STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS

FOR

BUILDING SEWER AND LATERAL INSTALLATIONS

AUGUST 2017

LOWER PAXTON TOWNSHIP AUTHORITY
LOWER PAXTON TOWNSHIP
DAUPHIN COUNTY, PENNSYLVANIA

8618490.3400

GHD
1240 NORTH MOUNTAIN ROAD
HARRISBURG, PA 17112
(717) 541-0622

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PREFACE

This document is provided by Lower Paxton Township Authority for use by property owners and their contractors for design and construction of public or private sanitary building sewers and service laterals. The standards in this document must be followed in design development and construction. Use of this document for any other purpose other than preparation of plans for submittal to Lower Paxton Township Authority or for construction of building sewers and service laterals in the Authority's service area is forbidden.

The specifications contained in this document meet or exceed the requirements of the Uniform Construction Code (UCC), the International Pluming Code (IPC) and the International Residential Code (IRC) for installation of service laterals and building sewers located on either public or private property. If a subject contained in either the IPC or IRC is not specifically addressed in the document, the requirements of the IPC or IRC are to be applied.

Please refer to the latest version of the "Standard Construction and Material Specifications for Wastewater Collection System Extensions", for any items not covered under these specifications.

LOWER PAXTON TOWNSHIP AUTHORITY

STANDARD CONSTRUCTION AND MATERIALS SPECIFICATIONS FOR BUILDING SEWER AND LATERAL INSTALLATIONS

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SECTION 1

GENERAL INSTRUCTIONS

1.01. DEFINITIONS: Wherever in these Specifications the following words, terms and expressions, or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

A. Agreement: The written agreement between the AUTHORITY and DEVELOPER or PROPERTY OWNER covering the work to be performed.

B. AASHTO: American Association of State Highway and Transportation Officials.

C. ACI: American Concrete Institute.

D. AISC: American Institute of Steel Construction.

E. "Approved", etc: The words "approved", acceptable", "satisfactory", or words of like import, shall mean approved by, or acceptable, or satisfactory, to the ENGINEER, unless another meaning is plainly intended or otherwise specifically stated.

F. ANSI: American National Standards Institute.

G. ASTM: American Society of Testing Materials.

H. AUTHORITY: LOWER PAXTON TOWNSHIP AUTHORITY including any agent, officer or employee duly authorized to act for the said party in connection with the work of the DEVELOPER or PROPERTY OWNER. Also referred to as OWNER.

I. Building Sewer: The Lateral pipe from a point near the Observation Tee or public right-of-way line to a point near the building foundation.

J. Completion Certificate: The certificate of the ENGINEER or AUTHORITY indicating the completion and acceptance of the work of the DEVELOPER or PROPERTY OWNER.

K. Contract: The written agreement executed by and between the DEVELOPER or PROPERTY OWNER and the CONTRACTOR covering the performance of the work and the furnishing of labor, materials and service in the construction of sewer extensions to the AUTHORITY'S wastewater collection system.

L. CONTRACTOR: The person, firm or corporation constructing the sewers on behalf of the DEVELOPER or PROPERTY OWNER, if other than DEVELOPER or PROPERTY OWNER.

M. Construction Observation: The observation of the work performed to ascertain its conformity with the AUTHORITY'S Standard Construction and Material Specifications.

N. DEVELOPER: The person, firm or corporation ultimately responsible for construction of the sewers with whom the AUTHORITY has entered into the Agreement, as well as agents acting on behalf of the DEVELOPER, including the DEVELOPER'S CONTRACTOR.

O. Drawings: The drawings which show the character and scope of the work to be performed and which have been prepared by the DEVELOPER or PROPERTY OWNER and approved by the ENGINEER and are referred to in the Agreement.

P. ENGINEER: The independent consulting engineer that the AUTHORITY has contracted to review/assess the DEVELOPER'S or PROPERTY OWNER's design, installation, and completion of any sewer construction. The word "ENGINEER" shall include the officers, agents and employees of the ENGINEER. In cases where the AUTHORITY does not employ a consultant, the word "AUTHORITY" is substituted for "ENGINEER" throughout these Specifications.

Q. Fed. Spec: Federal Specifications, United States Government.

R. Fill: The deposit of earth material placed by artificial means.

S. Grade: The vertical elevation of the ground surface.

T. Grading: Any excavation or filling or combination thereof.

U. Lateral: The entire sanitary sewer system extending from the sewer main to a building, including both the service lateral and building sewer. This part of the system is owned, operated and maintained by the PROPERTY OWNER.

V. Mass Grading: The grading that is completed on a large scale over a large area prior to preliminary grading.

W Observation Tee: The double sweeping tee placed at the transition connection and extended to the surface and capped to allow inspection of flow from the building sewer.

X. Laws and Regulations: Laws, rules, regulations, ordinances, codes and/or orders of the AUTHORITY, Lower Paxton Township, Dauphin County, Commonwealth of Pennsylvania, and United States of America.

Y. Professional Services Contract: The Agreement between the AUTHORITY and the DEVELOPER or PROPERTY OWNER where the DEVELOPER or PROPERTY OWNER agrees to pay for all applicable charges from the AUTHORITY, the ENGINEER, and the Authority's Solicitor with respect to the Development's review approval and inspection.

Z. PROPERTY OWNER: The owner of the property at the time the Lateral is being installed or replaced.

AA. Project: The total construction of the sanitary sewer extension covered under the agreement or the total construction of the Lateral by the PROPERTY OWNER.

BB. Project Representative: The authorized representative of the AUTHORITY or ENGINEER assigned to the site or any part thereof for observation of construction.

CC Service Connection: The point of connection between the service lateral and the building sewer.

DD. Service Lateral: The Lateral pipe from the sewer main to the Observation Tee or a point near the public right-of-way line.

EE. Sewer System: The sanitary sewer system including the collection sewers, interceptors, pumping stations, lift stations, force mains and any and all other appurtenances thereto, as constructed or dedicated, owned, operated and maintained by the AUTHORITY.

FF. Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data which are specifically prepared by or for the DEVELOPER or PROPERTY OWNER to illustrate some

portion of the work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a supplier and submitted by the DEVELOPER or PROPERTY OWNER to illustrate material or equipment for some portion of the work.

GG. Specifications: Those portions of these Standard Construction and Material Specifications consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the work and certain administrative details applicable thereto and all supplements thereto.

HH. Street: A public road in a city or town, typically with houses and buildings on one or both sides. Street and road are used interchangeable within this document.

II. Subcontractor: A person, firm or corporation having a direct contact with the CONTRACTOR to perform part of the latter's contract; such as one who installs or furnishes and installs equipment forming a permanent part of the Contract work, or who furnishes labor for work required by the Contract in accordance with these Specifications, Detail Drawings, and Drawings. This term does not include individual workmen furnishing labor only, nor one who merely furnished material not worked to a special design.

JJ. Supplier: A manufacturer, fabricator, supplier, distributor, or vendor of materials or equipment.

KK. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or their control systems or water.

LL. Warranty Period: An 18 month time period beginning with the AUTHORITY'S final acceptance and issuance of completion certificate.

MM. Work: The entire completed construction of the sewer extension or the various identifiable parts thereof required to be furnished under these Specifications. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by these Specifications.

1.02. GOVERNING AGENCY REQUIREMENTS

A. Where Laterals are to be installed within the limits of existing street, the removal and protection of street paving, backfilling of trenches, temporary and permanent replacement of street paving, restoration of shoulders and the maintenance and protection of traffic will be performed in strict conformance with the requirements of Lower Paxton Township, the Commonwealth of Pennsylvania Department of Transportation (PennDOT), or other governing agency, as applicable.

B. PROPERTY OWNER or PROPERTY OWNER's representative shall obtain a sewer connection permit and pay all applicable AUTHORITY fees (e.g. sewer connection permit fee; inspection permit fee; tapping fee; customer facilities fee; etc.). Prior to obtaining a sewer connection permit, a drawing shall be submitted to the AUTHORITY for review and approval. The drawing shall include the following:

1. PROPERTY OWNER's name, address, and telephone number.
2. Street name and nearest intersection.

3. North arrow.
4. Existing and proposed utilities.

C. The CONTRACTOR shall pay the cost of inspection by personnel of PennDOT, as may be required. CONTRACTOR shall perform work within the right-of-way of State Highways in accordance with the requirements of the latest edition of the Commonwealth of Pennsylvania, Pennsylvania Code, Title 67, Transportation, Department of Transportation, Chapter 459, and Occupancy of Highways by Utilities. These requirements are made a part of these Specifications.

1.03. ILLEGAL CONNECTIONS

A. Stormwater or groundwater drainage shall not be discharged to any portion of the Sewer System owned by the AUTHORITY. Illegal connections are as outlined in the Lower Paxton Township Codified Ordinance.

B. Pursuant to the Federal Clean Streams Act of 1968, no rain water leaders, roof drainage, groundwater sump pumps, area or yard drainage, basement, surface or groundwater or water from underground drainage fields shall be permitted to drain into or be admitted into the Sewer System, nor shall any of these be admitted to the Sewer System by the use of pumps of any type.

C. The Sewer System, and all extensions thereto, are intended to convey sanitary sewage only.

D. All illegal connections are required to be corrected on existing, proposed, or facilities that require modifications to the Service Lateral or Building Sewer.

1.04 INTERFACING EXISTING SEWER SYSTEM

A. CONTRACTOR shall not permit groundwater or surface water to enter any portion of the existing Sewer System owned by the AUTHORITY through the new Lateral connection.

B. Flushing, draining or depositing water or debris from the new Lateral, or related construction, into the existing Sewer System owned by the AUTHORITY, is forbidden.

1.05 DRAWINGS AND SPECIFICATIONS

A. The Drawings and these Specifications are complementary, and the requirements of any one shall be considered as the requirements of all.

B. The Specifications in this document are written as if they were included in the Contract Documents executed by and between the DEVELOPER or PROPERTY OWNER and the CONTRACTOR. Whether they are so used is at the discretion of the DEVELOPER or PROPERTY OWNER. All sanitary sewer extensions provided by the DEVELOPER, however, must conform to the requirements of these Standard Construction and Material Specifications.

C. All Drawings pertaining to the Project are to be submitted by the DEVELOPER or PROPERTY OWNER to the AUTHORITY for review. After review of the Drawings by the AUTHORITY, the DEVELOPER or PROPERTY OWNER shall make any corrections required, and submit corrected copies thereof to the AUTHORITY. The AUTHORITY'S approval of the Drawings shall not relieve the DEVELOPER or PROPERTY OWNER from responsibility for errors or discrepancies in such Drawings. All Drawings shall be prepared and submitted in conformance with the requirements set forth in Section 01300 and with the agreement.

D. Deviations from the Drawings or these Specifications required by the exigencies of construction will be determined by the ENGINEER only, and authorized in writing.

E. At all times the DEVELOPER shall keep on the Project, available to the AUTHORITY and ENGINEER and their representatives, one (1) copy of the Drawings and these Specifications.

1.06. PRELIMINARY PROJECT SITE INSPECTION

A. Unless the requirement is waived by the ENGINEER prior to the start of actual construction operations, the DEVELOPER or PROPERTY OWNER, or his authorized representative, shall go over the Project accompanied by the ENGINEER, or his designated representative, and shall observe for himself/herself, with the approved Drawings before him/her, all pertinent conditions relative to the Project, including the status of rights-of-way and structures, obstructions, or other objects to be removed, altered and changed.

1.07. WORKING CONDITIONS

A. No night, weekend, or legal holiday work, requiring the presence of the ENGINEER or AUTHORITY or a representative of either, will be permitted, except in cases of emergency, and then only with the written consent of the ENGINEER or AUTHORITY and to such an extent as they may judge necessary.

B. Any request for AUTHORITY or ENGINEER project representatives for construction observation must be scheduled at the Administration Office 24 hours in advance by calling 717-657-5617 between 8:00 a.m. and 5:00 p.m.

1. Normal working hours are considered to be between 6:30 am and 2:30 pm.

1.08. MATERIALS

A. Before construction starts, the DEVELOPER or PROPERTY OWNER shall furnish the ENGINEER with a complete statement of the origin, composition, and manufacture of all materials to be used in the construction of the Project, as called for in these Specifications. Only materials conforming to the requirements of these Specifications and approved by the ENGINEER shall be used in the work.

B. Representative preliminary samples of the materials, of the character and quality prescribed in these Specifications shall be submitted when indicated or directed, for advance examination or test. Written approval of the quality of such samples shall be received by the DEVELOPER or PROPERTY OWNER prior to obtaining materials from the respective sources of supply.

C. Materials shall be stored so as to insure preservation of their specified quality and fitness for the work.

D. If any material intended for use in the construction of the Project has been inspected and rejected after such material has been delivered to the Site, the CONTRACTOR shall immediately remove all such rejected material from the property.

1.09. PERMITS AND LICENSES

A. With the exception of the PennDOT Highway Occupancy Permit, if applicable, and the Water Quality Management Permit, if applicable, which will be obtained under the AUTHORITY'S signature, the DEVELOPER or PROPERTY OWNER shall, unless otherwise specified, procure all necessary permits and licenses, pay all charges and fees, and shall give all notices necessary and incident to the proper and lawful prosecution of the work. The DEVELOPER or PROPERTY OWNER shall prepare the applications and pay any fees and charges associated with any required Highway Occupancy and/or Water Quality Management Permit(s).

B. The PennDOT Highway Occupancy and Water Quality Management Permit applications shall be prepared by the DEVELOPER or PROPERTY OWNER in the name of the AUTHORITY and submitted to the AUTHORITY along with the application fees. After review of the applications by the AUTHORITY, the DEVELOPER or PROPERTY OWNER shall make any corrections, if required, and submit corrected copies to the AUTHORITY. The AUTHORITY will forward the applications and fees to the Pennsylvania Department of Transportation and the Department of Environmental Protection.

C. Payment for personnel from State Agencies, as required to be on hand during the construction of work on Highways under their jurisdiction, shall be borne by the DEVELOPER or PROPERTY OWNER.

D. Where work is to be done by the CONTRACTOR, in placing any pipe or other construction under railroad tracks, within the right-of-way of any railroad company, the CONTRACTOR shall be governed by the requirements of the railroad company involved, and shall consult with the officials thereof relative to the installation. If the railroad company requires any of their personnel to be on hand during the construction of the work, payment for such personnel or any other costs associated with the railroad crossing shall be borne by the DEVELOPER or PROPERTY OWNER.

E. When working within Township road or street right-of-ways, the DEVELOPER, individual PROPERTY OWNER or PROPERTY OWNER's representative is required to obtain a street and road occupancy permit.

F. The DEVELOPER, PROPERTY OWNER and CONTRACTOR shall observe all applicable Local, State, and Federal laws and regulations.

