PUMP STATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
1. Demolition, excavation and backfilling required for the complete construction of a replacement recessed wet well sanitary sewer pump station. This shall include all pumping units and appurtenances, pipes, valves and structures necessary to complete the system as indicated on the drawings.

1.02 GENERAL

A. The Town's pressure sewer system has been standardized on the basis of factory built pumping stations of similar quality to those manufactured by Smith & Loveless Inc. of Lenexa, Kansas or Pumping Systems Inc. of East Weymouth, Massachusetts.

B. The design of all pumping stations must be reviewed and approved by the Town Wastewater Department prior to construction. 3-phase power shall be used for all pump stations, wherever feasible.

C. Multiple pumps or ejector units shall be provided with each raw wastewater pumping station. For duplex stations, each pumping unit shall be identical, and with sufficient capacity to handle the design peak hour effluent flow with one pump off-line.

D. Wastewater pumping station structures and electrical and mechanical equipment shall be protected from physical damage as the result of a flood of 100 year recurrence interval. All pumping stations shall be designed to be fully operational and accessible during a flood of 25 year recurrence.

E. All pumping station sites shall be fully accessible by maintenance vehicles during all weather conditions. Gravel access roads and associated easements must be conveyed with the pumping station.

F. Water supply for wash down and maintenance shall be provided at a yard hydrant to be located within 10 feet of the wet well access hatch. The Town is not obligated to take ownership of any pump station that serves developments. If ownership is transferred and accepted by the Town it must meet the requirements of these specifications in full.

1.03 SUBMITTALS

A. Shop drawings shall be submitted to the Engineer for approval prior to any equipment being delivered to the site. Shop drawings shall include all structural, mechanical and electrical components with detailed dimensions and specifications.

B. Two complete operation and maintenance manuals shall be provided prior to final acceptance of the pump station by the Engineer.

1.04 QUALITY ASSURANCE

A. All materials and construction of same shall be as shown on the contract drawings and shall meet the requirements of the Town Sewer Department.

B. The recessed wet well mounted pump station shall be supplied complete by an experienced pump station manufacturer.

C. All applicable regulations of the Occupational Health and Safety Administration should be followed when assembling, installing, or servicing this pump station. In particular, this pump station is a confined space, under no circumstances should it be entered without the required safety equipment and precautions.

D. Electrical Equipment: Electrical systems and components (e.g. motors, lights, cables, conduits, switch boxes, control circuits, etc.) shall comply with the National Electrical Code, latest edition. In addition, equipment located in the wet well shall be suitable for use under corrosive conditions.

1.05 REFERENCES

A. The Standard Specifications shall refer to the Vermont Agency of Transportation Standard Specifications for Construction (1990 Edition).

1.06 WARRANTY

A. The pump station manufacturer will take full responsibility for startup and operator training. The pump station manufacturer will warranty the station as a unit against defects in material and workmanship for one year from the date of startup.

PART 2 - PRODUCTS 2.01 GENERAL

A. The Contractor shall provide all fittings, couplings and appurtenances to provide a complete and operable system.

2.02 WET WELLS

A. A reinforced concrete foundation shall be provided for the wet well and pump chamber, designed by a structural engineer licensed in the State of Vermont.

B. The foundation and structure shall be designed to prevent flotation of the dry well and wet well under worst case conditions. Flotation computations shall be submitted as part of the design for review by the Town.

C. The effective volume of the wet well shall be established such that the filling time shall not exceed 30 minutes under design average flow conditions (unless equalization is incorporated in the design). When the anticipated initial flow tributary to the pumping station is less than the design average flow, provisions shall be made such that a 30 minute fill time is not exceeded for initial flows.

D. Suitable and safe means of access for persons wearing self-contained breathing apparatus shall be provided to both the dry well and to the wet well.

E. Pre-cast concrete wet wells shall be of steel reinforced design with a documented compressive strength of 4000 psi at 28 days. Butyl rubber gaskets shall be specified at all joints.

