City of Bonners Ferry

Sewer Standards

Adopted by Resolution 2-1-2022

Contents

Standard Drawings

Standard Manhole
External Drop Manhole
Manhole Frame/Cover
Sewer Service Lateral
Sewer Service Lateral Marker
Manhole Collar
Sewer Tapping Saddle
Sewer Trench Backfill

Adopted by Resolution 2-1-2022

1.0 Standards for Sanitary Sewer Systems

These Standards contain the design criteria and improvement standards for the extensions or connections to the City of Bonners Ferry Sanitary Sewer System. The conditions apply to all improvements made by both public agencies and private developers. These improvements may include the following:

- Sewer main extensions, modifications, and replacements.
- Sewer Lateral connections to City mains.
- Sewer lift stations.

2. 0 Plan Approval and Permits

The construction of sanitary sewer extensions within the City service area requires the approval of the City. No construction shall be permitted until the Engineering Plans have been reviewed and approved by the City and the Idaho Department of Environmental Quality (IDEQ).

3.0 Sanitary Sewer System Design Requirements

All sanitary sewer systems shall conform to the design requirements and criteria set forth in the following references:

- These City Standards.
- IDEQ standards per IDAPA 58.01.16.
- The Idaho Standards for Public Works Construction (ISPWC), latest edition.
- The Recommended Standards for Wastewater Facilities (aka 10 State Standards), latest edition.

Where standards may be in conflict, the City Engineer will decide as to which standards reflects the best interest of the City. Where a City standard does not exist for proposed infrastructure, ISPWC standards and the 10-State Standards will be used.

Sanitary sewers shall be extended to the limits of the respective property being served. The extension shall be of size and profile grade necessary to be extended to other properties upstream in the future. In cases where the plan does not require future extension, the sewer system shall be extended as necessary to serve the affected property.

4.0 Design Standards

4.1 Diameter

The minimum diameter sanitary sewer main shall be 8”. Larger diameters may be required to accommodate capacity or to minimize grades.

4.2 Velocity and Slope

All sanitary sewers shall be designed and constructed to provide a minimum velocity of 2 fps flowing full. The maximum non-restrained pipe allowable velocity shall be 10 fps. For velocities exceeding 10 fps, pipe anchors shall be required with a detailed drawing submitted to the City for approval by the Engineer. Table 4-1 provides the minimum slopes for sanitary sewers as permitted by the City.

Table 4-1

Sewer Pipe Size (Inches)	Minimum Slope
4" Lateral	2.00%
6" Lateral	1.00%
8"	0.40%
10"	0.28%
12"	0.22%
15"	0.15%
18"	0.12%

Variations to Table 4-1 may be allowed by City Engineer, if main is being rebuilt between existing manholes that have already been adopted by the City.

4.3 Alignment, Grade, and Depth

All sewers shall be designed and constructed with a straight alignment and continuous profile grade between manholes. The minimum bury depth for sewer mains is 60". Bury depths less than 60" must be preapproved by the City.

4.4 Water/Sewer Separations

All sanitary sewer mains shall be located at least 10 feet horizontally from any water main. Any deviations from this standard must meet the IDEQ requirements for water/sewer separations. Vertical separations of water and sewer main crossings must also meet IDEQ requirements.

4.5 Sanitary Sewer Manholes

A. Locations

Sanitary sewer manholes are required at the following locations:

1. At the end of all sewer mains 8" and larger in diameter. When the main is to be extended in the future, the end of the line shall be a bell, plugged and marked with a 2" x 4" stake. Cleanouts are not acceptable in main line installations, except at the end of a dry or inactive sewer line which will be connected or extended in the future.
2. All changes in slope.
3. Changes in sewer main pipe diameter.

4. All connections to the main line 8” and larger.
5. Changes in sewer alignment.
6. Manholes shall be located at no more than 400’ intervals.

B. Diameter

The minimum diameter of sewer manholes shall be 48” for sewer pipes up to 18” in diameter. Larger diameter manholes will be required for special configurations and sewer pipe larger than 18”.

C. Cones

All standard City manholes shall have pre-cast eccentric cones except for special shallow manholes which may have concentric cones. All manholes shall be equipped with City approved drop rung type safety steps. See Standard Manhole Drawing for other requirements.

D. Drop Connections

Outside drop connections shall be avoided whenever possible. When no other alternative is feasible, an outside drop connection will be required at all locations where the entering sewer is 24” or more above the outfall invert elevation. Line connections to manholes, or to stubs integral to a manhole, shall be made with approved flexible joints. Inside drop connections are not allowed unless the diameter of the manhole is increased an equal amount to compensate for the inclusion of the drop inside the manhole.

E. Channels

The sanitary sewer manholes shall be fully channeled to conform to the inside diameter of the sewer line from invert to spring line, then the channel shall be vertical to the top of the pipe. The shelves shall slope as shown on the Standard Sewer Manhole. All manhole section joints and pick holes shall be filled with grout and smooth finished outside and inside after installation.

F. Downstream Inverts

A minimum of a 0.1’ drop from invert to invert across manholes is required. Where diameters change, the downstream invert shall be lowered so that the elevation of pipe crowns match. The maximum drop from invert to invert across manholes shall be 1’.

G. Soil Pressure

Care must be taken to ensure that pressures exerted on the soils beneath the manholes and the adjacent mains are approximately uniform. Unequal soil pressures may result in uneven settlement at manholes. A spread foundation or other measures may be required to reduce the unit load imposed by the manhole, if the bearing strength of the soil is insufficient or if groundwater may be an issue.

H. Manhole Penetrations

All manholes shall be provided with KOR-IN-SEAL type flex joints or sand collars meeting ASTM SDR-35 specifications or other materials as approved by the Engineer to allow slight differential movement.

I. Sewer Service Laterals

Lateral connections to mains will be in accordance with the City's standard drawings and the latest edition of the Uniform Plumbing Code, as adopted by the Idaho Department of Building Safety.

For multi-tenant sites such as multi-family or commercial uses, each building shall have a separate minimum 6" sewer lateral.

J. Pressure Sewer Laterals and Grinder Pumps

Where gravity flow for sewer laterals is not possible, a privately owned and maintained grinder pump system to service individual structures may be allowed with the following conditions:

1. The installation must be approved by the City Engineer or Sewer Department Superintendent.
2. Pump station is to be installed outside of the building served.
3. Service line is to enter main through lateral tap, and not a manhole unless specifically approved by the City Engineer and Sewer Superintendent.
4. Solids handling pumps are not allowed.

