

JOHNSON COUNTY WASTEWATER
SERVICE LINE DESIGN AND CONSTRUCTION STANDARDS
VERSION 2017

The following Design and Construction Standards adopted by Johnson County Wastewater (JCW) on March 29, 2017 are the standard for design and construction of building (service) sewer lines extending from the building foundation to the sanitary sewer main owned, operated and maintained by JCW.

SECTION 1. MATERIALS

A. Pipe, Fittings, Joints

1. Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe & Fittings:

- a. Pipe and fittings shall conform to ASTM D2751 SDR 23.5, ASTM D1527 Schedule 40, ASTM F628 Foamed Core DWV, ASTM D2661 DWV.
- b. Joints shall be solvent welded. The solvent cement shall meet the requirements of ASTM D 2235.

2. PolyVinyl Chloride (PVC) Pipe & Fittings:

- a. Pipe and fittings shall be made of PVC plastic pipe having a minimum cell classification of 12454 conform to ASTM D2241 SDR-26, ASTM D3034 SDR-26. Minimum cell class shall be 12454.
- b. Joints shall conform to ASTM D3212 and shall be of a push-on type with a bell-end grooved to receive a synthetic rubber gasket. The basic polymer of the synthetic gasket shall conform to ASTM F477, except when the gasket is anticipated to come in contact with petroleum based products in which case oil-resistant Nitrile (Buna-N) gaskets shall be used. Natural rubber gaskets shall not be accepted.

3. High Density Polyethylene Pipe (HDPE) and Fittings:

- a. Shall meet the requirements of ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-PR) based on outside diameter, ASTM D1248, ASTM D3350. All HDPE pipe shall be marked with a green stripe to signify its use for sanitary sewer utilities. Only solid wall HDPE pipe in accordance with ASTM F714 shall be accepted. HDPE profile wall pipe and fittings will not be accepted.
- b. Pipe shall be manufactured from high density high molecular weight polyethylene resin and shall conform to ASTM D1248. Minimum cell classification shall be 345434C as referenced in ASTM D3350-84.
- c. Pipe supplied under this specification shall have a nominal IPS (Iron Pipe Size) OD. The SDR (Standard Dimension Ratio) of the pipe shall be SDR 11, 160 psi or SDR 17, 100 psi.
- d. Pipe shall be joined by use of the heat fusion technique of butt fusion resulting in a monolithic pipe. Friatec fusion welded couplings are also acceptable. All joints shall be fully restrained and as strong as the pipe in both tension and hydrostatic loading.
- e. Fittings shall be molded from a polyethylene compound having a cell classification equal to or exceeding the compound used in the pipe or shall be manufactured using a polyethylene compound having a cell classification equal to or exceeding the compound used in the pipe supplied under this specification. All fittings supplied under this specification shall be of the same manufacturer as the pipe being supplied, unless electrofused couplings are used. Minimum cell classification shall be 345434 C as referenced in ASTM D 3350-84.
- f. The HDPE pipe shall be provided to the project site in straight sections and shall not have been coiled at any time. The pipe shall be furnished in pipe lengths normally produced by the manufacturer, except for fittings, closures, and specials.

4. Ductile Iron Gravity Sewer Pipe (DIP) & Fittings: DIP shall not be used for new installations. For connecting to existing DIP, the following apply as needed:

- a. Pipe shall meet the requirements of ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51. Minimum allowed thickness shall be Special Class 50 and 51 as required on the drawings. Fittings shall be in accordance with ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53
- b. Pipe and fittings shall have mechanical or push-on joints conforming to ANSI/AWWA C111/ A 21.11. Hubless joints are not allowed.
- c. Gaskets shall be neoprene or other synthetic rubber. Nitrile (Buna-N) gaskets shall be used where the gasket may come into contact with petroleum based products.
- d. All DIP pipe and fittings shall be furnished with a 1 mil exterior bituminous coating conforming to ANSI/AWWWA C 151/A21.51.
- e. All DIP pipe and fittings shall be wrapped in a seamless polyethylene tube encasement, ANSI/AWWO C105/A21.5, LLD-8 mil or HDCL-4 mil and installed with Method A. All clay, mud, cinders, etc shall be removed from the pipe prior to installing the tub encasement. Where DIP is encased in concrete, the polyethylene tube shall be installed over the pipe for 5 feet either side of each end of the concrete encasement.
- f. All DIP pipe and fittings shall be lined with a hydrogen sulfide resistant interior lining of either Protecto 401 Ceramic Epoxy as manufactured by Induron Coatings, Inc. or PolyBond Plus as manufactured by American Ductile Iron Pipe. Lining shall be installed and field cuts shall be repaired as recommended by the manufacturer.