1.10. CARE OF PUBLIC AND PRIVATE PROPERTY.

A. The CONTRACTOR shall comply with all provisions of the Pennsylvania Underground Utilities Act. The CONTRACTOR shall protect all land monuments and property markers that will be affected by the construction until they have been correctly referenced. CONTRACTOR shall satisfactorily reset monuments and markers that are disturbed by the CONTRACTOR during the construction of the Project or otherwise.

1.11. SAFETY REQUIREMENTS

A. The CONTRACTOR is responsible for all site safety, including, but not limited to, safety associated with all trenching, testing, and traffic control.

B. If the use of explosives is necessary for the prosecution of the work, the CONTRACTOR shall store and use in strict conformity to all State and local laws and regulations. **No explosives shall be used without first securing appropriate State and/or local blasting permits.**

C. If work involves asbestos cement pipe (ACP), CONTRACTOR shall comply with a regulatory requirements, local state or federal, for the proper handling and disposal of ACP. DEP's Asbestos Abatement and Demolition/Renovation Notification form must be completed, signed and submitted to DEP by the Contractor and proof of submission must be provided to the Authority.

D. Observance of, and compliance with, said regulations shall be solely and without qualification, the responsibility of the CONTRACTOR, without any responsibility whatsoever on the part of the AUTHORITY or ENGINEER. The duty of enforcing such laws and regulations lies with the governing body, not with the AUTHORITY or ENGINEER.

1.12. REGULATIONS AND REQUIREMENTS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

A. The DEVELOPER, PROPERTY OWNER and CONTRACTOR is advised that he will be required to design and conduct his work in compliance with the rules, regulations and requirements of the Pennsylvania Department of Environmental Protection and all other applicable laws and regulations (Paragraph 1.010).

1.13. OBSERVANCE OF LAWS AND REGULATIONS

A. The DEVELOPER or PROPERTY OWNER at all times shall observe and comply with all Federal and State laws and regulations, and local bylaws, ordinances and regulations in any manner affecting the conduct of the work or applying to employees on the Project, as well as all safety precautions and orders or decrees which have been promulgated or enacted, or which may be promulgated or enacted, by any legal bodies or tribunals having authority or jurisdiction over the work, materials, equipment, employees or the Contract between the DEVELOPER or PROPERTY OWNER and the CONTRACTOR; such observance and compliance shall be solely and without reliance on superintendence or direction by the AUTHORITY or ENGINEER.

1.14. ENGINEER'S DUTIES

A. The work shall at all times be subject to the observation of the ENGINEER, AUTHORITY or their authorized employees, who shall have free access to the work, and be furnished by the DEVELOPER or PROPERTY OWNER with every reasonable facility for examination of the work, to the extent of uncovering, testing or removing finished portions thereof. The CONTRACTOR shall provide all labor and equipment necessary for such observations. The ENGINEER may require the CONTRACTOR to uncover for observation, or to remove any work done or placed in violation or disregard of instructions issued to the DEVELOPER, PROPERTY OWNER or CONTRACTOR by the ENGINEER, AUTHORITY or their representatives.

B. The ENGINEER and his assistants are the representatives of the AUTHORITY during the construction of the work. When so authorized by the AUTHORITY, it shall be the duty of the ENGINEER to provide observation of construction to provide greater assurance that materials and work conform fully to the requirements of these Specifications. The ENGINEER shall perform such other duties as may be assigned him from time to time and shall have such additional authority as may be defined elsewhere in these General Instructions. The ENGINEER shall in no case act as foreman or perform other duties for the CONTRACTOR nor interfere with the management of the work by the CONTRACTOR.

C. All observations and tests shall be performed without unnecessarily delaying the work. All material and workmanship, if not otherwise designated by these Specifications shall be subject to observation and test by the AUTHORITY and/or ENGINEER or their duly

authorized representatives. The AUTHORITY and ENGINEER shall have the right to reject defective material or workmanship, or require its correction. Rejected workmanship shall be satisfactorily replaced with proper material and the CONTRACTOR shall promptly segregate and remove rejected material from the premises. If these Specifications, the ENGINEER'S instructions, laws, ordinances, or any public authority require the work to be specially tested or approved, the CONTRACTOR shall give the ENGINEER timely notice of its readiness for inspection.

D. The ENGINEER shall, within a reasonable time after presentation to it, determine all questions in relation to the construction of the Project, and in all cases decide every question that may arise relative to the performance of the work.

E. The ENGINEER shall have full authority to decide all questions that may arise relative to the quality and acceptability of materials furnished and the manner, rate of progress, quality and acceptability of work performed, and the interpretation of these Specifications.

F. Any verbal opinion or suggestion that the ENGINEER may give the CONTRACTOR shall in no way be construed as binding the AUTHORITY in any way.

1.15. DEFECTIVE WORK

A. When any material not conforming to the requirements of these Specifications and Drawings, has been delivered upon the Site of the Project, or incorporated in the work, or when any work performed is of inferior quality, such material or work shall be considered as defective and shall be immediately removed and renewed or made satisfactory as directed by the ENGINEER or AUTHORITY. Failure or neglect on the part of the ENGINEER or AUTHORITY to condemn or reject any bad or inferior work or materials, shall not be construed as to imply an acceptance of such work or materials, if such bad or inferior material or work becomes evident at any time prior to the delivery of the Completion Certificate by the AUTHORITY to the DEVELOPER or PROPERTY OWNER.

B. The CONTRACTOR shall promptly move from the premises all materials condemned by the ENGINEER or AUTHORITY as failing to conform to these Specifications, whether incorporated into the work or not, and the CONTRACTOR shall promptly rebuild and replace its own work.

1.16. NOTICE

A. The service of any notice, by the AUTHORITY or ENGINEER to the DEVELOPER or PROPERTY OWNER, shall be considered accomplished upon completion of any one of the following procedures.

1. When delivered, in writing, to the person in charge of the office used by the addressee to conduct business;

2. When delivered, in writing, to the addressee or any of its authorized agents in person;

3. When delivered, in writing, to the addressee or any of its agents at the office used by the addressee to conduct the business of the DEVELOPER or PROPERTY OWNER at or near the site of the work;

4. When deposited in the United States Mail, postpaid, and addressed to the party intended for such service at its office used for conducting business at the site of the work, or its last known place of business.

1.17. ENGINEERING STAKES

A. Setting and maintaining suitable stakes, grade boards, temporary structures, templates, and other materials for establishing and maintaining points, marks, and lines shall be the responsibility of the CONTRACTOR.

B. The CONTRACTOR is entirely responsible for maintaining all grades and elevations in the construction of the project in accordance with the approved plans.

1.18. ITEMS REQUIRED PRIOR TO BEGINNING CONSTRUCTION

Items Required from DEVELOPER or PROPERTY OWNER only installing a Lateral:

1. Sewer connection permit.
2. County Conservation District approved Erosion Control Plan (if needed).
3. Blasting permit (if needed).
4. Township Road Occupancy Permit and/or street-cut permit (if needed).
5. PennDOT Highway Occupancy Permit (if needed).
6. “Approved” Traffic Control Plan from Township (if applicable).
7. 24 hour notice indicating PROPERTY OWNER intends to start work.
8. Shop drawings of construction materials approved by the AUTHORITY or ENGINEER.

END OF SECTION

SECTION 02221

TRENCHING

PART 1 GENERAL

1.01. WORK INCLUDED

A. Excavated trenches for piping shown on Drawings.

B. Compacted bed and compacted fill over piping to subgrade elevations.

1.02. RELATED WORK

A. Section 02211 - Rock Removal.

1.03. REFERENCES

A. Pennsylvania Department of Transportation (PennDOT) Publication 408.

1.04. PERMITS

A. Township Road Occupancy Permit and/or street-cut permit.

B. State highway occupancy permit in AUTHORITY'S name.

C. Blasting permits (Township or other).

D. Stream crossing permit.

E. Wetland encroachment permit.

1.05. PROTECTION

A. Notify all utilities prior to work so that they may locate all affected facilities.

B. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.

C. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

D. Notify ENGINEER of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

E. Protect bottom of excavations and soil adjacent to and beneath foundation from frost.

F. Use rubber tired or treated equipment on pavement unless otherwise authorized in writing by agency having jurisdiction.

G. Grade excavation top perimeter to prevent surface water run-off into excavation.

H. DEVELOPER, PROPERTY OWNER, OR CONTRACTOR at all times, shall keep the gutters open so that storm or other waters shall not have their flow obstructed. If, in any case, the material excavated from the trenches must temporarily extend over the gutters, it shall be duty of the CONTRACTOR to plank or bridge over the gutters without extra compensation so that the flow of water is not prevented.

I. Temporary Protective Construction:

1. Temporary Fence Barricade: Erect and maintain substantial temporary fences surrounding excavation to prevent unauthorized persons entering such areas.

2. Temporary Fence: Where necessary, to keep one side of streets or roadway free from obstruction or to keep material piled along side of the trench from falling on private property outside the right-of-way, erect and maintain a safe and substantial fence.

3. Barricades: Furnish and erect substantial barricades at crossings of trenches, or along trenches, to protect the traveling public.

4. Excavation Covers: Cover open excavation when work therein is suspended or left unattended, such as at the end of a work day. For such covers, use materials of sufficient strength and weight to prevent their removal by unauthorized persons.

5. Remove temporary protective construction at the completion of work on the Project.

J. Blasting shall be in accordance with DEP regulations and requirements of Section 02211.

K. Assume the risks attending the presence or proximity of overhead or underground public or private utility lines, pipes, conduits and their attending support work, existing structures and property of whatever nature. Responsibility for damages and expenses arising out of the work, for direct or indirect injury to such structures or to any person or property by reason of them, or by reason of injury to them, whether such structures are or are not shown on the Drawings, rests solely with the CONTRACTOR.

1. Support of Existing Utility Lines: Adequately support underground utilities not requiring removal and exposed as a result of excavation. Provide adequate support along their entire exposed length. Support system shall be acceptable to the affected utility company. Install these supports in such a manner that backfilling may be performed without dislodging such utilities.

a. Place and carefully compact aggregate backfill around the supports, and leave such supports in place as a guard against breakage due to backfill settlement.

2. Utility pole guy line supports: Restore to satisfaction of utility company.

1.06. WORK IN PRIVATE RIGHT OF WAY

A. Protect all property including land, ornamental shrubs and trees, fences, patios, landscaping and other existing improvements and replace in kind all those damaged at no cost to the AUTHORITY.

B. Pay all valid and substantiated claims for property damage, including trespass occupation for damage outside the right-of-way.

C. It shall be the DEVELOPER'S OR PROPERTY OWNER'S responsibility to obtain all rights-of-way for access to the construction site. Written authorization from all affected property owners shall be provided to ENGINEER before beginning work in the affected area.

1.07. QUALITY ASSURANCE

A. Testing and Inspection Service: DEVELOPER OR PROPERTY OWNER is responsible for paying for a qualified independent geotechnical testing and inspection laboratory to perform soil testing during trench backfilling operations where required by PennDOT. AUTHORITY has the right to employ and pay for additional soil testing and inspection services if determined to be necessary by the ENGINEER.

PART 2 PRODUCTS

2.01. SELECT MATERIALS IN ACCORDANCE PENNDOT'S PUBLICATION 408

A. Coarse Aggregate AASHTO No. 8 (PennDOT 1B Stone).

B. Coarse Aggregate AASHTO No. 57 (PennDOT 2B Stone).

C. Coarse Aggregate PA No. 2A.

D. Coarse Aggregate PA No. 2RC.

E. Coarse Aggregate PA No. R-3.

2.02. COMMON FILL MATERIALS AND SUITABLE BACKFILL MATERIAL (FOR RIGHTS-OF-WAYS AND FUTURE PRIVATE STREETS AND FUTURE STREETS TO BE DEDICATED TO THE TOWNSHIP WHERE MASS GRADING IS INVOLVED, SEE DETAILS)

A. Suitable Earth Fill: Reused or imported; graded free of stones and rocks greater than 3 x 6 inches, clay lumps, brush roots, weeds, clearing and grubbing waste, or other organic or unsuitable materials. Earthen fill must be made up of less than 20% stones.

B. On a case by case basis, with the ENGINEER'S approval, native material with rock fragments larger than six (6) inches may be used to backfill the trench in rights-of-ways provided that the bedding depth is increased to eighteen (18) inches over the pipe and no rock fragments larger than six (6) inches in diameter are present in the first eighteen (18) inches of backfill over the bedding. Large rocks shall be kept to the side of the trench.

C. If the above noted conditions cannot be met, acceptable fill materials shall be brought on site. All imported fill and backfill material must comply with the Pennsylvania DEP regulations pertaining to "Clean Fill".

PART 3 EXECUTION

3.01. INSPECTION

A. Verify stockpiled fill to be reused is approved.

B. Verify backfill and areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen.

3.02. PREPARATION

A. Identify required lines, levels, contours, and datum.

B. When necessary, compact subgrade surfaces to density requirements for backfill material.

3.03. EXCAVATION

A. All excavation shall be unclassified; remove as required for piping installation shown on the Drawings. Excavate subsoil required for piping as shown on the Drawings.

B. Cut trenches as required by OSHA:

1. Roads, streets, highway shoulders, residential driveways, residential lawns; sides of excavation are to be kept vertical or laid back. Provide temporary shoring or sheeting as required by all applicable laws, codes, and regulations.

2. Underdeveloped areas and open country; excavation may be sloped back from 12 inches above top of pipe. Keep excavation within rights-of-way. Slope angle shall be as required to maintain excavation stability and as required by applicable laws, codes, and regulations.

C. Removal of Pavement and Storage of Materials:

1. Grub and clean surface of all materials of whatever nature over the line of trench.

2. Classify material removed and preserve such material as may be required for use in backfilling.

3. Store material removed and preserve such material as may be required for use in backfilling. Remove material not required for backfilling or which cannot be stored on streets or rights-of-way.

4. Saw cut paving to neat lines equidistant from the centerline of the trench. Shall be 1' wider on either side of trench width (i.e. 5' trench = 7'cut).

5. Remove all undermined pavement with additional saw cutting.

6. In business streets, important thoroughfares, narrow streets, or other limited areas, proceed as follows:

a. Remove from streets, the first 100 feet or additional length as may be necessary when directed by the ENGINEER.

b. Material subsequently excavated shall be used to backfill the trench where allowed by the Detail Drawings.

c. Material not required for backfilling or which cannot be stored on streets or right-of-ways shall be removed. CONTRACTOR shall at his own expense bring back as much of the required material removed as may be required to properly backfill the trench or if so required furnish other material as may be necessary.

D. Hand trim excavation and leave free of loose matter. Hand trim for bell and spigot pipe joints.

E. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd, measured by volume. Remove larger material under Section 02211.

F. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

G. Correct unauthorized excavation.

H. Fill over-excavated areas under pipe bearing surfaces in accordance with direction by ENGINEER.

I. Stockpile excavated material in area designated on site and remove excess subsoil not being reused from site.

J. Excavate trenches at least 30 feet in advance of pipe laying except in muck or quicksand where pipe laying must follow as closely as the best interests of the WORK will require.

K. Excavated material shall be placed so as to minimize the inconvenience to occupants traveling in streets and driveways of adjoining properties.

L. Excavated material shall not be deposited on private property without written consent of the property owner filed with the AUTHORITY.

M. In case more material is excavated from an excavation or trench than can be backfilled over the completed work, or can be stored within the limits of the right-of-way, or in the event working space is limited or space cannot be provided for traffic and drainage, the excess material shall be removed to some convenient place provided by the DEVELOPER OR PROPERTY OWNER. The CONTRACTOR shall bring back as much material so removed as may be required to backfill the work, if of the proper kind, or if so required furnish other material as may be necessary.

N. At the end of each work day trenches shall be completely backfilled and/or steel plates, with Township approval, shall be placed over the excavation to accommodate traffic. All trenches on state roads must be backfilled at of day; steel plates are not permitted unless authorized by PA DOT

O. Remove all rubber-tired equipment from the streets at the conclusion of each workday. No equipment will be permitted to be parked on the streets with the exception of any tracked equipment, which must be moved to the side of the roadway and visibly marked with flashers and otherwise in compliance with all safety requirements of local authorities.

3.04. BACKFILLING – EXISTING STREETS

A. Support pipe during placement and compaction of bedding fill. The bedding shall be graded by hand to provide a uniform and continuous bearing support for its entire length - bell holes shall be provided at ends of pipe lengths, but size of holes shall be kept to a minimum. The bell holes shall be backfilled with bedding material which shall be compacted and brought up to the height of the adjacent material. After pipe is placed bedding material shall be hand placed and carefully compacted to the dimension shown on the Drawings. Bedding material to be placed to spring line of pipe and chalked by hand the length of pipe, before initial cover is placed.

B. Backfill trenches to contours and elevations. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

C. Stone backfill material must be uniform in depth extending to both trench walls.

D. Machine compact <u>all backfill material</u> as shown on detailed Drawings or as directed by ENGINEER. Compaction shall be at least 100 percent of the maximum dry density in paved and gravel areas. The maximum dry density shall be determined by ASTM D698 or as directed by ENGINEER. The Township may engage a qualified independent testing agency to perform field density testing at a frequency determined by the Township Engineer. The use of a qualified

independent testing agency in no way relieves the Contractor of its responsibility to furnish materials and construction in full compliance with the plans and specifications.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

F. Remove surplus backfill material from site.

G. Backfill in accordance with the detailed Drawings. Backfill compacted using a trench roller or a wacker shall be installed in one (1) foot lifts. Backfill compacted using a hydraulic tamper or boom mounted tamper shall be installed to a minimum depth of four (4) feet above the top of the pipe and then compacted in accordance with the written instructions of the tamper manufacturer.

H. 2A Modified Stone backfill must be used for the entire trench for all pipe that is located within existing streets per the Detail Drawing.

I. At the end of each work day the excavated area shall be completely backfilled and/or steel plates, with Township approval, shall be placed over the excavation to accommodate traffic. All trenches on state roads must be backfilled at of day; steel plates are not permitted unless authorized by PA DOT.

J. At the end of the work day all stone must be removed from the street and the streets must be swept with water.

3.05. BACKFILLING – FUTURE PRIVATE STREETS OR FUTURE STREETS TO BE DEDICATED TO THE TOWNSHIP

A. When the future street has already been rough graded to the final elevation and a trench is dug to install the sanitary sewer, the backfill must be PA No. 2A coarse aggregate trench backfill, properly compacted, from the top of the pipe bedding to the bottom of the proposed paving per Detail Drawing TR-1B. Trench shall be constructed as noted above in Paragraph 3.04

B. Backfilling for future private streets or future streets to be dedicated to the Township, only when the pipe is installed at the same time as the mass grading, shall be constructed as noted above in Paragraph 3.04, except as follows:

1. Backfill may be suitable earth fill (defined above) if suitable material is available and if constructed per Detail Drawing TR-1C.

3.06. BACKFILLING –RIGHT-OF-WAYS

A. Support pipe during placement and compaction of bedding fill. The bedding shall be graded by hand to provide a uniform and continuous bearing support for its entire length - bell holes shall be provided at ends of pipe lengths, but size of holes shall be kept to a minimum. The bell holes shall be backfilled with bedding material which shall be compacted and brought up to the height of the adjacent material. After pipe is placed bedding material shall be hand placed and carefully compacted to the dimension shown on the Drawings. Bedding material to be placed to spring line of pipe and chalked by hand the length of pipe, before initial cover is placed.

B. Backfill trenches to contours and elevations. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

C. Backfill material must be uniform in depth extending to both trench walls.

D. Machine compact all backfill material as shown on detailed Drawings or as directed by ENGINEER. Compaction shall be at least 95 percent of the maximum dry density in unpaved areas. The maximum dry density shall be determined by ASTM D698 or as directed by ENGINEER. The Township may engage a qualified independent testing agency to perform field density testing at a frequency determined by the Township Engineer. The use of a qualified independent testing agency in no way relieves the Contractor of its responsibility to furnish materials and construction in full compliance with the plans and specifications.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

F. Remove surplus backfill material from site.

G. Backfill in accordance with the detailed Drawings. Backfill compacted using a trench roller or a wacker shall be installed in one (1) foot lifts. Backfill compacted using a hydraulic tamper or boom mounted tamper shall be installed to a minimum depth of four (4) feet above the top of the pipe and then compacted in accordance with the written instructions of the tamper manufacturer.

H. Suitable earthen backfill may be used above the pipe bedding for the entire trench for all pipe that is located within rights-of-ways per the Detail Drawing. Suitable earthen backfill shall be free of topsoil, vegetation, clearing and grubbing waste, lumber, metal, refuse; and free of rock or similar hard objects larger than 3 x 6- inches.

3.07. UNSUITABLE MATERIAL

A. Remove and dispose of unsuitable material encountered during trench excavation work. Replace with R-3 Coarse Aggregate material as specified herein or Class A concrete bedding when directed by the ENGINEER.

3.08. TOLERANCES

A. Top Surfaces of Backfilling: As required to meet existing grade and/or ground elevations.

B. Whenever the trenches have not been properly filled, or if settlement occurs, they shall be re-excavated, refilled, re- compacted, smoothed off, and finally made to conform to the surface of the ground.

END OF SECTION

SECTION 02720

BUILDING SEWERS AND SERVICE LATERALS

PART 1 GENERAL

1.01. SITE CONDITIONS

A. Pipe Line Ownership: The Lower Paxton Township Authority (AUTHORITY) is not the owner of the Building Sewer or Service Lateral being installed under this specification section. The Property Owner is the ultimate owner of the pipeline. Access to the property is by permission of the Property Owner to be secured by AUTHORITY:

1. The construction of the Building Sewer and Service Lateral pipeline shall conform to the requirements of this specification section.

2. Each individual lot shall have its own private Building Sewer and Service Lateral. No shared laterals will be permitted between separate lots/Property Owners.

B. Environmental Requirements: Do not perform pipe installation when weather conditions are such that work cannot be performed satisfactorily:

1. Keep trenches dewatered until pipe joints have been made and inspections and tests have been performed.

2. Under no circumstances lay pipe in water or on bedding containing frost.

PART 2 PRODUCTS

2.01. BUILDING SEWER MATERIALS

A. Elastomeric Materials: Elastomeric materials used in pipelines shall be suitable for continuous contact with domestic sewage.

B. The use of Schedule 40 PVC is prohibited.

C. PVC Pipe (4 or 6-inch diameter):

1. Pipe and Fittings:

a. Unplasticized polyvinyl chloride (PVC) gravity sewer pipe and fittings with integral wall bell and spigot joints meeting ASTM D3034 specification for Type PSM PVC sewer pipe and fittings, Standard Dimension Ratio (SDR) 35, SDR 26, or ASTM F789. (For gasket joints only.)

b. The pipe shall be joined with an integral bell, bell-and-spigot type rubber gasketed joint. Rubber gasket shall conform to ASTM F 477. The rubber gasket shall be compressed radially on the pipe spigot to form a watertight seal in accordance with ASTM D3212.

c. Fittings shall be made of PVC having a cell classification of 12454B as defined in ASTM D1784.

d. Pipe stiffness at 5 percent deflection shall be 46 psi for all pipe diameters when tested in accordance with ASTM D2412.

e. Double Sweeping Tee: Fabricated from SDR 26 PVC material and as manufactured by GPK.

f. Schedule 40 to SDR 35 adapter for connection to interior plumbing: SDR 26 PVC fitting “long neck” as manufactured by Multi Fittings or GPK.

D. Ductile Iron Pipe (DIP): Provide pipe conforming to ANSI A21.50 and ANSI A 21.51 requirements and having a Class 52 wall thickness:

1. Use DIP only where required by special site conditions or as directed by the AUTHORITY. Where DIP is used for pipe sewer mains, use DIP pipe for service connection piping. Building sewer can transition to PVC if it is less than 18 feet. SDR 26 PVC pipe may be used in place of DIP with prior approval from the ENGINEER.

2. Fittings: Gray iron or ductile iron conforming to ANSI A21.10 requirements.

3. Joints: Provide push-on or mechanical style rubber-gasket joints conforming to ANSI A 21.11 requirements.

4. The interior of all DIP and fittings is to be lined with Protector 401 Ceramic Epoxy Lining (or approved equal), in accordance with the manufacturer’s specifications.

5. Pipe and Fitting Coating: Manufacturer’s standard asphaltic coating, approximately one mil thick in accordance with AWWA C151, applied to the outside of pipe and fittings.

E. Flexible Pipe Couplings with Anti-Shear Stainless Steel Collar (only for pipes 6-inches and smaller):

1. Provide flexible pipe couplings with anti-shear stainless steel collar designed for differing pipe material connection; and for transition/reducing conditions of differing pipe material connections. (Flexible-couplings are not permitted for connecting pipe of like materials.)

2. Coupling Construction: Virgin PVC material which meets the performance requirements of Commercial Standard Specification CS 226-59. Couplings designed for pipe outside diameter coupling shall incorporate recesses to contain the stainless steel bands. Couplings provided with pre-assembled type 305 stainless steel bands and screws.

3. Acceptable Manufacturers:

a. FERNCO Inc., Distributed by the General Engineering Company.

b. Or Equal.

F. Ductile Iron Pipe (DIP) or Cast Iron Pipe to SDR 35 Polyvinyl Chloride (PVC) Pipe Transition Gaskets:

1. Gasket Construction: Virgin SBR in accordance with ASTM D 2000 MBA 710, compounded for sewer service. Designed for use in cast iron mechanical joint fittings for adapting PVC sewer pipe.

2. Acceptable Manufacturers:

a. Romac Industries, Inc.

b. Or Equal.

G. Cleanout Caps and Plugs: Designed for permanent installation but removable at a future time. Pipe caps and plugs shall be able to withstand the pressures of the line acceptance test as outlined hereinafter:

1. Cleanout Cap Construction: In non-traffic areas, provide Panella-type push-on clean out cover with cast iron body and brass cap with countersunk lug, as shown on the Detail Drawings.

H. Cap Protection Casting: Gray iron casting conforming to ASTM A 48, Class No. 35, designed for AASHTO Highway Loading Class HS-20. Casting shall be a product of the U.S.A.:

1. Finish: Cover bearing surface machined to prevent movement under traffic. Casting surfaces factory cleaned and coated with manufacturers standard asphalt paint; non-tacky drying.

2. Acceptable Manufacturers: East Jordan Iron Works, Inc., Model No. 1565, or Neenah Foundry Company Model NF-1975 479.

3. Use Cap Protection Casting with all observation tees and any cleanouts located in areas of vehicular traffic.

2.02. SERVICE LATERAL MATERIALS

A. General Requirements: Where a new Service Lateral is to be constructed along with the Building Sewer (for connection into the main sewer), the DEVELOPER OR PROPERTY OWNER shall make the connection to the main sewer using the fittings as specified in the following paragraphs. Use the same material and fitting type as the type of main sewer pipe being connected into, unless otherwise directed by the AUTHORITY.

B. Pipe and Fitting Materials, Flexible Pipe Couplings with Anti-Shear Collar, Cleanout Plugs, and Cap Protection Casting: Use same as specified under 2.01. Building Sewer Materials.

C. Straight tees: use straight tees to connect to the sanitary sewer main. Wyes are only permitted when laterals are connected on a cul-de-sac.

D. Saddles: No saddle connections are allowed on main line.

PART 3 EXECUTION

3.01. PREPARATION

A. Inspection: Inspect each section of pipe and each pipe fitting before laying in conformance with the inspection requirements of the appropriate referenced standard:

1. Mark with large, painted X and remove rejected pipe from the Project.

B. Pipe Cleaning: Clean piping interior prior to laying pipe and following pipe laying. Keep open ends of piping and pipe attachment openings capped or plugged until actual connection or actual pipe testing.

3.02. CONSTRUCTION METHODS

A. General Requirements:

1. Use proper and suitable tools and appliances for the proper and safe handling, lowering into trench and laying of pipes.

2. Lay pipe proceeding upgrade true to line and grade, at a 90 degree angle to curb line. Lay bell and spigot pipe with bell end upgrade.

3. Exercise care to ensure that each length abuts against the next in such manner that no shoulder or unevenness of any kind occurs along inside bottom half of pipeline.

4. Before joints are made, bed each section of pipe full length of barrel with recesses excavated so pipe invert forms continuous grade with invert of pipe previously laid. Do not bring succeeding pipe into position until the preceding length is embedded and securely in place with Initial Backfill.

5. Dig bell holes sufficiently large to permit proper joint making and to insure pipe is firmly bedded full length of its barrel. All pipe should be properly bedded.

6. All pipe should be properly bedded to haunch line with applicable aggregate stone to prevent deflection and/or egg shaping before backfill is placed above the pipe.

7. Walking or working on completed pipeline, except as necessary in tamping and backfilling, is not permitted until trench is backfilled one-foot deep over top of pipes.

8. Take up and relay pipe that is out of alignment of grade, or pipe having disturbed joints after laying.

9. Take up and replace with new piping, such newly installed pipe sections found to be defective after installation.

10. In the case of repairs, perform pipe reconnections in accordance with the Pipe Reconnection Detail Drawing. Place 40 lb. bags of concrete beneath repair couplings.