K. Excavations

All excavations within City rights-of-way or other public place requires an approved City Encroachment Permit prior to beginning any excavation. All excavated areas shall be protected at all times by fencing, covering with steel plates, or other means approved by the City.

5.0 Sanitary Sewer System Materials

5.1 Standards

All materials used for construction of City sewer mains, side sewers, and appurtenances, shall be new and undamaged. All materials to be used shall be subject to inspection by the Engineer prior to use. The Developer shall provide the Engineer with shop drawings and certificate of materials, as requested. All materials and equipment shall be installed in accordance with the manufacturer's recommended installation procedures and these Standards.

5.2 Gravity Sewer Pipe

Unless otherwise approved, all sewer pipes shall be solid wall PVC SDR 35, conforming to ASTM 3034 or 3035 specifications, PVC C900 ASTM D1784, High Density Polyethylene (HDPE), or ductile iron pipe Class 50 for force mains. The sewer pipe shall be clearly

marked with the type, class, thickness, and manufacturer. The lettering shall be legible and printed at the factory.

5.3 Fittings

All sewer pipe fittings shall be of the same material as the pipe. The size of the cleanout shall be the same size as the sewer pipe. All fittings shall have rubber gaskets with manufactured pipe stops, integrally formed. Where dissimilar pipe materials cannot be avoided Romac couplings shall be utilized.

5.4 Pipe Trenching, Bedding, and Backfill

Pipe trenching, bedding and backfill to be completed in accordance with Standard Detail SS-8. Trench stabilization, where it is determined necessary by the City Engineer, will be per ISPWC Section 304 Trench Foundation Stabilization. The use of native material backfill must be specifically approved by the City Engineer prior to pipe installation.

6.0 Sanitary Sewer System Installation and Testing

6.1 Connection to Existing Sewer System

The connection between the new sanitary sewers and the existing sewer mains shall be plugged and tied off to the top manhole step and left in place until the new piping and the plugged manhole has been cleaned, pressure tested, TV camera inspected, and is ready for acceptance.

6.2 Sewer Pipe Cleaning

All sewer pipes shall be thoroughly cleaned by jet cleaning and cubing to remove any solids or construction debris that may have entered the pipe during construction, as approved by the Inspector. The Developer shall be responsible to ensure that material flushed from sewers are trapped, and do not enter the existing downstream system. The Inspector shall approve the Developer's method prior to cleaning sanitary sewer mains.

The rate of flushing shall be such that the flow will not overload the downstream sewer system. The flushing of a sewer main tributary to a downstream lift station shall be coordinated with the City to ensure that the lift station is not overloaded. In the event that the City finds debris in the downstream sanitary sewer system, the Developer shall be responsible for the removal and subsequent cleaning.

6.3 Pressure and Leakage Tests

All new sanitary sewer mains, extensions of existing mains, appurtenances and sewer services shall be pressure tested for leakage in accordance with ISPWC Section 500. All testing shall be observed by the City Engineer or designated City representative.

6.4 Closed-Circuit TV Inspection

ll new sanitary sewer extensions will be TV camera inspected by the City prior to acceptance. Prior to TV camera inspection:

1. Sewer lines must be cleaned.

2. All construction must be completed and approved by the City Engineer or designated City representative.

3. The Developer shall bear all costs for correction of deficiencies found during TV inspection, including all costs for subsequent TV inspections to verify the correction of deficiencies.

4. Sags in sanitary sewer lines identified during the TV inspection greater than 0.5" shall be repaired by the contractor by removal and re-laying of the pipe. Repaired sections of pipe shall be TV inspected for verification prior to final inspection at the cost of the Developer as described above.

6.5 Vacuum Testing Sanitary Sewer Manholes

All new sanitary sewer manholes shall be vacuum tested by the City prior to acceptance to ensure that the manhole is air-tight and not susceptible to infiltration. On projects with more than one manhole, the Developer shall have all of the manholes ready for testing at finish grade and have access, by truck, to each manhole prior to scheduling the vacuum testing with the Inspector.

Manholes shall not be considered ready for testing until all grouting has been performed and the frame and cover have been grouted into place. It is the responsibility of the contractor to ensure all manholes are ready for testing prior to scheduling with the Inspector.

The Developer shall bear all costs for correction of deficiencies found during the vacuum testing and for all costs for additional testing by the City to verify correction of the deficiencies. Vacuum testing to be completed in accordance with ISPWC Section 502.

7.0 Sewer Lift Stations

7.1 General

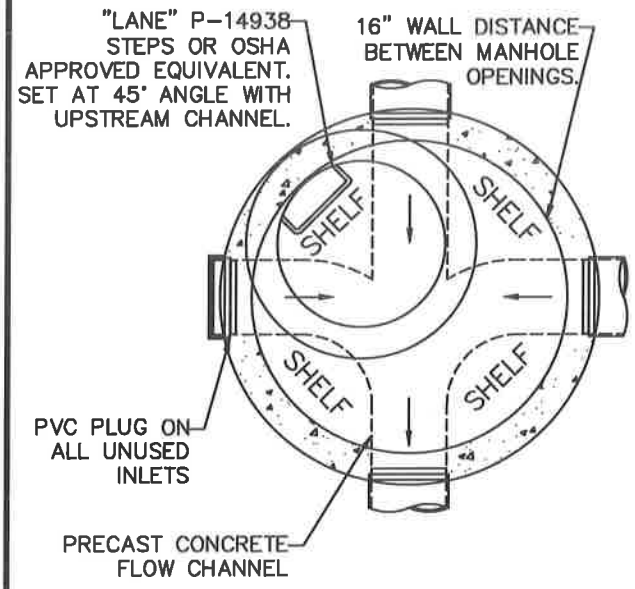
Sewage pump stations will be approved on an individual basis. The proposed pump station must be designed with adequate capacity to provide service for the ultimate development of the potential service area. A pre-design meeting will be required with the City Engineer and Sewer Department Superintendent to review current equipment and design requirements.

7.2 Basic Lift Station Design Requirements

1. All sewage pump stations shall be designed in accordance with IDEQ design requirements for sewage pump stations and force mains. The pump stations shall also be designed to meet the City of Bonners Ferry's Lift Station Standards.
2. Lift station pumps shall be manufactured by Flygt (or approved equal) and be housed by a OneLift pump station structure as manufactured by Oldcastle Concrete.
3. Each lift station will be equipped with a minimum of 2 pumps. Any lift station that receives wastewater from another lift station shall be equipped with three pumps.
4. All stations shall be provided with a back-up power generator equipped with an automatic transfer switch.

