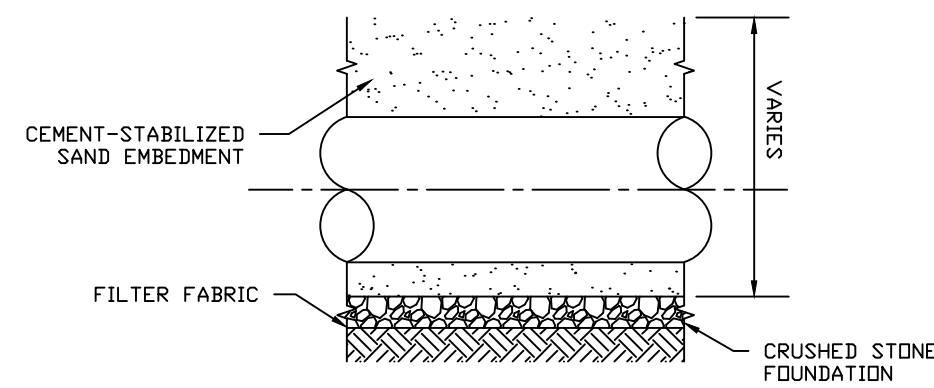
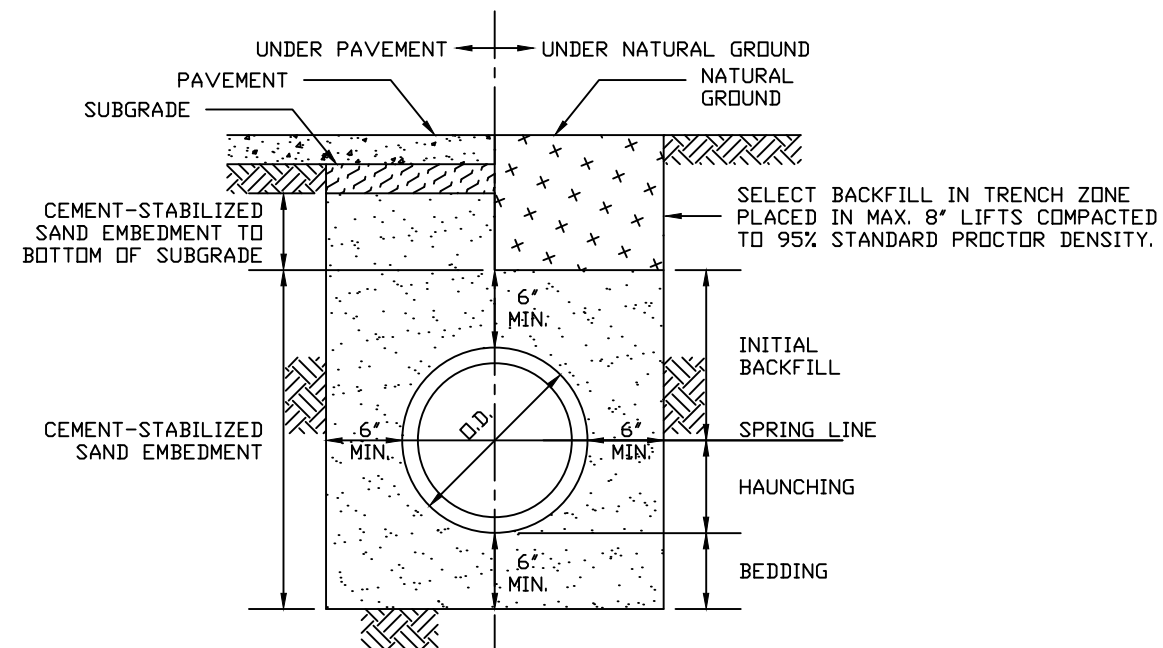