11. Minimum slope of 4-inch building sewer is ¼-inch per foot.

12. Minimum cover of 3 feet is required.

13. Install tees on mainline sewer a minimum of 5 feet from outside walls of manholes.

14. In general, where depth of sewer invert is 12-feet or more, or elsewhere as designated by the ENGINEER, install service connections to enter the sewer as shown on Sewer Detail Drawings for “Service Connection-Deep Sewer”. Use same material used for service connections.

15. Install pipe and fittings in accordance with manufacturer’s written instructions.

16. Do not kick or throw PVC pipe and fittings into the trench.

B. Pipe Laying and Joining: Perform pipe laying and joining in strict accordance with pipe manufacturer’s installation instructions and such additional requirements as specified herein:

1. Make joints absolutely watertight and immediately repair detected leaks and defects in newly installed pipe. Methods of repair subject to approval of the AUTHORITY:

a. Laying Specified Types of Plastic Pipe: Installation and joint assembly according to ASTM D 2321 for Class I bedding material.

b. Laying Ductile Iron Pipe: Installation and joint assembly according to AWWA C 600. Where necessary to field cut pipe use approved pipe cutter, milling cutter or abrasive wheel saw.

C. Service Lateral-to-Existing Main Sewer Connection:

1. PVC Fitting in Mainline:

a. Connection of the Service Lateral to the sewer main shall be made by removing a section of the sewer main and replacing it with an SDR 35 PVC straight tee connection and then reconnecting this to the sewer main with rigid PVC gasketed couplings. If existing lateral and main are not PVC, match existing material.

b. Pipe to pipe connections shall be made in accordance with Pipe Reconnection Detail.

c. Observation tees shall be installed at the connection between the Building Sewer and the Service Lateral or within the right-of-way line (easement).

d. All sewer laterals, including the reconnection at mainline, tee and all pipe, shall pass an air test before AUTHORITY acceptance.

D. Service Lateral-to- Manhole Connection: Cut the required pipe opening in the manhole by core drilling methods only. Make the pipe opening no more than 2-inches above the bench of the manhole base or into the base. Make the opening of sufficient size to accommodate the pipe with a pipe opening seal:

1. Pipe Opening Seal: Provide KOR-n-SEAL pipe opening seal as manufactured by NPC Systems, Inc. and as distributed by Monarch Products Co., Inc., York Haven, PA; substitutes not allowed by AUTHORITY.

2. CONTRACTOR must vacuum test manhole prior to core bore and after core bore if required by AUTHORITY.

3. Drop connections are not allowed unless specifically approved by AUTHORITY on a case-by-case basis.

4. Form a new channel in the existing manhole bench for the new connection. Form the channel to a depth and width of one-half the pipe diameter of the new pipe entering the existing manhole. Channels may not be formed by using brick, block or any other preformed material. Channel must have a smooth finished surface.

5. Core boring for new lateral connections are not permitted to be cut under existing steps or over an existing lateral connection.

3.03. PIPELINE CONSTRUCTION

A. General Requirements: Construct Building Sewers, and laterals where required, to such points as directed by the AUTHORITY, and in accordance with the Detail Drawings included in these Specifications. Lay and join piping in every respect as specified previously and the following additional requirements:

1. Cleanouts and Observation Tees: Install a 6 x 6 x 6-inch double sweeping tee for OWNER's use in inspection and testing of building sewer lines connection. Cleanout/observation tee riser to be of same material as service lateral line. When final grading is accomplished, install cleanout protective casting at finished grade in accordance with the Standard Details. Close the outlet of double sweeping tee on the building sewer side with a plug. Type of plugs used and method of installation subject to ENGINEER'S approval. Installed plug shall successfully pass Line Acceptance Test. Sizes of tees as indicated on the Detail Drawings:

    a. Install a cleanout riser with cap on the vertical outlet of the tee. Cleanout riser of same material as observation tee. Sizes of cleanout risers as indicated on the Detail Drawings. Riser pipe must be one continuous section of pipe unless deeper than 13.75 feet.

    b. All observation tees shall be located within the public easement.

    c. Install a protective casting on all Observation Tees Risers.

    d. Observation tees shall not be located in any sidewalk area, unless otherwise directed by OWNER.

    e. Observation tee riser casting must be placed during the installation of the sewer main and lateral stubs. Certificate of occupancy will not be issued if the casting is not in place and flush to the ground.

2. Building Sewers shall not exceed a maximum distance of 100 feet without having a cleanout installed. Cleanout shall include a riser of the same material and size as the Building Sewer and Service Lateral where required:

    a. All cleanout risers shall have cap protection casting to prevent damage to riser and cap. The casting shall be able to withstand any imposed traffic loads. Cleanouts shall not be located in any sidewalk area, unless otherwise directed by OWNER.

    b. Cleanout risers shall be at grade, but remain visible for future inspections.

    c. Cleanout risers located in all areas and at the building are to be capped with a Panella-type, push-on clean out cover, with cast iron body and brass cap with countersunk lug, as shown on the Detail Drawings.

    d. All Cleanouts shall be constructed on horizontal grade and riser shall have no bends; must be vertical and shall be a solid piece of pipe unless deeper than 13.75 feet.

    e. If Cleanout riser is in an area of vehicular traffic, a metal riser protective casting must be used.

3. Pipe Line Bends: Construct Building Sewers and Service Laterals using not greater than 45 degree bends except where indicated otherwise on the Detail Drawings in these Specifications. Provide at least 1-foot spool piece between 45 degree bends, unless bends are less than 45 degrees. Any 90 degree bends required by the Authority shall be with two 45 degree bends separated by a minimum of 1 foot, to be used only with Authority approval.

3.04. INSPECTION AND TESTING

A. Inspections: During the progress of the Building Sewer construction, and Service Lateral construction where required, the AUTHORITY will make periodic inspections of the work. The inspections to be performed by the AUTHORITY may include the following:

1. Inspection of pipe bedding procedures.

2. Inspection of air testing procedures.

3. Inspection of backfilling procedures.

4. Inspection of cleanout riser and casting.

B. General Requirements for Testing: Conduct test specified herein so that each pipe line installed in the Project is tested to the satisfaction of the AUTHORITY. Tests shall be conducted in the presence of the AUTHORITY:

1. Provide tools, materials, apparatus and instruments necessary for pipeline testing.

2. Give the AUTHORITY a minimum of 24 hours advance notification of the time when the testing is to be performed. Schedule all inspections as stated in Section 1 of General Instructions.

3. Building sewers and laterals/main need to be tested separately. CONTRACTOR CANNOT test the entire mainline, lateral and building sewer all at once.

4. For new building sewer connections the 6” observation tee needs to be tested if the plumber is hooking into it.

5. If the observation tee was not previously tested the lateral testing procedure will need to include the observation tee and stack pipe.

6. If the new lateral is tying into an existing main, the tee and pipe reconnections to the main must be tested, except if connecting into a line that is VCP. Air testing requirements are identified in Section 02700 of the Standard Construction and Material Specifications and Detail Drawings.

C. Testing Equipment: Control valve and test gauge apparatus shall be located above grade during the testing to allow for observation by the AUTHORITY:

1. Use testing apparatus equipped with necessary piping, control valves and gauges to control pressure within piping test section and to monitor pressures throughout the test.

2. To prevent accidental overloading of piping test section, provide testing apparatus with an approved pressure relief device set to relieve at 10 psi. An extra pressure gage of known accuracy shall also be provided so that the gages of the test equipment can be frequently checked. All gages shall be oil filled and shall read to the 1/10 psi increment

3. The test gauge shall be in satisfactory operating condition and recently calibrated. Gauge shall read in one-tenth increments and be liquid filled.

D. Line Acceptance Test: After the pipe line is constructed, observed by AUTHORITY representative and then <u>partially backfilled to at least 2 feet above the pipe</u>, perform a low pressure air line acceptance test in accordance with the Standards listed herein and the following:

1. Test the seal plugs before actual use by testing plugs outside the trench in a short length of pipe pressurized to maximum anticipated testing pressure. Plugs shall hold and be properly braced, and show no movement. All Building Sewers to be tested from 6-inch clean out riser previously installed by pipe excavation contractor. A 4-inch clean out after 6-inch stub for the purpose of testing of Building Sewer acceptance test will not be allowed. The installation of clean out for testing will be grounds for rejection of Building Sewer.

2. Introduce low-pressure air slowly into sealed pipeline until internal air pressure meets the following requirements. Introduce air until the pressure stabilizes (2 minutes) after which the test period shall begin. Test pressure shall be 5 psig.

   (Or, if groundwater conditions are known, the test pressure shall be determined as follows:

   $$\text{Test Pressure} = 5 \text{ psig} + \frac{H}{2.31}$$

   where H = depth of groundwater above the pipe in feet.)

   a. A successful test is when no drop in pressure (no loss of air at all) is observed with the trench partially backfilled; and when pressure is maintained throughout the backfilling operations, as may be required by the AUTHORITY according to the next paragraph.

   b. DEVELOPER may be required to hold the pipe line under air test pressure while performing the remainder of the backfilling operations. This requirement is necessary in order to determine leakage, if any, produced by backfilling operations under certain adverse conditions and shall be at the discretion of the AUTHORITY.

3. Building Sewer:

   a. Insert 6” solid ball in downstream side of observation tee making sure that it is all the way past the T into the 6” pipe.

   b. Insert 6” test ball into the top of the 6” observation tee.

   c. Insert 4” solid ball into the upstream side of the Building cleanout making sure that it is all the way past the T into the 4” pipe as close to the reconnection point as possible.

   d. Insert 4” solid ball into the top of the 4” Building cleanout.

   e. Insert 4” solid balls into the top of any remaining intermediate cleanouts.

   f. Inflate line to proper pressure. Make sure air source (i.e. air compressor, air tank etc.) is disconnected from the test ball once proper pressure is achieved.

   g. Wait for allotted time making sure that there is 0 PSI drop.

   h. Deflate line. Make sure liquid filled pressure gauge returns to 0 PSI.

4. Lateral:

   a. Insert solid balls into 6” observation tees on the downstream side.

b. Install solid ball into the upstream side of the mainline.

c. Install a test ball into the downstream side of the mainline.

d. Inflate line from the downstream MH. To proper pressure. Make sure air source (i.e. air compressor, air tank etc.) is disconnected from the test ball once proper pressure is achieved.

e. Wait for allotted time making sure that there is 0 PSI drop.

f. Deflate line. Make sure liquid filled pressure gauge returns to 0 PSI.

5. New Building Sewer Installation:

a. Insert 6” solid ball in downstream side of observation tee making sure that it is all the way past the T into the 6” pipe.

b. Insert 6” test ball into the top of the 6” observation tee.

c. Insert 4” solid ball into the upstream side of the Building cleanout making sure that it is all the way past the tee into the 4” pipe as close to the reconnection point as possible.

d. Insert 4” solid ball into the top of the 4” Building cleanout.

e. Insert 4” solid balls into the top of any remaining intermediate cleanouts.

f. Tape or secure all stack pipes.

g. Inflate line to proper pressure. Make sure air source (i.e. air compressor, air tank etc.) is disconnected from the test ball once proper pressure is achieved.

h. Wait for allotted time making sure that there is 0 PSI drop.

i. Deflate line. Make sure liquid filled pressure gauge returns to 0 PSI.

E. Repair and Retest: When the pipeline fails to meet test requirements specified previously, comply with the following procedures:

1. Determine source or sources of leakage.

2. Repair or replace defective material, and if a result of improper workmanship, make corrections in the presence of the AUTHORITY.

3. Conduct additional test required to demonstrate that pipeline meets specified tests requirements.

F. The AUTHORITY will make a final inspection of the installed pipeline upon completion of the street restoration (if any), including paving.

END OF SECTION

Detail Drawings

LOWER PAXTON TOWNSHIP AUTHORITY
STANDARD DETAILS

EROSION & SEDIMENTATION CONTROL DETAILS (ES)

ES-2 Building Sewer Trench Plug (Bentonite)

TRENCH DETAILS (TR)

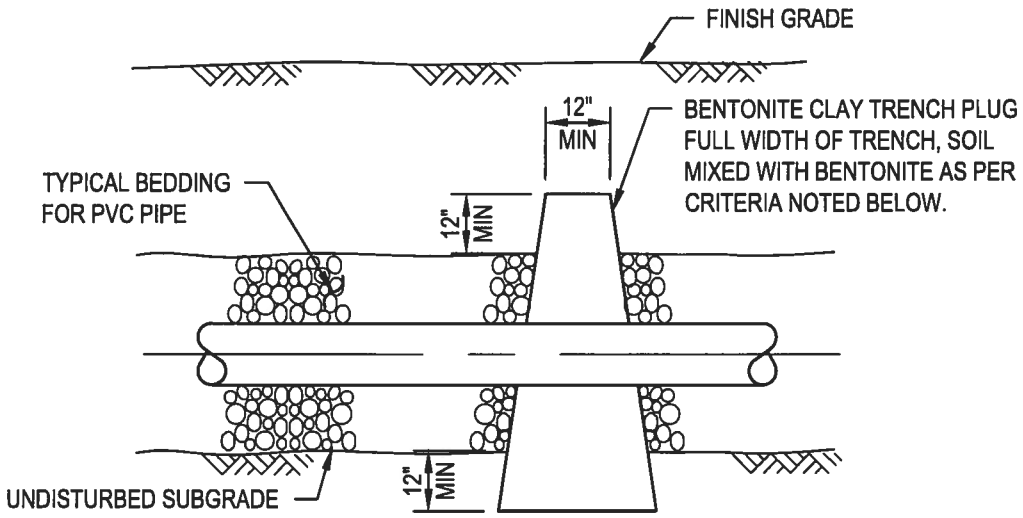
TR-1A Trench Detail for Existing Public/Private Paved or Gravel Streets and Parking Lots
TR-1B Trench Detail for New Public/Private Streets following Grading when Sewer is Installed on Undisturbed Earth or Rock.
TR-1C Trench Detail for New Public/Private Streets only when Mass Grading/Fill is Involved.
TR-2 Trench Detail in Unpaved Areas
TR-3 Unsuitable Material Excavation
TR-4 Final Trench Paving

BUILDING SEWER/SERVICE LATERAL DETAILS (LAT)

LAT-1 Service Lateral – Normal Depth
LAT-2 Service Lateral Connection to Existing Sewer Main
LAT-3 Service Lateral – Deep Sewer
LAT-4 Building Sewer and/or Service Lateral Installation/Replacement
LAT-5 Cleanout/Observation Tee Cap Protection Casting
LAT-6 Observation Tee

TESTING DETAILS (T)

T-1 Existing Service Lateral and/or Building Sewer Air Test



CRITERIA FOR TRENCH PLUGS

BASE SOIL TYPE	USCS CLASSIFICATION[1]	PERCENT BENTONITE ADDITION[3]	BENTONITE ADDITION (LBS/CY SOIL)
A - Silts and Clays	ML, MH, CL, CH, SC	5%	150
B - Sands	SM, SW, SP	15%	500
C - Gravels[2]	GM, GC, GW	25%	900

