CHAPTER 12

LIFT AND PUMP STATIONS

CHAPTER 12

LIFT AND PUMP STATIONS

INDEX

Graphics

12.0 LIFT AND PUMP STATIONS

12.1 GENERAL

1) All lift and pump stations, shall be designed for each application, by a Professional Engineer registered in the State of Colorado. Pertaining plans and specifications must be submitted to the Town Engineer or Director of Public works for verification and approval.

2) All electrical controls, enclosures, etc. shall be "U.L." tested and approved. Prior to construction and installation, documentation to that purpose must be submitted to the Director of Public Works for verification and approval.

3) For all lift stations there shall be a minimum of two (2) discharge pumps. Each discharge pump shall be designed to handle the full design flow.

4) A separate generator enclosure building shall be associated with each lift station.

5) For all sewage pump stations there shall be a minimum of three (3) discharge pumps. Each discharge pump shall be designed to handle the full design flow.

   There shall be a minimum of two (2) standby generators.

   Wet well, Dry well and Pump House shall be designed as a single structure.

6) When discharging from a lift station into a sanitary sewer gravity flow line, the discharge pipe shall have a minimum diameter of 6".

7) When discharging from a lift station into a sanitary sewer pressure line, the discharge pipe shall be doubled and have a minimum diameter of 4". They shall be made of pressure rated ductile iron pipe.

8) When discharging from a pump station into a sanitary sewer gravity flow line, the discharge pipe shall have a minimum diameter of 6".

9) When discharging from a pump station into a sanitary sewer pressure line, the discharge pipe shall be doubled (see Drawing No. LS-2d), and have a minimum diameter of 4". They shall be made of pressure rated ductile iron pipe.

12.2 LIFT STATIONS

As in the case of the siphon, pump manufacturers' working drawings should be followed when a design calls for the installation of pumps. Horizontal pumps are also available and are sometimes preferred; a vacuum pump and air-relief valves permit automatic operation. Pumps should be selected so as to operate for at least 10-minute intervals. Compressed air-operated sewage ejectors may be used to advantage. Obtain the manufacturers' recommendations for the most efficient pump and motor horsepower to meet job requirements. Submersible pumps are also available for pumping small and large quantities of settled sewage. Normally at least two pumps, each being capable of handling the maximum flow, should be provided.

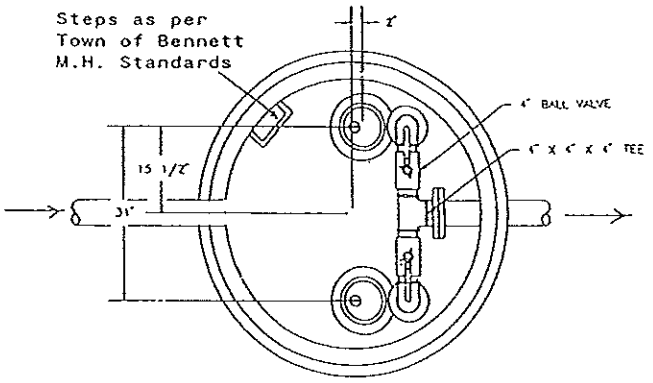
12.3 PUMPING STATIONS

Pumping plants should contain at least three pumping units of such capacity to handle the maximum sewage flow with the largest unit out of service. The pumps should be selected so as to provide as uniform a flow as possible to the treatment plant. Two sources of motive power should be available. Small lift stations, under 1 mgd capacity, should have duplicate pumping equipment or pneumatic ejectors with auxiliary power. All stations should be made to prevent or minimize overflow.

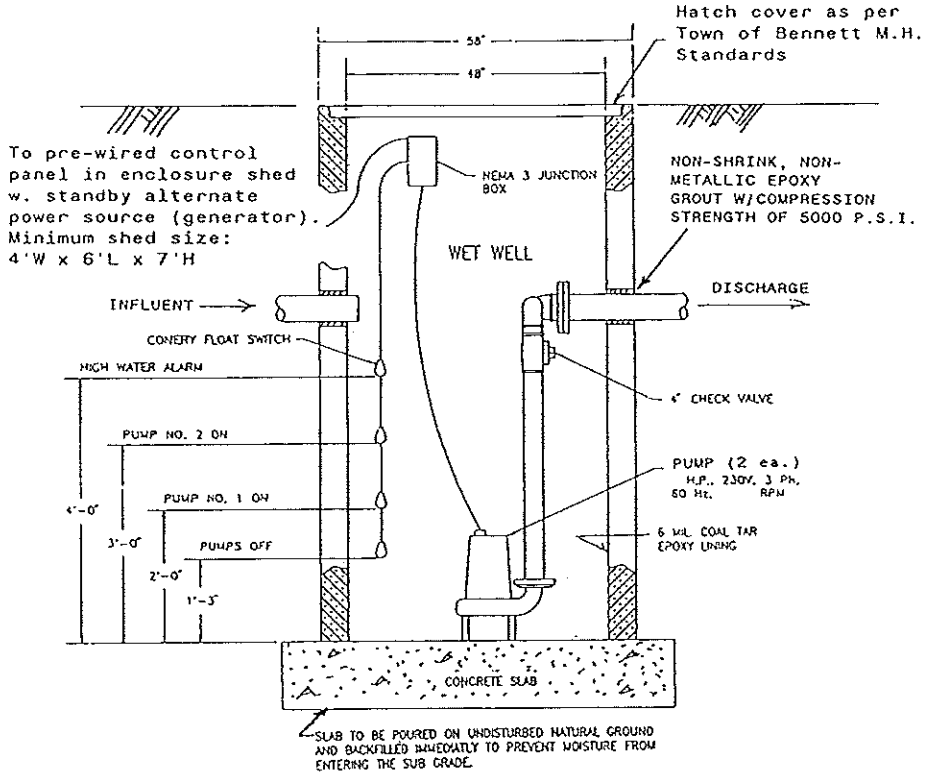
In all cases raw sewage pumps should be protected by screens or racks unless special devices are approved. Housing for electric motors above ground and in dry wells should provide protection against flooding and good ventilation, preferably forced air, and accessibility for repairs and replacements. All electrical equipment and wiring shall meet National Electrical Code requirements. Wet wells or sump pumps should have sloping bottoms and provide for convenient cleaning. Select water-level pump controls with care because they are the most frequent cause of pump failure. Submersible pump stations are also used.