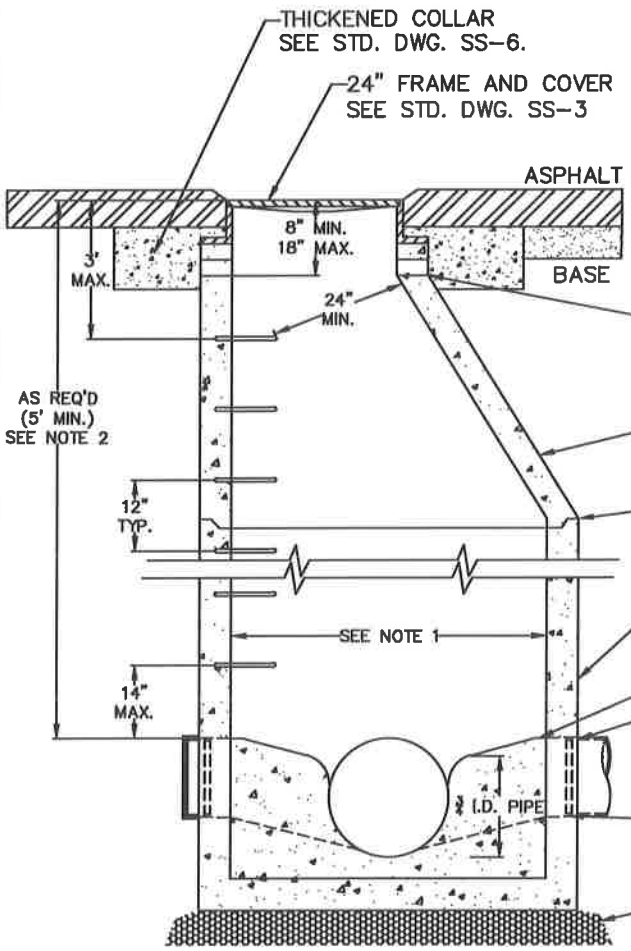
STANDARD DRAWINGS

Adopted by Resolution 2-1-2022



NOTES THIS DETAIL:

1. MANHOLE INSIDE DIAMETERS SHALL BE 48" FOR PIPE DIAMETERS 24" OR LESS, 60" FOR ANY PIPE DIAMETER GREATER THAN 24" AND/OR PIPE DEPTHS GREATER THAN 25'.
2. MANHOLES WITH PIPE DEPTHS LESS THAN 5' REQUIRE PRE-APPROVAL FROM THE CITY.
3. INVERT ELEVATIONS FOR STRAIGHT THROUGH CHANNELS SHALL HAVE 0.10' FALL FROM INLET TO OUTLET.
4. ALL MANHOLE PIPE PENETRATIONS SHALL BE INSTALLED WITH WATERTIGHT PVC SAND COLLARS CAST-IN-PLACE FOR NEW MANHOLES OR CORE & GROUT-IN-PLACE FOR EXISTING MANHOLES. BOOTS ARE NOT ACCEPTABLE.
5. PRIOR TO PAVING, FRAME AND COVER SHALL BE ADJUSTED TO ¼" BELOW FINISH SURFACE ELEVATION & SECURED TO CONCRETE GRADE RINGS ON FULLY DEPRESSED RAMNECK OR APPROVED EQUIVALENT. BIODEGRADABLE MATERIALS ARE NOT ACCEPTABLE.
6. PRIOR TO PAVING, THICKENED COLLARS SHALL BE CONSTRUCTED & CURED.



CITY OF BONNERS FERRY STANDARD DRAWING

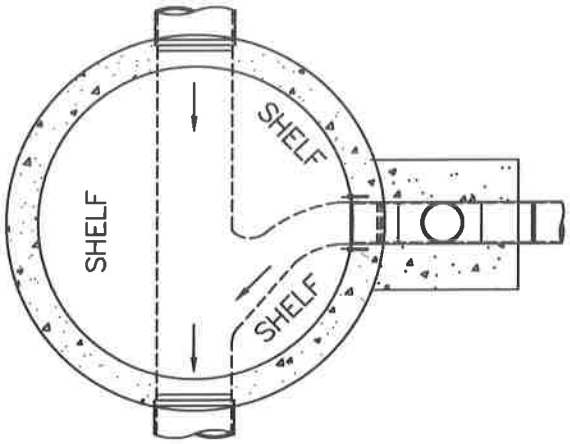
STANDARD MANHOLE

APPROVED BY:

CITY ENGINEER, PE 10385

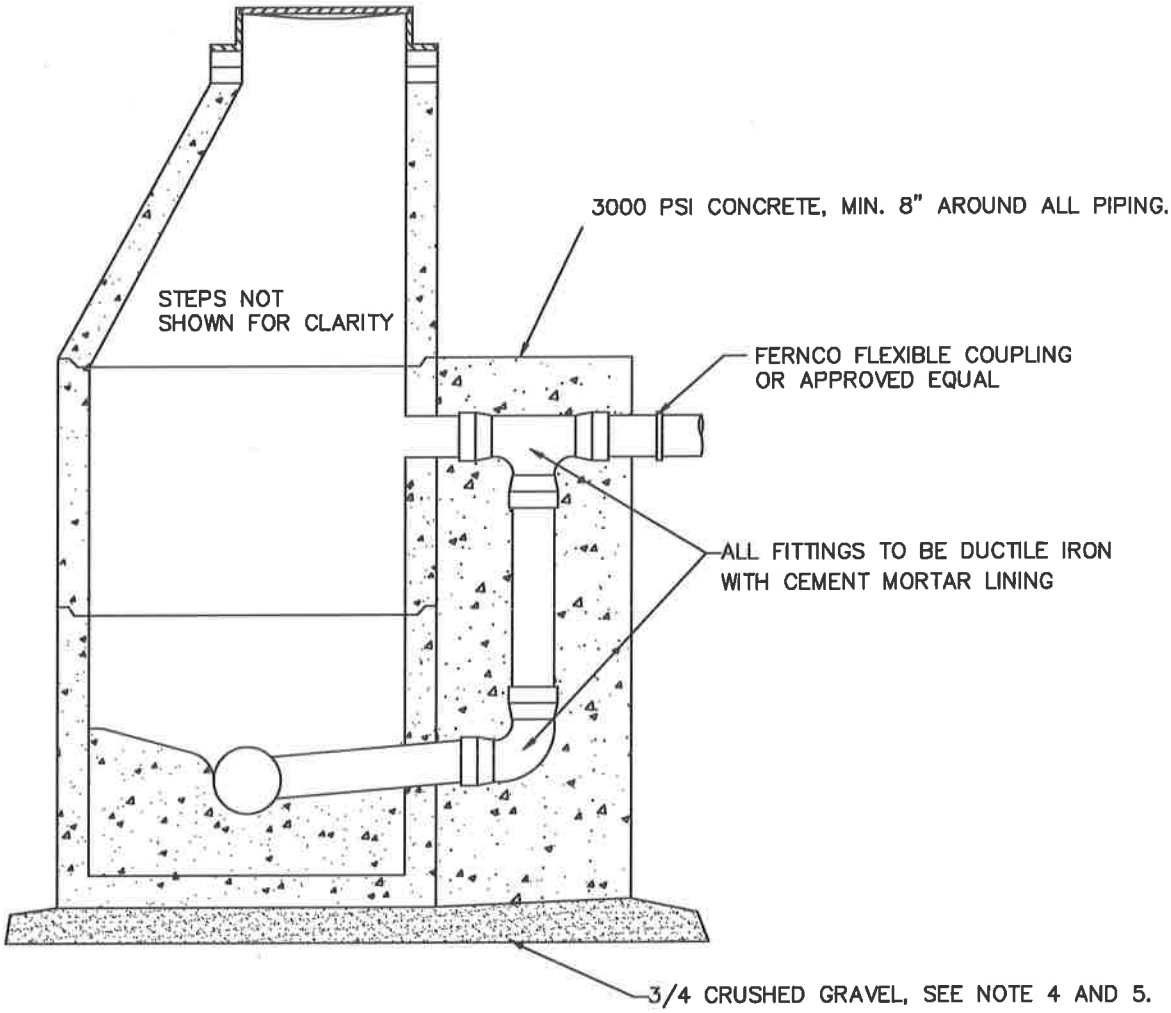
1/26/22
DATE:

DWG NO. SS-1



NOTES THIS DETAIL:

1. INTERIOR DROP MANHOLES WILL ONLY BE ALLOWED FOR GRAVITY SEWER PIPES (NON-PRESSURIZED FLOW).
2. CHANNEL AT BASE OF DROP STRUCTURE SHALL BE FORMED WITH 0.15' FALL INTO CONCRETE BENCH AND MATCH NEW OUTLET CHANNEL INVERT TO SPRING LINE OF THROUGH CHANNEL.
3. MANHOLE, STEPS, FRAME, COVER, AND ALL FEATURES OTHER THAN DROP ASSEMBLY TO MATCH DETAIL SS-1.
4. 3/4" GRAVEL TO BE 12" LAYER, COMPACTED TO 95% OF MODIFIED PROCTOR, OR AS OBSERVED BY ENGINEER.
5. IF NATIVE MATERIAL BELOW MANHOLE IS DETERMINED TO BE UNSUITABLE BY ENGINEER, BALLAST MAY BE REQUIRED BY TO PROVIDE ADEQUATE SUPPORT.



CITY OF BONNERS FERRY STANDARD DRAWING

EXTERNAL DROP MANHOLE

APPROVED BY:

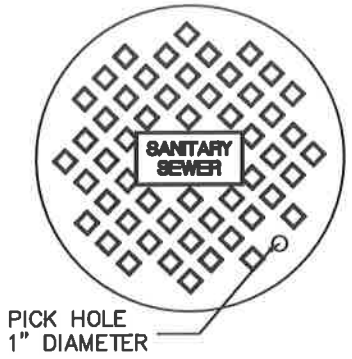
CITY ENGINEER, PE 10385

3/16/21
DATE:

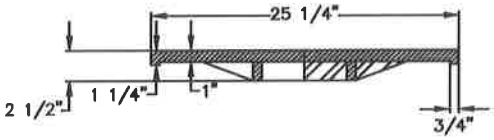
DWG NO. SS-2

NOTES THIS DETAIL:

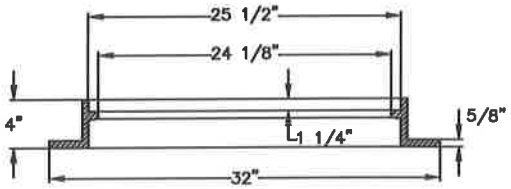
1. ALL LETTERING & ARTWORK SHALL BE FLUSH WITH FRAME RIM/LIP MOLDED INTO THE TOP OF THE COVER.
2. FRAME SHALL BE GRAY IRON CONFORMING TO A.S.T.M. A48–90, GRADE 30. COVER SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A536–84, CLASS 80–50–06.
3. FIT TOLERANCES SHALL BE < 1/8" ±.
4. WELDED FRAME & COVERS ARE NOT ACCEPTABLE.
5. ALL FRAME & COVERS SET ON MANHOLES IN DEPRESSION AREAS SUBJECTED TO STORM WATER PONDING AND/OR RUNOFF SHALL BE WATERTIGHT AND INSTALLED WITH RAINGUARD INFLOW PAN OR APPROVED EQUIVALENT.
6. INSTALLATION OF FRAME & COVERS WITHIN CURB & GUTTER, VALLEY GUTTERS, OR SWALES ARE NOT ACCEPTABLE.