F. All pipe penetrations shall be pre-cast openings with flexible rubber boots or compression fittings to create watertight connections.

G. The top of the wet well shall be designed with a 30" x 30" wet well access hatch of 1/4" diamond plate aluminum suitable for concrete embedment. The hatch shall include a lockable latching device.

H. The pre-cast concrete wet well shall be externally coated with an asphaltic sealant and tested for water tightness using an approved vacuum or water testing procedure.

I. The wet well suction inlets shall be designed in accord with the standards set in ASCE Manual #37, Design and Construction of Sanitary and Storm Sewers, to minimize the deposition of solids.

2.03 DRY PIT/RECESSED PUMPING STATION

A. The station may be prefabricated and factory-built or built on the site. The foundation and structure shall be designed to prevent flotation of the dry well and wet well under worst case conditions. Flotation computations shall be submitted as part of the design for review by the Town.

B. As a minimum, the station shall include two vertical dry-pit submersible, non-clog sewage pumps, 3 phase motors (for pump motors over 5 HP in size), valves, internal piping, control panel with circuit breakers, variable frequency drives and automatic level controls, lighting, sump pump, ventilator, dehumidifier, heater with adjustable thermostat, wiring, elapsed time meters for each pump and a remote alarm system tied into the Town's radio telemetry system. The pumping system shall be designed to pass 3" solids without clogging. Lifting equipment shall be provided capable of lifting pumps and motors in and out of the dry well for maintenance.

C. A dehumidifier assembly with a hermetically sealed Freon compressor, expansion coil, fan, and condenser coil shall be furnished which shall maintain the relative humidity of the air in the pump chamber low enough to prevent condensation on the walls. The dehumidifier shall be controlled automatically by an adjustable humidistat and low air temperature cutout. The condensate shall be drained to the sump.

D. The station shall be provided with a 36" wide x 6'-10" insulated metal door hinged at one side to provide access to the equipment chamber. The equipment chamber access cover shall be designed with a lockable latching device. The fiberglass cover shall be formed with a drip-lip around the edge to prevent rainwater from entering the equipment chamber or wet well. Aluminum stairs shall be located in the equipment chamber to provide ready access from the surface.

E. A heavy synthetic rubber mat shall be cemented to the station floor in the walkway area after the final coat of paint has been applied.

F. Light fixture(s) shall be installed in the pump chamber to provide adequate illumination for the control panel and other areas. Lights shall be turned on automatically when the entrance lid is raised, and a manual switch shall be provided to maintain the lighting when the lid is closed.

G. Lifting points shall be installed for lifting pumps directly above each pump. The design shall have provision for a sump pump with minimum 100 gph capacity operating off a float switch in the dry pit sump. Two check valves and a gate valve shall be installed on the discharge line. The pipe shall enter the wet well at an elevation of 6 feet or more below final grade and above alarm level.

H. A ventilating blower shall provide air circulation to the floor of the pump chamber. The exhaust outlet shall be screened to prevent the entrance of foreign matter and insects and shall have a suitable cover to prevent the entrance of rain and snow.

I. Fresh air to the pump chamber shall be drawn from the surface. The air inlet shall be screened to prevent the entrance of foreign matter and insects and shall have a suitable cover to prevent the entrance of rain and snow. The blower shall be sized to exchange the air in the station once every two minutes. The ventilating blower and station lights shall be turned on automatically when the entrance tube cover is raised and shall have a manual cold weather switch located on the inside of the entrance cover. A dual range thermostatically controlled electric heater shall be provided within the pump station to keep the temperature within the pump chamber above freezing.

J. The heater will be provided with an automatic circulating fan, thermostatic control and an ON-OFF switch. The heater will be operated by connection to the convenience receptacle located on the control panel.