12.4 PLAN DESIGN PARAMETERS

Exhibit examples are shown on Drawing No.'s LS-1 through LS-3 within the back of this Chapter.



PLAN

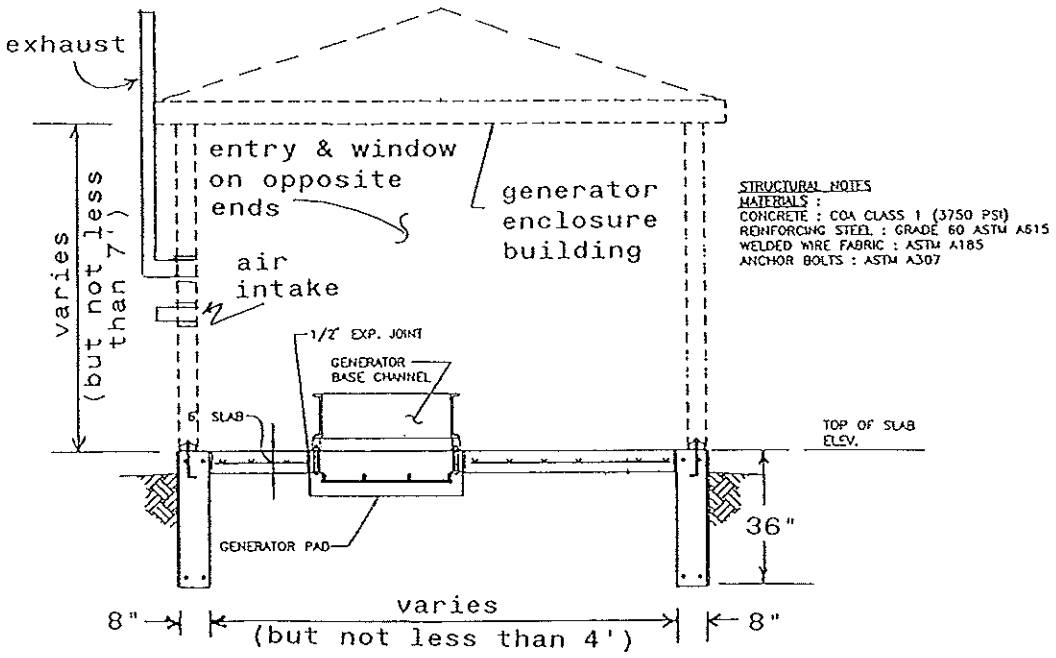


SECTION

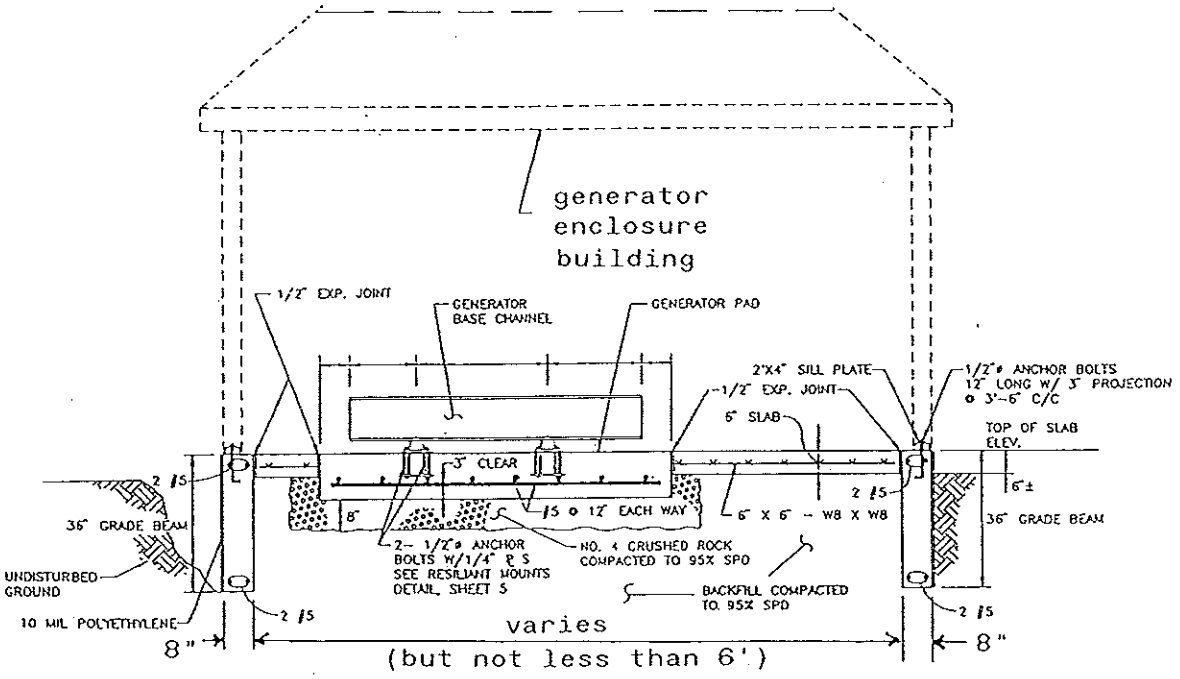
Notes:

1. All lift and pump stations shall be designed, for each application, by a Professional Engineer registered in the State of Colorado. Pertaining plans and specifications must be submitted to the Town Engineer or Director of Public Works for verification and approval.
2. There shall be a minimum of two (2) discharge pumps. Each discharge pump shall be designed to handle the full design flow.
3. A seperate enclosure shed with standby power (generator), shall be associated with each lift and/or pump station.