NOTES:

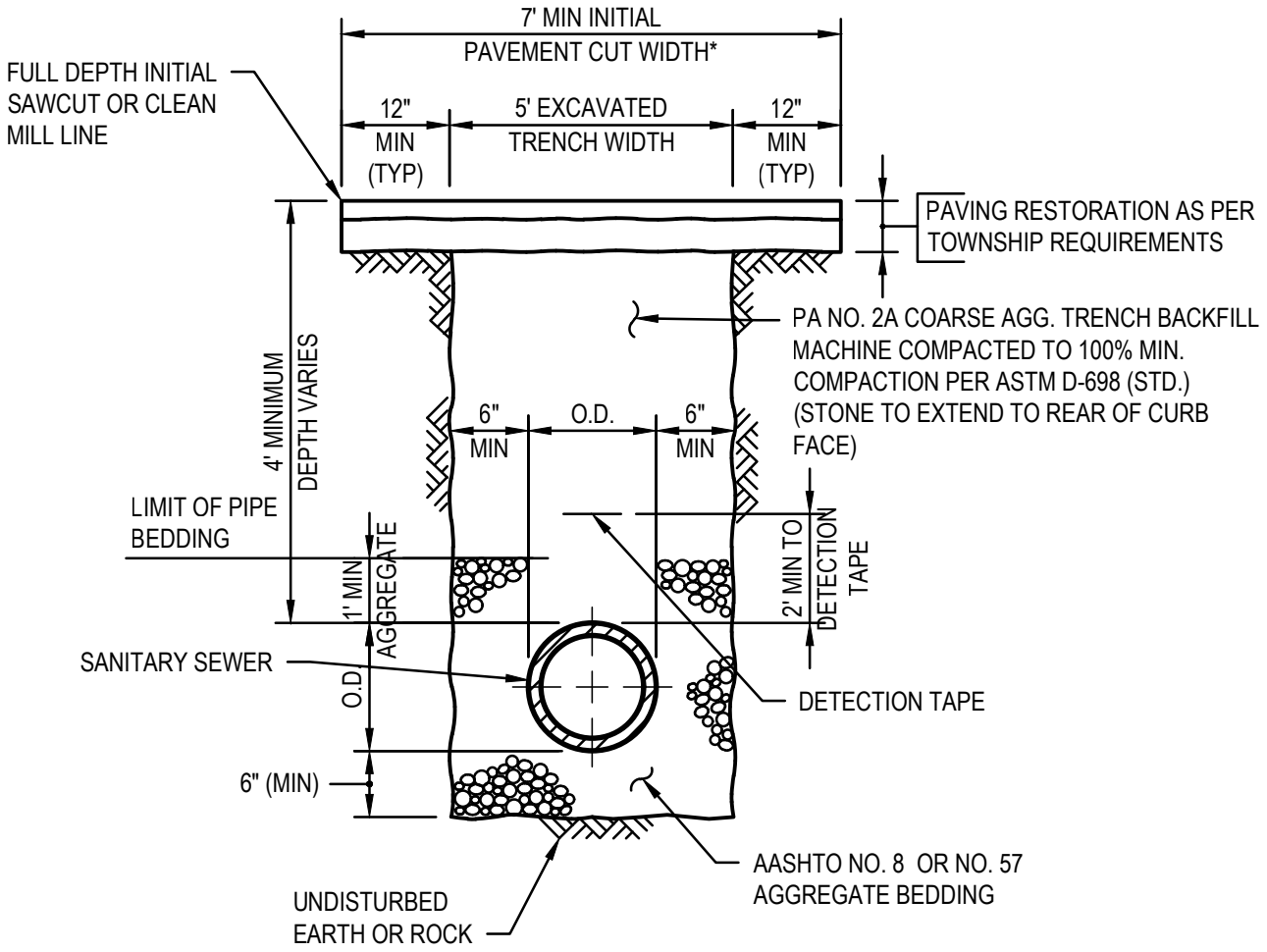
1. SUBMIT GRAIN SIZE ANALYSIS, PLASTICITY LIMITS (IF APPLICABLE), AND UNIFIED SOIL CLASSIFICATION SYSTEM CLASSIFICATION (PER ASTM D2487) FOR PROPOSED BASE SOIL TO TOWNSHIP FOR REVIEW AND APPROVAL.
2. TYPE C BASE SOILS MUST CONTAIN AT LEAST 10% BY WEIGHT FINES CONTENT (PASSING NO. 200 STANDARD SIEVE).
3. PERCENT BENTONITE ADDITION IS ON A WEIGHT BASIS. USE POWDERED SODIUM MONTMORILLONITE BENTONITE MEETING THE REQUIREMENTS OF AMERICAN PETROLEUM INSTITUTE SPECIFICATION 13A. THOROUGHLY MIX BENTONITE INTO APPROVED BASE SOIL PRIOR TO PLACEMENT AND COMPACTION, USING APPROVED ROTARY EQUIPMENT. CONTINUE MIXING UNTIL UNIFORM APPEARANCE AND CONSISTENCY ACHIEVED. PLACE BLENDED PLUG MATERIAL IN LIFTS NO THICKER THAN 6 INCHES AND COMPACT WITH AN APPROVED OSCILLATING BASE PLATE COMPACTOR (AKA "WACKER" OR "JUMPING JACK") UNTIL NO VISIBLE MOVEMENT OCCURS UNDER CONTINUED COMPACTION.
4. TRENCH PLUGS ARE REQUIRED FOR ALL STREAM AND WETLAND CROSSINGS. LOCATIONS AND SPACING OF TRENCH PLUGS ARE AS NOTED ON THE E&S NOTES AND DETAILS, AND AS SHOWN ON THE PLANS AND PROFILES.
5. TRENCH PLUGS ARE TO BE KEYED INTO THE BOTTOM OF TRENCH AND TRENCH WALLS BY A MINIMUM DISTANCE OF 12-INCHES.

BUILDING SEWER TRENCH PLUG (BENTONITE) DETAIL

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	ES-2

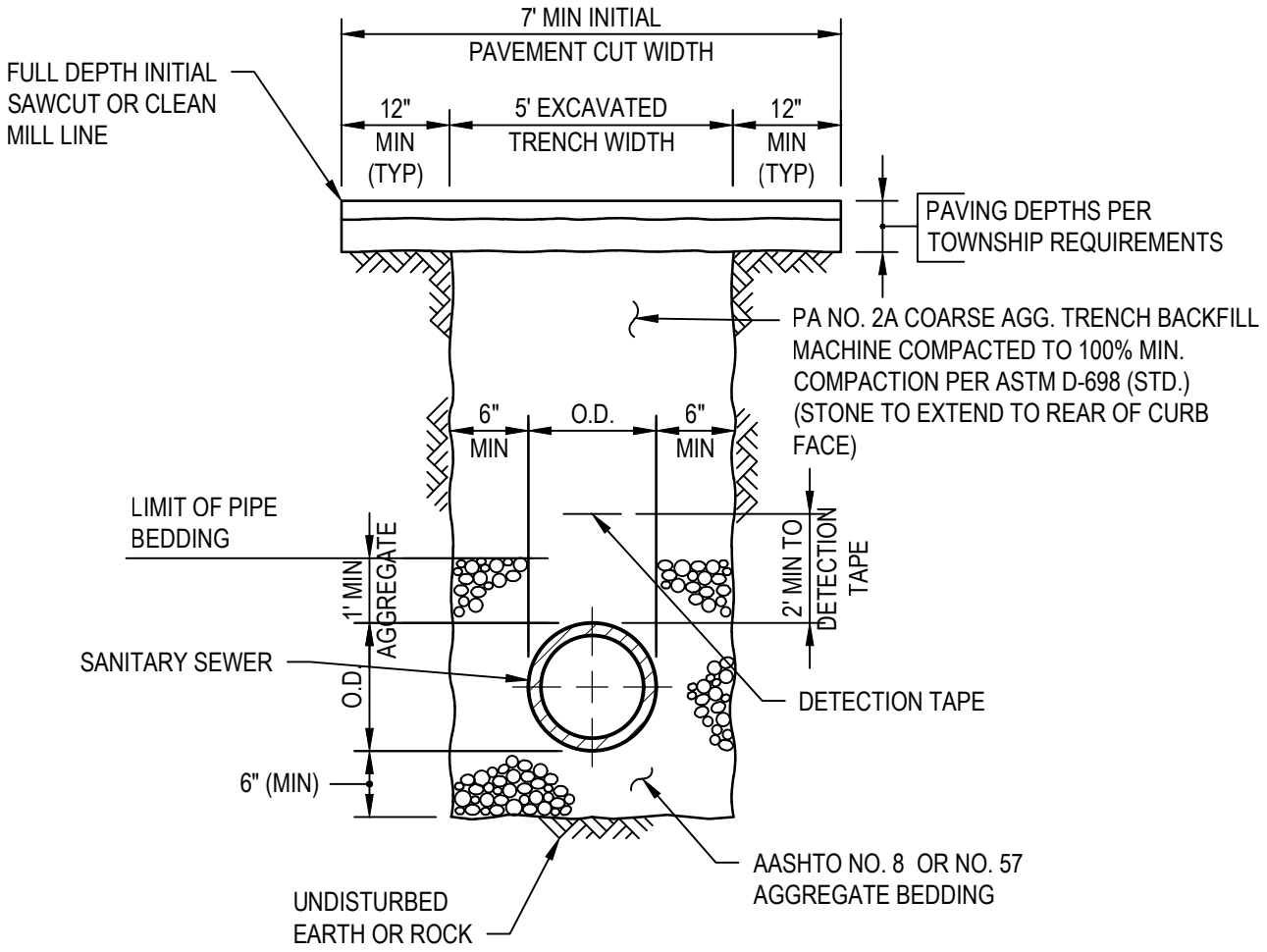
* SMALLER WIDTH WILL NOT BE ALLOWED



TRENCH DETAIL FOR EXISTING PUBLIC / PRIVATE PAVED OR GRAVEL STREETS AND PARKING LOTS

DATE	REVISIONS
JUNE, 2017	UPDATED STANDARD DETAILS

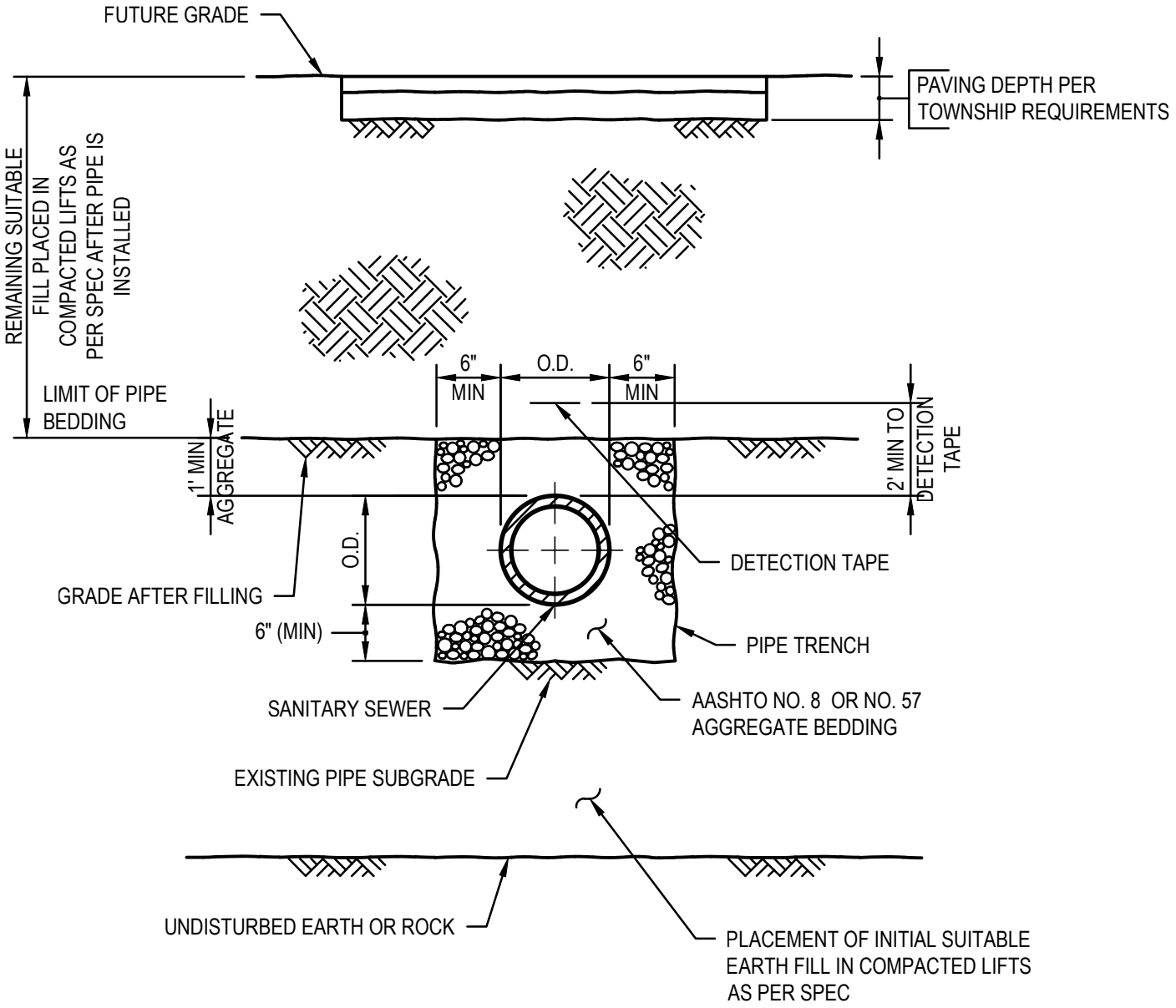
SCALE	FILE
NO SCALE	TR-1A



TRENCH DETAIL FOR NEW PUBLIC / PRIVATE STREETS FOLLOWING GRADING WHEN SEWER IS INSTALLED ON UNDISTURBED EARTH OR ROCK

DATE	REVISIONS
JUNE, 2017	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	TR-1B