5. Couplers for Dissimilar Pipe Materials:

The connection of pipes of different materials shall be made using a Mission Flex-Seal ARC Coupling, Fernco Strong Back RC Coupling or approved equal that provides a permanent and watertight connection which includes a stainless steel solid wall which withstand the hydrostatic test pressure and prevent offset of the joint within the coupling.

6. Saddles:

See Section II.D.2 for usage allowances and requirements. A Multi Fittings Saddle Tee Gasket Hub and Gasket Skirt with Stainless Steel Bands conforming to ASTM D3034, F679, F170 or approved equal.

B. Pipe Embedment

1. Bedding Aggregate:

All material used for granular embedment for pipe bedding shall conform to the requirements of ASTM C33 and shall meet the following gradation: Sieve size gradations: 1 - 100% passing, 3/4 - 80 to 100% passing, 3/8 - 30 to 60% passing, No. 4 - 0 to 25% passing, No. 8 - 0 to 5% passing. Testing shall be in accordance with Section 2536, Paragraph 2.01 of the JCW Construction and Material Specifications for Sanitary Sewers where required.

2. Haunching and Initial Backfill Aggregate:

Where granular material is required for haunching and initial backfill, it shall conform to the Bedding Aggregate specification.

3. Groundwater Interruption Barrier:

- a. A groundwater interruption barrier shall be installed for a minimum length of four (4) feet as measured along the sewer service line. The upstream end of the barrier shall begin at a point where the sides of the sewer trench consist of undisturbed earth, not previously excavated for footing or foundation construction.
- b. The groundwater interruption barrier shall consist of one of the following:
 - 1) Concrete Encasement. The service line shall be fully encased in concrete having a minimum compressive strength of 2500 pound per square inch (psi). Encasement shall be poured against undisturbed earth on the bottom and sides of the trench and poured to a depth of 6 inches above the top of the pipe. Encasement shall begin and end at a pipe joint, fitting, or other point of flexibility for deflection. The pipe shall be anchored to prevent flotation during the placement of concrete. Backfill above the concrete encasement wall consist of compacted earth material only; no gravel shall be used for a depth of at least two feet over the top of the pipe.
 - 2) Compacted Clay. The service line shall be installed on clay embedment compacted to a minimum of 95% standard density as established by AASHTO Standard Method T-99. The clay embedment shall be free of rocks and stones having a dimension larger than one inch, and shall be compacted by hand tamping under and around the sides of the pipe in lifts not to exceed six (6) inches. The pipe shall be fully supported by the clay embedment to the spring line for rigid pipes and to the top of pipe for flexible pipe materials. Above the support limits, the clay shall be compacted to a minimum of 90% standard density (AASHTO Std. Method T-99) in lifts not to exceed eight (8) inches, and shall continue to the top of the trench as required to receive finish grade work. A testing laboratory may be required to perform in-situ density tests to verify compaction in accordance with specified limits. The cost for tests whose results indicate failure to achieve the specified compaction limits shall be paid for by the permit applicant.

SECTION II. INSTALLATION

A. Maximum Trench Width:

The maximum allowable trench width below a horizontal plane 6 inches above the top of pipe shall be 30 inches.

B. Pipe Bedding:

The thickness of bedding material below the pipe shall be a minimum of 6 inches for any of the pipe types listed in this Standard. The bedding material shall be placed before installation of the pipe in the trench and shall be prepared to provide a continuous pipe support between pipe bells and joints. Embedment shall be placed and densified by shovel slicing, or vibrating and prepared so that the pipe will be true to line and grade after installation. If unsuitable sub-grade conditions are encountered, additional granular material shall be added to provide support for the pipe.

