SEWER REGULATIONS

TOWN OF IPSWICH
MASSACHUSETTS

ADOPTED JULY 9, 1979

Amended through August 1, 2000

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These Sewer Regulations are organized in five Divisions and five Appendices as follows:

DIVISION I - SPECIFICATIONS FOR SEWER CONSTRUCTION

DEFINITION OF TERMS

Wherever in these specifications the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

ALTERATION: Change in the form or character of any of the work done or to be done.

A.S.T.M.: The American Society for Testing Materials.

TOWN: The Town of Ipswich, Massachusetts.

BOARD: The Board of Selectmen as Sewer Commissioners of the Town of Ipswich, Massachusetts, acting for the Town.

ENGINEER: Authorized agent of the Board of Selectmen as Sewer Commissioners, such agent acting within the scope of the particular duties entrusted to him through the Town Manager.

LAYOUT: See Right-of-Way.

LOCATION: See Right-of-Way

MATERIAL: Any substance proposed to be used in connection with the construction of any integral part and/or appurtenant part and/or any incidental part of the proposed project.

DRAWINGS: See Plans.

PLANS: The contract drawings, Town Standards, Detail Sheets, or exact reproductions thereof, which show the location, character, dimension and details of the work, including any alterations thereof, permissible under the contract and authorized by duly approved written orders.

REFERENCE: Where reference is made to Publications and Standards issued by Associations or Societies, the intent shall be to specify the current edition of such Publication or Standards (including tentative revisions) in effect during construction of the project, notwithstanding any reference to a particular date.

RIGHT-OF-WAY: That area which has been laid out or acquired for the purposes of the proposed project.

SPECIFICATIONS: The directions, provisions, and requirements contained herein, designated as the General Specifications, together with all written agreements made or to be made pertaining to the method and manner of performing the work.

THE WORDS: "As directed", "as permitted", "as required", or words of like effect shall mean that the direction, permission or requirements of the Engineer is intended, and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean approved by or acceptable or satisfactory to the Engineer, unless otherwise provided herein. The words "necessary", "suitable", "equal", or words of like import shall mean necessary, suitable or equal in the opinion of the Engineer. The words "complete in place" shall mean the inclusion of all work, including incidentals, mentioned or implied in the Specifications and on the plans, or work that may reasonably be inferred, as necessary to the proper execution of the item.

SEWER SPECIFICATIONS

I. SEWER PIPE

A. General

Sewer pipe shall consist of sections of pipe of the kinds, sizes and classes shown on the plans and as directed, laid on a firm foundation with tight joints, I a trench in accordance with these specifications. All pipe shall be subject to inspection at the site of the work by the Engineer. The purpose of the inspection shall be to cull and reject pipes which, independent of physical tests, fail to conform to the above specifications in the particulars of dimensions, workmanship, finish, blisters, cracks or fractures.

B. Kinds of Pipe

Pipe for the construction of sewer mains shall be either Polyvinyl Chloride Pipe (PVC), Asbestos-Cement pipe or Reinforced Concrete sewer pipe. Mixing of pipe will not be permitted between manholes.

C. Materials

1. Asbestos-Cement Pipe

a. Asbestos-Cement pipe shall conform in al respects to ASTM Designation C428 for Asbestos-Cement Nonpressure Sewer Pipe, Type II, and shall be of the classes shown on the Drawings.

b. The exterior edge of the ends of the pipe which extend into the coupling area shall be free from axial chips having a length greater than 1/8 in. The interior edge shall be free from axial chips having a length greater than 1 inch., a width greater than 1 in., or a depth greater than 1/8 in.

c. Joints shall be of the sleeve-coupling type. Sealing shall be by means of rubber rings. The joints shall be of such design that they will provide a continuous, watertight conduit when the ends are drawn together, and will permit expansion, contraction, settlement and lateral displacement. All surfaces of the joint upon which the rubber ring may bear shall be smooth, free from spalls, laitance, cracks, airholes, fractures, or other defects that would affect proper sealing of joint. One coupling of the sleeve-coupling type shall be furnished with each length of pipe, and its physical and chemical properties shall be equal to that of the pipe.

d. The necessary number of sealing rings shall be furnished with each length of pipe. The rings shall be of the proper size and shape for the joints of the pipe furnished and shall in all respects conform to ASTM

Specifications for Rubber Rings for Asbestos-Cement Pipe Designation D1869 and shall be solid cross-section.

2. Reinforced Concrete Pipe
   a. The pipe shall be centrifugally cast or roller-suspension cast reinforced concrete culvert pipe. Pipe shall conform to the ASTM Specifications for Reinforced Concrete Pipe, Designation C78-62T, Wall B, or Wall C. Pipe Class shall be as specified on the Drawings.
   b. Type II cement shall be used, the 28 day compressive strength of which shall not be less than 6,000 PSI. The absorption shall not exceed 4 percent of the dry weight. Reinforcement shall be circular for all concrete pipe and shall be the cross-sectional areas as specified in ASTM C76-62. Longitudinal Steel shall extend to within 1 in. of the end of the pipe in both the tongue and groove, and one extra circumferential rod shall be provided at the groove end. Pipe shall not be shipped until the concrete has attained 4,000 PSI compressive strength and not before five (5) days after manufacture, whichever is longer.
   c. Pipe shall have a minimum laying length of approximately 8 feet except as otherwise approved by the Engineer for closure or other similar special pieces. Joints for concrete pipe shall be the standard tongue and groove type of joint with provisions for using a round rubber gasket in a recess joint as manufactured by Lock Joint Pipe Co., New England Concrete Pipe Corporation, and others. The round rubber "O" ring gasket shall meet ASTM Designation C433-62T Specifications in all respects, except that neoprene shall not be used.
   d. The quality of all materials, the process of manufacture and the finished pipe shall be subject to inspection and approval by the Engineer or his authorized agents. Such inspection may be made at the place of manufacture, or on the work after delivery, or at both places, and the pipe shall be subject to rejection at any time on account of failure to meet any of the specifications. Pipe rejected after delivery to the job shall be marked for identification and shall be removed from the job at once.
3. Polyvinyl Chloride Pipe (PVC)
   a. The pipe and fittings shall conform to ASTM D3034-81 (or latest issue) SDR35 and have integral wall bell and spigot joints. The pipe shall be color-coded or labeled for in-ground identification as sewer pipe.
   b. All pipe and fittings shall be bell and spigot rubber ring joints. Solvent cement joints will not be permitted. The bell of the pipe shall consist of an integral wall section. The rubber ring shall have a cross section and shall be locked into place within the bell at the factory.
   c. Standard laying length shall be 20 feet and 12.5 feet plus or minus 1 inch. Up to 15% of the total footage may be furnished in random lengths.
   d. The pipe shall meet the impact test from a free falling tub (20-pound Tub A) in accordance with ASTM Method of Test D244-80). No shattering or splitting (denting is not a failure) shall be evident when the following energy is impacted:

Six C	Ft. Lbs.

4”	150
6”	210
8”	210
10”	220
12”	220
15”	220

e. All fittings and accessories shall be furnished by the pipe supplier or approved equal and have bell and/or spigot configurations compatible with that of the pipe. Wyes, tees, saddles, bends and adapters, and any other fittings required, shall be provided.

f. The pipe shall be designed to pass all tests at 73°F (+/- 3°F).

g. The minimum “pipe stiffness” at 5% deflection shall be 46 PSI for all sizes when tested in accordance with ASTM Method of Test D24122-77 or latest issue, “External Loading Properties of Plastic Pipe by Parallel-Plate Loading”.

h. Joints shall be sealed with a rubber ring gasket recommended by the manufacturer and approved by the Town. The rubber gasket shall be of a composition and texture which is resistant to the common ingredients in sewage, industrial wastes including oils, and groundwater, and will endure permanently under the conditions likely to be imposed by this use.

i. Joint Tightness: Two sections of pipe shall be assembled in accordance with the manufacturer’s recommendation. The joint shall then be tested in accordance with ASTM D3213-81, “Joints for Drain and Sewer Plastic Pipe using Flexible Elastomeric Seals.”

j. The pipe shall be marked along the outside of the barrel an bold style type and shall indicate the manufacturer’s name, pipe size, PVC compound used, and the ASTM material specifications for the PVC compound unused, (ASTM D1784-78 or latest issue).

k. Pipe stoppers, if required, shall be approved factory-fabricated units.

D. Construction Methods

1. Excavation

a. The trench for the pipe shall be excavated to the required line and grade and be of sufficient width to permit thorough tamping of the fill under the haunches and around the pipe. The bottom of the trench shall be shaped or channeled to conform to the curvature of the pipe. If any cross pipes, conduits, drains or other unforeseen obstacles are encountered in the excavation, the grade of the bottom of the trench may be raised or lowered during the excavation operation, as directed by the Engineer.

b. If, in the opinion of the Engineer, the material at or below the normal grade of the bottom of the trench is unsuitable for foundation, it shall be removed to the depth and width directed by the Engineer and be replaced with screened gravel.

c. When the use of explosives is necessary for excavation, all blasting operations shall be conducted in full compliance with all laws of the State, local ordinances, and with all possible care to avoid injury to persons and

property. The rock shall be well-covered, and sufficient warning shall be given to all persons in the vicinity of the work before blasting. Care shall be taken to avoid injury to utilities or other structures above and below ground.

In addition to observing all municipal and other ordinances relating to storage and handling of explosives, the Contractor shall conform to any further regulations which the Engineer may deem necessary.

In addition to any other notice which may be required, the Contractor shall notify an authorized representative of all utilities which may be affected by the operation. This notice shall state the time of the blast.

d. The Contractor may be required to excavate test pipes for the purpose of locating underground utilities or structures as an aid in establishing the precise location of new work. Test pipe shall be backfilled as soon as the desired information has been obtained. The backfilled surface shall be maintained in a satisfactory condition for travel until resurfaced as hereinafter specified.

e. Excavated material shall be stacked without excessively surcharging the trench bank or obstructing free access to hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.

It is expressly understood that no excavated material shall be removed from the site of the work or disposed of by the Contractor except as directed by the Engineer. When removal of surplus materials has been approved by the Engineer, the contractor shall dispose of such surplus material in approved areas designated by the town.

Should conditions make it impractical or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided by the contractor. When required, it shall be rehandled and used in backfilling the trench.

f. Trench excavation, consisting of rock and boulders exceeding 50 lbs. in weight, and small fragments when directed by the Engineer, shall not be used for backfilling. Common fill used to supply any deficiency of trench backfill shall be provided by the Contractor without additional payment unless specifically stated in writing by the Engineer.

2. <u>Bedding</u>

a. The pipe shall be laid true to the specified lines and grades when and as directed. Each section of pipe shall have a firm bearing throughout its length. Nothing but selected line material or gravel free from large stones shall be placed around and under the pipe.

b. The pipe shall be bedded in an earth or gravel foundation of uniform density carefully shaped to fit the lower part of the pipe exterior for at least 10% of its overall height.

c. The pipe shall be laid on a crushed-stone gravel base as required by the Engineer. The depth of stone shall be from the spring line of the pipe to a point 6 inches below the invert grade, or as directed by the Engineer. The

width of stone area shall be determined by the diameter of pipe plus tow (2) feet, and shall be free of sand and foreign material.

d. Bedding Polyvinyl Chloride Sewer Pipe (PVC): Bedding material for PVC sewer pipe shall consist of either gravel borrow or crushed stone. Gravel borrow shall conform to the Commonwealth of Massachusetts Department of Public Works Standard Specification for Highways and bridges classification M1.03.0 Type C. Crushed stone shall conform to Massachusetts Standard Specification M2.01.4. The bedding material shall be carried to 12 inches above the top of the pipe for the full width of the trench. The bedding material shall be compacted to not less than 95% of maximum density as determined in accordance with the requirements of Method D of ASTM Specification D1557-78. The minimum bedding thickness under the pipe shall be 6 inches. From a point 12 inches above the top of the pipe, the remainder of the trench shall be backfilled in accordance with Section 7. "Backfilling" of these regulations. The use of jetting or flooding to obtain the necessary compaction for the bedding of the pipe will not be permitted.

3. <u>Pipe Laying</u>

a. Asbestos-Cement Pipe shall be installed as provided in the manufacturer's specifications for installation and as follows.

As soon as the excavation is completed to normal grade of the bottom of the trench, the Contractor shall immediately place the bed of screened gravel. The pipe shall then be laid accurately to the line and grade indicated on the Drawings. Screened gravel shall be placed to mid-diameter or to 1 ft. above the top of the pipe where indicated on the Drawing, and shall be thoroughly compacted to give firm support to the pipe. Coupling holes shall be excavated in the screened gravel so that only the barrel of the pipe shall bear upon the gravel bedding. The ends of the pipe shall be pushed home into the couplings to form a closed joint. The interior of each pipe shall be checked at each joint in accordance with the manufacturer's instructions and by the use of a feeler gauge fabricated for that purpose. No blocking under the pipe will be permitted.

The pipe lengths shall be assembled with care so as not to chip the pipe ends. The swinging or stabbing of pipe in order to facilitate pipe seating will not be permitted. The Contractor shall use care in handling and installing pipe and fittings. Under no circumstances shall pipe or fittings be dropped either in to the trench or while unloading. The interior of the pipe shall be kept clean of oil, dirt and foreign matter, and machined ends and couplings shall be wiped clean immediately prior to jointing.

b. Reinforced Concrete Sewer Pipe shall be installed as provided in the manufacturer's specifications for installation and as follows.

As soon as the excavation is completed to the normal grade of the bottom of the trench, the Contractor shall immediately place screened gravel in the trench, and then the pipe shall be firmly bedded in this gravel to conform accurately to the lines and grades indicated on the Drawings.

All pipe shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plug or other approved means. Good alignment shall be preserved in laying.

Screened gravel shall be placed and compacted to give complete vertical and lateral support for the lower section of the pipe as indicated on the Drawings. A depression shall be left in the supporting gravel at the joint to prevent contamination of the rubber gasket immediately before being forced home. Before the pipe is lowered in to the trench, the tongue and groove must be cleaned and free from dirt. The gasket and bell shall be lubricated by a vegetable lubricant, which is not soluble in water, furnished by the pipe manufacturer, and harmless to the rubber gaskets. The pipe shall be properly aligned in the trench to avoid any possibility of contact with the sides of the trench and fouling of the gasket. As soon as the spigot is centered in the bell of the previously laid pipe, it shall be forced home with jacks or come-alongs. After the gasket is compressed and before the pipe is brought fully home, each gasket shall be carefully checked for proper position around the full circumference of the joint. Steel inserts shall be used to prevent the pipe from going home until the feeler gauge is used to check the final position of the gasket. The jacks or come-alongs shall be sufficiently back along the pipe line (a minimum of 5 lengths) so that the pulling force will not dislodge the pieces of pipe in place. Only a jack or come-along shall be employed to force the pipe home smoothly and evenly and hold the pipe while backfilling is in progress. Under no circumstances shall crowbars alone be used, nor shall any motor-driven equipment be used. As soon as the pipe is in place and before the dome-along is releaded, screened gravel backfill shall be placed and compacted as indicated on the Drawings for at least one-half the length of pipe. Not until this backfill is placed shall the come-along be released. If any motion at the joints can be detected, a greater amount of backfill shall be placed before pressure is released.

c. The Contractor shall construct at least one impervious dam of clay or concrete in the gravel bedding every 300 ft. to interrupt the unnatural flow of groundwater after construction is completed.

d. Polyvinyl Chloride Pipe (PVC) shall be installed as recommended by the manufacturer and as specified herein. All pipes, fittings and accessories shall be inspected for defects and straightness before installation. All defective pipe shall be rejected. Any single pipe section which exceeds a total curvature equal to 1/16 inch per foot of length shall be rejected until it can comply with this specification.

   (1) The pipe shall be laid to the lines and grades as shown on the Drawings. The use of blocking under the pipe will not be permitted. The interior of the pipe and fittings shall be kept clean during installation.