WET BEDDING CROSS-SECTION



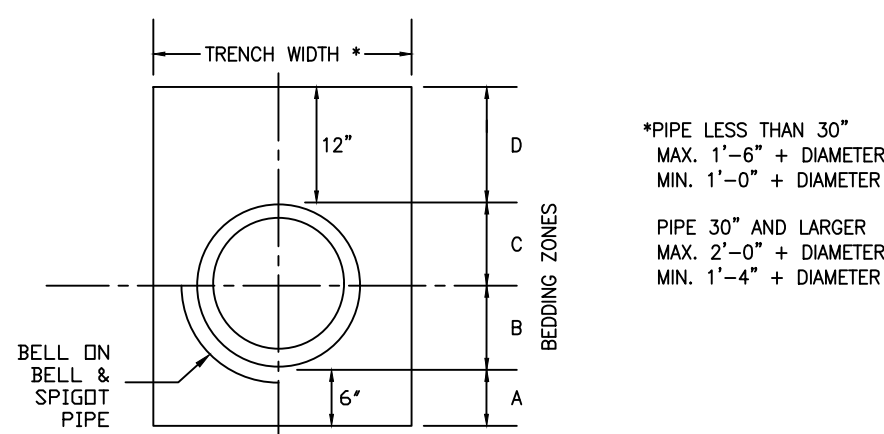
WET BEDDING LONGITUDINAL-SECTION



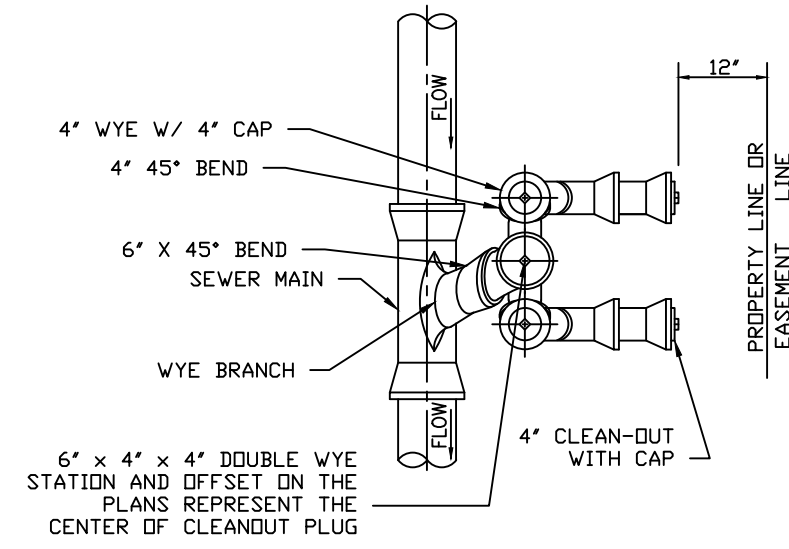
GRAVITY LINE BEDDING AND BACKFILL

PIPE MATERIAL	BEDDING ZONE			
	A	B	C	D
CAST IRON	BS	BS	BS	EF
DUCTILE IRON (PRESSURE)	BS	BS	BS	EF
DUCTILE IRON (GRAVITY)	CS	CS	CS	EF
PVC (PRESSURE PIPE)	BS	BS	BS	EF
PVC (GRAVITY PIPE)	CS	CS	CS	EF
STEEL	BS	BS	BS	EF

