FORT BEND COUNTY ENGINEERING CONSTRUCTION NOTES

CONSTRUCTION

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE–CONSTRUCTION MEETING.
2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PAVING AT CONSTRUCTION@FBCTX.GOV.
3. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM FORT BEND COUNTY PRIOR TO COMMENCING CONSTRUCTION OF ANY IMPROVEMENTS WITHIN COUNTY ROAD RIGHT OF WAYS.
4. ALL PAVING IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FORT BEND COUNTY "RULES, REGULATIONS AND REQUIREMENTS" RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS AS CURRENTLY AMENDED.
5. ALL ROAD WIDTHS, CURB RADII AND CURB ALIGNMENT SHOWN INDICATES BACK OF CURB.
6. A CONTINUOUS LONGITUDINAL REINFORCING BAR SHALL BE USED IN THE CURBS.
7. ALL CONCRETE PAVEMENT SHALL BE 5½ SACK CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET.
8. ALL WEATHER ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
9. 4" X 12" REINFORCED CONCRETE CURB SHALL BE PLACED IN FRONT OF SINGLE FAMILY LOTS ONLY. ALL OTHER AREAS SHALL BE 6" REINFORCED CONCRETE CURB.
10. CURB HEADERS ARE REQUIRED AT CURB CONNECTIONS TO HANDICAP RAMPS, WITH NO CONSTRUCTION JOINT WITHIN 5' OF RAMPS.
11. GUIDELINES ARE SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION – BOTH DAY AND NIGHT.
12. ALL R1–1 STOP SIGNS SHALL BE A MINIMUM OF 36"X36" WITH DIAMOND GRADE SHEETING PER TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
13. STREET NAME SIGNAGE SHALL BE ON A 9" HIGH SIGN FLAT BLADE W/REFLECTIVE GREEN BACKGROUND. STREET NAMES SHALL BE UPPER AND LOWERCASE LETTERING WITH UPPERCASE LETTERS OF 6" MINIMUM AND LOWERCASE LETTERS OF 4.5" MINIMUM. THE LETTERS SHALL BE REFLECTIVE WHITE. STREET NAME SIGNS SHALL BE MOUNTED ON STOP SIGN POST.
14. A BLUE DOUBLE REFLECTORIZED BUTTON SHALL BE PLACED AT ALL FIRE HYDRANT LOCATIONS. THE BUTTON SHALL BE PLACED 12 INCHES OFF OF THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE HYDRANT.
15. THE PROJECT AND ALL PARTS THEREOF SHALL BE SUBJECT TO INSPECTION FROM TIME TO TIME BY INSPECTORS DESIGNATED BY FORT BEND COUNTY. NO SUCH INSPECTIONS SHALL RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER. NEITHER FAILURE TO INSPECT NOR FAILURE TO DISCOVER OR REJECT ANY OF THE WORK AS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, REQUIREMENTS AND SPECIFICATIONS OF FORT BEND COUNTY OR ANY PROVISION OF THIS PROJECT SHALL BE CONSTRUED TO IMPLY AN ACCEPTANCE OF SUCH WORK OR TO RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER.
16. STABILIZED SUBGRADE: DETERMINE THE THICKNESS OF THE STABILIZED SUBGRADE AFTER CURING AND COMPACTION. IF THE SUBGRADE DEPTH IS GREATER THAN THE PROPOSED THICKNESS BY 20% OR MORE, THE CMT LAB MUST PROVIDE VERIFICATION THE PERCENTAGE OF MATERIAL BEING USED TO STABILIZE THE SUBGRADE MEETS OR EXCEEDS PROJECT REQUIREMENTS. TEST RESULTS REQUIRED.
17. CONTRACTOR TO PROVIDE MONTHLY SCHEDULE UPDATES AND WEEKLY LOOK AHEAD
18. ALL DRAINAGE AND DETENTION CAPACITY MUST BE IN PLACE PRIOR TO BEGINNING ANY PAVING ACTIVITIES
19. ALL TURN LANES AND MEDIAN OPENINGS SHALL HAVE THE SAME SURFACE AS THE EXISTING STREET. FROM THE ROW, ALL STREET AND DRIVEWAY CONNECTIONS SHALL HAVE THE SAME SURFACE AS THE EXISTING OR PROPOSED STREET.
20. MINIMUM DEPTH FOR BORES/UTILITIES SHALL BE AS FOLLOWS:
OPEN DITCH – 3' MIN. BELOW FLOWLINE; 5' MIN. BELOW TOP OF PAVEMENT
CURBED STREETS – 5' MIN. BELOW TOP OF PAVEMENT

NOTE: FORT BEND COUNTY NOTES SUPERSEDE ANY CONFLICTING NOTES.