C. Pipe Joining

1. ABS (Solvent Weld Only):

Apply cement to the outside of spigot and inside of coupling in sufficient quantity so that when the spigot is fully inserted into the coupling a bead of excess cement will form around the entire perimeter of the pipe. Make joint within one minute by shoving spigot home with one-quarter rotation. Care should be taken to keep the joint free of water and dirt while making the connection. Make sure that the pipe marking is visible for material verification by the JCW. Remove excess cement from joint exterior with a clean, dry cloth. The joint shall not be disturbed for 15 minutes after assembly.

2. PVC (Gasket Joint Only):

- a. Clean and dry surfaces of all joint components. Apply approved pipe lubricant immediately before jointing. Lubricate according to manufacturer's recommendations. Keep the lubricant and joint surfaces free from foreign material.
- b. Align the pipe section and insert the spigot straight into the bell until the spigot insertion mark is flush with the entrance of bell. Do not swing or stab the joint.
- c. Check for proper jointing and gasket seating after joint assembly by rotation of the spigot by hand for one-fourth (1/4) to one half (1/2) turn. Make sure that the pipe marking is visible for material verification by JCW.

3. DIP: DIP shall not be used for new installations. For connecting to existing DIP, the following apply:

- a. All grooves, sockets, gaskets and plain ends shall be clean of all dirt and foreign materials and lubricated as recommended by the pipe manufacturer.
- b. All field cut joint ends shall be beveled as recommended by the manufacturer and shall be repaired with an epoxy polyamide paint system. The cut surface of the pipe to be coated shall be dry and free of dirt, dust, sand, grit, mud, oil, grease, rust, loose mill scale or other objectionable substances. Cleaning and painting operations shall be performed in a manner which will prevent contaminants from getting on freshly painted surfaces. Any damages to the lining system that result from the field cut or other shall be repaired according to the manufacturer's recommendations.
- c. Push-On Joint
 - 1) Insert the gasket, making sure that it faces the proper direction and is correctly seated.
 - 2) Push the plain end into the bell of the pipe keeping the joint straight while pushing. Make any necessary deflection after the joint is assembled.