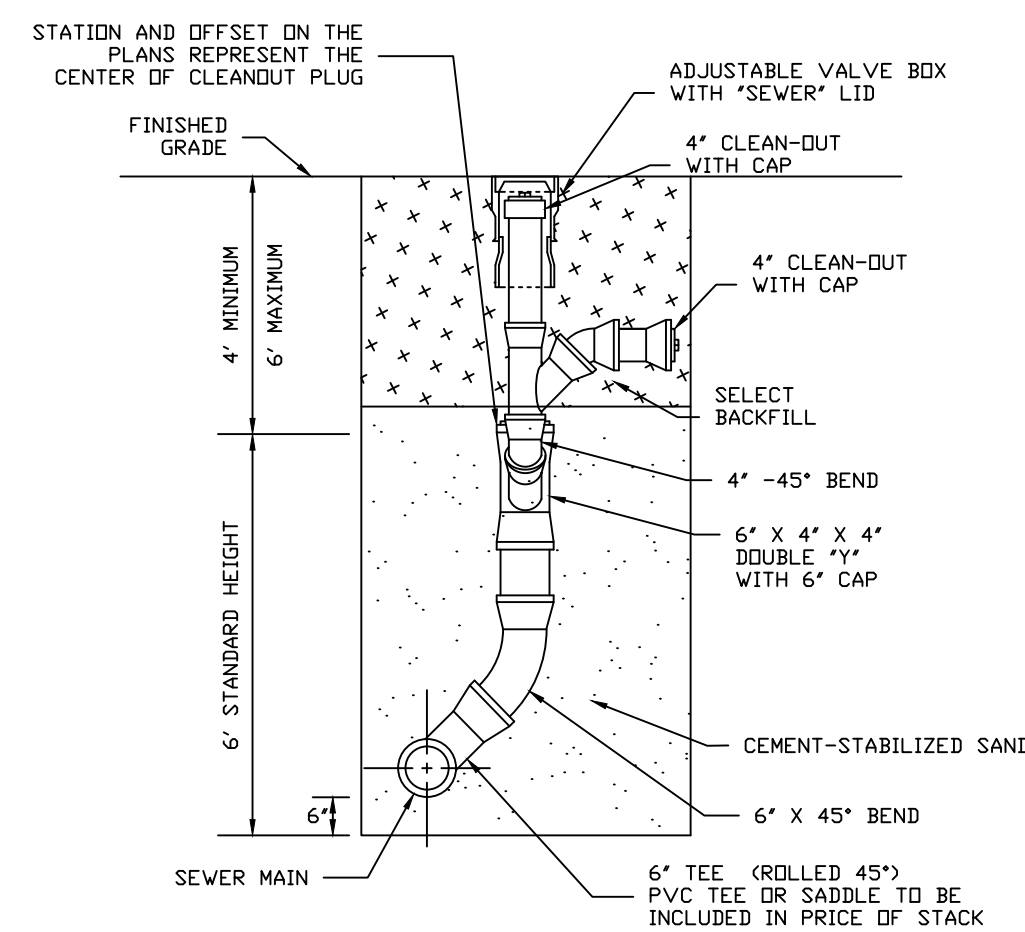
BS-BANK SAND  
 AB-AGGREGATE BEDDING (WET CONDITIONS ONLY)  
 ES-SELECT EARTH PLACED SAME DAY PIPE IS LAID  
 EF-EARTH FILL PLACED NEXT DAY (OR LATER) AFTER PIPE IS LAID  
 CS-CEMENT STABILIZED SAND