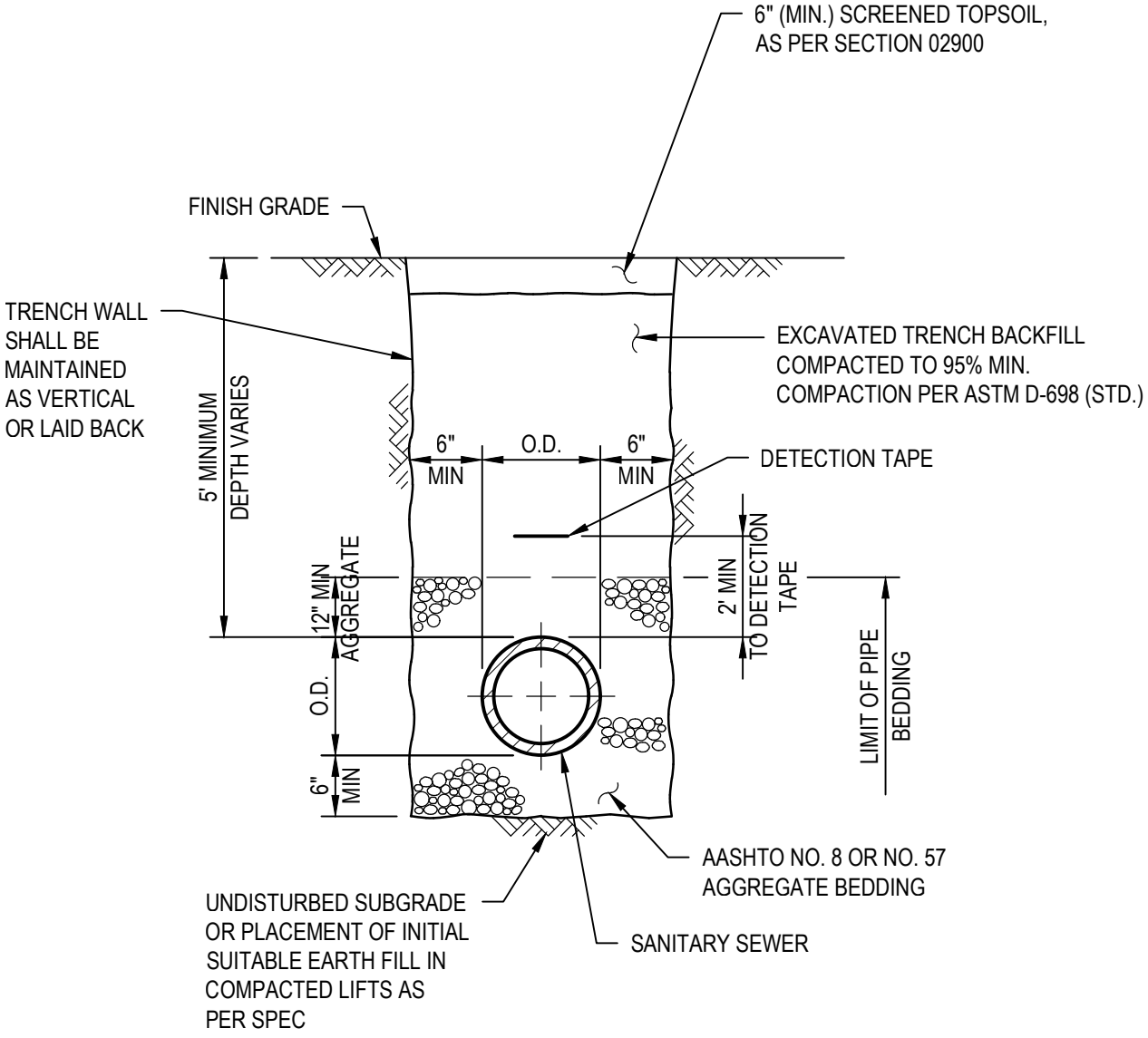
NOTE:

WHERE THERE IS FILL BENEATH THE PROPOSED SEWER THE PIPE SHALL BE DIP WITH PROTECTO 401 LINING. SDR 26 MAY BE APPROVED IF STONE BEDDING IS EXTENDED TO VIRGIN GROUND; HOWEVER, PRIOR APPROVAL FROM AUTHORITY IS REQUIRED.