- d. Mechanical Joint
 - 1) Place the gland on the plain end with the lip extension toward the plain end. Follow gland installation by placing the gasket with the narrow edge toward the plain end of the pipe.
 - 2) Push the pipe into the bell socket. Press the gasket around the entire socket. Push the gland up to the bell and center on the pipe.
 - 3) Insert and hand-tighten the bolts until all are even. Tighten the bolts evenly with a torque wrench to the manufacturer's torque specifications.
4. HDPE: TWO JCW INSPECTIONS are required for HDPE pipe as noted below. An additional partial inspection fee for INSPECTION 2 shall be included with the permit fees.
 - a. Butt-fused Joint
 - 1) The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Socket fusion, extrusion welding or hot gas welding, threaded or solvent cement joints and connections are not permitted. All equipment and procedures used shall be used in strict compliance with the manufacturer's recommendations. Fusion shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment. Certifications for all personnel shall be submitted to JCW prior to the inspection of the work.
 - 2) The butt-fused joint shall have true alignment and uniform roll back beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of the pressure. The fused joint shall be water tight and shall have tensile strength equal to that of the pipe and shall indicate a ductile rather than brittle fracture when tested. All defective joints shall be cut out and replaced. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than five percent (5%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling in the opinion of JCW shall be discarded and not used.
 - 3) Butt fusion beads shall be uniform on both sides of the joint (i.e. no wrinkles or discontinuities).
 - 4) All internal beads shall be removed after the cooling time using a suitable bead removal tool from the manufacturer. The bead removal tool shall not induce any slits, gouges or defects in the pipe wall. The bead removed from each joint shall be provided to JCW at the time of inspection and will be retained by JCW.
 - 5) After the pipe has been successfully joined, the installer shall place the pipe in the trench and haunch the pipe.
 - 6) For JCW INSPECTION 1: JCW shall inspect all butt fused joints and haunched pipe in the trench. The JCW inspector shall inspect the removed internal beads from each joint and bend the removed internal beads back at several positions. No evidence of the bead splitting shall be seen. If the bead splits at any point, then the joint shall be cut from the pipeline and remade. If a similar defect recurs, all further production jointing shall cease until the equipment has been thoroughly cleaned and examined. New trial joints shall be made and shown to be satisfactory.
 - 7) After JCW INSPECTION 1, the HDPE pipe shall be allowed sufficient time (6 hours minimum) to rest and contract prior to tie-ins and connections. The pipe, except at the tie-in locations, may be backfilled during the rest period.
 - 8) For JCW INSPECTION 2: JCW shall inspect all tie-ins and connections a minimum of 6 hours after JCW INSPECTION 1 of the joints and haunched pipe.
 - b. Electrofusion Joint
 - 1) Fusion shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment. Certifications for all personnel shall be submitted to JCW prior to the inspection of the work.
 - 2) Pipe edges shall be chamfered and the pipe interior and exterior shall be cleaned and pipe shall be rounded as recommended by the manufacturer.
 - 3) The oxide layer of the pipe shall be removed using a scraper tool from the manufacturer. Files, rasps, sand paper and other similar tools shall not be used.
 - 4) Pipe shall be inserted in the coupling for final connection in a manner to ensure a stress-free assembly of the component parts.
 - 5) The coupling shall be connected by fusion leads to the electrofusion unit and the fusion process shall be recorded, completed and documented as required by the manufacturer.
 - 6) Joint shall be allowed to cool as recommended by the manufacturer before moving or placing any stress on the joint.
 - 7) All defective joints shall be removed and replaced.
 - 8) After JCW inspection of the joints, the pipe shall be placed in the trench and haunched to allow the completion of JCW INSPECTION 1.
 - 9) After JCW INSPECTION 1, the HDPE pipe shall be allowed sufficient time (6 hours minimum) to rest and contract prior to tie-ins and connections. The pipe, except at the tie-in locations, may be backfilled during the rest period.
 - 10) JCW INSPECTION 2: JCW shall inspect all tie-ins and connections a minimum of 6 hours after JCW INSPECTION 1 of the joints and haunched pipe.
5. Special Joints
 - a. Where two different types of pipe material are to be joined or where the pipe size is enlarged or reduced, fittings noted in Section 1.A.5 designed for such use shall be utilized.
 - b. No right angle (90°) bends shall be installed. When making a bend that is equal to 90°, two (2) 45° bends with a minimum of one (1) foot of pipe between the bends is required.