4. All electrical controls, enclosures, etc. shall be "U.L." tested and approved. Prior to construction and installation, documentation to that purpose must be submitted to the Director of Public Works for verifioation and approval.
5. When discharging from the lift or pump station into a sanitary sewer gravity flow line the discharge pipe shall have a minimum diameter of 6" (six inches).
6. When discharging from the lift or pump staton into a sanitary sewer pressure line the discharge pipe shall have a minimum diameter of 4" (four inches) and be made of pressure rated ductile iron pipe.

	NON-CLOG LIFT STATION FOR FLOWS NOT EXCEEDING 20 G.P.M. (GENERAL EXHIBIT ONLY)	Issued: _____ Revised: _____
	Town of Bennett	Drawing No. LS-1



SECTION THROUGH WIDTH



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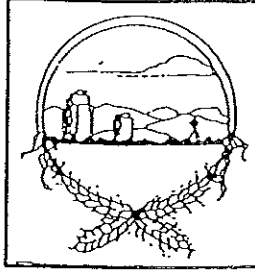


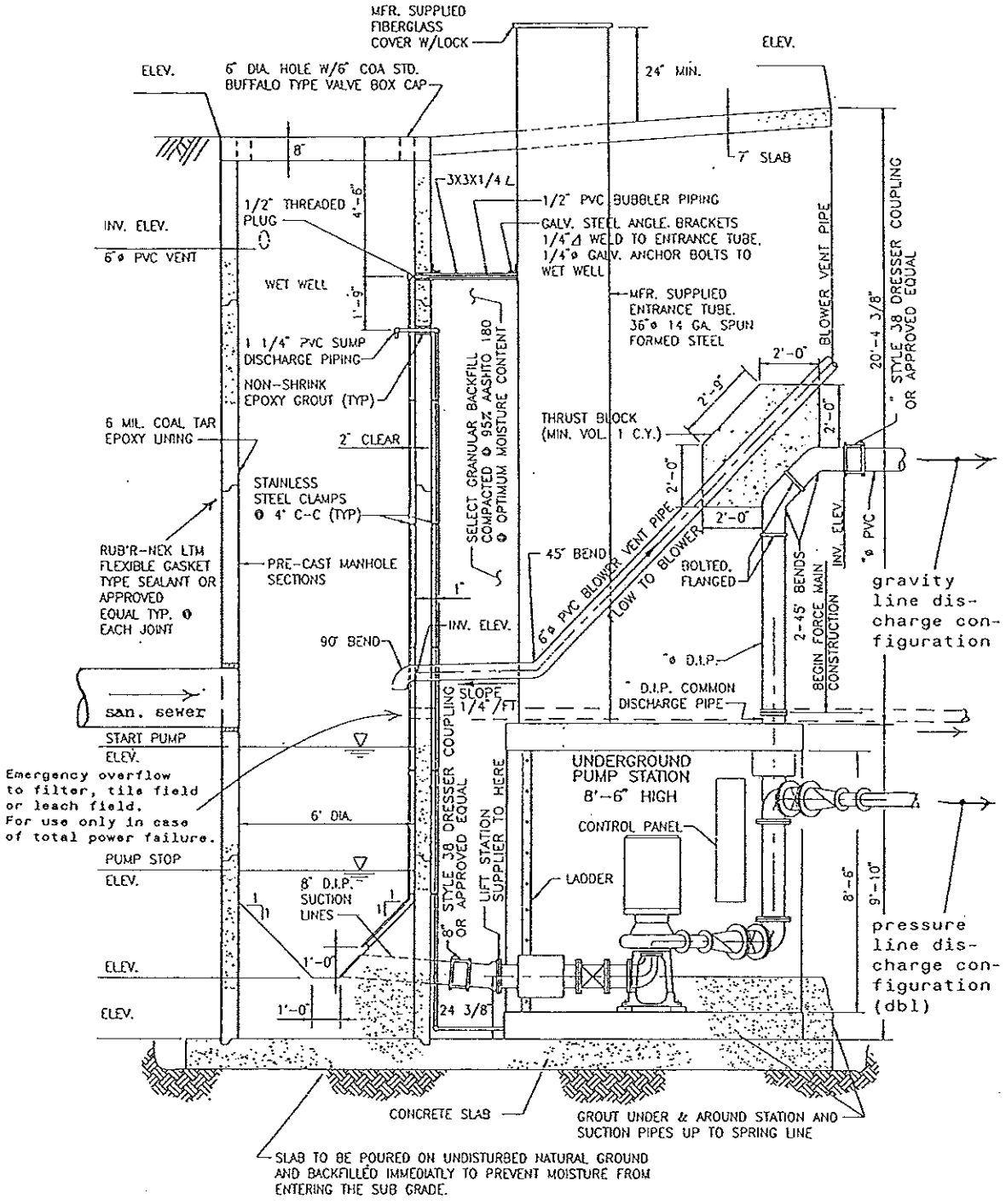
NON-CLOG LIFT STATION
TYPICAL GENERATOR ENCLOSURE BUILDING
(EXHIBIT ONLY)