PRIVATE UTILITIES

NOTICE
THE CONTRACTOR SHALL CONTACT TEXAS ONE CALL AT (800) 245–4545 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.

CAUTION: TELEPHONE CABLES

THE LOCATION OF TELEPHONE 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.

WHEN TELEPHONE LINE MARKINGS ARE NOT VISIBLE, CALL (800) 245–4545 FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

WHEN EXCAVATING WITHIN EIGHTEEN (18) IN OF THE INDICATED LOCATION OF TELEPHONE FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON–MECHANIZED EXCAVATION PROCEDURES. WHEN BORING THE CONTRACTOR SHALL EXPOSE THE TELEPHONE FACILITIES.

WHEN 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.

CAUTION: UNDERGROUND GAS FACILITIES

LOCATION OF GAS MAIN LINES (TO INCLUDE UNIT GAS TRANSMISSION AND/OR INDUSTRIAL GAS SUPPLY CORPORATION WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE.

WHEN GAS PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (800) 245–4545 FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

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

WHEN GAS FACILITIES ARE EXPOSED SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

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

CAUTION: OVERHEAD ELECTRICAL FACILITIES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL THE APPROPRIATE OWNING AUTHORITY.

CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT (800) 245–4545 AND THE CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS (713) 863–1450 A MINIMUM OF 48 HOURS PRIOR TO PROCEEDING WITH ANY WORK IN STREET RIGHT–OF–WAY OR EASEMENTS.