- c. Angles less than 90° to the downstream pipe shall not be installed in the service line and service lines shall not be installed at an angle less than 90° to the downstream main.
- D. Tee Connections, Taps and Saddles
1. Permission, Usage, Type
 - a. No connections or saddles shall be made on JCW's facilities without obtaining a connection permit from JCW.
 - b. JCW shall inspect all sanitary sewer piping and appurtenances located on the exterior of the building from the building foundation to the connection on the main.
 - c. Connections or saddles shall not be allowed on any pipe 18 inches or larger.
 - d. Existing connection points on the sanitary sewer main shall be used. Where multiple connection points exist for a lot, unused connection points shall be permanently capped. Where an existing connection point does not exist for a lot, connection shall be made by core drilling a manhole or, on PVC pipe, by installing a new tee on the main.
 - e. The service line bell on the tee or the tap for a saddle shall be located above the center line of the pipe the connection is made to at 45° from the horizontal. See the Tee Orientation and Riser Detail on the JCW Sanitary Sewer Standard Details document.
 2. Saddles
 - a. Saddles shall be used only for connection to existing DIP and Vitrified Clay Pipe (VCP). JCW written approval for use of a saddle is required and, if approved, will be included on the sewer connection permit.
 - b. The main shall be exposed six (6) inches in all directions from the tap hole for JCW inspection of the tap hole before the saddle is installed. The service line shall be ready for inspection when JCW inspection of the tap hole is made. Contact JCW for the JCW Saddle Detail.
 - c. All taps for saddles shall be machine tapped.
 - d. Exposed pipe filler material on ABS Composite mains shall be sealed with an epoxy coating.
 - e. The field cut on DIP shall be cleaned and repaired with an epoxy polyamide paint system as noted in Section II.C.3.b of this document.
 - f. The Multi Fittings Saddle Tee Gasket Hub and Gasket Skirt shall be joined to the main with stainless steel bands.
- E. Allowable Grades
1. Service lines shall be installed on a straight alignment and at a uniform grade of not less than 1/4 inch of fall per foot of pipe (2%) for 4-inch pipe and 1/8 inch per foot (1%) for 6-inch pipe.
 2. No lines shall be installed with a grade greater than 45° (100% slope).
 3. Anchors on 36 foot centers will be required where the service line is installed at grades between 15 to 35% and on 24 foot centers for pipe at grades between 35 to 100% in accordance with JCW Construction and Material Specifications for Sanitary Sewers.
- F. Haunching and Backfill
1. Haunching of the pipe shall be done by placing bedding aggregate above the bedding up to the pipe centerline for all pipe types. The bedding aggregate shall extend from the exterior of the pipe to the trench walls and be densified by shovel slicing or vibrating. Haunching shall be placed to the centerline of the pipe for JCW inspection and approval of all exterior sanitary piping and appurtenances.
 2. After JCW inspection and approval, bedding aggregate shall be placed from the pipe centerline to a minimum of 6 inches above the top of the pipe for all pipe types.
 3. Service lines that have not been inspected by JCW shall be excavated and uncovered for JCW inspection. Service lines shall be reinstalled as required to allow complete inspection.
 4. For all pipe types, the initial backfill material from the centerline of the pipe to a point three (3) feet above the top of the pipe shall be material free of rocks or stones having a dimension larger than six (6) inches.
 5. The remainder of the trench shall be backfilled with job excavated material free of large rocks, debris and vegetation. For areas outside of street or alley right-of-way or other pavement, the backfill material from the top of the pipe embedment to a point at grade shall be compacted to at least 90% of maximum dry density at a moisture content within 2% of optimum moisture as determined by ASTM D698.
 6. Backfill in public street or alley right-of-way shall be installed in accordance with the entity having jurisdiction. Under other areas to be paved, the backfill material from the top of the pipe embedment to a point at grade shall be compacted to at least 95% of maximum dry density at a moisture content within 2% of optimum moisture as determined by ASTM D698.
 7. Service Lines shall be encased in reinforced concrete encasement (RCE) in accordance with the JCW Minimum Plan Requirements for Gravity Main Projects Standard Detail where required by JCW.
- G. Pipe Cover
The building sewer shall be installed in a trench deep enough to provide a minimum of thirty inches (30") of earth cover over the top of the pipe.

SECTION III. DESIGN STANDARDS

A. Allowable Connections

1. A current permit issued by JCW is required and shall be obtained for each connection to the JCW sanitary sewer system, for each new service line, for all appurtenances connected to the sanitary sewer system and for all modifications or repairs to existing service lines or appurtenances.
2. A single separate and independent connection shall be provided for every building.
3. The service line shall not duplicate plumbing routing inside the building or the sanitary sewer main.
4. Multiple service lines shall not be provided in lieu of a main extension.
5. All Commercial Buildings (including any building other than a single-family residence) require a distinct JCW permit and additional fees to connect to the JCW sanitary sewer system. In addition, a Modified Use Permit shall be obtained by the

property owner for any change of use, redevelopment, expansion or other modification of an existing use for an existing building.

6. Existing service lines, or portions thereof, may be reused only when the line meets current JCW Service Line Design and Construction Standards. Inspection (video (as noted below) and spot excavation at locations required by JCW) and air pressure testing of existing service line to be reused shall occur and be witnessed and approved by JCW prior to permitting and reuse. For service lines that shall not be reused:
 - a. The service line shall be replaced in accordance with the current JCW Service Line Design and Construction Standards.
 - b. OR, the service line may be evaluated for CIPP lining or pipe bursting as follows:
 - i. The service line shall be cleaned by the applicant prior to the evaluation video.
 - ii. The applicant shall introduce dye water and video the line in question while witnessed by a JCW inspector.
 - iii. The applicant shall provide a copy of the evaluation video to the JCW inspector at the time of the video.
 - iv. JCW will review the evaluation video to verify whether CIPP lining or pipe bursting will be authorized.
 - v. JCW will provide written results for the evaluation.
 - vi. CIPP lining or pipe bursting including video and JCW inspection requirements shall be in accordance with current JCW Standard Specifications.

