PART 2

STANDARD REQUIREMENTS AND SPECIFICATIONS

Section 1 - CONSTRUCTION GENERAL

a. The requirements herein established regulate the sizes, materials, methods and workmanship to be used in the construction of sewer drains, house connections and other similar work and appurtenances thereto connected or intended to be connected or to discharge, directly or indirectly, to any public sewer or drain of the District, as provided in Section S3d of the Sewer Ordinances of The Metropolitan District.

b. These requirements are minimum requirements primarily for the construction of sewer house connections but shall also apply to the construction of any sewer or portion of sewer.

c. The District Standard Specifications for Sanitary Sewers, Storm Drains, and Water Mains – The Metropolitan District, Hartford, Connecticut, as revised, have been and hereby are established as requirements for the construction of any sewer work under the jurisdiction of the District.

d. All manholes, catch basins or other structures shall be constructed to meet the required minimum standards of the District. All downstream catch basins, which drain directly to the public sewer, drain or water course, shall have a 2-foot sump and hooded trap or elbow.

Section 2 – TRENCH EXCAVATION

a. Excavations shall be made in such manner and to such width as required to give suitable room for laying and jointing the piping or for construction of structures; all sheeting, bracing, and supports shall be furnished and placed; all cofferdamming, pumping, and draining shall be done; and the bottoms of the excavations shall be rendered firm and dry and acceptable in all respects.

b. When excavating near existing structures, attention is directed to the fact that there are pipes, manholes, drains, and other utilities and structures in certain locations. The Drain Layer Contractor should exercise caution when excavating especially on private property, because the completeness or accuracy of the given information is not guaranteed.

c. Trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method to the full depth of pavement.

d. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least three feet above the top of the pipe before excavation.

e. The trench for the pipe shall be at least 18-inches beyond the outside of the barrel of the pipe on each side, the top of the barrel of the pipe shall be as shown on the approved drawings and the bottom of the trench shall be at the bottom of the pipe.

f. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.

g. In rock excavation there shall be no projecting rock within 6-inches of the outside of the pipe on the sides, top and bottom. The bottom 6-inches of trench shall be refilled with sand or gravel and properly tamped before the pipe is laid. All excavated rock shall be disposed of and the trench refilled with suitable sand or gravel.

h. Trenching in streets or highways shall conform to the requirements and specifications of the state, city or town authorities having jurisdiction.

Section 3 – LAYING PIPE FOR LATERALS AND HOUSE CONNECTIONS

a. Connection laterals shall be of 6-inch diameter or larger pipe, laid to grade and to the points ordered. Laterals will not be laid on a grade flatter than one percent, and will usually have 8-feet of cover at the curb or street line in most residential zones and 10-feet of cover at the curb in business zones.

b. House connections, shall be laid on an even-tamped foundation of course sand, or 3/4-inch crushed stone except that when clay, wet, soft or silty soil conditions prevail, 3/4-inch crushed stone shall be used for foundation of all pipe. The backfill shall be thoroughly compacted by tamping or other approved methods up to the spring line of the pipe (see also Part 2, Section 4, Backfill Operations).

c. Pipes larger than 6-inch diameter or pipes conveying storm water only, may be laid at a grade less that 1% only when specifically approved by Engineering & Planning.

d. If house connection depth is not sufficient to clear under other utilities, varying gravity flow grades shall be designed (not less than 1%) to pass over or under without touching said other utilities. If, on excavating for the sewer or sewer connection, the natural soil foundation is found to be soft, the soft soil shall be removed and not less than 4-inches of approved stone, processed stone or concrete, as required by the Engineering & Planning Department of the District, shall be placed in an approved manner for the pipe foundation.

e. In general, the Drain Layer Contractor shall maintain adequate cover to protect the pipe being installed from physical damage due to live loads or possible winter freezing. In an area where pavement and cultivated lawn already exist, such cover shall generally be no less than 3.5 feet; in an area not so developed or in an area where existing ground surfaces will be altered, such cover shall be no less than 4 feet in which case reinforced concrete or ductile iron pipe must be used as approved by the District.

f. Whenever the Drain Layer Contractor temporarily terminates the sewer connection outside the building, the open end of the pipe shall be fitted with an approved cap to prevent any drainage, storm or muddy water and debris from entering the public sewer and the Drain Layer Contractor shall arrange for inspection.