GENERAL WD ENGINEERING NOTES

1. THE CONTRACTOR IS TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE PLANS AND WHAT EXISTS IN THE FIELD, CONTRACTOR IS TO NOTIFY THE ARCHITECT AND ENGINEER IMMEDIATELY.
2. WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING ARE DESIGNED IN ACCORDANCE WITH THE LATEST EDITION OF THE DOCUMENTS – "STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, AND STREET PAVING", "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEM, WATER LINES, STORM DRAINAGE, AND STREET PAVING" AND THE "INFRASTRUCTURE DESIGN MANUAL" PUBLISHED BY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING.
3. EXISTING UTILITY INFORMATION SHOWN IS NOT GUARANTEED TO BE ACCURATE AND ALL INCLUSIVE. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AND SHOULD BE VERIFIED BY THE CONTRACTOR IN ADVANCE OF CONSTRUCTION. CONTRACTOR SHALL VERIFY THE INVERT, AND/OR FLOW LINE ELEVATIONS OF POINTS OF CONNECTIONS PRIOR TO THE COMMENCEMENT OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND OTHER FACILITIES. ANY CONFLICT OR DISCREPANCY DISCOVERED MUST IMMEDIATELY BE BROUGHT TO THE ENGINEER'S ATTENTION.
4. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT (800) 245–4545 A MINIMUM OF 48 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION.
5. THE CONTRACTOR IS REQUIRED TO COMPLY WITH THE LATEST EDITION OF THE OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
6. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
7. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING'S "STANDARD CONSTRUCTION SPECIFICATIONS" REFERENCED ABOVE, AT NO COST TO OWNER.
8. ANY DAMAGE TO ANY OF THE EXISTING PAVEMENT AND/OR UTILITIES MUST BE REPAIRED IMMEDIATELY. THE CONTRACTOR MUST NOTIFY THE APPROPRIATE UTILITY OWNER, WHO WILL MAKE THE REPAIRS AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SHIPPING OF ALL MATERIALS. THE LOADING AND UNLOADING OF ALL PIPE, VALVES, HYDRANTS, MANHOLES AND OTHER ACCESSORIES SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDED PRACTICES AND SHALL BE AT ALL TIMES PERFORMED WITH CARE TO AVOID ANY DAMAGE TO THE MATERIAL. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE SUCH MATERIAL AT THE POINT OF DELIVERY AND TO REJECT ALL DEFECTIVE MATERIAL. THE DEFECTIVE MATERIAL MUST BE REPLACED WITH SOUND MATERIAL.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STORAGE OF MATERIAL AND EQUIPMENT IN A SAFE AND WORKMANLIKE MANNER TO PREVENT INJURIES, DURING AND AFTER WORKING HOURS UNTIL PROJECT COMPLETION. THERE SHALL BE NO PAYMENT MADE TO CONTRACTOR FOR STORED MATERIAL.
11. THE WORK AREA SHALL BE BARRICADED AND ILLUMINATED DURING DARKNESS AND PERIODS OF INACTIVITY, WHEN IN AN AREA OF DIRECT PUBLIC ACCESS.
12. ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
13. GUIDELINES SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAG MEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION – BOTH DAY AND NIGHT.
14. CONTRACTOR SHALL NOT PERFORM ANY WORK WITHIN AREA DELINEATED AS WETLANDS UNTIL ALL NECESSARY PERMITS ARE APPROVED.
15. NO CONNECTIONS SHALL BE MADE TO EXISTING WATER LINES OR SANITARY SEWERS UNTIL ALL PROPOSED LINES HAVE BEEN THOROUGHLY CLEANED, TESTED AND APPROVED BY THE ENGINEER.
16. FINAL APPROVAL BY OWNER'S REPRESENTATIVE OF GRADING ADJACENT TO BUILDING REQUIRED PRIOR TO INSTALLATION OF LANDSCAPING MATERIALS. COORDINATE WITH LANDSCAPE ARCHITECT TO ENSURE POSITIVE DRAINAGE.
17. 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.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE AND POSITIVE DRAINAGE AT ALL TIMES DURING CONSTRUCTION OF PROPOSED FACILITIES. NATURAL GROUND ADJACENT TO UTILITY TRENCH EXCAVATION TO BE GRUBBED PRIOR TO REPLACEMENT OF EXCESS TRENCH MATERIAL. NO SEPARATE PAYMENT.
19. IN ORDER TO COMPLY WITH TEXAS ACCESSIBILITY STANDARDS, THE CONTRACTOR SHALL ENSURE THAT THE SLOPE OF SIDEWALK AND/OR PAVING WITHIN THE A.D.A. PATH DOES NOT EXCEED 2% IN ANY DIRECTION EXCEPT A.D.A. APPROVED RAMPS.
20. SURFACE RESTORATION: AT THE END OF ALL CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL RESTORE THE EXISTING FACILITIES AND ALL SPOIL MATERIAL, VEGETATION & DEBRIS SHALL BE HAULED AND DISPOSED OF OFF SITE, I.E., THE PROPERTY, SHALL BE MADE EQUAL TO OR BETTER THAN EXISTING SITE CONDITION PRIOR TO CONSTRUCTION.
21. CONTRACTOR SHALL HYDROMULCH SEED ALL DISTURBED AREAS UNLESS OTHERWISE SHOWN ON ARCHITECTS/LANDSCAPE ARCHITECTS PLANS.
22. CONDITION OF THE ROAD AND/OR RIGHT–OF–WAY, THROUGHOUT CONSTRUCTION OF THIS PROJECT, SHALL BE AS GOOD OR BETTER THAN CONDITION PRIOR TO STARTING WORK BY CONTRACTOR.
23. CONTRACTOR SHALL PREPARE A SET OF "AS–BUILT" DRAWINGS SHOWING ANY FIELD CHANGES MADE TO THE APPROVED ENGINEERING PLANS AND SUBMIT TO THE DESIGN CONSULTANT FOR SUBMISSION TO CITY ENGINEER.
24. IF THE CONSTRUCTION DOES NOT BEGIN WITHIN A YEAR AFTER THE PLANS HAVE BEEN SIGNED, NEW SIGNATURES MUST BE OBTAINED AND LETTERS OF AVAILABILITY MUST BE UPDATED.
25. THE CONTRACTOR SHALL FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING PUBLIC AND PRIVATE UTILITIES THAT HAVE OR MAY HAVE ANY EFFECT ON THE PROPOSED IMPROVEMENTS BEFORE ANY WORK COMMENCES. THE INSTALLATION OF ALL GRAVITY FLOW PIPES SHALL BEGIN AT THE OUTFALL OR CONNECTION TO THE EXISTING SYSTEM AND PROCEED UPSTREAM. IF ANY DISCREPANCY FROM THE PLAN IS FOUND, THE CONTRACTOR IS TO NOTIFY WD ENGINEERING BEFORE PROCEEDING FURTHER.
26. ALL EXISTING UTILITIES, CURBS, RETAINING WALLS, BUILDINGS, ETC. ARE PROPOSED TO BE DEMOLISHED AND SITE TO BE SCRAPED CLEAN. IT MAY BE NECESSARY FOR CONTRACTOR TO VERIFY FINAL GRADES AND CONDITION OF SITE PRIOR TO START OF CONSTRUCTION.