   (2) All joints shall be completely cleaned of all dirt and other foreign matter. The joint surfaces shall be coated with the proper lubricant

as recommended by the manufacturer just before making the connection. Each joint shall be inspected to insure that it is properly made, free of defects, and aligned. Any defects or misalignment shall be replaced by the Contractor.

(3) Cutting of the pipe and beveling shall be done using methods approved by the manufacturer. Standard pipe cutters may cause damage to the pipe and shall not be used unless approved. Irregularly cut pipe will not be acceptable.

(4) Jointing of pipe for closure sections, or when connecting pipes of different materials, or when connecting plain end pipe sections, shall be made using either adapter fittings or other approved methods.

(5) Connection of PVC pipe to existing manholes and other structures shall be made using a rubber ring water stop around the pipe or other approved method, since concrete will not bond to the PVC pipe. Connections to new manholes shall be made using standard gasketed sleeves or similar methods fabricated into the manhole or as approved.

(6) Wyes or tees for service connections or branches shall be factory fabricated. At locations where fabricated wyes or tees cannot be used, PVC gasketed and strapped connections shall be used and installed as recommended by the pipe manufacturer.

4. Faulty Construction

Any pipe showing settlement after laying, or which is not in true alignment before final acceptance of the work, shall be taken up and relaid by the Contractor.

5. Dewatering and Drainage

a. The Contractor shall, at all times during construction, provide ample means and devices with which to remove promptly and dispose properly of all water entering trench and structure excavation and keep them acceptably dry until the structures to be built thereon are completed. all water pumped and drained from the work shall be disposed of in a suitable manner without damage to the sewer, pavements, pipes, electrical conduits, or any other work or property. Existing or new sanitary sewers shall not be used to dispose of drainage.

b. Drainage shall be adequate. No pipe shall be laid in water. No masonry shall be laid in water, and no water shall be allowed to rise over masonry for 4 days. In no event shall water be allowed to rise so as to set u unequal pressures in the structures until the concrete or mortar has set at least 24 hours.

The Contractor shall constantly guard against the possibility of flotation of the pipe after its having been laid. He shall place adequate backfill promptly to prevent this occurrence, and his method of handling drainage and carrying on his operations shall always be adequate to prevent flotation.

c. If the Contractor elects to use underdrains for handling the water, he shall furnish and install the underdrain pipe and screened gravel, graded from

coarse to fine, and shall furnish and install all sumps, pumping equipment, etc., to maintain the water level continuously at the required elevation. Pipe underdrains shall consist of sound, extra-strength, vitrified perforated clay pipe, laid with open joints and surrounded with graded screened gravel.

d. An impervious bulkhead cutoff of clay or concrete shall be constructed in the trench bottom between individual portions of the underdrainage system or as directed to interrupt the unnatural flow of groundwater after construction is completed. All excavation below normal grade, if required primarily for the purpose of installing underdrains, together with the screened gravel and underdrain pipe, shall be understood to be part of the drainage work to be done.

6. Bracing and Sheeting

a. The Contractor shall furnish, install, and maintain such braced excavation and sheeting as may be required to support the side of the trench, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures from undermining or other damage. If the Engineer is of the opinion that, at any point sufficient or proper, supports have not been provided, he may order additional supports, and compliance with such order shall not relieve or release the Contractor from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the braced excavation or sheeting, and if formed, shall be immediately filled and rammed.

b. The contractor shall leave in place all sheeting which the Engineer may direct him to leave in place at any time during the progress of the work. The Engineer may direct that sheeting be cut off at any specified elevation. sheeting left in place shall be to a minimum of 1 ft. above the top of the pipe or 5 ft. below final grade.

c. The right of the Engineer to order sheeting, bracing or sheeting left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to person or property occurring from, or upon the work occasioned by, negligence, or otherwise growing out of a failure on the part of the Contractor to sheet, brace or leave in place sufficient sheeting to prevent any caving or moving of the ground.

d. All sheeting not left in place shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property. all voids left, or caused by withdrawal, shall be immediately refilled with sand by tamping with tools especially adapted for that purpose, or otherwise as may be directed.

e. No sheeting driven below mid-diameter of a pipe shall be withdrawn.

f. Wood for shoring and sheeting shall be 3 in. maximum thickness and shall be fir, spruce, pine or hemlock, Grade 2, having a rough or planed surface with square edges, or tongue and groove.

g. Steel soldier beams and trench boxes shall be of adequate weight for the use intended and shall meet with the approval of the Engineer.

7. Backfilling

a. As soon as practical after the sewer pipe has been laid, the pipe bedding shall be completed by placing screened gravel around the pipe to mid-diameter. As the screened gravel is placed, it shall be compacted by approved tools. Common fill free from stones or other foreign material shall then be placed to a depth of 1 foot over the top of the pipe.

b. Where the pipes are laid cross-country, the remainder of the trench shall be filled with common fill and mounded 6 inches above the existing grade or as directed. In streets, the trench shall be backfilled as shown in the typical trench detail on the Drawings.

c. Whenever a loam or gravel surface exists prior to cross-country excavations, it shall be removed, conserved, and replaced to the full original depth as a part of the work under the pipe items. In some areas, it may be necessary to remove excess material during the cleanup process, so that the ground may be restored to its original level and condition. If the Contractor prefers not to store loam or topsoil, he shall replace it with loam or topsoil of equal quality and in equal quantity.

d. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Fill shall not be placed on snow, ice, or frozen uncompacted soil, nor shall snow, ice, or frozen soil be incorporated in any fill. At the close of each day's operations, the surface of the compacted fill shall be rolled or otherwise smoothed to eliminate any ridges or mounds.

e. Subject to the approval of the Engineer, fragments of ledge and boulders smaller than 50-lb. weight may be used in trench backfill providing that the quantity, in the opinion of the Engineer, is not excessive. Rock fragment shall not be placed until the pipe has at least 2 feet of each cover. Small stones and rocks shall be thoroughly intermixed or placed in thin layers alternating with earth to insure that all voids are completely filled. Fill shall not be dropped into the trench in a manner to endanger the pipe.

f. Bituminous paving shall not be placed in backfilling unless specifically permitted, in which case it shall be broken up as directed. Frozen material shall not be used under any circumstances.

g. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading it will not be permitted. In addition, the backfill material shall be stepped so that its leading face does not exceed a slope of 1.5 horizontal and 1 vertical from the trench bottom.

h. Common fill shall be placed in uniform layers not exceeding, before compaction, a depth of 3 feet in cross-country areas and 1 foot in paved areas. Each layer shall be thoroughly compacted by rolling, tamping, or vibrating with mechanical compacting equipment, or by hand tamping. In sandy soils "jetting" with water will be permitted.

i. Granular fill shall be placed in uniform layers not to exceed 12 inches measured before compacting. It shall be thoroughly compacted to at least

92% of maximum laboratory dry density as determined by ASTM Test Designation D1557, Method D.

j. If rolling is employed, it shall be by sue of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench. Where other methods are not practical, compaction shall be by sue of hand or pneumatic tamping with tools weighing at least 20 pounds. Hand tamping, if used, will be performed with iron tampers having a tamping face not exceeding 25 square inches in area. The method shall consist of one man tamping for each man shoveling backfill into the trench, and the material shall be spread and compacted in layers not over 6 inches thick. If necessary, sprinkling shall be employed in conjunction with rolling or tamping. If backfilling is done by machine, it shall be conducted in a manner to obtain results equal to those obtained by other methods described above. All compaction equipment and methods are subject to the approval of the Engineer.

k. Compaction Control. The contractor will make compaction tests as directed by the Town in accordance with ASTM D1556-64 (1974) as the work progresses to determine the degree of compaction being attained. Corrections for oversize stones larger than 3/4-inch in size shall be made in accordance with ASTM "Procedure for Testing Soils", suggested method for correcting maximum density and optimum moisture content of compacted soils for oversize particles. Any corrective work required as a result of such tests, such as additional compaction or a decrease in the thickness of layers, shall be performed by the Contractor. Compaction control tests will be made at no expense to the Town, and by a testing laboratory approved by the Town.

8. <u>Compaction</u>

a. Common fill shall consist of mineral soil substantially free from organic materials, loam, wood, trash, and other objectionable materials which may be compressible or which cannot be properly compacted. Fill from mid-diameter to 1 foot above the top of the pipe shall not contain stones, broken concrete, masonry rubble, or other similar materials larger than 2 inches in its largest dimension. Above this point common fill may have material up to 10 inches in its largest dimension. Common fill shall have physical properties such that it can be readily spread and compacted. Snow, ice and frozen soil shall not be permitted.

b. In most areas, material excavated from the trench will meet the requirements of common fill. Where excavated material does not meet the requirements, it will be replaced with suitable material.

c. Granular fill shall consist of hard durable stone and coarse sand, essentially free from frost, frozen lumps, loam and clay, well-graded, and containing no stone having any dimension greater than 3 inches. The grading of sizes and material shall be such that the gravel may be thoroughly consolidated. The grading shall conform to the following requirements:

1.	Passing 3/8 in. sieve	70% maximum

2.	No. 10 sieve	50% maximum
3.	No. 200 sieve	5% maximum

d. Screened gravel shall consist of hard, durable particles of proper size and gradation, and it shall be free from sand, loam, clay, excess fines, and deleterious materials. The size of the particles shall be uniformly graded gravel such that not less than 95% will pass a No. 4 sieve. Quality and gradation shall be acceptable to the Engineer.

9. Restoring Trench Surface

a. Where the trench occurs adjacent to paved streets, in shoulders, sidewalks, or in cross-country areas, the Contractor shall thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, he shall immediately deposit additional fill to restore the level of the ground. In and adjacent to streets and highways, if the top 18-inch to 24-inch layer is unsuitable for use as subgrade or shoulder material, the Engineer may order the Contractor to remove this layer and to provide granular fill for subgrade.

b. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved highway shall be restored by the Contractor to a condition at least equal to that existing before work began.

c. In sections where the sewer passes through grassed areas, the Contractor shall, at his own expense, remove and replace the soil, or shall loam and seed the surface to the satisfaction of the Engineer. the depth of the loam replaced shall be at least equal to that removed by the Contractor in his trenching operations, but in no event shall it be placed to less than 6 inches in depth.

10. Paving & Pavement Replacement

a. Where existing street, driveway or sidewalk pavements have been interfered with or dug up in connection with sewer work, the surface shall be replaced to a depth of 2 1/2 inches in streets and driveways and 2 inches in sidewalks. The material used shall be bituminous concrete Type I-1 applied in two courses, laid on a gravel foundation of 12 inches in streets or driveways and 6 inches on sidewalks. In State highways permanent pavement shall be a 2 1/2 inch bituminous concrete surface paving applied in 2 courses over a 6 inch concrete base slab.

b. When and where directed by the Engineer, temporary pavement of hot mix or cold patch to a depth of 1 1/2 inches will be used. Temporary pavement shall be maintained in good condition until its removal. Trenches shall be inspected at least once a week and after each storm. Holes and settlements shall be promptly refilled with bituminous mixture. Hot mix shall be used when available; otherwise, cold patch will be used. When directed by the Engineer, permanent pavement of a thickness greater than 2 1/2 inches shall be placed.

c. Except as otherwise specified herein, the Standard Specifications for Highways, Bridges and Waterways as issued by the commonwealth of Massachusetts, Department of Public Works, shall apply to materials and

workmanship requirements for temporary and permanent pavements used as shown on the Drawings and to replace pavements removed or damaged during construction.

d. The Contractor shall place the pavement, after pipe laying and backfilling operations are completed, and after the 12 inch granular fill subbase, if so required, is shaped and compacted.

e. The Contractor shall be required to hose clean all road surfaces after backfilling and before any surfacing, but in no case shall pavement be placed until the trench material is dry.

f. The concrete slab base for permanent pavement in Massachusetts State Highways shall be Class F cement concrete with High Early Strength as defined in Section M of the Standard Specifications for Highways and Bridges of the commonwealth of Massachusetts Department of Public Works. Approximately 90 days after placement of the temporary patch, the patch and sufficient gravel shall be removed to provide for a permanent concrete base slab and bituminous concrete wearing course. The Contractor shall cut or break out existing pavement using pneumatic drill, pavement saw, or other approved method. The bituminous pavement removed shall extend 1 foot outside the trench on each side. Edges of pavement shall be straight and sound. The concrete base slab shall extend at least 12 inches outside the limits of the excavated trench on each side, and shall be 6 inches in thickness with #10", 4" x 4" wire reinforcing.

g. The contractor shall, if necessary, reset manhole and catch basin frames, gate covers and other castings to finish grade before laying the bituminous pavement.

11. <u>Pipe Testing & Cleaning</u>

a. Infiltration Test. Depending on the groundwater level, pipe may be tested for infiltration after the backfill has been placed. Infiltration tests shall be made under the supervision of the Engineer, and the length of line to be tested shall be not less than the length between adjacent manholes and not more than the total length of each size of pipe. The allowable infiltration shall be 100 gallons per inch of diameter per day per mile of pipe.

b. Exfiltration Test. Leakage tests by exfiltration shall be made on all pipe, before or after backfilling, at the discretion of the Engineer. The Contractor shall be required to test the first section of pipeline installed to demonstrate that the work conforms to these specifications. The pipe shall be plugged by pneumatic bags or mechanical plugs in such a manner that the air can be released from the pipe while it is being filled with water. The test shall be continued for one hour, and provisions shall be made for measuring the amount of water required to maintain the water at a constant level during this period.

If any joint shows an appreciable amount of leakage, the joint shall be replaced or repaired to the satisfaction of the Engineer. If any pipe is defective, it shall be removed and replaced. If the quantity of water required to maintain a constant level in the pipe for one hour does not exceed 100 gallons per inch of diameter per day per mile of pipe and if all

the leakage is not confined to a few joints, workmanship shall be considered satisfactory. If the amount of leakage indicated defective joints or broken pipes, they shall be corrected or replaced by the Contractor.

c. Air Testing. The contractor may use an air test in lieu of the exfiltration test as described above. If he elects to do this, he shall submit his proposed method of testing to the Engineer for approval. If the results of the air test are unsatisfactory, the Contractor shall be required to perform the exfiltration test as outlined in I-D-11lb. hereinabove.

d. Cleaning. At the conclusion of the work, the Contractor shall thoroughly clean all pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. Debris cleaned from the lines shall be removed from the low end of the pipeline. If, after this cleaning, obstructions remain, they shall be removed. After the pipelines are cleaned, if the water level is above the pipe, the Engineer shall examine the pipe for leaks. If any defective pipes or joints are discovered at this time, they shall be repaired by the Contractor.

II. SEWER MANHOLES

A. General

Sewer manholes shall be constructed of precast reinforced concrete or cast-in-place concrete, to the lines and grades as shown on the plans and in accordance with the following specifications.

B. Materials

1. Precast Reinforced Concrete Manholes

a. Precast concrete barrel sections and precast manhole bases shall conform to ASTM Designation C478 and shall meet the following requirements.

(1) 48 inch inside diameter barrel section shall be used in conjunction with the pipe diameters shown on the Drawings. The designated barrel size shall extend from the top of the cast-in-place or precast base to the bottom of the eccentric of slab top.

(2) The wall thickness shall not be less than 5 inches for 48-inch diameter barrel sections.

(3) Sections shall have tongue and groove joints with approved round rubber "O"-ring gaskets.

(4) Top sections shall be eccentric except that precast concrete top slabs shall be used where cover over the top of the pipe is less than 5 feet for 48-inch diameter manholes.

(5) Type II cement shall be used except as otherwise approved.

(6) The round rubber "O"-ring gaskets shall conform to ASTM C443. They shall be designed and manufactured so that the completed joints will withstand an internal water pressure in excess of 15 PSI without showing any leakage by the gasket or displacement of it. The Contractor shall provide facilities for testing the effectiveness of the joints against leakage. Such tests shall be made by an internal pressure against the joint of at least 15 PSI.

(7) All sections shall be cured by an approved method and shall not be shipped nor shall be subject to loading until the concrete compressive strength has attained 3,000 PSI or until 5 days after fabrication and/or repair, whichever is longer.