Section 4 - BACKFILL OPERATIONS

a. After the subgrade has been prepared and the pipe laid, the fill material shall be placed and built up in successive layers.

b. In general, and unless other material is indicated on the drawings, bank gravel shall be suitable material for backfilling trenches. Bank gravel shall conform to the requirements of Article M.02.01-2, CONN DOT Form 814.

c. As soon as practicable after the pipes have been laid, the trenches shall be refilled in 6-inch layers at least to a level two feet above the top of the pipe with bank gravel, compacted in accord with the requirements below, each layer to be leveled and thoroughly compacted to the satisfaction of the District before the next layer is deposited. Special care shall be taken to consolidate the gravel under the pipes and the whole work of backfilling shall be done in a manner which will prevent subsequent settlement and injury to the pipe.

d. Layers of fill shall not exceed 6-inches in thickness (loose). Thinner layers shall be used if necessary to achieve the required compaction. In embankments the fill layers shall be slightly crowned or sloped to the edge(s) to facilitate drainage.

e. Each layer of material shall be compacted by the use of vibratory compaction equipment or rollers or other means to achieve the required compaction. At such points as cannot be reached by mobile mechanical equipment, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.

f. All backfill material shall be compacted to at least the specified percent of maximum density as determined by ASTM D1557, Method C.

LOCATION	PERCENT MAXIMUM DENSITY
Below pipe centerline	95
Above pipe centerline (below unpaved surface)	92
Above pipe centerline (below paved surface)	95
Embankments	92
Below pipe in embankments	95
Below structures	95

g. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction. The water content of the soil shall be adjusted by wetting or drying as may be necessary to obtain proper compaction.

h. Backfill from one foot above the pipe to the top of the trench shall meet the requirements of the town wherein the work is being done and such requirements can be determined from the proper town official at the time of obtaining the street excavation permit.

i. The Drain Layer Contractor and/or the plumber shall seal the opening under the footing with concrete suitably compacted between the cast iron soil pipe and the concrete footing and earth around the opening to prevent the backflow or seepage of subsoil or surface water into the building.

Section 5 - PIPE SPECIFICATIONS

Pipe used for the construction of work within the scope of these regulations shall be:

a. Approved PVC (Polyvinylchloride) plastic pipe in lengths no greater than 13 feet for 6-inch pipe, as specified in the District's Approved Materials for Sanitary Sewer Installations. Plastic pipe shall have joints of the bell and spigot type with compressed rubber ring gaskets and shall be clearly stamped with the manufacturers name.

b. Reinforced concrete pipe of required class, ASTM C-76, with approved "O"-ring gasket. Generally reinforced concrete pipe shall not be used in sizes less than 12-inch diameter.

c. Ductile iron pipe, Class 52, with "O"-ring or mechanical joints.

d. Where excessive depths create loading beyond the loading capacity of the pipe described above, the Drain Layer Contractor shall use extra strength pipe or concrete encasement, as approved by The District.

Section 6 - JOINT BETWEEN HOUSE CONNECTION AND HOUSE PLUMBING

Connection of the sewer pipe with the cast iron soil pipe or PVC plastic schedule 40 plumbing pipe at the normal point just outside the building foundation shall be made with an approved “O” ring gasket or “FERNCO” fitting. The District may limit the size and rate of grade of pipe, or limit the discharge in some other manner, if the proposed amount of said discharge from the individual house connection or lot drain may cause overloading of any part of the public sewer drainage system per Section S2e and S2f of the District Sewer Ordinances.