TRENCH DETAIL FOR NEW PUBLIC / PRIVATE STREETS ONLY WHEN MASS GRADING / FILL IS INVOLVED

DATE	REVISIONS
JUNE, 2017	UPDATED STANDARD DETAILS

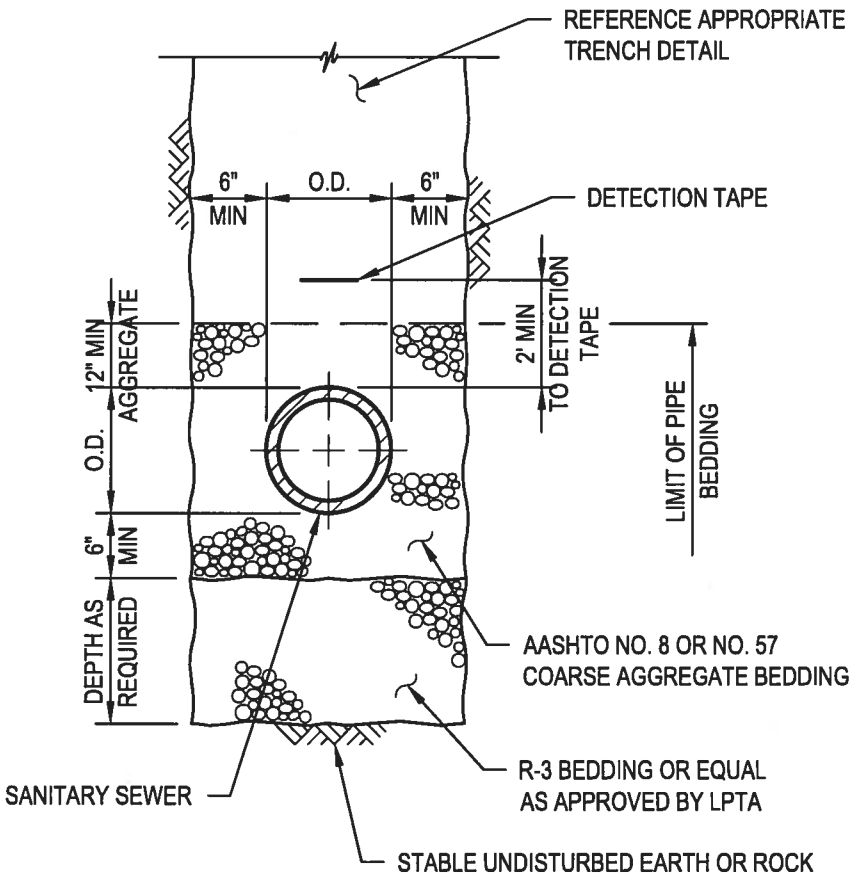
SCALE	FILE
NO SCALE	TR-1C



TRENCH DETAIL IN UNPAVED AREAS

DATE	REVISIONS
JUNE, 2017	UPDATED STANDARD DETAILS

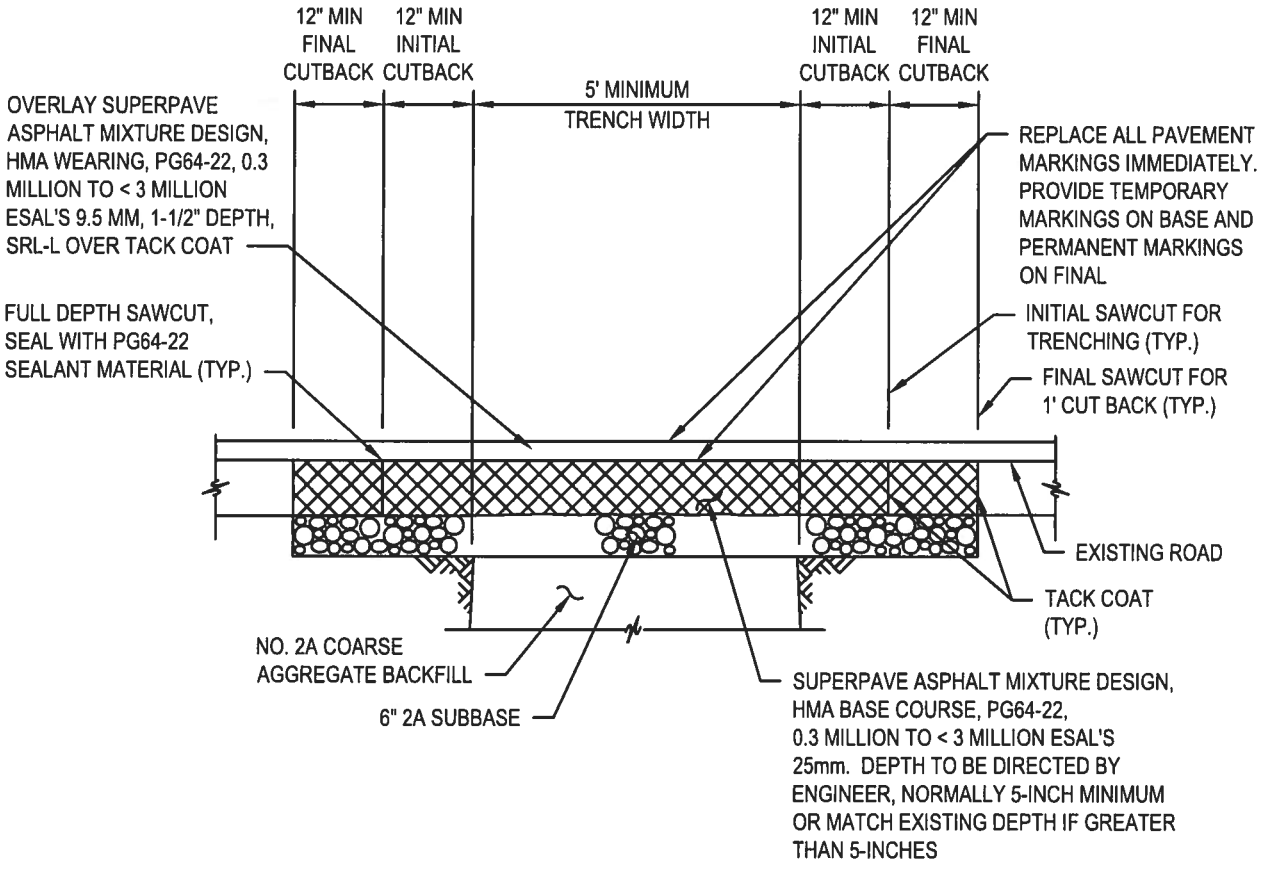
SCALE	FILE
NO SCALE	TR-2



UNSUITABLE MATERIAL EXCAVATION

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

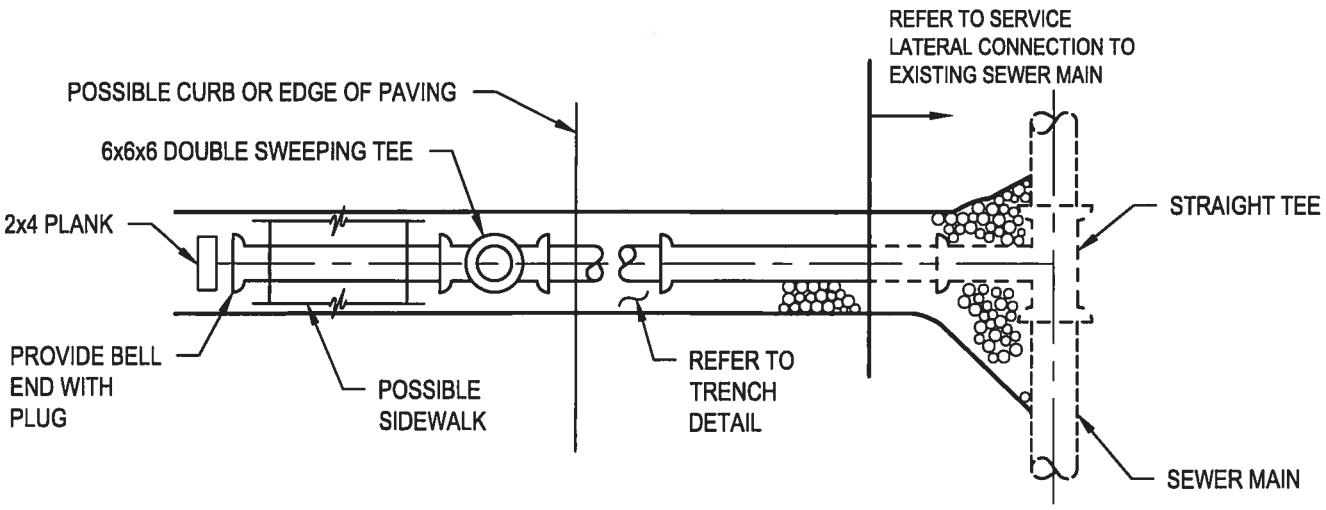
SCALE	FILE
NO SCALE	TR-3



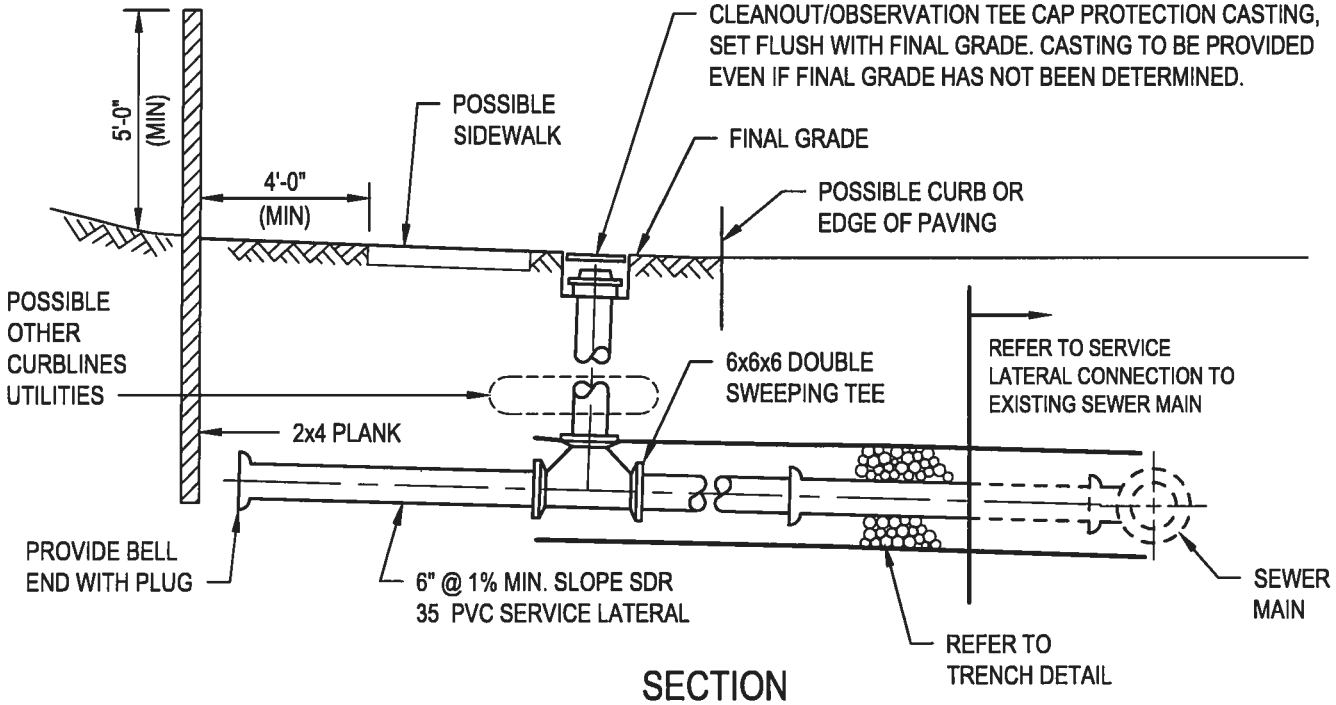
FINAL TRENCH PAVING DETAIL

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	TR-4



PLAN



SECTION

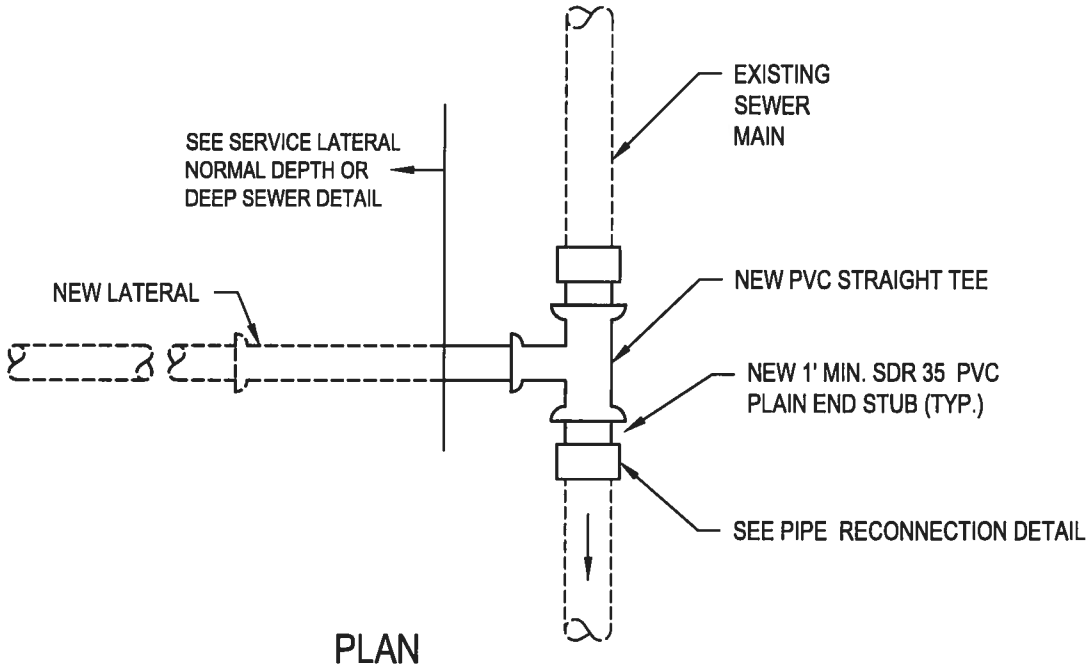
NOTES:

1. CURB CLEANOUT NOT TO BE LOCATED IN SIDEWALK (UNLESS DIRECTED BY LOWER PAXTON TOWNSHIP) OR BENEATH OTHER CURBLINE UTILITIES.

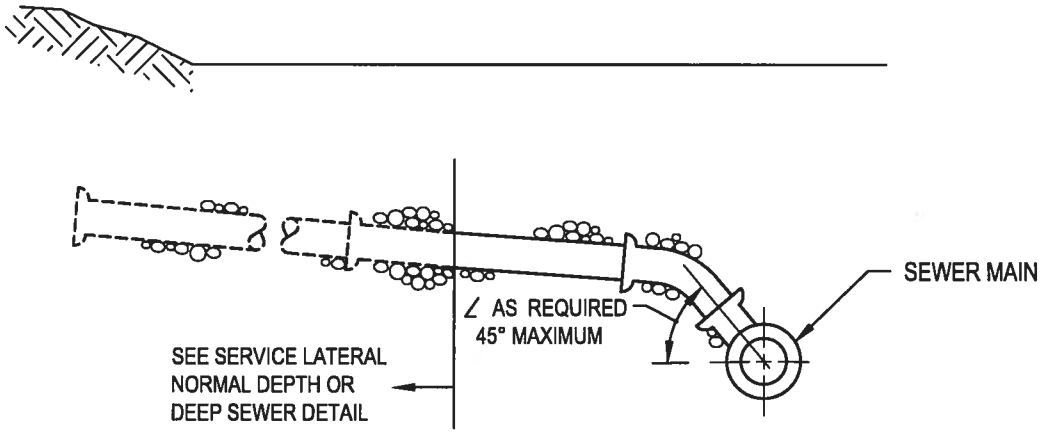
SERVICE LATERAL - NORMAL DEPTH

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	LAT-1



PLAN



ELEVATION

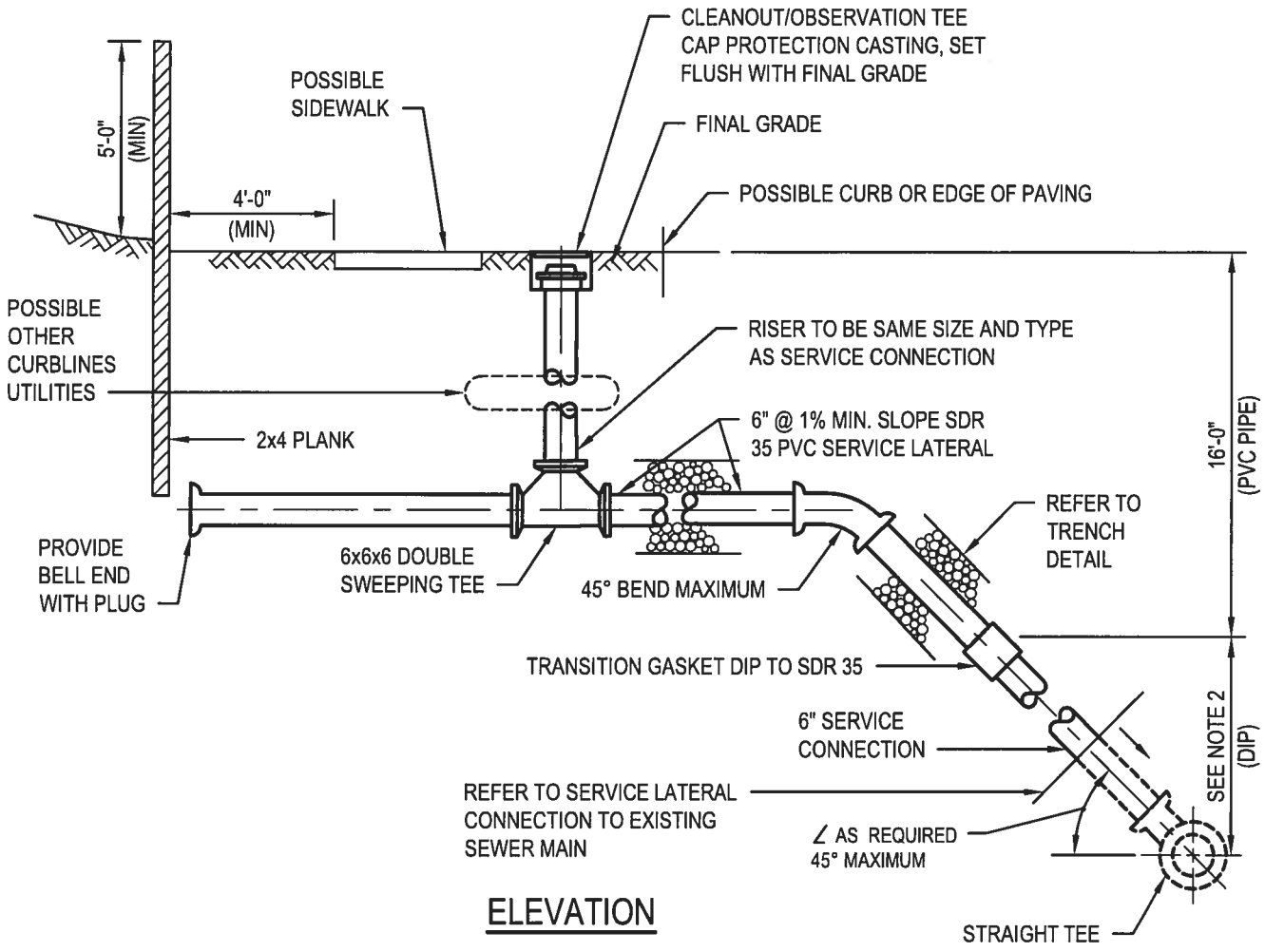
NOTES:

1. EXISTING MAIN SEWER TO BE SAW CUT.

SERVICE LATERAL CONNECTION TO EXISTING SEWER MAIN

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	LAT-2



ELEVATION

NOTES:

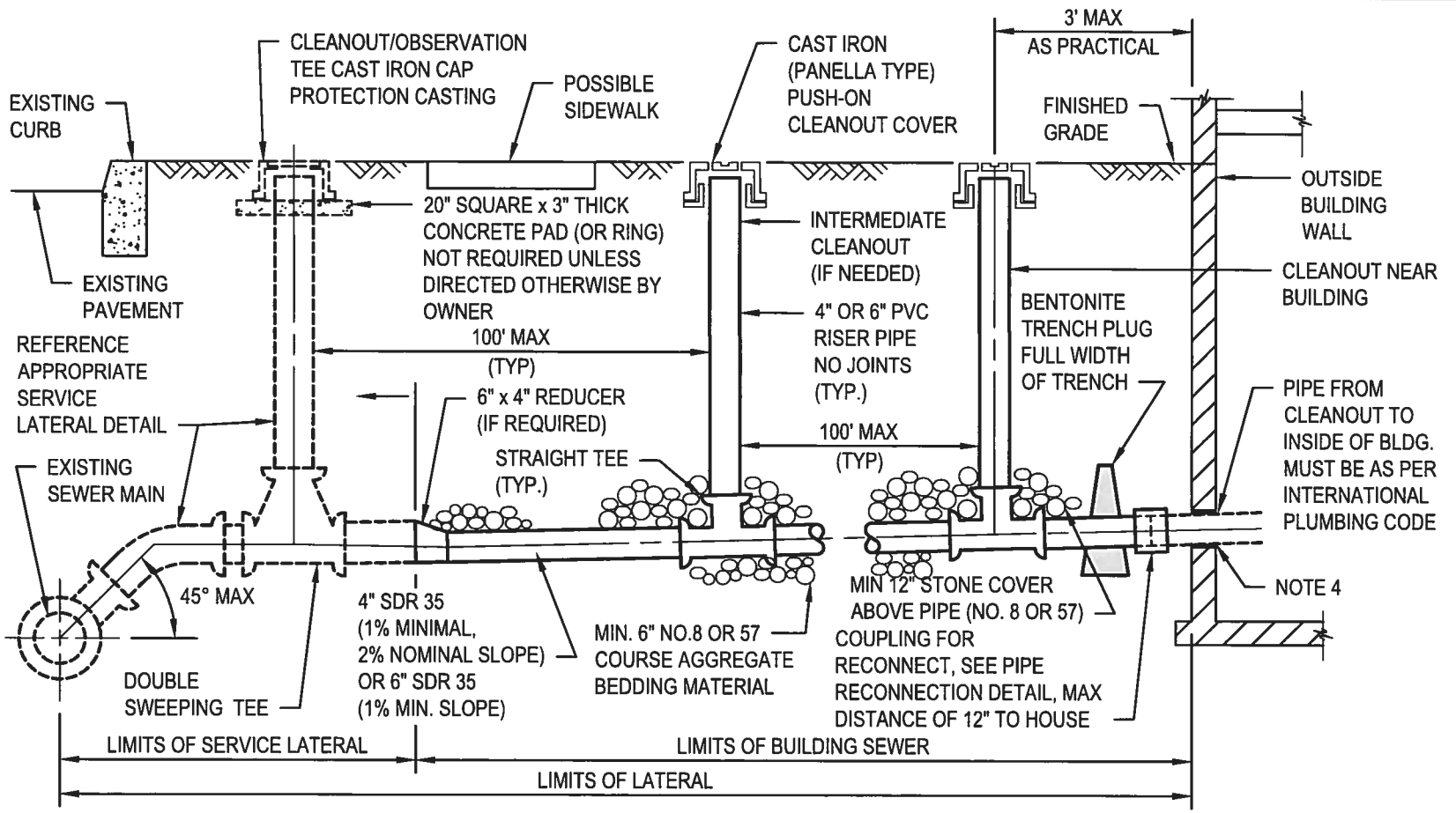
1. CURB CLEANOUT NOT TO BE LOCATED IN SIDEWALK (UNLESS DIRECTED BY LOWER PAXTON TOWNSHIP) OR BENEATH OTHER CURBLINE UTILITIES.
2. PIPE TYPE TO REMAIN THE SAME AS THE MAINLINE UNTIL 16' OR LESS OF COVER.