(8) Precast concrete top slabs shall be designed for a minimum of H-20 loading plus the weight of soil above.

(9) The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on the inside of each precast section.

(10) Precast concrete bases may be used as an alternate to cast-in-place bases. The precast base shall conform to all the requirements of the Specification on manhole barrel sections ASTM C478, and shall be installed as shown on the Drawings.
The thickness of the bottom slab of the precast bases shall not be less than the manhole barrel sections or top slab, whichever is

greater. Design for reinforcement shall not be less than that for the top slab.

2. Cast-In-Place Manholes
   a. Cement shall be domestic Portland cement conforming to ASTM Designation C150, Type II.
   b. Fine aggregate shall be washed natural sand conforming to ASTM Designation C33.
   c. Coarse aggregate shall be well-graded crushed stone conforming to ASTM Designation C33, size No. 67, unless otherwise directed.
   d. Water shall be potable, clean, and free from deleterious amounts of acids, alkalis, oils or organic matter.
   e. No admixtures shall be used unless approved by the Engineer in writing.
   f. Reinforcing steel shall be deformed intermediate grade, steel bars conforming to ASTM Designation A615, Grade 40. Rail-steel bars shall not be permitted in the work.
   g. Concrete aggregate which has been shown by test or actual service to produce concrete of the required strength, durability, watertightness, and wearing qualities may be used where authorized by the Engineer.
   h. Water stops shall be of the synthetic rubber, 6 inch dumbbell type, meeting Corps of Engineer Specifications CRD-C-513-71. Water stops shall be Serviced/Durajoint, Code 5318-60 as manufactured by W.R. Grace and Co. or approved equal.
3. Manhole Rungs

   Manhole rungs shall be aluminum alloy temper T6, 5/8 inch diameter drop front design, 12-inches wide and meeting the requirements of the Occupational Safety and Health Act. Rungs shall be equal to Alcoa Part No. 15295, and shall be placed 12 inches on center. They shall not be subjected to any load for a period of at least 7 days.
4. Manhole Frames and Covers
   a. Manhole frames and cover castings shall be of good quality, strong, tough, even-grained, cast iron, smooth, free from scale, lumps, blisters, sand holes, and defects of any kind which render them unfit for the service for which they are intended. Castings shall be thoroughly cleaned and subject to hammer inspection. Manhole covers and frame seats shall be machined to a true plan surface. Before shipment from the factory, castings shall be given a coating which is smooth and tough, but not brittle. Manhole castings shall be equal to the patterns as manufactured by the Neenah Foundry, or approved equal.
   b. Manhole frames and covers in streets shall be equal to LeBaron Cat. No. LB-308.
   c. Bolted and gasketed manhole frames and covers, for use in cross-country areas, shall be equal to LeBaron 30-inch, Type LBB-308.
   d. The manhole covers shall have a checkered pattern with the letter “S” for “sewer” centered on the manhole cover in 4 inch letters.
   e. Frames shall be set firm and true to grade, and mortar shall be placed from the top of the manhole up and over the base flange to the top of the frame.

Where necessary to adjust for grade, the precast top section of precast manholes shall be extended with brick masonry.

5. Brickwork

a. Brick inverts shall be formed on all manholes. Brick shall be used to adjust grades of frames and covers.

b. Cement shall be domestic Portland cement conforming to ASTM Designation C150, Type II.

c. Lime for mortar shall be hydrated, conforming to ASTM Designation C207, Type S.

d. Sand shall be clean, hard, sharp, durable particles, preferably siliceous, with not more than 5% in volume of loam, mica, clay, or other deleterious substances. The sand shall be graded from fine to coarse so that, when tested dry, it will conform to the limits of ASTM specification for Aggregate for Masonry Mortar, C144.

e. Water shall be free from injurious amounts of oils, acids, alkalis, and organic matter, and shall be clean and fresh.

f. Brick shall be sound, hard and uniformly burned, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM Specification C32, Grade SS. Underburned or salmon brick will not be acceptable, and only whole brick shall be used unless otherwise permitted.

g. Mortar shall consist of 1 part cement, 1/4 part lime, and 2 parts sand, shall be mixed only in such quantity as may be required for immediate use, and shall be used before the initial set has taken place. Mortar shall not be retained for more than 1 1/2 hours and shall be constantly worked over with hoe or shovel until used. Prepared mortar shall not be allowed to stand in beds during the noon hour or overnight.

h. Bricks shall be cleaned and thoroughly wetted shortly before they are put into the work, and each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling. Joints between bricks shall not exceed 1/2 inch and shall be pointed. Bricks forming the shaped inverts in manholes shall be laid on edge as shown on the details.

i. Manhole inverts shall be constructed to conform to the sizes of flow through sewers. At changes in directions, the inverts shall be laid out in curves of the longest possible radii tangent to the centerline of the sewer pipes. Shelves shall be constructed to the elevation of the highest pipe crown unless shown on the Drawings to be different and shall be sloped to drain toward the flowing-through channel.

C. Construction Methods

1. General

Sewer manholes shall be built to the lines, grades, dimensions and designs as shown on the plans and in accordance with the Specifications for materials and construction as described and referred to herein. The utmost care and caution shall be exercised by the Contractor in all types of sewer manhole construction to ensure watertight structures.

2. Precast Reinforced Concrete Manholes

a. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer. Sections rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. All sections which have been damaged after delivery shall be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced.

b. At the time of inspection, the sections will be carefully examined for compliance with ASTM Specifications and these Specifications, and with the approved manufacturer's Drawings. All sections shall be inspected for general appearance, dimension, "scratch-strength", blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.

c. Imperfections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 PSI at the end of 7 days and 5,000 PSI at the end of 28 days, when tested in 3-inch by 6-inch cylinders stored in the standard manner.
Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.

d. Manholes shall be constructed of 48-inch diameter precast concrete barrel sections with cast-in-place or precast manhole base.

e. The cast-in-place bases of manholes shall be placed on a bed of screened gravel. The tops of the cast-in-place bases shall be shaped to mate with the precast barrel sections, and shall be adjusted in grade so that the top of the eccentric or slab top sections is approximately at the correct elevation. Brick lined channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped to drain toward the flow-through channel.

f. Precast concrete barrel sections shall be set so as to be vertical and with sections in true alignment with a 1/4-inch maximum tolerance to be allowed. The outside and inside joint shall be filled with non-shrink mortar and finished flush with the adjoining surfaces. All joints must set for 24 hours before backfilling. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides. If any leaks appear in the manholes, the inside joints shall be caulked with lead wool to the satisfaction of the Engineer. The Contractor shall install the precast sections in a manner that will result in a watertight joint.

g. Holes in the concrete barrel sections required for handling or other purposes shall be plugged with a non-shrinking gourt or non-shrinking grout in combination with concrete plugs, and shall be finished flush on the inside.
Where holes must be cut in the precast sections to accommodate pipes, cutting shall be done prior to setting them in place to prevent any subsequent jarring which may loosen the mortar joints.

h. All work shall be protected against flooding and flotation.

i. The areas disturbed in constructing the manholes shall be graded, and all site work necessary to achieve a finished surface as indicated on the Drawings shall be performed. Where topsoiling and seeding are required, it shall be completed in accordance with these Specifications. The Contractor is referred to Section I-9 regarding restoration of existing surfaces. All grading and site work shall be completed to the satisfaction of the Engineer.

j. The precast concrete bases shall be placed on a bed of screened gravel, as shown on the Drawings, to provide even bearing and closer grade control. the tops of the precast concrete bases shall be shaped to mate with the precast barrel sections.

k. Manhole pipe connections may be accomplished by use of:

(1) The "RES-SEAL", a cast iron compression ring which compresses a rubber ring into a tapered hole in the barrel, shall be used for sealing the pipe into the manhole barrel.

(2) A tapered hole filled with non-shrink waterproof grout after the pipe is inserted is acceptable, provided the gorut is placed carefully to completely fill all around the pipe. If this method is used, the Contractor shall place a concrete encasement around the stub.

(3) Any method approved by the Engineer.

l. Manhole rungs shall be cast in to the units during the process of manufacture. They shall not be drilled and mortared in afterwards. Those parts which are embedded in the concrete shall receive a heavy coating of zinc chromate or other approved paint.

3. Cast-In-Place Manholes

a. General

All cast-in-place concrete manholes shall be constructed in the following manner unless shown otherwise on the plans or as directed by the Engineer.

(1) A base slab having a minimum depth of 10 inches and an outside diameter 6 inches greater than the outside diameter of the structure to be built, shall be cast in place, the top of said slab being a minimum of 4 inches below the invert of the lowest pipe in the structure.

(2) The wall above the slab shall be constructed as shown on the plans and shall have the dimensions indicated on the detail. All form work shall conform with the Standard Specifications for Highways and Bridges of the Commonwealth of Massachusetts, Department of Public Works.

(3) A brick invert shall be constructed in accordance with that shown on the plans.

(4) The conical section of cast-in-place manholes shall be constructed of concrete.

(5) The forms, dimensions, concrete and construction methods shall be subject to the approval of the Engineer in advance of construction.

(6) Backfilling shall be done in a careful manner, bringing the fill up evenly around the full circumference of the structure. If any leaks appear, they shall be caulked with lead wool to the satisfaction of the Engineer.

b. Concrete Quality

(1) Unless otherwise specified or directed, concrete shall be designed for a minimum allowable compressive strength of 3,500 PSI at 28 days. Slump shall preferably be between 2 inches and 4 inches, and shall not exceed 5 inches. Water shall be kept to a minimum to obtain concrete which is as dense and watertight as possible. The maximum water content shall be 6.4 gallons per 100 lb. sack, and the minimum cement factor shall be 5.2 (100 lb.) sacks per cubic yard. Adjustments shall be made for sacks of cement weighing other than 100 lbs. per sack in order to maintain the same ratios.

c. Mixing Concrete

(1) Ready-mix concrete shall conform to ASTM specification C94 and the requirements herein, or as otherwise approved by the Engineer. If ready-mix concrete is to be used, the manufacturer shall furnish a statement to the Engineer for his approval, giving the dry proportions to be used, with evidence that these will produce concrete of the quality specified.

(2) Concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged. The mixer shall be rotated at a speed recommended by the mixer manufacturer, and mixing shall be continued for at least 1 1/2 minutes after all the materials are in the mixer. concrete shall be placed within 1 1/2 hours of the time at which water was first added; otherwise, it shall be rejected. concrete which has been remixed or retempered, or to which an excess amount of water has been added, shall also be rejected.

d. Forms

(1) Forms shall be free from roughness and imperfections, substantially watertight, and adequately braced and tied to prevent motion when concrete is placed. no wooden spreaders shall be allowed in the concrete.

(2) Wire ties shall not be allowed. Metal ties or anchorages which are required within the forms shall be so constructed that the metal work can be removed for a depth of at least 1 inch from the surface of the concrete without injury to such surface by spalling or otherwise. Forms shall be thoroughly cleaned before using and shall be treated with oil or other approved material.

(3) No form shall be removed without the knowledge and consent of the Engineer. At an average ambient temperature of 50° or higher, inside forms shall be retained for at least 48 hours and outside

forms for at least 24 hours. At a lower average ambient temperature, forms shall be retained one day longer.

e. Placing Concrete

(1) Reinforcement, where required, shall be accurately placed in exact positions shown, shall be secured against displacement with annealed iron wire ties or suitable clips at intersections, and shall have a clear space of 2 inches between the steel and face of forms unless otherwise indicated. Wire ties passing through the forms for the purpose of holding the steel in proper position shall not be allowed. Concrete blocks with wire ties cast therein may be used where approved by the Engineer for the purpose of maintaining the clearance between reinforcement and forms. Reinforcing bars shall be free from rust, scale, dirt, grease, and injurious contaminants.

(2) No concrete shall be placed until the forms and method of placement have been approved by the Engineer. Before depositing concrete, all debris, foreign matter, dirt and water shall be removed from the forms. The surface of concrete previously placed, such as the manhole base or horizontal construction joint, shall be cleaned and brushed with cement paste. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its having been placed.

(3) High frequency mechanical vibrators shall be used to the extent necessary to obtain proper consolidation of the concrete. Care shall be taken to avoid segregation of aggregates by excessive vibration. Concrete adjacent to forms and around pipe studs shall be carefully spaded or rodded.

(4) Concrete walls shall be deposited in one continuous operation with concrete brought up evenly on all sides. Chutes shall be of metal, "U" shaped, and provided with a baffle plate at the end, if necessary, to prevent segregation of materials. Chutes shall be placed at an angle of not less than 25 degrees nor more than 45 degrees from horizontal, and they shall be kept clean and free from hardened concrete.

(5) No concrete shall be mixed or placed during freezing weather without explicit permission. If concrete is placed when the ambient air temperature is below 40°F, the water, sand, and gravel shall be heated so that the temperature of the concrete shall be at least 50°F. This temperature shall be maintained for 72 hours after placing. No concrete shall be placed on frozen ground.

(6) At the base of walls in manholes and structures and where construction joints are used, water stops shall be installed.

f. Finishing Concrete

As soon as forms have been stripped, form ties, if employed, shall be removed, and recess shall be filled to insure complete watertightness. Any defects in the surface of the walls shall be chipped out and repaired in a

workmanlike manner. Defective concrete shall be cut to a minimum depth of 1 inch, thoroughly roughened, and neat cement shall be brushed in. The hole shall then be filled with mortar in the proportion of 1 part cement and 2 1/2 parts sand with a minimum of water. Mortar for filling form tie recesses shall be mixed to a slightly damp consistency (just short of "balling"), pressed into the recess until dense, and troweled smooth. Mortar in larger patches shall be applied and allowed to assume a partial set, following which it shall be struck off flush with the adjoining surface. Patches shall be kept moist for several days to assure proper curing.

g. Reinforcing Steel

(1) Reinforcement shall be accurately fabricated to the dimensions indicated on the Drawings. Stirrups and tie bars shall be bent around a pin having a diameter not less than 2 times the minimum thickness of the bar. Bends for other bars shall be made around a pin having a diameter not less than 6 times the minimum thickness, except for bars larger than 1 inch, in which case the bends shall be made around a pin not less than 8 times the minimum thickness. All bars shall be bent cold.

(2) Reinforcement shall be shipped to the work with bars of the same size and shape fastened in bundles with metal identification tags giving size and mark securely wired on. The identification tags shall be labeled with the same designation as shown on submitted bar schedules and shop drawings.

(3) All bars shall be stored off the ground and shall be protected from moisture and be kept free from dirt, oil, or injurious coatings.

(4) Unless otherwise shown, splices in reinforcement shall be lapped not less than 30 diameters. All bar splices shall be staggered wherever possible. When splicing bars of different diameters, the length of lap is based on the larger bar.

(5) Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust, scale, dirt, and other coatings, including ice, that reduce or destroy bond. Where there is a delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

(6) Reinforcement which is to be exposed for a considerable length of time after being placed shall be painted with a heavy coat of cement grout, if required by the Engineer.

(7) In no case shall any reinforcing steel be covered with concrete until the amount of and position of the reinforcements have been checked by the Engineer and his permission has been given to proceed with the concreting.

h. Water Stops

(1) Water stops for all joints as indicated on the Drawings shall be continuous around all corners and intersections. Splices shall be made in accordance with the manufacturer's recommendations, subject to the approval of the Engineer.

(2) A sufficient number of ties shall be placed, as directed, to ensure that water stops shall remain in the required position during concrete placement. The holes for the wire ties shall be drilled just below the bulb.

III. SEWER SERVICE CONNECTIONS

A. General

Where service connections are required, they shall extend from, and be connected to, the wye branch connection or the chimney connection, whichever the case may be, and shall terminate at the actual sideline of the street. They shall consist of the necessary bends, pipe and suitable caps and stoppers.