PAVING

1. GUIDELINES SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED.
2. EXISTING PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO FORT BEND COUNTY STANDARDS.
3. PAVING CONSTRUCTION SHALL BE IN ACCORDANCE WITH FORT BEND COUNTY STANDARDS AND CIVIL DETAIL SHEETS AND PER THE SOILS REPORT.
4. CONTRACTOR SHALL BLOCK OUT (SQUARE) AROUND ALL INLETS AND MANHOLES IN PROPOSED PAVING.
5. REFER TO GRADING PLAN FOR PAVING THICKNESSES. SEE DETAIL SHEET AND GEOTECH REPORT FOR TYPICAL SECTIONS AND REINFORCING DETAIL.
6. EXPANSION JOINT SHALL BE PLACED AT THE END OF EACH CURB RETURN AND AS SPECIFIED IN THE GEOTECH REPORT.

WATER LINE

1. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING STANDARD CONSTRUCTION SPECIFICATIONS DATED OCTOBER 2002 WITH LATEST ADDENDA AND AMENDMENTS THERETO.
2. SANITARY PRECAUTIONS MUST BE TAKEN DURING WATER LINE CONSTRUCTION, AS CALLED FOR BY AWWA STANDARDS. PRECAUTIONS INCLUDE KEEPING PIPE CLEAN AND CAPPING OR OTHERWISE EFFECTIVELY SEALING OPEN PIPE ENDS TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPE LINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.
3. ALL WATER LINES TO BE DISINFECTED IN CONFORMANCE WITH AWWA C–651. A MINIMUM OF ONE BACTERIOLOGICAL SAMPLE SHALL BE COLLECTED FOR EACH 1,000 FEET OF COMPLETED WATER LINE, OR FRACTION THEREOF, TO CHECK EFFICIENCY OF DISINFECTION PROCEDURES AND SHALL BE REPEATED IF CONTAMINATION PERSISTS.
4. ALL FLANGES BELOW GRADE SHALL BE INSULATED.
5. ALL WATERLINES SHALL BE ENCASED IN BANK SAND AT LEAST 12" ABOVE THE PIPE. COST OF BANK SAND TO BE INCLUDED IN THE UNIT PRICE OF WATERLINE.
6. ALL WATER LINES SHALL BE BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON WATER DWG. NO. 02317–04.
7. HYDROSTATIC TESTING: ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH AWWA STANDARDS. LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF, TO MAINTAIN PRESSURE WITHIN 5 P.S.I. OF THE SPECIFIED TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR HAS BEEN EXPELLED. THE TEST PRESSURE SHALL BE EITHER A MINIMUM OF 125 P.S.I.G. OR 1.5 TIMES THE MAXIMUM DESIGN PRESSURE WHICHEVER IS LARGER. THE MAXIMUM LEAKAGE SHALL BE CALCULATED USING THE FORMULA AS FOLLOWS:

WHERE L = (S)(D)(P^1/2)/133,200

L = ALLOWABLE LEAKAGE IN GAL./HR.
S = LENGTH OF PIPE TESTED IN FEET
D = INSIDE DIAMETER OF PIPE IN INCHES S
P = PRESSURE IN POUNDS PER SQUARE INCH (GAUGE)

