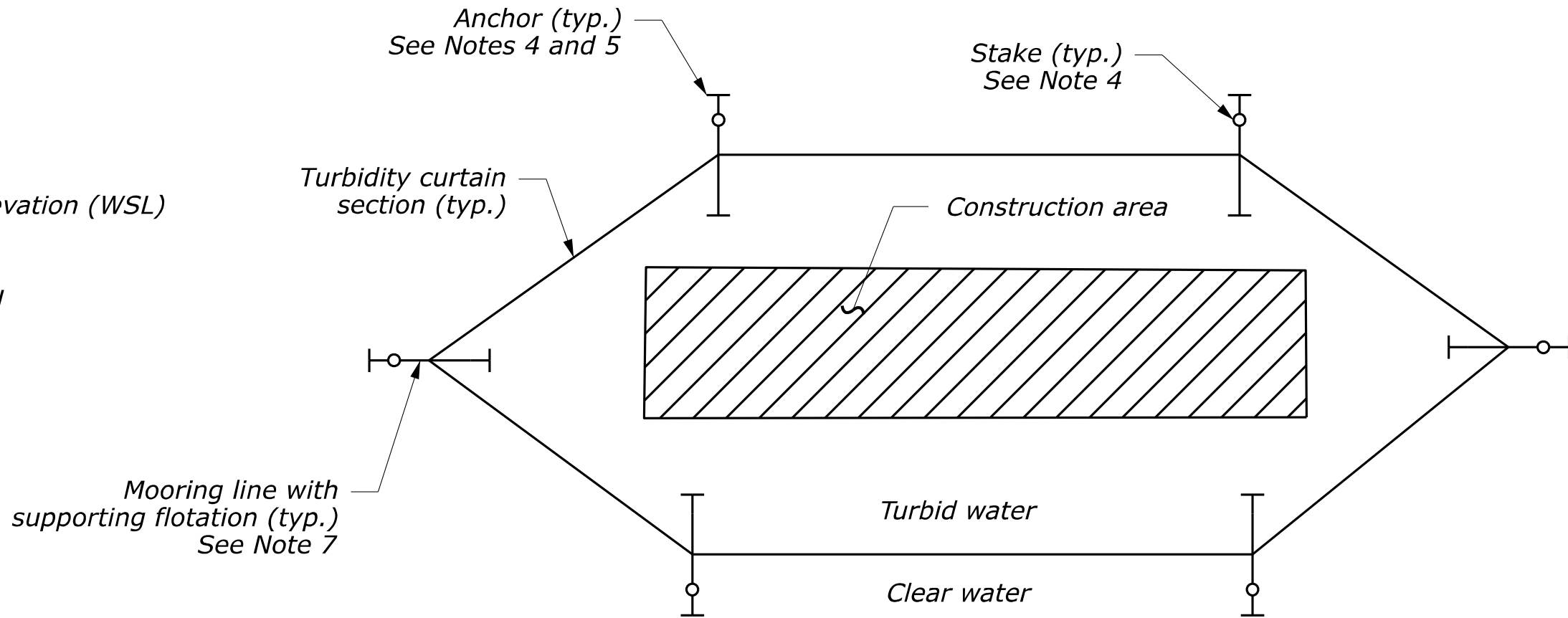
FLOATING TURBIDITY CURTAINS

USAGE CHART

TYPE	MAXIMUM CURRENT (FT/S)	ADDITIONAL CONDITIONS
1	0.0	No Wave/Wind/Tidal Action
2	3.5	Moving Water (One Direction)
3	5.0	Tidal Action or Subject to Wind and Wave Actions



PLAN VIEW - INSTALLATION FOR SHORELINE WORK



PLAN VIEW - INSTALLATION FOR PILE WORK

NOTES:

1. Select a floating turbidity curtain type to suit the site conditions and meet erosion control and water quality requirements. Submit details and specifications of the selected curtain type for approval prior to installation.
2. Install floating turbidity curtains before the start of any construction activities that could impact the area of concern.
3. Install floating turbidity curtains parallel to the direction of flow of a moving water body. Do not install curtains across the main flow of a significant moving water body. Do not install curtains where the flow of water will remove accumulated sediment or significantly move the curtain.
4. Install floating turbidity curtain stakes in a vertical position unless otherwise directed. Install anchors and stakes at no more than 100-foot spacing.
5. For Type 1 floating turbidity curtains, install anchors made of wooden stakes (2- by 4-inch rectangular or 2½-inch minimum diameter) or metal stakes (1½ pounds per linear foot). For Type 2 and 3 curtains, install anchors that are either weighted or that dig into the channel bottom.
6. Extend the ends of floating turbidity curtains well up into the shoreline as approved, especially if high water conditions are expected. Secure the ends firmly to the shoreline (preferably to rigid bodies such as trees or piles) to fully enclose the area where sediment may enter into the water body.
7. Provide minimum ½-inch nylon rope for adjustment line for mooring system. Ensure the mooring line is securely attached and is sufficiently buoyant to remain afloat under normal load conditions.
8. For Type 1 and 2 floating turbidity curtains, extend the nylon reinforced vinyl fabric through the entire depth of the water (to the channel bottom) unless tidal actions are present.
9. In areas subject to wind and wave actions or where tidal actions are present, use Type 3 floating turbidity curtains as directed. Install Type 3 curtains according to the manufacturer's recommendations and as approved.
10. Remove captured sediment behind floating turbidity curtains prior to removing the curtains. Do not disperse sediment into adjacent water body.

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY	EFLHD DETAIL E157-11
FLOATING TURBIDITY CURTAINS	SPECIFICATION FP-24, FP-14
	APPROVED FOR USE 05/2024

**ENTECH**  
CIVIL ENGINEERS, INC.  
15021 KATY FREEWAY, STE. 500  
HOUSTON, TX. 77094  
281-945-0069  
TX FIRM NUMBER: F-6932  
SURVEYED BY: LANDTECH, INC.  
FB NO. P-6331

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RODRIGO GUADARRAMA  
TEXAS REG. NO. 111437  
OCTOBER 15, 2025  
  
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CITY OF HOUSTON  
HOUSTON PUBLIC WORKS


SHARPSTOWN AREA DETENTION  
POND A  
STORMWATER POLLUTION  
PREVENTION PLAN DETAILS  
FLOATING TURBIDITY CURTAIN

WBS NUMBER	FOR CITY OF HOUSTON USE ONLY
M-410040-001A-3	
DRAWING SCALE	
NTS	
CITY OF HOUSTON PM	
SUPUN ILANGAMUDALIGE	
SHEET NO. 40 OF 42	