Issued: _____

Revised: _____

Town of Bennett

Drawing No.
LS-1a



WET WELL AND PUMP STATION ELEVATION

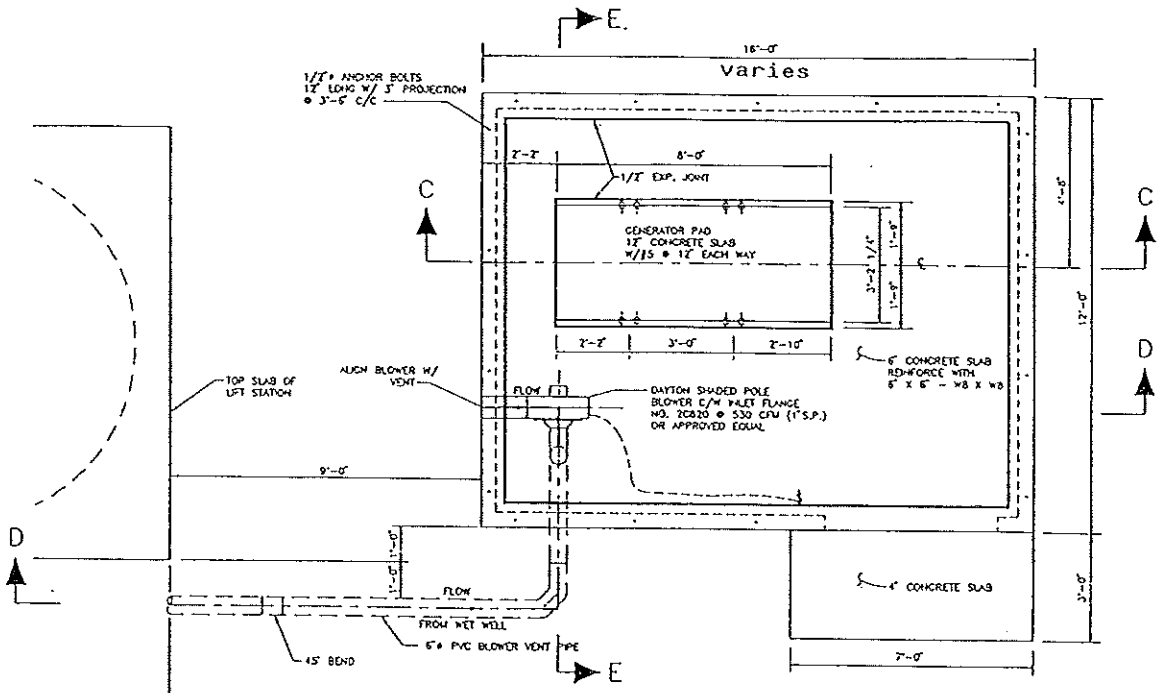
DOUBLE CHAMBER LIFT STATION
FOR FLOWS NOT EXCEEDING 70 G.P.M.
(EXHIBIT ONLY)