B. Materials

1. Service connections shall be 5 inches minimum,, Class 3300 A.C. pipe, in lengths not to exceed 5 feet. Asbestos cement service connections shall conform to the requirements of ASTM Designation C428-70T and shall be provided with suitable caps or stoppers to insure against infiltration into the sewer line.
2. Polyvinyl Chloride Pipe (PVC) and fittings for service connections shall conform to ASTM D3034-81 (or latest issue) SDR35 and all other requirements set forth in these specifications for PVC sewer pipe. PVC pipe for service connections shall be 4-inch or 6-inch diameter as directed by the Town. Generally 4-inch service connections shall be for single family dwellings. Multi-family dwellings, commercial and industrial buildings generally shall require a 6-inch service connection.

C. Construction Methods

1. Service connections shall be constructed in the same manner as sewer pipe as hereinbefore set forth in these specifications.
2. Service connections shall be installed at a minimum slope of 2 percent, where possible.
3. The location of service connections shall be determined in the field.
4. The contractor shall be careful to permit the Engineer ample time to obtain the exact location of each connection before it is covered. connections which are covered before the Engineer has had time to obtain their locations shall be exposed at the Contractor's expense, so that location measurements can be taken.
5. Service connections shall be extended to the right-of-way line and shall be sealed with stoppers or caps. If so directed by the Engineer, the service connection shall be extended to within 5 feet of the building to be sewered and shall be sealed with caps. Six inches of screened gravel shall be placed in front of the stopper or cap and over the top of the last 3 feet of pipe laid. Each service connection, or the wye branch or chimney if no service connection is extended, shall be backed with a piece of wood (2 inches x 4 inches) that extends to a point 5 feet below the finished ground surface. the wood shall be placed slightly ahead and above the end of the service pipe wye branch or chimney to avoid damage when excavating later.
6. Approved manholes or cleanouts shall be installed at all changes of direction, or approved by the Engineer.

IV. VERTICAL DROPS AT MANHOLES

A. General

Where a drop manhole is indicated on the plans or as directed, a vertical drop shall be constructed at the inlet as shown on the plan or as directed. Every vertical drop shall consist of a drop and a cleanout, whether constructed in side or outside of the manhole structure.

B. Construction Methods

A vertical drop shall be built concurrently with the manhole to which it is attached, and shall conform to the designs, dimensions, sizes, and materials as shown on the plans or as directed. Where vertical drops are to be constructed at existing sewer manholes, they shall be built as directed by the Engineer. In either case, it shall be firmly secured from movement by encasement in concrete or brick masonry, if outside the structure, or firmly strapped by an approved method if built inside an existing sewer manhole.

V. CHIMNEY CONNECTIONS

A. General

Chimney connections shall consist of the pipe, pipe bends and encasement in concrete or brick masonry as shown on the plans or as directed. The strength class for each connection shall be Class 3300.

B. Materials

1. Asbestos cement chinmey connections shall conform to the requirements of ASTM Designation C428-70 and shall be provided with approved caps or stoppers to insure against infiltration into the sewer line.
2. PVC pipe and fittings for chimney connections shall be as specified herein and shall be provided with approved caps or stoppers to prevent infiltration.

C. Construction Methods

Chimney connections shall be constructed in accordance with the plans and to the elevation determined by the Engineer. In the event the Contractor elects to use brick encasement, the minimum thickness shall be 8 inches as measured from the outside wall of the pipe. The brick encasement shall be square in form, and all voids between the pipe and brick shall be filled with mortar as succeeding courses are laid. Backfill around chimneys shall consist of selected materials placed and tamped in one foot increments. The utmost care shall be exercised by the Contractor to avoid strains on the chimney caused by uneven or unbalanced backfilling. Concrete for concrete encasement shall be as specified in Section II-B-2 of these specifications. Concrete for PVC chimney connections shall have achieved initial cure before backfilling will be permitted. Heavy equipment or similar vehicle will not be permitted to pass over the connection for a minimum of 16 hours after construction.

VI. WYE BRANCHES

A. General

The Contractor shall install asbestos-cement or PVC wye branches where connections from existing buildings are contemplated and in other locations where there is probability for the need for such connection in the future.

B. Materials

1. Asbestos Cement wye branches shall conform to the requirements of ASTM Designation C428, latest revision, and shall be provided with approved caps or stoppers to insure against infiltration into the sewer line. Plastic plugs shall not be used. Concrete for encasement shall conform to Section II-B-2 of these specifications.
2. PVC wye or tee branches shall conform to ASTM D3034-81 (or latest issue) SDR 35 and to the requirements set forth in Section 1 of these Specifications. Concrete encasement for wye or tee branches will not be required, unless otherwise directed by the Town. Wyes or tees shall be provided with approved caps or stoppers to insure against infiltration.

C. Construction Methods

1. Wye branches shall be installed and capped as shown on the Drawings and in locations directed by the Engineer. No backfill shall be placed over the concrete encasement within 16 hours of casting.
2. The Contractor shall be careful to permit the Engineer ample time to obtain the exact location of each wye branch before it is covered up. Wye branches which are covered before the Engineer has had time to obtain their location shall be exposed at the contractor’s expense so that location measurements can be taken.

VII. MISCELLANEOUS PROVISIONS

A. Indemnity Agreement, Conveyance of Title, and Insurance Certificates

Contractors applying to install sewer extensions pursuant to applications approved under this Division and Division II, Article II of these Regulations, shall be required, as a precondition to the Sewer Division's issuance of approval, to execute an Indemnity Agreement and a conveyance of Title (attached in Appendices II and III to these Regulations, respectively, and incorporated herein) and to file with the Public Works Director Certificates of Insurance in accordance with requirements of (a) the Commonwealth of Massachusetts General Laws, with respect to Workers' Compensation, and of (b) Town of Ipswich Street Opening Regulations. (Amended 3/26/90)

B. Street Opening Permits; Notification Requirements

1. Prior to the commencement of work within the public way, the Contractor shall obtain a street opening permit from the Department of Public Works, pursuant to Town By-Laws Chapter XII, Section 5(c), and file therewith a bond as assurance that the road shall be properly restored to Town standards. This bond shall remain in effect for a duration of 2 years after completion of work.
2. The Sewer and Water Divisions shall be notified by the Contractor at least 2 working days prior to the commencement of work.
3. Upon completion of work, connections shall not be made to the sewer until the work has been approved by the Engineer. (Amended 3/26/90)

C. Use of Explosives

When the use of explosives is necessary for the prosecution of work, the Contractor shall observe the utmost care not to endanger life and property. All explosives shall be stored in a secure manner, and all such storage places shall be clearly marked, "DANGEROUS - EXPLOSIVES" and shall be in the care of competent watchmen at all times. The method of storage and the handling of explosives and highly inflammable materials shall conform with all State laws and regulations pertaining thereto. The Contractor shall obtain all necessary permits relating to the storage and use of explosives.

D. Barricades, Warning Signs, and Traffic Control

1. The Contractor shall at all times and at his own expense provide, place, and erect all necessary barricades and warning signs and furnish and keep lighted all lights necessary mutually to protect the work, traffic, pedestrians, and animals. He shall also furnish at his own expense a sufficient number of watchmen at all times to protect the work.
2. Whenever it is deemed necessary, in the opinion of the Chief of Police, to direct traffic around work areas within the public way, the Contractor shall, at his own expense, obtain the services of a policeman at such times as may be designated.
3. The Contractor shall be held responsible for all damage to the work due to any failure of signs.

E. Dust Control

For purposes of dust control, calcium chloride shall e applied by the contractor at rates and in locations designated by the Engineer. The number and frequency of applications shall be determined by the Engineer.

F. State Highway Opening Permit

1. Work within State Highways is subject to the control of the Commonwealth of Massachusetts District 5 Highway Engineer who issues Highway Opening Permits subject to his specific written conditions.
2. The Town shall make application to the district Highway Engineer on behalf of the Contractor, who shall be required to comply with the conditions of the State Permit.
3. At least 45 days before doing any work in the State Highway, the Contractor shall notify the commonwealth of Massachusetts, Department of Public Works, district Five Office, District Highway Engineer, 485 Maple Street, Danvers, MA 01923, Telephone (617) 774-3190.

G. As Built Plans and Profiles

Upon completion of a sewer main extension, the contractor shall file with the Sewer Division one set of reproducible as-built plans and profiles of said extension. Plans shall be at the scale of 1" = 40', and profiles shall be at the horizontal scale of 1" = 4' and vertical scale of 1" = 4' of all sewer pipe, manholes, wyes, chimneys, services, easements, roadways, other utilities and physical features. Said plans shall also show the written physical dimensions of all ties, inverts, slopes, pipes, metes and bounds.

H. State Water Resources Commission Permit

Prior to the commencement of any work, it will be necessary for the Town to obtain on behalf of the contractor a Permit for the Extension of the Sewerage System from the Director of the Division of Water Pollution Control, Water Resources Commission, commonwealth of Massachusetts, at 110 Tremont Street, Boston, MA 02108, as prescribed under Section 43 of the General Laws, Chapter 21. Adherence to the conditions set forth in this Permit is mandatory.

I. Preconstruction Conference

Prior to commencement of construction of all sewer extensions to be located in public ways, a preconstruction conference shall be held, at which the Department of Public Works Director, town Engineer, the Resident Engineer, the contract Superintendent, and representatives of applicable utilities - gas, electric - shall be present. Procedures shall be arranged for locating utilities and notifying emergency services (police, fire, ambulance), and school bus transportation officials. Trailer and materials storage sites shall be identified. Procedures for homeowner notifications shall be discussed, as shall cash flow projections and all other applicable matters to the contract. Minutes shall be prepared for this meeting and shall be distributed to all affected parties.

J. Standard Details

The Town's Standard Details are specified in Appendix V of these Regulations and incorporated herein. They shall be adhered to in all instances by the Contractor except with specific approval of the Engineer. The Engineer shall document in writing all instances of deviations from the Standard Details

DIVISION II

TOWN OF IPSWICH, MASSACHUSETTS
SEWER REGULATIONS CONCERNING CONNECTIONS TO THE SYSTEM, SEWER USE AND OTHER RELATED FACTORS

AUTHORITY: Under the authority of the General Laws of the Commonwealth of Massachusetts, Section 10 of Chapter 83; and the Acts of 1946, Chapter 30, Section 12; duly accepted by the Town of Ipswich, the Ipswich Board of Selectmen, acting in the capacity of Sewer commissioners, hereby make and set forth the following regulations in connection with the municipal sewer system of the Town of Ipswich.

ARTICLE I
DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in this regulation shall be as follows:

Section 1. "BOD: (Denoting Biochemical Oxygen Demand) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20°C, expressed in milligrams per liter.

Section 2. "Building Drain" shall mean that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipe inside the walls of the building and conveys it to the building sewer, beginning five (5) feet (1.5 meters) outside the inner face of the building wall.

Section 3. "Building Sewer" shall mean the extension from the building drain to the public sewer or other place of disposal.

Section 4. "Combined Sewer" shall mean a sewer receiving both surface runoff and sewage.

Section 5. "Garbage" shall mean solid wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the handling, storage, and sale of produce.

Section 6. "Industrial Wastes" shall mean the liquid wastes from industrial manufacturing processes, trade, or business as distinct from sanitary sewage.

Section 7. "Natural Outlet" shall mean any outlet into a watercourse, pond, ditch, lake, or other body of surface or groundwater.

Section 8. "Person" shall mean any individual, firm, company, association, society, corporation, group, or partnership.

Section 9. "pH" shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution.

Section 10. "Properly Shredded Garbage" shall mean the wastes from the preparation, cooking, and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half (1/2) inch (1.27 centimeters) in any direction.

Section 11. "Public Sewer" shall mean a sewer in which all owners of abutting properties have equal rights, and is controlled by public authority.

Section 12. "Sanitary Sewer" shall mean a sewer which carries sewage and to which storm, surface, and groundwaters are not intentionally admitted.

Section 13. "Sewage" shall mean a combination of the water-carried wastes from residences, business buildings, institutions, and industrial establishments, together with such ground, surface, and stormwaters as may be present.

Section 14. "Sewage Treatment Plant" shall mean any arrangement of devices and structures used for treating sewage exclusive of septic tanks, leach fields, cesspools, etc.

Section 15. "Sewage Works" shall mean all facilities for collecting, pumping, treating and disposing of sewage.

Section 16. "Sewer" shall mean a pipe or conduit for carrying sewage.

Section 17. "Shall" is mandatory: "May" is permissive.

Section 18. "Slug" shall mean any discharge of water, sewage, or industrial waste which, in concentration of any given constituent or in quantity of flow, exceeds for any period of

duration longer than fifteen (15) minutes, more than five (5) times the average twenty four (24) hour concentration of flows during normal operation.

Section 19. "Storm Drain" (sometimes termed "Storm Sewer") shall mean a sewer which carries storm and surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted cooling water.

Section 20. "Town Engineer" shall mean the Town Engineer of the Town of Ipswich, or his authorized deputy, agent, or representative.

Section 21. "Suspended Solids" shall mean solids that either float on the surface or are in suspension in water, sewage, or other liquids, and which are removable by laboratory filtering.

Section 22. "Watercourse" shall mean a channel in which a flow of water occurs, either continuously or intermittently.

Section 23. "Sewage Disposal Installer" shall be a person who is properly licensed by the Board of Sewer Commissioners to install sewers in the Town of Ipswich. Any person desiring to become a "Sewage Disposal Installer" must apply in writing to the Ipswich Sewer Division at the Town Hall Annex on a form available at that office. The cost of the application is $50.00 for one year for a period from July 1 to June 30 of the following year. This license is renewable each year, and the application fee is required with each renewal application. In signing the application, the person agrees to perform all work in laying "Building Sewers" in accordance with these regulations and to the satisfaction of the Town Engineer. The installer will be responsible for making repairs to all underground or overhead utilities, and further agrees to meet all requirements set forth in the street opening permit obtained at the Public Works Department Office. should the licensed installer fail to perform his work in accordance with these requirements, his license may be revoked by the Board of Sewer Commissioners.

Section 24. "Private pressure sewer" shall mean a privately-owned and -installed sewer for the conveyance of domestic sewage, usually of small diameter and intended to serve one or a small number of dwelling units, operated under pressure generated by a pump or pumps owned and operated by the installing party. A private pressure sewer is installed at the motion of a private party, for the benefit of said private party. Such private pressure sewers are normally laid at or near the same profile as the surface grade, at a sufficient depth to avoid frost action. Sewage grinder systems discharging comminuted raw sewage, and septic tank effluent systems (STEP sewers) are included within this definition.

ARTICLE II
BUILDING SEWERS AND CONNECTIONS

Section 1. No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the Town Engineer. Any person proposing a new discharge into the system or substantial change in the volume or character of pollutants that are being discharged in to the system shall notify the Town Engineer at least forty-five (45) days prior to the proposed change or connection. No person whose building is served, or to be served, by a private well water supply shall be authorized to connect and/or use a sewer governed under these rules and regulations unless said person shall have installed a sewage flow meter of a type acceptable to the Town Engineer, or alternatively a meter on the private well water supply, the reading of either of which meters shall serve as the basis for billing sewer user charges. Moreover, no occupancy permit shall be issued under the State Building Code, and no certificate of compliance shall be issued pursuant to Section 13 of this Article, unless and until the metering requirements of this Section shall have been met to the satisfaction of the Department of Utilities.

Section 2. There shall be three (3) classes of building sewer permits: (a) for single family residential service; (b) for multifamily residential service; and (c) for service to buildings producing industrial or commercial liquid wastes. The owner or his agent shall make application for service on a form provided by the Town. Said permit application shall be supplemented by plans, specifications and/or any other information considered pertinent in the judgment of the Town Engineer. Permit and inspection fees shall be paid to the town at the time the application is filed, in accordance with the following schedule.

Single Family Residential	$200.00
Multifamily Residential	$200.00/Dwelling Unit
Commercial & Industrial	$400.00; if flow metering is required, the fee shall be determined by the Sewer commissioners based upon recommendation from the Town Engineer

Section 3. All costs and expenses incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the Town from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer, except that the Town will supply a riser at the public sewer if it is required. (See Section 6 below.)