B. Non-Allowable Connections

1. Roof, areaway, garage, foundation or storm sewers shall not be connected to JCW facilities either directly or indirectly.
2. Swimming pools shall not be connected directly to and, unless by specific written authorization from JCW, shall not be drained to JCW facilities.
3. In accordance with the current Johnson County Code of Regulations for Sanitary Sewer Use, no person or user shall introduce into any public sanitary sewer or into the sewerage system any pollutant which may cause damage to the sewage system or workers, pass through, interference or significant inhibition of microbial activity, etc.

C. Alignment and Service

1. A service line for a lot shall generally not cross another lot (or extension of the lot to the back of curb at the street) to access the sewer. The service line for a lot may enter another lot only if the other lot is contiguous with the lot served or located immediately across public street right-of-way from the lot served. The distance that the service crosses another lot (beyond the public street right-of-way, if applicable) shall be no more than one half the width of the minimum allowable sewer easement, i.e. seven and one-half (7.5) feet. The portion of service line that crosses another lot shall be located only in the sanitary sewer easement (or utility easement) required for the sanitary sewer main.
2. Service lines shall not cross wetland areas or Best Management Practices (BMPs) for storm water mitigation. Service lines shall not generally cross water courses unless by specific written authorization by JCW.
3. Service lines shall not cross existing or future arterial, four (4) lane, or wider roads.
4. Any property connecting to the sanitary sewer shall extend the sanitary sewer main to the project property boundary to serve tributary areas which lie outside of the project boundary and do not otherwise have direct access to the sanitary sewer main.
5. The provided point of connection for the lot or building shall be used. Where a connection point does not exist, the connection point shall be installed at a precast manhole or on the main at the closest location to the building unless otherwise directed by JCW.
6. Plumbing for building additions and/or tenant finish revisions shall be routed into the interior building plumbing unless the addition is constructed within 10 feet of the existing building service line and can connect to that service line.

D. Service Line Sizing and Length

1. Single family and duplex dwellings shall use 4-inch (minimum) or 6-inch pipe(s) as service lines.
2. Pipe diameters for the service lines of multi-family, commercial and industrial structures shall be sized according to the rate of wastewater discharge. Rate calculations sealed by a Kansas PE supporting pipe diameters larger than 6 inches shall be provided.
3. The diameter of the service line shall be equal to or less than the diameter of the sewer main. Two service lines shall be provided when the diameter of the service line would exceed the diameter of the sewer main unless the connection is made at a sewer manhole. Manholes shall not be added to accommodate a service line installation in this case.
3. When the length of service line installed within the boundaries of the lot served will exceed 100 feet and the proposed use of the property is for single family residential purposes:
 - a. The JCW Sewer Service Line Agreement and Covenant document shall be executed by the property owner(s) prior to permitting.
 - b. The owner shall provide a to scale plot plan as on record with the City or other jurisdictional agency showing the following: a north arrow, street address, Plat with #, Lot #, Block # (for unplatted lots, legal boundary description shall be included), Lot dimensions including all easements, structures, sanitary sewer and storm structures and pipe, utilities, all water courses, all bodies of water, entire route (with direction changes and distances noted) of the service line from the building to the connection on the main (with building exit location, building plumbing and main flow lines, pipe length and slope, and cleanouts with locations shown and labeled) for JCW approval prior to permitting.
4. Where retaining walls must cross a service line, the crossing shall be in a perpendicular fashion and the service line shall be encased in reinforced concrete (RCE) meeting the JCW standard specifications. The following elevations at the location the wall crosses the service line or main shall be noted on the Site plan: flow line elevation of the pipe, finish grade at top of the wall, finish grade at the bottom of the wall, and elevation of the bottom of the foundation. The length of RCE along the pipe on each side of the wall shall be equal to the depth of the pipe on each side of the wall. See the JCW Minimum Plan Requirements for Gravity Main Projects on the Privately-Financed Projects page at www.jcw.org for additional requirements. Retaining walls shall not bear weight directly or indirectly on sanitary service lines.