ORDINARY TRENCH EMBEDMENT & BACKFILL



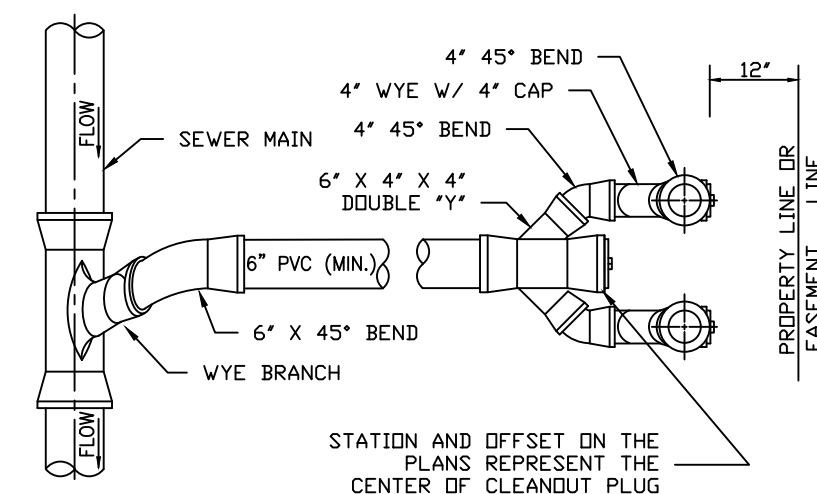
PLAN VIEW



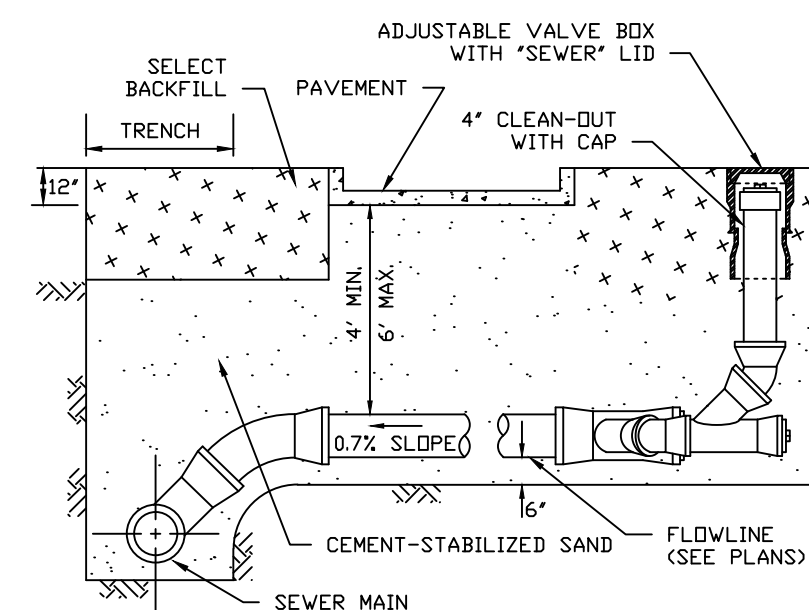
PROFILE VIEW

NEAR SIDE SERVICE CONNECTION

- NOTES:
- ONLY SDR26 PVC OR EQUIVALENT SHALL BE USED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
  - USE SINGLE WYE BRANCH FOR SINGLE SERVICE AND DOUBLE WYE BRANCH FOR DOUBLE SERVICE.
  - MAIN STACKS SHALL BE A MINIMUM OF 6" IN DIAMETER.
  - ALL CONNECTIONS TO THE MAIN SANITARY SEWER SHALL BE APPROVED BY THE CITY OF FRIENDSWOOD UTILITIES DIVISION OF PUBLIC WORKS. SCHEDULE INSPECTIONS AT (281) 996-3382.
  - ALL SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH THE CITY OF FRIENDSWOOD TECHNICAL SPECIFICATIONS, LATEST REVISION.
  - INDIVIDUAL RESIDENTIAL CLEANDUTS SHALL BE 4" PVC.



PLAN VIEW



PROFILE VIEW

FAR SIDE SERVICE CONNECTION

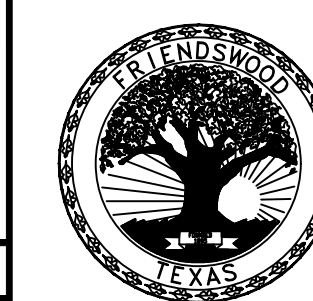
NOTES:

- ONLY SDR26 PVC OR EQUIVALENT SHALL BE USED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
- USE SINGLE WYE BRANCH FOR SINGLE SERVICE AND DOUBLE WYE BRANCH FOR DOUBLE SERVICE.
- ALL CONNECTIONS TO THE MAIN SANITARY SEWER SHALL BE APPROVED BY THE CITY OF FRIENDSWOOD UTILITIES DIVISION OF PUBLIC WORKS. SCHEDULE INSPECTIONS AT (281) 996-3382.
- ALL SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH THE CITY OF FRIENDSWOOD TECHNICAL SPECIFICATIONS, LATEST REVISION.
- INDIVIDUAL RESIDENTIAL CLEANDUTS SHALL BE 4" PVC.