Section 4. A separate and independent building sewer shall be provided for every building, except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, in which instance the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer.

Section 5. Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the Town Engineer, to meet all requirements of these regulations.

Section 6. The size, slope, alignment, materials of construction of a building sewer and the methods to be used in excavating, placing of the pipe, jointing, testing, and backfilling the trench,

shall all conform to the following: The specifications for sewer house connections are as follows: Five inch transite pipe and fittings or other type approved by the Town Engineer shall be required. A 4 inch or larger, extra heavy cast iron pipe must be placed through or under the cellar wall to a distance of 5 feet from said wall. A lead joint shall be required at the junction of the transite, or other approved pipe and cast iron pipe, at the branch fitting of the lateral sewer (unless a ringtite joint can be made). Road surface shall be pre-cut to avoid damaging surface surrounding the trench. The trench shall not exceed 3 feet in width; no pipe shall be laid at a pitch less than 1/4 inch per foot (2%). The trench in the street shall conform to all requirements set forth on the street opening permit. The licensed installer shall be responsible for repairing any damage to public utilities (water, sewer, gas, or electricity), or to Town trees, shrubs, poles, or signs, which take place while doing the work or on account thereof. The licensed installer shall be responsible for the upkeep of the sewer connection trench in the street for 2 years after the date of completing the installation. Where the entrance to the public sewer requires the use of a riser, the Sewer Division shall construct the same at no cost to the owner. The Town Engineer shall decide if a riser is necessary. A manhole or cleanout shall be required with any change in direction of the sewer connection of greater than 30°, and in such case the manhole or cleanout shall be constructed as directed by the Town Engineer. connections may be laid under the cellar floor. All trenches shall be tamped when backfilled in a manner satisfactory to the Town Engineer.

Section 7. Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the building sewer.

Section 8. No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or ground water to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer.

Section 9. The connection of the building sewer in to the public sewer shall conform to the requirements of the building and plumbing code or other applicable rules and regulations of the Town, or the procedures set forth in appropriate specifications of the A.S.T.M. and the W.P.C.F. Manual of Practice No. 9. All such connections shall be made gaslight and watertight. Any deviation from the prescribed procedures and materials must be approved by the Town Engineer before installation.

Section 10. The sewer installer shall notify the Town Engineer when the building sewer and the sewer connection are ready for inspection and final connection to the public sewer. The connection shall be made under the supervision of the Town Engineer or his representative.

Section 11. All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored in a time and manner satisfactory to the Town.

Section 12. The Town will not be responsible for water leaking into the owner’s cellar as a result of construction of the building sewer. Adequate precautions against this should be taken by the sewer installer and are the responsibility of the owner.

Section 13. Private pressure sewers connected to the municipal sanitary sewer system shall be considered extensions of the Town of Ipswich sewage collection and treatment system, and therefore within the public way shall be defined as public sewers and shall be subject to all the bylaws and rules and regulations pertaining to sewers. No private pressure sewer system may be extended, either from an existing public way or from a public easement, except to provide service to a lot which has an on-site disposal works system which has been determined by the Ipswich Board of Health to be in failure. [Amended 2/1/99]

a. Private pressure sewer extensions shall be subject to such design standards as may now be in effect or as may be adopted in the future by the Town, acting through its Board of Sewer Commissioners and/or by its Board of Health.

b. Such private pressure sewer extensions shall be designed by and installed under the supervision of a registered professional engineer (sanitary), and shall be installed only by a licensed sewage disposal installer, upon receipt of an installation permit and a street opening permit. Plans shall be submitted to the Department of Utilities for review and approval, together with payment of a building sewer permit and inspection fee as prescribed in Section 2 of the Article, plus a refundable deposit of two hundred dollars ($200) for preparation of and submission to the Town of as-built plans.

c. The maintenance, repair, and replacement of private pressure sewers laid in the public way shall be the responsibility of the installer/owner. Said installer/owner shall hold the Town harmless with respect to any damage or interruption thereto, including, without limitation, damage or interruption resulting from utility installation, repair or replacement in the public way and from maintenance, repair, resurfacing, or realignment of the public way. In the event a private pressure sewer fails or malfunctions and the Town remedies the failure or malfunction, the Town shall assess all those parties connected to said private pressure sewer for said repair or replacement in the same manner as it assesses charges for the installation of sewer service pipe and service branches. [Amended 2/1/99]

d. Any easement or other interest over private property required for the installation of a private pressure sewer shall convey no right to, nor impose any responsibility upon, the Town. All instruments conveying such property interest(s) shall be timely filed, and attested copies shall be submitted with the owner/installer's application for an installation permit.

e. That portion of a private pressure sewer extension permitted to be installed in a public way shall be designed in anticipation of future flows from additional connections thereto as may be reasonable anticipated from abutting properties with on-site systems existing at the time such extension was permitted, thereby precluding the need for multiple, parallel private pressure sewers in the same public way, and further shall be permitted on the condition that the Sewer Commissioners, in their sole discretion, may approve additional connections thereto for other failed systems. [Amended 2/1/99]

f. No STEP system shall be permitted unless it provides for appropriate aeration and chlorination of the sewage, in order to prevent nuisance conditions and/or corrosion within the municipal sewer system.

g. Any new user connecting to the municipal sanitary sewer system by a private pressure sewer shall be charged the customary and regular sewer use and connection charges and any other regular fees incidental to said connection; if said installation is not at the expense of the Town, said user shall be exempt from such betterments as are assessed for the installation of public sewers. The provisions of the foregoing sentence to the contrary notwithstanding, in the event the Town subsequently installs a municipal sewer line, the installer of (and any subsequent connectee to) a private pressure sewer shall be required to connect to the new municipal system, and shall be subject to the then applicable betterment and service lateral fees, but shall not be required to pay a connection fee. [Effective 10/1/96]

ARTICLE III
USE OF THE PUBLIC SEWERS

Section 1. No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process waters to any sanitary sewer.

Section 2. Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as storm sewers, or to a natural outlet approved by the Town Engineer. Industrial cooling water or unpolluted process waters may be discharged, on approval of the Town Engineer, to a storm sewer or natural outlet. (Amended 3/26/90)

Section 3. No person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewers:

a. Any gasoline, benzane, naptha, fuel oil, or other flammable or explosive liquid, solid, or gas.

b. Any waters or wastes containing toxic or poisonous solids, liquids, or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plant.

c. Any waters or wastes having a pH lower than 6.5 or greater than 8.5, or having any other property capable of causing damage or hazard to structures, equipment, and personnel of the sewage works. (Amended 3/26/90)

d. Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers or other interference with the proper operation of the flow in sewers or other interference with the proper operation of the sewage works such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, underground garbage, whole blood, manure, entrails, paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders. (Amended 3/26/90)

Section 4. No person shall discharge or cause to be discharged the following described substances, materials, waters, or wastes if it appears likely in the opinion of the Town Engineer that such wastes can harm either the sewers, sewage treatment process, or equipment, have an adverse affect on the receiving stream, or would otherwise endanger life, limb, public property, or constitute a nuisance. In forming his opinion as to the acceptability of these wastes, the Town Engineer shall give consideration to such factors as the quantities of subject wastes in relation to flows and velocities in the sewers, materials of construction of the sewers, nature of the sewage treatment process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant, and other pertinent factors. The substances prohibited are:

a. Any liquid or vapor having a temperature higher than (150°F) (65° C)

b. Any water or waste containing fats, wax, grease, or oils, whether emulsified or not, in excess on 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32°F and 150°F (65°C)

c. Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of 3/4 horsepower (0.76 hp metric) or greater shall be subject to the review and approval of the Town Engineer.

d. Any waters or wastes containing strong acid, pickling wastes, or concentrated plating solutions, whether neutralized or not.

e. Any waters or wastes containing iron, nickel, chromium, copper, zinc, cadmium, arsenic, boron, manganese, beryllium, lead, mercury, or similar or objectionable or toxic substances or wastes exerting an excessive chlorine requirement, to such degree that any such material received in the composite sewage at the sewage treatment works exceeds the limits established by the Town engineer for such materials. (3/3/88)

f. Any waters or wastes containing phenols or other taste- or odor-producing substances, in such concentrations exceeding limits which may be established by the Town Engineer as necessary, after treatment of the composite sewage, to meet the requirements of the State, Federal, or other public agencies or jurisdictions for such discharge to the receiving waters. (3/3/88)

g. Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the Town Engineer in compliance with applicable State or Federal regulations. (3/3/88)

h. Any waters or wastes having a pH in excess of 9.5. (3/3/88)

i. Materials which exert or cause:

(1) Unusual concentrations of inert suspended solids (such as, but not limited to fullers earth, lime slurries, and lime residues) or of dissolved solids (such as, but not limited to, chloride and sodium sulfate).

(2) Excessive discoloration (such as, but not limited to, dye wastes and vegetable tanning solutions).

(3) Unusual BOD, chemical oxygen demand, or chlorine requirements in such quantities as to constitute a significant load on the sewage treatment works.

(4) Unusual volume of flow or concentration of wastes constituting “slugs” as defined herein. (3/3/88)

j. Waters or wastes containing substances which are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirements of other agencies having jurisdiction over discharge to the receiving waters. (3/3/88)

Section 5. If any waters or wastes are discharged, or are proposed to be discharged, to the public sewers, which waters contain the substances or possess the characteristics enumerated in Section 4 of this Article, and which, in the judgment of the Town Engineer, may have a deleterious effect upon the sewage works, processes, equipment, or receiving waters, or which otherwise create a hazard to life or constitute a public nuisance, the Town Engineer may:

a. Reject the wastes;

b. Require pretreatment to an acceptable condition for discharge to the public sewers;

c. Require control over the quantities and rates of discharge; and/or

d. Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges.

If the Town Engineer permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the Town Engineer and subject to the requirements of all applicable codes, regulations, and laws. (3/3/88)

Section 6. Grease, oil, and sand interceptors shall be provided when, in the opinion of the town Engineer, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Town Engineer and shall be located as to be readily and easily accessible for cleaning and inspection.

Section 7. Where preliminary treatment or flow-equalizing facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at his expense.

Section 8. When required by the Town Engineer, the owner of any property serviced by a building sewer carrying industrial wastes shall install a suitable control manhole, together with such necessary meters, and other appurtenances in the building sewer to facilitate observation, sampling, and measurement of the wastes. Such manhole, when required, shall be accessible and safely located, and shall be constructed in accordance with plans approved by the Town Engineer. The manhole shall be installed by the owner at his expense, and shall be maintained by him so as to be safe and accessible at all times.

Section 9. All measurements, tests, and analyses of the characteristics of waters and wastes to which reference is made in these regulations shall be determined in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater", published by the American Public Health Association, and shall be determined at the control manhole provided, or upon suitable samples taken at said control manhole. In the event that no special manhole has been required, the control manhole shall be considered to be the nearest downstream manhole in the public sewer to the point at which the building sewer is connected. Sampling shall be carried out by customarily accepted methods to reflect the effect of constituents upon the sewage works and to determine the existence of hazards to life, limb, and property. (The particular analyses involved will determine whether a 24-hour composite of all outfalls of a premise is appropriate or whether a grab sample or samples should be taken.)

Normally, but not always, BOD and suspended solids analyses are obtained from 24-hour composites of all outfalls, whereas pH's are determined from periodic grab samples. All industries discharging into a public sewer shall perform such monitoring of their discharges as the Town Engineer and/or other duly authorized employees of the Town may reasonably require, including installation, use, and maintenance of monitoring equipment, keeping records and reporting the results of such monitoring to the Town Engineer. Such records shall be made available upon request by the Town Engineer to other agencies having jurisdiction over discharges to the receiving waters.

ARTICLE IV
PROTECTION FROM DAMAGE

Section 1. No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance, or equipment which is a part of the sewage works. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct.

ARTICLE V
POWERS AND AUTHORITY OF INSPECTORS

Section 1. The town Engineer and other duly authorized employees of the Town bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling, and testing in accordance with the provisions of this regulation. The town Engineer or his representatives shall have no authority to inquire into any processes including metallurgical, chemical, oil, refining, ceramic, paper, or other industries beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways or facilities for wastes treatment.

Section 2. While performing the necessary work on private properties referred to in Article V, Section 1, above, the Town Engineer or duly authorized employees of the town shall observe all safety rules applicable to the premises established by the company, and the company shall be held harmless for injury or death to the Town employees, and the town shall indemnify the company against loss or damage to its property by Town employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions as required in Article III, Section 8.

Section 3. The Town Engineer and other duly authorized employees of the Town bearing proper credentials and identification shall be permitted to enter all private properties through which the Town holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair, and maintenance of any portion of the sewage works lying within said easement. All entry and subsequent work, if any on said easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved

ARTICLE VI
INSPECTION OF PROPERTY AT TIME OF SALE OR TRANSFER

Section 1. Purpose

This Article, governing real property connected to the Town's sanitary sewer system, is intended to be implemented upon transfer of real property, in a manner similar to that provided under 310 C.M.R. Title 15.000. The purpose of this Article is to ensure that no real property be conveyed with any illigal connection to the Town of Ipswich wastewater collection and treatment system. To the extent the provisions set forth in this Article ("Rules and Regulations") vary from or are inconsistent with 310 C.M.R. Title 15.000, these rules and regulations shall govern.

Section 2. Definitions

A. "Person" - any individual, firm, association, partnership, corporation or chief executive officer or general manager of any firm, association, partnership or corporation, including heir, executor, administrator, and/or successor and assign.

B. "Illegal Connection" - any condition on any real property which permits the introduction into the public wastewater treatment system of any surface water or ground water not otherwise required by law to be treated as wastewater. This definition includes, but is not limited to, downspouts, roof drains, sump pumps, and surface water drains or pipes ("Infiltration/Inflow Conditions").

C. "Transfer" - the conveyance of any interest in real property, with or without consideration, whether by deed, lease, assignment or any other form of transition and whether or not the transfer is to a person related by blood or marriage to the transferor, but including neither a mortgage nor a change in the form of ownership among the same owners (such as placing real property within a family trust of which the owners are the beneficiaries).

D. "Real Property" - any real property on which is situated any building which has been improved with a connection to the public wastewater collection and treatment system operated by the Town (hereinafter "Town").

E. "Certificate of Compliance" - a certificate issued by the Town of Ipswich Department of Utilities (hereinafter in this Article referred to as "Department") stating that such real property has been inspected and found to be in compliance with these Rules and Regulations and with Chapter XV, Section 15 of the General By-Laws of the Town.

Section 3. Application Procedure

A. Any person transferring any interest in any real property shall, prior to making such transfer, apply to the Department for a certificate of compliance on a form provided by the Town and, upon receipt of a certificate of compliance, or of non-compliance, as applicable, shall submit a copy of same to the buyer or other person acquiring title to such real property.

B. The Department shall cause the real property to be inspected for compliance with these Rules and Regulations and within fourteen (14) calendar days shall issue a certificate of

compliance, or shall issue a certificate of non-compliance which identifies the nature of the non-compliance and the action required by the applicant to achieve compliance. Failure of the Department to conduct an inspection of the property or to issue a certificate of compliance or a certificate of non-compliance within said fourteen (14) day period shall be deemed as an approval of the application, provided the Department has been given reasonable opportunity to access the premises within said fourteen (14) day period.

C. Real property shall be inspected for compliance with these Regulations at or within nine (9) months prior to the time of transfer. If weather conditions preclude inspection at the time of transfer, the inspection may be completed as soon as weather permits, but in no event later than six (6) months after the transfer. The seller shall notify the buyer in writing of the requirements of these regulations. A Certificate of Compliance shall be valid for a period of two (2) years from the date of issuance. A Certificate of Compliance issued for a lot having a community connection to the sanitary sewer system and/or a community drainage system serving its improvements shall be deemed to apply to all real property then in existance on the lot at the time of issuance of the Certificate of Compliance for the life of the Certificate.