E. Cleanouts

1. Cleanouts (C/O) shall be provided in accordance with JCW Standard Details and shall be provided at 100 foot intervals when the service line length exceeds 100 feet. For service lines less than 200 feet, placement of the cleanout should be at the service line mid-point where possible. The number of exterior cleanouts shall be limited to the greatest extent possible.
2. Cleanouts shall be placed outside of pavement to the greatest extent possible. For existing cleanouts that must be located in pavement, a protective concrete pad shall be installed around the lid and frame in accordance with JCW standards.
3. The contractor shall clearly record the horizontal location of the threaded plug at the top of all C/Os by providing distances from two fixed points on the building or other structure that will not be removed so that the cleanout can readily be located in the event it is damaged or buried in the future. This information shall be provided to the JCW inspector at the time of the inspection for JCW inspector concurrence.

F. Manhole Connections

1. External drop connections shall not be allowed. Internal drop connections shall generally not be allowed; however, internal drop connections may be considered by JCW where unusual conditions or circumstances are encountered. Site specific written approval from JCW is required for an internal drop.
2. The top of sewer service pipe shall be set equal to the top of the upstream main sewer. A concrete invert directing the service line's flow toward the downstream main sewer is required. Existing concrete inverts shall be reformed in accordance with JCW standard details.
3. When connecting plastic pipe to a precast manhole for which no service stub was provided, the connection shall be made by core drilling the manhole, installing a PSX Direct Drive Boot Gasket by the Press-Seal Gasket Corporation, and reforming the invert.
4. An angle 90° or greater to the downstream main is required.
5. A minimum of one (1) foot of manhole wall is required between the holes required for the pipe.
6. New service line connections shall not be made into existing brick manholes unless under specific written authorization from JCW.

G. Service Cap-offs

1. Service connections for all buildings that will be demolished shall be capped as required by JCW. A JCW permit and JCW inspection of the cap is required before demolition of the building or other modifications.
2. The contractor shall clearly record the horizontal location of the cap by providing an exhibit indicating the distances to the cap from two fixed points on the building or other structure that will not be removed so that the cap location can readily be located in the future. The exhibit shall be provided to the JCW inspector at the time of the inspection for JCW inspector concurrence.
3. Temporary Caps. Tee, Wye or manhole service connections that will be reused for a new building at the site shall be temporarily capped in accordance with JCW's standard detail and specifications. A fitting meeting the specifications noted in this standard for the applicable material type of the tee or wye. For VCP, a Low Pressure Nylon Expansion Plug by COB Industries with a synthetic gasket conforming to ASTM F477 or approved equal shall be used. Natural rubber seals shall not be accepted.
4. Permanent Caps. Each service connection intended for the lot that will not be used for the current project shall be permanently capped or plugged as follows:
 - a. Tee or wye connections shall be permanently decommissioned by capping or plugging the tee or wye and concrete encasing the plug or cap in accordance with the JCW Standard Tee or Wye Cap-off Detail.
 - i. Where the main is located outside of pavement, disconnect service line at the tee or wye on the main.
 - ii. Where the main is located in pavement, disconnect the service line as close as possible to edge of said pavement. Location shall be as required by JCW's Inspector.
 - b. Manhole connections shall be permanently decommissioned by plugging the service line (may be plugged from inside the manhole), filling the line with specified cementitious material and repairing the manhole wall and reforming the invert in accordance with the JCW Standard MH Cap-off Detail.

SECTION IV. INSPECTION PROCEDURE

All lines and appurtenances related to sanitary sewer service and located outside of the building shall be inspected by JCW Appurtenances located inside the building shall be inspected by JCW where required to confirm compliance with the Sewer Use Code. Before calling the JCW for a service line inspection, the line should be completely installed but not backfilled as outlined under Section II, Item F. When requesting an inspection the caller is required to know the permit number, correct address and the name of the plumber. All requests for inspections shall be made before 4:00 PM. A copy of the sewer connection permit and all other documents attached to the permit as issued by JCW shall be at the site during all phases of installation and at the time of inspection(s). Failure to have the sewer permit at the site or failure to completely and properly install the sewer line shall require re-installation and re-inspection of the sewer line and payment of partial inspection fee(s) in accordance with a current fee schedule.