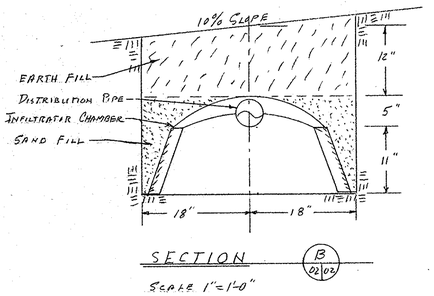
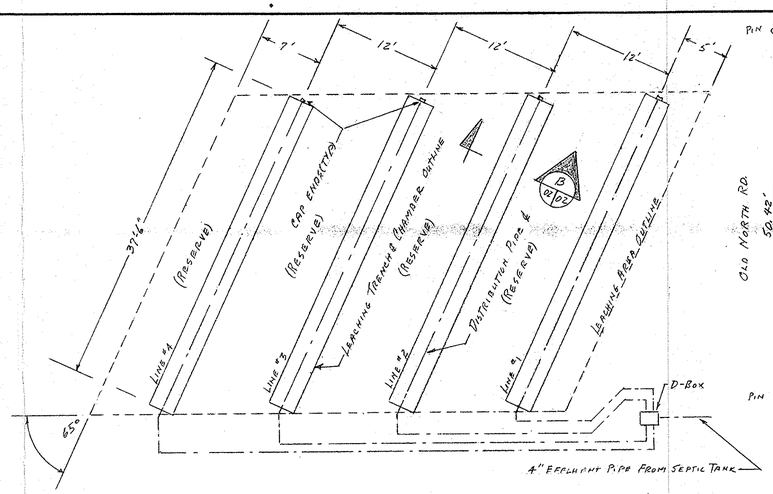


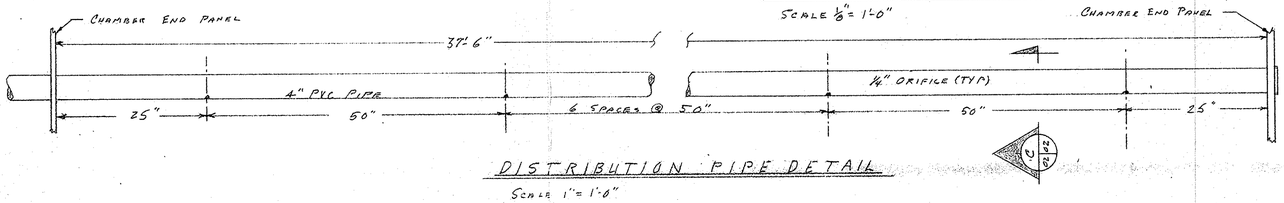
SECTION B 02/02

SCALE 1"=1'-0"



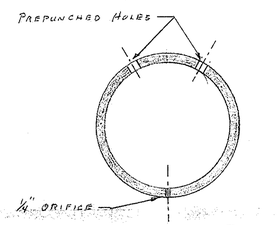
LEACHING AREA PLAN

SCALE 1/8"= 1'-0"



DISTRIBUTION PIPE DETAIL

SCALE 1"= 1'-0"



SECTION C 02/02

HALF SCALE

LEACHING AREA LOCATION

SCALE 1"= 10'

LEACHING SYSTEM CALCULATIONS

1.0 Calculations are based on an exhibition hall with an estimated unit flow of 5 gpd/person since no such entity is listed.