Section 4. Correction of Violations

A. If an applicant is notified of a violation and has corrected the non-compliance, he/she shall notify the Department of the correction on a form provided by the Town. Within fourteen (14) days after receipt of the notice of correction, the Department shall cause the real property to be reinspected. If the inspection demonstrates that the non-compliance has been corrected, the Department shall issue a certificate of compliance within five (5) days after completion of the inspection.

B. If a reinspection demonstrates that the non-compliance has not been corrected to the Rules and Regulations of the Town, a second notice of non-compliance shall be issued to the applicant, and the procedure for correction and certification of correction shall be the same as for an original inspection. All non-compliance shall be corrected within six months of transfer of such real property.

Section 5. Prohibitions

A. No person shall cause or permit the introduction of surface water or ground water into the public wastewater treatment system operated by the Town in violation of these Rules and Regulations.

B. No person shall use, modify, or alter any “illegal connection” in any way unless with approval by the Department and in accordance with these Rules and Regulations, to achieve compliance with these Rules and Regulations.

C. No person shall fail to take necessary corrective actions, as directed by the Department, arising from an inspection and issuance of a certificate of non-compliance.

D. No person shall fail to obtain an inspection in accordance with these Rules and Regulations when and as required.

Section 6. Inspection Procedures

A. By making an application, the applicant grants to the Town the right of entry onto the applicant's property for the purpose of making the necessary inspection required under these Rules and Regulations. Entry shall not occur except upon prior notice to the applicant and only during regular business hours or at another reasonable time acceptable to the applicant.

B. The inspection shall consist of one or more of the following procedures, as deemed applicable By the Department:
   1. Visual inspection of all exposed piping and drainage systems inside and outside of the building;
   2. Smoke testing by a commonly accepted method; and/or
   3. Dye testing by any commonly accepted method.

Section 7. Fees

Each application under this bylaw shall be accompanied by a non-refundable application and inspection fee of $40; for every reinspection required, the applicant shall pay an additional $25 reinspection charge.

Section 8. Penalties

Any person who violates any of the provisions of these Rules and Regulations shall be subject to a penalty in a summary proceeding or civil collection proceeding in an amount not exceeding $300 for each violation. Each day that a violation continues after notice thereof has been provided to the violator shall be considered a separate violation.

Section 9. Severability

The sections and subsections of these Rules and Regulations shall be deemed to be severable. A determination that any section or subsection of these Rules and Regulations is unenforceable shall not affect the enforceability of any other section or subsection.

(Article VI Adopted Effective 4/1/97)

DIVISION III

LEGISLATIVE AUTHORIZATIONS FOR THE DEVELOPMENT OF THE SEWER SYSTEM, BETTERMENT AND CONNECTION CHARGES

INTRODUCTION

This Division contains sections which are Legislative Acts adopted specially for the Town of Ipswich, Town Meeting acceptance of enabling legislation, and relevant general legislation not inconsistent therewith.

ARTICLE I
DEVELOPMENT OF THE SEWER SYSTEM

An Act Authorizing the Town of Ipswich to Construct and Operate a System of Sewers (Chapter 30, Acts of 1946, as amended). This Act was approved by the Legislature February 12, 1946, and accepted by Town Meeting March 11, 1946. Section 9 was amended by Chapter 508, Acts of 1962, which was approved May 31, 1962, and accepted by the 1963 Annual Town Meeting. Sections 7 and 9 were amended by Chapter 83 of the Acts of 1999, which was approved by the Town Meeting of April 6, 1998, and enacted by the legislature September 24, 1999 to be effective July 1, 1999.

Section 1. The Town of Ipswich may lay out, construct, maintain, and operate a system or systems of main drains and common sewers for a part or the whole of its territory with such connections and other works as may be required for a system of sewage disposal, and may construct such sewers or drains over and under land or tidewater in said Town as may be necessary to conduct the sewage to filter beds and treatment works and, for the purpose of providing better surface or other drainage, may make, lay, and maintain such drains as it deems best. And for the purposes aforesaid the Town may, within its limits, make and maintain sub-drains.

Section 2. The Town may make and maintain in any way therein where main drains or common sewers are constructed, such connecting drains, underdrains, and sewers within the limits of such way as may be necessary to connect any estate which abuts upon the way.

Section 3. The Town may, at the meeting when this act is accepted, vote that the Selectmen shall act as a Board of Sewer commissioners. If the Town does not so vote at said meeting, the Town shall elect by ballot at any town meeting not later than the second annual meeting after the commencement of construction hereunder of a system of sewerage and sewage disposal, a board of three Sewer Commissioners who shall be citizens of the Town, to hold office, if elected at an annual meeting: one until the expiration of one year; one until the expiration of two years; and one until the expiration of three years from such annual town meeting and until their successors are qualified; or if elected at a special meeting: one until the expiration of one year; one until the expiration of two years; and one until the expiration of three years from the next succeeding annual town meeting and until their successors are qualified; and thereafter at each annual town meeting, the Town shall elect one member of the board to serve for three years and until his successor is qualified. Any selectmen shall be eligible to election to said board. In either case, whether the Town votes that its selectmen shall act as Board of Sewer Commissioners or elects a Board of Sewer Commissioners, the Town may at any time thereafter, by any or all the methods permitted by general law, provide for the election of a Board of three Sewer Commissioners, or that the selectmen may act as a Board of Sewer Commissioners, as the case may be.

NOTE: Chapter 620, Acts of 1966 (the Charter of the Town of Ipswich) provides that the Board of Selectmen shall constitute the Board of Sewer Commissioners.

Section 4. Said Board of Sewer Commissioners, acting for and on behalf of said Town, may take by eminent domain under Chapter 79 of the General Laws, or acquire by purchase or otherwise, any lands, water rights, rights of way or easements, public or private, in said Town, necessary for accomplishing any purpose mentioned in this act, and may construct

such main drains and sewers under or over any bridge, railroad, railway, boulevard or other public way, or within the location of any railroad, and may enter upon and dig up any private land, public way, or railroad location for the purpose of laying such drains and sewers and of maintaining and repairing the same, and may do any other thing proper or necessary for the purposes of this act, provided that they shall not take in fee any land of a railroad corporation and that they shall not enter upon or construct any drain or sewer within the location of any railroad corporation, except at such time and in such manner as they may agree upon with such corporation or, in case of failure to agree, as may be approved by the Department of Public Utilities.

Section 5. Until the Board of Sewer Commissioners has first been elected as provided in this act or the selectmen have first been authorized by vote to act as such board, as the case may be, but not in any event later than the second annual meeting after the commencement of the work of construction authorized hereby, the Town may carry on such work by a duly authorized committee of the Town. The committee shall serve without pay and shall have all the powers and authority given to the Board of Sewer Commissioners in this act or by general law. Whenever the phrase "said Board of Sewer Commissioners" or "said Board" hereinafter occurs, it shall mean and include the Board of Sewer Commissioners, the Selectmen acting as such, or the committee of the Town provided for in this section, as the case may be.

Section 6. Any person injured in his property by any action of said Board of Sewer Commissioners under this act may recover damages from said Town under said Chapter 79.

Section 7. The Town shall by vote determine what proportion of the cost of said system or systems of sewerage and sewage disposal the Town shall pay, provided that it shall pay not less than one fourth nor more than two thirds of the whole cost. In providing for the payment of the remaining portion of the cost of said system or systems or for the use of said system or systems, the Town may avail itself of any or all of the methods permitted by general laws, and the provisions of said general laws relative to the assessment, apportionment, division, reassessment, abatement, and collection of sewer assessments. Liens therefor and interest thereon shall apply to assessments made under this act. At the same meeting at which it determines the proportion of the cost which is to be borne by the Town, it may by vote determine by which of such methods the remaining portion of said cost shall be provided for. The collector of taxes of said Town shall certify the payment or payments of such assessments or apportionments thereof to the Sewer Commissioners, or to the selectmen acting as such, who shall preserve a record thereof. Notwithstanding the provisions of the first sentence to the contrary, if the owners of not less than 75 per cent of the land abutting a proposed sewer project, calculated on the basis of total frontage of those lots to be served by said project, petition the sewer commissioners for construction of an extension of the sewer system subject to betterment, the sewer commissioners may assess betterments up to 100 per cent of the cost of such extension to the sewer system.

NOTE: See Section 15 below; also, Division III, Article III, Section 3 Note

Section 8. For the purpose of paying the necessary expenses and liabilities incurred under this act, the Town may borrow such sums as may be necessary not exceeding, in the aggregate, $600,000, and may issue bonds or notes therefor which shall bear on their face the words "Ipswich Sewerage Loan, Act of 1946". Each authorized issue shall constitute a separate loan. Indebtedness incurred under this act shall be in excess of the statutory limit, but

shall, except as provided herein, be subject to Chapter 44 of the General Laws, inclusive of the limitation contained in the first paragraph of Section 7 thereof.

Section 9. The income of the sewer system shall be appropriated to defray all operating expenses, interest charges and payments on the principal as they accrue upon any bonds or notes issued for the purpose of the sewer system or an extension thereof. If in any fiscal year there should be a net surplus remaining after providing for the aforesaid charges for that fiscal year, such surplus, or so much of said net surplus as may be necessary to reimburse the town's general fund for any net deficit as may have been incurred in any prior fiscal year after the effective date of this section, shall be paid into the town's general fund, and the sewer commissioners shall adjust the sewer rentals and charges for the succeeding fiscal year to meet not only its aforesaid projected operating expenses and debt service, but also to fully reimburse the town's general fund for any net deficit as may remain outstanding. If in any fiscal year there should be a net surplus after providing for the aforesaid charges and for the payment of any reimbursement in full, such surplus may be appropriated for such new construction, extraordinary maintenance, or repairs, as the sewer commissioners, with the approval of the town, may determine. Said commissioners shall annually, and as often as the town may require, render a report upon the condition of the sewer system under their charge, and an account of their activities including an account of the receipts and expenditures.

Section 10. Said Board of Sewer Commissioners may annually appoint a clerk and may appoint a superintendent of sewers who shall not be a member of the Board, and shall define their duties. It may remove the clerk or superintendent at its pleasure. Said Board may, at its discretion, prescribe for the users of said sewer systems such annual rentals or charges based upon the benefits derived therefrom as it may deem proper, subject, however, to such rules and regulations as may be fixed by vote of the Town.

Section 11. All contracts made by the Board of Sewer Commissioners shall be made in the name of the Town and shall be signed by the Board, but no contract shall be made or obligation incurred by said Board for any purpose in excess of the amount of money appropriated by the Town therefor.

Section 12. Said Board may from time to time prescribe rules and regulations for the connect-on of estates and buildings with main drains and sewers and for inspection of the materials, the construction, alteration and use of all connections and drains entering into such main drains or sewers, and may prescribe penalties, not exceeding $20, for each violation of any such rule or regulation. Such rules and regulations shall be published at least once a week for three successive weeks in some newspaper published in the Town of Ipswich, if there be any, and if not, then in some newspaper published in the County of Essex, and shall not take effect until such publications have been made.

Section 13. No act shall be done under authority of the preceding sections, except in the making of surveys and other preliminary investigations, until the plans for said system of sewerage and sewage disposal have been approved by the State Department of Public Health. Upon application to said Department for its approval, it shall give a hearing, after due notice to the public. At such hearing plans showing in detail all the work to be done in constructing said system of sewerage and sewage disposal shall be submitted for approval by said Department.

Section 14. This act shall be submitted for acceptance to the voters of the Town of Ipswich at a town meeting within five years after its passage, in the form of the following question which

shall be placed upon the official ballot to be used at said meeting: "Shall an act passed by the general court in the year nineteen hundred and forty-six entitled, 'An Act authorizing the Town of Ipswich to construct and operate a system of sewers'. be accepted?" If a majority of the votes in answer to said question is in the affirmative, then this act shall thereupon take full effect, but not otherwise.

Section 15. The Annual Town Meeting, May 2, 1978, under Article 36 voted "... to determine that proportion of the cost of systems of sewerage and sewage disposal which shall be paid by the Town shall be fifty percentum (50%) under the provisions of Section 7 of Chapter 30 of the Acts of 1946 and to rescind any inconsistent action of any prior Town Meeting."

Section 16. By vote of the 1979 Annual Town Meeting, April 3, 1979, under Article 24, Town of Ipswich By-Laws, Chapter XV, Section 9 was amended to read as follows: "Section 9, Sewer Tie-ins. All buildings heretofore or hereafter erected on any lot of land adjoining the sewerage system of the Town of Ipswich shall be required to tie in by pipeline to the said sewerage system and to dispose of such sewerage through such tie-in; in the event and only in the event the Board of Health so rules in writing pursuant to a vote thereof that a public health nuisance does not exist on a given lot, the Sewer Commissioners, upon written application therefor, may grant an exemption to this requirement. The owners of buildings in the Town of Ipswich shall be responsible for compliance with this section. Each day of continued noncompliance with this section shall be deemed to be a separate violation."

ARTICLE II
PAYMENT OF ANNUAL USER CHARGES, BETTERMENT ASSESSMENTS AND THE PAYMENT OF INTEREST THEREON

Section 1. Pursuant to a vote under Article 37, 1978 Annual Town meeting, the Town accepted the provisions of Chapter 83, Sections 16A through 16F inclusive (Chapter 586, Acts of 1977).

Section 16A. Tax Liens for Unpaid Annual Sewer Charges.
If the rates and charges due to a city, town or sewer district which accepts this section and sections 16B to 16F, inclusive, by vote of its city council or of the voters in towns or districts and which, by its clerk, files a certificate of such acceptance in the proper registry of deeds, for supplying or providing for a sewer system or rendering service or furnishing materials in connection therewith to or for any real estate at the request of the owner or tenant are not paid on or before their due date as established by local regulations, ordinances or by-laws, which due dates shall be so established as to require payments at least as often as annually, such rates and charges, together with interest thereon and costs relative thereto, shall be a lien upon such real estate as provided in Section 16B. The register of deeds shall record such certificate of acceptance in a book to be kept for the purpose, which shall be kept in an accessible location in the registry. Sections 16B to 16F, inclusive, shall also apply to a sewer district which has accepted Sections 16A to 16F , inclusive, and whose clerk has filed the certificate of acceptance. Wherever in said Sections the words "board or officer in charge of the sewer department' or their equivalent appear, they shall also mean and include the officers exercising similar duties in any city, town or district. A fire or water district authorized to provide a sewer system shall, for the purposes of Sections 16A to 16F, inclusive, be deemed to be a sewer district.

Section 16B. Tax Liens: Effective Dates; Termination Dates; Recovery of Rates and Charges. Such lien shall take effect by operation of law on the day immediately following the due date of such rate or charge and, unless dissolved by payment or abatement, shall continue until such rate or charge has been added to or committed as a tax under Section 16C and thereafter, unless so dissolved, shall continue as provided in Section 37 of Chapter 60, except that the date provided for termination of the lien in case of a recorded alienation shall be at the expiration of two years from October 1st of the year of such addition or committal. Anything in this section to the contrary notwithstanding, if any such rate or charge is not added to or committed as a tax under Section 16C on or before December 31st of the year immediately following the year in which such rate or charge shall terminate on October 1st of the third year following the year in which such rate or charge becomes due. Notwithstanding such lien, any such overdue rate or charge may be collected through legal means, including the shutting off of a sewer connection, which may be deemed advisable, provided that after the termination of such a lien, no city, town or sewer district shall attempt to enforce by shutting off the sewer connection, collection of such rate or charge from any person not liable therefor, who has succeeded to the title or interest of the person incurring such rate or charge. All such rates and charges excluded by court decree under Section 76B of

Chapter 60 shall, to the extent that they were properly chargeable to the person owning or to the tenant occupying the premises for which such rates and charges were incurred, be recoverable from such person or tenant, as the case may be, in an action of contract or otherwise. If at the time of the entry of such decree such person or tenant is still the owner or tenant of the premises, whether through redemption or otherwise, such rates and charges, to the extent that they were properly chargeable to him, may be enforced in any other manner provided or available for collection and enforcement of sewer connection rates and charges.