Issued: _____

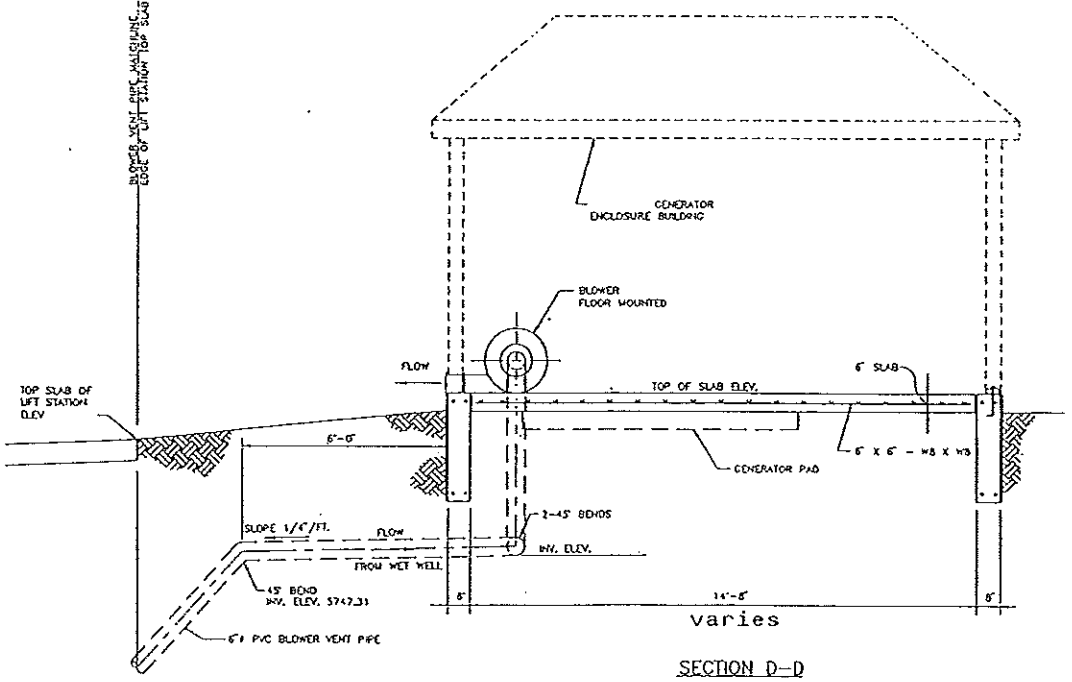
Revised: _____

Town of Bennett

Drawing No.
LS-2



BUILDING FOUNDATION PLAN



SECTION D-D

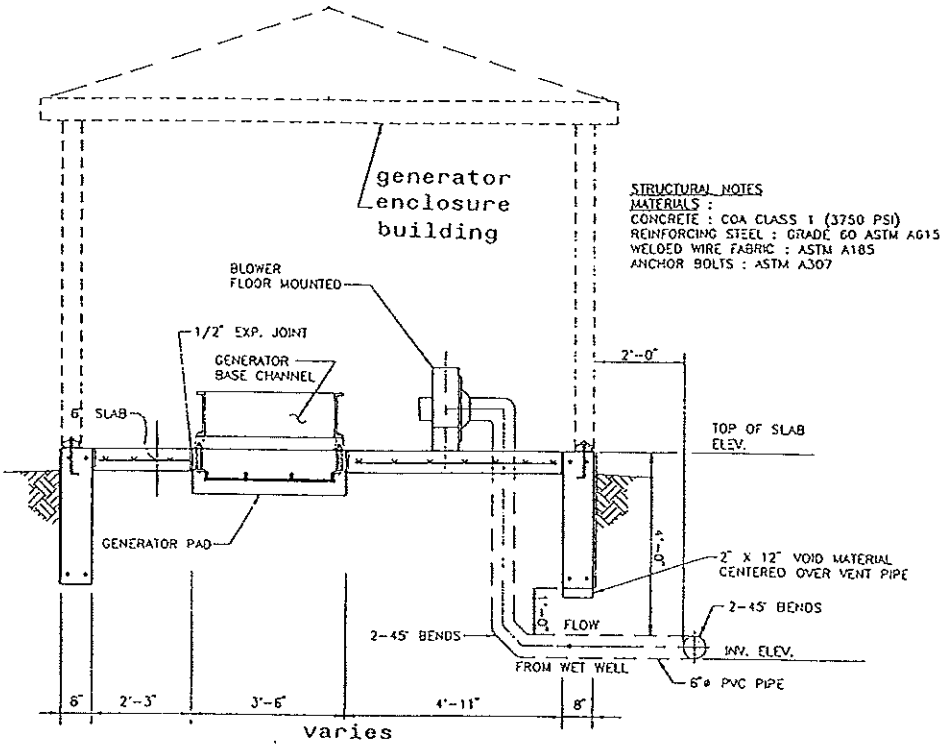
DOUBLE CHAMBER LIFT STATION
FOR FLOWS NOT EXCEEDING 70 G.P.M.
(EXHIBIT ONLY)