Section 7 - IMPROPER DISCHARGE TO SEWERS

a. Until proper fixtures have been completed and tightly joined to a sewer house connection, no one shall allow, pump or discharge any water, wastes or other drainage to the sewer house connection or public sewer.

b. Any water in a trench or excavation shall be pumped or discharged to a gutter, catch basin or other proper drainage facility.

c. In the District towns, except in portions of Hartford, the public sewers are sanitary sewers for SANITARY SEWAGE only, and the construction, regulation and use of storm drains are generally within the jurisdiction of the town or State of Connecticut. Subsoil drainage and other clean waters may generally be disposed of in accordance with such town or state regulations. Connections to public storm drains in the towns require permission from the proper town authority and connections to any storm drain of the Connecticut State Department of Transportation, Bureau of Highways may be made only after permission from the proper State of Connecticut authority.

d. In Hartford, even though some District sewers are still combined sanitary and storm sewers, new connections shall be constructed in accordance with Section S3r of Sewer Ordinances as follows:

"When any new building is erected in an area served by combined sewers or by separate sanitary and storm sewers under the jurisdiction of the District, separate connections shall be made from said building to said combined sewer, or to said separate storm and sanitary sewers; one such connection shall be limited to such wastes as are permitted in sanitary sewers, and the second connection shall be used to convey such other flows as are permitted in storm drains.”

Section 8 - GROUND WATER SEEPAGE AND INFILTRATION

a. Prevention of infiltration of subsurface and subsoil waters to the sanitary sewer system is always of great concern to the District. Many of the requirements of the District for pipe laying and jointing are intended to cause the construction of sewers that are reasonably watertight so as to minimize infiltration of water through joints or pipe defects, into the sewer.

b. The District may, when it deems advisable, require a leakage test of the pipe and structures after the construction of any sewer or house connection regulated herein. This can be achieved using the hydraulic or air test method. Whether or not any leakage in the sewer or house connection constructed is in excess of the latest maximum rate called for in special provision amendments to the District's Standard Specifications, the Drain Layer Contractor shall repair, correct the construction and stop the leakage to the satisfaction of the District.

Section 9 - SEWER HOUSE CONNECTIONS IN PROXIMITY TO WATER SERVICE, STORM DRAIN OR OTHER UTILITY

a. The sanitary sewer connection or storm drain connection and water service should generally be laid in separate trenches about 5 feet apart. If the Drain Layer Contractor requests that such pipes be constructed in the same trench, because of special conditions, the sanitary sewer connection or storm drain connection may be constructed in one excavated trench not less than 4 feet from the water service or as may be approved by the District.

b. The sanitary sewer and storm drain connection shall be constructed not less than 5 feet from any underground gas, electric or telephone service or as may be approved by the appropriate Public Utility Company.

c. Separate sanitary sewer and storm drain connections, in Hartford, may be constructed in the same trench provided a spacing of not less than 1 foot is maintained between the two pipes.

Section 10 – OIL/GREASE-WATER SEPARATOR TANK SPECIFICATIONS

a. Each oil/water separator tank shall be constructed of:

- precast concrete or precast polymer concrete;
- other material(s) must be designed, constructed, installed and maintained in conformance with the Regulations of Connecticut State Agencies, Section 22a-449(d)-1(e);
- other material(s) resistant to corrosion and degradation for the concentrations of chemicals involved, and approved by the Department of Engineering and Planning.

b. Tank shall have a minimum capacity sufficient to pretreat the maximum daily flow proposed and no less than 1000 gallons.

c. The inlet extension to grade shall be provided with a vent line which extends 8 feet above finished grade and properly secured to the building. The size of the vent shall be at least half the size of the outlet discharge line from the tank.

d. The inlet piping shall not include any sources of domestic sewage wastewater or stormwater.

e. The outlet pipe shall be at least the size of the inlet pipe or greater and at a minimum shall be 6-inches in diameter. Schedule 40 pipe or approved equal shall be used to bridge disturbed trench.

f. The outlet pipe shall be connected to the sanitary sewer.

g. If heavy piping, such as cast iron, is used, all piping must be structurally secured.