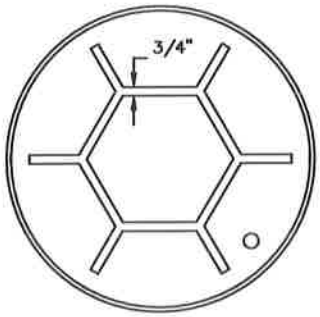
SEWER COVER



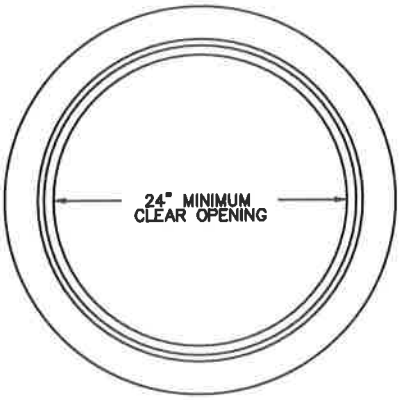
COVER SECTION VIEW



FRAME SECTION VIEW



BOTTOM OF COVER



FRAME

CITY OF BONNERS FERRY STANDARD DRAWING

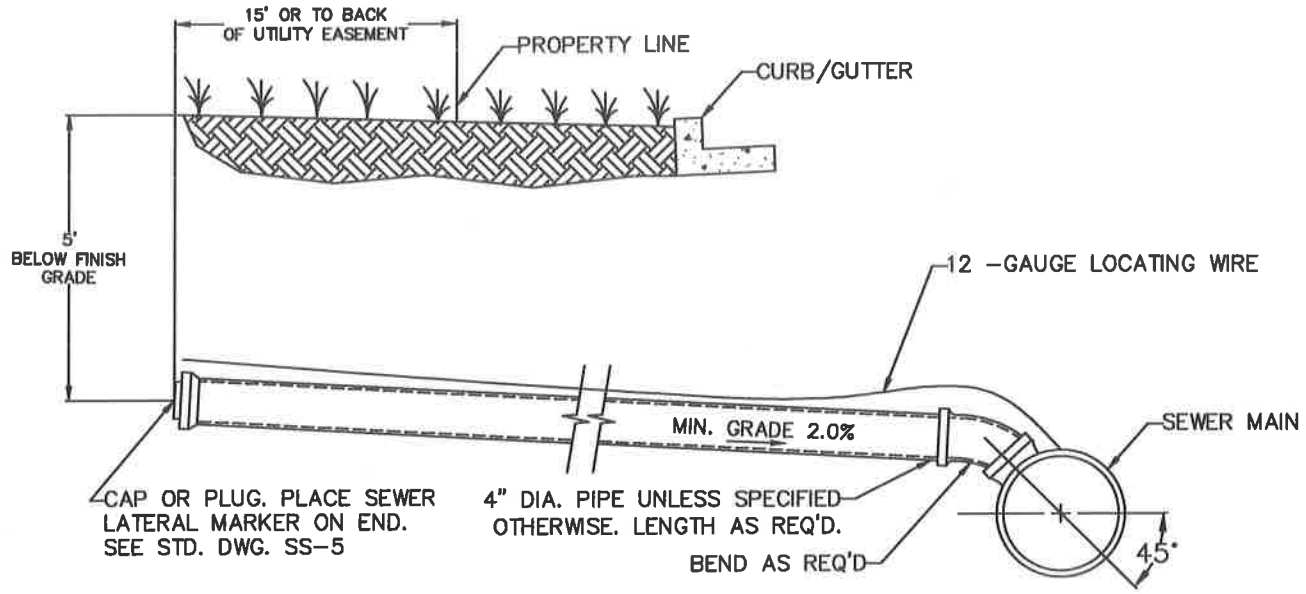
MANHOLE FRAME/COVER

APPROVED BY:

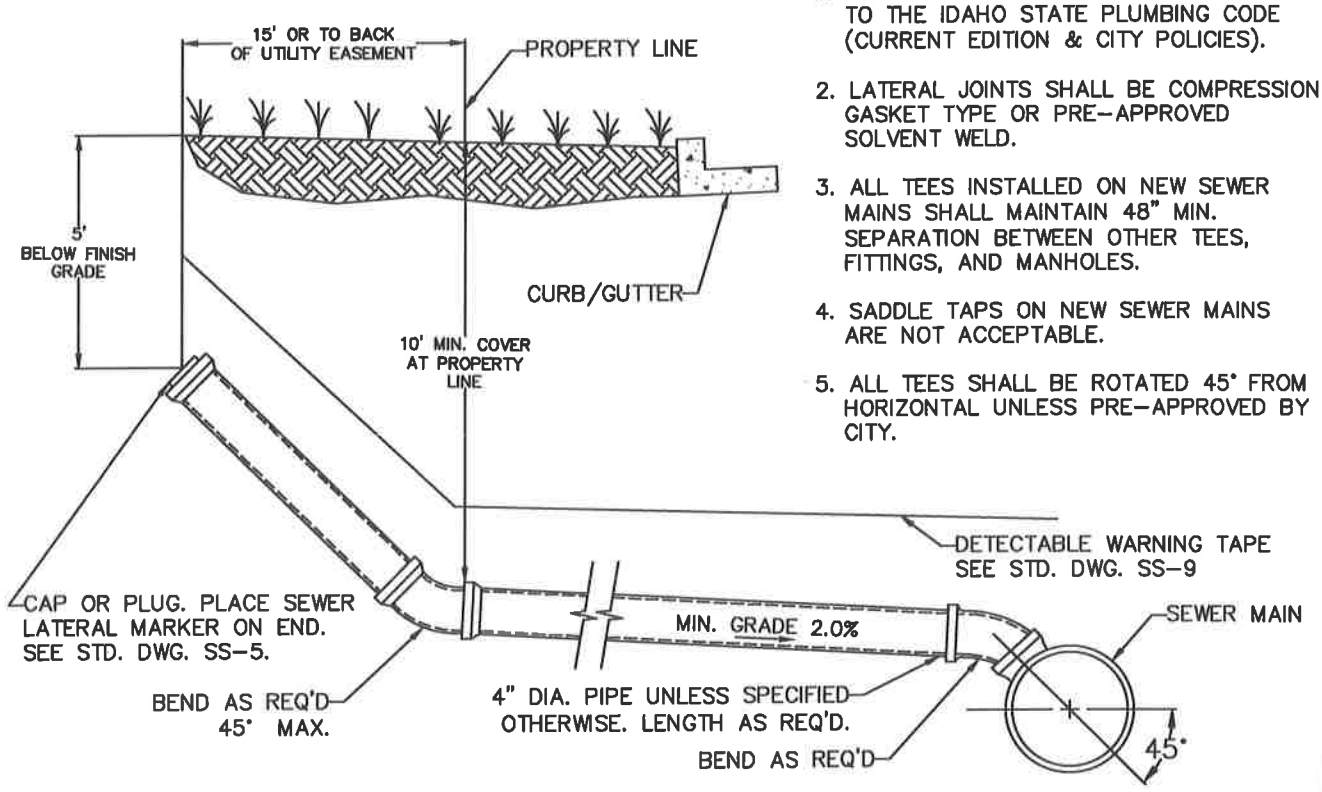
CITY ENGINEER, PE 10385

3/16/21
DATE:

DWG NO. SS–3



TYPE "A"
STANDARD LATERAL CONNECTION



TYPE "B"
DEEP LATERAL CONNECTION

NOTES THIS DETAIL:

1. ALL SEWER LATERALS SHALL CONFORM TO THE IDAHO STATE PLUMBING CODE (CURRENT EDITION & CITY POLICIES).
2. LATERAL JOINTS SHALL BE COMPRESSION GASKET TYPE OR PRE-APPROVED SOLVENT WELD.
3. ALL TEES INSTALLED ON NEW SEWER MAINS SHALL MAINTAIN 48" MIN. SEPARATION BETWEEN OTHER TEES, FITTINGS, AND MANHOLES.
4. SADDLE TAPS ON NEW SEWER MAINS ARE NOT ACCEPTABLE.
5. ALL TEES SHALL BE ROTATED 45° FROM HORIZONTAL UNLESS PRE-APPROVED BY CITY.