SANITARY SEWER SYSTEM CONSTRUCTION NOTES

- FINISHED ELEVATION ON SANITARY MANHOLE RIMS SHALL BE THREE (3) INCHES ABOVE FINISHED GRADE IN UTILITY EASEMENTS. IF THE MANHOLE IS LOCATED ADJACENT TO A PUBLIC STREET, THE FINAL ELEVATION SHALL BE TWO (2) INCHES ABOVE THE TOP OF THE CURB OR TWO (2) INCHES ABOVE THE CENTERLINE OF THE STREET FOR STREETS WITH NO PERIMETER CURB (TOP OF CURB SHOULD EQUAL CENTERLINE OF STREET).
- WATER LINES AND SANITARY SEWER LINES SHALL BE INSTALLED IN SEPARATE TRENCHES, PER ITEM EIGHT (8) BELOW.
- ALL PROPOSED SANITARY SEWER LINES SHALL BE DUCTILE IRON OR PVC. PVC PIPE SHALL CONFORM TO ASTM D3034, SDR 26 FOR ALL DEPTHS.
- ALL PVC PIPE (ALL TYPES SDR/DR WALL THICKNESS TO BE USED) SHALL HAVE RUBBER GASKET EQUIPPED BELL AND SPIGOT JOINTS CONFORMING TO ASTM D212. THE GASKET MATERIAL SHALL CONFORM TO ASTM F477. SOLVENT WELDED JOINTS WILL NOT BE APPROVED FOR CITY SANITARY SEWER LINES.
- ALL DUCTILE IRON PIPE SHALL BE 150 PSI WITH EIGHT (8) MIL BLACK VIRGIN POLYETHYLENE WRAP AS SPECIFIED IN ANSI A21.5/AWWA C105.
- SANITARY SEWER MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF FRIENDSWOOD DESIGN STANDARDS AND TECHNICAL SPECIFICATIONS, LATEST REVISION. CONTRACTOR TO FURNISH TEST PLUGS AND RISERS. ALL SANITARY SEWER LINES TO BE AIR TESTED IN ACCORDANCE WITH THE CITY OF FRIENDSWOOD TECHNICAL SPECIFICATIONS.
- SANITARY SEWER TRENCHES WITHIN OR UNDER ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT TO BE BACKFILLED WITH CEMENT-STABILIZED SAND BACKFILL (1.1 SACKS OF CEMENT PER TON OF SAND) TO THE BOTTOM OF THE SUBGRADE. BEDDING, HAUNCHING, AND INITIAL FILL SHALL BE CEMENT-STABILIZED SAND FOR GRAVITY SANITARY SEWERS AND BANK SAND FOR FORCE MAIN SANITARY SEWERS.
- WATER LINE/NEW SANITARY SEWER LINE SEPARATION. WHEN NEW SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER THAN NINE (9) FEET IN ALL DIRECTIONS. SANITARY SEWERS THAT PARALLEL WATER LINES SHALL BE INSTALLED IN SEPARATE TRENCHES. WHEN NINE (9) FEET OF SEPARATION CANNOT BE MAINTAINED, THEN THE FOLLOWING GUIDELINES APPLY:
  - WHEN THE SANITARY SEWER PARALLELS A WATER LINE, THE SANITARY SEWER SHALL BE CONSTRUCTED OF CAST IRON OR PVC MEETING ASTM SPECIFICATIONS WITH THE PRESSURE RATING FOR BOTH THE PIPE AND JOINTS OF 150 PSI. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO (2) FEET BETWEEN THE OUTSIDE DIAMETERS OF THE PIPE AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR (4) FEET BETWEEN THE OUTSIDE DIAMETERS OF THE PIPE. THE SANITARY SEWER LINE SHALL BE LOCATED BELOW THE WATER LINE.
  - WHEN A SANITARY SEWER CROSSES A WATER LINE AND THE SANITARY SEWER LINE IS CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI; AN ABSOLUTE MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN THE OUTSIDE DIAMETERS SHALL BE MAINTAINED. THE SANITARY SEWER LINE SHALL BE LOCATED BELOW THE WATERLINE WHEN POSSIBLE AND ONE (1) LENGTH OF THE SANITARY SEWER PIPE SHALL BE CENTERED ON THE WATER LINE.
