

SANITARY SEWER NOTES:

1. WATER LINES, WASTEWATER COLLECTION SYSTEMS, AND DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING'S "STANDARD CONSTRUCTION SPECIFICATIONS" DATED OCTOBER 2002, AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" DATED OCTOBER 2002 UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN IS CONSISTENT WITH THE MINIMUM STANDARDS ESTABLISHED IN THE "INFRASTRUCTURE DESIGN MANUAL", DATED OCTOBER 2002. CONTRACTOR SHALL OBTAIN COPY OF SAME AND USE IT. OBTAIN FROM 611 WALKER FILE ROOM.
2. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO THE EXISTING PUBLIC OR PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER LINES, WASTEWATER COLLECTION SYSTEMS AND STORM SEWERS, DURING CONSTRUCTION. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD CONSTRUCTION SPECIFICATIONS" WITH LATEST ADDENDA AND AMENDMENTS THERETO, WITH NO COST TO THE CITY OF HOUSTON.
3. ALL SANITARY SEWERS SHALL BE INSTALLED BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 02317-01, 02317-02, AND 02317-08 AS APPLICABLE.

GENERAL NOTES - STORM SEWERS

1. STORM SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF HOUSTON DESIGN MANUAL (OCT. 2002) AND CONSTRUCTION STANDARD SPECIFICATIONS AND DETAILS (OCTOBER, 2002) AS CURRENTLY AMENDED.
2. REINFORCED CONCRETE PIPE (C-76 CLASS III) STORM SEWER SHALL BE INSTALLED BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 02317-02, 02317-03, 02317-05 AND 02317-06 AS APPLICABLE.
3. ALL SEWERS CONSTRUCTED INSIDE LOT EASEMENTS SHALL BE R.C.P. TWENTY (20) FOOT WIDE EASEMENTS SHALL BE PROVIDED.
4. ALTERNATIVE TO CEMENT-STABILIZED SAND BACKFILL FOR PIPES 54-INCH AND LARGER, FROM 1-FOOT ABOVE THE TOP OF THE PIPE TO THE BOTTOM OF THE SUBGRADE. CONTRACTOR MAY BACKFILL WITH SUITABLE MATERIAL, PROVIDED THE BACKFILL MATERIAL IS PLACED IN 8-INCH LIFTS AND MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY. TESTS SHALL BE TAKEN AT 100-FOOT INTERVALS ON EACH LIFT. BEDDING AND BACKFILL TO 1-FOOT ABOVE THE TOP OF THE PIPE SHALL BE CEMENT-STABILIZED SAND.
5. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION, (713-316 3565), AND WRITTEN NOTIFICATION 48 HOURS IN ADVANCE.
7. CONTRACTOR TO OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT."
8. ALL STORM SEWER MANHOLE RIMS LOCATED OUTSIDE THE PROPOSED PAVING SHALL BE SET TO PROPOSED FINISH GRADE ELEVATION.
9. BEFORE UTILITY CONSTRUCTION BEGINS, ADEQUATE DRAINAGE MUST BE PROVIDED SO THAT NO SHEET FLOW FLOODING OF ROADWAY OR ADJOINING PROPERTIES OCCURS.
10. THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
11. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY. ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE FINAL DRAFT OF STORMWATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES AS PREPARED BY HARRIS COUNTY/HCFCD, AND THE CITY OF HOUSTON ALL IN COMPLIANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS.
12. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB, SHALL BE AS GOOD AS OR BETTER THAN THE CONDITION PRIOR TO STARTING WORK.