SERVICE LATERAL - DEEP SEWER

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

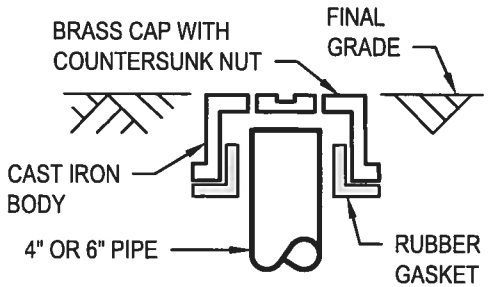
SCALE	FILE
NO SCALE	LAT-3

BUILDING SEWER AND/OR SERVICE LATERAL INSTALLATION/REPLACEMENT



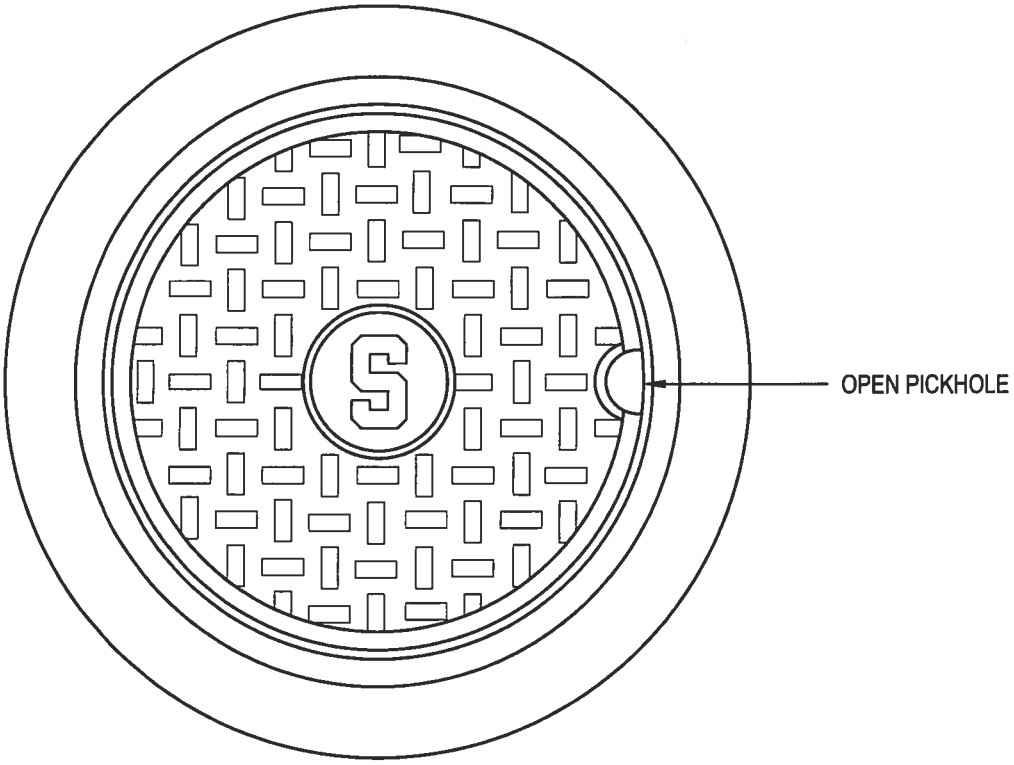
NOTES:

1. PIPE SIZES AND MATERIALS TO BE IN ACCORDANCE WITH TOWNSHIP RULES & REGULATIONS.
2. IF 4" BUILDING SEWER EXISTS, USE ECCENTRIC 6" x 4" REDUCER FITTING FOR TRANSITION TO OBSERVATION TEE (4"x6" FLEXIBLE COUPLING NOT ALLOWED).
3. CLEANOUT SPACING IS 100' MAXIMUM.
4. A WALL SLEEVE TO BE 2" > THAN THE DIAM. OF BUILDING SEWER PIPE AND SEALED WATERTIGHT, AS PER THE INTERNATIONAL PLUMBING CODE.
5. A HORIZONTAL SEPARATION OF 5 FEET OF UNDISTURBED OR COMPACTED EARTH IS REQUIRED BETWEEN BUILDING SEWER AND WATER SERVICE.
6. IN TRAFFIC AREAS AND ON OBSERVATION TEE A CAST IRON PROTECTION CASTING SHALL BE USED INSTEAD OF A CAST IRON PUSH-ON CLEANOUT COVER
7. POSITIVELY NO EXTRA CLEANOUT TO BE ADDED AFTER INITIAL 6" LATERAL STUB FOR THE SOLE PURPOSE OF TESTING BUILDING SEWER. WILL BE CAUSE FOR REJECTION OF INSPECTION. PLUMBERS MUST TEST FROM 6" CLEANOUT RISER TO 4" BUILDING CLEANOUT.
8. INSTALL TRENCH PLUG IN ALL BUILDING SEWER TRENCHES

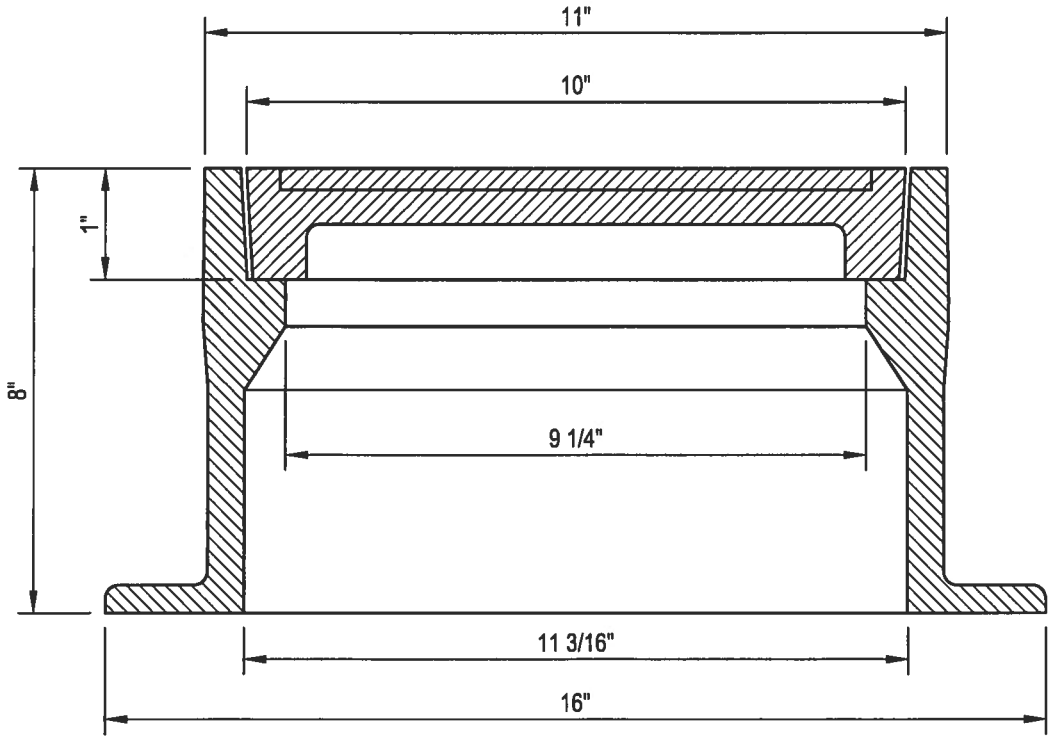


CAST IRON (PANELLA TYPE) PUSH-ON CLEANOUT COVER
NO SCALE

DATE	REVISIONS				SCALE	FILE
OCT. 2016	UPDATED STANDARD DETAILS				NO SCALE	LAT-4



PLAN

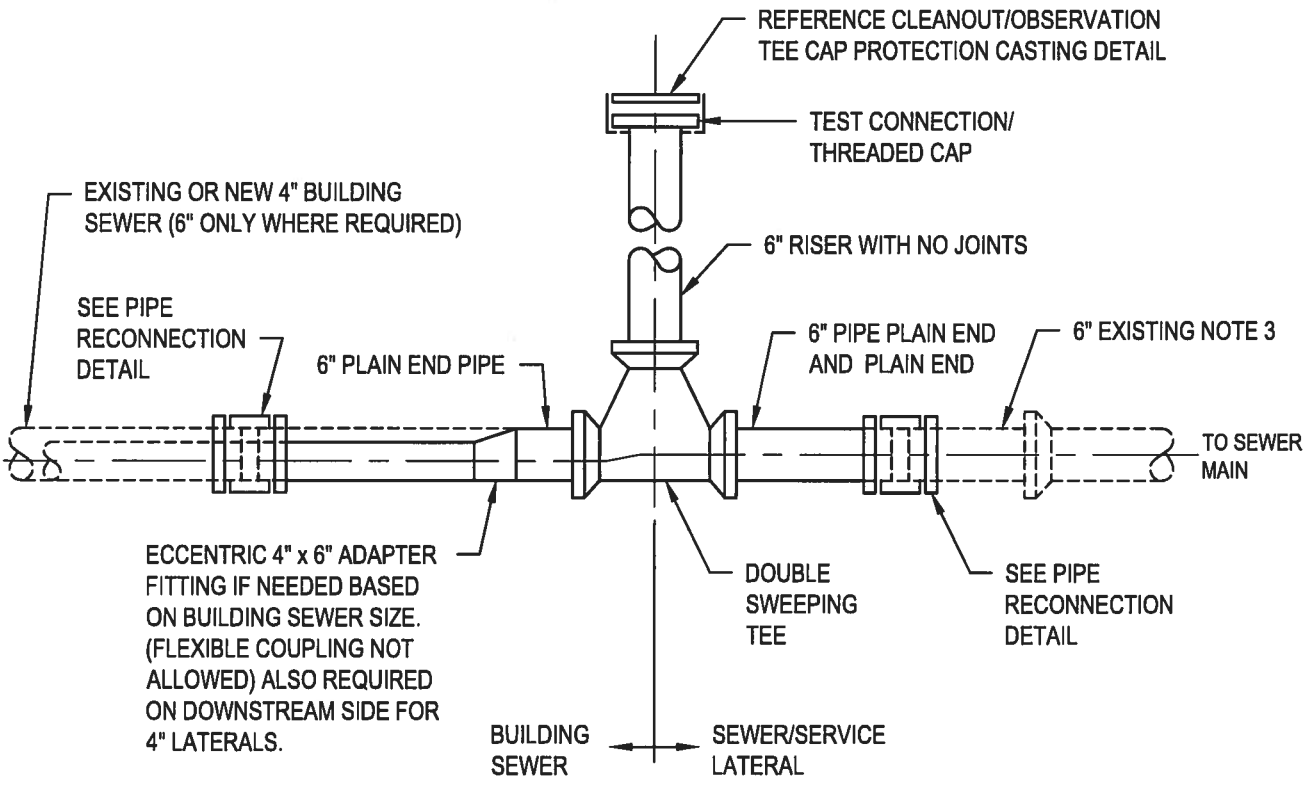


SECTION

CLEANOUT/OBSERVATION TEE CAP PROTECTION CASTING

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	LAT-5



ELEVATION

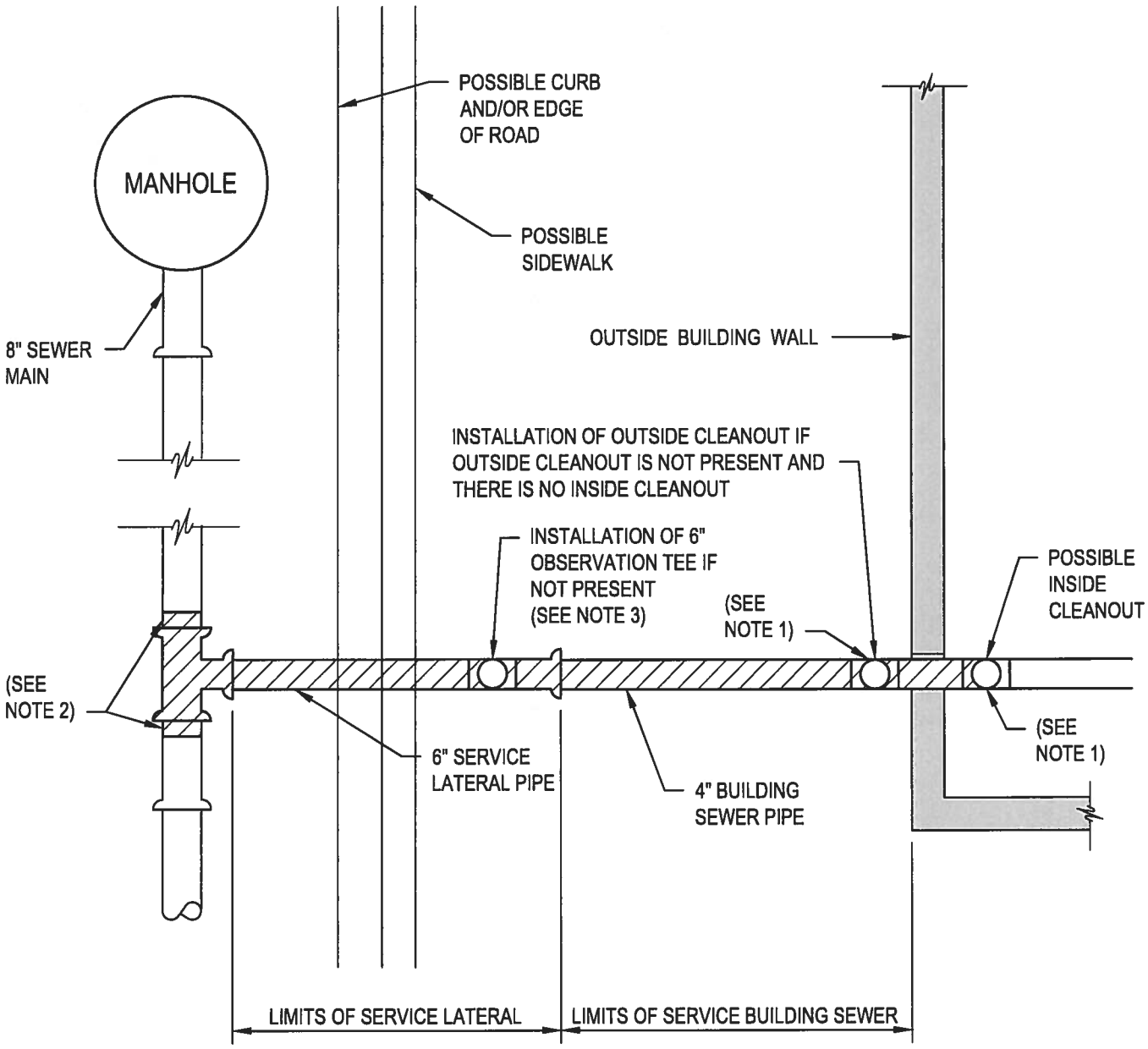
NOTES:

1. REFER TO APPROPRIATE DWG'S. FOR CLEANOUT CAP DETAILS.
2. LOCATE OBSERVATION TEE 5'-0" (MAX.) FROM CURB, OR AT THE CONNECTION POINT BETWEEN SEWER LATERAL AND BUILDING SEWER IF KNOWN.
3. IF 4" LATERAL EXISTS, USE ECCENTRIC 4" x 6" ADAPTER FITTING FOR TRANSITION TO OBSERVATION TEE (4" x 6" FLEXIBLE COUPLING NOT ALLOWED).

OBSERVATION TEE

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	LAT-6



NOTES:

1. TEMPORARY PLUG INSERTED THROUGH CLEANOUT TO INVERT OF TEE FOR TESTING OF BUILDING SEWER PIPE.
2. TEMPORARY PLUG INSERTED AT MAINLINE PIPE FOR TESTING OF LATERAL PIPE.
3. TEMPORARY PLUG INSERTED THROUGH OBSERVATION TEE TO INVERT OF PIPE FOR TESTING OF SERVICE LATERAL AND BUILDING SEWER.

AREA TO BE AIR TESTED

EXISTING SERVICE LATERAL AND/OR BUILDING SEWER AIR TEST

DATE	REVISIONS
OCT, 2016	UPDATED STANDARD DETAILS

SCALE	FILE
NO SCALE	T-1