Issued: _____

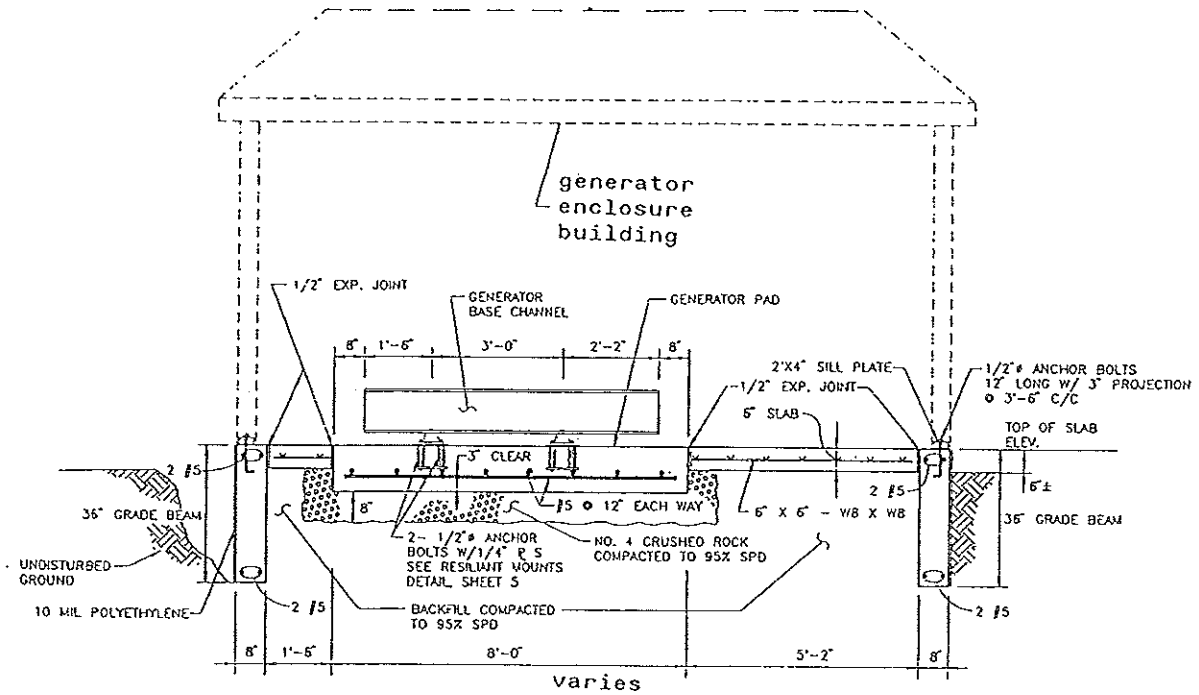
Revised: _____

Town of Bennett

Drawing No.
LS-2a



SECTION E-E



SECTION C-C

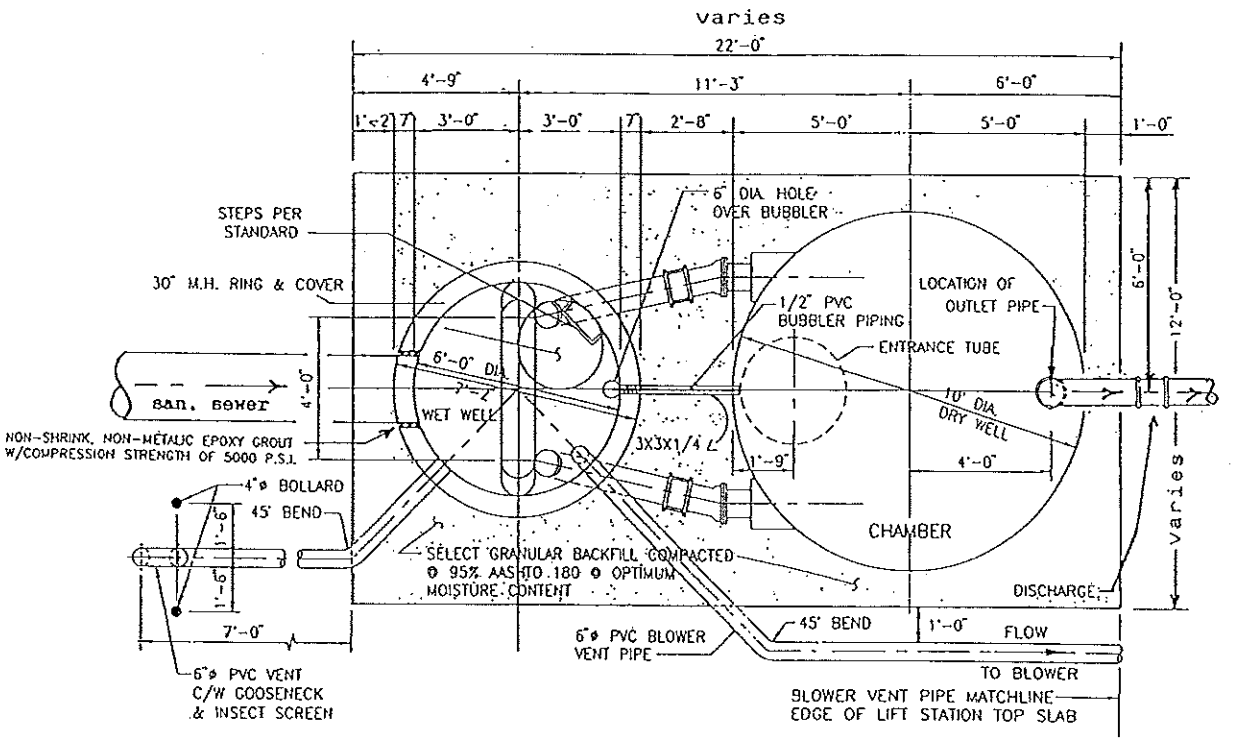
DOUBLE CHAMBER LIFT STATION
FOR FLOWS NOT EXCEEDING 70 G.P.M.
(EXHIBIT ONLY)