8. ALL WATER PIPE AND RELATED PRODUCTS MUST CONFORM TO ANSI/NSF STANDARD 61.
9. 4" THRU 12" WATER LINES SHALL BE P.V.C. CLASS 150, DR–18, AWWA C–900 AND 1" THRU 3" WATER LINES SHALL BE SCHEDULE 40 P.V.C..
10. 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 P.S.I.G. CONFORMING TO THE REQUIREMENTS OF CITY OF HOUSTON STANDARD SPECIFICATION SECTION 02501–DUCTILE IRON PIPE AND FITTINGS.
11. ALL WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" OVER PIPE AND BACKFILLED WITH BANK SAND TO THE BOTTOM OF THE PAVEMENT SUBGRADE.
12. ALL WATER LINES TO HAVE 4' MINIMUM COVER TO FINISHED GRADE AND MINIMUM 12" CLEAR TO OTHER UTILITIES AT CROSSINGS UNLESS OTHERWISE NOTED ON PLANS.
13. CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 9' (NINE FEET) BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.
14. CENTER OF FIRE HYDRANT TO BE LOCATED 3'–0" FROM BACK OF CURB.
15. UTILITY CONTRACTOR TO TURN FIRE HYDRANTS AND MAKE ALL FINAL ADJUSTMENTS AFTER COMPLETION OF PAVING. NO SEPARATE PAY.
16. "W.L.E." INDICATES "WATER LINE EASEMENT"

GEOTECHNICAL

1. ALL GRADING/BACKFILL/COMPACTION SHALL BE IN ACCORDANCE WITH THE SOILS REPORT AND ANY ADDENDUMS THERETO. SOILS REPORT SHALL BE OBTAINED FROM OWNER.
2. EARTH BACKFILL SHALL BE MADE BY MECHANICAL MEANS TO PRODUCE A DENSITY EQUAL TO THAT OF SURROUNDING UNDISTURBED SOIL.
3. ALL AREAS TO BE FILLED ARE TO BE FREE OF VEGETATION, DEBRIS, PONDING WATER, LOOSE SOILS, MUD & MUCK. CLEARING, GRUBBING AND STRIPPING OF SITE SHALL BE PER GEOTECHNICAL REPORT.
4. ALL FILL SHALL BE COMPACTED IN 8" LIFTS, 95% STANDARD PROCTOR DENSITY.
5. THE BUILDING AND PAVEMENT AREAS SHOULD BE CLEARED OF ALL PAVEMENT COMPONENTS AND ANY OTHER DEBRIS. ALL UTILITIES AND ASSOCIATED BEDDING MATERIAL THAT ARE PLANNED TO BE ABANDONED SHOULD BE COMPLETELY REMOVED FROM PROPOSED CONSTRUCTION AREAS. THE LOOSENED SOILS SHOULD BE MOISTURE CONDITIONED IF NECESSARY AND COMPACTED TO AT LEAST 95 PERCENT OF THE STANDARD PROCTOR (ASTM D 698) MAXIMUM DRY DENSITY TO WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT. THE EXPOSED SOIL SUBGRADE AREA SHOULD BE PROOF ROLLED WITH A PNEUMATIC ROLLER TO DETECT WEAK AREAS ONCE FINAL SUBGRADE ELEVATIONS HAVE BEEN ACHIEVED THROUGHOUT THE SITE. WEAK AREAS DETECTED DURING PROOF ROLLING, AS WELL AS ZONES OF DEBRIS AND ORGANICS SHOULD BE REMOVED AND REPLACED WITH SOILS EXHIBITING SIMILAR CLASSIFICATIONS, MOISTURE CONTENT, AND DENSITY AS THE ADJACENT IN–SITU SOILS. SUBSEQUENT TO PROOF ROLLING, AND JUST PRIOR TO PLACEMENT OF FILL, THE EXPOSED SUBGRADE SHOULD BE MOISTURE CONDITIONED AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY (ASTM D 698) WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT.
GRADE ADJUSTMENTS WITHIN THE BUILDING AREA SHOULD BE ACCOMPLISHED WITH SELECT FILL COMPOSED OF CLEAN, SANDY CLAY (NOT SILTY) WITH A PLASTICITY INDEX RANGING BETWEEN 10 AND 20 PERCENT. ALL SELECT FILL SHOULD BE PLACED ON PREPARED SURFACES IN LIFTS NOT TO EXCEED EIGHT INCHES LOOSE MEASURE, WITH COMPACTED THICKNESS NOT TO EXCEED SIX INCHES. THE SELECT FILL SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THE ASTM D 698 MAXIMUM DRY DENSITY AT A MOISTURE CONTENT WITHIN 2 PERCENT OF OPTIMUM.
IN PAVEMENT AREAS, ON–SITE SOILS MAY BE CONSIDERED FOR GRADE ADJUSTMENTS PROVIDED THEY ARE FREE OF ORGANICS AND DEBRIS. THE ON–SITE SOILS SHOULD BE MOISTURE ADJUSTED TO WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT, AND COMPACTED TO AT LEAST 95 PERCENT OF THE STANDARD PROCTOR (ASTM D 698) MAXIMUM DRY DENSITY.
6. REFERENCE SOILS REPORT PREPARED FOR THIS PROJECT FOR MINIMUM PAVING REQUIREMENTS. IF A DISCREPANCY EXISTS BETWEEN GEOTECHNICAL REPORT REQUIREMENTS AND REQUIREMENTS SHOWN HEREIN, CONTRACTOR SHALL USE THE MORE STRINGENT REQUIREMENTS.