2.0 Estimated attendance is 60 persons per day.

3.0 Sewage flow = (5 gpd/person)(60 persons) = 300 gpd.

4.0 Septic tank capacity (calculated) = (300 gpd)(2) = 600 gal.

5.0 Septic tank design capacity = 1500 gal.

6.0 Percolation rate = 22 min/inch.

7.0 Effluent loading rate (soil class II) = 0.48 gpd/sf.

8.0 Absorption area = (3 sf/ft,bottom)+(1.67 sf/ft side) = 4.67 sf/ft.

9.0 Absorption = (4.67 sf/ft)(0.48 gpd/sf) = 2.24 gal/ft.

10.0 Trench length req'd = (300 gpd)/(2.24 gal/ft) = 134 Lf.

11.0 Absorption area req'd = (134 Lf)(4.67 sf/ft) = 626 sf.

12.0 Design area = 657 sf.

13.0 Trench length = (657 sf,design)/(4.67 sf/ft) = 141 Lf.

14.0 Use 4 lines at 37.5 Lf each = 150 Lf.

15.0 Leaching area = (150 Lf)(4.67 sf/ft) = 701 sf.

16.0 Design rate = (150 Lf)(2.24 gal/ft) = 336 gpd.

17.0 Percent flow = (336 gpd,design)/(300 gpd,flow) = 112%.

18.0 Storage volume = (150 Lf)(15 gal/ft) = 2250 gal.

DISTRIBUTION LINE CALCULATIONS

1.0 ASSUMPTIONS

1.1 Trickle flow = 10 gpm max.

1.2 Orifice diameter = 0.25"

1.3 Average head = 2" w.g. = 0.17 ft. w.g.

2.0 ORIFICE DISCHARGE RATE

2.1 $Q = 11.79\ d^2\ h_d^{0.5} = (11.79)(.25)^2(.17)^{.5} = 0.30$ gpm

3.0 ORIFICE SPACING

3.1 Orifices required = (10 gpm/(0.30 gpm/orifice) = 33.3 (Use 34)

3.2 Number of distribution lines = 4

3.3 Distribution line length = 37.5 ft = 450"

3.4 Orifices per line = 3 4/4 = 8.5 (Use 9)

3.5 Orifice spacing = (450")/(9 orifices) = 50"

3.6 Line design = 8 spaces @ 50" = 400"
2 spaces @ 25" = 50"
450"

SPECIFICATIONS

1.0 LIMITATIONS & SETBACKS

1.1 Structures of any kind SHALL NOT be built within the leaching area outline.

1.2 The septic tank and leaching area shall not be installed closer than 10 ft. to any lot line or subsurface drain.

1.3 This lot is served by a municipal water supply and there are no water wells within 200 ft of the leaching area.

1.4 The cellar walls shall not be closer than 10 ft. from the septic tank or 20 ft. from the leaching area.

2.0 MATERIALS

2.1 Septic Tank

2.1.1 The septic tank shall be constructed of reinforced concrete and shall have a minimum capacity of 1500 gal. below the flow line.

2.1.2 Inlet and outlet tees are required and shall have a minimum depth below the flow line as shown on the plans.

2.1.3 The tees shall be made of concrete and shall be cast integrally with the tank.

2.1.4 Access ports shall be provided above each tee.

2.1.5 The tank shall be as manufactured by Kellogg Bros., Inc. of Southwick, Ma.

2.2 Sand Fill

2.2.1 The sand fill shall be a medium, bank-run sand that is free of clay, fines, dust, organic matter or wood.

2.2.2 It shall be a granular, sharp sand containing not more than 10% of material finer than 100 mesh or coarser than 8 mesh.

2.3 Earth Fill

2.3.1 The earth fill shall be a silt loam, or clay loam, similar to existing Worthington topsoil.

2.3.2 It shall contain no stones larger than 2" O.D., stumps, roots, weeds, or similar materials.

2.3.3 Silt reclaimed from sand and gravel washing may be used for this purpose.

2.4 Leaching Chambers

2.4.1 The leaching chambers shall be made up of semi-cylindrical sections, 6 ft. long, capable of being coupled end-to-end to make a trench type chamber of varying lengths.

2.4.2 The chamber sections shall be cast from polyethylene foam and shall be designed for an H-10 wheel loading when covered with 12" of soil.

2.4.3 They shall be high capacity "Infiltrator" units, as manufactured by Infiltrator Systems, Inc., Old Saybrook, CT.

2.5 Pipe

2.5.1 The building sewer shall be 4" PVC pipe, type SDR-21, with push-tight joints, or schedule 40, with solvent cemented joints.

2.5.2 The effluent pipe shall be 4" dia. PVC pipe, SDR-26, with push-tight joints.

2.5.3 The distribution pipes shall be 4" dia., perforated PVC pipe, sch. 20 or DWV, with solvent cemented joints.

2.6 Distribution Box

2.6.1 The distribution box shall be precast concrete or cast plastic, and shall be furnished with a tight fitting cover.

2.6.2 It shall be constructed with integral, tight fitting closure seals for the pipe openings.

3.0 INSTALLATION

3.1 Septic Tank

3.1.1 The septic tank location shall be excavated to a bottom elevation of 89.50 ft.

3.1.2 Sand fill shall be placed in the excavation, leveled and compacted to a final elevation of 89.96 ft.

3.1.3 The tank shall be placed on the compacted sand, sealed and backfilled up to the outlet invert level.

3.2 Building Sewer

3.2.1 The building sewer shall be run to the septic tank essentially as shown.

3.2.2 It shall be supported on a bed of sand in a trench and shall slope from the building to the tank at not less than 1/4" per foot.