K. A mercury float switch shall not be used. Wet well high and low alarms should be based on the bubbler pressure transmitter signal. Float switches shall each have two normally open and two normally closed contacts. Float switches will be wired to the local alarm system that will automatically activate the alarm at the main pumping station via a radio.

1. DRY PIT

i. Dry wells, including the associated superstructure, shall be completely separated from the wet well. Common walls and pipe penetrations shall be gas tight. Secondary pump H-O-A- switches, run lights and alarm silencer shall be located in an auxiliary panel located near the top of the dry well. The panel shall be located to allow access by maintenance personnel without entering the dry well. The dry well shall be constructed with entry stairs, automated ventilation and shall not be constructed in a way to be considered a confined space under OSHA regulations.

2. RECESSED UNIT

i. The equipment chamber shall be provided with a split fiberglass cover hinged at the partition wall separating the equipment chamber from the access man way to the wet well. Both the equipment chamber and wet well access covers shall be designed with lockable latching devices. The fiberglass cover shall be formed with a drip-lip around the edge to prevent rainwater from entering the equipment chamber or wet well. Brackets shall be provided to support the cover in the open position and to restrain it under load. An aluminum ladder shall be located in the equipment chamber to provide ready access from the surface.

ii. The station shall be prefabricated and factory-built in one complete assembly. The pumping chamber shall be designed to mount directly on top of the pre-cast concrete wet well with a watertight seal. The supporting floor plate shall be minimum ⅜" thick steel plate with reinforcing as required to prevent deflection and to ensure rigidity. The station shell shall be a minimum of 1/4" inch or heavier, ASTMA-36 steel plate. All outside surfaces shall be ground smooth, blasted with steel grit, and coated with two coats of coal tar epoxy polyamide coating. Factory-built, recessed-mounted and surface mounted stations, including the associated superstructure, shall be completely separated from the wet well. Common walls and pipe penetrations shall be gas tight.

iii. Two 17-pound magnesium anodes shall be provided as cathodic protection and shall include 30" long insulated copper leads. Copper lugs shall be provided by the Manufacturer on opposite sides of the station for anode connections. A heavy synthetic rubber mat shall be cemented to the station floor in the walkway area after the final coat of paint has been applied.

2.04 SEWAGE PUMPS

A. The sewage pumps shall be designed such that, with any one pump out of service, the remaining unit(s) will have capacity to handle the design peak hourly flow. The pumps shall be new vertical submersible dry-pit, non-clog type specifically designed for raw sewage applications. The pumps shall be 4", 6" or 8" non-clog solids handling pumps designed specifically for handling sanitary sewage.

B. Each pump shall be of heavy cast iron construction. The shaft shall be of solid stainless steel construction sealed against leakage by a double mechanical seal. Impellers shall be of the enclosed type made of close-grained cast iron. All impellers less than full diameter shall be trimmed, to prevent the buildup of foreign particles.

C. The pump shall be designed such that the rotating element can be easily removed from the volute, without disconnecting the seal system, electrical wiring or removal of the motor from the back head and seal. The pump shall be supported via a floor-mounted cast iron base with four legs to provide rigidity and balance. The motor shall be fitted with heavy lifting eyes or lugs, each capable of supporting the entire weight of the pump and motor.

1. Vacuum primed/self primed

i. A separate and independent priming system shall be furnished for each main pump, providing complete standby operation. Each priming system shall be complete with vacuum pump, vacuum control solenoid valve, prime level sensing probe, and a float operated check valve installed in the system to prevent liquid entry into the vacuum pump head.

ii. Vacuum pumps shall be constructed of corrosion resistant components and shall be capable of priming the main pump and suction piping in not greater than 60 seconds under rated static lift conditions.

iii. Unless self-priming sewage pumps are specified, multiple vacuum priming pumps shall be provided. For duplex stations, two priming pumps shall be specified with associated piping to allow use with either sewage pump.

iv. Each pump shall be of heavy cast iron construction specifically designed for vacuum priming and use of mechanical seals. The shaft shall be of solid stainless steel construction through the mechanical seal for corrosion and abrasion resistance.