GENERAL NOTES - WATER

1. ALL WATER LINES TO HAVE A MINIMUM OF FOUR (4) FEET OF COVER TO TOP OF CURB.
2. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD SPECIFICATIONS AND STANDARD CONSTRUCTION DETAILS FOR WASTE WATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" OCTOBER 2002.
3. ALL A.C. WATER MAINS USED IN THIS PROJECT RANGING IN SIZE FROM 6 INCHES THRU 16 INCHES SHALL BE AWWA C-400-80 CLASS 200 OR LATEST REVISION WITH MAXIMUM PIPE LENGTH OF 6 FEET 6 INCHES.
4. ALL WATER MAINS UNDER STREET PAVEMENT - 4 INCHES THRU 12 INCHES IN DIAMETER, IF NOT SPECIFIED OTHERWISE, SHALL BE AWWA C-900 PVC PIPE.
5. ALL FLUSHING VALVES SHALL BE SET THREE (3) FEET BEHIND BACK OF CURB.
6. STEEL WATER LINE SECTION TO EXTEND A OF FIVE (5) FEET MINIMUM BEYOND 45° BENDS.
7. THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
8. WHENEVER SANITARY SEWERS CROSS UNDER WATER MAINS, A 12" MINIMUM CLEARANCE IS REQUIRED. WHENEVER SANITARY SEWERS CROSS OVER WATER MAINS, A 2' MINIMUM CLEARANCE IS REQUIRED. ONE 18" JOINT OF DUCTILE PIPE SHALL BE INSTALLED IN THE SEWER LINE AND CENTERED AT THE WATER LINE CROSSING. REFER TO CITY OF HOUSTON, DESIGN MANUAL, PAGES 7-11 & 7-12 SEE TABLE 7.4 THIS SHEET.
9. DUCTILE IRON PIPE SHALL BE MINIMUM THICKNESS CLASS 50. THE PRESSURE RATING FOR BOTH THE PIPE AND THE JOINTS SHALL BE 150 PSI OR GREATER.
10. WHENEVER SANITARY SEWERS CROSS OVER WATER MAINS, AND THE OUT-TO-OUT PIPE CLEARANCE IS LESS THAN 24", A CENTERED 18" JOINT OF DUCTILE IRON PIPE SHALL BE USED. REFER TO CITY OF HOUSTON, DESIGN MANUAL, PAGES 7-11 & 7-12 SEE TABLE 7.4 THIS SHEET.
11. WHENEVER WATER MAINS CROSS UNDER SANITARY SEWERS, AND THE MINIMUM PIPE CLEARANCE IS 2' OR GREATER, BUT LESS THAN 9', A CENTERED 20' OF CEMENT STABILIZED SAND BACKFILL (2 SACKS OF CEMENT PER CUBIC YARD OF SAND) STARTING AT A POINT 1/4 OF THE PIPE DIAMETER ABOVE THE BOTTOM OF SANITARY SEWER TO 1-FOOT ABOVE THE TOP OF SANITARY SEWER, OR ONE SANITARY DIAMETER, WHICHEVER IS LARGER. CENTER ONE JOINT OF SANITARY SEWER PIPE ABOUT THE WATER MAIN.
12. ALL P.V.C. WATER MAINS SHALL BE F C-900, DR 18, CLASS 150.
13. ALL WATER METERS MUST HAVE INDIVIDUAL SERVICE LEADS AS PER CITY OF HOUSTON STANDARDS.

CITY OF HOUSTON
Department of Public Works & Engineering

DESIGN MANUAL
Water Line Design Requirements

Table 7.4
PROTECTION REQUIREMENTS AT
WATER LINE - SANITARY SEWER CROSSINGS

PRIMARY CONDITION	PROPOSED WATER EXISTING SANITARY				PROPOSED WATER PROPOSED SANITARY OR EXISTING WATER PROPOSED SANITARY			
	WATER OVER SANITARY		WATER UNDER SANITARY		WATER OVER SANITARY		WATER UNDER SANITARY	
IF THE CLEARANCE IS	Less than 2'	Greater than or equal to 2' but less than 9'	Less than 2'	Greater than or equal to 2' but less than 9'	Less than 2'	Greater than or equal to 2' but less than 9'	Less than 2'	Greater than or equal to 2' but less than 9'
*Protection Requirement	1,2,3	2	6	4	1,3,5	2	1,3,5	5

*** PROTECTION REQUIREMENTS FOR SANITARY SEWER CROSSINGS**
(Unless Variance is Granted by the TCEQ)
(All clearances shall be measured from outside wall to outside wall)