Section 16C. Adding Unpaid Charges to Tax on Property.
If a rate or charge for which a lien is in effect under Section 16B has not been added to or committed as a tax and remains unpaid when the assessors are preparing a real estate tax list and warrant to be committed by them under Section 53 of chapter 59, the board or officer in charge of the sewer department, or the town collector of taxes if applicable under Section 38A of Chapter 41, shall certify such rate or charge to the assessors, who shall forthwith add such rate or charge to the tax on the property to which it relates and commit it with their warrant to the collector of taxes as a part of such tax. If the property to which such rate or charge relates is tax exempt, such rate or charge shall be committed as the tax.

Section 16D. Interest of Taxes.
Except as otherwise provided, the provisions of Chapters 59 and 60 shall apply, so far as pertinent, to all rates and charges certified to the assessors under Section 16C. Without limiting the generality of the foregoing, upon commitment as a tax or part of a tax under said Section 16C, all such rates and charges shall be subject to the provisions of law relative to interest on the taxes of which they become or, if the property were not tax exempt would become, a part; and the collector of taxes shall have the same powers and be subject to the same duties with respect to such rates and charges as in the case of annual taxes upon real estate, and the provisions of law relative to the collection of such annual taxes, the sale or taking of land for the nonpayment thereof and the redemption of land so sold or taken shall, except as otherwise provided, apply to such rates and charges.

Section 16E. Abatement of Taxes.
An owner of real estate aggrieved by a charge imposed thereon under Sections 16A to 16F, inclusive, in addition to such remedy as he may have under Section 10 of Chapter 165, may apply for an abatement thereof by filing a petition with the board or officer having control of the sewer department within the time allowed by law for filing an application for abatement of the tax of which such charge is, or if the property were not tax exempt, would have been, a part, and if such board or officer finds that such charge is more than is properly due, a reasonable abatement shall be made; and, except as otherwise provided herein, the provisions of Chapter 59 relative to the abatement of taxes by assessors shall apply, so far as applicable, to abatements hereunder. If such petition is denied in whole or in part, the petitioner may appeal to the appellate tax board upon the same terms and conditions as a person aggrieved by the refusal of the assessors of a city or town to abate a tax.

Section 16F. Recovery By Landlord Against Tenant for Charges.
An owner of real estate who, in order to prevent the imposition of a lien thereon or to discharge the same, has paid charges for sewer connections furnished to a tenant or other person who was bound to pay the same, may recover from such tenant or other person in an action of contract the amount of the charges so paid with all incidental costs and expenses.

Section 2. Pursuant to a vote on Article 32, Annual Town Meeting, April 3, 1979, the following enabling legislation was accepted by the Town of Ipswich (Chapter 749, Acts of 1978, amending Chapter 80, Section 13 and adding a new Section 13B):

Section 13B. In a city or town which accepts the provisions of this section, the board making the order for the assessment of any betterment, or balance of any assessment apportioned in accordance with the provisions of Section 13, shall, upon the application of the owner of the real property assessed if such owner is eligible for an exemption under clause 41A of Section 5 of Chapter 59, enter into a deferral and recovery agreement with such owner on behalf of the city or town. Any such application shall be filed with said board within six months after notice of such assessment has been sent out by the collector. Such application may be filed with the clerk or secretary of said board or delivered by mail or otherwise at their office.

The said agreement shall provide:

a. that no sale or transfer of such real property may be consummated unless the betterment assessment which would otherwise have been collected on such real property has been paid, with interest as applied in accordance with the provisions of Section 13;
b. that upon the demise of the owner of such real property, the heirs-at-law, assignees or devisees shall have first priority to said real property by paying in full the total betterment assessment which would otherwise have been due, plus interest; however, if such heir-at-law, assignee or devisee is a surviving spouse who enters into a betterment assessment deferral and recovery agreement under this section, payment of the betterment assessment and interest due shall not be required during the life of such surviving spouse.
c. that if the betterment assessments due, plus interest, are not paid by heir-at-law, assignee or devisee, or if payment is not postponed during the life of a surviving spouse, such betterment assessments and interest shall be recovered from the estate of the owner; and
d. that any joint owner or mortgagee holding a mortgage on such property has given written prior approval for such agreement, which written approval shall be made a part of such agreement. In the case each betterment assessment deferral and recovery agreement entered into between said board making the order for the assessment of a betterment and the owner or owners of such real property, said board shall forthwith cause to be recorded in the registry of deeds of the county or district in which the city or town is situated a statement of their action which shall constitute a lien upon the land covered by such agreement for such betterment assessment as has been assessed under the provisions of this chapter, plus interest as hereinafter provided. The statement shall name the owner or owners and shall include a description of the land. Unless such a statement is recorded, the lien shall

not be effective with respect to a bona fide purchaser or other transferee without actual knowledge of such lien. The filing fee for such statement shall be paid by the city or town and shall be added to and become a part of the taxes due.

Section 3. Section 13 of said Chapter 80 is hereby amended by striking out the first sentence, as most recently amended by Section 1 of Chapter 216 of the Acts of 1977, and inserting in place thereof the following sentence: "Assessments made under this Chapter shall bear interest at one rate of five percent per annum or, at the election of the city or town at a rate equal to two percent above the rate of interest chargeable to the city or town, for the betterment project to which the assessments relate, from the 30th day after assessments have been committed to the collector."

NOTE: The 1979 Annual Town Meeting, under Article 32, elected for an interest rate equal to two percent above the rate of interest chargeable to the Town for the betterment project to which the assessments relate, from the 30th day after assessments have been committed to the collector.

Section 4. Other legislative references relative to sewer betterments, connections, and user charges, not inconsistent with the Special Acts, by-laws, and accepted legislation, are outlined hereinbelow:

CONSTRUCTION AND MAINTENANCE OF SEWERS AND DRAINS

Chapter 83

Section 1. Laying Out, Construction, etc., of Sewers, etc.

A city or town may lay out, construct, maintain and operate a system or systems of common sewers and main drains in public or private ways for a part or the whole of its territory as adjudged necessary for the public convenience or the public health with such connections and other works as may be required for a system or systems of sewerage and drainage and sewage treatment and disposal. Such works for sewage treatment and disposal may include any wastewater treatment facility for treating, neutralizing or stabilizing sewage, including: treatment or disposal plants; the necessary intercepting, outfall and outlet sewers; pumping stations integral to such facilities; and equipment and appurtenances related to the foregoing. For the purposes of this chapter the word "Sewage" shall mean wastewater from homes, public buildings, commercial or industrial establishments, or any combination thereof, and shall include any surface or ground water that may be present therein.

A city or town may install and maintain, in any way therein where sanitary sewers are constructed, such connecting sewers within the limits of such way as may be necessary to connect any estate which abuts upon the way.

No act shall be done except in the making of surveys, reports and other preliminary investigations, until the plan for said system or systems of sewerage and sewage treatment and disposal has been approved by the Department of Public Health.

The aldermen of a city or selectmen, sewer commissioners, or road commissioners, acting for and on behalf of a city or town, may take by eminent domain under Chapter 79, or acquire by purchase or otherwise, any lands, rights or way or easements, public or

private, in said city or town necessary for accomplishing any purpose mentioned in this section, and may construct such sewers or drains under or over any bridge, railroad, railway, or public way, or within the location of any railroad, and may enter upon and dig up any private land, public way or railroad location for the purpose of laying such sewers or drains and of maintaining and repairing the same, and may do any other thing proper or necessary for the purpose of this section, provided that they shall not take in fee any land of a railroad corporation, and that they shall not enter upon or construct any sewer or drain within the location of any railroad corporation except at such time and in such manner as they may agree upon with such corporation or, in case of failure to agree, as may be approved by the Department of Public Utilities. Any person injured in his property by such action may recover damages from such city or town under Chapter 79.

Any city, town or district may enter into agreements and contracts with the Metropolitan District Commission for the purpose of making connections and for the collection, treatment and disposal of sewage. No connection shall be made until the plans have been approved by the Department of Public Health and, in instances within the Metropolitan Sewerage District, until the contract and plans are approved by the Metropolitan District Commission. The word "district", as used in this paragraph, shall be construed, so far as apt, as it is defined in Section 1A of Chapter 40.

Until the Board of Sewer Commissioners has first been elected or the selectmen have first been authorized by vote to act as such board, as the case may be, the Town may carry on such work by a duly authorized committee of the Town. Said committee shall serve without compensation and shall have all the powers and authority usually conferred upon a Board of Sewer Commissioners by law.

Section 2. Plans and Records.

Plans and descriptions of all main drains and common sewers belonging to a town, with a true record of the charges of making and repairing said drains and sewers and of all assessment therefor, shall be kept in the office of the Town Clerk or in such other office of the Town as the Town by ordinance or by-law may determine.

Section 3. Sewer Connections

The board or officers of a city or town having charge of the repair and maintenance of sewers may, upon request of the owner of land and payment by him of the actual cost thereof, construct a particular sewer from the street line to a house or building. A town may appropriate money for connecting estates within its limits with common sewers, and no estate shall, in any year in which such an appropriation is made, be connected with a common sewer except in the manner hereinafter provided. If bonds or notes are issued to pay the cost of making such connections, the assessments provided for in Section 24 shall be applied to the payment of such bonds or notes, If the Board of Health of a town making such appropriation shall order land abutting upon a public or private way in which a common sewer has been laid to be connected with such sewer, or if the owner of such land shall make to the board or officer having charge of the maintenance and repair of sewers application to connect his land with a common sewer, such board or officer shall make such connection.

Section 3A. Repair of Sewers in Private Ways.
The board or officers of a city or town having charge of the repair and maintenance of sewers may, at the request of the owner of land and payment by him of the actual cost thereof, repair a break in a sewer laid in a private way and remove any sewerage flowing from such break.

SEPARATION, PURIFICATION AND DISPOSAL OF SEWAGE

Section 5. Separate System of Plumbing.
In this section, surface or storm water and such other waters as shall be specified by the Department of Public Health shall be designated as sewage. When a town has provided both a drain for waters and a sewer for sewage in a public way, the owner of every parcel of land abutting on such way or connected with such drain or sewer shall arrange his plumbing so that the waters shall be kept separate from the sewage, and shall make such connections with the drain and sewer, respectively, that the waters shall pass into the drain and the sewage into the sewer in accordance with the directions of the board or officer having charge of the repair and maintenance of sewers in such town.

Section 6. Establishment of Sewage Disposal Works.
A town, with the approval of the Department of Environmental Quality Engineering, after a public hearing by said department of all parties interested, of which notice shall be given by publication in one or more newspapers, may purchase land within its limits, or take the same by eminent domain under Chapter 79, for the treatment, purification and disposal of sewage. Towns or persons owning or operating filter beds or other works for treatment, purification and disposal of sewage shall provide and maintain works adequate for the treatment of the sewage at all times, and shall operate such works in such manner as will prevent a nuisance therefrom or the discharge or escape of unpurified or imperfectly purified sewage or effluent into any stream, pond or other after, or other objectionable result.

Section 7. Prevention of Nuisance from Works.
If the Department of Environmental Quality Engineering determines upon examination that a filter bed or other works for the treatment, purification and disposal of sewage causes the pollution of a stream, pond or other water, or is likely to become a source of nuisance or create objectionable results in its neighborhood by reason of defective construction, inadequate capacity or negligence or inefficiency in maintenance or operation or from other cause, it may issue notice in writing to the town or person owning or operating such works requiring such enlargement or improvement in the works or change in the method of operation thereof as may be necessary for the proper maintenance and operation of the works and the efficient purification and disposal of the sewage. If said department determines after investigation that the unsatisfactory operation of a sewage disposal system is due wholly or partly to the discharge into the system of manufacturing waste or other substance of such character as to interfere with the efficient operation of said works, it may if necessary prohibit the entrance of such waste or other material, or may regulate the entrance thereof in to the system, or may

require the treatment of such waste or other material in such manner as may be necessary to prevent its interference with the operation of the works.

Section 8. Digging Up Public Ways.
No person shall dig up or make an excavation in a public way for the laying, altering or repairing of a drain or sewer without obtaining a written permit from the board or officer having charge of the maintenance and repair of sewers in the town in which such way is situated. Notwithstanding any contrary provision of any local ordinance or bylaw, no such permit shall, except in case of an emergency, be approved or issued by said board or officer until copies of the notices to public utility companies required by Section 40 of Chapter 82 have been filed with said board or officer by the applicant for such permit. Whoever violates any provision of this section shall be punished by a fine of not more than $50 for the first offense and not less than $50 nor more than $100 for any subsequent offense.

Section 10. Obstruction of Sewers; Connections, etc; Publication of Regulations, etc.
A city, town or sewer district may from time to time prescribe rules and regulations regarding the use of common sewers to prevent the entrance or discharge therein of any substance which may trend to interfere with the flow of sewage or the proper operation of the sewerage system and the treatment and disposal works, for the connection of estates and buildings with sewers, for the construction, alteration, and use of all connections entering into such sewers, and for the inspection of all materials used therein, and may prescribe penalties, not exceeding $20, for each violation of any such rule or regulation. Such rules and regulations shall be published at least once a week for three successive weeks in a newspaper published in the city or town, if there be any, and if not, then in a newspaper published in the county, and shall not take effect until such publications have been made.

Section 11. Requirement of Connection with Sewer.
The Board of Health of a town may require the owner or occupant of any building upon land abutting on a public or private way in which there is a common sewer to connect the same therewith by a sufficient drain, and such owner or occupant who fails to comply with such order shall be punished by a fine of not more than $200.

Section 12. Repair of Private Drain.
If a city council or a town accepts this section or has accepted corresponding provisions of the earlier laws, the Board of Health may require the owner or occupant of an estate which drains into a private drain in a public or private way to put such drain in good repair and condition. If he fails to comply with said order within ten days after notice thereof, he shall be punished by a fine of not more than $20 for every day during which such failure continues.

Section 13. Enforcement by Equity Jurisdiction.
The supreme judicial court and the superior court shall have jurisdiction in equity to restrain the unlawful use of common sewers or the placing or depositing of material

therein or the violation of regulations regarding the use thereof made under Section 10, and to enforce the provisions of Sections 5 to 7, inclusive.

ASSESSMENTS AND BETTERMENTS

Section 14. Assessment for Construction.
A person who enters his particular drain into a main drain or common sewer, or who by more remote means receives benefit thereby for draining his land or buildings, shall pay to the Town a proportional part of the charge of making and repairing the same, and of the charge, not already assessed, of making and repairing other main drains and common sewers through which the same discharges, which shall be ascertained, assessed and certified by the aldermen, sewer commissioners, selectmen, or road commissioners.

Section 15. Assessment for Sewerage Systems.
The city council of a city or a town may adopt a system of sewerage for a part or the whole of its territory and may provide that assessment under Section 14 shall be made upon owners of land within such territory by a fixed uniform rate, based upon the estimated average cost of all the sewers therein: according to the frontage of such land on any way in which a sewer is constructed; or according to the area of such land within a fixed depth from such way; or according to both such frontage and area; but no assessment in respect to any such land, which by reason of its grade or level or any other cause cannot be drained into such sewer, shall be made until such incapacity is removed. If the assessment is according to the area within such fixed depth, the lien therefor shall attach to the parcel assessed.
NOTE: The method of calculating betterment assessments is outlined in Appendix IV to these Regulations.)

Section 16. Assessment for Use of Sewers.
The aldermen of any city, or the Sewer Commissioners, selectmen or road commissioners of a town, may from time to time establish just and equitable annual charges for the use of common sewers, which shall be paid by every person who enters his particular sewer therein. The money so received may be applied to the payment of the cost of maintenance and repairs of such sewers or of any debt contracted for sewer purposes.
NOTE: The assessment for use of sewers is set forth in Division IV of these regulations.

Section 17. Payment for Permanent Privilege.
The aldermen of any city except Boston or a town in which main drains or common sewers are laid may determine that a person who uses such main drains or common sewers in any manner, instead of paying an assessment under Section 14, shall pay for the permanent privilege of his estate such reasonable amount as the aldermen or the Sewer Commissioners, selectmen or road commissioners shall determine.