  - WHEN A SANITARY SEWER LINE CROSSES UNDER A WATER LINE AND THE SANITARY SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RICID PLASTIC COMPOSITE PIPE, CLAY PIPE OR CONCRETE PIPE WITH GASKETED JOINTS, A MINIMUM OF TWO (2) FEET OF SEPARATION SHALL BE MAINTAINED. THE INITIAL BACKFILL SHALL BE CEMENT-STABILIZED SAND (1.1 SACKS OF CEMENT PER 1 TON OF SAND) FOR ALL SECTIONS OF SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE. THIS INITIAL BACKFILL SHALL BE FROM ONE QUARTER (1/4) DIAMETER BELOW THE CENTERLINE OF THE PIPE TO ONE (1) PIPE DIAMETER, BUT NOT LESS THAN TWELVE (12) INCHES ABOVE THE TOP OF PIPE.
  - WHEN A SANITARY SEWER CROSSES OVER A WATER LINE, ALL PORTIONS OF THE SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW SANITARY SEWER MAY BE ENCASED IN A JOINT OF 150 PSI CLASS PIPE AT LEAST EIGHTEEN (18) FEET LONG AND A MINIMUM OF TWO (2) NOMINAL SIZES LARGER THAN THE NEW SANITARY SEWER. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT INTERVALS OF FIVE (5) FEET WITH SPACERS OR BE FILLED TO THE SPRING LINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR WITH AN APPROVED MANUFACTURER SEAL.
- FOR ALL PVC PIPE, USE MANHOLE WATER STOP GASKET AND CLAMP ASSEMBLY AT MANHOLE CONNECTIONS. CLAMP SHALL BE STAINLESS STEEL MATERIAL.
- SANITARY SEWER MANHOLES SHALL BE STANDARD TYPE, UNLESS OTHERWISE NOTED. TOP OF RIMS OF ALL SANITARY SEWER MANHOLES SHALL BE AT OR ABOVE THE 100-YEAR BASE FLOOD ELEVATION AND HAVE INFLOW PROTECTORS UNDER THE COVERS. FOR MANHOLES LOCATED IN THE 100-YEAR FLOOD PLAIN, VENT AND SEAL THE MANHOLE COVERS. SECTIONS OF PRECAST MANHOLES SHALL BE JOINED WITH "RAM NEK" GASKET MATERIAL OR AS APPROVED BY THE CITY OF FRIENDSWOOD.
- SANITARY SEWER LINES LOCATED IN OTHER AREAS NOT SPECIFIED IN ITEM 7 SHALL BE BACKFILLED ABOVE THE INITIAL BACKFILL WITH CEMENT-STABILIZED SAND OR SELECT BACKFILL MATERIAL WITH A PI BETWEEN TWENTY (20) AND FORTY (40).
- IF WET SAND IS ENCOUNTERED IN THE FIELD, USE SPECIAL BEDDING.
- SANITARY SEWERS CROSSING UTILITIES OTHER THAN WATER SHALL HAVE A MINIMUM CLEARANCE OF SIX (6) INCHES (ADDRESSED IN CITY OF FRIENDSWOOD TECHNICAL SPECIFICATION 02125 - EXCAVATION AND BACKFILL FOR UTILITIES).
- ALL PRECAST CONCRETE MANHOLES SHALL HAVE THE TOP ADJUSTMENT CONSTRUCTED OF PRECAST PCC RINGS, SEALED WITH NON-SHRINK GROUT INSIDE AND OUTSIDE, AND BETWEEN EACH SECTION AND MANHOLE COVERS.
- ALL SANITARY SEWER MANHOLE COVERS SHALL INCLUDE THE WORDS "SANITARY SEWER" AND "CITY OF FRIENDSWOOD" AND INCLUDE THE CITY OF FRIENDSWOOD SEAL. ALL MANHOLE COVERS SHALL HAVE A MINIMUM DIAMETER OF THIRTY-TWO (32) INCHES, AS SHOWN IN THE DETAIL ON THIS SHEET.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM SEWER DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL, AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF WAY AND UTILITY EASEMENTS AND RE-GRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.

SANITARY SEWER STANDARD DETAILS



DEPARTMENT OF ENGINEERING & PROJECTS

FILE NAME: SSSD1 - 2019.DWG  
 DATE APPROVED: JULY 1, 2017  
 SCALE: NTS  
 REVISED DATE: OCTOBER 2019

PROJECT NUMBER: DATE SUBMITTED: SHEET: XX OF XX