Issued: _____

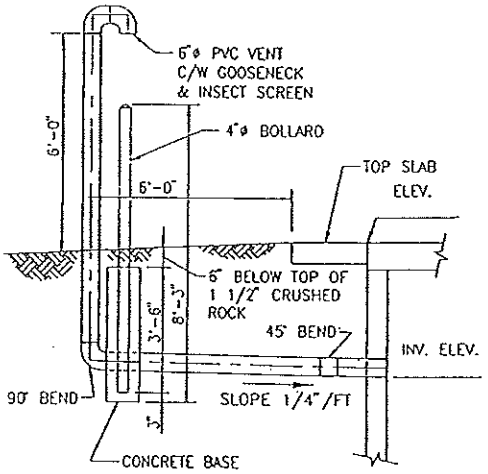
Revised: _____

Town of Bennett

Drawing No.
LS-2b



WET WELL AND PUMP STATION PLAN (BOTTOM SLAB)



VENT AND BOLLARD ELEVATION

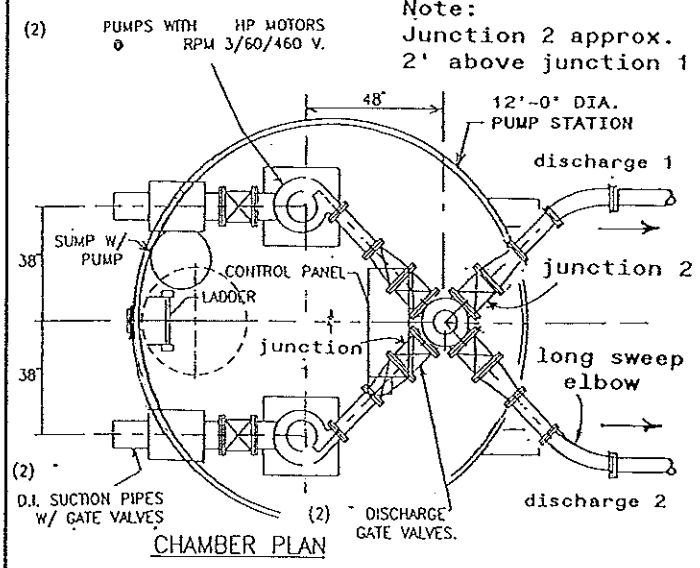
DOUBLE CHAMBER LIFT STATION
FOR FLOWS NOT EXCEEDING 70 G.P.M.
(EXHIBIT ONLY)

Town of Bennett

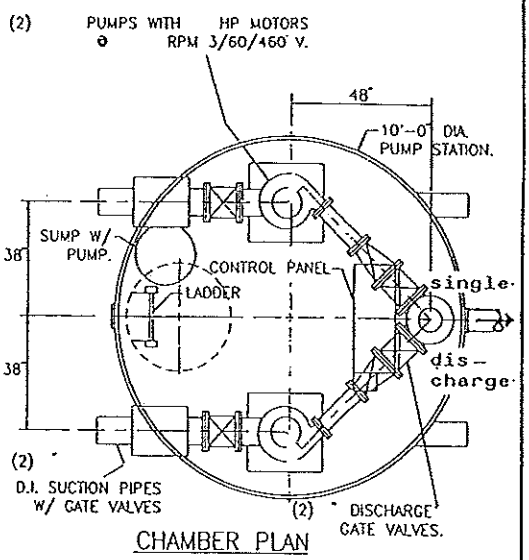
Issued: _____

Revised: _____

Drawing No.
LS-2c



pressure line(s) discharge



gravity line discharge

Notes:

1. All lift and pump stations shall be designed, for each application, by a Professional Engineer registered in the State of Colorado. Pertaining plans and specifications must be submitted to the Town Engineer or Director of Public Works for verification and approval.
2. There shall be a minimum of two (2) discharge pumps. Each discharge pump shall be designed to handle the full design flow.
3. A seperate generator enclosure building shall be associated with each lift station.
4. All electrical controls, enclosures, etc. shall be "U.L." tested and approved. Prior to construction and installation, documentation to that purpose must be submitted to the Director of Public Works for verification and approval.
5. When discharging from the lift station into a sanitary sewer gravity flow line, the discharge pipe shall have a minimum diameter of 6" (six inches).
6. When discharging from the lift staton into a sanitary sewer pressure line, the discharge pipe shall be doubled and have a minimum diameter of 4" (four inches). They shall be made of pressure rated ductile iron pipe.

