1. Minimum size building sewer shall be 4 inches (100 mm).

SECTION 33 3313
SANITARY UTILITY SEWERAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Perform excavating and backfilling required for work of this Section.
   2. Furnish and install sanitary sewage system as described in Contract Documents beginning at 5 feet 1 500 mm from where it enters building and connecting to serving sewer system.

B. Related Sections:
   1. Section 22 1313: Sanitary sewage system within building and within 5 feet 1 500 mm of building.
   2. Section 31 2316: Procedure and quality of excavating.

1.2 REFERENCES

A. American Society For Testing And Materials:
   1. ASTM A 74-03b, 'Standard Specification for Cast Iron Soil Pipe and Fittings.'
   2. ASTM C 564-03a, 'Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.'
   4. ASTM D 2321-00, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.'
   8. ASTM D 3034-00, 'Standard Specification for Type PSM Poly Vinyl Chloride)(PVC) Sewer Pipe and Fittings.'

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Install cleanouts in accordance with local governing authority and State codes.
PART 2 - PRODUCTS

2.1 COMPONENTS

A. Cast Iron Soil Pipe And Fittings:
   1. Meet requirements of ASTM A 74, Service Grade:
      a. Cast iron for bell and spigot fittings.
      b. Cast iron for no-hub joints.
   2. Approved Joint Material And Manufacturers:
      a. For Bell And Spigot Pipe: Rubber gaskets meeting requirements of ASTM C 564 and
         compatible with pipe used.
      b. For No-Hub Pipe:
         1) Category Four Approved Products. See Section 01 6000 for definitions of Categories.
            a) SuperGrip 304 American Brass & Iron (AB&I).
            b) Husky SD 4000 coupling by Husky Technologies
            c) Neoprene gaskets with type 304 stainless steel clamp and 24 ga type 304
               stainless steel housing by Clamp-All Corp.
            d) MG Coupling by MG Piping Products.

B. ABS Schedule 40 solid wall plastic pipe and fittings meeting requirements of ASTM D 2661 joined with
   pipe cement meeting requirements of ASTM 2235.

C. PVC:
   1. Schedule 40 solid wall plastic pipe and fittings meeting requirements of ASTM D 2665 joined
      using cement primer meeting requirements of ASTM F 656 and pipe cement meeting
      requirements of ASTM D 2564.
   2. Gasket joint gravity sewer pipe and fittings meeting requirements of ASTM D 3034 or ASTM F
      789. Joints shall be integral wall and elastomeric gasket.

2.2 MANUFACTURERS

A. Contact Information:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before installation, inspect pipe for defects and cracks. Do not use defective, damaged, or unsound
   pipe.

3.2 PREPARATION

A. Excavate and backfill as specified in Sections 31 2316 and 2323 with following additional
   requirements:
   1. Runs shall be as close as possible to those shown on Drawings.
   2. Excavate to required depth and grade to obtain fall required.
   3. Bottom of trenches shall be hard. Tamp as required.
   4. Remove debris from trench before laying pipe.
   5. Do not cut trenches near footings without consulting Architect.
6. Excavate trenches so outside pipe will be 12 inches 300 mm minimum below frost line or 18 inches 450 mm minimum below finish grade, whichever is deeper.

3.3 INSTALLATION

A. General:
1. When work is not in progress, close open ends of pipe and fittings so no trench water, soil, or other substances will enter pipes or fittings.
2. Keep trenches free from water until pipe jointing material has set. Do not lay pipe when condition of trench or weather is unsuitable for such work.
3. Trench width at top of pipe:
   a. Minimum: 18 inches 450 mm or diameter of pipe plus one foot 300 mm, whichever is greater.
   b. Maximum: Outside diameter of pipe plus two feet 600 mm.

B. Placing And Laying of Underground Pipe:
1. Deflections from straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed 6/D inches per linear foot 12 500/D mm per m of pipe where D represents nominal diameter of pipe expressed in inches mm.
2. Deflections to be determined between center lines extended of two connecting pipes.
3. If alignment requires deflection in excess of these limitations, provide special bends or sufficient number of shorter lengths of pipe to provide angular deflections within limits approved by Architect.
4. Laying:
   a. Pipe laying shall proceed up-grade with spigot ends of bell-and-spigot pipe pointing in direction of flow.
   b. Lay each pipe true to line and grade and in such manner as to form close concentric joint with adjoining pipe and to prevent sudden offsets of flow line.
   c. As work progresses, clear interior of pipe of dirt and superfluous materials. Where cleaning after laying is difficult because of small pipe, keep suitable swab or drag in pipe and pull forward past each joint immediately after jointing has been completed.
5. Make joints between cast iron pipe and other types of pipe with standard manufactured cast-iron adapters and fittings.
6. Valve, plug, or cap, as directed by Architect, where pipe ends are left for future connections.

C. Cast Iron Pipe And Fittings:
1. Shape trench bottom to give substantially uniform circumferential support to lower third of each pipe. Provide depression under bell of each joint to maintain even bearing of sewer pipe.
2. Connect to street main as required by local authorities.
3. Use jacks to make-up gasketed joints.

D. Thermoplastic Pipe And Fittings:
1. Install in accordance with Manufacturer's recommendations and ASTM D 2321.
2. Stabilize unstable trench bottoms.
3. Bed pipe true to line and grade with continuous support from firm base.
   a. Bedding depth: 4 to 6 inches 100 to 150 mm.
   b. Material and compaction to meet ASTM standard noted above.
4. Excavate bell holes into bedding material so pipe is uniformly supported along its entire length. Blocking to grade pipe is forbidden.
5. Piping and joints shall be clean and installed according to Manufacturer's recommendations. Break down contaminated joints, clean seats and gaskets and reinstall.
6. Do not use back hoe or power equipment to assemble pipe.
7. Initial backfill shall be 12 inches 300 mm above top of pipe with material specified in referenced ASTM standard.
8. Minimum cover over top of pipe:
   a. 36 inches 900 mm before allowing vehicular traffic over pipe.
   b. 48 inches 1 200 mm before use of compaction equipment other than hand or impact tampers.
3.4 FIELD QUALITY CONTROL

A. Failure to install joints properly shall be cause for rejection and replacement of piping system.

END OF SECTION