2.05 INTERIOR PIPING AND VALVES

A. Pump suction and discharge piping shall be drilled and tapped for 125 pound American Standard flanges. All flanged ductile iron pipe shall meet the requirements of ANSI A21.51 (AWWA C151) latest version. All suction and discharge pipes hall be equipped with the appropriate gauges for reading mg/Hg and psi and shall be scaled to read within 1 unit or less.

B. Pump suction lines protruding through the equipment chamber wall shall be sealed with multiple link seals or welded to create a gas-tight seal. Suction and discharge valves shall be new non-lubricated eccentric type plug valves with resilient facings and 1/4 turn operating valve. All valves shall be supplied with ANSI 125 pound flange end connections. New check valves shall be placed on the discharge lines between the pumps and the plug valves. Check valves shall be non-slamming, bronze mounted swing type valves with bolted covers and outside levers. Check valves shall have ANSI 125 pound flanged ends.

2.06 EMERGENCY STORAGE AND PUMPING REQUIREMENTS

A. All wastewater pumping stations shall include provision for emergency power to prevent flooding in the event of a power outage. Manual transfer switches shall be required for all stations. A cord and cap connection shall be installed to connect the generator to the transfer switch. The cord end shall be of the style and size required for connection to the Wastewater Department's portable generator. On a case-by-case basis, emergency storage tanks may be considered by the Town Wastewater Treatment Department. The designer should insure that a minimum emergency storage volume of 25% of the design average daily flow (or 4 hours storage based on a 16 hour operating day) is provided for each pumping station if requested by the Town Wastewater Treatment Department.

B. Emergency storage tanks shall have at least one manhole access to grade with aluminum or copolymer plastic ladder rungs at 8" on center. The manhole access shall have a cast iron from and cover (LeBaron LC266 type C or equal) or a 30" x 30" hinged, diamond plate hatch (Bilco or equal).

C. The emergency storage system shall be free-draining toward the wet well with the fill/drain pipe invert elevation above the high water alarm level. The emergency storage tanks shall not be used as part of the normal pump dose volume.

D. An emergency pumping connection shall be made to allow maintenance personnel to pump into the force main with a portable pump in the event of an emergency. The force main connection shall include a four (4), or six (6) inch quick connect hose fitting and associated valves. On a case-by-case basis, the Town Wastewater Treatment Department may require an emergency generator. (For example, environmentally sensitive locations).

2.07 ELECTRICAL

A. Variable Frequency Drives shall be used for all pumps. The Town Wastewater Department may request a particular brand for maintenance and repair reasons. When permitted PVC piping shall be used in all areas that meet the requirements of the National Electric Code.

B. Electrical systems and components (i.e. motors, lights, conduits, switch boxes, control circuits, etc.) shall not be installed in raw sewage wet wells. Electrical systems and components in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors may be present, shall comply with the National Electric Code requirements for Class I Group D, Division 1 locations and shall be corrosion resistant. Each flexible cable shall be provided with a watertight seal and separate strain relief. A fused disconnect switch located above ground shall be provided for the main power feed for all pumping stations. When such equipment is exposed to weather, it shall meet the requirements of weatherproof equipment NEMA 4. A 110 volt power receptacle to facilitate maintenance shall be provided inside the control panel for lift stations that have control panels outdoors. Ground fault interruption protection shall be provided for all outdoor outlets.

C. All wiring shall meet the requirements of the National Electric Code and shall be color-coded as indicated on the wiring diagram. All wiring outside the panel shall be in conduit, except for the 115 volt accessory items that are provided with insulated service cord. Conduit shall be provided from the control panel across the ceiling, and up the entrance tube to receive the feeder lines, and shall terminate in a threaded conduit connection through the wall of the entrance tube. All receptacles shall be of the ground fault type. Accessory items such as the sump pump, heater, dehumidifier and air compressors shall be plugged into polarized grounded convenience outlets located close to their installed position so that such items can be readily removed and serviced if necessary.