1. Place one full section of approved restrained joint water line centered at sanitary sewer. Not applicable for existing water.
2. If no evidence of sanitary sewer leakage, place one full section of water line centered over sanitary sewer; if there is evidence of leakage, use note 4 below.
3. One foot minimum clearance.
4. Auger 9 feet minimum each side of sanitary sewer. Place one full section of water line, centered under sanitary sewer. Fill augered hole with bentonite/clay mixture. If sewer line is leaking, sewer line shall be replaced with 150 psi lined ductile iron or PVC pipe with appropriate adapters on all portions of the sanitary sewer within 9 feet of the water line. Provide restrained joints for both water and sanitary sewer lines at each end of proposed pipe section. Water line must pass a pressure and leakage test as specified in City's Standard Specifications. Sewer line shall pass an infiltration, ex-filtration low pressure air test or leakage test as specified in TCEQ Chapter 317-2 Design Criteria for Sewage Systems.
5. Place minimum one full section of sanitary sewer, 150 psi lined ductile iron or PVC pipe centered at the water line and provide restrained joints for both water and sanitary sewer lines at each end of proposed pipe section. Use cement-stabilized sand backfill for all portions of the sanitary sewer within 9 feet of the water line, as measured perpendicularly from any point on the water line to the sanitary sewer (minimum 2.5 sacks cement per cubic yard of sand). The cement-stabilized sand bedding shall start at a point 6 inches below the bottom of sanitary sewer to 6 inches above the top of sanitary sewer and one quarter of the pipe diameter or 6 inches, whichever is greater, on the side of the sanitary sewer.
6. Not allowed.

GENERAL NOTES - PAVING

1. PAVING SHALL BE IN ACCORDANCE WITH HARRIS COUNTY "RULES, REGULATIONS AND REQUIREMENTS RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS OR RE-SUBDIVISIONS" AND THE LATEST REVISIONS AND/OR AMENDMENTS OF SAME.
2. GUIDELINES SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.
3. ALL RADII AT CURB RETURNS TO BE 25.0' TO BACK OF CURB UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION, (713-316-3561). AND WRITTEN NOTIFICATION 48 HOURS IN ADVANCE.
5. STOP SIGN (R1 - 1A) TO BE PLACED AT INTERSECTIONS.
6. OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY FOR CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN COUNTY ROAD R.O.W.
7. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT. PRIOR TO STARTING CONSTRUCTION.
8. OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITY AND/OR CULVERTS WITHIN COUNTY ROAD RIGHTS OF WAY.

NOTE:

"AUTHORIZATION NOTICE ISSUED BY HARRIS COUNTY PUBLIC INFRASTRUCTURE ENGINEERING DEPARTMENT PERMIT OFFICE REQUIRED PRIOR TO CONSTRUCTION OF UTILITIES OR LEFT TURN LANES WITHIN HARRIS COUNTY RIGHT-OF-WAY." CONTACT HARRIS COUNTY PERMIT OFFICE (713-956-3000)

PRIVATE UTILITY COMPANY NOTES

Centerpoint Energy, Inc. / Electric Facilities

Overhead lines may exist on the property. We have not attempted to mark these lines since they are clearly visible, but you should locate them prior to beginning any construction. Texas law, Section 752, Health & Safety Code, forbids all activities in which persons or things MAY come within six (6) feet of live overhead high voltage lines. Contractors and owners are legally responsible for safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or moved, call Centerpoint at 228-7400.

Centerpoint Energy, Inc. / Gas Facilities

Location of Centerpoint main lines (to include United Gas Transmission and/or Industrial Gas Supply Corporation where applicable) are shown in an approximate location only. Service lines are usually not shown. The contractor shall contact the Utility Coordinating Committee at 223-4567 or 1-800-669-8344 a minimum of 48 hours prior to construction to have main and service lines field located. The contractor shall determine the exact location before commencing work and agree to be fully responsible for any damages caused by his failure to exactly locate and preserve these underground facilities.