<u>FOR CONCRETE TANKS ONLY</u>

h. Interior of the tank shall be coated with an epoxy petroleum resistant sealant (ensure that the epoxy vendor states that the product will be resistant to gasoline, oil, and solvents). Exterior of the tank shall be coated with a waterproof foundation sealant, including the exterior top and bottom. Interior and exterior of the extensions to grade shall also be waterproofed.

<u>FOR CONCRETE AND CONCRETE POLYMER TANKS ONLY</u>

i. The tank shall have manholes with extensions to grade above the inlet and outlet piping. The extensions shall have steel frames and manhole covers.

j. The outlet piping shall utilize a tee-pipe on the interior of the tank. The tee-pipe shall be equipped with a stand pipe riser extending up the extension to grade but no closer than 8-inches from the manhole cover. The tee-pipe shall extend 6 to 15-inches from the bottom of the tank.

k. If there is a structural seam, it must be located above the static liquid level of the tank, filled in with non-shrinking cement or water plug and coated with a waterproof sealant.

l. Voids between inlet and outlet piping of the tank and the tank itself shall be grouted with non-shrinking cement and coated with a waterproof sealant.

m. The concrete covers provided by the oil separator manufacturers must be permanently removed.

Section 11 – BACKWATER VALVE REQUIREMENTS

a. Sewage backups into homes, buildings or other facilities are caused by a variety of conditions, ranging from heavy rainfall runoff, especially in combined sewer systems, to collapsed sewer house connections, and plugged main sewers.

Some methods of preventing such occurrences is to, depending on the situation, install backwater valves on basement fixtures, or directly inline with house connections. Foundation and gutter drains should be disconnected from cellar sumps and capped off. A sump pump should be installed and its discharge directed to the outside ground surface. Backwater valves will minimize or completely stop sewer backups. Annual valve inspection and maintenance is vital to ensure proper operation of the valve for many years.

b. There are three documents which deal with the problem of surcharging of sewers and flooding of basements.

The Public Health Code of the State of Connecticut.
The State of Connecticut Basic Building Code.
The Building Officials and Code Administrators, (BOCA) National Building Code.

Each of these publications deal with the sewer back-up problem. The authorities require that the property owner provide adequate protection against the possibility of backflow or cellar flooding.

c. The State of Connecticut Public Health Code, Section 19-13-B45(s) states "Where a house drainage system may be subjected to backflow of sewage, suitable provision shall be made to prevent its overflow in the building."

d. The State Building Code, Section 1701.0 states "Backwater traps: when there is a possibility that a plumbing drainage system will be subject to backflow of sewage, suitable provisions shall be made to prevent overflow into the building." The installation of the trap is the responsibility of the home owner.

e. The BOCA National Building Code, Section 1701.0 states "A backwater valve shall be installed where plumbing fixtures are subject to backflow from the public sewer." Section P-1003.3 Location of backwater valves states "Backwater valves shall be installed so their working parts will be readily accessible for service and repairs."

Section 12 – GUIDE TO PLANS FOR SWIMMING POOL FILTER BACKWASH DRAINS TO THE SANITARY SEWER

The following information will be required, in plan form, for review prior to the issuance of a permit:

a. Type of Filter

Pressure Sand Filter or

Diatomaceous Earth Filter - A separator must be provided to prevent diatomaceous earth from entering the sewer system. Trash barrels must be provided in the pump room to dispose of this waste.

b. Filter size (capacity in sq. ft.)

c. Pump size (rate in cfs).

d. Sump and/or holding tank size (capacity in cu. ft.)

e. Size of outlet pipe or orifice from sump to sanitary sewer of plumbing shall be a maximum of 2-inch dia.

f. Size of drain pipe from pool main-drain to sump pit. (normally 2-inch dia.)

g. 3-inch minimum air gap required between top of sump and inlet drain pipe.

h. Backwash rate (maximum 100 gpm)

i. Duration of backwash discharge.