D. The package pump station shall be completely pre-wired at the factory, except for the power feeder lines. All wires shall meet the requirements of the National Electrical Code and shall be color-coded as indicated on the wiring diagram. All wiring outside the panel shall be in conduit, except for the 115 volt accessory items that are provided with insulated service cord. Conduit shall be provided from the control panel across the ceiling, and up the entrance tube to receive the feeder lines, and shall terminate in a threaded conduit connection through the wall of the entrance tube. All receptacles shall be of the ground fault type.

E. All material and equipment necessary for a complete and workable electrical system shall be furnished and installed including: conduit and fittings, wire and cable, service panel, grounding, alarm system, connections to pump station, power company connection fees, telephone service fees. The above grade panel and signal communicator shall be provided by the pump station manufacturer and shall be PVC , fiberglass, aluminum, or stainless steel construction.

F. All materials and equipment shall meet the standards of the National Electrical Manufacturers' Association and Underwriters Laboratories, Inc., and shall bear their label whenever standards have been established and label service is available. Installation of electric systems and controls shall be in conformance with the latest edition of the National Electric Code, local ordinances and regulations prescribed by the local Power Company.

G. Completed electric work performed shall comply with the latest edition of the National Electric Code Underwriters Laboratories regulations and all Municipal, State and other public or private authorities having jurisdiction. The developer is responsible for acquiring all necessary permits.

H. All equipment and workmanship shall be guaranteed to be free from mechanical and electrical defects for a period of one year from the day of final acceptance. Any replacement of parts or adjustments, including labor made necessary by such defects and adjustments, shall be rectified without cost to the Town.

Required Testing:

1. All mechanical, control and alarm functions shall be tested in the presence of the Town representative to demonstrate that all equipment is fully operational.

2. Any grounds, opens, shorts or other defects shall be rectified at no cost to the Town before acceptance.

2.08 CONTROLS

A. Pumping sequence shall be arranged in an alternating lead/lag configuration. When liquid level reaches the predetermined lead pump on elevation, the designated lead pump shall start automatically. This pump shall continue to operate until such time as the liquid level falls below the designated pump off elevation. If flow into the wet well exceeds the capacity of the lead pump, and liquid level rises to the lag pump on elevation, then the designated lag pump shall be automatically activated. Both the lag pump and the lead pump shall continue to operate until liquid level falls to the pump off elevation.

B. A high level alarm condition shall occur if liquid level rises above the predetermined alarm level (typically established at an elevation 6" above the lag pump on elevation). The alarm condition shall remain in affect until manually reset from the control panel. The main equipment control system shall be mounted internally within the pump station in a NEMA 4 panel, complete with suitable latching devices.

C. All circuit breakers, pump control switches shall be mounted so that they are operable without opening the cabinet. The low voltage, automatic pump control section shall be separate from the high voltage circuit breaker motor section and shall be provided with a hinged access door and latch. The control switches shall be mounted on the face of the automatic pump control section door. A grounding-type convenience duplex outlet shall be provided for 115 volt AC operation.

D. An auxiliary control panel shall be provided immediately adjacent to the access door in the dry well and shall contain: pump control switches for each pump, runtime meters, and pump run lights. Thermal magnetic circuit breakers shall be provided for branch-circuit and over current protection of all motor, control and auxiliary circuits.

E. All pump motors shall be provided with VFD control and a VFD bypass switch. Each VFD shall be capable of an alarm condition in the case of malfunction and the pump cannot run. All switches shall be labeled and a coded wiring diagram shall be provided. An automatic alternator with manual ON-OFF switch shall be provided to change the sequence of operation of the pumps on the completion of each pumping cycle.

F. Provisions shall also be made for the pumps to operate in parallel, should the level in the wet well continue to rise above the starting level for a low-level pump. The panel shall include a time delay to prevent the simultaneous start-up of both pumps.