Southwestern Bell Telephone Company

The locations of Southwestern Bell Telephone Company facilities are shown in an approximate way only. The contractor shall determine the exact location before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve these underground utilities.

The contractor shall call 1-800-344-8377 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 Southwestern Bell Telephone facilities, all excavations must be accomplished using non-mechanical excavation procedures. When boring the contractor shall expose the Southwestern Bell Telephone facilities.

When Southwestern Bell Telephone facilities are exposed, the contractor should provide support to prevent damage to the conduit ducts or cables. When excavating near telephone poles the contractor shall brace the pole for support.

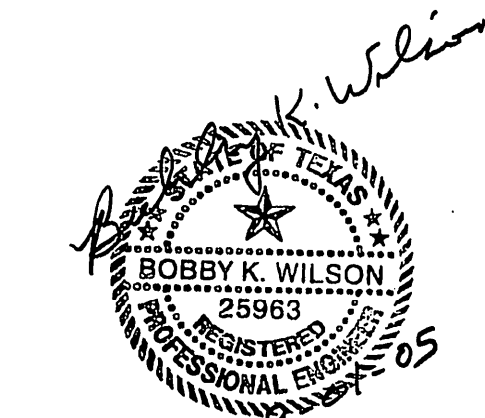
Thank You

STANDARD HCFCD NOTES FOR PLANS

1. Harris County Flood Control District, Construction Department, shall be notified at least 48 hours prior to construction (713-684-4116). A copy of the approved construction drawings is required at this time.
2. Engineer shall submit letter and record drawings to the Harris County Flood Control District, Construction Department, requesting inspection and acceptance of items constructed in Harris County Flood Control District Right-of-Way. Prior to requesting inspection, the drainage right-of-way and/or easements shall be staked and flagged.
3. Contractor shall be responsible for protecting, maintaining, and restoring backslope drainage systems.
4. All disturbed areas within the Harris County Flood Control District right-of-way, except the channel bottom, shall be hydro-mulch seeded as per Harris County Flood Control District specification entitled "Turf Establishment" (Dry Application) or approved equal.
5. Backfill to be compacted in no greater than 1 foot lifts to the density of the undisturbed adjacent soil.
6. Contractor shall be responsible for excavating channel flowline to design elevations as shown on plans and downstream as necessary to insure no water in storm sewer during "dry" conditions.
7. Contractor shall be responsible for maintaining flow in channel during construction and restoring channel to original condition.
8. All excavated material is to be removed from the Harris County Flood Control District right-of-way. No fill is to be placed within designated flood plain area without first obtaining a fill permit.
9. Contractor, with the assistance of the Engineer if necessary, shall be responsible for obtaining all applicable City, County, State, and Federal permits.

"STORM WATER QUALITY PRE-CONSTRUCTION INSPECTION REQUIREMENTS":

THE PROPERTY OWNER OR THE CONTRACTOR SHALL CONTACT THE HARRIS COUNTY STORM WATER QUALITY PERMITTING SECTION AT 713-956-3000 FOR A PRE-CONSTRUCTION INSPECTION PRIOR TO COMMENCING ANY CLEARING OR CONSTRUCTION ACTIVITIES ON THE SITE.



PROVIDENT CONSULTING, INC.
1405 ALLSTON ST.
HOUSTON, TEXAS 77008
(713)802-1019

PRIVATE UTILITY LINES SHOWN

CENTERPOINT ENERGY, ENTEX

SBC VALID FOR ONE YEAR
APPROVED ONLY FOR UNDERGROUND CONDUIT FACILITIES

CENTERPOINT ENERGY
APPROVED ONLY FOR PROPOSED UNDERGROUND UTILITIES
UNLESS NOTED VALID AT TIME OF REVIEW ONLY.

VILLAS at WILLOWBROOK
H.C.M.U.D. #191
UTILITIES & PAVING

NOTES

WATER	WASTEWATER	TRAFFIC
ST. & BRIDGE	STORMWATER	SWD

FILE NO:

DRAWING SCALE:
N/A

VERT: HORZ:

SHEET No: 3 OF 24