STORM SEWERS

1. STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON "STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" OCTOBER, 2002 ISSUE, AS CURRENTLY AMENDED.
2. STORM SEWERS SHALL BE INSTALLED, BEDDED, AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS NOS. 02317–02, 02317–03, 02317–05, 02317–06 & 02317–07 AS APPLICABLE UNLESS OTHERWISE SHOWN ON DRAWINGS.
3. ALL STORM SEWER MANHOLES SHALL BE CONSTRUCTED PER CITY OF HOUSTON DRAWING NO. 02081–01, 02081–02, 02081–03, 02081–04 OR 02081–05.
4. ALL PROPOSED STORM SEWER STRUCTURES SHALL BE REQUIRED TO HAVE A ONE (1) FOOT BASE CONSISTING OF COMPACTED CEMENT STABILIZED SAND (1–1/2 SACK CEMENT/C.Y.).
5. ALL PROPOSED PIPE STUB–OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
6. STORM SEWER PIPE USED FOR CONNECTION TO STORM SEWER IN PUBLIC RIGHT–OF–WAY SHALL BE REINFORCED CONCRETE PIPE ASTM C–76, CLASS III, AND SHALL EXTEND TO FIRST INLET OR MANHOLE. ALL OTHER PRIVATE STORM SEWERS SHALL BE H.D.P.E. HANCOR SURE–LOK F477 OR APPROVED EQUAL AND BEDDED WITH CEMENT STABILIZED SAND PER VENDOR REQUIREMENTS. EMBEDMENT TO BE A MINIMUM OF 1' AROUND ENTIRE PIPE. PIPE GRADES ARE BASED ON CONCRETE PIPE TO PRODUCE THREE (3) FPS MINIMUM VELOCITY.
7. CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINTS ONLY CONFORMING TO ASTM C443.
8. ALL SEWERS 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 THE BOTTOM OF THE PAVEMENT SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL IN 8 INCH LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS ON EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM DESIGNATION D–698/AASHTO T99). MOISTURE CONTENT OF BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CEMENT– STABILIZED SAND SPECIFICATION ASTM C33, LATEST EDITION.
9. CULVERT TO BE SIZED AND GRADE SET BY CONTRACTOR IF NOT IDENTIFIED, ENGINEER APPROVAL REQUIRED PRIOR TO PLACEMENT.
10. "STM. S. E." INDICATES "STORM SEWER EASEMENT."