G. A running time meter shall be supplied for each pump to record the hours of operation. The meter shall be enclosed in a dust and moisture proof molded plastic case. The flush mounted dial shall register in hours and tenths of hours up to 99999.9 hours before repeating. The meter shall be suitable for operation from a 115 volt, 60 cycle supply and be mounted on the surface of the control cabinet.

H. An automated generator start, alarm and transfer switch adequate for normal operation of the pump station. All pump stations shall include a level sensing unit capable of providing a 4-20mA signal.

I. All pump stations shall be equipped with a back-up control system in the event of a primary control failure . Any of the following primary devices shall be considered acceptable for control of the pumps and for activating alarms based on sewage level in the wet well:

1. Ultrasonic level sensors (Badger Meter Model 2100 or equal).

J. Submersible level transducers (Consolidated Electric Model 157GSC or equal).

K. Direct acting non-mercury float switches (Consolidated Electric Model 9G or equal).

L. The following secondary devices shall be considered acceptable for back-up control of the pumps and for activating alarms based on sewage level in the event of a level sensor failure:

1. Direct acting non-mercury float switches (Consolidated Electric Model 9G or equal).

2.09 RADIO TELEMETRY SYSTEM

A. Each pump station shall be equipped with a radio telemetry unit (RTU) that is capable of being integrated with the Wastewater Department's current system. Each RTU shall be wired to the pump station's control panel and shall input:
- Sewage pump status
- Sewage pump fail
- Power failure
- Wet well level (continuous)
- Wet well high level
- Wet well low level
- Station flood alarm
- Pump 1 and 2 run times

2.10 SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)

A. All Town owned pump stations shall be integrated into the Wastewater Department's SCADA system. The control panel must be able to receive and output a 4-20mA signal. A voltage signal will not be accepted. All costs associated with the integration shall be at the expense of the developer or owner. The Town shall not be liable for any costs.

2.11 SPARE PARTS

A. A complete replacement pump shaft seal assembly shall be furnished with each lift station. The spare seal shall be securely fastened to the control panel and shall include complete installation instructions.

B. Two (2) spare volute gaskets shall be provided.

C. A spare filter cone for the seal filter shall be provided in the same container as the pump shaft seal.

D. Provide 100%%% spare lamps and fuses for control panel.

E. Provide all lubricants required for initial operation.

F. Provide one (1) spare input and output card, processor, and power supply for the Programmable logic controller (PLC) system.

G. Provide one (1) spare level transducer.

2.12 O & M MANUALS

A. Installation of all mechanical equipment shall be done in accordance with written instructions provided by the manufacturer. Installation instructions shall be delivered with the station.

B. The manufacturer shall provide 5 copies of a complete and detailed operating and maintenance manual. This manual shall provide all design criteria, general operating procedures, maintenance and servicing procedures for all major components, and as-built drawings of the contributory gravity sewer system, the pumping station and force main. All instructions and parts lists shall be prepared for the specific equipment furnished and shall not refer to similar equipment. Operating manuals must be submitted to the Town prior to final acceptance of the station.

PART 3 - EXECUTION

3.01 EXCAVATIONS

A. Excavations shall be made to a point at least 6 inches below the existing structures to accommodate the new pump station. All excavations are to be kept dry throughout construction until the structures have been inspected by the Engineer and approval given to commence backfilling operations.

3.02 BACKFILL

A. Backfill shall consist of materials meeting the granular borrow requirements of the Backfill Section.

3.03 FIELD TEST

A. Upon completion of installation, the Contractor shall conduct a field test in the presence of the Engineer to demonstrate that the pumping units and all appurtenances are properly installed and deliver the specified flow/head requirements. All necessary equipment and labor to perform the test shall be furnished by the Contractor.

EXCAVATION AND BACKFILLING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities and the pump station.

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.03 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 5.5 pound rammer and 12 inch drop.