CITY OF BONNERS FERRY STANDARD DRAWING

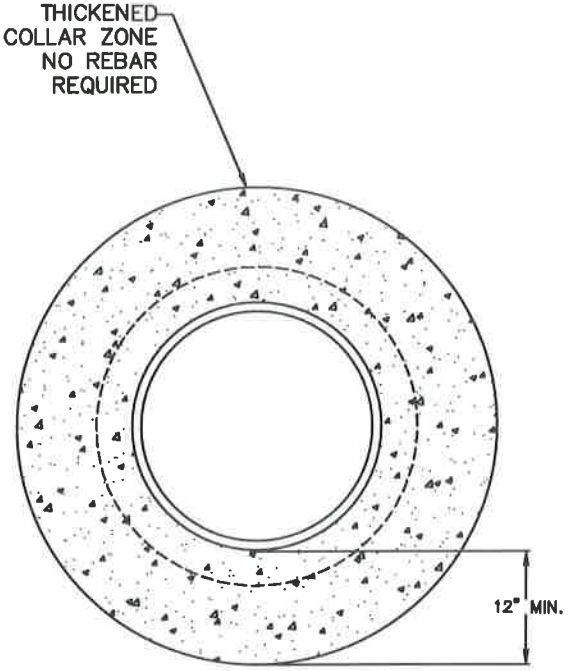
SEWER SERVICE LATERAL

APPROVED BY:

CITY ENGINEER, PE 10385

DATE: 3/19/21

DWG NO. SS-4



NOTES THIS DETAIL:

1. THICKENED COLLARS SHALL BE INSTALLED AROUND ALL SEWER MANHOLES, CLEANOUTS AND VALVE BOX STRUCTURES UTILIZING ANY ONE OF THE FOLLOWING MATERIALS:

   A. CONCRETE. MINIMUM 4000 PSI COMPRESSIVE STRENGTH. MONOLITHIC POUR WITH A MINIMUM 24-HOUR CURE TIME PRIOR TO PAVEMENT.

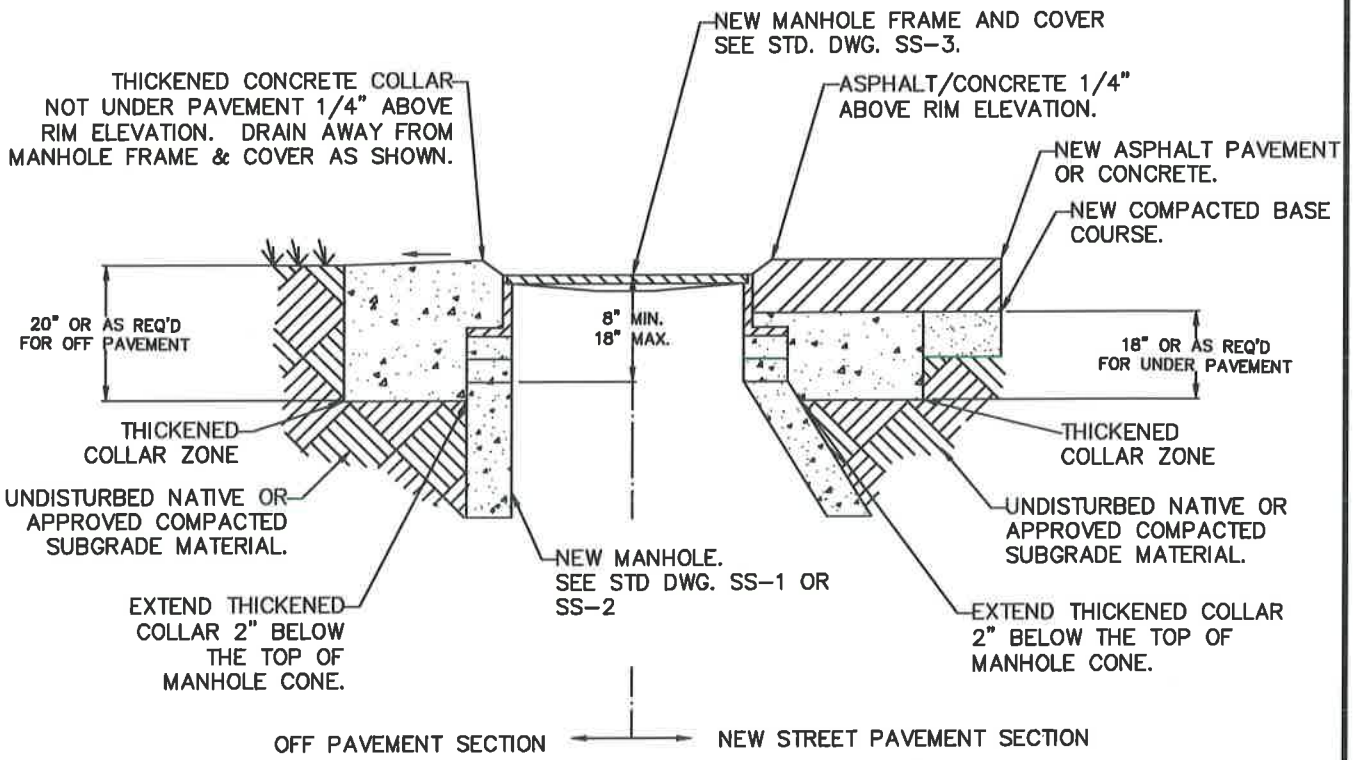
   B. CONTROL DENSITY FILL "CDF". 3 SACK MIX WITH A MINIMUM 24-HOUR CURE TIME PRIOR TO PAVEMENT.

   C. ASPHALT. SAME HOT MIX DESIGN AS ROAD PLACED IN 2" LIFTS AND COMPACTED WITH A MECHANICAL TAMPER PRIOR TO PAVEMENT.

2. NO NATIVE, SUB-GRADE OR BASE COURSE MATERIAL MAY BE BACKFILLED AND COMPACTED WITHIN EXCAVATED THICKENED COLLAR ZONE. ALL DISTURBED MATERIAL SHALL BE REMOVED, HAULED AND DISPOSED OF OFFSITE.