SANITARY SEWERS

1. ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON "STANDARD CONSTRUCTION SPECIFICATION FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" OCTOBER, 2002 ISSUE AND ALL CURRENT AMENDMENTS THERETO AND BE SUBJECT TO A STANDARD EXFILTRATION TEST. TESTS ARE TO BE PERFORMED ON THE TOTAL FOOTAGE OF SEWER LINE INCLUDED IN THE PROJECT. REQUIREMENTS OF TEXAS ADMINISTRATIVE CODE, TITLE 30 CHAPTER 317, "DESIGN CRITERIA FOR SEWERAGE SYSTEMS" SHALL GOVERN WHERE CONFLICTS EXIST EXCEPT WHERE CITY REQUIREMENTS ARE OF HIGHER STANDARDS.
2. ALL MANHOLES ARE TO BE PER CITY OF HOUSTON DWG. NO. 02082–01, 02082–02, 02082N–02, 02082–03, AND 02082N–03 UNLESS OTHERWISE NOTED.
3. SANITARY SEWERS MANHOLES WILL HAVE BEDDING AND BACKFILL PER CITY OF HOUSTON DWG. NO. 02317–08 UNLESS OTHERWISE NOTED.
4. SANITARY SEWER PIPE TO BE SDR 26 P.V.C. PIPE MEETING ASTM SPECIFICATION D3034 WITH RUBBER GASKET JOINTS, UNLESS OTHERWISE NOTED.
5. SDR 26 P.V.C. PIPE USES "FULL BODIED" SDR 26 P.V.C. FITTINGS WITH APPROPRIATE ADAPTERS. AWWA C–900 DR–18 P.V.C. PIPE USES EITHER AWWA C900 DR–18 P.V.C. FITTINGS OR D.I.P. FITTINGS. SDR–26 P.V.C. PIPE SHALL HAVE A CELL CLASSIFICATION OF 12364–B AS DEFINED IN ASTM D–1784.
6. ALL SDR P.V.C. PIPE IS TO HAVE D.I.P. SIZE O.D. AND RUBBER GASKET BELL–AND–SPIGOT TYPE JOINT ENDS.
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 DWG. NO. 02317–01, 02317–02, OR 02317–03 AS APPLICABLE, WITH 1 1/2 SACK CEMENT/C.Y. STABILIZED SAND BACKFILL UP TO THE BOTTOM OF THE PAVEMENT SUBGRADE. 100 P.S.I. PERFORMANCE RESULTS ARE STILL REQUIRED.
8. ALL SANITARY SEWERS CROSSING WATER LINES WITH A CLEARANCE BETWEEN 6 INCHES AND 9 FEET SHALL HAVE A MINIMUM OF ONE 18' JOINT OF 150 P.S.I. DUCTILE IRON OR C900 P.V.C. 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 FOR 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 STORMWATER DRAINAGE AWAY FROM MANHOLE RIM.
11. IN WET STABLE TRENCH AREAS USE BEDDING PER CITY OF HOUSTON DWG NO. 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 317.2 LATEST AMENDMENT AND WITHOUT MECHANICAL PULLING DEVICES.
13. INFILTRATION, EXFILTRATION OR LOW–PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC, TITLE 30 317.2 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.
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"

PROPOSED LEGEND

PROPOSED WATER LINE, G.V.&B. WITH FLUSHING VALVE	
EXISTING WATER LINE, G.V.&B. WITH FLUSHING VALVE	
PROPOSED SANITARY SEWER LINE & MANHOLE & CLEANOUT	
EXISTING SANITARY SEWER LINE & MANHOLE	
PROPOSED STORM SEWER LINE, TYPE C MH & INLETS	
PROPOSED TYPE C INLET	
EXISTING STORM SEWER LINE AND MANHOLE & INLETS	
NATURAL GROUND	
TOP OF WALL ELEVATION	TW 92.00
TOP OF CURB ELEVATION	TC 92.00
TOP OF SIDEWALK ELEVATION	SW 92.00
FINISHED GRADE ELEVATION	FG 92.00
TOP OF PAVEMENT ELEVATION	TP 92.00
GUTTER ELEVATION	G 92.00
HIGH POINT	HP 92.00
EXISTING RELIANT ENERGY CONDUIT	
EXISTING RELIANT ENERGY GAS LINE	
EXISTING RELIANT ENERGY UNDERGROUND STREET LIGHT CABLE AND LAMP	
EXISTING SPRINT TELEPHONE	
PROPOSED INLET	
ONE JT. C900 PVC. CENTERED EACH WAY	
PROPOSED WATER METER	
PROPOSED BORE	
CLEAN OUT	CO
GRADE BREAK	-----HP-----

FBC Engineering Approval

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SLI DESIGN, INC.
ARCHITECTURE • PLANNING • INTERIOR DESIGN
15810 Park Ten Place Suite 300
Houston, TX 77084
713–465–4650
www.thesligroup.com

WD Engineering
TBPE NO F-8795
410 ASBURY STREET
HOUSTON, TEXAS 77007
713.301.4922 OFFICE
WDENGINEERING.COM

04/07/2026
STATE OF TEXAS
WILLIAM DAVIS WILKINSON
85626
LICENSED
PROFESSIONAL ENGINEER

Shell Federal Credit Union
Katy Fulshear
26620 FM 1093
Katy, Texas 77494

GENERAL NOTES

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