1.04 SUBMITTALS

A. Testing laboratory reports indicating that material for backfill meets requirements of this Section.

B. Field density test reports of backfill in place.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. Compacted Fill/Granular Borrow: Free of shale, clay, friable material, debris, and organic matter, graded in accordance with ANSI/ASTM C136 within the following limits:

Sieve Size	Percent Passing
3/4 Inch	75 - 100
No. 4	20 - 100
No. 100	0 - 20
No. 200	0 - 6

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

3.03 PROCEDURES

A. Existing Utilities:

1. Unless shown to be removed, protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to excavations. If damaged, repair or replace at no additional cost to the Owner.

2. When existing underground utilities, which are not scheduled for removal or abandonment, are encountered in the excavation, they shall be adequately supported and protected from damage. Any damage to utilities shall be repaired promptly at no additional cost to the Owner.

3. If the service is interrupted as a result of work under this section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.

4. If existing utilities are found to interfere with the permanent facilities being constructed under this section, immediately notify the Engineer and secure his instructions.

5. Do not proceed with permanent relocation of utilities until instructions are received from the Engineer.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the work, and post warning lights or signs.

2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this section.

C. Dewatering: The Contractor, at all times, shall conduct his operations so as to prevent the accumulation of water, ice, and snow in excavations or in the vicinity of excavated areas, and to prevent water from interfering with the progress of quality of the work. Under no conditions shall water be allowed to rise in open excavations after utilities have been placed.

D. Accumulated water, ice, and snow shall be promptly removed and disposed of by pumping or other approved means. Disposal shall be carried out in a manner which will not create a hazard to public health, nor cause injury to public or private property, work completed or in progress, or public streets, nor cause any interference in the use of streets and road by the public.

3.04 EXCAVATION

A. Care shall be exercised by the Contractor to avoid disrupting the operation of existing facilities to remain in place.

B. Provide sheeting and shoring necessary for protection of the work and for the safety of personnel.

C. Excavation shall not interfere with normal 45° bearing splay of foundations.

D. All excavations shall be in accordance with the latest OSHA requirements.

E. Where utility runs traverse public property or are subject to governmental or utility company jurisdiction, provide depth, bedding, cover, and other requirements as set forth by legally constituted authority having jurisdiction, but in no case less than the depth shown in the Contract Documents.

F. Where excavations occur in existing lawns, remove turf or plantings in sections and keep damp. Replace upon completion of the backfilling.

3.05 BACKFILLING

A. Backfilling shall not be done in freezing weather, with frozen materials, or when materials already placed are frozen.

B. Backfill material shall be evenly spread and compacted in lifts not more than 12 inches thick or as approved by the Engineer. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction.

C. Take special care that backfilling operations do not damage the pump station or pump station coatings.

D. Backfill material shall be compacted to the following percentages of maximum dry density and the in-place moisture content shall not be more than 2% above the optimum moisture content, as determined by Standard Proctor ASTM D698.

1. Around all structures, under roadway paving, shoulder and embankments - 95%.

2. All other areas - 90%.

SITE ENGINEER:

CIVIL ENGINEERING ASSOCIATES, INC.
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

COPYRIGHT © 2016 – ALL RIGHTS RESERVED

DRAWN
SAL
CHECKED
DSM
APPROVED
DSM

OWNER:

PHILO RIDGE, L.L.C.

2766 MT. PHILO RD.
CHARLOTTE, VT.

PROJECT:

SITE IMPROVEMENTS

2766 MT. PHILO RD.
CHARLOTTE, VT.

DATE	CHECKED	REVISION

PUMP STATION SPECIFICATIONS

DATE
OCT., 2016
SCALE
AS SHOWN
PROJ. NO.
16107

DRAWING NUMBER
C2.5

P:\ACAD\Projects\2016\16107\CADD\Plots\16107Dwg16107 - Site.dwg 10/4/2017 7:19:53 AM