3. ALL THICKENED COLLARS SHALL BE COMPLETED AND INSPECTED BY THE WASTEWATER UTILITY PRIOR TO PAVING. PROVIDE 48-HOUR NOTICE.

4. SEAL SAW CUT LINE & OUTSIDE MANHOLE FRAME LINE W/ CRAFCO PAVEMENT JOINT ADHESIVE OR APPROVED EQUIVALENT.



CITY OF BONNERS FERRY STANDARD DRAWING

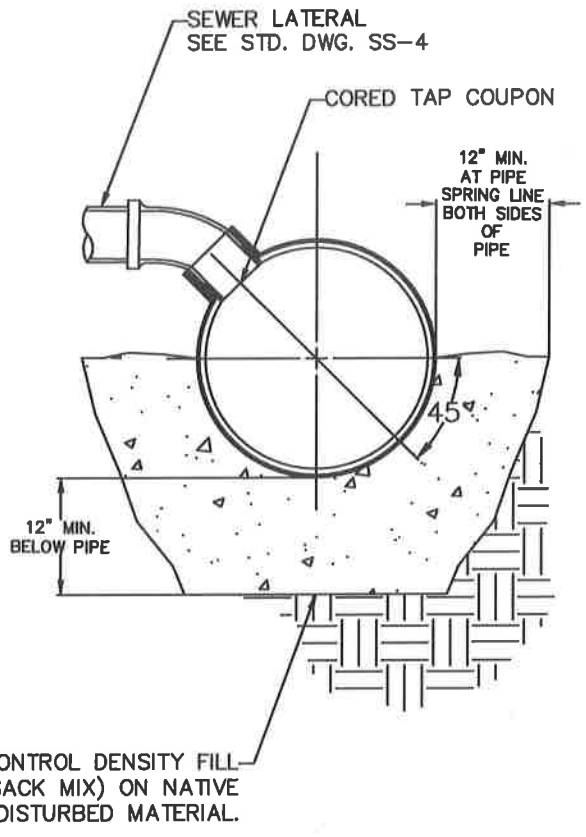
MANHOLE COLLAR

APPROVED BY:

CITY ENGINEER, PE 10385

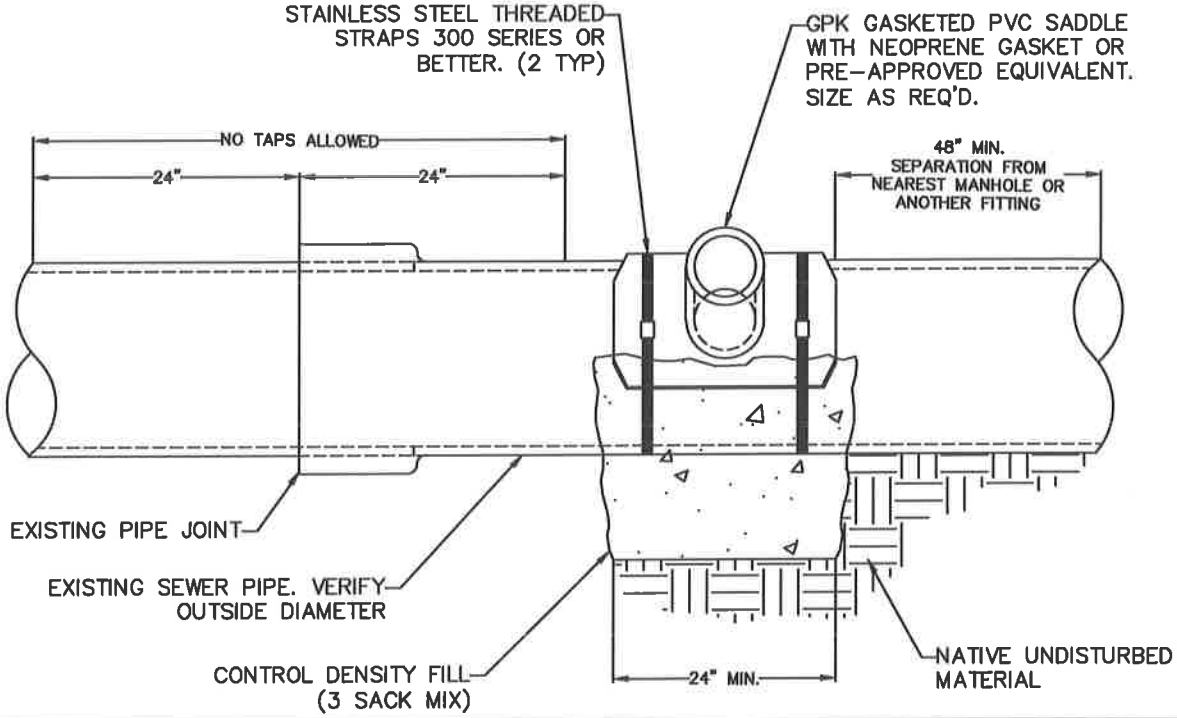
1/26/22
DATE:

DWG NO. SS-6



NOTES THIS DETAIL:

1. TAP SADDLES ARE ONLY USED WHEN CONNECTING A NEW SEWER LATERAL TO AN EXISTING SEWER MAIN AND MUST BE PRE-APPROVED BY THE CITY.
2. ALL SADDLES SHALL BE SIZED BASED ON THE OUTSIDE DIAMETER OF THE SEWER MAIN OR PLASTIC LINED PIPE (CIPP).
3. TWO (2) STAINLESS STEEL THREADED STRAPS CAPABLE OF 60 LBS. TORQUE SHALL SECURE SADDLE TO SEWER MAIN. GLUED OR CEMENTED SADDLES ARE NOT ACCEPTABLE.
4. UNLESS PRE-APPROVED BY THE CITY, ALL TAPS SHALL BE ORIENTATED AT 45° ABOVE SEWER MAIN SPRING LINE (ABOVE HORIZONTAL). TAPS ON PIPE CROWN OR SPRING LINE ARE NOT ACCEPTABLE.
5. ALL TAPS TO EXISTING SEWER MAIN SHALL BE CLEAN CUT BY DRILLING OR CORING METHOD ONLY. NO "BREAK-IN" OR HAMMERING TAPS WILL BE ALLOWED. PRESENT CORED TAP COUPON FOR WASTEWATER UTILITY INSPECTION.
6. WRAP EXISTING SEWER MAIN AND NEWLY INSTALLED SADDLE WITH PLASTIC PRIOR TO PLACING CONTROL DENSITY FILL (CDF). CDF SUBSTITUTIONS MAY BE MADE WITH CITY APPROVAL.
7. IF TAPPING A NEW SADDLE ONTO A CIPP LINED SEWER MAIN, GENTLY DEMO AND REMOVE CONCRETE/CLAY HOST PIPE AND ATTACH NEW SADDLE DIRECTLY ONTO THE CIPP PIPE.