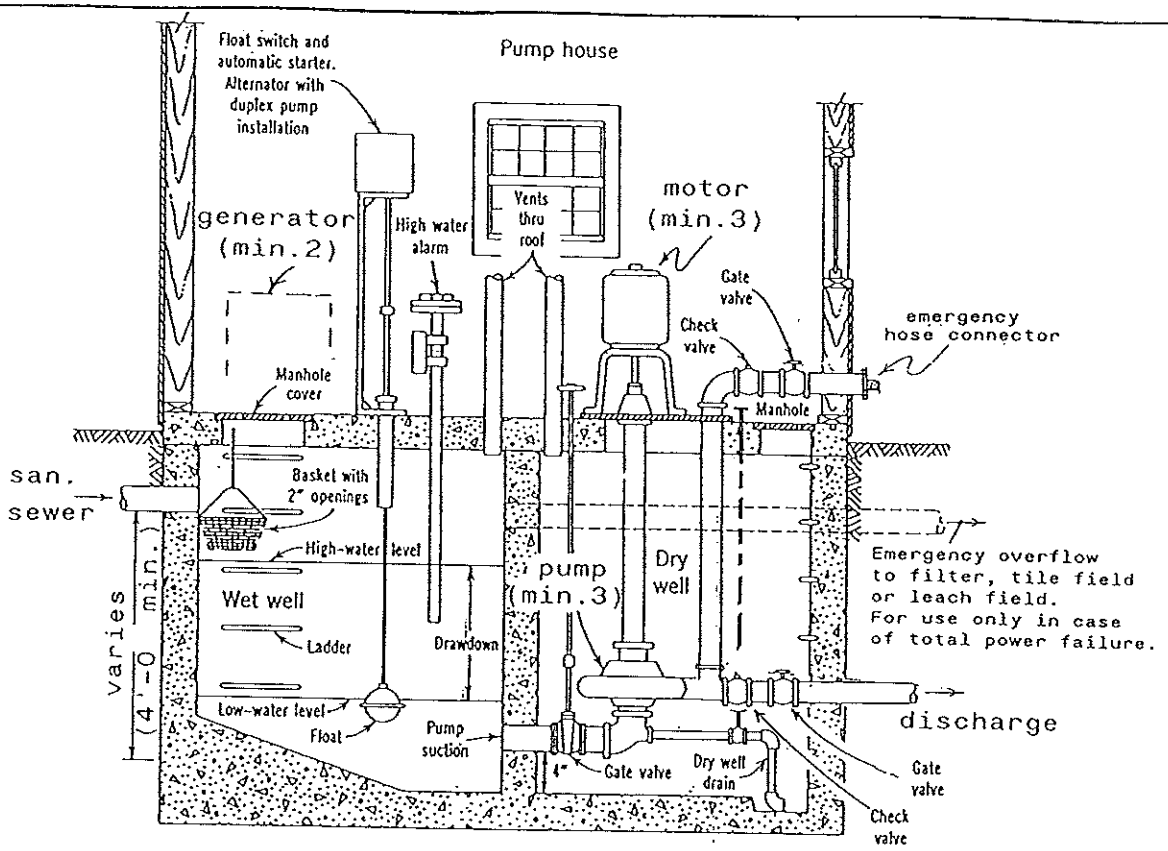
DOUBLE CHAMBER LIFT STATION
FOR FLOWS NOT EXCEEDING 70 G.P.M.
(EXHIBIT ONLY)

Issued: _____

Revised: _____

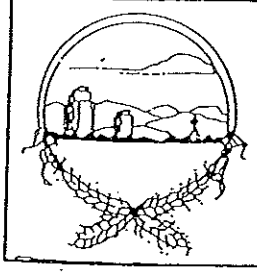
Town of Bennett

Drawing No.
LS-2d



Notes:

1. All sewage pump stations shall be designed, for each application, by a Professional Engineer registered in the State of Colorado. Pertaining plans and specifications must be submitted to the Town Engineer or Director of Public Works for verification and approval.
2. There shall be a minimum of three (3) discharge pumps. Each discharge pump shall be designed to handle the full design flow. There shall be a minimum of two (2) standby generators.
3. Wet well, Dry well and Pump House shall be designed as a single structure.
4. All electrical controls, enclosures, etc. shall be "U.L." tested and approved. Prior to construction and installation, documentation to that purpose must be submitted to the Director of Public Works for verification and approval.
5. When discharging from the pump station into a sanitary sewer gravity flow line, the discharge pipe shall have a minimum diameter of 6" (six inches).
6. When discharging from the pump staton into a sanitary sewer pressure line, the discharge pipe shall be doubled (see Drawing No. LS-2d), and have a minimum diameter of 4" (four inches). They shall be made of pressure rated ductile iron pipe.



SEWAGE PUMP STATION
FOR FLOWS EXCEEDING 70 G.P.M.
(EXHIBIT ONLY)

Issued: _____

Revised: _____

Town of Bennett

Drawing No.
LS-3