3.2.3 The pipe shall be sealed against water intrusion at both the building and the tank.

3.2.4 It shall be covered with no less than 6" of sand before final backfilling with soil.

3.3 Effluent Piping

3.3.1 The effluent pipe shall be connected to the indicated outlet opening of the septic tank and to the D-box inlet.

3.3.2 It shall be supported on a bed of sand in a trench and shall slope toward the D-box at not less than 1/8" per ft.

3.3.3 The pipe shall be sealed against water intrusion at both the tank and the D-box.

3.3.4 It shall be covered with not less than 6" of sand before final backfilling.

3.4 Distribution Box

3.4.1 The distribution box shall be located and oriented as shown on the plans.

3.4.2 It shall be supported on undisturbed earth or on fully compacted sand at the indicated pipe invert elevations.

3.4.3 It shall be water leveled to assure equal flow into the distribution lines.

3.5 Leaching Area

3.5.1 The leaching trenches shall be located as shown on the plans.

3.5.2 They shall be excavated to the bottom elevation listed, as level as possible.

3.5.3 A layer of sand shall be placed in the trench, compacted and graded to the chamber bottom elevations listed.

3.5.4 The chamber sections shall be placed in the trenches, snapped together and fsstened using stainless steel sheetmetal screws.

3.5.5 The distribution pipes shall be predrilled with 1/4" orifices in a line on the side opposite the two (2) lines of prepunched holes.

3.5.6 They shall be site assembled and installed so that the 1/4" orifices are in a line on the bottom of the pipe.

3.5.7 The distribution pipes shall be supported inside the chambers by plastic pipe straps at the end of each chamber section.

3.5.8 Solid chamber end covers, only, shall be obtained and the pipe entry holes shall be saw-cut at the proper elevation.

3.5.9 The end covers shall be slipped over the pipes at each end, snapped in place and fastened with stainless steel sheetmetal screws.

3.5.10 The outboard end of each distribution pipe shall be capped outside of the chamber as shown.

3.5.11 The chambers shall be connected to the D-box, as shown, and all pipes leaving the D-box shall be run level for 30" before sloping to the final connection to the distribution pipes.

3.5.12 Sand backfill shall be placed around the chambers up to the top of the awnings, and walking compacted, prior to the inspection.

3.5.13 After the installation has been inspected, the chambers, the pipes and the D-box shall be sand backfilled up to the top of them.

3.6 Finishing

3.6.1 Earth backfill shall be placed over all of the system components up to the natural grade, or to a minimum depth of 12", whichever is greater.

3.6.2 Previously excavated soil may be used if stones, roots and similar materials are removed.

3.6.3 The leaching area shall be graded to facilitate rainfall run-off and to channel surface water away from the system.

3.6.4 The area over the system components shall be graded to a level slightly higher than the existing grade to allow consolidation without causing a depression.

3.6.5 As soon as the final cover has been graded, the surface shall be seeded with a full-sun lawn grass mixture.

3.6.6 The area shall be mulched with a layer of hay or straw to promote germination and shall be covered with netting to prevent erosion.

3.6.7 The area may be used as a lawn, but SHALL NOT BE USED FOR PARKING OR FOR A DRIVEWAY.

3.6.8 Vehicles, other than normal lawn care equipment, shall not be driven over it.

3.6.10 Trees or woody shrubs SHALL NOT BE PLANTED ON IT OR ALLOWED TO GROW ON IT.

DATE	SYM.	REVISION	DRWN.	CHK.

DATE	SYM.	REVISION

Machine Design Tolerances Unless Noted
o.xxx ± .005 Inches
o.xx ± .010 Inches
o.x ± .030 Inches
Fractions ± 16ths
Angles ± 30 min.

SCALE: NOTED
DATE: 4/27/95
DRAWN: DGN SR
CHECKED:

WORTHINGTON HISTORICAL SOCIETY
WORTHINGTON, MASS.
SEPTIC WASTE TREATMENT SYSTEM
PLANS, SECTIONS & DETAILS

DONALD G. LYON
NEWTON
No. 21120
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS

NEWTON
ASSOCIATES IN ENGINEERING
WORTHINGTON, MASSACHUSETTS

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