CITY OF BONNERS FERRY STANDARD DRAWING

SEWER TAPPING SADDLE

APPROVED BY:

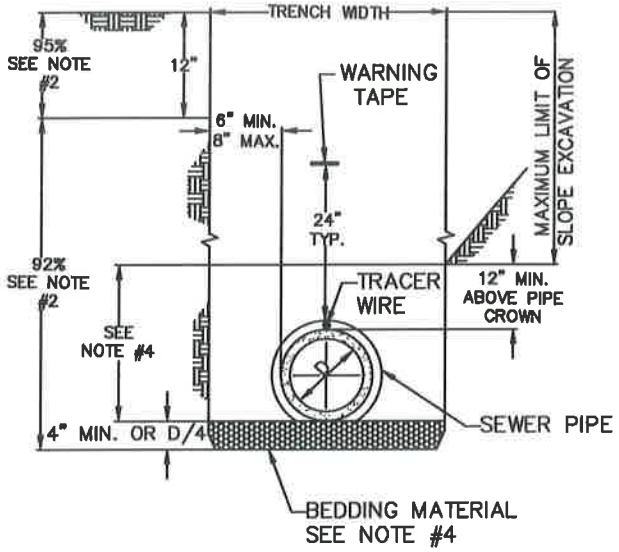
Michael B. Klaus
CITY ENGINEER, PE 10385

3/20/12
DATE:

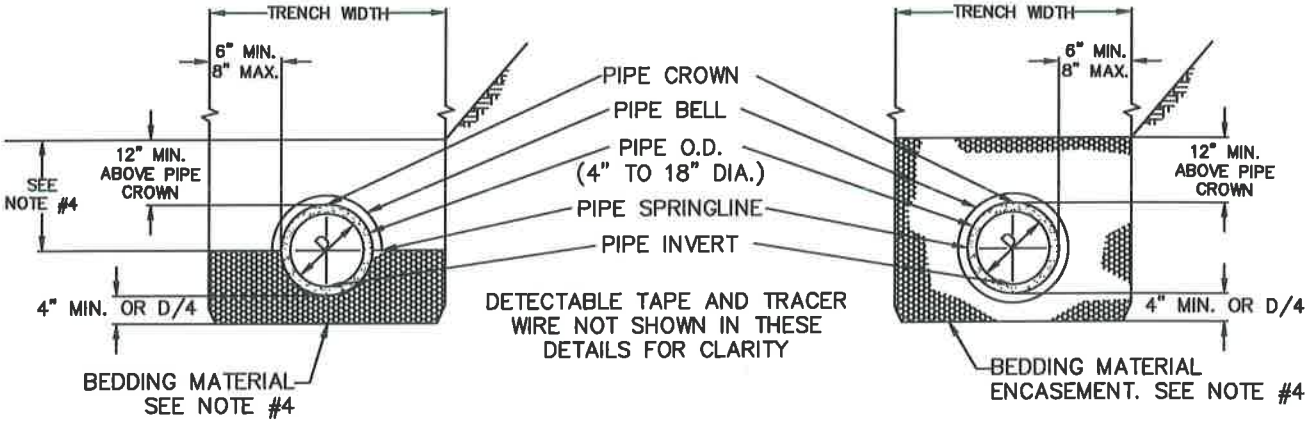
DWG NO. SS-7

NOTES THIS DETAIL:

1. FOR TRENCHING WITHIN IMPROVED STREETS, TOP OF TRENCH WILL INCLUDE 12" OF ¾" CRUSHED GRAVEL, AND HOT MIX ASPHALT, WITH THICKNESS TO MATCH EXISTING, WITH MINIMUM 4" THICKNESS.
2. MINIMUM RELATIVE COMPACTION USING A MODIFIED PROCTOR (ASTM D-1557). SUBMIT ALL COMPACTION TEST REPORTS TO CITY.
3. UNLESS PRE-APPROVED BY THE CITY, MINIMUM COVER OVER THE TOP OF ALL NEWLY INSTALLED PIPE TO FINISH GRADE SHALL BE 5 FEET (MIN.).
4. BEDDING MATERIAL SHALL BE SAND, GRAVEL, CRUSHED AGGREGATE, OR NATIVE GRANULAR MATERIAL HAVING A SAND EQUIVALENT NO LESS THAN 12% BY WEIGHT PASSING A #200 SCREEN AND 100% PASSING A #4 SCREEN.
5. CONTINUOUS #10 SOLID T.H.H.N. TRACER WIRE SHALL BE TAPED DIRECTLY TO TOP OF PIPE. ALL BREAKS SHALL BE SPLICED WITH 3M SPLICE KIT OR EQUIVALENT "WATERTIGHT" SPLICE KIT. TRACER WIRE SHALL EXTEND TO FINISH GRADE INSIDE ALL LOCATING WIRE BOXES AND SEWER STRUCTURES. LOCATE WIRE TO BE CONNECTED TO ALL SERVICE LINE LOCATE WIRES WITH 3M SPLICE KITS.
6. DETECTABLE WARNING TAPE MARKED "SEWER LINE BELOW" SHALL EXTEND CONTINUOUSLY 24" ABOVE ALL NEWLY INSTALLED SEWER LINES INCLUDING LATERALS.



TYPE A TRENCH
STANDARD INSTALLATION FOR NATIVE INSITU SANDY MATERIAL



TYPE B TRENCH
REQUIRED WHEN HARD ROCK OR GRAVEL IS WITHIN 6" OF PIPE INVERT, BUT BELOW SPRINGLINE.

TYPE C TRENCH
ROCK ENVELOPE REQUIRED WHEN HARD ROCK OR GRAVEL IS AT AND/OR ABOVE PIPE SPRINGLINE

CITY OF BONNERS FERRY STANDARD DRAWING

SEWER TRENCH BACKFILL

APPROVED BY:

CITY ENGINEER, PE 10385

DATE: 3/20/21

DWG NO. SS-8