Section 18 Determination of Method of Assessment.
The city counsel of a city or a town which itself is, or the officers of which are, entitled under Sections 14 to 17, inclusive, or under any special act, to assess upon land the whole or a part of the cost of laying, making, maintaining or repairing main drains or common

sewers, may determine that such assessments shall be made by two or more of the methods provided in said sections or special acts, and may determine what part of the expense or estimated average cost shall be paid under each method.

Section 19. Extension of Time for Payment

The aldermen of a city or the Sewer commissioners, selectmen or road commissioners of a town may extend the time for the payment of such assessments upon land which is not built upon until it is built upon or for a fixed time, but interest at the rate of 4% per annum shall be paid annually upon the assessment from the time it was made, and the assessment shall be paid within three months after such land is built upon or at the expiration of such fixed time.

Section 20. Fee for Use of Sewers

The owners of land or parts thereof not liable to assessment, or not in fact assessed, may use the common sewers for the disposal of their sewage from such land only on payment of such reasonable amount as the aldermen or the sewer commissioners, selectmen or road commissioners shall determine.

Section 21. Land Abutting Upon More Than One Way.

If land abuts upon more than one way, assessments for sewers based wholly or in part upon frontage shall be assessed upon the frontage upon one such way and upon so much of the frontage upon such other way as is not exempted by the board whose duty it is to make the assessment, and such board may exempt from assessment so much of the frontage upon such other way as they consider just and equitable.

Section 22. Sewers Built by Land Owners

If an ordinance or bylaw provides that any drain or sewer laid in any land or way, public or private, which is opened or proposed to be opened for public travel and accommodation shall be a main drain or common sewer, and such drain or sewer is laid in a private way or land at the expense of the owner thereof, his land shall not be assessed for such drain or sewer, except for the cost of connecting it with common drains or sewers already established.

Section 23. Payment of Portion of Cost by City or Town, etc.

A town by vote of its town meeting, or a city by vote of its board of aldermen or city council, shall determine whether it shall pay the whole or a portion of the cost of laying out and constructing main drains or of a system or systems of sewerage and sewage disposal, and if a portion, what portion. If the town or city votes to pay less than the whole cost, in providing for the payment of the remaining portion of the cost of said system or systems the town or city may avail itself of any or all of the methods of payment authorized by law to a town or city, and the provision s of Chapter 80 relative to the apportionment, division, reassessment, abatement and collection of assessments, to liens therefor and to interest thereon, shall apply to assessments made under this chapter. At the same meeting at which it determines that any portion of the cost is to be borne by the town or city, it may be vote determine by which of such methods the remaining portion of said cost shall be provided.

NOTE: See Division III, Article I, Section 15 above.

Section 24. Assessment for Particular Sewers.
The owner of any land benefited by the laying out of a particular sewer from the common sewer to the boundary of the way shall pay to the town for the permanent privilege of using the same such reasonable amount as the aldermen or the Sewer Commissioners, selectmen, or road commissioners determine, which may be fixed at the estimated average cost of all such particular sewers within the territory for which a system of sewers has been built or adopted. The board or officers authorized to lay out sewers shall assess the cost of connecting private land with a common sewer under Section 3 upon the land so connected and may require that an applicant, for a connection of his land with a sewer, shall pay in advance an amount equal to the estimated assessment therefor which shall be applied to the payment of the assessment, and the remainder, if any, shall be repaid to the applicant.

Section 27. Recording of Statements.
Whenever the aldermen of a city or the Sewer Commissioners, selectmen or road commissioners of a town lay out or determine to construct a sewer or drain in a public way, or in a way opened or dedicated to the public use which has not become a public way, or adopt an order for the establishment or reconstruction of a sidewalk for such a way, and assessments may be made or charges imposed under this chapter for the construction of such improvement or the use thereof, they shall forthwith cause to be recorded in the registry of deeds of the county or district in which such city or town is situated a statement of their action which shall specify the ways in which such sewer, drain or sidewalk is located. All assessments made or charges imposed under this chapter upon land which abuts upon any such way in which such sewer, drain or sidewalk is located shall constitute a lien upon such land from the time such statement is recorded, and all charges authorized by Section 16 shall, from the time of assessment, constitute a lien upon the land connected with the common sewer. Liens under this section shall continue for the same period and under the same conditions as a lien established under Chapter 80.

Section 28. Application of Betterment Law
The provisions of Chapter 80 relative to the apportionment, division, reassessment, abatement and collection of assessments, and to interest, shall apply to assessments made under this chapter.

Section 29. Duration of Lien Created Under Special Act.
Notwithstanding any provision in any special act to the contrary, any lien for sewer, drain or sidewalk assessments or for betterment assessments of any other nature created pursuant to the provisions of any special act shall continue in effect until the land subject to the lien has been alienated and the instrument alienating the same has been recorded and for such longer period as any special act may provide.

DIVISION IV

SEWER USER CHARGES AND INDUSTRIAL COST RECOVERY

ARTICLE I
SEWER USER CHARGES

Section 1. Pursuant to votes of the Board of Selectmen, acting as Sewer Commissioners, at their meetings of April 11, 1995, and April 18, 1995, the following user fee charges were adopted:

a. Effective June 1, 1998, each sewer user in the Town of Ipswich will be charged for the use of sewer at the rate of $2.21 per one hundred cubic feet of water as measured at each sewer user's water meter. [Adopted May 11, 1998]. Effective January 1, 2000, each sewer user in the Town of Ipswich will be charged for the use of sewer at the rate of $2.51 per one hundred cubic feet of water as measured at each sewer user's water meter. Effective August 1, 2000, each sewer user in the Town of Ipswich will be charged for the use of sewer at the rate of $3.77 per one hundred cubic feet of water as measured at each sewer user's water meter. [Adopted July 27, 2000]

b. Effective October 1, 1996, septage accepted for disposal at the Wastewater Treatment Plant will be charged at the rate of $.045 per gallon.

Section 2. Excessive Sewage Loadings

Effective August 1, 2000, there shall be a surcharge for excessive sewage loadings Biochemical Oxygen Demand (BOD), in accordance with the following formula: $.0675 divided by lb. x flow in MGD x (BOD_5 in ppm - 450 ppm BOD_5) x 8.34 lbs. divided by MGD/PPM = $ Charge. "BOD_5" means biochemical oxygen demand measured in a five-day standard test, and "ppm" means "parts per million." [Adopted July 27, 2000]

Section 3. Interest Charges

Interest charges to the maximum percentage permitted under Massachusetts General Laws, Chapter 83, Sections 16A-16F inclusive, as amended, shall be assessed following the date of billing. In addition to said interest charges, there shall be a service charge on sewer liens as set forth in the following schedule:

Unpaid Balance	Sewer Lien Service Charge
$ 1.01 - 50.00	$ 20.00
50.01 - 100.00	30.00
100.01 - 150.00	40.00
150.01 - 200.00	50.00
200.01 - 250.00	60.00
250.01 and over	100.00

(Adopted 3/26/90)

ARTICLE II
INDUSTRIAL COST RECOVERY

Section 1. In the event that the USEPA mandates implementation of those provisions of PL 92-500 relative to industrial cost recovery, the following procedure will be followed:
In view of the fact that wastewaters emanating from industries within the Town of Ipswich sewage service area are at or below the range of concentrations normally found in domestic wastewater, the volume of flow from contributing industries shall be utilized as the criterion in recovering from all industrial users that portion of the Federal Grant for the construction of the secondary wastewater treatment facility (and subsequent construction improvements thereto) allocable to the treatment of wastes from such users.

DIVISION V

PENALTIES: VALIDITY

Section 1. Any person found to be violating any provision of these regulations shall be served by the Town with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

Section 2. Any person who shall continue any violation beyond the time limit provided for in Section 1. above shall be guilty of a misdemeanor, and on conviction thereof shall be fined in the amount not exceeding five thousand dollars ($5,000) for each day of violation as provided for by MGL Chapter 83, Section 20 (amended July 25, 1987) and two hundred dollars ($200) for each day of violation as provided for by MGL Chapter 83, Section II (as amended).

Section 3. Any person violating any of the provisions of this regulation shall become liable to the Town for any expense, loss, or damage occasioned the town by reason of such violation.

Section 4. All regulations or parts of regulations in conflict herewith are hereby repealed.

Section 5. The invalidity of any section, clause, sentence, or provision of this regulation shall not affect the validity of any other part of this ordinance which can be given effect without such invalid part or parts.

Section 6. This regulation shall be in full force and effect from and after its passage, approval, recording, and publications as provided by law.

Section 7. Passed and adopted by the Town of Ipswich, State of Massachusetts, on the 7th day of July 1979, by the decision of the Sewer Commissioners.

APPENDIX I

TOWN OF IPSWICH
SEWER DIVISION
TOWN HALL
IPSWICH, MASSACHUSETTS

I (We), _____,
owner or lessee of the property at _____,
hereby give permission to officers, employees or agents of the Town of Ipswich Sewer Division to enter upon said premises for the purpose of installing, replacing, and/or repairing the sewer service pipe or pipes. It is expressly understood that all work done on private property will be at the complete expense of the owner or lessee. It is understood and agreed that the town of Ipswich is hereby released from all liability for any damage resultant of such work.

In witness whereof the following signature if affixed this _____ day of _____, 19_____.

_____

_____

_____

Witness:

_____

_____ (Date) _____

APPENDIX II

INDEMNITY AGREEMENT - WORK IN PUBLIC WAYS

In consideration of the promise of the inhabitants of the Town of Ipswich, a body corporate in the County of Essex, hereinafter called the Town, to accept the work hereinafter described (provided it is completed in a workmanlike manner) and of the promise of the Town to service, maintain, and use the said work and for other valuable consideration, the receipt whereof is hereby acknowledged.

hereinafter called the Indemnitor, covenants and agrees that it will indemnify and save harmless the public officials of the Town, both in their individual and official capacity, and the said Town from any claims or damages or judgments for personal injury or death, or for property damage of any kind sustained by any person or persons whomsoever, arising out of the performance of the said work.

The Indemnitor further covenants and agrees that it will take over the defense of, and pay all of the expense of the defense of, any suit at law or in equity brought by any person or persons whomsoever on account of such claims.

The Indemnitor agrees to furnish and herewith does furnish a certificate of paid insurance for public liability with limits for injuries to persons and to property as specified in Article IX, Section I of the Regulations of the Town's Water Division, said Insurance to be for the protection of all persons (except employees engaged in the said work) who may have claims for personal injuries or death or for property damage arising out of negligence of the Indemnitor or its servants or agents or independent contractors engaged in the said work.

The Indemnitor further agrees to furnish and herewith does furnish a certificate of paid-up workmen's compensation insurance for the protection of all employees of the Indemnitor, or of independent contractors performing the said work, against injuries arising out of and in the course of their employment upon the said work.

The Indemnitor shall not be liable under this agreement for any claims for occurrences after it has obtained a written acceptance of the said work from the said Town.

IN WITNESS WHEREOF, the Indemnitor has hereto affixed its hand and seal this _____ day of _____, 19_____.

APPENDIX III

CONVEYANCE OF TITLE

In consideration of the promise of the Inhabitants of the Town of Ipswich, hereinafter called the town, acting through its duly authorized officials, to accept the work hereinafter described, if it is performed satisfactorily to the said Town and in consideration of the promise of the town to maintain, use and repair the said work after it has been accepted, and for other valuable consideration, the receipt whereof is hereby acknowledged, the undersigned hereby agrees to assign, release and convey and transfer to the said Town all the right, title and interest that it may have in the said work, said assignment to take place within (_____) days after the said work is completed to the satisfaction of the Sewer Division.

Moreover, in the event the work is to be performed in an unaccepted way, the undersigned further agrees to convey a utility easement to the Town prior to the commencement of work.

The undersigned also acknowledges and agrees that the Town is under no obligation, either expressed or implied, to pay for the said pipe line or for any of the expense of installing the same.

IN WITNESS WHEREOF, the undersigned has hereunto affixed its hand and seal this _____ day of _____, 19_____.

APPENDIX IV

COMPUTATION OF SEWER BETTERMENTS

The preceding sketch is illustrative of a typical sewer construction project. On this sketch are shown the sewer main, the sewer service pipes to each lot and the frontage dimension for each lot.

Typically, the costs for a sewer project include: engineering design and contract administration and resident inspection costs; surveying and borings; preparation of easement plans and/or orders of taking and incidental pipe, ledge, manholes, service wyes, and such other costs which are directly related to the location of the sewer pipe, such as the relocation of water mains and/or sewer drains which directly interfere with the location of a sewer main, which location is determined by grade. Pavement restoration is another project cost. As a matter of policy, if the Town chooses to resurface a street from curb to curb in conjunction with a sewer project, only that portion of the pavement costs which would cover the trench plus 1 1/2 feet on each side of the edge of trench would be included in the betterment. Also, only those portions of the costs of relocating other utilities which are absolutely essential to the operation of the sewer are to be included in the computation of project costs, and those other costs for utility relocations which are deemed to be desirable, for the benefit of the Town, shall be excluded from the project cost calculations. Service pipe and service branches are deleted from the cost of the project and are assessed on a per lot basis equally among all those lots which actually receive a new service pipe under the project. After having deleted the extra pavement costs and extra costs for the relocation of utilities deemed to be for the benefit of the Town and not essential to the operation of the sewer pipe, a subtotaled net project cost is computed. A ration of the net project costs, exclusive of engineering, to the total project costs, exclusive of engineering, is thence determined and applied to the engineering costs. The pro-rated engineering costs which are associated with the project work to be bettered are then added to the net project costs, and the betterment is computed as set forth in the subsequent paragraphs of this Appendix. In accordance with the principle that the whole costs of a sewer project shall be apportioned between the abutters and the Town, as set forth in Section 7 of Chapter 30 of the Acts of 1946, federal, state, and/or private grants in aid or reimbursements shall be excluded from any consideration whatsoever in computing betterment assessments. (8/17/87)

As a matter of policy, properties owned by the Town of Ipswich shall be included in all betterment computations as if they were privately owned. Once bettered, the Sewer Department may then present an application for abatement to the Sewer Commissioners.

In the event a parcel was not bettered at the time sewers were installed during the period 1958-1976, yet the sewer was and is available, it shall be the policy of the Commissioners that the parcel shall be bettered an assessment at $7.20 per foot. In the alternative event that the sewerage was not available to the parcel but has become available since the time of installation by a change in lot lines, by an extension of the sewer undertaken by the property to said parcel, or otherwise (but not at Town expense), and as a result of the fact that the sewer is now available the parcel’s value for development purposes is significantly enhanced, it shall be the policy of the Commissioners that said parcel shall be charged a reasonable amount, in accordance with Sections 17 and 20 of Chapter 83 of the General Laws, to be determined periodically by the Commissioners. (8/17/87)

In order to compute the sewer betterment assessment, it is just necessary to compute the total length of frontage served by the sewer. Betterments are assessed against the total length of frontage of a lot if sewer is in any way available to the lot. For example, sewer fronts Lot 10 for about ten feet only. Nonetheless, the entire frontage of fifty feet is used in determining the total frontage. In order to expedite the connection of buildings to new sewer system extensions, any other cause within the meaning of MGL Chapter 83, Section 15, and said abutter, not at the Town's expense, removes said incapacity:

(a) within eighteen months of the date of sewer betterment commitment for the project, he shall have the entire amount abated which otherwise would be assessable under MGL 83:17 and paragraph four of this Appendix;

(b) within the period of nineteen to sixty months of the date of the sewer betterment commitment for the project, he shall have abated from the "reasonable amount" assessed under MGL 83:17 paragraph four of this Appendix the actual costs to remove said incapacity, but said costs shall not exceed the "reasonable amount";

(c) following sixty-one months after the date of commitment of the sewer betterment of the project, he shall be subject to the full "reasonable amount" as determined under MGL 83:17 and the fourth paragraph of this Appendix. (8/17/87)