Summary of Quantities				
A. General Items				
Item No.	Spec. Ref	Item Description	Unit of Measure	Estimated Quantity
1	01502	Mobilization	LS	1
2	01555	Traffic Control and Regulation	LS	1
3	01555	Flagmen-Uniformed Police Officers	LS	1
4	01562	Tree Mitigation (Cash Allowance due Parks - 6" to 11.99" on ROW)	INCH	30
5	01562	Tree Mitigation (Cash Allowance due Parks - 12" and Larger in ROW)	INCH	969
6	01578	Ground Water Control for Detention Pond and Open-Cut Construction	LS	1
7	01570	Filter Fabric Fence	LF	2,378
8	01570	Reinforced Filter Fabric Barrier	LF	250
9	01570	Bagged Gravel Barrier	LF	500
10	01570	Inlet Protection Barrier - Type II	LF	632
11	01575	Stabilized Construction Entrance/Exit	SY	1,000
12	02260	Trench Safety System for Storm Sewer ( Open -Cuts)	LF	17,418
13	02921	Hydro Mulch Seeding	AC	4
14	02922	Sodding	SY	3,600
15	HCFCD 2399-02	Floating Turbidity Curtains	LF	90
16	HCFCD 2399-03	Rock Filter Dam - Type 2	LF	70
B. Storm Sewer Items				
Item No.	Spec. Ref	Item Description	Unit of Measure	Estimated Quantity
1	02631	4FT x 4FT Precast Box Manhole	EA	1
2	02631	18-Inch Diameter RCP Arch-Pipe Storm Sewers (Trenchless)	LF	418
3	02631	24-Inch RCP Storm Pipe (Open-Cut) (All Depths)	LF	125
4	02631	Backslope Drainage Interceptor Pipe, 24-Inch CMP	LF	656
5	2633	Backslope Drainage Interceptor Structure, COH TYPE 'A' Inlets	EA	6
6	SPEC REF	Proposed 24-Inch Diameter Flap Gate	EA	1
7	02221	Remove/ Dispose Storm Pipe 48-Inch Diameter	LF	120
8	02221	Cut Plug and Abandon existing 18-inch Storm	EA	4
9	02221	Cut Plug and Abandon existing 24-Inch Storm Sewers	EA	4
10	02221	Cut Plug and Abandon existing 48-Inch Storm Sewers	EA	2
11	02631	15-inch Brick Plugs	EA	3
12	02631	18-inch Brick Plugs	EA	3
13	02631	24-inch Brick Plugs	EA	19
14	02631	48-inch Brick Plugs	EA	2
C. Water Items				
Item No.	Spec. Ref	Item Description	Unit of Measure	Estimated Quantity
1	02511	8-Inch Water Line Adjustment (including , cutting , installing new restrained joint pvc pipe, and removal of old pipe	EA	5
2	02516	Cut ,Plug and Abandon Existing 8-Inch Water Lines	EA	5
D. Detention Pond A				
Item No.	Spec. Ref	Item Description	Unit of Measure	Estimated Quantity
1	SP	Demolition (Excluding Trees)	LS	1
2	SP	Pond Excavation and Disposal	CY	106,390
3	SP	8-Inch Thick Concrete Weir	SY	1,018
4	SP	18-Inch Thick Riprap	SY	1,300
5	SP	2-Feet Thick Clay Liner	CY	9,353
6	SP	Perimeter Backslope Drainage Swale	LF	1,767
7	HCFCD 2832	Pilot Channel Concrete Swale ( Complete in Place )	LF	790
8	SP	12-Inch Concrete Slope Paving	CY	605
9	SP	12-Inch Cement Stabilized Sand (Beneath Spillway)	CY	320
10	SP	12-Inch Gravel Fill (Beneath Spillway)	CY	195
11	01578	Ground Water Control	LS	1
E. Tree Items				
Item No.	Spec. Ref	Item Description	Unit of Measure	Estimated Quantity
1	01562	Remove Tree 0" to 11.99" (or Palm Tree)	EA	11
2	01563	Remove Teee 12" to 29.99"	EA	40
3	01564	Remove Tree 30" to 45"	EA	13
4	01565	Clearance Prune Trees	EA	7
5	01566	Install Tree Protection Fence (up to 5000 ft)	LF	2,560
6	01567	Install Tree Protection Fence (beyond 5000 ft)	LF	675
F. Traffic Items				
Item No.	Spec. Ref	Item Description	Unit of Measure	Estimated Quantity
1	01554	Remove and Reinstall Existing Traffic Signs, Complete-in-Place	EA	30
2	02221	Remove Sign with Pole , with/or without Foundation	EA	20
3	SPL	CITY OF HOUSTON PROJECT SIGN	EA	2

			APP.
		REVISION	
		NO. DATE	



CIVIL ENGINEERS, INC.  
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TX FIRM NUMBER: F-6932

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FB NO. P-6331

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CITY OF HOUSTON

HOUSTON PUBLIC WORKS

SHARPSTOWN AREA DETENTION  
POND A

SUMMARY OF QUANTITIES

WBS NUMBER

M-410040-001A-4

DRAWING SCALE

AS NOTED

CITY OF HOUSTON PM

SUPUN ILANGAMUDALIGE P.E.

SHEET NO. 41 OF 42

FOR CITY OF HOUSTON USE ONLY



ABBREVIATIONS:


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

ABBREVIATIONS:

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

ABBREVIATIONS:

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



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LEGENDS & ABBREVIATIONS

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